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PRESS RELEASE

Imperfect exchange rate pass-through: the role of distribution services and variable demand elasticity

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This paper presents a model that integrates different mechanisms, generating a realistic pass-through of exchange rate fluctuations into the price chain. These features, that have hitherto been considered separately in the literature, are integrated into a Dynamic Stochastic General Equilibrium model so that the impact of the exchange rate on other macro-variables, such as the trade balance and output, can also be analysed.

This is a two-country model and in each country there are two production sectors, the non-traded and the traded goods sector. These sectors produce differentiated goods and services so that the firms have the market power to set their price. The traded goods are sold in the home market and in the foreign market via local distribution sectors that combine the traded goods with non-traded services in fixed proportions. The traded goods producers will set a different price for the home market and for the foreign market depending on:

- the nominal rigidity in each market. Prices are sticky according to a Calvo set-up that allows for a partial indexation to the lagged inflation rate in each market. In the event of any currency depreciation, the price of imported goods will only gradually adjust because of this price stickiness. The pass-through of the exchange rate in the short run is therefore smaller than in the long run;
- the elasticity of substitution in demand which determines the equilibrium mark-up. As traded goods are sold abroad through the local distribution sector, that combines them with non-traded services, this mark-up is calculated on the total marginal cost which in turn depends on the production costs of the traded goods sector and on the price of the non-traded services. As a result, the sales price will adjust less than proportionally to changes in the marginal cost of the traded goods sector and to changes in the exchange rate (for the import/export price). This also implies that the import price of traded goods at the border will not move one-for-one with the exchange rate. Moreover, the exchange rate determines the relative weight of the traded good price in the retail price and thus influences the mark-ups. So distribution margins explain why the pass-through is imperfect even for the import price at the border;
- the endogenous variation in the elasticity of substitution and the mark-up as a function of the relative price (or market share). The model assumes that producers face an elasticity of demand that is a positive function of their price. Consequently, if the currency depreciates, foreign exporters, who do not want their price to deviate too far from their competitors' prices, will reduce their optimal mark-up in order to defend their market share. So this is a second channel that explains a partial pass-through of the exchange rate to import prices at the border. This feature also generates a slow adjustment of prices that reinforces the impact of the nominal price stickiness.

Together, these features explain a pass-through that is smaller on impact but increasing over time, imperfect even for import prices at the border, and decreasing over the price chain. It is highest for prices at the border, then for the retail import price and finally for the aggregate CPI.

These mechanisms also modify the real effects of exchange rate fluctuations. For instance, the presence of distribution costs implies much lower expenditure-switching effects because they are determined by the retail import price which is much less volatile than the border prices. On the other hand, the presence of endogenous mark-ups implies that the terms of trade improve on impact following a depreciation: exporters increase their mark-ups instead of expanding their market share and importers are reluctant to raise their prices because of the competitive pressure. The immediate improvement of the terms of trade lowers the deflationary effects of the exchange rate depreciation on domestic demand. These two effects also explain the trade balance adjustment following a depreciation: the endogenous mark-up tends to improve the trade

balance on impact because of the terms-of-trade improvement, while the distribution sector reduces the improvement in the trade balance by weakening the expenditure-switching effect. The impact of these mechanisms on the real exchange rate is also analysed in detail. The real exchange rate shows large fluctuations because of an internal relative price effect (changes in the relative price of traded versus non-traded goods) and because of a market segmentation effect (deviations of the law of one price for traded goods).

The paper also discusses how the variable demand elasticity provides a solution to deal with the documented decline in the exchange rate pass-through. Enhanced competition stemming from increasing globalisation may have made producers more attentive to their relative price and thus less inclined to change their prices in response to exchange rate movements. The demand elasticity and the implied optimal mark-up can also change with changing market conditions over time.