

# Commentary: The International Price System

---

*Charles Engel*

I thank the organizers of this conference for inviting me to discuss this very interesting paper by Gita Gopinath. Gita has done a great job organizing the empirical research on prices and exchange rates, providing a coherent framework for understanding the data and introducing new ideas that will surely stimulate further research. This is a valuable contribution for policymakers to our understanding of the impact of import prices on inflation and for academics to the literature on exchange-rate pass-through.

Let me begin by summarizing the empirical findings. First, a very disproportionate share of international trade is denominated in U.S. dollars, and to a lesser extent, in euros. This matters because nominal prices adjust slowly, so the dollar price of goods invoiced in dollars reacts slowly to exchange rate changes.

In turn, this has implications for the effects of exchange rate changes on the local currency prices of imports. When, for example, the dollar appreciates relative to the yen, the yen price of dollar-denominated imports rises almost one-for-one. The exchange rate has a large effect on yen prices of imported goods—keeping in mind that 71 percent of Japanese imports are priced in dollars even though only 13 percent of their imports come from the United States. On the other hand, U.S.

imports overwhelmingly are priced in dollars, so a change in the dollar exchange rate has very little impact on the dollar price of imports. Gita emphasizes the asymmetry in the global effects of exchange rates on inflation. To the extent that trade is denominated in U.S. dollars, then when the dollar appreciates, U.S. goods lose competitiveness on world markets but U.S. import prices move little. In other countries, export competitiveness is therefore not influenced by movements in dollar exchange rates, but import inflation is impacted.

Then Gita shows that even when prices have a chance to adjust, the dollar prices of goods that are invoiced in dollars do not respond much to exchange rate changes. That is, one might think that once exporters are given a chance to adjust prices in response to a dollar appreciation, the ones that set the price in dollars might significantly reduce the dollar prices. And, conversely, the ones that set the price in the importer's currency might increase the price in units of the importer's currency, so that given a chance to adjust prices, the currency of invoicing does not matter. But that is not the case. The long-run response of prices to exchange rate changes is not very different from the short-run adjustment.

Gita then explains this finding using economic theories of pricing. Her point is that it is not the currency of invoicing that determines the long-run pass-through. Instead, the causality goes the other way. For example, consider a firm which exports to the United States. It may be profit-maximizing for the firm to maintain market share. It does not want to pass on cost changes to its price and move its price too far out of line from its competitors. In the short run, when nominal prices are sticky, the firm will choose to price in dollars because its competitors have also priced in dollars. That means that when the exchange rate changes, its dollar price does not automatically change. In the short run, the firm's price automatically stays in line with other firms that set prices in dollars, so its goal of maintaining competitiveness is automatically satisfied. Hence, it is the long-run considerations that determine the invoicing decision. But it is the invoicing decision that determines the effects of nominal exchange rate changes on inflation of imported goods.

Here, I will highlight, or emphasize, five points.

## I. Vehicle-currency Pricing

Gita explains existing models of the currency of invoicing, but interprets them in a novel way that I think is worth stressing.

The models mostly have been developed in a two-country setting. An exporter either prices in its own currency or the importer's currency. When there are strategic complementarities, the exporter prices in the importer's currency so that import prices are insensitive to exchange rates. This has been called *local-currency pricing*.

In a multicountry world, Gita suggests that the goal of keeping one's price similar to other competitors' prices could be achieved by pricing in any agreed upon currency—such as the U.S. dollar. This has been called a “vehicle currency.”<sup>1</sup> As long as all firms set their prices in a vehicle currency, then their prices relative to each other are insensitive to exchange rates.

This is an interesting and plausible idea, though there are questions that are left unanswered. Why do firms settle on *vehicle-currency pricing* instead of *local-currency pricing*? Under local-currency pricing, there is no pass-through of the exchange rate to the importer, but under vehicle-currency pricing there is pass-through but it is the same in the short run for all exporters. What determines vehicle-currency pricing instead of local-currency pricing?

Indeed, if firms choose vehicle-currency pricing, what determines the vehicle? Why is it primarily U.S. dollars? Gita suggests that pricing in special drawing rights (SDR) would make the effects of exchange-rate pass-through more symmetric globally.

Gita suggests the possibility of multiple equilibria. If exporters agreed to price in Chinese renminbi, for example, then they would achieve pretty much the same goal as pricing in U.S. dollars. But the Chinese would benefit from having their import prices less sensitive to exchange-rate changes. However, we don't know what sort of policy or stimulus would lead exporters to switch from dollars to renminbi. Again, this is a question that deserves further study.

## II. Pass-through to Consumer Prices

Almost all of the empirical analysis in the paper concerns the effects of exchange rates on import prices. Only one small section looks at consumer prices. But I think it is worthwhile to consider consumer prices further.

In a sense, all consumer prices are “invoiced” in local currency. American consumers buy goods priced in dollars; European consumers buy goods priced in euros, etc. There are very few exceptions to this in the world.

To some degree this makes the invoicing of imports moot. The imported good is taken at the dock by a distributor and brought to a retail outlet to sell to the consumer. In the very short run, a change in the exchange rate has no effect on the consumer’s price because it is set in the consumer’s currency. The demand for the good and therefore the revenue in the consumer’s currency is then unaffected by the change in the exchange rate. Invoicing only matters for how the revenue is split between the distributor and the exporter when the exchange rate changes. If they both hedge exchange rate changes, the short-run effect of currency fluctuations is further muted.

Now, Gita’s evidence shows that consumer prices *are* sensitive to some extent to the currency of invoicing of imports. The question is why? Is it because, when the dollar appreciates, the distributor is more likely to pass along the exchange rate change to consumer prices when the import is priced in dollars? But if the import is priced in the local currency, then why won’t the exporter pass along the exchange rate change? To understand this requires a more sophisticated model of the interactions between consumers, distributors and exporters.<sup>2</sup>

I don’t want to overemphasize this point. Most traded goods are not final consumer goods. Many traded final goods are investment goods such as machines. And many traded goods are intermediate goods that may be used in the production of final consumer goods. In both cases, we can think of the importer as the final buyer of the good, and Gita’s theoretical analysis applies directly.

In any case, it is worth noting that local currency price stickiness for final consumer goods is one major reason why imports tend to be pretty insensitive to exchange rate changes in the short run.

### III. Monetary Independence

It is sometimes claimed that monetary policy in any country with its own currency is immune to outside forces. If a country has its own currency, the central bank can determine the inflation rate no matter what happens in the rest of the world. That argument can be quickly put to rest. The argument is logical when goods prices adjust freely. But when there is nominal price stickiness, the outside world matters because of the trade-offs central banks face. When the dollar appreciates and yen prices of dollar-denominated imports rise, the Bank of Japan faces the problem of reducing aggregate demand and possibly raising unemployment to offset the inflationary effects of import prices.

On the other hand, this same consideration leads me to offer a warning about a possible misinterpretation of Gita's results. Gita finds that countries whose imports are priced in foreign currency experience more pass-through to the local-currency price both in the short run and the long run. In the short run, it means these countries' inflation rates are more sensitive to exchange rates. That does *not* mean that in the long run inflation sensitivity to external forces depends on the currency of invoicing or on pass-through. In the long run, when nominal prices have fully adjusted, the inflation rate is fully determined by local monetary policy. Pass-through in the long run refers to the pass-through of real costs to relative prices. In the long run, real rigidities do not matter for inflation.

### IV. Global Repercussions of Monetary Policy

Gita's analysis has emphasized the spillover effects of monetary policy that come through the exchange rate. It is worth mentioning that monetary policy has important spillover effects that work through other channels.

Gita looks at the effects of exchange rate changes holding the exporter's price constant, and holding aggregate demand in the exporter country constant. Suppose the United States has an expansionary monetary policy, as it did in the aftermath of the global financial crisis. One effect of that might be a depreciation of the dollar. That has a negative impact on aggregate demand in other economies, because it makes U.S. exports cheaper and switches demand toward U.S. goods.

But there are offsetting effects. For one, it raises inflation in the United States, which works the other way in terms of global competitiveness.

More importantly, I think, is that the expansionary effect on the real U.S. economy increases real import demand by the United States. This is an important positive spillover. Indeed, empirically, I believe that import demand in most countries is much more directly related to income and the business cycle than it is to the exchange rate.<sup>3</sup>

## V. Exchange Rate Misalignments

My final point steps a bit outside of the focus of Gita's paper. I want to note the exchange rate matters by itself, beyond its effects on aggregate demand. Exchange-rate misalignments cause some global misallocation of resources, even when they work in a desirable direction on aggregate demand.

Let me give a specific example to make my point. In the past year, both the Japanese yen and the euro have depreciated against the U.S. dollar by about 19 percent. In many ways, this is a welcomed development. While the U.S. economy has been picking up steam, the recoveries in Japan and Europe have been more sluggish. The depreciation of the dollar has had the desirable effect of deflecting some demand from U.S. goods toward Japanese and European goods.

Because wages in local currencies adjust slowly, this dollar depreciation is reflected as a gain in labor-cost advantage for Japanese and European firms relative to U.S. firms. However, from the perspective of global resource allocation, this change may be distortionary. Japanese and European firms have gained a cost advantage relative to U.S. firms, but not because they have become significantly more

productive. The change mainly reflects markets' anticipation of monetary policy, and financial market developments, in conjunction with sticky nominal wages.

There are other examples of distortions introduced by the dollar appreciation. Because consumer prices are set in local currencies, there have been large swings in the prices consumers in Japan and Europe pay for identical goods or close substitutes relative to prices U.S. consumers pay. Econ 101 tells us that there is a misallocation when consumers pay different prices for identical or near-identical goods.

U.S. investors that hold European or Japanese assets have lost ground relative to their counterpart investors in Europe and Japan. Stocks in both the United States and Europe have risen in local currencies since the beginning of the year. But for the U.S. investor in European stocks, these gains have been almost wiped out by the depreciation of the euro. Why should the U.S. investor in European stocks do worse than the European investor in those same stocks? It is an inefficient result of fluctuating exchange rates (combined with stickiness in the consumer prices that matter for the investors.)

Currency fluctuations may introduce global misallocations. The cost of these misallocations must be weighed against the desirable effects the exchange rate changes have had on aggregate demand.<sup>4</sup> My own sense is that currencies fluctuate too much. Monetary policy makers should consider the effects of their choices on exchange rates—above and beyond the effects that exchange rates have on aggregated demand.

But the misallocation is a global one. Individual national policy makers don't have the incentive to correct that global misallocation. Ideally, monetary policy makers would coordinate to determine how misaligned currencies are, and to gauge the costs of the misalignment compared to the problems of inflation and unemployment. Economic theory long ago established that exchange-rate movements are excessive and inefficient. The most prominent exchange rate theory is called the "overshooting" model, and that overshooting precisely reflects the inefficiencies that exchange-rate movements cause.

I don't believe there are any central banks that "manipulate" exchange rates or that are engaged in a currency war. I think there is a *sort* of coordination among central banks—an implicit agreement to *ignore* the exchange-rate impact of monetary policies. That is certainly a better place to settle than a currency war. But it is not as desirable as an agreement to modify, to some extent, excessive currency fluctuations. This is not an argument for fixed exchange rates. But I do think that policymakers should step back from their continued insistence on "market determined exchange rates."

## **VI. Conclusions**

Gita begins her study by stating that "the popular discourse on how exchange rate fluctuations impact inflation and trade is often quite simplistic." This paper does an excellent job of summarizing, organizing and explaining the evidence on prices and exchange rates. It rightly should have a significant impact on the discussions of monetary policy spillovers.

## **Endnotes**

<sup>1</sup>See Goldberg and Tille (2008) for a model of vehicle-currency pricing

<sup>2</sup>See Goldberg and Tille (2013) for a model of bargaining over these profits.

<sup>3</sup>See for example Hooper et al. (2000).

<sup>4</sup>See Engel (2011) for an analysis of these trade-offs in a New Keynesian model.

## References

- Engel, Charles. 2011. "Currency Misalignments and Optimal Monetary Policy: A Reexamination," *American Economic Review*, vol. 101, no. 6, pp. 2796-2822.
- Goldberg, Linda, and Cédric Tille. 2013. "A Bargaining Theory of Trade Invoicing and Pricing," NBER working paper no. 18985.
- \_\_\_\_\_, and \_\_\_\_\_. 2008. "Vehicle Currency Use in International Trade," *Journal of International Economics*, vol. 76, pp. 177-192.
- Hooper, Peter, Karen Johnson and Jaime Marquez. 2000. "Trade Elasticities for the G-7 Countries," *Princeton Studies in International Economics*, no. 87.