



# GLOBAL FINANCE BRIEF

## How Do Dollar Exchange Rate Movements Get Passed Through into US Import Prices?<sup>1</sup>

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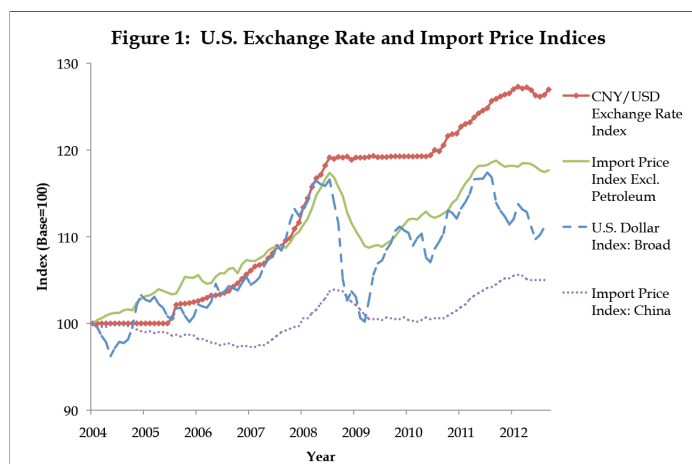
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It is often believed that currency appreciation by a trade partner will improve the bilateral trade balance for the US: because the resulting higher import prices will reduce demand for those imported goods. However, this shift will only happen if import prices in US dollar indeed are responsive to changes in the exchange rate. Figure 1 summarizes some key data for the US in this respect. It shows that the US dollar has depreciated 10% on a broad trade-weighted basis since 2004. However, against some countries such as China, it has depreciated much more by around 26%. The first fact implies that overall US import prices should have increased because it has become more expensive to buy imports, while the second fact implies that import prices from China specifically should have increased even more. Indeed, overall, US import prices (excluding petroleum prices) have increased by 18%. Surprisingly, prices of imports from China have increased by only 5% during the same time period. How can we understand these different movements in US import prices? In which ways does it matter that the dollar depreciation is mostly against some currencies but not others? Also, does it matter whether the depreciation changes the import prices of some specific products rather than other products?

This policy brief addresses these questions and provides three insights that contribute to a better understanding of the effect of exchange rate movements on US import prices. First, it shows that the overall response of import prices to exchange rate movements is muted and less than one-to-one. Second, import prices respond relatively little to exchange rate movements that are specific to a country, such as China, while they are more sensitive to broad US dollar movements. Third, market structure plays an important role in determining the exact impact of exchange rate movements: Countries with a large importer share in one product relative to other importers can use their market power to adjust their import prices more.



Source: Trade Weighted U.S. Dollar Index Broad, Exchange Rate and Import Price Indices from Federal Reserve Economic Data.

1. This brief summarizes calculations and extends discussion from work with Raphael Auer of the Swiss National Bank, Market Structure and Exchange Rate Pass-Through which is available from [http://people.brandeis.edu/~schoenle/research/Market\\_Structure\\_and\\_Pass\\_Through\\_Auer\\_Schoenle.pdf](http://people.brandeis.edu/~schoenle/research/Market_Structure_and_Pass_Through_Auer_Schoenle.pdf). I thank Catherine Mann for helpful comments.

To facilitate the subsequent discussion, it is useful to define the concept of “exchange rate pass-through.” Exchange rate pass-through refers to the rate of change of import prices following changes in the importing nation’s exchange rate. If the import price changes one-to-one with the exchange rate, we call this complete exchange rate pass-through; if import prices only react partially, then pass-through is said to be incomplete. A common finding in empirical research is that pass-through is quite incomplete, for example, even over a two-year horizon, a 10% appreciation of the foreign currency only increases US import prices by 1.5% on average. That is, the rate of pass-through is 15%.

The best data available to study exchange rate pass-through for the US are the monthly micro price data of the goods imported into the United States. These confidential data are collected by the Bureau of Labor Statistics (BLS) through the International Price Program (IPP) and underlie the construction of import and export price indices for the United States. This policy brief uses these data in combination with various exchange rate measures to study how market structure, such as being a relatively large importer, determines pass-through.

### Pass-Through Following Trade-Partner Currency and USD Movements

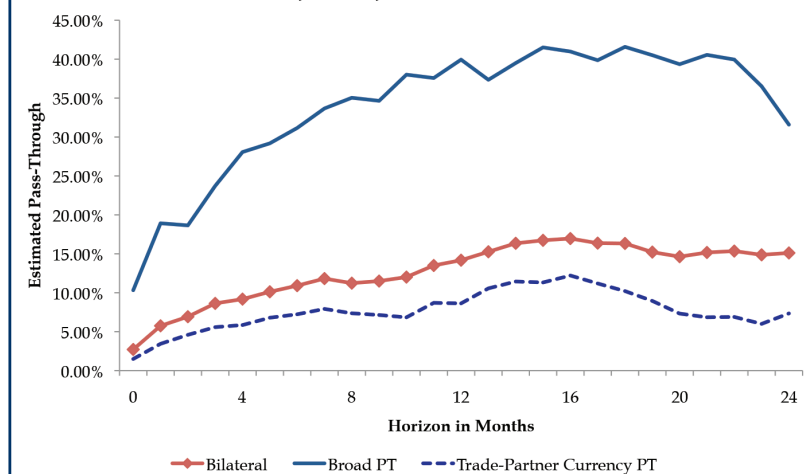
A starting point to learn more about the importance of market structure for pass-through into US import prices is to assess how different exchange rate movements differentially affect US import prices: Will import inflation be different if the bilateral exchange rate change is driven specifically by the trade partner currency, as opposed to being driven by broad movements of the USD that affect all importers equally?

To answer this question, it is useful to decompose changes in the bilateral exchange rate - as observed on currency markets - into broad USD movements and specific trade-partner currency (TPC) movements. Let’s consider the bilateral exchange rate between the US and one trade partner, say country Z, as an example. Since a change in the bilateral exchange rate can be caused either by a broad USD movement or Z’s currency movement, or both, we can break down the total change into two components: the broad USD movement is the average import-weighted change of the bilateral USD exchange rate against the rest of the world (ROW) excluding Z; the TPC exchange rate movement is the residual difference between the total bilateral exchange rate change and the component of broad USD exchange rate change:

$$\Delta TPC_{TP,t} = \Delta USD_{TP,t} - \Delta USD_{ROW-TP,t}$$

This relation basically says that if, for instance, the Chinese currency against appreciates by 10%, where 4% is due to USD moving against all other countries, then the idiosyncratic TPC movement of the Chinese RMB against the ROW is 6%. This decomposition allows us to distinguish the idiosyncratic country movements which affect only few firms from the common movements that affect all importers.

**Figure 2: Pass-Through into US Import Prices Following Bilateral, Broad, and TPC Movements**



The empirical estimates of pass-through using this decomposition are quite surprising. Broad USD movements are passed through at more than twice the rate of bilateral exchange rate movements. At the six-month horizon, USD pass-through is estimated at 31%, while bilateral exchange-rate pass-through is estimated at only 11%. At the two-year horizon, USD pass-through is at 32% while the bilateral one is at 15%. That is, a 10% USD appreciation caused by a broad movement of the USD would decrease the import price by 3.2% after two years, while a bilateral appreciation of the same magnitude only decreases import price by 1.5%.

Moreover, for any horizon, TPC exchange rate pass-through is even lower than bilateral exchange rate passthrough, which is already less than USD pass-through. As shown in Figure 2, at horizons up to two years, pass-through ranges up to 30% following a USD movement (solid line), but only up to 9.73% following a TPC movement (dashed line). In general, the USD pass-through rate is estimated to be between three to over four times as large as the TPC pass-through rate.

One explanation for this sizable difference in pass-through rates is market structure and firm-level price complementarities: a general USD appreciation moves the relative costs of all importers and thus affects the degree of competition for all imported goods, whereas an idiosyncratic TPC movement only affects the cost of the few importers originating from the country in question. Therefore, pass-through will be smaller in the second case: because importers are reluctant to increase price following a TPC appreciation for fear of losing their market share.

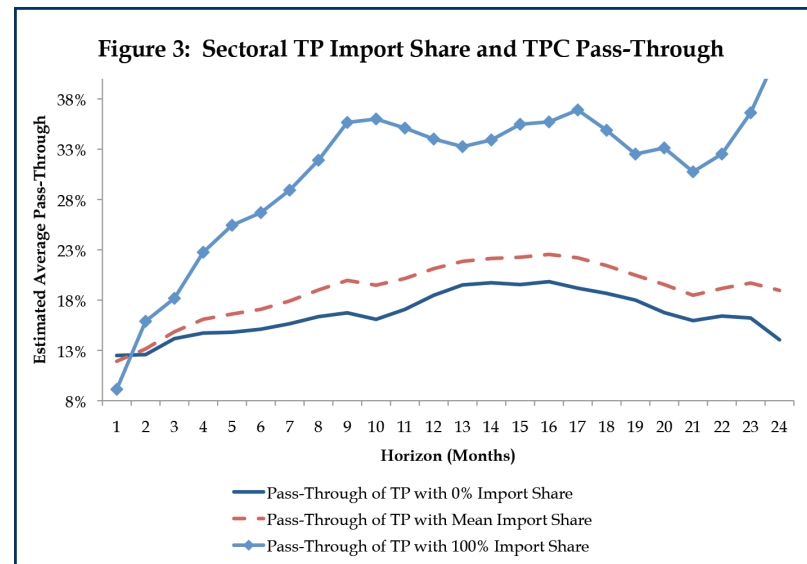
### Market Share and Pass-Through

A closer look reveals that indeed one has to take into account market structure to understand how exchange rate movements exactly affect US import prices. If a country has a large share of imports in a product category, relative to other importers, it may pass through exchange rate movements into prices to a high degree. Conversely, a country with little share in imports of a product cannot react much to exchange rate movements without losing market share.

Thus, the response of US import inflation to TPC movements should depend on the import share for a country in a particular product:

$$\text{Import Share} = \frac{\text{Imports}}{\text{Total Imports}}$$

Using the BLS micro data, one can show that the higher the sector-specific import share of trade partner, the larger is the rate of pass-through, *regardless of the general size of the trade partner economy*. In a sector in which a trade partner with an import market share of around 0%, the TPC pass-through rate is around 13% at the two-year horizon. In a sector where the trade partner supplies nearly 100% of imports, the TPC pass-through rate is equal to 38% at the same horizon.



Economically, what thus matters for pass-through is not the partner's overall economic importance through which a country could affect the world economy. Rather, it is the sector-specific importance: Icelandic fish producers have a higher rate of pass-through than that of German fish producers because Iceland is an important fish producer, although its macro economy does not in general influence world markets as much as Germany does. This suggests that high TPC pass-through works through high individual trade-partner market shares.

### What do we learn?

From a policy maker's perspective, these findings are highly relevant. First, we learn from the decomposition of the exchange rate into broad USD and specific trade-partner currency movements that pass-through following broad USD movements is very large but small following TPC movements. This fact gives rise to a much bigger role for the exchange rate on inflation dynamics - especially in times of large, permanent exchange rate evaluations - than is commonly assumed: the pass-through response by individual firms is exactly then the largest when all exchange rates move in the same direction via-vis the dollar. Second, the analysis has revealed that the rate of pass-through is large in response to country-specific currency movements exactly when the trade partner is either large or concentrated in specific sectors with a large market share. This suggests that incomplete pass-through of exchange rate movements into US import prices, as shown in the motivating Figure 1 at the beginning of this brief, must then predominantly be driven by TPC-specific movements that affect certain products and originate from particular countries.

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