Current Policy Perspectives

FEDERAL RESERVE BANK OF BOSTON™

No. 15-9

The Effects of a Stronger Dollar on U.S. Prices

Federico J. Díez and Gita Gopinath

Abstract:

We review the effects of a dollar appreciation on U.S. inflation, and on U.S. import and export prices. We calibrate the effects to match the 15 percent dollar appreciation that has occurred since June 2014. Pass-through into import prices and consumer prices is modest. Specifically, a 15 percent dollar appreciation should reduce consumer prices by a quarter of a percentage point in the short run, and by four-tenths of a percentage point after two years. In contrast, pass-through into U.S. exports prices is significantly larger, implying that most of the trade balance adjustment following a change in the value of the dollar occurs through the export channel.

JEL Codes: F31, F41, E31

Keywords: exchange rates, pass-through, inflation

Federico J. Díez is an economist in the research department at the Federal Reserve Bank of Boston. His e-mail address is federico.diez@bos.frb.org. Gita Gopinath is the John Zwaanstra Professor of International Studies and of Economics at Harvard University and a visiting scholar in the research department at the Federal Reserve Bank of Boston. Her e-mail address is gopinath@harvard.edu.

We thank Geoff Tootell and Giovanni Olivei for useful comments. We also thank Jianlin Wang for excellent research assistance. All remaining errors are our own.

This paper, which may be revised, is available on the web site of the Federal Reserve Bank of Boston at http://www.bostonfed.org/economic/current-policy-perspectives/index.htm.

This version: December, 2015

1 Overview

Since 2014:Q3, the U.S. dollar has strongly and rapidly appreciated against almost all foreign currencies. This fast phenomenon has raised concerns regarding the effects that a much stronger dollar will have on the U.S. economy. All else equal, a stronger dollar makes imported goods cheaper (when priced in dollars) and brings down inflation in the United States. Similarly, the dollar's appreciation hurts U.S. export products by making them more expensive in foreign markets. In this brief paper, we explore in detail the impact of the recent appreciation of the dollar relative to its trading partners on U.S. inflation and on U.S. import and export prices.

The main findings can be summarized as follows. First, we document the magnitude and the speed of the current dollar appreciation. Indeed, the Broad Dollar Index appreciated 15 percent since 2014:Q3, one of the three fastest appreciation episodes in the last 30 years. Second, we compute the exchange rate pass-through (ERPT) for several measures of U.S. import prices. For a broad price measure (all commodities excluding petroleum) we find an ERPT of 26–32 percent for the short term (after one quarter) and of 42–45 percent after eight quarters. Instead, when we look at a narrower measure of import prices such as the index for consumer goods excluding automotives, the short- and long-run ERPT are reduced to 13–15 percent and 24–25 percent, respectively.[1] Next, we use our pass-through estimates into import prices to evaluate the effect of the dollar appreciation in consumer prices using the PCE (personal consumption expenditures) price index. We do this in two different ways. We first use input-output estimates to decom-

[1]These differences are not surprising. Since there is a strong co-movement between the dollar and commodity prices, especially in crisis episodes, the dollar appreciates alongside a commodity price drop. This is mainly a reflection of global demand conditions, and does not imply that commodity prices drop because of the dollar appreciation.

pose consumer prices into tradeable and nontradeable goods, and we distinguish "at-the-dock" prices from distribution margins. These considerations allow us to find a short-term pass-through into consumer prices of 1.9 percent. Alternatively, we decompose consumer price inflation into inflation expectations, output gap, inflation from imported goods, and inflation from investment goods. From this specification, we obtain a estimate of 1.6 percent for the short-run pass-through into consumer prices, very much in line with the previous finding.[2] Further, we combine these findings with the current 15 percent appreciation of the U.S. dollar and compute an impulse response function that implies that, as a result of the appreciation, consumer prices should fall 0.24 percent in the short run and around 0.4 percent after two years. Finally, we also look at the ERPT into U.S. export prices and find that it is quite large: given that U.S. exports (and imports) are predominantly denominated in dollars, prices in foreign currency of U.S. exports should be more sensitive to exchange rate movements than dollar prices of U.S. imports.[3]

The rest of the paper is organized as follows. Section 2 documents the recent appreciation of the U.S. dollar. Section 3 describes the different data sources we use. Section 4 presents our exchange rate pass-through measures into different import price indices. Section 5 presents a decomposition of consumer prices using input-output estimates. Section 6 conducts an alternative analysis of the pass-through into consumer prices linking PCE inflation to import prices and other inflation determinants. Section 7 presents an impulse-response analysis of consumer prices based on our estimates and the current dollar appreciation. Section 8 presents our estimates of the exchange rate pass-through into U.S. export prices.

[2]The long-run pass-through is estimated to be between 2.7 and 3.2 percent.

[3]This implies that following the dollar appreciation, U.S. export quantities should decline more quickly than the increase in import quantities do.

Finally, Section 9 concludes.

2 Recent Dollar Dynamics

Over the 18 last months, the dollar experienced a sharp appreciation. Indeed, as Figure 1 shows, the Broad Dollar Index appreciated over 15 percent since June 2014. Further, if we look at the real exchange rate, we also observe a significant appreciation of over 13 percent. Moreover, if instead we look at the Major Currencies Dollar Index, the appreciation has been even greater: 15 percent in both nominal and real terms (see Figure 2).

To put these numbers in historical context, the last time the Broad Dollar Index reached the current high levels was in early 2003, after peaking in 2002. Thus, the current appreciation has taken the dollar's value to its highest point in over 12 years and is of a magnitude even greater than the appreciation observed during the Great Recession.[4]

Beyond the current magnitude reached by the stronger dollar, the speed at which the appreciation took place is also impressive. In Figure 3 we plot the percentage change in the dollar index in a given month relative to the same month in the previous year. From the figure it is apparent that the current appreciation is not just significantly larger but, in terms of the Broad Dollar Index, is the third-fastest in over 30 years, right after the appreciation of January 1998 (during the Asian and Russian crises) and March 2009 (during the last financial crisis). Interestingly, and in contrast to these other episodes, this recent appreciation process occurred during a period without a crisis at play, despite the recent tightening of

[4]We do not address the reasons underlying this sharp appreciation. However, two possible (and not exclusive) explanations include (1) weaker foreign growth outlook, and (2) higher (expected) U.S. interest rates.

the global financial conditions after China's devaluation.

Our goal is to study how these changes in the dollar affect import (and export) prices and, ultimately, how this, in turn, translates into U.S. consumer prices. Figures 4 and 5 present the evolution of the U.S. import price index relative to the dollar indices while Figures 6 and 7 compare the dollar indices with the export prices. From the figures it is apparent that the movements in the prices and the dollar are negatively correlated. In our analysis below, we take a closer look into these relationships.

3 Data

We conduct our analysis by combining variables from various data sources. This approach allows us to construct a rich database containing several measures of prices and exchange rates. We describe them next.

We have three different measures of nominal exchange rates, each one using different weights to construct trade-weighted exchange rates. We constructed the first two by using import and export weights, respectively. The third measure is constructed by the Bank of International Settlements (BIS), the so-called broad measure.[5]

We also use different price series. From the Bureau of Labor Statistics (BLS) we obtain export and import price indices. The export price indices we consider are for all commodities, for nonagricultural commodities, and for capital goods. Similarly, the import price indices included in our sample are the following: all commodities excluding petroleum, consumer goods excluding automotives, durable

[5]The BIS's broad measure includes 61 countries, and the nominal effective exchange rates are calculated as geometric-weighted averages of bilateral exchange rates.

manufactured consumer goods, nondurable manufactured consumer goods, and nonmanufactured consumer goods. Additionally, from the Bureau of Economic Analysis (BEA) we obtain measures of market-based PCE inflation, both headline and core.

Ultimately, we construct a dataset that spans from 1985:Q1 to 2014:Q4. However, since some of our series start at a later stage, some of our regressions consider a shorter time span, that begins in the mid-1990s.

4 Exchange Rate Pass-Through

Our first step in analyzing the effects of exchange rate variations on consumer prices is to look at the exchange rate pass-through (ERPT) into import prices. We need to know how import prices react to exchange rate changes, in order to study the effects on consumer prices.

To estimate the exchange rate pass-through into U.S. import prices we follow Burstein and Gopinath (2014). Specifically, we estimate the following dynamic lagged equation:

$$\Delta p_t = \alpha + \sum_{k=0}^{T} \beta_k \Delta e_{t-k} + \gamma X_t + \varepsilon_t, \tag{1}$$

where Δp is the log change in prices, Δe is the log change in the nominal exchange rate, and X is a vector of current and lagged trade-weighted foreign producer prices. Having $k > 0$ allows for lags in the pass-through from the exchange rate into prices, and t refers to quarters. The term $(\beta_0 + \beta_1)$ measures the short-run pass-through (after one quarter) while $\sum_{k=0}^{T} \beta_k$ measures the long-run pass-through. In our estimations, we set T equal to two years ($k = 8$), so that our long-run estimates

should be interpreted as the cumulative effects on prices after 24 months.

In Table 1 we present our estimates. The table has two headers: columns under header (A) use the authors-constructed exchange rate that uses imports weights while columns under header (B) use the BIS broad exchange rate. We will focus on (A) but the results are under (B) are quite similar. The results in the table are presented in five different panels, each one containing the short-run and long-run pass-through estimates for a different import price index. For instance, the first panel presents the ERPT estimates for the index of all import commodities excluding petroleum. The second panel contains the estimates for the price index of all consumer goods excluding automotives. Likewise, the remaining panels present the estimates for imported consumer nondurable, durable, and nonmanufactured goods.

Note that in all cases, the estimated ERPT is quite small. However, there are also significant differences depending on the price index considered. Indeed, the pass-through into import prices for all commodities excluding petroleum (the broader measure we consider) is more than twice as large as the pass-through into consumer goods. Intuitively, our estimates indicate that following a 1 percent dollar depreciation, in the short run import prices excluding petroleum would increase about 0.32 percent while consumer goods (excluding autos) prices would increase by less than half that magnitude (0.15 percent). Similarly, after eight quarters, the increases would be 0.45 percent and 0.25 percent, respectively. The estimates for the remaining import price indices lay close to these latter estimates. As mentioned in the introduction, it is not at all surprising that the pass-through estimates are reduced when we use import price indices that focus on consumer goods. The reason for this is that there is a strong co-movement between the U.S.

dollar and commodity prices, especially in crisis episodes, so the dollar appreciates alongside a commodity price drop. This co-movement is mainly a reflection of global demand conditions and not due to commodity prices dropping because of a higher U.S. dollar.

5 Decomposing Prices

In order to understand how the ERPT is transmitted into consumer prices, we can make use of an accounting identity. Specifically, consumer prices can be decomposed into tradeable goods and nontradeable goods. Furthermore, tradeable goods have two components, the price at the dock and the distribution margin. Thus, we can express consumer prices p as follows:

$$p = \alpha p_T + (1-\alpha)p_{NT} = \alpha\left(\beta p_{T,D} + (1-\beta)p_{DM}\right) + (1-\alpha)p_{NT}, \tag{2}$$

where α is the weight of tradeable goods within the overall consumer goods basket and β is the weight of the dock-price component of the tradeable goods.

We are interested in how U.S. inflation is affected by changes in the exchange rate. That is, we are interested in the elasticity of inflation with respect to exchange rate, $\epsilon_{\pi,\Delta e}$. It is straightforward to compute this elasticity from equation (2):

$$\epsilon_{\pi,\Delta e} = \alpha\beta \cdot \epsilon_{\pi_{T,D},\Delta e} + \alpha(1-\beta)\epsilon_{\pi_{DM},\Delta e} + (1-\alpha)\epsilon_{\pi_{NT},\Delta e}. \tag{3}$$

Next, we need to come up with estimates for the different components of equation (3) in order to obtain our object of interest, $\epsilon_{\pi,\Delta e}$.

Distribution Margin

To calibrate the distribution margin we use estimates from the literature. Burstein, Neves, and Rebelo (2003) use input-output tables to estimate that distribution wedges for tradeable consumption goods are quite large, on average around 40 percent of the retail price for the United States. Goldberg and Campa (2006) estimate that the distribution wedge is 43 percent for the United States. In a recent paper, Berger et al. (2012) use micro data to provide the most rigorous estimate of the size of the distribution wedge. They match goods in the import price index to those in the consumer price index for the period from January 1994 through July 2007 and find that the overall distribution wedge, which is the percentage difference between retail and at-the-dock prices is around 50–70 percent for the United States. They find that intra-firm transfer pricing considerations do not have a sizable effect on the size of distribution wedges. Further, they do not find that the wedge varies systematically with the exchange rate. This is consistent with constant mark-ups and/or all of the margin being local nontraded costs. This finding that the distribution margin is insensitive to the exchange rate is consistent with the evidence in Gopinath et al. (2011) who, using micro price data from a large grocery chain with stores in the United States and Canada, find that the markup from the wholesale cost to the retail price does not respond to exchange rate changes.

Hence, as a first approximation we can set the elasticity of the distribution margin to exchange rate shocks, $\epsilon_{\pi_{DM},\Delta e}$, equal to zero. Moreover, using the estimates from Berger et al. (2012) we set the share of the distribution margin to $1 - \beta = 0.6$.

Share of Imported Goods

Burstein, Eichenbaum, and Rebelo (2005) use U.S. input-output tables to estimate the share of tradeable goods in the consumption bundle to be 43 percent. These tradeable goods include imported goods and locally produced tradeable goods. If one assumes that all tradeable goods in the consumption bundle respond to exchange rate changes in the same way as imports do then our relevant product of shares boils down to $\alpha \cdot \beta = 0.43 \cdot 0.4 = 0.17$. However, it is not the case that locally produced tradable goods have the same sensitivity to the exchange rate as actual imported goods. Burstein, Eichenbaum, and Rebelo (2005) provide an estimate of 0.09 for the share of the pure imported component, working through both direct imports and the role of intermediate inputs in producing final goods. Since it is not clear which of these values is the best approximation to the data we take an average of the two and set $\alpha \cdot \beta = 0.13$.

Nontraded Goods Prices

We assume that pass-through into non-traded goods prices is zero, consistent with the evidence for the distribution sector.

Pass-Through into Consumer Price Inflation

Armed with these estimates from the literature, we now return to equation (3) and calculate the elasticity of consumer price (PCE) inflation with respect to changes in the exchange rate. Specifically, if we focus on the import price index for consumer goods excluding automotives, and we plugin these calibrated values along with our

estimate for $\epsilon_{\pi_{T,D},\Delta e}$, we obtain the following expression:

$$\epsilon_{\pi,\Delta e} = \alpha\beta \cdot \epsilon_{\pi_{T,D},\Delta e} = 0.13 \cdot 0.147 = 0.019.$$

This value implies that following a 1 percentage point depreciation of the U.S. dollar, PCE inflation should increase by approximately 2 percent.[6] That is, as expected, we find that changes in the exchange rate have a very limited effect on U.S. consumer prices. Next, we explore an alternative approach to somewhat corroborate these findings.

6 Robustness

In this section, we evaluate the robustness of our previous results by considering an alternative specification to analyze the pass-through from import prices to consumer price inflation.[7] Specifically, we consider the following equation:

$$\pi_t = \pi_t^* + \lambda \left(U_{t-1} - U_{t-1}^*\right) + \delta_m \pi_{t-1}^m + \delta_i \pi_{t-1}^i + \upsilon_t, \tag{4}$$

where π is the quarterly core PCE inflation rate, π^* is the anchor for inflation expectations, $U - U^*$ is the unemployment gap, π^m is the inflation for imported consumer goods excluding automotives (relative to a low-frequency measure of core PCE inflation), π^i is inflation in PDE investment (relative to a low-frequency measure of PDE investment inflation). The sample period considered spans from 1997 through 2014. The idea underlying equation (4) is that consumer price inflation can be explained by breaking it down into a variety of factors including

[6] Similarly, using our long-run estimates from Table 1, we find that consumer prices should increase by 3 percent.

[7] Series are demeaned and quarterly growth rates annualized.

inflation expectations, tightness of the labor market (that is, the distance to the non-accelerating inflation rate of unemployment, or NAIRU), inflation coming from imported goods, and inflation coming from investment goods.

The results are presented in Table 2. Note that our import price elasticity [$\delta_m = 0.11$] is in the same range as the estimate of Goldberg and Campa (2010) [0.07].[8] Further, the estimated import price elasticity (δ_m) is of a magnitude similar to the unemployment gap elasticity (λ).[9]

In order to evaluate how robust our results are, consider the following simple exercise. From Table 1, we know that the elasticity of imported consumer good prices with respect to the exchange rate is $\epsilon_{m,e} = 0.147$. Additionally, from Table 2, we know that $\epsilon_{PCE,m} = \delta_m = 0.111$. Combining these points we obtain:

$$\epsilon_{m,e} \cdot \epsilon_{PCE,m} = 0.147 \cdot 0.111 = 0.016 \approx 0.019.$$

This implies that combining our estimates from Table 1 with either those of Table 2 or with those from the price decomposition calibration yields similar results.

7 Quantitative Assessment

We next combine these ranges of possible elasticity values with the observed dollar appreciation of 15 percent. In other words, we take our ERPT estimates from Table 1 and combine these with the observed dollar appreciation. We focus on the impact that the appreciation has on the import price index of all consumer goods excluding petroleum.

[8] We focus on the effect of the import prices of consumer goods excluding automotives (second column in Table 2). Note that durable goods have very similar estimates while in the other cases, the estimated import elasticities are somewhat smaller.

[9] Interestingly, both variables have similar standard deviations: $sd_{U-U^*} = 1.81$; $sd_{\pi^m} = 1.7$.

Figure 8 plots the impulse response of prices to a 15 percent appreciation of the U.S. dollar. Based on our findings, the effects of the current dollar appreciation on consumer prices should be –0.24 percent in the short run and slightly over –0.40 percent after eight quarters. Similarly, Figure 9 plots the impulse response of the PCE inflation rate to the 15 percent dollar appreciation. In this case, we observe a large drop in the short run, of almost 0.25 of a percentage point, followed by small but negative values in the remaining seven quarters.

8 Trade Balance, Export Prices and Pass-Through

The United States' economy is in a special position, as the vast majority of its imports and exports are denominated in its own currency. Indeed, around 92 percent of U.S. imports and 97 percent of U.S. exports are priced in dollars. Furthermore, these dollar prices are sticky, with median durations of 10 months for imports and 11 months for exports. It follows that prices in foreign currency of U.S. exports are more sensitive to exchange rate movements than the dollar prices of U.S. imports. Taken together, these facts imply that the adjustments to exchange rate movements take place mostly through exports.

Next, we are interested in the effects of the dollar appreciation on the prices charged by U.S. exporters—that is, if this channel is indeed more reactive to exchange rate changes. To do so, we modify equation (1) and run the following regression:

$$\Delta p_t - \Delta e_t = \alpha - \sum_{k=0}^{T} \beta_k \Delta e_{t-k} + \gamma X_t + \upsilon_t, \tag{5}$$

where p represents the prices of U.S. exports, e is the export-weighted nominal

exchange rate, and X now stands for U.S. producer prices.

In Table 3 we present our results. We consider three types of export price indices (EPI). The first column looks at the EPI for all commodities, the next column looks at the EPI for capital goods (the main end-use category exported), and the last column looks at the EPI for nonagricultural goods. The difference with our previous regressions is quite stark—the short-run ERPT into export prices ranges between 0.86 and 0.99. This means that, following a 10 percent appreciation of the dollar, the prices of U.S. exports in foreign currency increase by 8.6–9.9 percent. These findings are consistent with our claims at the beginning of the section that the trade balance adjusts to exchange rate movements mainly through exports. In other words, we should expect that the adjustment in the trade balance following an appreciation should be mostly explained by a decrease in exports and not so much by an increase in imports.

9 Conclusions

This brief paper studies the effects of the dollar's current appreciation on U.S. inflation and the U.S. trade balance. We first document the magnitude of the appreciation process of over 15 percent since mid-2014. We provide some historical context for the current process, highlighting that it is one of the most important appreciation episodes in the last 30 years—both in terms of the value of the dollar and in terms of the speed at which the appreciation took place.

Next, we look at how the changes in the exchange rate translate into changes in U.S. consumer prices. We do this in two steps. First, we estimate the pass-through of the exchange rate into several import price indices. Second, we use these findings to estimate how the changes in import prices translate into actual

consumer prices. We conduct this analysis in two alternative ways. In the first one, we decompose prices using input-ouput table estimates to skim components such as nontradeable goods and distribution margins. In the second case, we run a regression specifying how PCE inflation is affected by inflation expectations, the output gap, and inflation from imported goods and investment goods. In all cases we find that the effects of the dollar appreciation on U.S. consumer price inflation is extremely limited.

Finally, we also look at the pass-through into export prices. In contrast to the previous case, we find that the dollar appreciation has a sizable effect on U.S. export prices. These findings are consistent with an argument that most of the trade balance adjustment following a dollar appreciation takes place through the export (and not the import) channel. The reason for this is that the U.S. exports and imports are predominantly denominated in U.S. dollars.

References

Berger, David, Jon Faust, John H. Rogers, and Kai Steverson. 2012. "Border Prices and Retail Prices." *Journal of International Economics* 88(1): 62–73.

Burstein, Ariel, Martin Eichenbaum, and Sergio Rebelo. 2005. "Large Devaluations and the Real Exchange Rate." *Journal of Political Economy* 113(4): 742–784.

Burstein, Ariel, and Gita Gopinath. 2014. "Chapter 7 - International Prices and Exchange Rates." In *Handbook of International Economics, vol.4*, eds. Elhanan Helpman Gita Gopinath and Kenneth Rogoff, 391–451. Amsterdam: Elsevier.

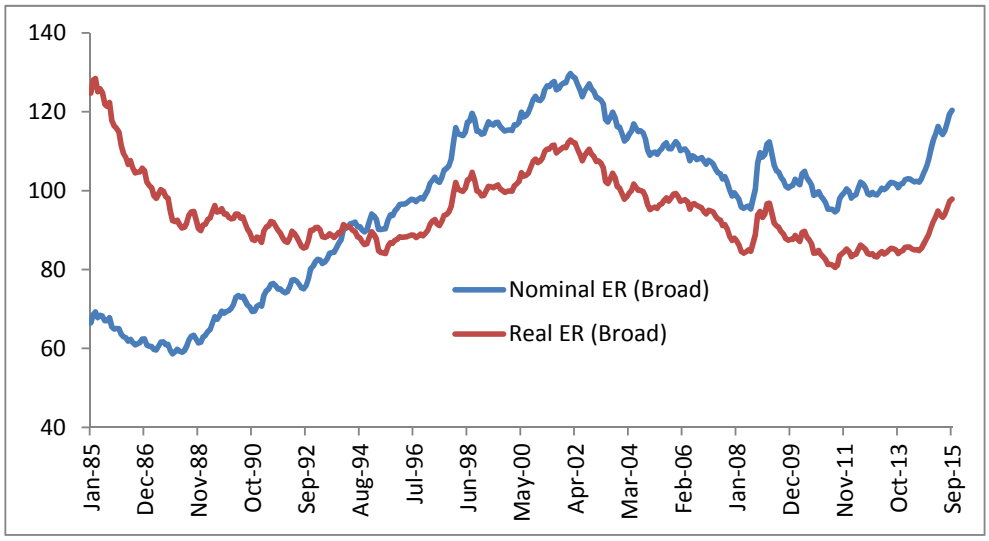
Burstein, Ariel T., Joao C. Neves, and Sergio Rebelo. 2003. "Distribution Costs and Real Exchange Rate Dynamics during Exchange-Rate-Based Stabilizations." *Journal of Monetary Economics* 50(6): 1189–1214.

Goldberg, Linda S., and José Manuel Campa. 2006. "Distribution Margins, Imported Inputs, and the Sensitivity of the CPI to Exchange Rates." Working Paper No. 12121. Cambridge, MA: National Bureau of Economic Research.

Goldberg, Linda S., and José Manuel Campa. 2010. "The Sensitivity of the CPI to Exchange Rates: Distribution Margins, Imported Inputs, and Trade Exposure." *Review of Economics and Statistics* 92(2): 392–407.

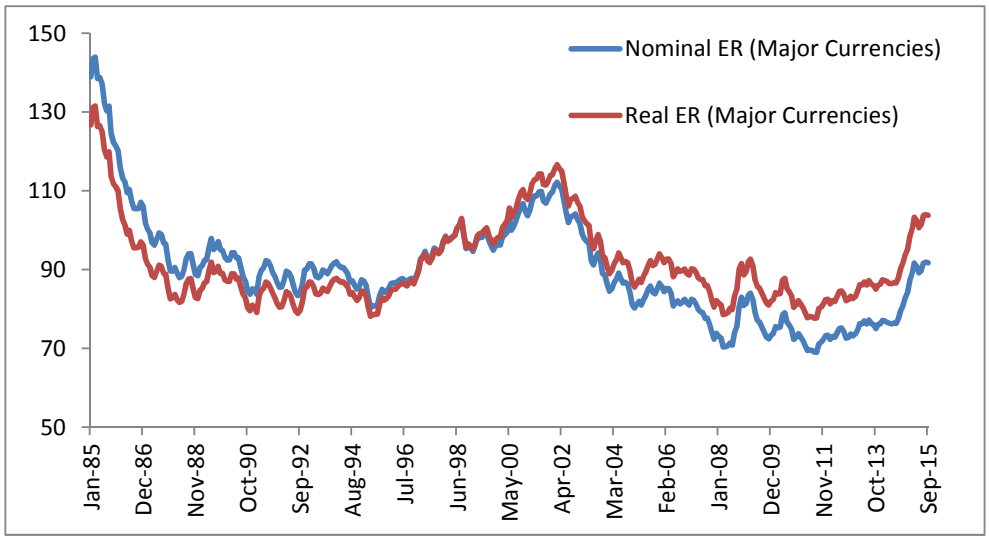
Gopinath, Gita, Pierre-Olivier Gourinchas, Chang-Tai Hsieh, and Nicholas Li. 2011. "International Prices, Costs, and Markup Differences." *American Economic Review* 101(6): 2450–86.

Figure 1: Broad Dollar Index



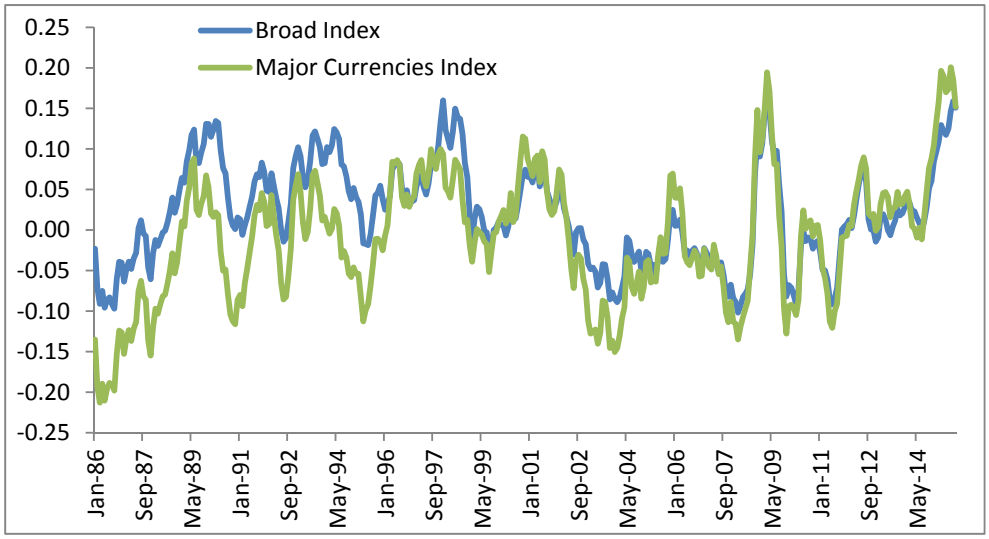
Source: Federal Reserve Board.

Figure 2: Major Currencies Dollar Index



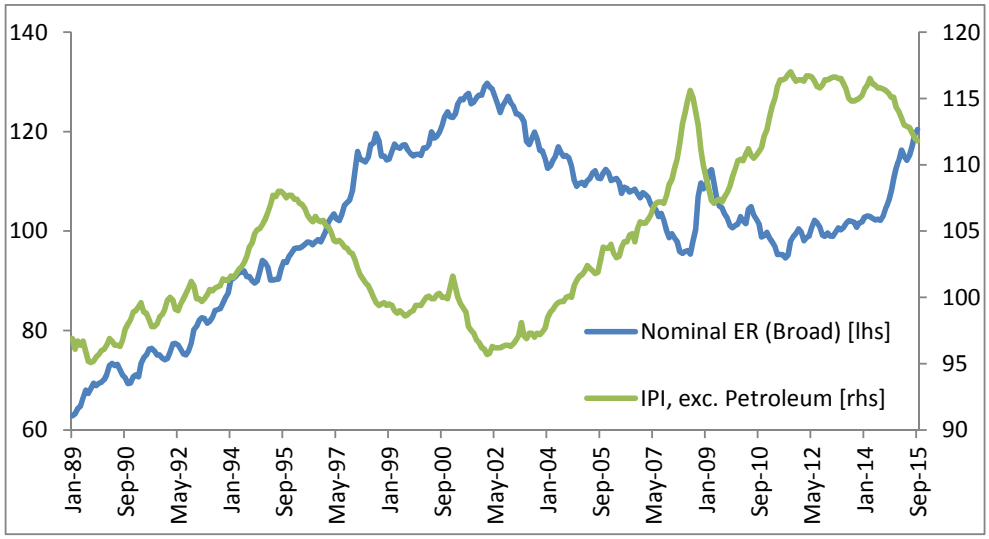
Source: Federal Reserve Board.

Figure 3: Appreciation of the Nominal Dollar Index (Year-Over-Year Percentage Changes)



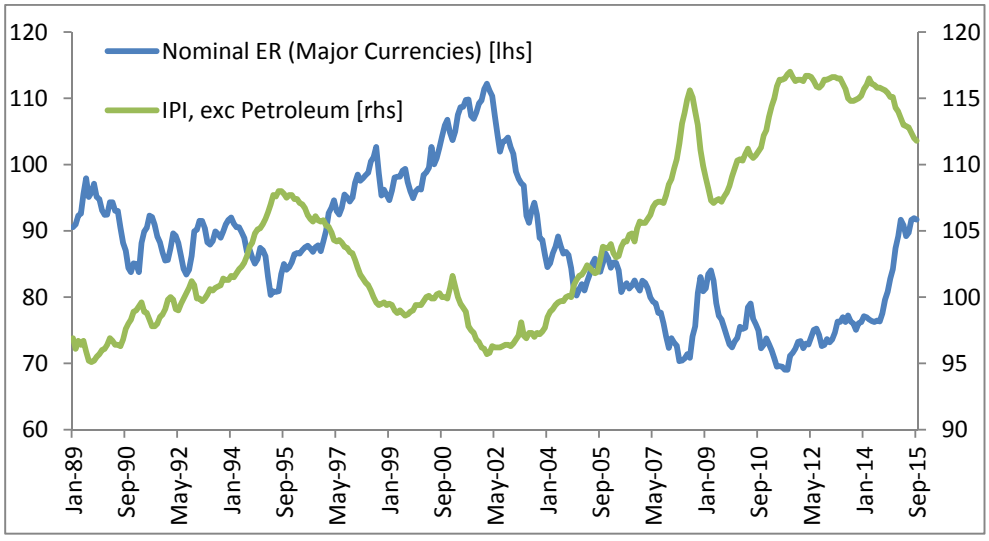
Source: Authors' calculations based on data from the Federal Reserve Board.

Figure 4: Import Price Index and Broad Dollar Index



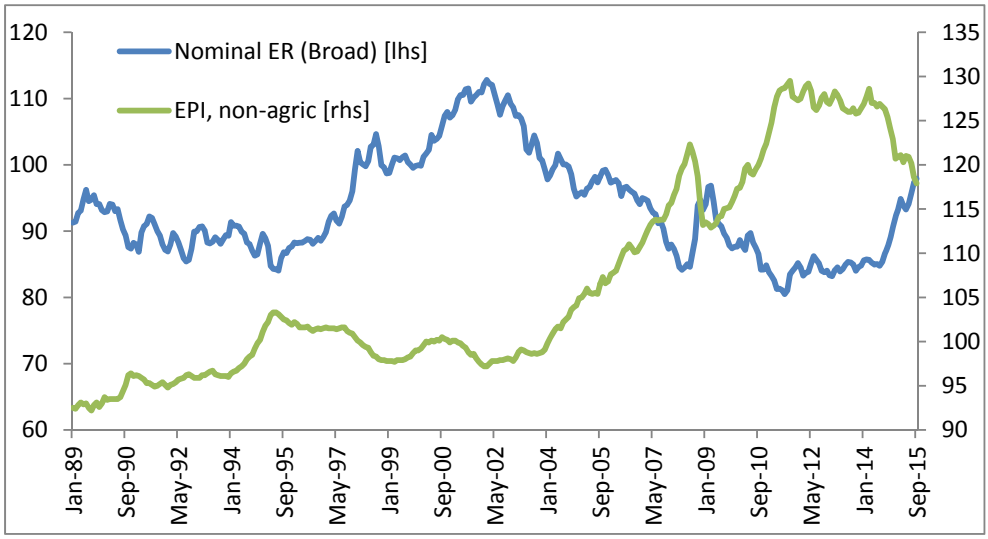
Source: Federal Reserve Board and Bureau of Labor Statistics.

Figure 5: Import Price Index and Major Currencies Dollar Index



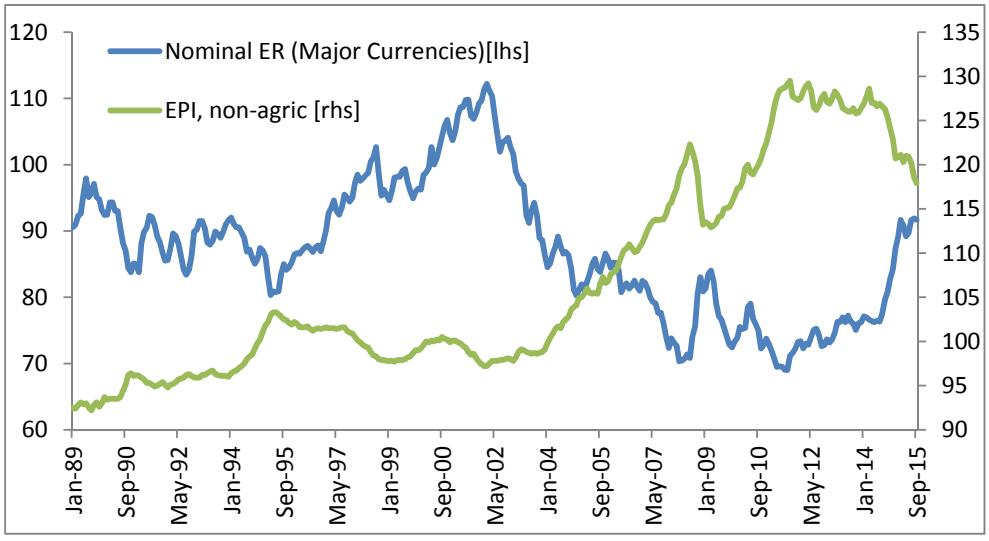
Source: Federal Reserve Board and Bureau of Labor Statistics.

Figure 6: Export Price Index and Broad Dollar Index



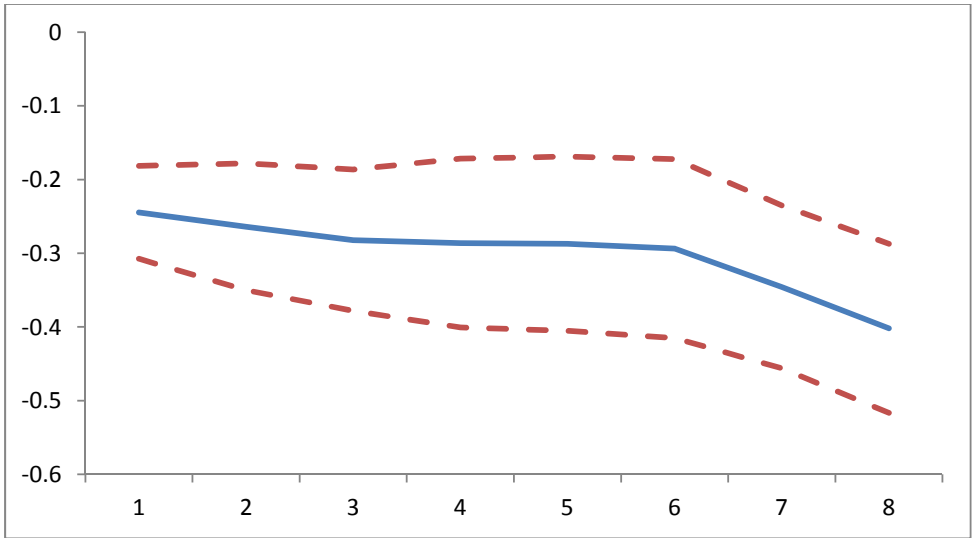
Source: Federal Reserve Board and Bureau of Labor Statistics.

Figure 7: Export Price Index and Major Currencies Dollar Index



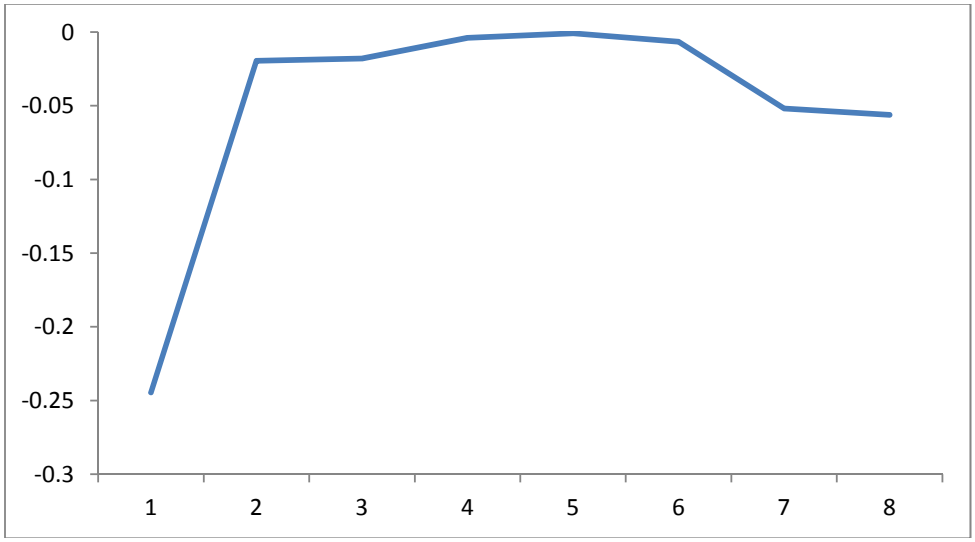
Source: Federal Reserve Board and Bureau of Labor Statistics.

Figure 8: Price Dynamics after a 15 Percent Appreciation in the U.S. Dollar



Source: Authors' calculations.

Figure 9: Inflation Dynamics after a 15 Percent Appreciation in the U.S. Dollar



Source: Authors' calculations.

Table 1: Short-Run and Long-Run Pass-Through

	(A)		(B)	
IPI: Nonpetroleum Imports				
	SRPT	LRPT	SRPT	LRPT
Estimate	0.325***	0.424***	0.258***	0.451***
se	(0.026)	(0.054)	(0.031)	(0.052)
Observations	88	88	75	75
IPI: Consumer Goods Excluding Automotives				
	SRPT	LRPT	SRPT	LRPT
Estimate	0.147***	0.241***	0.134***	0.249***
se	(0.019)	(0.034)	(0.027)	(0.040)
Observations	88	88	75	75
IPI: Nondurable Consumer Goods				
	SRPT	LRPT	SRPT	LRPT
Estimate	0.129***	0.213***	0.080***	0.193***
se	(0.041)	(0.052)	(0.033)	(0.053)
Observations	88	88	75	75
IPI: Durable Consumer Goods				
	SRPT	LRPT	SRPT	LRPT
Estimate	0.165***	0.276***	0.174***	0.303***
se	(0.026)	(0.041)	(0.019)	(0.044)
Observations	88	88	75	75
IPI: Nonmanufactured Consumer Goods				
	SRPT	LRPT	SRPT	LRPT
Estimate	0.180	0.276	0.279***	0.332**
se	(0.117)	(0.173)	(0.104)	(0.132)
Observations	88	88	75	75
Time range	1996:Q2–2014:Q4		1993:Q1–2014:Q4	

Notes: Columns with header A use authors-constructed import weighted exchange rate. Columns with header B use BIS trade weighted exchange rate. Newey-West standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. IPI stands for Import Price Index.

Table 2: Linking PCE and IPI

IPI:	NonPetroleum	NonAutomotive	NonDurable	Durable	Non-manufactured
λ	–0.147***	–0.157***	–0.152***	–0.145***	–0.149***
	0.027	0.026	0.028	0.025	0.028
δ_m	0.034**	0.111***	0.052*	0.102***	0.019*
	0.013	0.032	0.030	0.027	0.010
δ_i	0.131***	0.123***	0.128***	0.125***	0.130***
	0.015	0.015	0.016	0.014	0.015
Observations	72	72	72	72	72

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Data spans from 1997:Q1 to 2014:Q4. IPI stands for Import Price Index and PCE stands Personal Consumer Expenditures.

Table 3: Export Price Index: US Short- and Long-Run ERPT

EPI:	EPI_{all}	$EPI_{capital}$	EPI_{nonagr}
Short-run	0.856***	0.984***	0.868***
	(0.055)	(0.033)	(0.043)
Long-run	0.848***	1.051***	0.908***
	(0.098)	(0.077)	(0.087)
Observations	118	118	118

Notes: Regressions use authors-constructed export weighted exchange rate. Newey-West standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. EPI stands for Export Price Index.