Buy Foreign While You Can:
Cheap Dollar and Exchange Rate Pass-Through. [1]

Eduardo J. J. Ganapolsky
Federal Reserve Bank of Atlanta

Diego Vilán
Federal Reserve Bank of Atlanta

Preliminary draft

May 9, 2005

Abstract

We present evidence on the degree of exchange rate pass-through (ERPT) in the US for a wide variety of import categories over the period Dec.1993-Dec.2004. In general, we find low ERPT at the monthly frequency. The ERPT elasticity of total imports' prices is 18%, on average, but with substantial variation across imports categories. We do not find evidence of asymmetric ERPT during depreciation versus appreciation episodes. As in previous studies, we find a downward trend in ERPT elasticities for the main import categories over time. However, when we look at a more disaggregated level we observe that in many cases there was a reversion towards higher ERPT during 2004.

JEL Classification: F14, F31, F32.
Keywords: pass-through, trade deficit, import prices.

[1] We thank John Robertson for his comments and Kelley Heinsman for providing research assistance. The views expressed here are our own and not necessarily those of the Federal Reserve Bank of Atlanta or the Federal Reserve System. Mail address: 1000 Peachtree Street N.E., Atlanta, GA, 30305. Phone: (404) 498 8785/8728. Fax: (404) 498 8058. E-mail address: eduardo.ganapolsky@atl.frb.org , diego.vilan@atl.frb.org .

Buy Foreign While You Can:
Cheap Dollar and Exchange Rate Pass-Through.

1. Introduction

During 2004 we have seen that even though the dollar has depreciated against several major trading partners' currencies, the US trade deficit has increased, fueled mainly by the high level of imports. Basic economic intuition would tell us that a cheaper dollar would make US imports more expensive, thus Americans should import less. However, it seems that a cheaper dollar did not lead to proportionately more expensive imports.

In this paper we present evidence on the degree of exchange rate pass-through (ERPT) for a wide variety of import categories using monthly data for the period Dec.1993-Dec.2004. First, we decompose domestic import prices in its foreign price and exchange rate components to get a broad idea of the incidence of the ERPT phenomenon. Then, we perform some econometric exercises to test for the presence of ERPT in some selected import categories. These categories are generally different from those used in other studies.

In general, we find low ERPT at the monthly frequency over the last decade. The ERPT elasticity of total imports' prices averages 18%, although there is a considerable degree of variation across categories.

We show that items defined as Capital Goods or Consumer Goods consistently have low ERPT. On the other hand, most of our results suggest that the value of the dollar does not affect the prices of the products included under the Industrial Supplies and Materials category.

Like previous studies, we find a generalized downward trend in ERPT elasticities for the main import categories. However, at a more disaggregated level we find several cases for which there has been a reversion towards higher ERPT during 2004.

The rest of this paper is organized as follows. Section 2 briefly reviews the empirical literature. Section 3 gives a preview of the facts by making a simple decomposition of the import prices data. Section 4 presents the theoretical model we use and its empirical counterpart, emphasizing also how to interpret the regressions' output. Section 5 describes in detail all the data used in our estimations. Section 6 analyzes the empirical results. Finally, Section 7 summarizes the main results and concludes.

2. Review of the literature

The economic literature is generally supportive of the partial ERPT hypothesis that only a portion of the exchange rate movements will translate into import price changes. The paper by Goldberg and Knetter (1997), which gives a comprehensive treatment of the issue, reports that previous studies had found lower ERPT in the US than in other countries. In this respect, it points out that the size of the destination market appears to be important.

More recently, Campa and Goldberg (2002) provides cross-country and time series evidence for a group of 25 OECD countries during the period 1975-1999. It also finds low pass-through elasticities, both in the short and long run, for the US. Furthermore, the

paper suggests the degree of pass-through has fallen over time, which is mainly explained by the changing composition of the import bundle[2].

Olivei (2002) provides estimates of exchange rate pass-through for several import categories for the period 1981-1999. The paper reports a substantial degree of variation of the ERPT across groups and finds no asymmetric response to appreciations and depreciations.

Finally, Marazzi et al. (2005) finds that ERPT to US core import prices has declined considerably during the last decade. Apart from previous explanations (a shift towards low pass-through goods in the composition of the import bundle), it suggests that a geographical reorientation of US imports, a more competitive international markets fostered by the presence of China, or the existence of more hedging in the exchange rate markets could explain the phenomenon. Also, the paper agrees with the others in that the decline in ERPT seems to be a generalized phenomenon across countries.

3. A preview of the facts

As we mention in the Introduction, even though the real exchange rate has been depreciating for a while, the trade deficit has not narrowed accordingly but, on the contrary, has kept increasing.

In Figure 1 we break down the trade deficit, imports, and exports into the main categories of traded goods that compose each of them. The first fact coming out from these charts is that the acceleration of the trade deficit's growth rate is coincident with the rapid increase of *Consumer Goods* and *Industrial Supplies and Materials* deficits. The second

[2] Pass-through elasticities are stable along import categories, but there is a change towards lower pass-through categories in the last years.

observation is that the acceleration of these deficits is due to a fast increase in imports that is not matched by exports' growth. Finally, imports of *Capital Goods* have also been increasing at a rapid pace, but they are matched by a prompt increase in their exports.

In this paper we study import prices at different levels of aggregation, looking at the aggregate price index of *Total Imports*, the price indexes of the three main import categories (*Industrial Supplies and Materials*, *Consumer Goods* and *Capital Goods*), and finally, at the most disaggregated level, looking at the price indexes of the items that make up to 2/3 of each category.

To motivate the discussion we start with Table 1. This table reports for each item the frequency in which the monthly changes of the exchange rate and the domestic price move in the same (different) direction, defining the event as "pass-through" ("no pass-through"). The frequencies are computed using the import price indexes published by the Bureau of Labor and Statistics (BLS) and the inverse of the Broad Nominal Dollar Index published by the Board of Governors of the Federal Reserve System[3]. Then, we identify the items where pass-through or no pass-through constitutes the bulk of the cases setting 2/3 as our threshold.[4] We do the exercise for the whole sample and we also divide the sample between depreciations and appreciations to see if there is any sign of asymmetric ERPT.

Even tough the test is not too strict; the results do not show strong evidence in favor of the pass-through or the no pass-through hypothesis. For the entire sample case we find

[3]The index published by the Board is expressed in the amount of foreign currency per unit of dollar; we inverted it to work with a measure of dollars per unit of foreign currency. Thus, dollar depreciation (appreciation) is a positive (negative) change in the nominal exchange rate index.

[4] This is not a very stringent test for the ERPT hypothesis given we are defining as pass-through any movement in the same direction, independently of the magnitude, of both exchange rates and domestic import prices. As a result, we are putting the full and partial ERPT concepts all together under the pass-through definition.

clear evidence of no pass-through for just two items in the *Consumer Goods* category (*Apparel, household goods-cotton*, and *Gems, diamonds*).

When we split the sample we seem to uncover different behavior of some prices during depreciation and appreciation events. For example, within the *Industrial Supplies and Materials* category, we find evidence of pass-through in one item (*Crude oil*) when the dollar depreciates, but we do not find anything when the dollar appreciates. The *Capital Goods* category presents some interesting facts. There is no pass-through during depreciations but there is pass-through during appreciations in four items (*Computer accessories, Computers, Semiconductors,* and *Telecom equipment*). Finally, within the *Consumer Goods* category we observe that three, items (*Toys, games, sporting goods; TV's, VCR's; and Apparel, textiles, non-wool or cotton*) do not pass-through in depreciation events.

Figure 2 shows the decomposition of the monthly change of the dollar price of imported goods into its two components, (i) the change in the foreign currency price of the good, and (ii) the change in the dollar price of the foreign currencies. To construct this figure, we compute the monthly change of the domestic price and exchange rate indexes, and obtain the monthly change of the foreign currency price of the good as a residual by purging out the exchange rate variation from the domestic import price.

The figure suggests that most of the changes in the aggregate import price index are driven by the *Industrial Supplies and Materials* import index, while *Consumer Goods* and *Capital Goods* import prices remains quite flat during the period. When we dig into the decomposition of those variations we observe that in the *Consumer Goods* and *Capital Goods* cases, dollar depreciations (appreciations) are matched pretty closely by

reductions (increases) in the foreign price, and therefore, the dollar price of these categories does not show too much ERPT. On the other hand, the foreign price of *Industrial Supplies and Materials* seems to be more volatile and less related to changes in the nominal exchange rate. In other terms, the volatility of foreign prices is wiping out any possibility of ERPT.

These observations are very important to interpret what the absence of ERPT means. It could mean that there exists a highly negative correlation between nominal exchange rates and foreign prices; but it could also mean a very low correlation with a much larger volatility of foreign prices than exchange rates. Only in the first case we could interpret low ERPT as the outcome of foreign firms playing around with mark-ups in response to exchange rate variations. By observing low correlations between domestic prices and exchange rates we cannot identify which is the source of low ERPT in the economy.

In Table 2 we intend to give an answer to those questions by computing the aforementioned correlations. The table shows the correlations between domestic import price changes and nominal exchange rate changes, and also the correlations between foreign import price changes and nominal exchange rate changes. The results are broadly consistent with those derived from Figure 2 for more aggregated data.

In general, there is evidence towards the partial ERPT hypothesis; the correlation between domestic prices and exchange rates tends to be low. However, when we try to rationalize the sources of the low degree of ERPT, we detect some differences across categories. While *Industrial Supplies and Materials* show low correlation between foreign prices and exchange rates, *Capital Goods* and *Consumer Goods* show highly negative correlation coefficients. Indeed, this is also true at the more disaggregated level.

Within *Industrial Supplies and Materials*, all but 3 items show low correlation; within *Capital Goods*, all but 1 item show highly negative correlation; and finally, within *Consumer Goods*, all the items show strong and negative correlation.

Hence, those facts could be interpreted as favoring the explanation of variable mark-ups in the *Consumer Goods* and *Capital Goods* cases. Interestingly, the buffering effect of mark-ups seems to unwind for *Industrial Supplies and Materials*, where foreign prices move independently from exchange rates.

We complement those observations with the results of Granger causality tests reported in Table 3.[5] In general, we find causality in the Granger sense from exchange rates to domestic import prices for *Capital Goods* and *Consumer Goods*, but we failed to find any causal relationship for *Industrial Supplies and Materials*.

4. A framework to estimate exchange rate pass-through

4.1. Theoretical grounds

The literature defines ERPT as "the percentage change in local currency import prices resulting from a one percent change in the exchange rate between the exporting and importing countries".[6]

If the law of one price (LOP) holds, then exchange rate changes will always pass in "full" to domestic import prices. This result would be maintained also in the aggregate if the

[5] We test if there is causality in the Granger sense between changes in the nominal exchange rate and changes in the domestic import prices, either in one way or the other. The direction of causality that concerns us is the one that goes from exchange rates to domestic import prices.

[6] See for instance Goldberger and Knetter.

purchasing power parity (PPP) holds[7]. But if either the LOP or the PPP fail in any of their versions, then the possibility of having partial ERPT arises.

Lets call P the price in local currency of the imported goods, E the nominal exchange rate and P^* the price in foreign currency of the imported goods (including transportation, distribution, resale costs, etc.) then the PPP implies:

$$P = E \cdot P^*.$$

If P^* is independent of E, any change in E will fully transmit into P, this is the essence of full ERPT.

However P^* might depend on E:

$$P = E \cdot P^*(E).$$

and therefore the change in P for a given change in E will depend on the behavior of P^*.

We can assume the goods markets are not perfectly competitive, and then write P^* as being formed by two components, a mark-up and the marginal cost of producing (and delivering) the good. Thus, we should reformulate the previous statement: if the mark-up and the marginal cost of the exporter/producer are both independent of E, then exchange rate movements would fully pass-through into domestic import prices. Nonetheless, if any of them is related to E, changes in the exchange rate would imply that ERPT is partial.

[7] In terms of Goldberg and Knetter, the absolute version of the LOP means that "identical products sell for the same common-currency price in different countries". On the other hand, the relative version means that "the common-currency prices for a particular product change in the same way in the two countries". Regarding PPP, it requires that the LOP holds for all the goods in the economy (the absolute version also requires the absence of non-tradable goods, and the relative version needs constant non-tradable goods prices).

There is evidence in the literature, both at theoretical and empirical levels, that mark-ups and marginal costs would depend on E. Dornbusch (1987) shows how mark-up can adjust in response to changes in the exchange rate using imperfect competition models. Baldwin and Krugman (1989) and Bernard and Jensen (2004) present evidence on the existence of sunk cost to start an export business (advertising, set a distribution chain, R&D specific for a market, etc.), which would also contribute to rationalize mark-up changes[8].

Regarding changes in the marginal costs, according to Feenstra (1987) the exchange rate can enter the cost function directly through the price of imported inputs, or indirectly through a change in the scale triggered by the response of demand in the destination market. Burstein et al. (2003) shows that distribution costs are an important component of retail prices of tradable goods; and given distribution activities uses non-tradables, it could be affected by exchange rate movements.

In sum, we postulate the following import price equation, which is broadly consistent with those behind the empirical exercises in the rest of the literature:

$$P = E \cdot [\psi(E,.) \cdot c(E,.)],$$
$$\psi(E,.) \equiv \frac{P^*(E,.)}{c(E,.)}, \qquad (1)$$

where $\psi(.)$ is the mark-up that foreign firms charge on their costs, and $c(.)$ is their marginal costs.

[8] A foreign firm would not raise prices or leave the market and allow other firms to enter as soon as they observe the exchange rate falling. Instead, it would absorb the depreciation by reducing its margins. Vice-versa, when the exchange rate increases, the foreign firm would revamp its margins without reducing prices in local currency. Obviously, the buffering effect of margins has a limit. On the downside, at some point the foreign firm will decide the effort is not worth anymore and will start rising prices. On the upside, when other firms see the thick margins, they will be tempted to sink some resources to enter the market, driving prices and margins down.

As we mention above, mark-up depends basically on market characteristics and demand conditions in the importing country, and given the relationship of the latter with the value of the local currency, it depends indirectly on exchange rates. The cost of the imported product depends on the price of domestic and foreign inputs and the scale of production, then, it also depends in some way on exchange rates.

4.2. Empirical counterpart

The empirical implementation of the underlying model by most of the literature follows the regression equation presented in Goldberg and Knetter, which varies from paper to paper depending on the question they seek to answer and the data they draw on:

$$p_t = \alpha + \beta.e_t + \delta.x_t + \gamma.z_t + \varepsilon_t, \qquad (2)$$

where all the variables are in log, p_t is the domestic price of an imported product, e_t is the nominal exchange rate, x_t is a measure of the foreign costs, z_t denotes some controls, and ε_t is an error term.

The general setup is that domestic import prices (in local currency) are mainly driven by three variables: (i) the nominal exchange rate, (ii) the foreign exporter's costs, and (iii) domestic demand (directly, through its effect on mark-up; and indirectly, through the effects on scale and thus exporter's costs).

Campa and Goldberg uses as proxies for exporter's costs both an aggregate measure of labor costs in the trading partners, and real GDP in the domestic country, with the latter trying to capture the effect of demand on the scale and thus on marginal costs. Olivei combines (i) and (ii) by computing real exchange rates specific for each category of goods. Regarding demand conditions, it controls for the price of alternative goods with

domestic price indexes, and also for the expenditure on the imported good and its alternatives with US industrial production indexes. Finally, Marazzi et al. relies on foreign CPI and PPI to capture exporter's costs, and uses an index of primary commodities prices as representing the price of alternative goods, which in turn affects domestic demand.

In this paper we have the same underlying framework. When we take it to the data, we share with Goldberg and Knetter and Campa and Goldberg, the fact that we consider nominal exchange rate movements, as supposed to real exchange rate[9]. On the other hand, we share with Olivei and Marazzi et al. the way we control for foreign costs. The three papers use cost proxies specific to each good category, derived either from foreign CPI or PPI, although we construct our own indexes. We also share with Olivei the fact that we include US production indexes to control for the state of the business cycle in each sector, and domestic price indexes as proxies for the prices of alternative goods.

We estimate equation (2) in first-differences by using ordinary least squares and recursive least squares methods, specifically:

$$\Delta p_t = a + b_1.\Delta e_t + b_2.\Delta x_t + b_3.\Delta z_t + \nu_t, \qquad (3)$$

where Δ indicates the first-difference operator, ν_t is the regression residual, and a and b_i are the estimated coefficients.

It is apparent from equation (3) that the estimated coefficient b_1 is not an estimator of the pass-through elasticity given by β in equation (2). We can easily show that b_1 is

[9] Olivei directly considers the real exchange rate. Marazzi et al. considers it indirectly, given it restricts the nominal exchange rate and the foreign price index coefficients to be the same ($\beta = \delta$).

estimating a quadratic function of the true pass-through elasticity.[10] Therefore, the estimated pass-through elasticities will be computed as the square root of b_1.

To test for the presence of asymmetries in the pass-through elasticities we estimate a slightly different version of equation (3):

$$\Delta p_t = a + b_1.\Delta e_t + b_2.\Delta x_t + b_3.\Delta z_t + b_4.\Delta e_t D_t + \nu_t, \quad (4)$$

where D_t is a dummy variable that captures the depreciation events.[11]

In equation (4) we incorporate the interaction term with the aim of testing if the degree of ERPT is the same during depreciation and appreciation events or if it is different. So, in this case b_1 is estimating some function of the ERPT elasticity when the dollar appreciates and $(b_1 + b_4)$ is estimating the same function when the dollar depreciates. Thus, our asymmetry test consists of assessing if b_4 is significantly different from zero, in which case we can reject the hypothesis that ERPT is symmetric.

5. Data description

Import Prices and Quantities.

We use monthly import price data for the period Dec.1993-Dec.2004 from the BLS. The BLS reports price indexes at different levels of aggregation: (i) aggregate import price index (*level 1*), (ii) price index per import category (*level 2*) -e.g.: *Industrial Supplies and Materials* -, and (iii) price index per item within each import category (*level 3*) - e.g.: *Fuel oil*.

[10] We show this in the Appendix.

[11] The dummy variable takes the value 1 if the nominal exchange rate depreciates and 0 if it appreciates or remains unchanged.

In this paper we work with the three *level 2* categories that contribute the most to total imports. Regarding *level 3* items, they are selected in a way such that they explain 2/3 of imports of the corresponding *level 2* category. We use annual import data from the Bureau of Economic Analysis (BEA) for the years 2002, 2003 and 2004, while data for 2001 comes from the U.S. Census Bureau.

In some cases a BEA import category did not exactly match the description of a BLS import price category. To reconcile this difference we use our judgment in attempting to find an equivalent category. Table 4 shows all the cases in which the category names from the BEA do not exactly match those reported in the import price index statistics provided by the BLS.

Nominal Exchange Rates.

The Board of Governors constructs three nominal exchange rate indexes: Broad, Major and "Other Important Trading Partners" (OITP). The Broad index includes 26 currencies from the US main trading partners. The Major index includes the 7 most important currencies, while the remaining 19 are included in the OITP index. All these indexes are denominated in units of foreign currency per unit of dollar.

We use these time series at a monthly frequency for the period Dec.1993-Dec.2004. The results reported in the paper are based on the Broad index; we also perform some of the exercises with the Major index, but they are robust to this change.

Cost Proxies.

We construct three types of foreign cost proxies for each item and category in the study. The first index is constructed with monthly data for the period Dec.1993-Dec.2004 from the International Financial Statistics (IFS). Following Campa and Goldberg, we take

advantage of the fact that the IFS reports both the real and the nominal exchange rate per country adjusted by labor costs (*reu* and *neu* series), and we derive an approximate measure of the trading partners' costs.[12]

The other two indexes are both weighted averages of foreign price indexes, yet one is built by combining foreign Producer Price Index (PPI) and Wholesale Price Index (WPI) while the other is done entirely with foreign Consumer Price Index (CPI). The data we use is monthly and covers the period Dec.1993-Dec.2004. The weights are constructed from the relative importance of each country in the trade volume of each item. We obtain the historical monthly import volumes per country from Dec.1993 to Dec.2004 from the U.S. Department of Commerce.

Industrial Production.

We use monthly Industrial Production (IP) indexes constructed by the Board of Governors under the North American Industry Classification System (NAICS) for the period Dec.1993-Dec.2004. Since both, the IP indexes and the trade data from the Department of Commerce are built under the NAICS, it becomes necessary to use our judgment to reconcile these variables with the BLS classification system. Table 5 indicates how the import price indexes categories are matched. In some occasions a NAICS category is repeated (e.g. *Computers* and *Computer accessories*) and in some others, due to the lack of an appropriate match, we use a category index (i.e. a *level 2* index). This more aggregate index is able to capture an average of all the changes occurring in a particular sector. We drop out only one item (*Civilian aircraft*) within *Capital Goods* due to lack of sufficient data.

Domestic Prices.

[12] The exact derivation as well as the underlying assumptions is in the Appendix.

We use as domestic prices of imported goods two type of indexes; the industrial PPI for the items within *Industrial Supplies and Materials* and *Capital Goods*, and the urban CPI for all the final goods items within *Consumer Goods*. In this case, it also becomes necessary to use our judgment when matching the import price items with those categories used as proxies of domestic prices. Table 6 details how all items are matched.

We test for the presence of unit roots in all the data by using the augmented Dickey-Fuller methodology. We find that most of the time series in our data set were non-stationary at 1% level of significance. Hence, we estimate our models in first differences.

6. Results

Table 7 summarizes the results obtained from estimating equation (3). Column (a) shows the ERPT elasticities that we get from estimating a simple statistical relationship between domestic import prices and exchange rates. Columns (b) through (d) present the ERPT elasticities estimated using equation (3) for different specification of the foreign cost: broad, PPI/WPI based, and CPI based proxies. Finally, column (d) gives the estimated ERPT elasticity that we find when using specification (c) with one more control variable, the domestic price index, which acts as a proxy of the prices of competing goods.
The results are robust across different specifications, except for *Industrial Supplies and Materials*, where both the overall category and its related items change substantially when the model is specified as in (d).[13]

[13] We believe the proxy we use for the prices of competing goods is not as precise in this case. Within *Industrial Supplies and Materials* most of the items are commodities or very standardized products, so domestic prices and import prices refer to almost the same good, and therefore they are highly correlated.

We find strong evidence in favor of the partial ERPT hypothesis at the more aggregated levels. In our best specification, (c), *Total Imports* shows an average short run elasticity of 18% for the period Dec.1993-Dec.2004. At *level 2*, *Industrial Supplies and Materials* is more elastic than the *level 1* counterpart, but it is statistically significant only in specification (c), averaging 29% during the sample period. *Capital Goods* and *Consumer Goods* are both less elastic than the *level 1* counterpart, 8% and 13% respectively, and interestingly, they are statistically significant across all specifications.

At the most disaggregated level we cannot reject the non pass-through hypothesis in the majority of cases. As we point out above, the estimations of ERPT elasticities for *Industrial Supplies and Materials* are not very robust; nevertheless, we find that *Plastic materials* is consistently significant, with a degree of pass-through in the range of 19%-24%. Within *Capital Goods*, we find statistically significant partial ERPT for several items: *Electrical apparatus* 15%, *Industrial machines, others* 15%, *Medicinal equipment* 13%, and *Photo, service machinery* 17%. Finally, within *Consumption Goods*, the three items that we consistently find significant are *Furniture* 14%, *Gems, diamonds* 15%, and *Pharmaceutical preparations* 15%.

Table 8 shows the differential ERPT elasticities obtained from estimating equation (4). As in the rest of the literature, we do not find evidence of asymmetric pass-through in the vast majority of cases. Thus, from our econometric exercises we conclude that the degree of pass-through is the same whether the exchange rate depreciates or appreciates, which contradicts some of the preliminary ideas described in section 3.

In general, we cannot reject the hypothesis of zero differentials. Only in three items (*Lumber*, *Shingles and wallboard*, and *Household appliances*) appears to be some

different behavior, but in all of them the ERPT coefficients are not significant, either overall or during appreciation events. Furthermore, as in the previous table, the results for the first two items, which belong to *Industrial Supplies and Materials*, are not robust across all specifications.

Finally, we estimate equation (3) using recursive least squares. This implies equation (3) is estimated repeatedly using a larger sample each time. We start with a sample size of $t=48$ and then generate a vector of ($T-48$) coefficients by adding *1* new observation to the sample until $t=T$. We report these vectors in Figure 3, where we plot the path of the ERPT coefficients and a one standard deviation bounds.[14]

We can see in Figure 3 that the degree of pass-through of *Total Imports* has a slightly downward trend during the period under analysis. However, the behavior of its components is very heterogeneous. While Industrial *Supplies and Materials* resembles the aggregate pattern very well all over the period; the other two categories present a change in the trend in the last months, when both *Capital Goods* and *Consumer Goods* prices increase their sensitivity to exchange rates movements.

The heterogeneity is more evident when we dig into the components of each category. Within *Industrial Supplies and Materials*, there are items such as *Natural gas*, *Bauxite and aluminum*, and *Lumber* that have a definite upward trend. Among the components of *Capital Goods*, all but *Computers* and *Medicinal equipment* show slight increases in the ERPT coefficients during the last months, but in most of the cases the coefficients are drifting down over the whole period. In the last category, *Consumer Goods*, we find variables trending down (*Furniture*, *Other household goods*, *Gems, diamonds*,

[14] The charts show the evolution of the coefficients as they come from the regression, which should be transformed to be read as elasticities.

Pharmaceutical preparations, and *Apparel, textiles – non wool or cotton*), up (*Toys, games, sporting goods*, and *Writing and art supplies*), or showing no trend (*Apparel – cotton*, *TVs, VCRs*, *Household appliances*, and *Footwear*). During the last months, however, almost all the items show a stable or an upward trend in the ERPT coefficient.

7. Conclusion

In this paper we seek to answer the question of why the dollar depreciation has not stopped the trade deficit from deepening in the last years. Is it that the products we import have not become more expensive? Or, is it that even when they are more expensive we cannot prevent ourselves from buying them?

The answers seem to be "yes" in both cases. On one hand, prices of capital and consumer goods have not absorbed much of the movements in the exchange rate (either depreciations or appreciations) during the last ten years, and consequently have remained pretty stable. On the other hand, even though prices of industrial supplies and materials have been rising we have kept importing them.

A third question immediately arises; would this performance continue in the future?

In the paper we analyze the behavior of some import price indexes in the last decade, and relying on the results we intent an answer to the question.

Overall, we find that exchange rate movements are translated only slightly into changes in the domestic price of our imports at a monthly frequency. The ERPT elasticity of total imports' prices averages 18%, although there is a considerable degree of variation across import categories.

We show that capital and consumer goods consistently have low degrees of ERPT. In this regard, we see that dollar depreciations (appreciations) are matched pretty closely by reductions (increases) in the foreign price of these products. We believe this observation exposes in part the behavior of foreign exporters, suggesting that they alter their profit margins in response to exchange rate changes. Our results also suggest that the value of the dollar does not affect either the domestic price or the foreign price of the imports of industrial supplies and materials, which reveals the absence of a buffering effect from foreign margins.

As in previous works, we also find a downward trend in ERPT elasticities for the main import categories. However, this is not evident at the more disaggregated levels, where we notice a reversion towards higher ERPT during 2004.

This last observation is crucial for the response to our third question. It points to the fact that some foreign firms seem to have come to a halt regarding the absorption of exchange rate depreciations. After a long period of a falling dollar, margins have ended up being slim, and the chances of continuing with the same strategy have been reduced. Hence, some foreign exporters should start passing-through the exchange rate depreciations to domestic import prices to be able to survive, and we would see the cheaper dollar feeding into some domestic import prices. Afterward, the response would be "probably no". Obviously, we are looking at just to one side of the coin. While the capital account remains positive, the current account, and in turn the trade balance, will stay negative. Consequently, the dollar depreciation might continue, the import bundle might change, and we still would observe low ERPT into the aggregate index of domestic import prices.

8. Appendix

Recovering ERPT elasticities from regression coefficients:

From equation (2), the coefficient β is the elasticity of domestic import prices to the nominal exchange rate (ERPT):

$$\beta = \frac{d \log P_t}{d \log E_t} = \frac{\frac{1}{p} dP}{\frac{1}{E} dE} = \frac{dP}{dE} \cdot \frac{E}{P} = \eta_{P,E}.$$

The estimated coefficient b_1 in equation (3) is:

$$b_1 = \frac{d\Delta \log P_t}{d\Delta \log E_t} = \frac{d \log P_t - d \log P_{t-1}}{d \log E_t - d \log E_{t-1}} = \frac{\frac{1}{P_t} dP - \frac{1}{P_{t-1}} dP}{\frac{1}{E_t} dE - \frac{1}{E_{t-1}} dE} = \frac{\frac{P_{t-1} - P_t}{P_{t-1}}}{\frac{E_{t-1} - E_t}{E_{t-1}}} \cdot \frac{dP}{dE} \cdot \frac{E_t}{P_t}.$$

Using the above definition for the ERPT:

$$b_1 = \frac{\frac{\Delta P_t}{P_{t-1}}}{\frac{\Delta E_t}{E_{t-1}}} \cdot \eta_{P,E} = \frac{\Delta P_t}{\Delta E_t} \cdot \frac{E_{t-1}}{P_{t-1}} \cdot \eta_{P,E} \cong (\eta_{P,E})^2.$$

Deriving a cost proxy from the IFS exchange rate series:

The IFS provides a unit labor cost based real effective exchange rate (REER). The index is defined as the nominal exchange rate times a ratio of unit labor costs:

$$reu = neu \cdot \frac{\omega^*}{\omega}, \qquad (5)$$

where *reu* is the REER adjusted by labor costs, *neu* is the nominal exchange rate and ω^* and ω are the foreign and domestic normalized unit labor costs respectively. These costs are defined as the ratio of hourly compensation in manufacturing to measured labor productivity in that sector:

$$\omega = \frac{hw}{\ell}; \ \omega^* = \frac{hw^*}{\ell^*}, \qquad (6)$$

where *hw* is the hourly wage and ℓ is the measure of productivity in each sector. Adding up all the sectors it is possible to obtain an index ω for the country's entire manufacturing sector. The IFS reports this index for several countries, based on data availability.

Plugging (6) into (5) and rearranging terms we obtain:

$$hw^* = \frac{reu}{neu} \cdot hw \cdot \frac{\ell^*}{\ell}.$$

If we assume that the ratio of productivities amongst the US and its major trading partners is not significantly altered during the period under study, then we have that:

$$\frac{\ell^*}{\ell} = 1;$$

Thus, it is straightforward to obtain an expression to estimate the proxy of the exporter's foreign costs:

$$hw^* = \frac{reu}{neu} \cdot hw.$$

Table 1: Pass-Through (No Pass-Through) Frequencies

	Whole Sample		Depreciation		Appreciation	
	PT	No PT	PT	No PT	PT	No PT
Total Industrial Supplies & Materials	0.371	0.629	0.362	0.638	0.378	0.622
Plastic Materials	0.511	0.489	0.544	0.456	0.378	0.622
Organic Chemicals	0.405	0.595	0.614	0.386	0.486	0.514
Iron & Steel mill products	0.435	0.565	0.579	0.421	0.500	0.500
Finished metal shapes	0.415	0.585	0.528	0.472	0.492	0.508
Crude Oil	0.397	0.603	0.667	0.333	0.541	0.459
Fuel Oil	0.435	0.565	0.596	0.404	0.514	0.486
Petroleum Prod, others	0.450	0.550	0.544	0.456	0.554	0.446
Gas Natural	0.415	0.585	0.642	0.358	0.523	0.477
Bauxite & Aluminum	0.450	0.550	0.561	0.439	0.527	0.473
Lumber	0.527	0.473	0.439	0.561	0.500	0.500
Shingles & Wallboard	0.511	0.489	0.404	0.596	0.541	0.459
Capital Goods Except Automotive	0.667	0.333	0.672	0.328	0.662	0.338
Electrical Apparatus	0.504	0.496	0.544	0.456	0.311	0.689
Ind. Machines, others	0.427	0.573	0.614	0.386	0.419	0.581
Computer Accessories	0.878	0.122	0.070	0.930	0.122	0.878
Computers	0.797	0.203	0.170	0.830	0.138	0.862
Semiconductors	0.641	0.359	0.333	0.667	0.216	0.784
Telecom Equipment	0.626	0.374	0.298	0.702	0.230	0.770
Civilian Aircraft	0.000	1.000	0.800	0.200	0.500	0.500
Medicinal Equipment	0.511	0.489	0.491	0.509	0.311	0.689
Photo, Service Machinery	0.473	0.527	0.544	0.456	0.392	0.608
Consumer Goods	0.417	0.583	0.448	0.552	0.392	0.608
Apparel, household goods - cotton	0.420	0.580	0.316	0.684	0.419	0.581
Furniture, Household goods	0.382	0.618	0.509	0.491	0.500	0.500
Other Household goods	0.511	0.489	0.386	0.614	0.338	0.662
Toys/games/ sporting goods	0.420	0.580	0.316	0.684	0.351	0.649
TV's, VCR's, etc	0.703	0.297	0.094	0.906	0.200	0.800
Gems, diamonds	0.117	0.883	0.295	0.705	0.280	0.720
Household Appliances	0.496	0.504	0.351	0.649	0.297	0.703
Footwear	0.359	0.641	0.526	0.474	0.473	0.527
Pharmaceutical Preparations	0.500	0.500	0.528	0.472	0.323	0.677
Writing & Art Supplies	0.521	0.479	0.455	0.545	0.420	0.580
Apparel, textiles, non-wool or cotton	0.458	0.542	0.340	0.660	0.338	0.662

Source: own calculations based on data from BLS.

Where PT = Pass Through; No PT = No Pass Through.

Sample period ranges from December 1993 to December 2004.

Frequencies represent the ratio between the number of times a particular event occurred and the total number of events.

Table 2: Import Price and Nominal Exchange Rate Correlations

			Depreciation		Appreciation	
	Domestic	**Foreign**	**Domestic**	**Foreign**	**Domestic**	**Foreign**
Total Industrial Supplies & Materials	0.130	-0.285	0.011	-0.255	0.203	-0.107
Plastic Materials	0.184	-0.622	0.171	-0.449	0.064	-0.490
Organic Chemicals	-0.038	-0.670	-0.194	-0.610	-0.172	-0.629
Iron & Steel mill products	0.123	-0.368	0.112	-0.310	0.077	-0.187
Finished metal shapes	0.138	-0.751	0.038	-0.655	0.174	-0.511
Crude Oil	0.107	-0.061	-0.009	-0.115	0.270	0.147
Fuel Oil	0.003	-0.111	0.012	-0.074	0.079	0.014
Petroleum Prod, others	0.054	-0.125	0.045	-0.066	0.155	0.008
Gas Natural	0.223	0.132	0.077	0.011	0.044	-0.019
Bauxite & Aluminum	0.020	-0.465	0.019	-0.353	0.158	-0.163
Lumber	-0.052	-0.343	-0.145	-0.336	0.177	-0.033
Shingles & Wallboard	-0.080	-0.448	-0.194	-0.436	0.225	-0.058
Total Capital Goods Except Automotive	0.244	-0.953	0.119	-0.920	0.041	-0.892
Electrical Apparatus	0.147	-0.817	0.096	-0.759	-0.097	-0.688
Ind. Machines, others	0.231	-0.895	0.212	-0.766	0.033	-0.864
Computer Accessories	0.042	-0.825	-0.068	-0.754	-0.166	-0.742
Computers	0.121	-0.460	0.068	-0.430	-0.033	-0.332
Semiconductors	0.105	-0.718	0.124	-0.616	0.181	-0.400
Telecom Equipment	0.003	-0.899	0.113	-0.749	-0.070	-0.886
Medicinal Equipment	0.200	-0.913	0.041	-0.844	-0.035	-0.869
Photo, Service Machinery	0.194	-0.847	0.251	-0.682	0.060	-0.760
Total Consumer Goods	0.168	-0.986	0.163	-0.969	-0.065	-0.973
Apparel, household goods - cotton	-0.094	-0.951	-0.051	-0.909	-0.002	-0.876
Furniture, Household goods	0.228	-0.920	0.102	-0.913	0.264	-0.715
Other Household goods	0.119	-0.956	-0.041	-0.924	0.091	-0.898
Toys/games/ sporting goods	-0.090	-0.956	-0.201	-0.931	-0.079	-0.887
TV's, VCR's, etc	0.018	-0.879	-0.061	-0.804	0.095	-0.731
Gems, diamonds	0.192	-0.882	-0.148	-0.954	0.139	-0.583
Household Appliances	0.124	-0.954	0.327	-0.907	-0.114	-0.902
Footwear	0.090	-0.958	0.121	-0.924	-0.114	-0.906
Pharmaceutical Preparations	0.185	-0.850	0.129	-0.722	-0.011	-0.795
Writing & Art Supplies	0.138	-0.928	-0.104	-0.910	0.015	-0.805
Apparel, textiles, non-wool or cotton	-0.011	-0.949	0.022	-0.896	0.159	-0.871

Source: own calculations based on data from BLS and Board of Governors.

Where "Domestic" stands for domestic prices & "Foreign" for foreign prices.

Sample period ranges from December 1993 to December 2004.

Table 3: Granger Causality Tests

	Granger Causality Tests				
	E to ...		**... to E**		**Observations**
Total Imports	0.502		1.490		130
Total Industrial Supplies & Materials	0.617		0.404		130
Plastic Materials	2.859	*	0.551		130
Organic Chemicals	0.900		4.078		130
Iron & Steel mill products	0.128		0.014		130
Finished metal shapes	2.932	***	0.703		117
Crude Oil	0.099		0.352		130
Fuel Oil	0.818		0.402		130
Petroleum Prod, others	0.531		2.088		130
Gas Natural	0.832		1.627		117
Bauxite & Aluminum	2.126		2.094		130
Lumber	0.217		2.275		130
Shingles & Wallboard	0.042		3.568	**	130
Total Capital Goods Except Automotive	26.125	***	1.098		130
Electrical Apparatus	5.450	***	0.816		130
Ind. Machines, others	26.495	***	0.041		130
Computer Accessories	3.686	**	0.266		130
Computers	0.740		1.031		117
Semiconductors	3.418	**	4.716	***	130
Telecom Equipment	0.727		0.899		130
Medicinal Equipment	12.825	***	0.451		130
Photo, Service Machinery	25.204	***	0.010		130
Total Consumer Goods	11.683	***	0.232		130
Apparel, household goods - cotton	0.397		2.394	*	130
Furniture, Household goods	3.350	**	0.057		130
Other Household goods	2.220		4.078		130
Toys/games/ sporting goods	0.274		0.376		130
TV's, VCR's, etc	0.415		0.086		117
Gems, diamonds	1.193		0.012		93
Household Appliances	2.578	*	0.425		130
Footwear	4.575	***	0.542		130
Pharmaceutical Preparations	17.639	***	0.328		117
Writing & Art Supplies	4.897	***	0.776		130
Apparel, textiles, non-wool or cotton	1.124		0.530		117

Source: own calculations.

The reported values are F-statistics for estimations with two lags.

*,**, ***: significance at 10%, 5% and 1%, respectively.

Sample period ranges from December 1993 to December 2004.

Table 4: BEA and BLS category matching

BEA Category	BLS Category
Crude Oil	Crude
Bauxite & Aluminum	Bauxite, alumina, aluminum & products thereof
Finished metal shapes	Finished metal shapes & advanced manufacturing
Industrial Supplies, Other	Industrial Supplies (aggregate)
Lumber	Lumber & other unfinished building materials
Shingles & Wallboard	Selected Building Materials
Medical Equipment	Scientific and Medical Machinery
Photo, Service Machinery	Photo & other service industry machinery
Toys/games/sporting goods	Toys, shooting & sporting goods
Household Appliances	Household and kitchen appliances
Footwear	Footwear of leather, rubber, or other material
Writing & Art Supplies	Other products (notions, writing, supplies, tobacco products, etc.)

Table 5: BLS and NAICS category matching

BLS IM Price Category	NAICS IP Category
Plastic Materials	Plastics material and resin NAICS=325211
Organic Chemicals	Organic chemicals NAICS=32511
Iron & Steel Products	Iron and steel products NAICS=3311
Finished Metal Shapes	Fabricated metal product NAICS=332
Crude Oil	Crude oil NAICS=211111
Fuel Oil	Distillate fuel oil NAICS=32411
Petroleum Products	Petroleum and coal products NAICS=324
Gas Natural	Natural gas NAICS=211111
Bauxite	Alumina and aluminum production and processing NAICS=3313
Lumber	Wood product NAICS=321
Shingles/ Wallboard	Plywood and misc. wood products NAICS=3212
Ind. Supplies Other	Level 2 Industrial Supplies IP Index
Electrical App	Electrical equipment, appliance, and component NAICS=335
Ind. Machines Other	Machinery, Except Electrical NAICS=333
Comp Accessories	Computer and peripheral equipment NAICS=3341
Computers	Computer and peripheral equipment NAICS=3341
Semiconductors	Semiconductor and other electronic component NAICS=3344
Telecom Equipment	Communications equipment NAICS=3342
Civilian Aircraft	Aircraft and parts NAICS=336411
Medicinal Equipment	Medical equipment and supplies NAICS=3391
Photo/ Service Mach	Level 2 Capital Goods IP Index
Apparel household	Apparel and leather goods NAICS=3152
Furniture, Household	Household & Institutional furniture NAICS=3371
Other Household good	Furniture and related product NAICS=337
Toys/games	Level 2 Consumer Goods IP Index
TV's, VCR, etc	Audio and video equipment NAICS=3343
Gems Diamonds	Level 2 Consumer Goods IP Index
Household Appliance	Household appliances NAICS=3352
Footwear	Apparel and leather goods NAICS=3152
Pharmaceutical Prep	Pharmaceutical and medicine NAICS=3254
Writing & Art Supp	Paper NAICS=3221
Apparel Textiles	Textiles and products NAICS=313

Table 6: Import Prices and Domestic PPI/CPI matching

Imp Price Category	CPI/PPI Category	Index
Total Industrial Supplies & Materials	Intermediate Materials: Less food & Feeds	PPI
Plastic Materials	Plastic resins and materials	PPI
Organic Chemicals	Basic organic chemicals	PPI
Iron & Steel mill products	Steel mill products	PPI
Finished metal shapes	Fabricated Structural Metal Products	PPI
Crude Oil	Crude Petroleum	PPI
Fuel Oil	Gasoline	PPI
Petroleum Prod, others	Petroleum Products, refined	PPI
Gas Natural	Natural gas (to pipelines)	PPI
Bauxite & Aluminum	Primary nonferrous metals ex precious	PPI
Lumber	Lumber	PPI
Shingles & Wallboard	Building Paper & Board	PPI
Industrial Supplies Other	Intermediate Materials: Less food & Feeds	PPI
Total Capital Goods Except Automotive	Capital Equipment	PPI
Electrical Apparatus	Electrical industrial Apparatus	PPI
Ind. Machines, others	Capital Equipment	PPI
Computer Accessories	Computer peripheral equipment and parts	PPI
Computers	Electronic Computers	PPI
Semiconductors	Capital Equipment	PPI
Telecom Equipment	Telephone and Telegraph Equipment	PPI
Medicinal Equipment	X-ray and electro medical equipment	PPI
Photo, Service Machinery	Capital Equipment	PPI
Total Consumer Goods	CPI-U-All	CPI
Apparel, household goods - cotton	Window & floor covering & other linens	CPI
Furniture, Household goods	Furniture & Bedding	CPI
Other Household goods	Other Household Equipment & Furnishing	CPI
Toys/games/ sporting goods	Average of Sporting goods & Toys categories	CPI
TV's, VCR's, etc	Video and audio	CPI
Gems, diamonds	Jewelry & Watches	CPI
Household Appliances	Household Appliances	CPI
Footwear	Footwear	CPI
Pharmaceutical Preparations	Medical Care Commodities	CPI
Writing & Art Supplies	Stationary, Stationary Supplies, Gift Wrap	CPI
Apparel, textiles, non-wool or cotton	Apparel	CPI

Table 7: Pass-through Elasticities

	Statistical Model		Economic Models								
			Foreign Costs								Domestic Prices
			Broad based [a]		PPI/WPI based [b]		CPI based [c]				
Total Imports	0.156	*	0.169	**	0.177	**	0.170	**	0.000		
Total Industrial Supplies & Materials	0.241		0.263		0.291	*	0.269		0.169		
Plastic Materials	0.210	**	0.215	**	0.238	***	0.215	**	0.189	**	
Organic Chemicals	-0.106		-0.105		-0.104		-0.120		-0.177		
Iron & Steel mill products	0.227		0.228		0.194		0.201		0.179		
Finished metal shapes	0.154	***	0.152	*	0.161		0.156		0.148		
Crude Oil	0.357		0.347		0.384		0.360		0.170		
Fuel Oil	0.121		0.139		0.265		0.220		-0.226		
Petroleum Prod, others	0.223		0.226		0.262		0.222		0.056		
Gas Natural	0.693	**	0.698	**	0.700	**	0.695	**	0.218		
Bauxite & Aluminum	0.094		0.129		0.100		0.120		-0.097		
Lumber	-0.168		-0.168		-0.146		-0.144		0.258	*	
Shingles & Wallboard	-0.184		-0.162		-0.182		-0.150		0.114		
Total Capital Goods Except Auto	0.128	***	0.130	***	0.136	***	0.134	***	0.135	***	
Electrical Apparatus	0.146	***	0.149	*	0.149	*	0.145	*	0.148	*	
Ind. Machines, others	0.153	*	0.154	***	0.153	***	0.148	***	0.152	*	
Computer Accessories	0.075		0.084		0.082		0.089		0.084		
Computers	0.186		0.182		0.153		0.164		0.166		
Semiconductors	0.139		0.138		0.141		0.138		0.142		
Telecom Equipment	0.026		-0.008		0.057		0.049		0.065		
Medicinal Equipment	0.134	**	0.131	**	0.131	**	0.133	**	0.132	**	
Photo, Service Machinery	0.158	**	0.169	***	0.170	***	0.174	***	0.169	**	
Total Consumer Goods	0.084	**	0.085	**	0.084	**	0.084	**	0.083	**	
Apparel, household goods - cotton	-0.082		-0.083		-0.083		-0.087		-0.066		
Furniture, Household goods	0.143	***	0.141	***	0.141	***	0.138	***	0.141	*	
Other Household goods	0.090		0.087		0.086		0.091		0.096		
Toys/games/ sporting goods	-0.077		-0.082		-0.080		-0.081		-0.076		
TV's, VCR's, etc	0.026		0.035		-0.014		0.026		-0.038		
Gems, diamonds	0.143	*	0.148	**	0.149	**	0.153	**	0.146	*	
Household Appliances	0.092		0.095		0.091		0.089		0.112	*	
Footwear	0.076		0.077		0.082		0.080		0.082		
Pharmaceutical Preparations	0.153	**	0.149	**	0.148	***	0.143	*	0.127		
Writing & Art Supplies	0.108		0.112		0.105		0.110		0.105		
Apparel, textiles, non-wool or cotton	-0.029		-0.036		-0.030		-0.031		-0.025		

Source: own calculations.

*,**, ***: significance at 10%, 5% and 1%, respectively.

The elasticities are computed from the estimation of coefficient b_1 in equation (3).

Table 8: ERPT differentials (ERPT depreciation - ERPT appreciation)

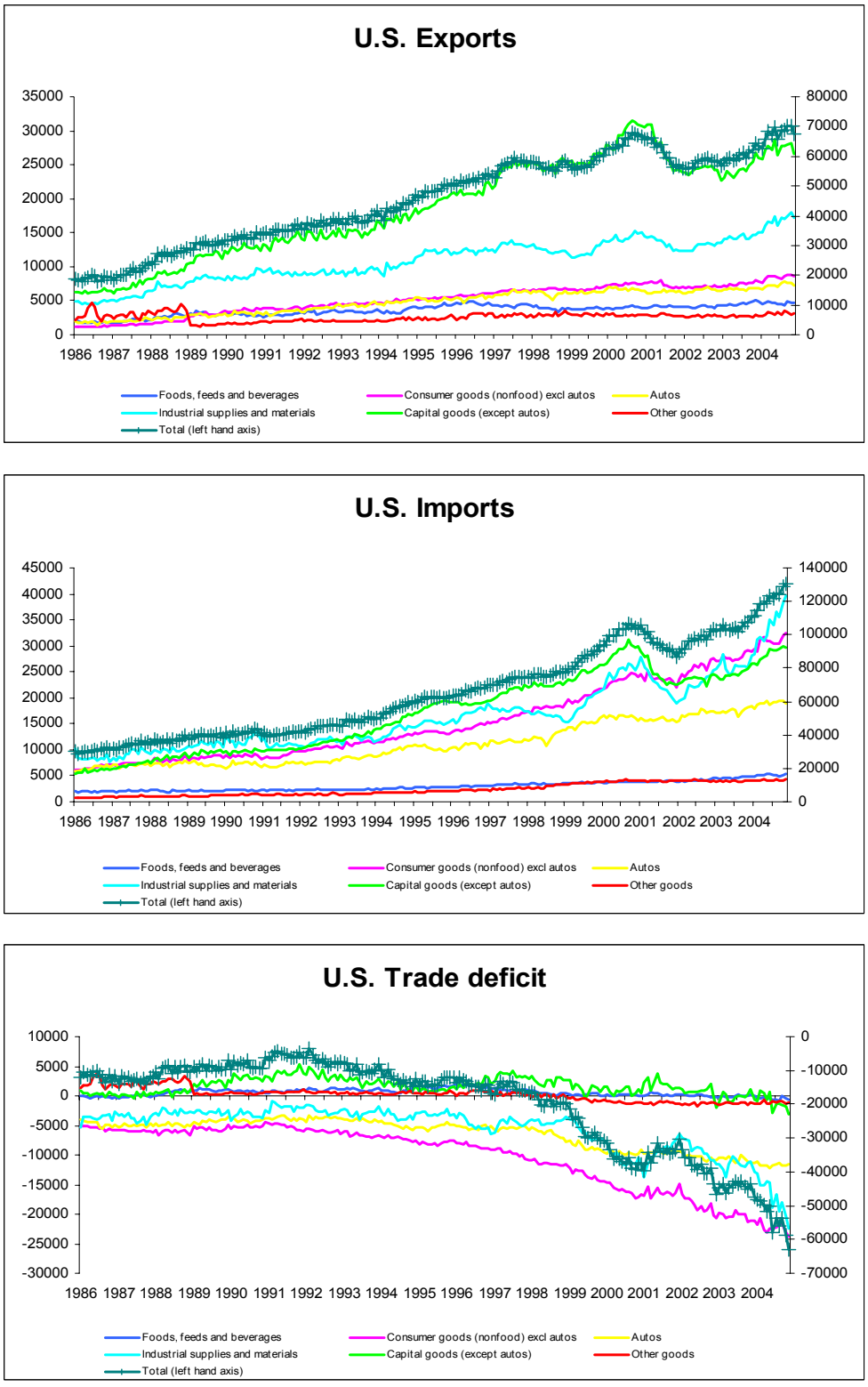
	Statistical Model	Economic Models			
		Foreign Costs			Domestic Prices
		Broad based	PPI/WPI based	CPI based	
		[a]	[b]	[c]	[d]
Total Imports	-0.228	-0.243	-0.271 ***	-0.249	
Total Industrial Supplies & Materials	-0.444	-0.482 *	-0.523 **	-0.487 *	-0.362
Plastic Materials	0.211	0.184	0.157	0.195	0.184
Organic Chemicals	-0.331	-0.342 *	-0.331	-0.317	-0.321 *
Iron & Steel mill products	-0.090	-0.110	0.048	-0.088	-0.168
Finished metal shapes	-0.223	-0.205	-0.224	-0.242	-0.224
Crude Oil	-0.756	-0.716	-0.779	-0.734	-0.445
Fuel Oil	-0.446	-0.294	-0.526	-0.465	-0.061
Petroleum Prod, others	-0.312	-0.320	-0.357	-0.318	0.370
Gas Natural	-0.683	-0.686	-0.680	-0.688	-0.395
Bauxite & Aluminum	-0.268	-0.287	-0.238	-0.256	-0.210
Lumber	-0.550 *	-0.565 *	-0.592 *	-0.630 **	-0.083
Shingles & Wallboard	-0.518 **	-0.520 **	-0.549 **	-0.532 **	-0.300
Total Capital Goods Except Auto	-0.062	-0.062	-0.061	-0.083	-0.058
Electrical Apparatus	0.142	0.138	0.148	0.156	0.135
Ind. Machines, others	0.178	0.169	0.176	0.176	0.174
Computer Accessories	-0.145	-0.149	-0.151	-0.151	-0.140
Computers	0.042	0.129	0.121	0.163	0.191
Semiconductors	-0.144	-0.122	-0.100	-0.117	-0.095
Telecom Equipment	0.150	0.183	0.151	0.146	0.082
Medicinal Equipment	-0.099	-0.060	-0.101	-0.097	-0.134
Photo, Service Machinery	0.203	0.181	0.188	0.179	0.181
Total Consumer Goods	0.119	0.113	0.119	0.124	0.115
Apparel, household goods - cotton	-0.019	0.033	-0.008	-0.044	0.130
Furniture, Household goods	-0.150	-0.147	-0.148	-0.148	-0.152
Other Household goods	-0.147	-0.152	-0.148	-0.148	-0.096
Toys/games/ sporting goods	-0.142	-0.130	-0.140	-0.148	-0.140
TV's, VCR's, etc	-0.142	-0.110	-0.125	-0.152	-0.120
Gems, diamonds	-0.234	-0.215	-0.260 *	-0.228	-0.257
Household Appliances	0.224 ***	0.213 ***	0.222 ***	0.229 ***	0.171
Footwear	0.143	0.139	0.139	0.149	0.139
Pharmaceutical Preparations	0.120	0.121	0.118	0.054	0.064
Writing & Art Supplies	-0.165	-0.157	-0.161	-0.147	-0.160
Apparel, textiles, non-wool or cotton	0.019	-0.043	-0.027	-0.024	-0.034

Source: own calculations.

*,**, ***: significance at 10%, 5% and 1%, respectively.

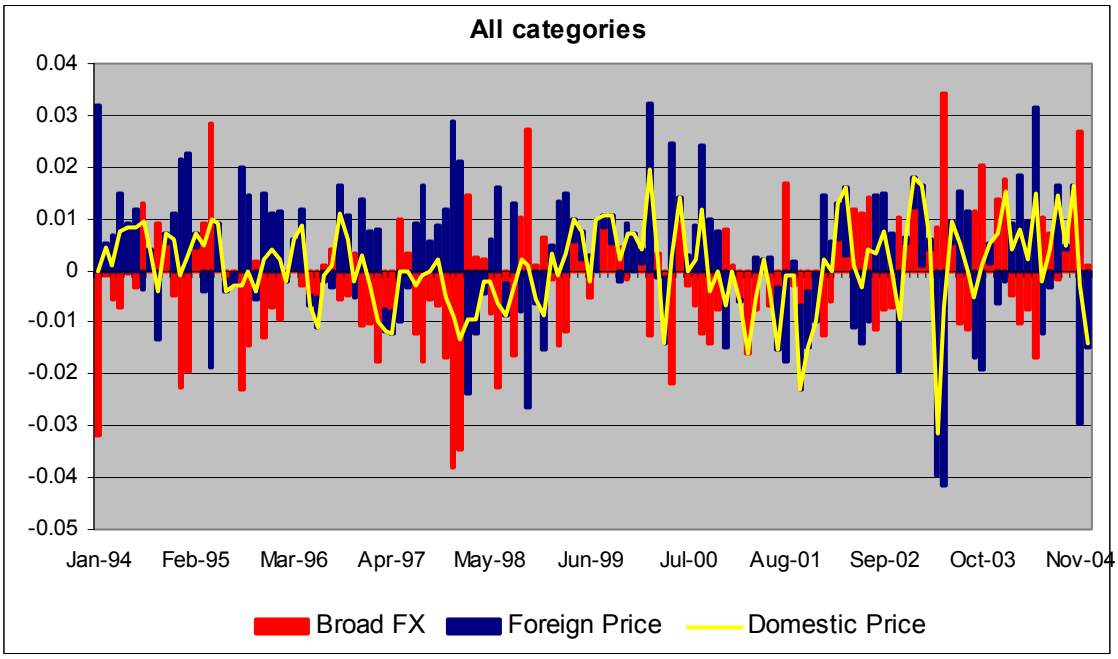
The elasticities are computed from the estimation of the coefficient b_4 in equation (4).

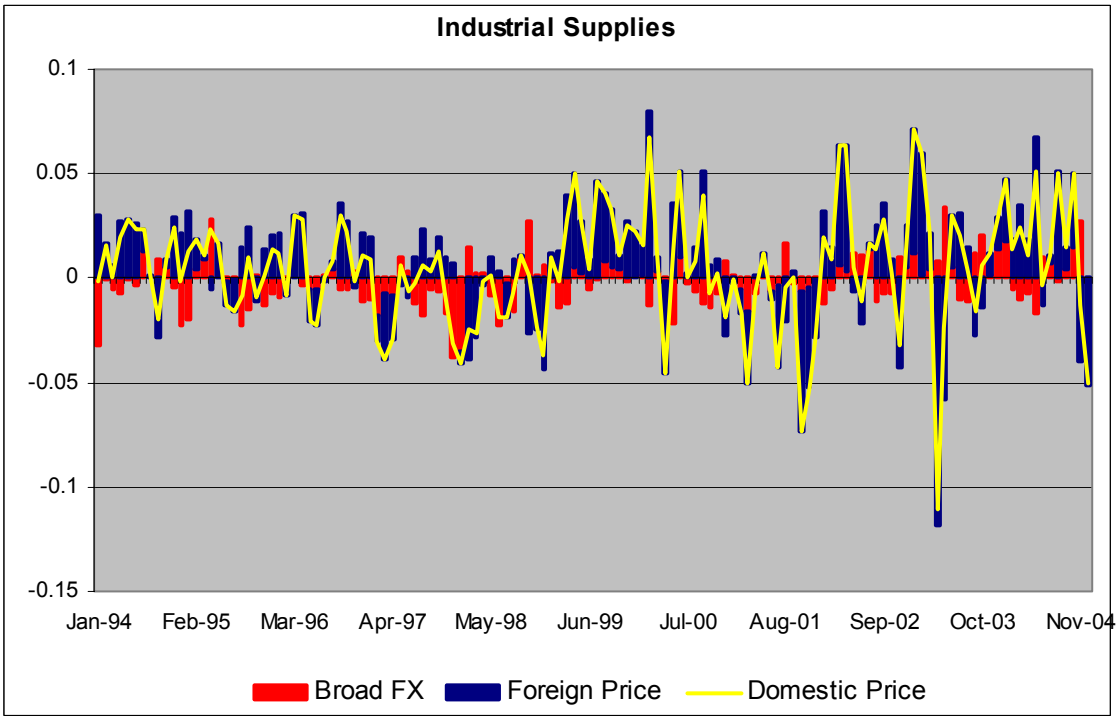
Figure 1: Exports, Imports & Trade deficit
(in millions of US dollars)



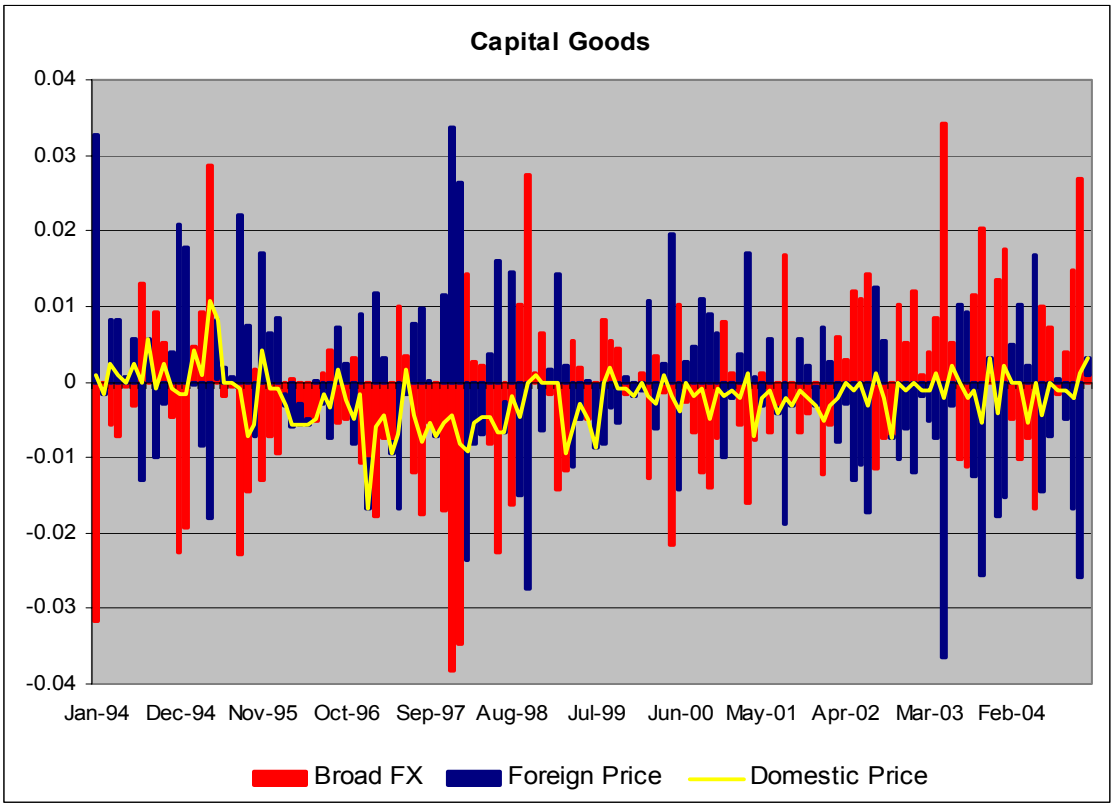
Source: Haver Analytics

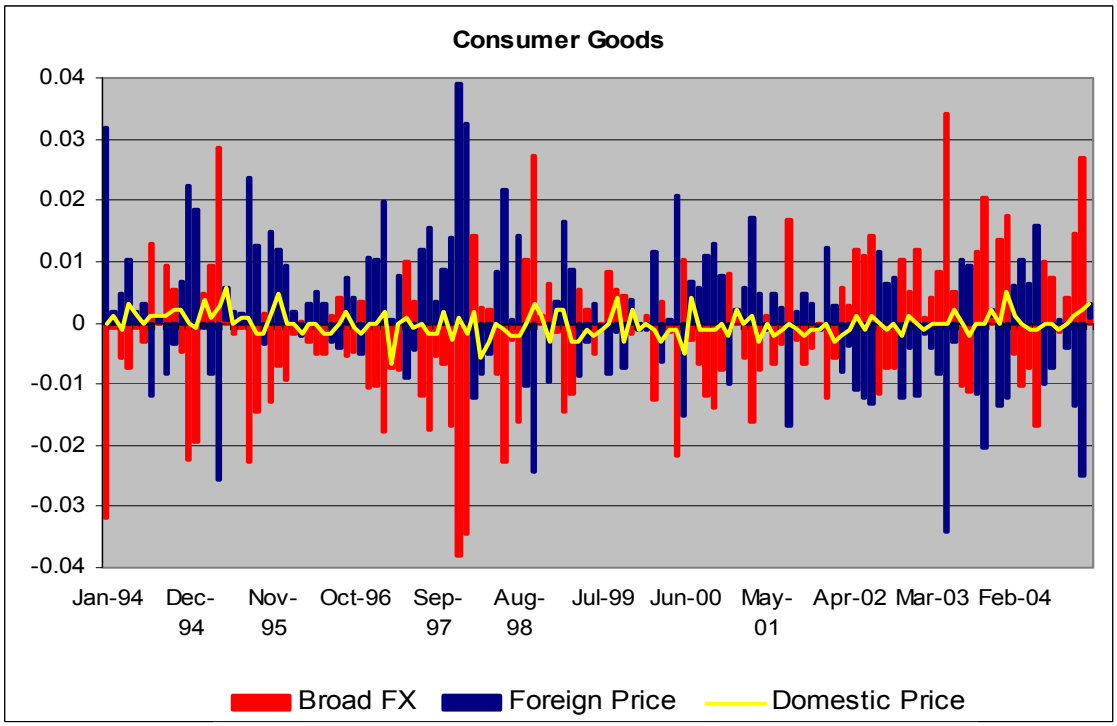
Figure 2: Import Price Decomposition





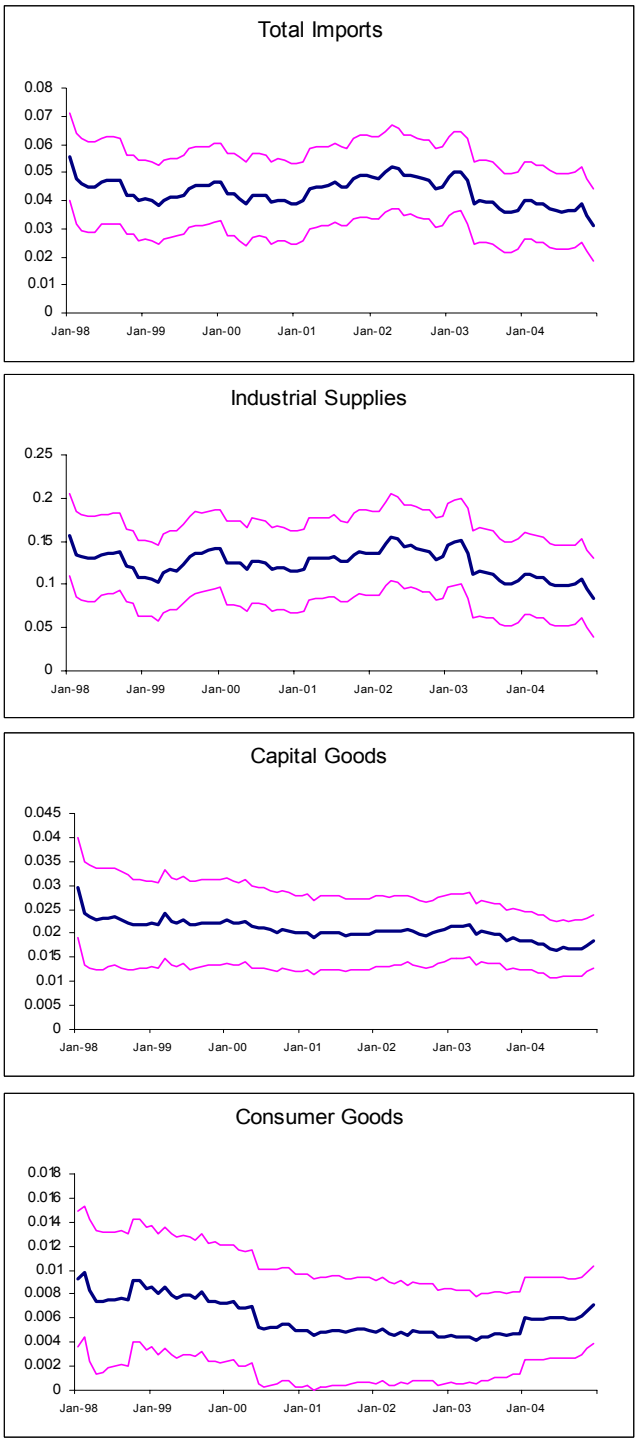
Source: own calculations





Source: own calculations

Figure 3: Evolution of ERPT coefficients

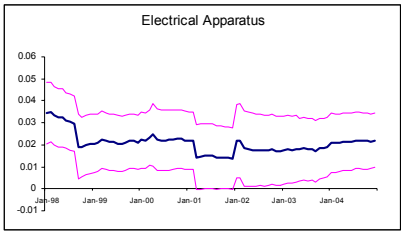


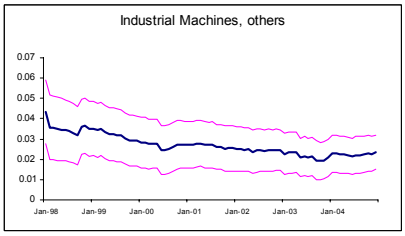
Recursive estimations of equation (3), using WPI/PPI specification (column [b] Table 7).
Sample period ranges from January 1998 until December 2004.
Graphs also show one standard deviation bounds.

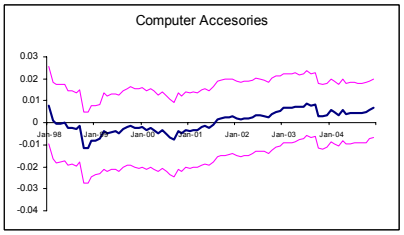
Industrial Supplies:

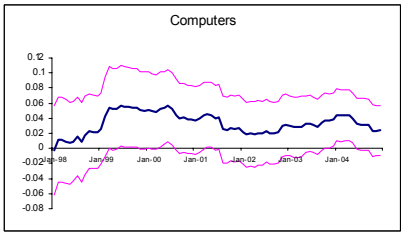
Recursive estimations of equation (3), using WPI/PPI specification (column [b] Table 7).
Sample period ranges from January 1998 until December 2004.
Graphs also show one standard deviation bounds.

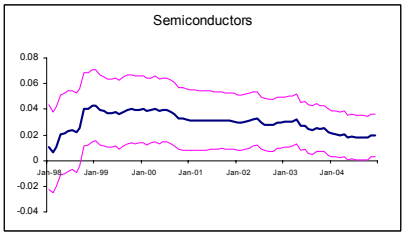
Capital Goods:

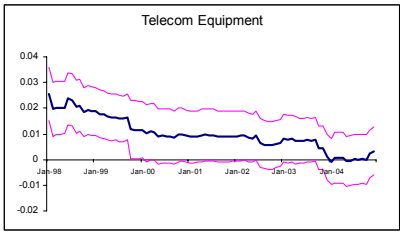


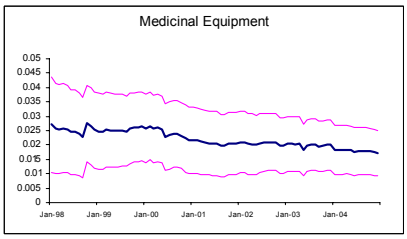


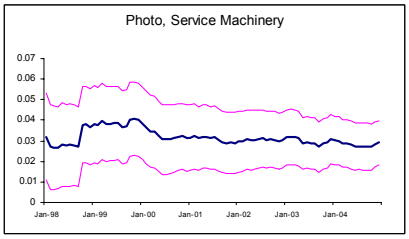






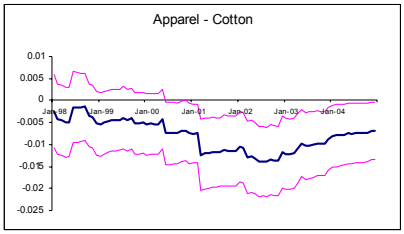


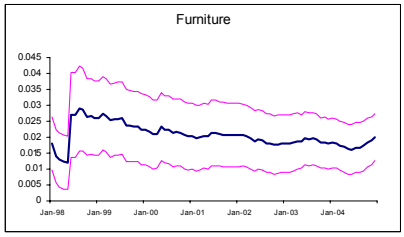


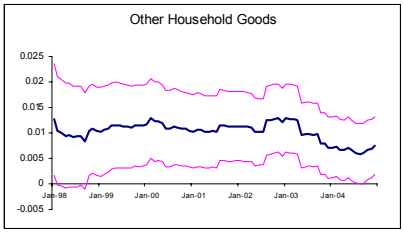


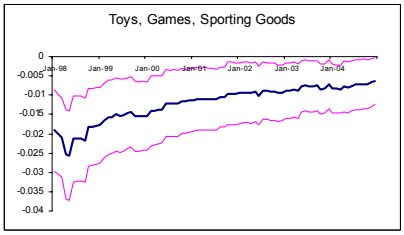
Recursive estimations of equation (3), using WPI/PPI specification (column [b] Table 7).
Sample period ranges from January 1998 until December 2004.
Graphs also show one standard deviation bounds.

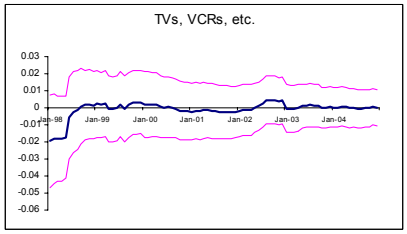
Consumer Goods:

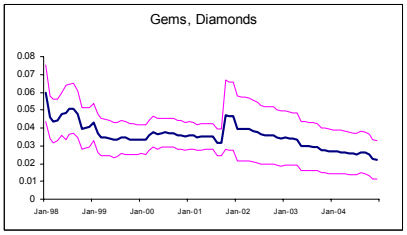


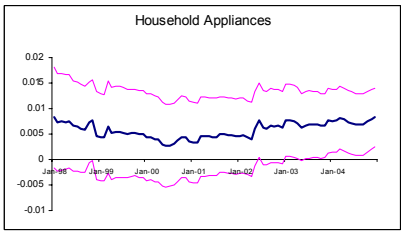


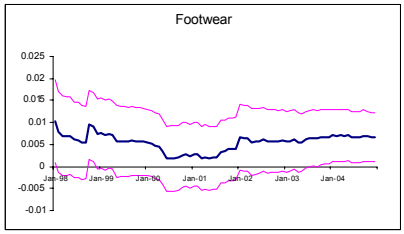


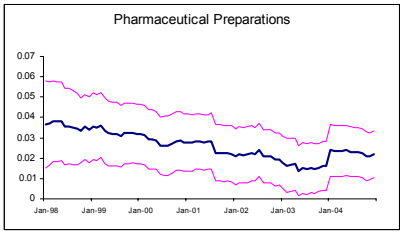


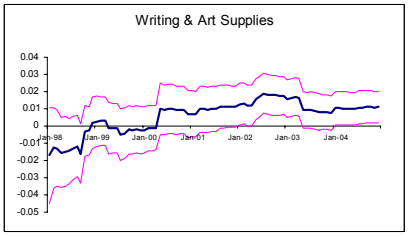


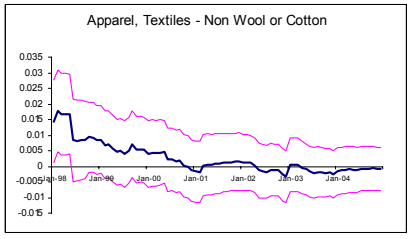












Recursive estimations of equation (3), using WPI/PPI specification (column [b] Table 7).
Sample period ranges from January 1998 until December 2004.
Graphs also show one standard deviation bounds.

References

[1] Baldwin, R. and P. Krugman (1989), "Persistent Trade Effects of Large Exchange Rate Shocks", *Quarterly Journal of Economics*, Vol. 104 (4), 635-654.

[2] Bernard, A. and B. Jensen (2004), "Entry, Expansion, and Intensity in the US Export Boom, 1987-1992", *Review of International Economics*, Vol. 12 (4), 662-675.

[3] Burstein, A., J. Neves, and S. Rebelo (2003), "Distribution Costs and Real Exchange Rate Dynamics during Exchange Rate Based Stabilizations", *Journal of Monetary Economics*, Vol. 50, 1189-1214.

[4] Campa, J. and L. Goldberg (2002), "Exchange Rate Pass-Through into Import Prices: A Macro or Micro Phenomenon?", NBER WP No. 8934.

[5] Cunningham, A. and A. Haldane (2000), "The Monetary Transmission Mechanism in the United Kingdom: Pass-Through and Policy Rules", Central Bank of Chile WP No. 83.

[6] Dornbusch, R. (1987), "Exchange Rate and Prices", *American Economic Review*, Vol. 77 (1), 93-106.

[7] Feenstra, R. (1989), "Symmetric Pass-Through of Tariffs and Exchange Rates under Imperfect Competition: An Empirical Test", *Journal of International Economics*, Vol. 27 (1), 25-45.

[8] Froot, K. and P. Klemperer (1989), "Exchange Rate Pass-Through when Market Share Matters", *American Economic Review*, Vol. 79 (4), 637-654.

[9] Goldberg, P. and M. Knetter (1997), "Goods Prices and Exchange Rates: What Have We Learned?", *Journal of Economic Literature*, Vol. XXXV, 1243-1272.

[10] Greenspan, A. (2005), "Current Account", Remarks from the speech at Advancing Enterprise 2005 Conference, London, England, February 4.

[11] Marazzi, M., N. Sheets, and R. Vigfusson (2005), "Exchange Rate Pass-Through to U.S. Import Prices: Some New Evidence", mimeo, Board of Governors, Federal Reserve System.

[12] Olivei, G. (2002), "Exchange Rates and the Prices of Manufacturing Products Imported into the United States", *New England Economic Review*, 3-18.

[13] Swamy, P. and S. Thurman (1994), "Exchange Rate Episodes and the Pass-Through of Exchange Rates to Import Prices", *Journal of Policy Modeling*, Vol. 16 (6), 609-623.

[14] Taylor, J. (2000), "Low Inflation, Pass-Through, and the Pricing Power of Firms", *European Economic Review*, Vol. 44, 1389-1408.

[15] Yang, J. (1997), "Exchange Rate Pass-Through in US Manufacturing Industries", *Review of Economics and Statistics*, Vol. 79 (1), 95-104.