Comments

Christian Broda: Economists usually agree that high oil prices are a reason behind the high inflationary episodes in the late 1970s and early 1980s around the world. In the last few years we have seen oil prices return to similar levels (in real terms) to those experienced in previous decades, but inflation has remained muted. The paper by José De Gregorio, Oscar Landerretche, and Christopher Neilson guides our thinking about the potential reasons for this muted response of the consumer price index.

In this brief discussion I focus on the statistical significance of the stylized fact uncovered in the paper (that is, that the pass-through from oil prices to consumer prices has decreased over time) and provide a simple back-of-the-envelope calculation to quantify how much of the decline in the influence of oil prices is due to the reduction in oil intensities around the world and how much is coming from a different interaction of oil prices and exchange rates in recent years, as opposed to the situation in the 1970s and 1980s.

While the paper documents the decline in pass-throughs over time, it provides no test of whether the decline is statistically significant. To determine the statistical significance of the results, I use the data on the United States and the United Kingdom kindly provided by the authors to replicate their results.

Table 2 shows pass-through coefficients calculated in the same way as was done in equation 2 of the paper for two different periods (the same breakpoints as in the paper are used). The new information of table 2 is that it includes standard errors, test statistics, significance levels, and confidence intervals for the nonlinear combination of parameters in equation 2. Calculations are based on the delta method.

The table shows that in the case of the United States the decline in pass-through coefficients is similar to that reported in appendix table A5. For the period before the break (1981Q4 [fourth quarter]), the pass-through coefficient is close to 0.07 and is significantly different from zero. For the

TABLE 2. Pass-Through Coefficients for the United States and the United Kingdom[a]

	Point estimate	t *statistic/* F *statistic*[b]	t *statistic: 95 percent confidence interval*
United States			
1975–85	0.068	5.05	[0.042, 0.095]
	(0.013)		
Post-1985	0.042	2.33	[0.007, 0.079]
	(0.018)		
Test of equality over time[b]		1.81	
		(0.181)	
United Kingdom			
1975–85	0.143	2.25	[0.017, 0.268]
	(0.063)		
Post-1985	0.036	0.72	[–0.062, 0.134]
	(0.049)		
Test of equality over time[b]		2.3	
		(0.131)	

Source: Author's calculation based on equation 2 in the text.

a. Coefficients refer to those in equation 2 in the text. Figures in parentheses are standard errors.

b. Second figure in parentheses represents the probability that the statistic will be greater than *F* for the test of equality between coefficients over time.

post-break period, the coefficient falls to 0.04.[1] However, the test of equality over time is not rejected at standard levels of confidence. That is, in the case of the United States, the pass-through coefficient has not significantly decreased over time.

The case for the United Kingdom is similar in that the pass-through coefficient decreased from 0.14 to almost 0.04 and that this decrease is not statistically significant.[2] While this should not be interpreted as conclusive evidence that the decline in the pass-through is not significant in the entire sample (after all, this example is only two countries out of a sample of more than 30), it is suggestive that further evidence is needed to assert that this is a strong fact. More powerful pooled tests can potentially provide this evidence.

Independently of their statistical significance, pass-through coefficients have been declining in most countries. I use the main results in the paper to

1. Appendix table A-5 reports a coefficient of 0.03 for the post-break period. The reason for the difference between the two estimates is that I use all four lags for the oil shock variable while the paper uses lags one and four only.

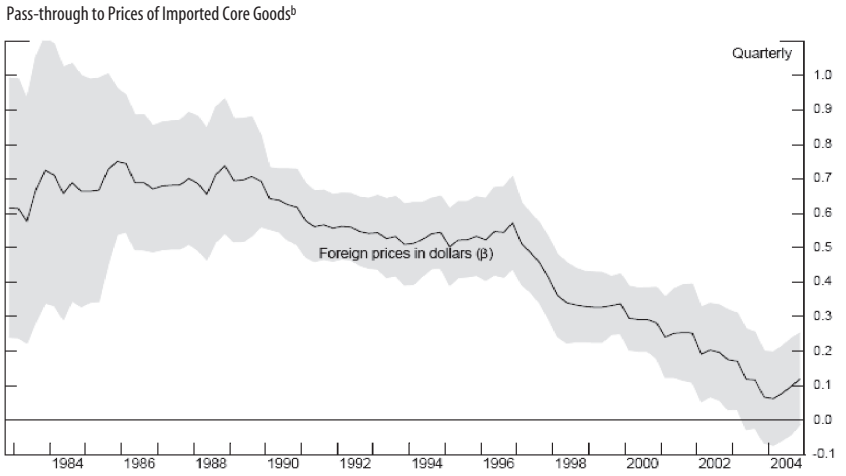
2. The pass-through coefficients for the United Kingdom are based on four lags of prices, four lags of output growth, and four lags of oil shocks.

assess the quantitative contribution of the two main explanations behind the decline in pass-through coefficients. I will first focus on the link between oil prices expressed in U.S. dollars, oil prices expressed in local currency, and consumer prices. The average pass-through coefficient between oil prices in dollars and consumer prices in the period pre-1975 is around 0.13 and declines to 0.03 after this period (figure 2). This implies a gap of about 0.10. This gap can be partially decomposed into two parts: the impact that changes in oil prices in U.S. dollars have on the price of oil in local currency and the changes in the pass-through coefficient between the local currency price of oil and consumer prices. Figure 5 suggests that the majority of the gap is due to the differences over time in the pass-through between oil prices in local currency and consumer prices. The gap between the pass-through coefficient from local currency oil prices to consumer prices in the pre-1975 period and that of the post-1975 period is 0.05, or around 50 percent of the original gap. This suggests that the buffering provided by exchange rates (that is, exchange rates were depreciating when the dollar price of oil increased such that the local currency price of oil did not rise as much) was *relatively* more important in later decades.

I focus next on the impact that oil intensities have on the pass-through coefficient between local-currency oil prices and consumer prices. Figure 6 provides valuable information about how to decompose the decline in pass-through into the contribution of the changes in oil intensity and the changes in the true pass-through coefficient for a given level of oil intensity. The figure suggests that around 50 percent of the differences in pass-through between pre-1975 and post-1975 (0.020/0.04) can be explained by changes in average oil intensity over this period. Since the pass-through in terms of local currency oil price and consumer prices is 50 percent of the original gap, the changes in oil intensities can explain roughly 25 percent of the decrease in the original gap.

In sum, the results of the paper suggest that the decline in pass-through from oil prices in U.S. dollars to consumer prices is of the order of 0.1. This decline is not statistically significant in the case of the United States and the United Kingdom, and its significance is uncertain for the rest of the sample. However, the economic significance of the decline is large, and about half of this decline can be explained by a better buffering role of exchange rates post-1975 relative to pre-1975, while another quarter of the decline is due to the fall in oil dependency around the world. In short, the authors provide a comprehensive and extremely useful examination of the importance of oil for consumer prices.

FIGURE 12. The Secular Decline in Pass-Through to U.S. Import Prices[a]



Source: Marazzi and others (2005, exhibit 1).

a. Rolling regression with a fixed ten-year window. Gray bands represent 95 percent confidence interval.

b. "Core goods" excludes petroleum, computers, and semiconductors. The exchange rate is an index of the dollar's nominal value against the currencies of thirty-five countries, weighted by bilateral shares of U.S. nonoil imports.

Roberto Rigobon: One of the most striking facts that have been documented in the recent literature in international economics is the massive drop in the estimates of the exchange rate pass-through that has occurred for all countries. This has been documented by several authors, and perhaps one of the best exponents of it is the study by Marazzi and others.[1] Figure 12 (replicated from Marazzi) shows the long-run estimate of the pass-through for the United States.

Notice that from a relatively stable coefficient (for almost twenty years) of around 0.60 to 0.70, there has been a steady decline since the mid-1990s. What is causing this decline? Country composition? Good composition? Price stickiness? Lower inflation in the world? Higher central bank credibility? This is clearly an open (and also important) question.

Most of the literature has tried to assess, or disentangle, the explanations behind the pass-through decline. Indeed, studies have used mostly aggregate data. I believe this avenue of research is unlikely to produce definite answers. The main reason is that there are very strong feedbacks in the

1. Marazzi and others (2005).

economy that will preclude the econometrician's being able to separate the different channels.

For instance, if the reason for the decline in the pass-through is because inflation is smaller and more stable, there is a positive feedback from exchange rates to inflation that will exacerbate the explanatory power of the channel. If credibility depends on low and stable inflation, a lower pass-through implies a smaller effect of the exchange rate shocks on prices, thus making inflation smaller and less volatile and improving the credibility of the central bank. In this simple example, what is causing what?

I believe that the answer lies in taking a look at the microdata, looking either at one particular market in great detail, as is done in the paper by José De Gregorio, Oscar Landerretche, and Christopher Neilson, or at large micro-data, covering thousands of items and several sectors (but sacrificing in the details just slightly).

This comment is organized as follows: First, I summarize some of my research that is related to the general topic addressed in this paper. Second, I discuss in detail the pass-through of oil studied in the paper.

A Preliminary Discussion of the U.S. Experience

In Gopinath and Rigobon and Gopinath, Itskhoki, and Rigobon, we look at the degree of stickiness and pass-through in the United States using the dataset collected by the Bureau of Labor Statistics (BLS) to produce the import and export price indexes.[2] The time span of our data is much shorter than that for data used in most papers—we only have ten years of monthly prices for more than 20,000 items, covering the period between 1994 and 2004. Aggregate indexes are much longer. Hence, there is an important limitation on trying to match the aggregate decline in the pass-through with the recent data. In any case, it is interesting to analyze what the detailed data say.

In particular, the data we use are unpublished data collected by BLS through the International Price Program (IPP) and are used to construct import and export price indexes for the United States. The primary reason for producing these indexes is to deflate the value of U.S. foreign trade. The target universe of the price indexes consists of all goods and services sold by U.S. residents to foreign buyers (exports) and all those purchased from abroad by U.S. residents (imports). We present details about the sampling procedure in our papers. Sampling is undertaken at the level of the entry level item (ELI), which in most cases corresponds to a ten-digit harmonized trade code. Within

2. Gopinath and Rigobon (2007); Gopinath, Itskhoki, and Rigobon (2007).

the ten-digit harmonized code, a good is defined as a unique combination of a firm and a product. On average, there are about four goods within each ten-digit classification code in any year. These goods will be our units of observation.[3]

Price data are collected every month for approximately 20,000 goods. A reporting company is contacted for the transaction price on a monthly basis. Respondents are asked to provide prices for actual transactions that occur as close as possible to the first day of the month. In several cases a company specifies whether a price has been contracted and the period for which it is contracted, including specifying the months in which actual trade will take place. The price information provided by the company is voluntary and confidential.

With this data, we computed the degree of stickiness of the import prices every month. The degree of stickiness is measured as the probability that we observe in that particular month that the price of an item will change. From our original paper, we reproduce figure 3 (which is figure 13 in this comment) that reports the probability that a price is changing every month in our dataset, together with the standard deviation bands.

As can be seen, there is a steady decline in the probability that prices change, from an average just above 30 percent to close to 20 percent at the end of the sample period. This evidence is the counterpart of the decline in the pass-through. The exact same reasons that explain a decline in the pass-through can explain an increase in price stickiness (or a decline in the probability that prices change).

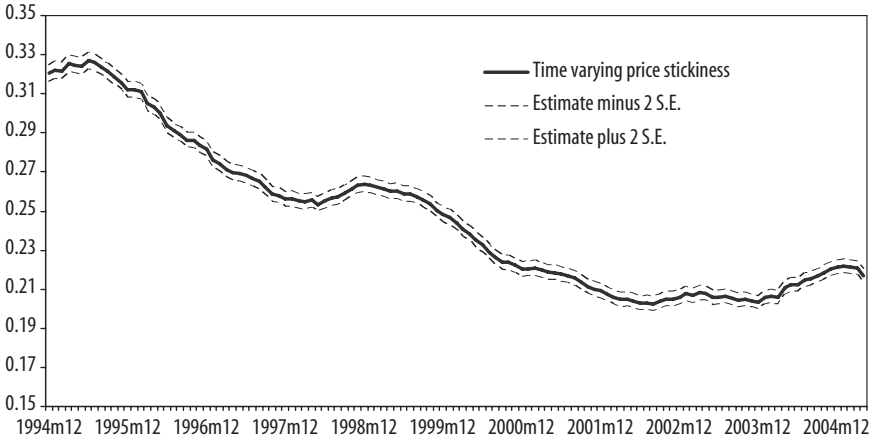
For example, in the standard menu cost model, a sizable decline in the inflation rate increases the degree of stickiness. If the inflation is lower, for the same menu cost, firms are less likely to change prices in anticipation of inflation.

In fact, in our dataset, if we split the data into ten different classes (figure 14), for which items are classified according to their degree of stickiness, we find a very strong and tight relationship between the degree of stickiness and the pass-through.

Again, I can repeat the questions raised earlier: what is causing the degree of stickiness to change in the sample? Inflation, central bank credibility, country composition, item composition, and so on. Our evidence suggests that the phenomenon explaining one is also explaining the other. This is important for the paper at hand, because the explanation of the decline in the pass-through cannot be exclusively an "oil" issue; rather it is an aggregate explanation.

3. An example of a description of a good is "Lot \# 12345, Brand X Black Mary Jane, Quick On/Quick Off Mary Jane, for girls, ankle height upper, TPR synthetic outsole, fabric insole, Tricot Lining, PU uppers, Velcro Strap."

FIGURE 13. Time Trend in Frequency of Price Adjustment



Source: Gopinath and Rigobon (2007, top panel of figure III).
S.E. = standard errors; m12 = December.

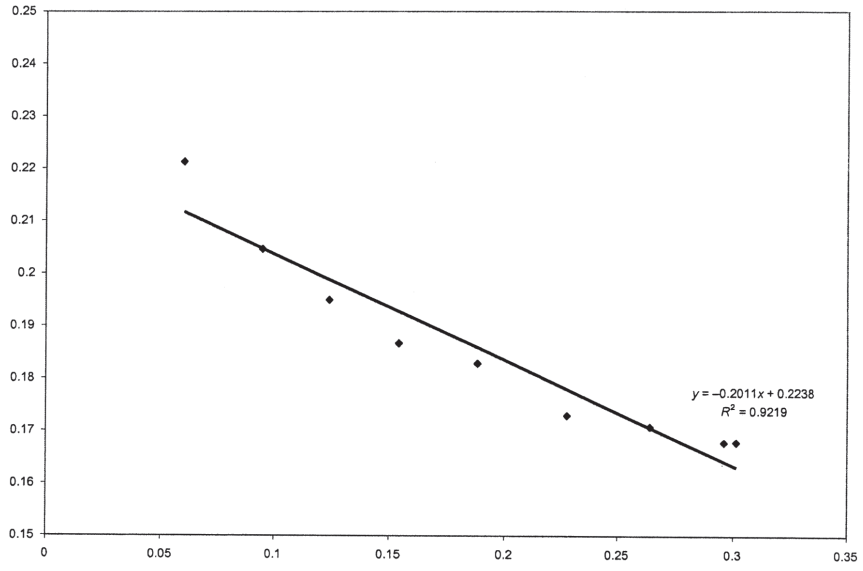
What is also interesting from these data is that we are able to compare the pass-through at the dock for different types of goods. For instance, the average pass-through at the item level in our dataset is about 20 percent, while the pass-through of homogeneous items—those that are traded in international organized markets, such as commodities—is only 5 percent, which in some sense corroborates what De Gregorio, Landerretche, and Neilson find as their long-run estimates.

Unfortunately our dataset is very short, which renders the detection of a decline in pass-through regressions nearly impossible. But the fact that all our estimates show very small pass-through estimates from the nominal exchange rate to the price of the item at the dock is inconsistent with the "old" view that import prices had a significant effect in the economy.

The Oil Pass-Through

As I said before, in my opinion, the answer to the decline in the pass-through lies in the microdata sets, or to put it in other words, in the details. Hence, it should not be surprising that I like De Gregorio, Landerretche, and Neilson's paper. They study in great detail a very relevant international price—that of oil. They still use aggregate series for measuring the CPI and output gap; however, concentrating on the oil market allows them to

FIGURE 14. Relationship between the Degree of Stickiness and the Pass-Through



Source: Author's calculations.

circumvent some econometric challenges that other specifications would be unable to do.

The advantages are several. First, and foremost, it is possible to study the pass-through not only from the exchange rate but from different prices and at different levels or stages of consumption. For example, we can study how changes in the oil price affect the price of gasoline at the dock, at wholesale prices, at retail, and so on.

Second, studying the microdata in detail allows us to include only those regressors that are relevant in the estimation—which reduces measurement problems. For instance, in the literature on the exchange rate pass-through (where Gita Gopinath and I have been working), it is common to take an aggregate price index and run a regression using some trade-weighted exchange rate as the explanatory variable. In this setup, if the weights are changing, there might be a spurious relationship or, even worse, a spurious shift in the parameters that is entirely the consequence of the aggregation bias. When one has access to the microdata, the correct exchange rate to use is the one included in the specification, used with the correct weights, and so forth. For example, since oil is invoiced in U.S. dollars, De Gregorio,

Landerretche, and Neilson use the relevant exchange rate when they study the oil market.

Finally, the proper transmission mechanism is more likely to be captured in the microevidence. In particular, there are several theories that have been advanced to explain the overall decline in the pass-through: an increase in competition internationally; a decline in overall inflation in the world; an increase in central bank credibility; a movement from producer pricing to local pricing (pricing to market), or vice versa; an increase in the degree of stickiness around the world; and so on.

For the oil sector, we must also include sectorial explanations such as, first, a decline in the usage of oil and, second, a shift in the type of shocks hitting the oil market. In part, shocks mostly originated from the supply side—where the most dramatic changes were always related to abrupt disruptions in the supply of oil—while the recent shock is clearly caused by a shift in the world aggregate demand.

Understanding which of these channels is the relevant one is of crucial importance so that we can learn the causes of the overall decline in pass-through and in particular the one related to oil prices.

Some Comments on the Paper

Having said "how good" the microanalysis is, let me discuss the actual results and sections of this paper. With all papers, some sections are more believable than others, and some are liked more than others. Overall, the paper gives a consistent message, and therefore, even if there are subsections that I do not completely love, they provide further robustness to those sections that I do love.

The paper first reports the decline in pass-through from oil prices to the CPI, for several countries in the world. This should not be surprising. Even the casual observer should have noticed that oil price increases today do not seem to have the devastating effect they used to have thirty years ago. Still, I believe this is the first paper to document formally the decline of the oil pass-through into CPI.

They estimate standard Phillips curves, which we know might have a thousand possible problems but which, in this particular case, represent and capture well enough the question the authors are trying to answer. It is very interesting that they find that the two-year pass-through has decreased from an average of 14.1 percent to just below 2.0 percent. When they estimate using oil prices in domestic currency as opposed to oil prices in U.S. dol-

lars (to take into account the endogenous response of the exchange rate to oil price fluctuations), the drop is from 6.5 percent to 1.5 percent—implying that the exchange rate pass-through has also dropped. To test for the change in the use of oil in each economy, they weighted oil prices by the share in each economy through time. Because this is measured in domestic currency, the measurement combines both the endogenous response of the exchange rate as well as the change in usage. The decline in the pass-through is from 4.0 to 2.5 percent, and the estimates are not statistically different from zero.

In summary, with the change in the composition and the exchange rate response they find that the overall effect of oil on the CPI is roughly the same across time. There is something to be explained, and they move to a VAR analysis. However, the first sections are, to me, the most relevant ones.[4]

Final Words

This paper reports two very interesting findings. First, there is a generalized decline in the pass-through of oil prices to CPI. Second, most of this decline can be explained by a change in the usage of oil and by a decline in the exchange rate pass-through—or what I have been calling the endogenous response of the exchange rate.

These two results are a very good step toward understanding the puzzling low pass-through that we are observing in almost all countries. But they lead to more questions, such as, What is driving the change in the exchange rate pass-through? What role do central bank credibility and low inflation play in that decline? Which channels have weakened? What is the impact of oil prices on the overall GDP? Although the paper provides some answers, the discussion of supply versus demand shocks does not seem to capture a sizable portion of the decline, and stickiness plays absolutely no role in gas prices. These are important steps toward our final goal of comprehending what is behind the pass-through that we observe.

4. Just to be clear about what I do not like about VARs, I do not trust the estimates of VARs when triangular decompositions are used with emerging markets and quarterly data. Indeed, I do not trust even their use with monthly data. The exclusion restriction required in the estimation implies that output, interest rates, and prices are causal within the month or quarter. Although I believe that this assumption might be reasonable for the United States, Europe, or even Japan, I think this is pushing it too much for emerging markets. I think that oil is exogenous, as the authors assume. Hence, the exclusion restriction in that case is clearly granted. But that exclusion restriction means that running Phillips-curve-like regressions is correct, and that is what they are doing in the first part of the paper.

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