

Microeconomic Aspects of the Globalization of Inflation:

A Joint Conference with the Swiss National Bank

The Globalization and Monetary Policy Institute hosted “Microeconomic Aspects of the Globalization of Inflation,” a joint conference with the Swiss National Bank on Aug. 19–20 in Zurich. The conference brought together researchers to examine how globalization affects pricing, exploring in greater detail some of the issues raised by Auer and Fischer (2010), as well as to increase understanding of how price dynamics unleashed by globalization affect the measurement of fundamental determinants of improved living standards over time.

Organizers were Raphael Auer and Andreas Fischer of the Swiss National Bank, Peter Egger of the Swiss Federal Institute of Technology and Mark Wynne of the Federal Reserve Bank of Dallas. Presenters included researchers from the Paris School of Economics; the U.S. Bureau of Labor Statistics; The Graduate Institute, Geneva; Brandeis University; Pennsylvania State University; Central European University; the Federal Reserve Bank of New York; and the Board of Governors of the Federal Reserve System. Paper discussants were drawn from a similarly diverse set of institutions, including the University of Warwick, the University of Zurich, the Federal Reserve Banks of Dallas and Atlanta, the University of Frankfurt and New York University.

The extent to which changes in exchange rates pass through to import prices—and from import prices to final goods prices—is a key determinant of the international transmission of inflation. Furthermore, the extent of pass-through is critically important to the conduct of monetary policy in an open economy. When pass-through is complete, optimal monetary policy entails focusing on the domestic output gap and domestic inflation. However,

when pass-through is incomplete, optimal monetary policy needs to take into account exchange rate misalignments.

Identifying the extent of pass-through is challenging econometrically. Several of the papers at the conference used novel approaches to produce improved estimates and found a greater degree of pass-through than in previous studies. One key determinant of this pass-through is the choice of currency in which imports are invoiced. If imports are priced in the currency of the supplier, (short run) pass-through will be higher than if they are priced in the currency of the importer.

A common theme of the papers presented was the use of detailed microdata to shed new light on important macro or aggregate questions. Indeed, all of the papers used microdata with varying degrees of fineness to address different questions. Two papers dealing with measurement issues used such data to construct alternatives to official price indexes to quantify the extent of the biases in these indexes due to globalization. And two papers that addressed questions from a general-equilibrium perspective illustrated how such a perspective can shed new light on old relationships.

The Extent and Determinants of Pass-Through

Julien Martin of the Paris School of Economics began the conference with “Globalization of Inflation: Micro Evidence on the Imported Input Channel.” One of the most prominent aspects of globalization is the increased vertical specialization of production. Intermediate inputs once produced in-house or sourced domestically are increasingly

obtained from low-cost overseas suppliers. What happens when the prices of these imported intermediate inputs change? How are they transmitted to final goods prices? Is the pass-through one-for-one or smaller? Pass-through would be expected to be less than one-for-one to the extent that imported intermediate inputs are just a single cost among many (others include labor, capital and domestic inputs) and firms can substitute between imported and domestic inputs. Martin reported that he used a unique French dataset for some 500 French manufacturing firms that allowed him to match the cost of imported intermediate inputs with the price of the final product made by each firm from 2005 to 2010.

Martin's key finding was that the pass-through from imported intermediate inputs to final goods prices was only 0.12. When the cost of imported intermediate inputs rises 1 percent, the price of the final product made using these inputs (whether sold domestically or exported) rises 0.12 percent. But a significant amount of international trade is between related parties; that is, between domestic parents and foreign subsidiaries or affiliates. Interestingly, Martin found that the pass-through was lower for inputs purchased from related parties. He also found no evidence of asymmetry in pass-through: Import price declines were passed through at the same rate as import price increases.

The aspect of globalization that has perhaps attracted the most attention and generated the most concern in some quarters is China's increasingly important role in global trade. In 1974, U.S. imports from China amounted to just less than \$123 million. By 2010, such imports totaled \$383 billion, accounting for about one-fifth of all U.S. imports that year, and China had become the most important source of imports to the United States.

The conference's second paper, presented by Mina Kim of the U.S. Bureau of Labor Statistics (and coauthored with Deokwoo Nam of City University of Hong Kong, Jian Wang of the Federal Reserve Bank of Dallas and Jason Wu of the Federal Reserve's Board of Governors) was a case study of how change



Conference discussions continue over lunch.

in China's exchange rate policy in 2005 showed up in the prices of U.S. imports from China. Kim said she and her coauthors used a detailed, monthly goods-level dataset on the prices of U.S. imports from and exports to China between September 1993 and March 2011 to document aspects of trade between the two countries.

First, they found that growth in the volume of imports from China has come from a greater range or variety of products rather than simply more of an existing set of products. That is, most of the trade growth has occurred along the extensive rather than the intensive margin. Second, they noted that almost all imports from and exports to China are invoiced in dollars rather than yuan. For imports, the share invoiced in dollars increased from a low of about 97 percent around the turn of the century to 99 percent or more in recent years. All U.S. exports to China were invoiced in dollars until 2009, when the euro was used for a small share of exports. Third, the authors found significant stickiness in the prices of U.S. imports from China, with prices remaining unchanged for about 11 months on average. But there was some evidence that prices became less sticky after abandonment of the renminbi's peg to the dollar in 2005. Finally, they used the microdata to estimate pass-through from changes in the exchange rate to import prices and found that short-run pass-through was about 0.2, while long-run pass-through was about 0.8 (comparable to estimates reported by Auer 2010).

As noted earlier, the choice of currency in which to invoice imports is a key determinant of pass-through. This was the subject of the third paper, “Micro, Macro and Strategic Forces in International Trade Invoicing,” presented by Cédric Tille of the Geneva Graduate Institute for International and Development Studies. Tille and coauthor Linda Goldberg of the Federal Reserve Bank of New York used a highly disaggregated dataset on all Canadian imports between February 2002 and February 2009 to uncover a number of new stylized facts about the determinants or correlates of which currency is used to invoice imports. While most Canadian imports come from the U.S. and are invoiced in U.S. dollars, Tille and Goldberg found that larger transactions were more likely to be invoiced in the importer’s currency. They hypothesized that one possible implication is that a shift in the structure of importing from large numbers of small importers to small numbers of larger ones (such as Wal-Mart, for example) might lead to greater use of the importers’ currency for transactions and, thereby, to less exchange rate pass-through to import prices.

The fourth paper, “The Origin of Exchange Rate Shocks, Market Structure, and Pass Through,” presented by Raphael Schoenle of Brandeis University, investigates the importance of variation in firms’ markups as an explanation for incomplete long-run pass-through. Schoenle said he and coauthor Auer started by decomposing bilateral exchange-rate movements between the U.S. and its trading partners into two components, the first capturing the dollar against all currencies except that of the specific trading partner and the second capturing the currency of the specific trade partner against the rest of the world.

The authors showed that pass-through rates of exchange rate movements to import prices are much higher for broad changes in the value of the dollar than they are for changes in the currency of a specific trade partner. They also showed that it is not the overall economic importance of a trade partner that matters for pass-through but, rather, the

importance of a trade partner in a specific sector. The greater the market share of a trade partner, the higher the long-run pass-through. For the specific case of China, they showed that the pass-through rate to U.S. import prices from changes in the trade-partner-specific U.S. dollar–renminbi exchange rate is 0.81 at the six-month horizon and 1 at the 12-month horizon.

Importance of a General-Equilibrium Perspective

Pass-through regressions can be controversial. Like all single-equation regressions, pass-through regressions are susceptible to omitted-variable bias. Specifically, failure to control for the types of shocks hitting the economy may cause pass-through estimates derived from standard regressions to be upwardly or downwardly biased.

For example, suppose that the domestic economy is hit by an expansionary nominal (monetary) shock. This will typically cause the domestic currency to depreciate and drive up nominal wages, increasing the prices of domestic goods. A pass-through regression that fails to control for such shocks would yield downwardly biased estimates of the pass-through coefficient. Alternatively, suppose that the domestic economy is hit by a favorable technology shock. Such a shock will cause wages—and, thus, domestic prices—to fall. At the same time, for low values of the intertemporal elasticity of substitution, the currency will tend to depreciate and the standard pass-through regression will generate upwardly biased estimates of pass-through.

Saroj Bhattacharai’s presentation, “Exchange Rate Pass-Through in General Equilibrium,” examined the extent to which standard pass-through regressions are susceptible to bias by writing down a standard general-equilibrium model of a small open economy. Estimating the model using data for three small open economies (Australia, Canada and New Zealand), he found in all three cases that long-run pass-through is complete, in contrast to findings in the regression literature.

“The Geography of Consumer Prices,” presented by Attila Rátfai (and coauthored with Ádám Reiff of Magyar Nemzeti Bank), also used a general-equilibrium model to shed new light on existing statistical studies. A seminal paper by Engel and Rogers (1996) estimates that the effective width of the U.S.–Canada border is 75,000 miles, based on a comparison of prices for the same goods in the U.S. and in Canada. Rátfai said he and Reiff first used data on the prices for 46 goods and services sold in both Hungary and Slovakia to estimate the effective width of the border between the two countries with the Engel and Rogers method and arrived at an estimate of 4,236 miles. They then calibrated a multiregion general-equilibrium model to the same data (with the feature that shopping at more distant locations is costlier to the consumer) and found that the implied width of the border fell to just 89 miles, or about 2.1 percent of what is estimated in the reduced-form regression. The paper argues that part of the reason the reduced-form estimate of the border effect is so distorted is that it “confounds the underlying border friction with the effect of lumpy and staggered price-setting.”

Implications for Measurement

The last two papers examined potential implications of globalization for the measurement of macroeconomic aggregates. Accurate measurement of the macroeconomy is challenging in the best of times. These challenges are amplified when prices for individual goods and services rapidly change, and when there is a lot of churning of products (arrival of new models or varieties, disappearance of older ones).

The U.S. economy experienced a surge in productivity growth in the late 1990s (the so-called New Economy)—much of it attributed to innovation in the information technology sector. Benjamin Mandel’s paper, “Effects of Terms of Trade Gains and Tariff Changes on the Measurement of U.S. Productivity Growth” (Feenstra et. al 2011, coauthored with Robert Feenstra, Marshall Reinsdorf and Matthew Slaughter) argues that the Information Technology



Conference participants hear how globalization affects pricing.

Agreement (ITA) of the World Trade Organization caused the globalization of the IT sector to greatly increase after 1995. (The ITA eliminated all tariffs on IT goods globally in four stages between 1997 and 2000. The pact was signed by more than 50 countries, accounting for over 95 percent of world trade in ITA-covered products.)

With the extensive use of cross-border production networks in IT, these tariff reductions had an amplified effect on final prices. The concomitant of this was rapid declines in the prices of imported IT goods, which are not well-captured by the conventional import and export price indexes. Specifically, the conventional indexes overstate the true rate of price change because they fail to take proper account of substitution possibilities, changes in tariffs and, most importantly, increases in the variety of imports and exports over time. The failure to fully capture these price declines also has implications for the measurement of productivity. Mandel noted that, when properly measured, improvements in U.S. terms of trade can account for about one-eighth of the pickup in labor productivity growth that the U.S. experienced between 1996 and 2006, or one-fifth of the increase in total factor productivity growth over the same period.

Christopher Kurz presented the final paper,

“Offshoring Bias in U.S. Manufacturing: Implications for Productivity and Value Added” (Houseman et al. 2010, coauthored with Susan Houseman, Paul Lengermann and Mandel). It highlights a different bias in the official statistics associated with globalization—this one due to a shift of inputs to U.S. manufacturers from (relatively high-cost) domestic suppliers to (relatively low-cost) foreign ones. Price declines associated with this change were not captured by the official price indexes, with the result that import prices were overstated, Kurz said. The authors estimated that as a result of this bias in the official import price statistics, multifactor productivity growth in manufacturing was overstated by 0.1 to 0.2 percentage points from 1997 to 2007, while the growth of real value added was overstated by 0.2 to 0.5 percentage points.

Conclusions

As with all research programs, progress made in addressing the questions posed at the conference raised more questions.

On the question of pass-through, the newer research using detailed price data suggests that long-run pass-through is a lot higher than previously estimated, although the empirical regularity between transaction size and choice of invoicing currency uncovered by Tille and Goldberg in the Canadian data suggests that pass-through may vary over time as market structures change. Given the critical importance of pass-through elasticity for the international transmission of inflation, further research on its determinants and magnitude is clearly warranted.

In the measurement area, while there has been a significant amount of work documenting problems with measures of consumer price inflation (see, for example, Wynne and Sigalla 1996, and Wynne and Rodriguez-Palenzuela 2004), relatively little is known about the extent of biases in measures of import and export prices. Yet official measures of such prices are known to be subject to the same sorts of biases that affect measures of consumer price inflation.

While the work of Houseman et al. (2010)

highlights the biases associated with sourcing intermediate goods overseas, it leaves for future research the potential biases associated with imported capital inputs and services. Cavallo and Landry (2010) point out the important role that imports of capital goods have played in U.S. productivity growth in recent decades but do not address the question of potential biases associated with shifting to low-cost producers of those goods. The limited information available on the prices of internationally traded services suggests the possibility of significant biases associated with the growth of services offshoring. Likewise, the biases associated with substitution possibilities and increased variety that Feenstra et al. (2011) investigate in the context of IT may also arise in other traded-goods sectors.

—Mark Wynne

Note

Susanna Bosshard of the Swiss National Bank provided expert logistical support for the conference.

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