

Conference on International Economics

By Michael Sposi



globalization has led to increased integration across countries in goods markets and financial markets and has changed the environment in which policy operates. As a result, researchers in the various subfields have developed new methods to study and measure the consequences of globalization.

To better understand these developments, the Federal Reserve Bank of Dallas' Globalization Institute and the University of Houston brought together researchers from academic institutions and the Federal Reserve System for a conference focusing on international trade and prices and on international finance and sovereign debt.

The goal was to foster a cross-pollination of ideas across these subfields of international economics.

International Trade, Prices

Understanding the welfare implications of globalization—or of policy, for that matter—is of the utmost importance to economists. From a practitioner's perspective, the measurement of welfare is challenging. A central difficulty involves constructing indexes that accurately quantify changes in price levels and the cost of living across both time and space. Any reasonable price index must be consistent with some notion of consumer preferences, or consumer utility, and must be constructed to use real-world data. Stephen Redding of Princeton University presented the paper "A Unified Approach to Estimating Demand and Welfare" (co-authored with David Weinstein of Columbia University), which explores a new approach to bridging price-index theory and data at the most

fundamental level.

Current methods of constructing price indexes and measures of welfare rely on three distinct approaches: 1) macroeconomic price indexes based on time-invariant preferences,¹ 2) microeconomic demand-system estimation with time-varying demand curves and 3) actual price data constructed using formulas that differ from those implied by macro and micro approaches but that embed intuitive properties researchers want to exploit.

The micro and macro approaches are mutually inconsistent with each other, and neither is consistent with the approaches used by statistical agencies, the authors point out.

The authors develop a unified estimation approach to reconcile the discrepancies between micro prices, macro prices and practice. In particular, they provide conditions under which the aggregate utility function can be characterized by a constant aggregate demand parameter, in spite of demand for each good changing over time. Additionally, the estimation approach incorporates the properties of the approaches statistical agencies use most.

The authors demonstrate a new source of estimation bias that arises when one ignores changes in demand over time. They show empirically that this bias implicitly overstates cost-of-living changes by an average of 2.8 percentage points per year between 2000 and 2014. This bias is roughly as large as the bias that would arise if one failed to account for changes in the varieties of goods and services over time.

2016 Conference Summary

When: Oct. 7–8

Where: Federal Reserve Bank of Dallas

Sponsors: Globalization Institute,
Federal Reserve Bank of Dallas;
University of Houston



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Expectations and Export Decisions

Not only is accounting for changes in varieties important for measuring economic well-being, it is also important for understanding fluctuations in trade volumes. That is, much of the variation in trade volume is due to an extensive margin, reflecting firms entering and exiting export markets. Eduardo Morales of Princeton University presented “What Do Exporters Know” (co-authored with Michael Dickstein of New York University), which examines firms’ export decisions.

Existing theories of export decisions involve firms balancing a fixed cost of accessing foreign markets with future profits that can be earned from selling into those markets. Uncertainty surrounding profits includes the firms’ relative competitiveness, local demand conditions and the local policy environment in the foreign market. As such, if a researcher observes that a particular firm did not export to a market, it is inferred that either the fixed cost is too large or the expected profits are too small.

However, the researcher has very little

information about what the firm’s expectations actually were when making the decision. So if a researcher incorrectly specifies the expectations on which firms are acting, the estimated fixed costs of exporting will be biased. This is an important empirical issue given that many questions involve quantifying the response of exports to trade cost shocks.

To mitigate this bias, the authors introduce a new econometric technique that allows the researcher to measure firms’ expectations using a few pieces of available data, such as lagged aggregate exports, lagged domestic sales and distance. The authors apply their methodology to Chilean exporters and find that, after accounting for the information available to firms at the time of the export decision, the estimated parameters for the fixed cost of exporting are at least 70 percent lower. One key implication is that, relative to a model in which firms have complete information, firms increase their exports substantially more in response

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to otherwise equal reductions in trade costs.

In addition to the decision of whether to export, firms are faced with the challenge of managing complex global supply chains, from initial design to sourcing of inputs, assembly and final distribution. That is, international trade involves vertical linkages and trade in intermediate goods. To understand how spillovers occur across countries, one must first develop a framework that accounts for the specific types of linkages. Chart 1 depicts a typical supply chain for an arbitrary electronic device.

Previously, researchers incorporated trade in intermediate goods, but there were very few attempts to explicitly incorporate the sequential nature of the global value chain, in which various stages of production specifically make use of output from previous stages.

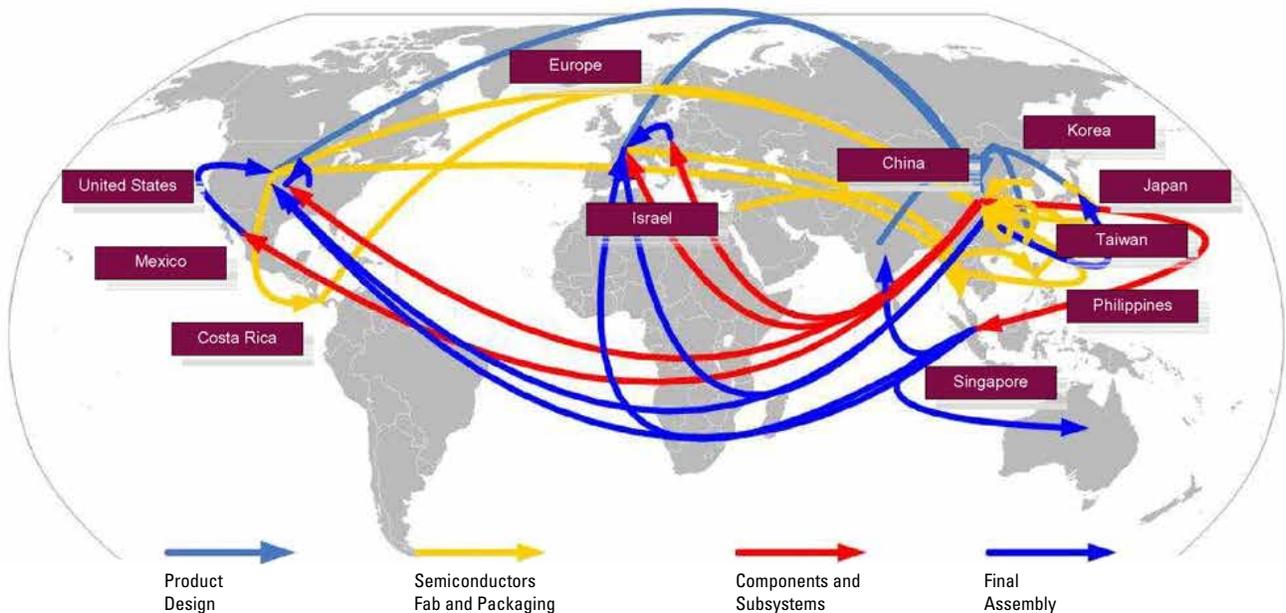
Challenges to Supply Chain Modeling

From a modeling perspective, many complications arise, making modeling an optimal supply chain technically challenging.

Pol Antràs of Harvard University presented “On the Geography of Global Value Chains” (co-authored with Alonso de Gortari of Harvard), which develops a model to characterize the best location for each stage of production in a global value chain. Key trade-offs include: 1) minimizing the transport costs between each stage, and 2) assigning each stage of production to the location that has a comparative advantage at that stage (i.e., labor-intensive activities to countries with low wages and high productivity at that stage) in order to minimize the final consumer cost.

Between each stage of production, trade costs are incurred, including transportation, storage and potentially tariff costs. After each stage of production, trade costs accumulate and further raise the value of the good. Trade costs tend to be roughly proportional to the value of the good—for example, a tax rate incurring high trade costs at the end of the supply chain carries a greater impact than at the beginning of the chain. Therefore, it is generally more efficient to incur proportionately smaller trade costs at the end of the supply chain by, for instance, being closer to

Chart 1
Global Value Chain for Electronics Industry



SOURCE: IDC Manufacturing Insights (courtesy ventureoutsources.com).

a large market.

This feature guides the main finding of the model: More upstream or basic activities should generally be performed at locations that are less central in the global economy, such as Singapore and Indonesia, while more downstream activities should be performed at more central locations, such as China. Between the beginning and final stages, each step of production should occur at locations that are geographically close to the previous stage, such as Thailand. These predictions are broadly consistent with the data.

Trade costs are clearly an important determinant of the magnitude and direction of trade flows. Additionally, trade costs are important for determining the balance of trade. That is, in order for a country to run a trade deficit, it must borrow resources from the rest of the world. Ricardo Reyes-Heroles of the Federal Reserve Board presented his paper “The Role of Trade Costs in the Surge of Trade Imbalances,” in which he argues that the decline in trade costs since 1970 accounts for 69 percent of the rise in global imbalances during the period.

He identifies two channels through which trade costs affect imbalances. First, trade costs drive a wedge between the real “effective” interest rate (i.e., the real interest rate converted into units of consumption) paid by the borrower and the real effective rate received by the lender on capital flows used to finance the imbalances. During the times when the borrowing country borrows, its consumption basket will be loaded with high-cost imported goods, but when that country subsequently repays the loans, its consumption basket will contain relatively low-cost domestic goods. This composition effect means that the overall gains to borrowing are diminished and, hence, there is less incentive to borrow in the first place. As trade costs decline over time, the gap between real effective borrowing and lending rates narrows and it becomes less costly to run trade imbalances.

The second channel involves expectations of declining trade costs. Such expecta-

tions create additional current demand for international borrowing, driving up the real interest rate. In turn, current imbalances are smaller than they otherwise would have been, and future imbalances are larger than they otherwise would have been. That is, trade imbalances are postponed to a future time when they are less costly to finance. As a result, the expectation of future trade-cost declines generates an upward “tilt” in the magnitude of global imbalances over time.

International trade in goods is not independent of financial considerations. For one, a country’s balance of trade must be reconciled with the balance of payments so that a trade deficit is accompanied by net foreign borrowing, or a trade surplus is accompanied by net foreign lending. For another, the exchange rate, which is intimately linked to the current account and capital flows, has important implications for firms that buy and sell goods across the world. The next set of papers explores international capital markets more closely.

International Finance and Sovereign Debt

Distortions that generate suboptimal investment rates come with costly implications for economic performance. Liliana Varela of the University of Houston presented “Reallocation, Competition and Productivity: Evidence from a Financial Liberalization Episode.” The paper shows that distortions in international capital markets do, in fact, have consequences for the allocation of resources and aggregate productivity within a country. She develops a model with heterogeneous firms that use capital for production and for research and development, which affects future productivity and competitiveness. She uses the model as a framework to examine the consequences of a financial liberalization episode in Hungary.

Before 2001, foreign firms in Hungary were allowed access to international credit markets, but domestic firms were not. Growth rates for domestic firms were quite similar to those of international firms. After

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2001, capital controls were removed for all firms.

Following the financial liberalization, domestic firms grew much faster than international firms did. The paper shows that domestic firms experienced higher growth in labor productivity, and especially greater R&D and capital intensity. The higher degree of capital intensity was a direct consequence of access to foreign capital. The paper also shows that, following the liberalization, all firms became more competitive as the foreign firms' markups decreased relative to domestic firms', particularly in sectors that rely more on external finance.

International credit and financial markets improve the allocation of resources and generate higher efficiency and productivity, but some features of these markets are not well understood. For instance, the foreign exchange market (one of the largest in the world) seems to admit systematic arbitrage opportunities. Consider a U.S. investor exchanging one U.S. dollar for euros on the spot market, investing those euros in a risk-free German government bond and then converting the proceeds from that bond back into dollars at a predetermined forward rate. Such a transaction should yield the same return as investing that same U.S. dollar in a U.S. risk-free asset, such as a short-term Treasury. This equality, known as "covered interest parity" (CIP), has failed to hold following the Great Recession yet remains deeply rooted in the way practitioners and researchers think about financial markets. In fact, the assumption that CIP holds can be found in almost any textbook on international finance.

Wenxin Du of the Federal Reserve Board presented "Deviations from Covered Interest Parity" (co-authored with Alexander Tepper of Columbia University and Adrien Verdelhan of the Massachusetts Institute of Technology's Sloan School of Management and the National Bureau of Economic Research). The authors show that while CIP was a robust feature of the data prior to the financial crisis, it has since broken down among the G-10 currencies—the Australian dollar, Canadian

dollar, Swiss franc, Danish krone, euro, British pound, Japanese yen, Norwegian krone, New Zealand dollar and Swedish krona—vis-à-vis the U.S. dollar.

While this deviation between textbook theory and reality, known as the cross-currency basis, has been documented and studied previously, the authors present evidence pointing to a new combination of factors driving it: 1) the increased cost of financial intermediation following the crisis, and 2) the persistent imbalances in investment demand and funding supply across countries. With regard to the first factor, the authors argue that because of regulations, financial intermediaries cannot fully hedge their foreign currency positions. They find that the magnitude of the cross-currency basis is larger at quarter-ends, when quarterly regulatory reports are due, a feature absent prior to the crisis. Concerning the second factor, they show that the cross-currency basis is higher for countries with higher nominal interest rates, reflecting greater demand for investment relative to saving. Moreover, the basis tends to increase with monetary policy announcements.

Whether CIP holds is crucial for central banks, whose monetary policy is aimed at targeting the exchange rate of, for instance, small open economies. Manuel Amador of the Federal Reserve Bank of Minneapolis and the University of Minnesota presented "Exchange Rate Policies at the Zero Lower Bound" (co-authored with Javier Bianchi and Fabrizio Perri of the Minneapolis Fed and Luigi Bocola of Northwestern University and the National Bureau of Economic Research). The authors argue that if the nominal interest rate consistent with CIP happens to be negative, pursuing an exchange rate objective necessarily implies deviations from CIP given that the nominal interest rate is constrained to be non-negative. This provides an arbitrage opportunity resulting in capital inflows into the small open economy that is costly for the central bank because it has to take the negative side of the arbitrage trades by accumulating foreign reserves in order to manage an

exchange rate target.

The authors also argue that there are welfare losses to the small open economy that would not exist away from the zero lower bound (ZLB). In particular, deeper financial integration with the outside world, which is typically beneficial when the economy is above the ZLB, becomes a curse when at the ZLB following foreign interest rate increases. The reasoning is that, at the ZLB, the size of the required reserve accumulation increases.

International financial markets play an equally important role in the conduct of fiscal policy as it pertains to debt issuance and repayment. Governments across the world regularly tap international credit markets for the financing of infrastructure projects as well as for regular spending on payroll and social programs. In many cases, much financing is sourced from foreign investors. When a country's fiscal authority runs into trouble, or when the debt is denominated in foreign currency and the local currency depreciates, the government must decide whether to default. Benjamin Hébert from Stanford University presented "The Costs of Sovereign Default: Evidence from Argentina" (co-authored with Jesse Schreger of Princeton University and Harvard Business School). The paper sheds light on the magnitude of default costs. A key issue that any study confronts is the chicken-and-egg problem: Does the economy deteriorate because of the sovereign default, or does the government default because the economy deteriorates? To examine this, the authors explore legal rulings in the case of Argentina and examine how equity returns and exchange rates responded to changes in the probability of default.

By assuming that Argentine firms in the economy are not directly impacted by the legal rulings, they use prices of credit default swaps to measure changes in the probability of Argentine government default. The authors compile and isolate 15 rulings that potentially changed the probability of default. They find that, on average, increases in the likelihood of default reduced the U.S.-dollar value of Argentine assets. Specifically, on

July 30, 2014, when Argentina defaulted, the risk-neutral five-year default probability increased from 40 percent to 100 percent, and the estimates imply that this change alone was responsible for a 28 percent decline in the value of Argentine firms.

The authors translate the changes in the value of the equities into changes in real economic activity, and find that the present discounted value of gross domestic product growth declined between 3.6 percent and 6.6 percent as a result of the default.

Given that the economic consequences of sovereign default are large, it is crucial to have a theoretical foundation to understand the inner workings of the market for sovereign debt. Whether warranted or not, on occasion investors may place a high probability on the government defaulting or may believe that there is a high degree of uncertainty in terms of default. This makes it more difficult for the government to auction bonds and, thus, increases the incentive for the government to default. In this sense, default can potentially be self-fulfilling in that investors' expectations are the very reason for default. In the previous literature, such situations tend to result in failed auctions, in which the government cannot issue debt at a positive price, and default results.

Empirically, it is rare that governments fully default, though they may pay extremely high spreads to borrow from investors. Satyajit Chatterjee of the Federal Reserve Bank of Philadelphia presented "Self-Fulfilling Debt Crises, Revisited: The Art of the Desperate Deal" (co-authored with Mark Aguiar of Princeton University, Harold Cole of the University of Pennsylvania and Zachary Stangebye of the University of Notre Dame). The paper presents a model that attempts to capture these more realistic features.

Their model includes "fire-sale auctions," in which the government can issue debt at a positive, albeit low, price when investors place a high probability on default. That is, the government knows that its fundamentals are relatively strong enough and is therefore willing to make such deals. The

authors refer to these as "desperate deals" because the government will have to pay a high spread (over "safe" asset prices) for the credit.

Under these circumstances, the sovereign country can circumvent some consequences of coordination failure that result in a self-fulfilling debt crisis. The model, therefore, produces debt dynamics and volatile spreads more in line with the data than what other theories predict. Specifically, the model indicates that: 1) actual default is rare, 2) spreads are volatile in emerging economies and 3) large spikes in spreads are only weakly correlated with declines in output (e.g., recently in Portugal, Ireland, Italy, Spain and Greece).

Pushing the Research Frontier

The papers presented at the conference pushed the research frontier for various subfields within international economics, including international trade, international finance and sovereign debt. Moreover, the presentations and discussions made evident that there are important overlaps between each subfield. The interdependence between international trade, trade imbalances and capital flows is one such overlap. Another is the close relationship between international capital markets and sovereign debt and default.

Each paper prompted excellent participant discussions, including those by "Exchange Rate Policies at the Zero Lower Bound" co-author Luigi Bocola, Laura Alfaro of Harvard University, Michael Devereux of the University of British Columbia, Jonathan Eaton of Penn State University, Robert Johnson of Dartmouth College, Hanno Lustig of Stanford University, Benjamin Malin of the Federal Reserve Bank of Minneapolis, Vivian Yue of Emory University and Jing Zhang of the Federal Reserve Bank of Chicago.

Note

¹The Törnqvist index is one of the more commonly used indexes.