Understanding Trade, Exchange Rates and International Capital Flows

By Jian Wang

The U.S. has embraced rapid globalization since the 1970s, with the trade share of gross domestic product (GDP) increasing from less than 6 percent in 1970 to over 15 percent in 2013. Financial integration is even more phenomenal: The GDP share of foreign assets invested in the U.S. increased more than tenfold from around 10 percent in 1970 to over 150 percent in 2013. U.S. financial assets invested abroad grew at a similar pace over the period.

The rapid real and financial globalization in the past 30 years poses many challenges to policymakers in the U.S. and around the globe. When making decisions at home, they can no longer ignore changes abroad. Policymakers must better understand the interaction among domestic and foreign economies as they seek to maximize their nation’s welfare.

My research has primarily focused on understanding the interactions of economies through international trade and financial markets. Globalization has made countries more integrated than ever, and countries are no longer insulated from shocks that originate from abroad. Policymaking requires an understanding of how real and monetary changes are transmitted across countries through international trade and financial markets.

**International Trade and Exchange Rate Pass-Through**

Engel and Wang (2011) found that standard open-economy models significantly underestimate foreign country influence through international trade on a domestic economy and may provide misleading policy suggestions.

Why is international trade more volatile than GDP in the data? Examining the properties of traded goods across countries helps answer the question. Most international trade for Organization for Economic Cooperation and Development (OECD) countries involves durable goods, which include durable consumption goods (such as automobiles and personal computers) and capital investment (such as machinery). Durable goods purchases fluctuate more over business cycles than nondurable goods. Families can postpone replacing automobiles during a downturn more easily than they can defer nondurable purchases of food and gasoline. Because a large share of GDP is nondurable goods and international trade is mainly in durable goods, international trade volume varies substantially more than GDP in the data. We find that including durable goods trade in an otherwise standard model, which doesn’t distinguish between durable and nondurable goods, can broadly improve the model’s ability to match trade sector data.

Global trade collapsed following the financial crisis in 2008–09. Imports and exports plunged in major trade countries, and global trade suffered the biggest contraction since World War II.

Global trade collapsed following the financial crisis in 2008–09. Imports and exports plunged in major trade countries, and global trade suffered the biggest contraction since World War II. Various policies have been proposed in response to this decline. Based on research with Charles Engel, I discussed the collapse of global trade in a Federal Reserve Bank of Dallas Economic Letter (Wang 2010), which argues that the drop in international trade was generally consistent with cyclical trade movements over the past 35 years. Empirical findings and a theoretical model in Engel and Wang (2011) predict a large drop in the volume of trade when markets experience a steep recession, especially if a prolonged downturn is expected. Several subsequent studies confirm that the collapse of global trade in the recent financial crisis was main-
ly attributable to a collapse of worldwide demand for durable goods (Chart 1), though other factors, such as trade finance, may have played a role.

The exchange rate is a focal point of international economic activities. Exchange rate fluctuations alter the relative prices of goods and services between countries and, thus, substantially impact international trade.

An important channel through which the exchange rate affects the real economy is aggregate price levels. The extent that exchange rate changes are passed through to prices is referred to as exchange rate pass-through (ERPT). Import price ERPT declined sharply after the 1990s (see Marazzi and Sheets 2007 for an example involving the U.S.). An and Wang (2012) and Muntaz, Oomen and Wang (2011) document that greater economic stability after the 1980s—especially involving monetary policy and inflation—contributed to reduced ERPT.

The findings suggest that ERPT decline is related to more disciplined monetary policy after the 1980s. Several factors may contribute to this during such a stable monetary regime. Shambaugh (2008) documents that ERPT is greater for nominal shocks (for example, monetary policy shocks) than for real shocks (for example, demand shocks). An economy experiences fewer nominal shocks in a regime with more stable monetary policy and inflation, and thus its ERPT is lower. The research shows that low ERPT is not independent of monetary policy. Therefore, it is misleading to argue that central banks can afford looser policy when inflation is less responsive to exchange rate movements.

Another problem found in previous studies of ERPT is that aggregate price indexes may underestimate the impact of exchange rates on U.S. import prices. In goods-level data underlying U.S. trade price indexes, Nakamura and Steinsson (2012) document that 40 percent of products are replaced without a single price change. They argue that price adjustments for these goods are through product replacement rather than regular price changes: Firms replace existing products with new models and designs at a new price rather than changing current-item prices. Standard price indexes that focus on price changes for identical products cannot capture this type of adjustment and underestimate the extent of price changes in the economy.

Kim et al. (2013) investigate the product-replacement bias involving trade between the U.S. and China and find that renminbi appreciation substantially affects prices of U.S. imports from China after taking into account price changes through product replacement. Following China’s abandonment of its hard-currency peg to the U.S. dollar in June 2005, the renminbi appreciated more than 25 percent by September 2014. However, only a very small fraction of the Chinese currency gain was passed on to U.S. import prices when ERPT was estimated from aggregate price indexes. For instance, Auer (2012) finds that ERPT of renminbi appreciation from 2005 to 2008 into the U.S. import price index was only around 20 percent.

Why didn’t Chinese exporters pass along production cost increases following renminbi appreciation, at least in the long run? One reason could be producers’ voluntary reduction of profit margin, which would help them maintain market share. However, China’s exports to the U.S. are mainly from labor-intensive industries, and it is unlikely that Chinese exporters have a large profit margin with which to absorb currency appreciation. A large share of imported inputs is another potential reason for the low ERPT observed in the data (see Amiti, Itskhoki and Konings 2014). China imported many of its inputs from other countries, and the prices of imported materials decreased when the renminbi appreciated, imposing downward pressure on China’s export prices to the U.S. However, this explanation conflicts with the fact that the Chinese currency did not appreciate much against countries providing a major source of inputs—such as Japan and South Korea—while it gained strongly against the U.S. dollar.

Kim et al. (2013) find that Chinese exports did not absorb as much renminbi appreciation as the aggregate import price index suggested. The authors found that for a large fraction of U.S. imported goods from China, prices never changed. Less than 50 percent of renminbi appreciation is passed through to U.S. import prices from China if these “no-price-change” goods are included in the estimation of ERPT. Pass-through increases to about 100 percent if goods with at least one price change are included. In other words, ERPT is much higher if goods that change prices through product replacement are excluded, suggesting that the conventional estimation of ERPT based on aggregate price indexes underestimates the effect of renminbi appreciation on U.S. import prices.

**Exchange Rate Determination and Business Cycles**

Besides international trade, the exchange rate plays an important role in international
financial markets. The foreign exchange market is the largest and most liquid financial market in the world. Its average daily turnover exceeds $5 trillion, according to a 2013 survey by the Bank for International Settlements. Currency trading is important for individuals, firms and governments that buy foreign goods and services, invest abroad and seek profit or protection through speculation.

Despite the significance of exchange rates in economic activity, researchers and policymakers still debate the factors driving their fluctuation and whether the central banks should consider exchange rate movements when conducting monetary policy.

Wang (2011) finds that the effect of including exchange rate stabilization in the Taylor rule depends on several key factors (the rule theorizes that an appropriate policy rate is based on an economy’s performance relative to its capacity, the output gap and the rate of inflation). Those factors include the source of exchange rate fluctuation, the central bank’s stance on inflation and a country’s trade openness. If the central bank takes a strong stance on inflation, exchange rate stabilization can improve welfare by fine-tuning interest rates to alleviate international price distortions caused by noisy exchange rate movements and sticky prices. Admittedly, welfare improvement from exchange rate stabilization is small in the model, especially if a country’s consumption is biased toward home-produced goods and services, such as in the U.S.

For countries that do not appropriately anchor inflation, stabilizing the exchange rate through monetary policy will substantially increase macro instability and reduce overall welfare. In this case, when a central bank attempts to alter interest rates in response to exchange rate changes, it will tend to amplify the negative effect of exchange rate noise by destabilizing the inflation rate.

Following the 2008 financial crisis, the Federal Reserve instituted several rounds of quantitative easing (QE) to stabilize the financial markets and aid U.S. economic recovery. QE policy in the U.S. inevitably spilled over to other countries through exchange rates and interest rates. Wang (2011) suggests that the central banks in other countries should continue to focus on inflation stabilization and let exchange rate swings mostly run their course. Unfortunately, policymakers, particularly those in emerging markets, could not restrain themselves from loosening monetary policy to stabilize their currency’s value. As my model predicted, countries focusing more on exchange rate stabilization during this period suffered higher inflation and less-stable domestic macroeconomic conditions (Chart 2).

This paper assumes that the exchange rate was mainly driven by noise in financial markets. Although this is a useful way for theoretical models to match exchange rate behavior in the data, it remains highly debatable whether exchange rates are determined by economic fundamentals or by noise unrelated to economic fundamentals. Therefore, understanding the factors driving exchange rate movements remains an important research topic.

In a seminal paper, Meese and Rogoff (1983) find that economic fundamentals—such as money supply, balance of trade and national income—are of little use when forecasting out-of-sample exchange rates. This casts doubt on fundamental-based exchange rate models. Various combinations of economic variables and econometric methods have been used in attempts to over-

**Chart 2**

**Inflation Lower in Countries Not Trying Exchange Rate Stabilization**

Percent average monthly year/year inflation, March 2009–Dec. 2010

![Chart showing inflation trends](chart.png)

**NOTE:** The greater the percent change in currency vs. the U.S. dollar, the less likely the country’s central bank attempted to stabilize the exchange rate.

**SOURCES:** National statistics offices of each country; Haver Analytics; Wall Street Journal; author’s calculations.
null
There is no strong evidence that foreign ownership can induce productivity gains for target firms relative to domestic-acquired firms.

International Capital Flows

Recent research (Wang and Wang 2014) considers international capital flows and their impact on host countries’ productivity, income and financial conditions, using firm-level data. Conventional wisdom holds that foreign direct investment (FDI) can increase host countries’ productivity, both directly by introducing new technologies and indirectly by technology spillovers from FDI firms to domestic ones. As a result, many emerging markets provide tax and other incentives to attract FDI, which has dramatically increased in these countries over the past three decades.

However, the authors find that FDI can be driven by foreign investors’ easy access to financial markets rather than their technological advantages. Although numerous empirical studies document the superior productivity performance of FDI-involved plants and firms relative to their domestic counterparts, the positive correlation cannot be simply interpreted as a causal relationship. Instead, it may just reflect endogenous FDI decisions: Foreign investors choose to acquire or start business with more productive domestic firms. For instance, Fons-Rosen et al. (2013) find that FDI has a very small effect on target firms’ productivity in their sample of advanced European economies, after controlling for unobservable factors that influence acquisition decisions.

Even after controlling for endogenous choice of FDI firms, a second issue remains for identifying performance gains from foreign ownership. Previous studies found that foreign acquisition can improve target firm performance. However, numerous empirical studies document that domestic mergers and acquisitions are also followed by substantial change in the performance of target firms. See Maksimovic and Phillips (2001) for a study on productivity and McGuckin and Nguyen (2001) for a study on labor input and wages. In particular, Fons-Rosen et al. (2013) find that negative changes in foreign ownership are also associated with firm productivity improvement, consistent with greater productivity arising from the ownership change. Even though previous studies documented performance gains following foreign acquisitions, it remains unclear whether foreign ownership per se is crucial for the gains. If a domestic entity acquired the target firms, they might have exhibited a similar performance improvement.

Wang and Wang (2014) compare the post-acquisition performance changes for foreign- and domestic-acquired firms in China, which allows us to isolate the specific impact of foreign ownership relative to domestic acquisitions. Although the study uses Chinese data, the results likely apply to other countries, especially other emerging markets.

Several findings stand out. First, there is no strong evidence that foreign ownership can induce productivity gains for target firms relative to domestic-acquired firms. If we compare foreign-acquired firms with domestic firms that experienced no change in ownership, the result is significant productivity gains for foreign-acquired firms in the acquisition year and in subsequent years. These findings suggest that foreign acquisitions in China during the sample period did not differ from domestic acquisitions with regard to productivity, even though both induced productivity gains over companies whose ownership did not change.

Second, foreign ownership significantly improved the financial condition (as measured by leverage and liquidity ratios) of target firms relative to domestic acquisitions. These results show that following transactions, foreign-acquired firms rely less on external short-term debt and more on internal capital than domestic-acquired firms.

Although several empirical studies cast doubt on the productivity benefits of FDI to advanced economies, it may still be reasonable to believe the existence of such gains for FDI to emerging markets because these countries lag far behind in technology. However, the results suggest that even FDI to emerging markets could be mainly driven by financial advantages rather than productivity advantages, casting doubt on the efficacy of tax and financial-benefit policies intended to catch up to the technological frontier. The data also indicate that FDI improves target
firms’ exports, supporting the financial channel of FDI in promoting international trade. Manova, Wei and Zhang (forthcoming) find that FDI firms’ exports from China outperform domestic firms, a finding that is more pronounced in financially vulnerable sectors. Their results suggest that FDI can mitigate financial constraints of firms in the host countries, promoting exports and economic growth. However, they do not examine the effect of FDI on firm productivity. The results of Wang and Wang (2014) complement Manova, Wei and Zhang’s (forthcoming) findings by showing that such a channel remains at work even after excluding the impact of domestic acquisition.

Foreign ownership is also found to increase output, employment and wages of target firms relative to domestic-acquired firms. This may result from improved financial conditions leading to increased sales and market share. The empirical results suggest foreign ownership benefits the host countries by strongly easing target firm financial constraints, promoting their participation in export activities, resulting in increases in output, employment and labor incomes. However, Wang and Wang (2014) do not find strong evidence that foreign ownership increases firm productivity.

Many developing countries provide tax and other incentives to attract FDI. The study shows that FDI acquisitions promote host-country international trade by improving the finances of target firms. Therefore, removing trade barriers through free-trade agreements and World Trade Organization membership is a more effective strategy to attract FDI. The results also suggest that FDI to emerging markets such as China may reflect the inefficiency of their financial markets. Government officials should not be overly concerned with increasing FDI. Instead, emerging market leaders should reform financial markets rather than provide tax or policy incentives to maintain FDI.

References