The Great Trade Collapse (and Recovery)*

BY GEORGE ALESSANDRIA

The collapse and rebound in U.S. international trade from 2008 to 2010 was quite stunning. Over this period, the fluctuations in international trade were bigger than the fluctuations in either production of or expenditures on traded goods. These relatively large fluctuations in international trade were surprising to some, since international trade had been growing at a very fast pace for quite a long time. They were equally surprising for trade theorists, since these movements in trade arise in standard models of international trade only when the costs of international trade rise and fall substantially. In this article, George Alessandria places these recent fluctuations in international trade in historical context. He then considers some explanations for the relatively large fluctuations in trade related to the nature of trade, protectionism, and financial constraints.

The collapse and rebound in U.S. international trade from 2008 to 2010 was quite stunning. Over this period, the fluctuations in international trade were bigger than the fluctuations in either production of or expenditures on traded goods. For example, from July 2008 to February 2009, U.S. real imports and real exports each fell by about 24 percent, while industrial production in manufacturing fell only 12 percent. The rebound was equally impressive, with real imports and real exports expanding about 20 percent between May 2009 and May 2010, while manufacturing production rebounded by only 10 percent. Most countries experienced similar outsized movements in international trade.[1]

These relatively large fluctuations in international trade were surprising to some, since international trade had been growing at a very fast pace for quite a long time. These fluctuations were equally surprising for trade theorists, since these movements in trade arise in standard models of international trade only when the costs of international trade rise and fall substantially. Thus, initially when trade was collapsing, many economic and financial analysts interpreted these movements in trade as either a sign of growing protectionism, making imported goods more costly, or a sign of a lack of available finance for international transactions. Indeed, the G20, a group of finance ministers and central bank heads from 20 major industrialized and emerging market economies, pledged to resist protectionist measures at a meeting in Washington, D.C. in November 2008. That same group met in London in April 2009 and pledged to provide about $250 billion in support of finance for international trade.

In this article, these recent fluctuations in international trade are placed in historical context. We then consider

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* The views expressed here are those of the author and do not necessarily represent the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

[1] According to the World Trade Organization (WTO, 2011), the nominal value of goods traded fell about 40 percent from the third quarter of 2008 to the end of the first quarter of 2009. Only by the first quarter of 2011 did the volume of trade recover to its pre-collapse level. The WTO is a multilateral agency that deals with global rules of trade between nations. For the euro area, a collection of 17 European countries that share a common currency, from July 2008 to February 2009, the volume of exports and imports fell 23.2 and 24.4 percent, while industrial production fell only 20.2 percent. From May 2009 to May 2010, exports and imports rebounded by 12.7 and 17.7 percent, respectively, while manufacturing production rose only 9.3 percent.

some explanations for the relatively large fluctuations in trade related to the nature of trade, protectionism, and financial constraints. These explanations shed light on the role of policy in fluctuations in trade.

A SIMPLE THEORY OF INTERNATIONAL TRADE

To put the movements in international trade in context, it is useful to start with a basic model of a country's demand for imported goods from the rest of the world. To make things simple, let's assume there are a home country, which we can call the U.S., and a foreign country, which we will call the rest of the world (ROW for short).

This theory assumes that the amount of goods, say, cars, imported by the U.S. depends on two things: the price of imported cars relative to the price of all cars and total spending on cars. In this theory, if the price of imported cars is high, so that imported cars are relatively more expensive, then consumers will buy fewer imported cars; they will substitute and buy more cars produced at home. Similarly, if consumers purchase more cars, as in boom times, then some of these purchases will also be on imported cars.

This theory is a good approximation of the level of imports. Over time, we can also use the theory to study the relationship between the changes in imports, import prices, and expenditures. To understand how changes in prices and expenditures affect imports, it is useful to define price elasticity and income elasticity. Price elasticity tells us how a change in the price of imported cars affects the importation of cars. For instance, if the price elasticity is -1.5, then a 1 percent increase in the price of imported cars will lower imports by 1.5 percent. Income elasticity tells us how a change in income or expenditures affects imports. For instance, if income elasticity is 2, then a 1 percent increase in income will increase imports by 2 percent. Typically, we find that the volume of imports tends not to be very responsive to changes in import prices (a low price elasticity) and quite responsive to changes in income or expenditures (a high income elasticity).[2] We will consider in detail measures of these elasticities later.

We described our theory in terms of consumers buying cars, but it applies more generally to producers buying inputs for production or capital goods for investment. Indeed, this theory mostly applies to firms, since very few consumers directly purchase goods internationally. A similar import demand equation determines imports by the ROW. After all, exports from the U.S. to the ROW must equal imports by the ROW from the U.S.

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PUTTING THE COLLAPSE IN CONTEXT

With our theory in hand, we can next explore to what extent the movements in trade in the most recent recession were unusual in either scale or historically. To say whether something is large or small, we need a reference point. Our theory says imports should move with expenditures, and so we consider how trade moved relative to different measures of expenditures.

We consider three measures of expenditures. The first is gross domestic product (GDP), the amount of all goods and services produced by a country in a particular period. It is a very broad measure of economic activity and includes the production of all goods in the U.S., even those that are difficult to trade internationally. Our second measure, which we call demand, is a measure of final expenditures that is weighted by the share of each good in trade. Specifically, our measure of demand is a weighted average of purchases of durable and nondurable goods by consumers and investment in equipment by businesses. The weights are based on the importance of each type of good in U.S. trade. Our third measure, industrial production of manufactured goods, is a measure of the amount of tradable goods produced in a country. The manufacturing sector is considered a better proxy for the production of tradables than GDP, since it accounts for nearly 80 percent of U.S. international trade but only about 20 percent of U.S. GDP.

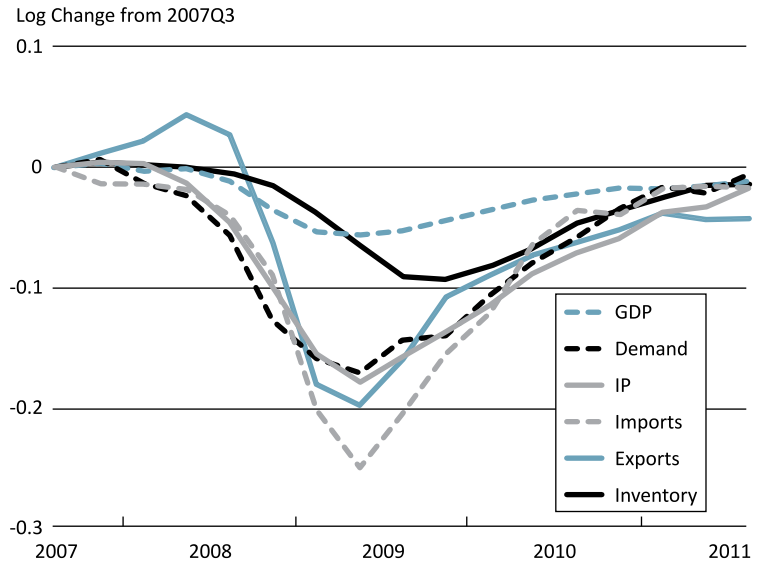
Last, because we are interested in the cyclical movements in trade and expenditures, it is useful to remove from these data series their long-run trends. This is particularly important for international trade, since international trade has grown, on average, about twice as fast as measures of production or spending.[3] By doing this, we can more reasonably compare fluctuations in trade in both shallow and deep recessions.[4] Figure 1 shows the move-

[2] See the recent work by Jane Haltmaier on these estimates.

[3] The major reason that international trade has grown faster than production or expenditures is that the costs of international trade, such as tariffs and shipping costs, have fallen over time.

FIGURE 1

U.S. Trade and Expenditures



Note: Deviations from an HP trend removed from data from 1967Q1 to 2011Q3.

ments in de-trended exports, imports, and our three measures of expenditures from the quarter prior to the start of the recession, the fourth quarter of 2007, to the third quarter of 2011.[5] At the start of the recession, imports fell slightly and exports expanded slightly. From the second quarter of 2008 to the second quarter of 2009, imports and exports fell dramatically, about 23 percentage points each. The sharp contraction in imports and exports was much larger than the fall in GDP (5.4 percent), demand (14.7 percent), or industrial production (16.5 percent) over the same period. Similarly, from the second quarter of 2009 the rebound in exports and imports was quite large compared with the rebound in GDP, demand, or industrial production.

To put the dynamics of trade in historical context, the table reports the peak-to-trough movements in imports and exports in each of the last seven recessions. For imports and exports, the declines in this downturn are comparable to those in previous downturns. For example, imports fell 4.4 times as much as GDP in 2008-09, which is about equal to the median decline of 4.6 over these seven recessions. Imports fell about 1.5 times as much as demand for tradable goods, which is a bit smaller than the median decline of 2.4. Similarly, exports fell about 1.3 times as much as manufacturing production in this recession, which is the median decline in these seven recessions.

Evidence on Auto Imports and Sales. One might be concerned that we have not properly accounted for the different composition of expenditures and trade flows. That is, our trade-weighted measure of expenditures does not accurately reflect the composition of trade. This clearly explains why trade falls more than GDP, since the goods that fluctuate the most over the business cycle, namely, consumer

TABLE

Peak Drop in Trade Relative to Absorption

IMPORTS

	Median	1971Q1	1975Q2	1980Q3	1982Q4	1991Q1	2001Q4	2009Q2
GDP	4.62	4.72	4.62	5.25	2.38	2.59	5.92	4.44
IP	1.56	1.17	1.64	2.44	1.17	1.56	2.00	1.40
Demand	2.41	2.50	2.41	2.84	2.39	1.55	5.46	1.47

EXPORTS (peak to trough)

	Median	1971Q2	1975Q2	1980Q4	1982Q4	1990Q4	2002Q1	2009Q2
IP	1.35	0.92	0.86	1.08	1.72	1.53	2.33	1.35

Notes: Measured from start of recession based on the NBER dates. The third panel measures the difference in exports between the peak and trough, where the peak is only the start of the recession if exports fall immediately. All data were HP filtered with a smoothing parameter of 1600, and so the drop is measured relative to the trend.

[4] We remove a Hodrick-Prescott (HP) trend from each data series for the period first quarter of 1967 to the third quarter of 2011. The HP trend varies over time. We focus on removing those fluctuations that are greater than 32 quarters in duration. The finding of relatively large fluctuations in trade during recessions is robust to a variety of detrending measures.

[5] The data on exports, imports, GDP, and expenditures are from the Bureau of Economic Analysis and are based on data through the "preliminary" estimates of data for the third quarter of 2011.

durables[6] and business investment in equipment, account for a large share of international trade, while services, such as education and health care, tend to not fluctuate much over the business cycle and are a relatively small fraction of trade. To avoid this mismatch between the composition of imports and spending on tradable goods, we next consider the dynamics of imports and sales of imported motor vehicles. There is no compositional bias here.

Figure 2 plots the change in imports and sales of motor vehicles produced outside of North America[7] from the beginning of 2008 to the end of 2010 relative to the averages in the second quarter of 2008.[8] Sales of imported motor vehicles fell continuously from May 2008 to December 2008 before stabilizing at roughly 45 percent below the levels at the beginning of 2008.[9] These declines in sales reflected the deepening recession in the U.S. Imports fell more or less in lock-step with sales of imported motor vehicles until January 2009, when they fell an additional 40 percent. Comparing imports and sales relative to the start of the recession, we see that from January to July of 2009, imports had fallen roughly twice as much as sales of imported motor vehicles. The relatively large drop in imports relative to retail sales of imported motor vehicles is consistent with the more aggregate evidence we presented before.

The import and sales data for motor vehicles show that car dealers were selling motor vehicles off their lots in 2009 out of their existing inventory and then not replacing those motor vehicles with new imports. Indeed, we see from Figure 2 that the stock of imported cars in inventory rose substantially through 2008 and then started declining when imports of motor vehicles collapsed. Only in August 2009 did we see that the change in inventory, sales, and imports was roughly in line.[10] Thus, car dealers' inventory management decisions appear to be very important in explaining the dynamics of imports in the recent recession.

In summary, the data show that imports and exports generally fluctuate more than expenditures or production of traded goods over the business cycle. The evidence from motor vehicles shows that these fluctuations in trade do not represent a mismatch between the composition of trade and expenditures. The aggregate data show that the relatively large fluctuations in trade in the current recession were pretty typical for the U.S. What was unusual was that this was a deep recession so that economic activity fell more than is typical in a recession. The movements in trade relative to the decline in economic activity were of the same magnitude as previous downturns. The similarity of trade flows across different recessions suggests that any explanation of the movements in international trade should be generally related to the nature of international trade and not specific to the collapse and recovery in the most recent global recession.

[6] Consumer durables are goods that are meant to last more than three years. Examples include automobiles, washing machines, and televisions.

[7] These are motor vehicles primarily produced in Europe, Japan, and Korea. Because of data considerations, motor vehicles produced in Mexico and Canada are excluded from this measure. For our purposes, motor vehicles produced in the U.S. by foreign-owned firms are not considered imports, while vehicles produced outside of North America by U.S.-owned firms are considered imports.

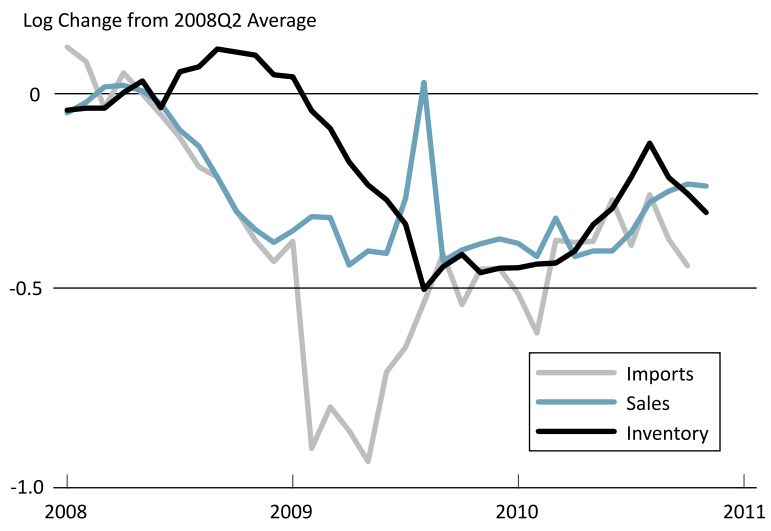
[8] The data have been seasonally adjusted, but no trend has been removed.

[9] The large spike in sales of imported cars in July 2009 was a result of the federal government's "cash for clunkers" program that essentially temporarily subsidized the purchase of new autos.

[10] There is a spike in sales of autos in June and July of 2009 that is related to the U.S. government's "cash for clunkers" program. This program provided an incentive for owners of old, energy-inefficient cars to purchase new cars.

FIGURE 2

Dynamics of Imported Autos



INVENTORIES AND CYCLICAL FLUCTUATIONS IN TRADE

Here we consider one possible explanation for the sudden, relatively large movements in international trade that is based on the idea that the inventory holdings of firms buying from abroad are different from the inventory holdings of firms buying locally. Our previous theory of final demand for imported goods still holds, but now we consider how imports and inventory holdings adjust to changes in final demand for imported goods. The key idea is that higher inventories of imported goods lead importers to respond differently in an economic downturn than buyers of domestically produced goods.

Inventories are products or inputs that firms hold in warehouses or in transit, such as cars in the belly of a ship, that have been produced and may be available to be sold or used but may not be sold or used in a particular period. A clear example of inventory holdings is the cars available on a dealer's lot. A dealer will tend to have many more cars available for consumers to inspect, test drive, or buy than the dealer will sell in any particular month. Inventories are held at all stages in the production process from inputs for production to finished goods.

While we focus on how this idea affected trade flows in the global recession, the same mechanism has been found to be important in explaining trade dynamics in emerging markets following large devaluations, that is, periods when a country's currency weakens. Under such circumstances, it takes more of the local currency to buy imported goods. This idea is explained in more detail in *Import Collapses and Devaluations in Emerging Markets*.

To build some intuition for how inventories might affect trade flows, let's consider a car dealer, whom we will call the ROW dealer. This dealer buys autos from a factory in the ROW, imports them, and then sells them to consumers at his car dealership in the U.S. We summarize the dealer's inventory, sales, and monthly imports in the top and bottom panels of Figure 3. Suppose that in normal times, described by months 0 and 1, consumers buy 10 cars per month from the car dealer. Also, suppose that to sell these 10 cars, the dealer needs to have twice as many cars available, or 20 cars, so that customers can kick the tires a bit. Let's also suppose the dealer orders cars from the manufacturer before he knows how many cars he will sell in the current month, since it takes a month to ship the cars from

Import Collapses and Devaluations in Emerging Markets

Here I describe how movements in exchange rates also affect trade flows, based on a paper I wrote with Joe Kaboski and Virgiliu Midrigan (2010a). In this paper, we studied the dynamics of imports in periods surrounding a large exchange-rate devaluation in six emerging markets (Argentina, Brazil, Korea, Mexico, Thailand, and Russia). A devaluation is a sudden, sharp worsening in the exchange rate of a country's currency that makes imported goods much more expensive compared with goods produced within the country. The devaluations in the six countries we studied occurred during times of very low economic activity.

We emphasize three salient features of imports and prices in large devaluations. First, the volume of imports falls sharply, particularly in the short run, say, the first few months following the devaluation. Second, the sharp drop in imports is largely accounted for by a reduction in the number of products imported. That is, goods that were previously imported are temporarily not imported at all. Third, exchange rate pass-through* is initially low. That is, the price that retailers charge for their imported products rises more gradually than the exchange rate or cost of their inputs.

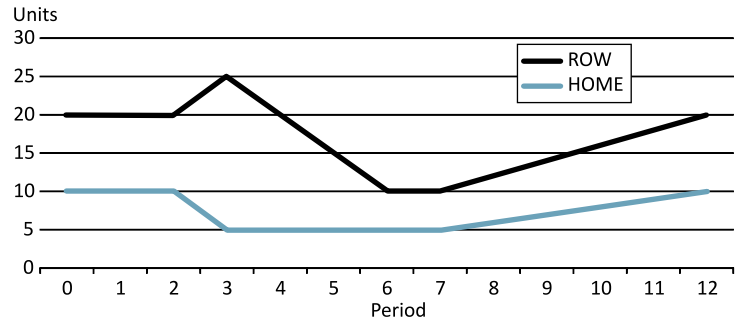
Inventory considerations can help explain these three features. To make things concrete, consider a car dealer in Argentina that imports cars from the U.S. and then sells them in Argentina. The devaluation raises the dealer's cost of importing the cars. At this higher cost, the car dealer eventually would like to sell fewer cars at a higher price. However, initially when the devaluation occurs, since the car dealer did not anticipate the increase in the cost of imported cars, the car dealer may already have a lot of cars sitting on his lot. The car dealer will raise the price of these cars, since replacing a car in inventory has gotten more expensive. But he will not raise his price fully because if he did so, it would take a very long time to sell all the cars in inventory, and there are costs to carrying these cars in inventory that he would like to avoid.

At the higher price, the car dealer's inventory of cars will take longer to sell, and so the car dealer will not need to import any cars initially. After a few months and after the car dealer has sold some cars and lowered his inventory to levels more in line with the lower sales rate, the car dealer will start importing again. In this way, we see low pass-through and a sharp contraction in imports in the short run. The same mechanism holds for any firm that imports infrequently and holds inventories of imported inputs.

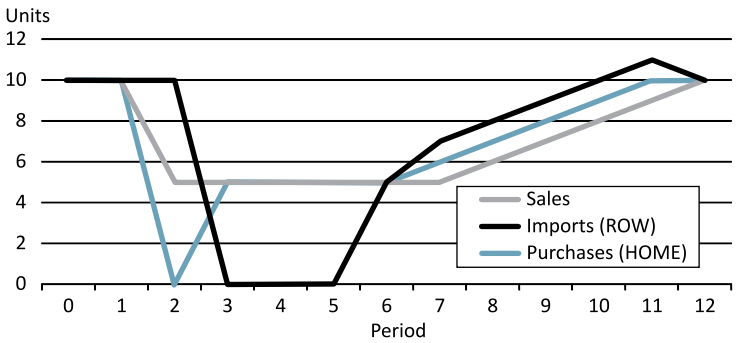
* For a discussion of exchange rate pass-through, see my *Business Review* article with Jarcy Zee.

FIGURE 3

Inventory



Sales, Purchases, and Imports



the ROW to his dealership in the U.S. This means he orders 10 cars a month and begins each month with 20 cars available, assuming he sold 10 cars as expected in the previous month.

Now suppose that after ordering 10 cars from the manufacturer, the dealer is surprised and there is a big recession. So in the current month (month 2) only five customers show up and buy five cars. He will now start the next month off with 25 cars: the 15 cars he didn't sell plus the 10 cars he imported. Suppose the dealer expects the recession to last a while so that only five cars are sold per month until month 8, at which point sales increase one unit a month until reaching 10 units in month 12. Since the dealer expects to sell only five cars in month 2, he would like to have only 10 cars available on the lot instead of the 25 he currently has. Moreover, since the dealer likes to have twice the inventory on hand relative to sales, the dealer really only needs to have 10 cars available and would like to send 15 cars back to the manufacturer this month. If it's too costly to ship these cars back or the manufacturer won't take them back, the dealer can get inventory down to 20 cars by selling the five cars this month and not ordering any new cars. By not importing for three months, he can reduce his inventory to 10 cars in three months. In this way, we see a much sharper drop in imports than sales that is persistent.

Next, let's contrast the behavior of our ROW dealer with a car dealer, whom we call the HOME dealer, who is located next to the auto factory and holds half the inventory, say, 10 cars per month and sells 10 cars per month. Also, suppose that because this dealer buys locally he can wait until after he knows how much he sells before he orders more cars. If the recession leads to a drop in sales from 10 cars per month to five cars per month, the dealer would like to lower his inventory to five cars per month. He can do this by temporarily lowering his purchases from 10 cars to 0 cars in month 2, since he already has five cars left over that did not sell in month 1. In month 3, the HOME dealer purchases five cars from the manufacturer. Thus, in a recession, we get a sharp temporary drop in purchases by the HOME dealer and a more persistent drop in imports by the ROW dealer.

Figure 3 plots the dynamics of inventory, sales, purchases, and imports by our two auto dealers in our simple example. Notice that even though both dealers sell the same number of cars each month, the purchases by the ROW dealer fall more than those of the HOME dealer in the recession. The large movements in ROW imports relative to HOME purchases arise because the high inventory level of the ROW dealer leads to a stronger need to adjust inventory. The reasons the ROW dealer holds more inventory are discussed in greater detail below.

Implications for the Recovery. Inventory considerations also matter for imports and domestic purchases when sales rebound, since the ROW and HOME dealers have different needs to rebuild their inventories. Specifically, we see that both dealers start rebuilding their inventory in month 7 in anticipation of the increase in sales in month 8. However, the ROW dealer has a stronger incentive to rebuild inventory than the HOME dealer, since the ROW dealer likes to have more inventory on hand. Thus, we see that imports are higher than domestic purchases from period 7 to 11.

Implications for Trade in the Global Recession. Our discussion has mostly concentrated on explaining the dynamics of imports by ROW dealers selling in the HOME country following a decline in HOME sales or income as in a HOME recession. However, the trade collapse was global in nature. For instance, U.S. imports and exports both fell and rebounded tremendously. To understand how exports fall when a country enters a recession in our model, recall that imports by ROW dealers are equal to exports by producers in the ROW. Thus, a decline in sales in export markets will lead to a drop in exports by the producer and imports by the final consumer.

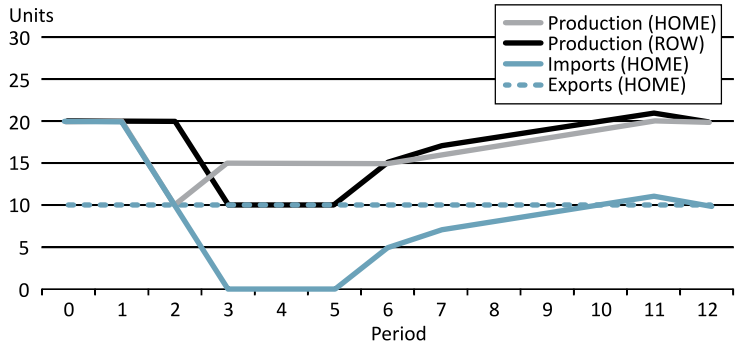
The simple model of trade and inventories can easily deliver a global collapse in trade when sales fall globally. To make things concrete, let's suppose that the HOME and ROW countries sell the same number of autos and ROW and HOME autos account for half of auto sales in each market. With this configuration of market share, in normal times HOME and ROW each import and export 10 units and produce 20 units.

The top panel of Figure 4 shows the impact on HOME imports, exports, and the production of autos when the HOME country enters a recession like the one described in Figure 3 while ROW sales are constant. Here we see that imports fall but exports remain constant. In this case, HOME production falls because of both lower sales at HOME and the need to adjust inventories. ROW production falls more than HOME production because the need to adjust inventories is stronger because of the higher stock of inventories held by ROW dealers.

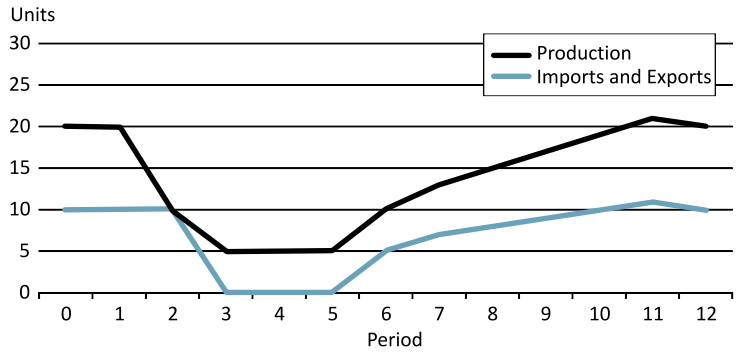
The bottom panel of Figure 4 shows what happens to production and trade when there is a global recession. Now, HOME imports and exports fall. The global nature of the recession leads to a very large and sustained decline in production. Thus, to the extent that there is a common downturn in economic activity, imports and exports will both fall in a recession.

FIGURE 4

HOME Recession



Global Recession



In our work studying the dynamics of international trade in the global recession (Alessandria, Kaboski, and Midrigan 2010b) and over the business cycle (Alessandria, Kaboski, and Midrigan 2012), my co-authors and I find that between 75 to 90 percent of the fluctuations in international trade that the simple theory of international trade cannot explain (that is, those fluctuations not explained by the movements in expenditures or relative prices) can be explained by the inventory mechanism.

Inventory Holdings of Importers: Explanations and Evidence. Relatively large cyclical fluctuations in trade arise when importers hold more inventory than nonimporters. We now describe some reasons that this may be the case and then present some empirical evidence supporting this view. Three main reasons stand out to explain why firms that are buying inputs from abroad may hold extra inventory compared with firms that transact only domestically. These reasons are all related to the fact that the costs of and barriers to international transactions are higher than those for domestic transactions.

First, importers have stronger incentives than nonimporters to use inventories to economize on shipping costs. For example, most people who shop at warehouse clubs tend to make large and infrequent purchases rather than going every day to buy small

quantities. Because the cost of each international transaction is relatively large, importers can save by placing a few large orders. The larger costs to international trade are primarily related to larger administrative requirements such as getting permits, undergoing inspections, and arranging financing and transportation.

Second, importers hold more inventories because it just takes longer to ship goods from distant international suppliers than local domestic suppliers. The extra time can add a month or two to the time it takes to get a product delivered once it is produced in a foreign factory. The delays arise because distances are longer and because there are more steps in the process. For instance, many products and countries require permits to export, and the products must pass through customs and ports on their way out of and into a country. This is somewhat mechanical, since imports in transit are included in inventory.

Third, because of the time and costs involved in international trade, there is greater uncertainty with international transactions than with domestic transactions. Two sources of uncertainty are particularly troubling. First, there are more opportunities for delays from inclement weather or even natural disasters as well as delays in getting processed through customs in both the exporting and the importing country. If an input from abroad does not show up on time, it can bring the production process to a halt, and this is quite costly. For instance, following the tsunami in Japan in March 2011, many auto manufacturers in the U.S. that used parts produced in Japan to assemble autos ran out of these parts and thus had to substantially curtail production. Importers also face greater uncertainty with their sales, since the delays in getting inputs from abroad might constrain an importer from filling an order from a customer. As a precaution against these risks, firms will tend to hold extra inventory.

Evidence of Inventory Premiums of Importers. We now discuss some direct evidence that producers that are importing inputs from foreign suppliers tend to hold more inventory than those that are obtaining their products locally. In my work with Joe Kaboski and Virgiliu Midrigan (2010a), using data from manufacturing establishments[11] in Chile, we find that establishments that buy imported inputs tend to hold more inventory than those establishments that only buy inputs locally. Indeed, we estimate that establishments tend to hold, on average, 2.5 months of domestic inputs and 4.5 months of imported inputs. Using aggregate data for the U.S., in another paper with Joe Kaboski and Virgiliu Midrigan (2010b), we also find that industries that import relatively more inputs tend to hold relatively more inventory.

The inventory explanation for trade fluctuations implies that the large, sharp fluctuations in trade are the optimal response to the business cycle. Since firms are behaving optimally, there is no role for government action to encourage international trade.

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[11] An establishment is a physical location, or plant, where economic activity takes place, while a firm is a collection of establishments with the same owner. For instance, the Ford Motor Company owns a manufacturing assembly plant in Louisville, Kentucky, where about 4,000 workers assemble trucks. This assembly plant is an establishment.

ALTERNATIVE EXPLANATIONS

Here we consider two common explanations to explain why trade fell more than spending on traded goods. Both explanations operate by making imported goods more expensive, thus shifting demand away from imported goods.

Protectionism. The first explanation for the fall in trade points to governments protecting their domestic industries by making trade more difficult by raising taxes on imported goods; erecting new barriers to international trade, such as making it hard to get permits and increasing the costs of getting goods through customs; or favoring certain domestic producers and products with subsidies, bailouts, and preferential government purchases.

There is certainly evidence of some increase in trade barriers (see the study by Simon Evenett) in some countries and some industries. Indeed, the Global Trade Alert, a publication coordinated by the Centre for Economic Policy Research, an independent academic and policy research think tank based in London, identifies approximately 2,000 changes in trade policy, and among these, about 1,500 worked to restrict imports from November 2008 to November 2011. Many countries, including the U.S., implemented some policy. An example of one of these policies is the Buy American provision in the American Recovery and Reinvestment Act of 2009 (section 1605 of Title XVI). This

provision required, with limited exceptions,[12] that none of the funds appropriated or otherwise made available by the act may be used for the construction, alteration, maintenance, or repair of a public building or public work unless all the iron, steel, and manufactured goods used are produced in the United States.

While there is certainly some specific evidence of trade barriers increasing in certain countries and industries, the impact of these policies on trade has been found to be relatively limited. In particular, a paper by Jonathan Eaton, Samuel Kortum, Brent Neiman, and John Romalis estimates that these rising international barriers to international trade had a relatively small impact on the collapse of international trade globally, accounting for less than 5 percent of the decline in trade in the period of the great trade collapse.

Tightening Financial Conditions. A second common explanation for the relatively large decline in international trade in the recent crisis attributes the decline to extreme difficulties in the financial sector. The simple idea is that international trade requires more credit from financial institutions than domestic transactions because it either takes longer or is harder to enforce international contracts than domestic contracts.[13] Given the need for credit in order to carry out trade, the worsening credit conditions in recessions tend to hit trade harder.

There are two main approaches to finding evidence of this effect. The first, summarized in the work of Davin Chor and Kalina Manova, is to see whether exports of industries that are relatively reliant on extensive external financing, or borrowing from financial intermediaries like banks, fell by more than exports of industries that use less external financing. Likewise, it is also possible to study whether trade fell more in countries where credit conditions deteriorated the most so that the availability of finance for trade was relatively more restricted. Using this approach, Chor and Manova estimate that the increase in the costs of financing from September 2008 to August 2009 may have lowered U.S. imports by as much as 5.5 percent.

The second approach examines whether firms associated with a particular bank tended to export less if their bank performed worse. The idea is that banks that were in distress would provide their customers with less financing for international transactions. The lack of financing would make it harder for the customers associated with these banks to export at least until these customers could switch banks.

Using this approach there is some evidence of an impact of bank stress. Using a sample of Japanese firms matched to their primary bank, Mary Amiti and David Weinstein attribute between 19 and 23 percent of the decline in Japanese exports in 2008 and 2009 to the finance channel. Using Peruvian firms and banks, Daniel Paravisini, Veronica Rappoport, Philipp Schnabl, and Daniel Wolfenzon find that about 10 to 15 percent of the drop in exports in the 2008 and 2009 period can be attributed to credit frictions. Paravisini and co-authors also show that some biases in the empirical methodology used by Amiti and Weinstein may overstate the impact of credit on trade by 100 percent.

Overall, attributing the recent collapse in trade to problems in the financial sector is quite appealing, given that many of the problems in the recent recession affected the financial sector the most. The empirical work finds some support for this channel. However, one concern with this explanation of a trade collapse based on financial considerations is that, for the U.S., movements in international trade in the current downturn were similar in magnitude to previous downturns in which the financial sector was less affected.

SUMMARY

International trade collapsed and rebounded strongly from 2008 to 2010 in the U.S. and the rest of the world. For the U.S., these relatively large fluctuations in international trade are quite typical of past U.S. recessions and recoveries. For the U.S., relative to the size of the downturn, the collapse and rebound were not unusual. What was unusual was the relatively deep recession.

In this article, we presented a simple theory that can explain these types of cyclical fluctuations in exports and imports based on the different inventory holdings of users/resellers of imported and domestic inputs. These different inventory holdings arise because importers and domestic buyers face different costs of buying inputs. In a recession, given the higher inventory holdings of importers, there is a stronger incentive to adjust inventories, and so trade falls and rebounds by more. When there is a global recession, this leads to very strong declines in both imports and exports.

This simple theory of inventory and trade suggests that the relatively large fluctuations in trade arise naturally as the response of shocks to the economy rather than policy-induced distortions such as an increase in protectionism. This suggests that there is a limited role for policy in responding to these cyclical fluctuations in trade.

[12] Waivers from this provision were possible if U.S. goods were not available, sold for an unreasonable cost, or were inconsistent with the public interest.

[13] Enforcing contracts for international transactions can be particularly difficult, since buyers and sellers are located in different countries and thus subject to different legal systems. To overcome these problems, the buyer and seller often contract with banks to intermediate the transaction, with the banks essentially guaranteeing payment to the seller once the buyer fulfills the terms of the contract.

Of course, other channels seem to have played a role as well. There is some evidence that some part of the contraction in international trade was attributed to increased protectionism. Reversing these policies would certainly increase international trade. Tightening credit may have also played a role in the collapse of trade, and the lowering of spreads may have helped in the recovery of international trade. There is ongoing work to more precisely parse out the contribution of these different sources of cyclical fluctuations.

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