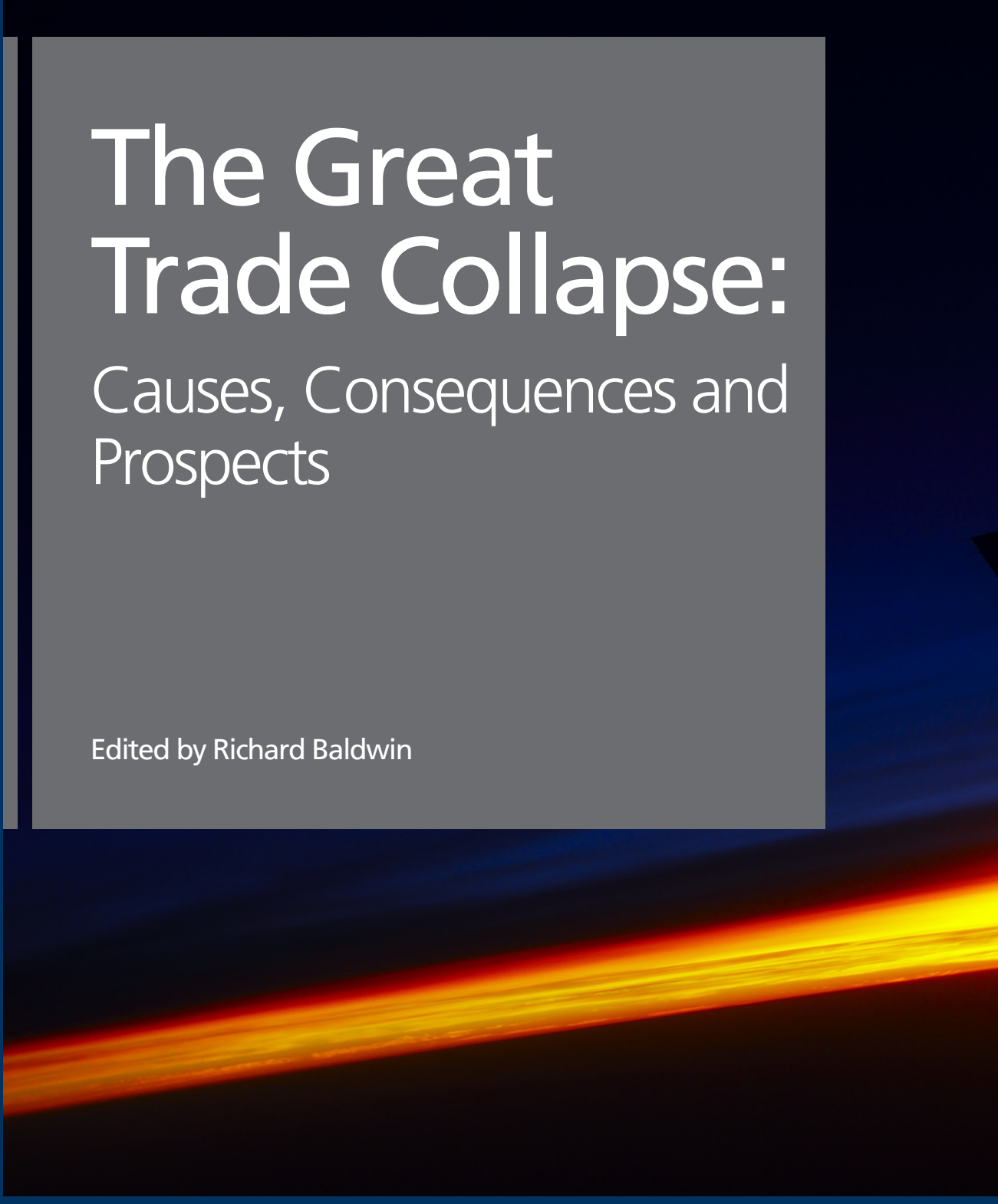
The Great Trade Collapse:

Causes, Consequences and Prospects

Edited by Richard Baldwin



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A VoxEU.org Report

The Great Trade Collapse: Causes, Consequences and Prospects

A VoxEU.org Publication

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Centre for Economic Policy Research (CEPR)

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Foreword

In an earlier Ebook, prepared for the London G20 Summit in April 2009 - "The collapse of global trade, murky protectionism, and the crisis" - Richard Baldwin and Simon Evenett noted that world trade was experiencing a "sudden, severe and synchronised collapse", the sharpest in history and the deepest since WWII. At that time, the reasons for the collapse were not entirely clear, though the two leading explanations were the widespread use of international supply chains and the drying up of short-term credit.

In this Ebook, Richard Baldwin, Editor in Chief of Vox and CEPR's Policy Director, has brought together some answers, just in time for the WTO's 7th Trade Ministerial Conference in Geneva (30 November - 2 December 2009). The two dozen chapters summarise the latest research on the causes of the collapse, as well as the consequences and prospects for the future. It brings together contributions from many of the world's leading economists and establishes a remarkable consensus - both on the causes of 'the great trade collapse' and on its implications.

It is clear from the essays that international trade was a major casualty of the global financial crisis. It is our hope that the insights and recommendations that the authors provide will go some way towards assisting governments and policy-makers in making the right choices in ensuring that the patient returns to full health.

In closing, it is important to acknowledge the rapid and highly professional contribution made by "Team Vox" - notably Jonathan Dingel, Nicole Hunt, Anil Shamdasani, and Pierre-Louis Vezina. This Ebook would not have been possible without their energy, enthusiasm and commitment.

Stephen Yeo
Chief Executive Officer, CEPR
London, 26 November 2009

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The great trade collapse: What caused it and what does it mean?

Richard Baldwin
Graduate Institute, Geneva and CEPR

World trade experienced a sudden, severe and synchronised collapse in late 2008 - the sharpest in recorded history and deepest since WWII. This Ebook - written for the world's trade ministers gathering for the WTO's Trade Ministerial in Geneva - presents the economics profession's received wisdom on the collapse. Two dozen chapters, written by leading economists from across the globe, summarise the latest research on the causes of the collapse as well as its consequences and the prospects for recovery. According to the emerging consensus, the collapse was caused by the sudden, recession-induced postponement of purchases, especially of durable consumer and investment goods (and their parts and components). This was amplified by "compositional" and "synchronicity" effects in which international supply chains played a central role.

The "great trade collapse" occurred between the third quarter of 2008 and the second quarter of 2009. Signs are that it has ended and recovery has begun, but it was huge – the steepest fall of world trade in recorded history and the deepest fall since the Great Depression. The drop was sudden, severe and synchronised. A few facts justify the label: The Great Trade Collapse.

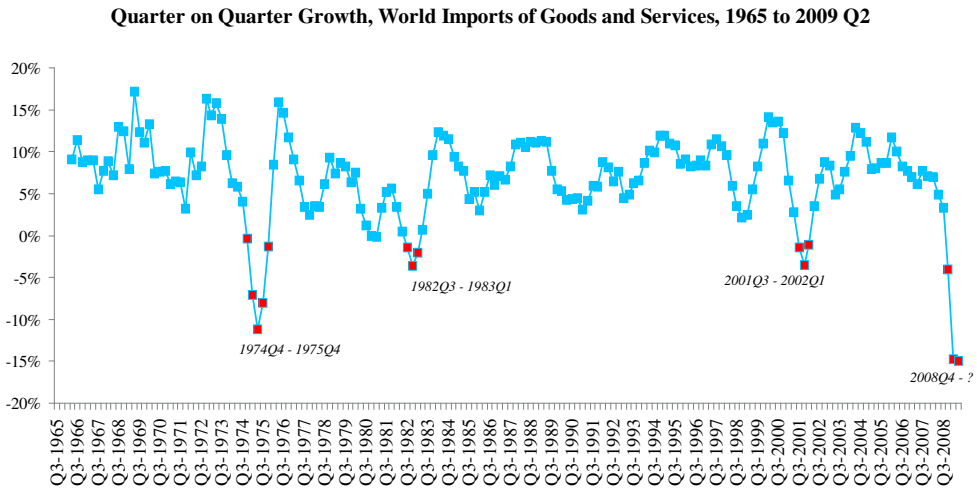
It was severe and sudden

Global trade has dropped before – three times since WWII – but this is by far the largest. As Figure 1 shows, global trade fell for at least three quarters during three of the worldwide recessions that have occurred since 1965 – the oil-shock recession of 1974-75, the inflation-defeating recession of 1982-83, and the Tech-Wreck recession of 2001-02. Specifically:

- The 1982 and 2001 drops were comparatively mild, with growth from the previous year's quarter reaching -5% at the most.
- The 1970s event was twice that size, with growth stumbling to -11%.
- Today collapse is much worse; for two quarters in a row, world trade flows have been 15% below their previous year levels.

The OECD has monthly data on its members' real trade for the past 533 months; the 7 biggest month-on-month drops among the 533 all occurred since November 2008 (see the chapter by Sónia Araújo and Joaquim Oliveira).

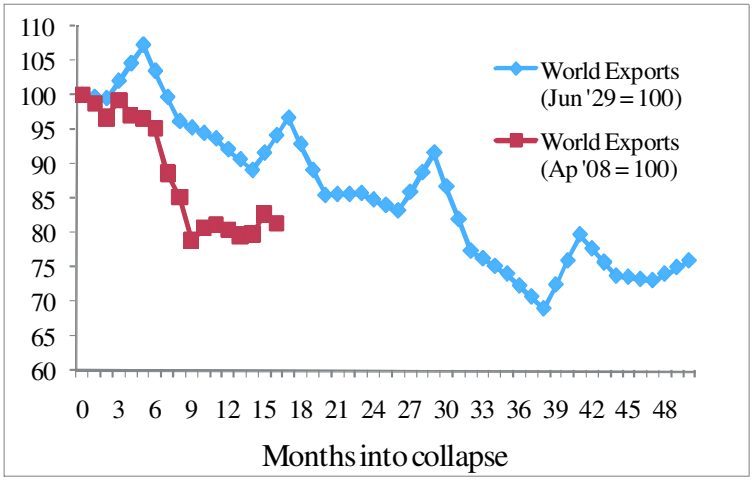
Figure 1. The great trade collapses in historical perspective, 1965 - 2009



Source: OECD Quarterly real trade data.

The great trade collapse is not as large as that of the Great Depression, but it is much steeper. It took 24 months in the Great Depression for world trade to fall as far as it fell in the 9 months from November 2008 (Figure 2).

Figure 2. The great trade collapses vs. the Great Depression

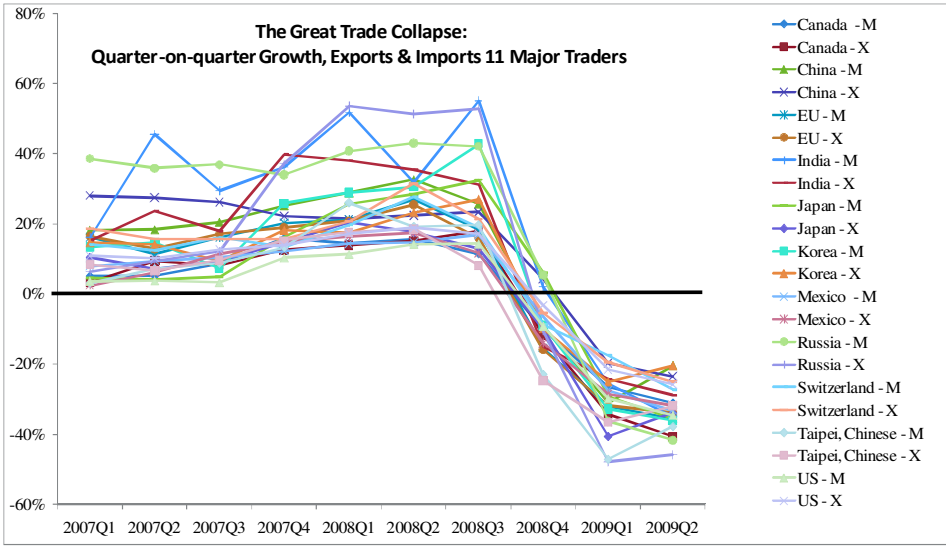


Source: Eichengreen and O'Rourke (2009).

It was synchronised

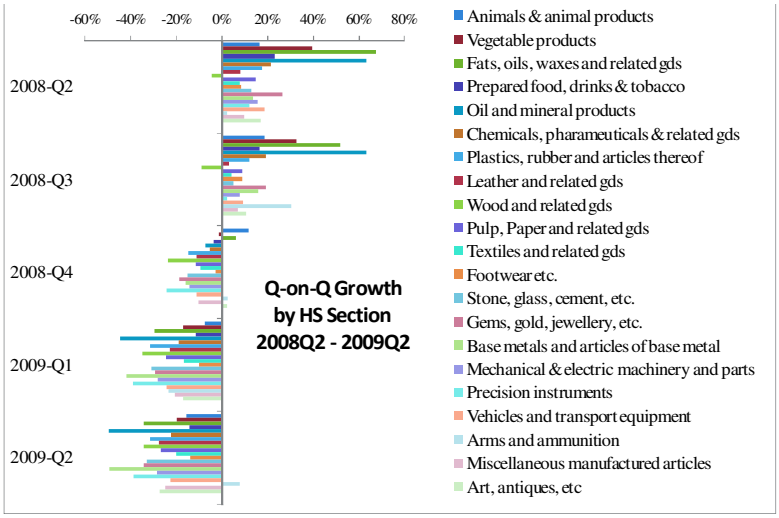
- All 104 nations on which the WTO reports data experienced a drop in both imports and exports during the second half of 2008 and the first half of 2009.
- Figure 3 shows how imports and exports collapsed for the EU27 and 10 other nations that together account for three-quarters of world trade; each of these trade flows dropped by more than 20% from 2008Q2 to 2009Q2; many fell 30% or more.
- World trade in almost every product category was positive in 2008Q2, almost all were negative in 2008Q4 and all where negative in 2009Q1 (Figure 4).

Figure 3. The great trade collapse, 2008 Q2 to 2009 Q2



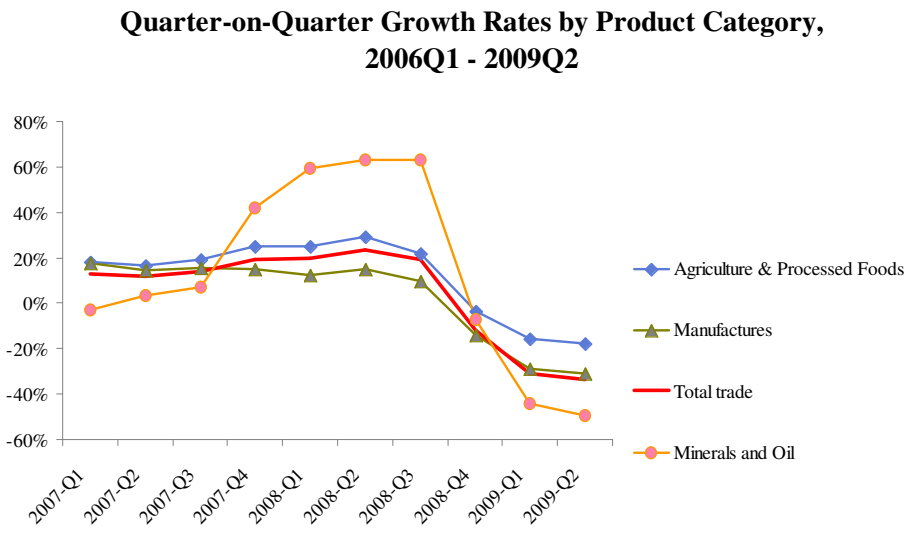
Source: Eichengreen and O'Rourke (2009).

Figure 4. All types of goods trade collapsed simultaneously



Source: Comtrade database

Figure 5. The great trade collapse and values: Food, oil, and manufactures



Source: ITC online database.

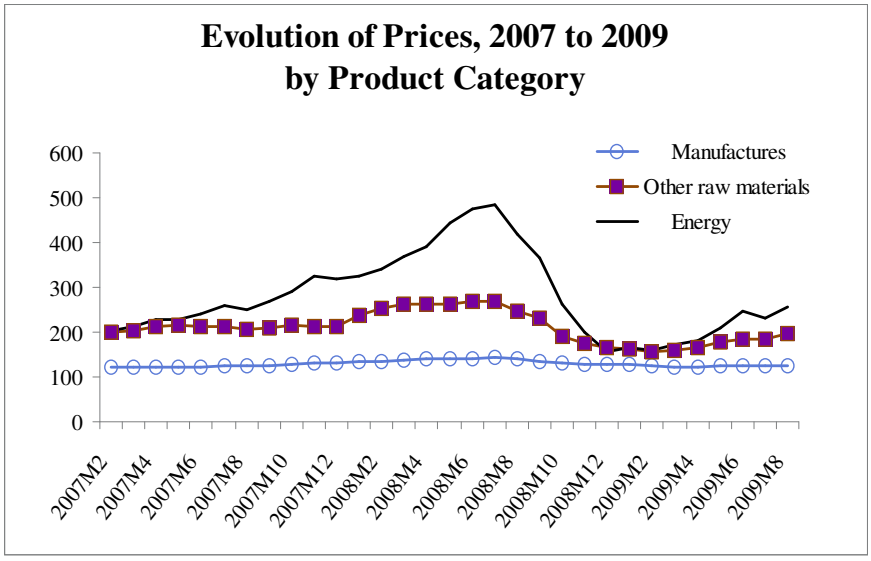
Manufactures and commodities

Trade collapsed across the board, but it is important to distinguish between commodities and manufactures. The collapse in minerals and oil trade started from a boom time and fell faster than total trade (Figure 5). The reason was prices. Food, materials and especially oil experienced a steep run up in price in early 2008; the boom ended in mid 2008 – well before the September 2008 Lehman's debacle. The price of manufactures, by contrast, was rather steady in this period (Figure 6).

Since food, fuels and raw materials make up about a quarter of global trade, these price movements had a big impact on aggregate trade figures. Countries dependent on commodity exports, in particular oil exporters, were among those that experience the greatest drop in exports (see the chapters Africa by Peter Draper and Gilberto Biacuana, and by Leonce Ndikumana and Tonia Kandiero, and on India by Rajiv Kumar and Dony Alex).

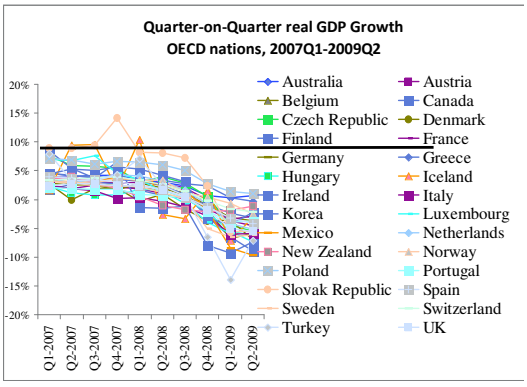
The drop in manufactures trade was also massive, but involved mostly quantity reductions. Exporters specialising in durable goods manuafactures saw a particularly sharp decline in their exports (see chapters on Japan by Ruyhei Wakasugi and by Kiyoyasu Tanaka). Mexico, which is both an oil exporter and a participant in the US's manufacturing supply chain, experienced one of the world's most severe trade slumps (see chapter by Ray Robertson).

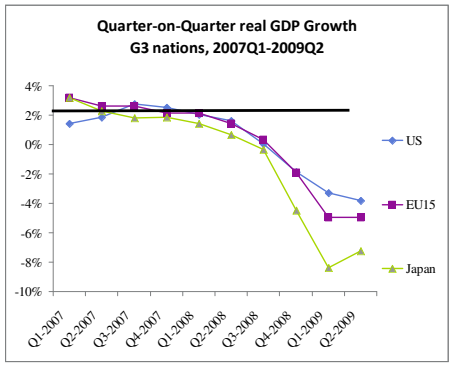
Figure 6. The great trade collapse and prices: Commodity vs. manufactures



Source: CPB online database.

Figure 7. The current recession, OECD nations and G3, 2007Q1 - 2009Q2





Note: G3 is US, EU and Japan.

Source: OECD online data base.

Causes

The great trade collapse was triggered by – and helped spread – the global economic slump that has come to be called "The Great Recession."[1]

As the left panel of Figure 7 shows, the OECD nations slipped into recession in this

1 See Di Giovanni and Levchenko (2009) for evidence on how the shock was transmitted via international production networks.

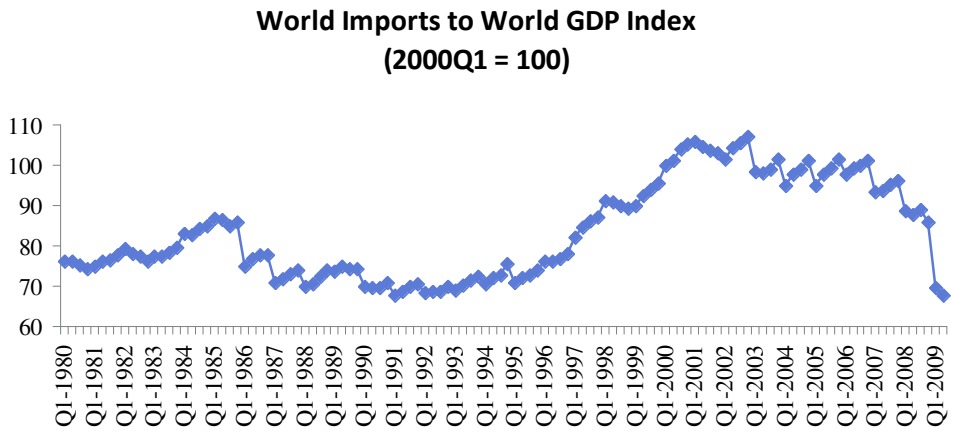
period, with the largest importing markets – the US, EU and Japan (the G3) – seeing their GDP growth plummet more or less in synch. The US and Europe saw negative GDP growth rates of 3 to 4%; Japan was hit far worse.

Why did trade fall so much more than GDP?

Given the global recession, a drop in global trade is unsurprising. The question is: Why was it so big? The chapter by Caroline Freund shows that during the four large, postwar recessions (1975, 1982, 1991, and 2001) world trade dropped 4.8 times more than GDP (also see Freund 2009).

This time the drop was far, far larger. From an historical perspective (Figure 8), the drop is astonishing. The figure shows the trade-to-GDP ratio rising steeply in the late 1990s, before stagnating in the new century, right up to the great trade collapse in 2008.

Figure 8. World trade to world GDP ratio, 1980Q1 to 2009Q2



Source: World imports from OECD online data base; World GDP based on IMF data.

The rise in the 1990s is explained by a number of factors including trade liberalisation. A key driver, however, was the establishment of international supply chains (manufacturing was geographically unbundled with various slices of the value-added process being placed in nearby nations). This unbundling meant that the same value-added crossed borders several times. In a simple international supply chain, imported parts would be transformed into exported components which were in turn assembled into final goods and exported again, so the trade figures counted the final value added several times.

As we shall see, the presences of these highly integrated and tightly synchronised production networks plays an important role in the nature of the great trade collapse (see chapters by Rudolfs Bems, Robert Johnson, and Kei-Mu Yi, and by Andrei Levchenko, Logan Lewis, and Linda Tesar).

Emerging consensus on the causes

Economists around the world have been working hard to understand the causes of this unusually large and abrupt shut down of international trade. The dozen chapters in Part II of this book summarise all the key research – most of it done by the authors themselves. They do not all agree on all points, but a consensus is emerging.

When sales drop sharply – and the great trade collapse was a gigantic drop in international sales – economists look for demand shocks and/or supply shocks. The emerging consensus is that the great trade collapse was mostly a demand shock – although supply side factors played some role.

The demand shock operated through two distinct but mutually reinforcing channels:

- Commodity prices – which tumbled when the price bubble burst in mid 2008 – continued to follow world demand in its downward spiral. The price movements and diminished demand sent the value and volume of commodities trade diving.
- The production and exports of manufacturing collapsed as the Lehman's-induced shock-and-awe caused consumers and firms to wait and see; private demand for all manner of 'postpone-able' consumption crashed.

This second point was greatly amplified by the very particular nature of the demand shock that hit the world's economy in September 2008.

Why so big?

This consensus view, however, is incomplete. It raises the question: If the trade drop was demand driven, why was the trade drop so much larger than the GDP drop? The answer provided by the emerging consensus is that the nature of the demand shock interacted with "compositional" and "synchronicity" effects to greatly exaggerate the movement of the trade-to-GDP ratio.

Compositional effect

The compositional effect turns on the peculiar nature of the demand shock. The demand shock was very large, but also focused on a narrow range of domestic value-added activities – the production of "postponeable" goods, consumer durables and investment goods. This demand drop immediately, reducing demand for all related intermediate inputs (parts and components, chemicals, steel, etc). The compositional-effect argument is founded on the fact that postponeables make up a narrow slice of world GDP, but a very large slice of the world trade (Figure 9). In a nutshell, the common cause of the GDP and trade collapse – a sudden drop in the demand for postponeables – operated with full force on trade but diminished force on GDP due to the compositional difference. The large demand shock applied to the near-totality of trade while only applying to a thin portion of GDP.

Here is a simple example.[2] Suppose exports consisted of 90% "postponeable" (consumer and investment electronics, transport equipment, machinery and their parts

and components). GDP, however, consists most of non-tradeables (services, etc). Taking postponeables' share in US GDP to be 20%, the pre-crisis situation is:

$$\frac{\text{exports}}{GDP} = \frac{0.90\ \text{postponeables} + 0.10\ \text{other}}{0.20\ \text{postponeables} + 0.80\ \text{other}}$$

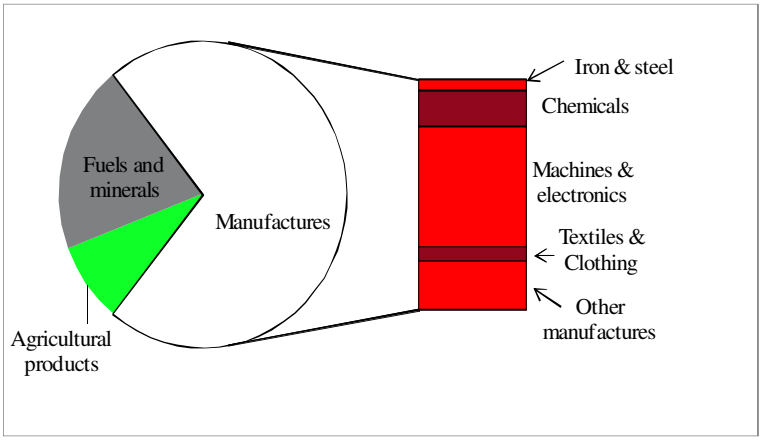
When the sales of postponeables slumps by, say, half, the numerator falls much more than the denominator. Assuming that "other" continues growth in trade and GDP by 2%, the post-crisis trade to GDP ratio is

$$\frac{\text{exports}}{GDP} = \frac{0.45\ \text{postponeables} + 0.102\ \text{other}}{0.10\ \text{postponeables} + 0.816\ \text{other}}$$

Exports have fallen 44.8% in this example, while GDP has fallen only 8.4%. In short, the different composition of trade and GDP, taken together with the specific nature of the demand shock, has resulted in trade falling more than 5 times as fast as GDP.

See the chapter by Andrei Levchenko, Logan Lewis, and Linda Tesar for a careful investigation of this logic using detailed US production and trade data; they find that the compositional effect accounts for most of the US trade drop. The chapter by Joseph Francois and Julia Woerz uses US and Chinese data to argue that the compositional effect is key to understanding the trade collapse.[3]

Figure 9. Composition of world goods trade



Source: WTO online database for 2007.

2 This is drawn from Baldwin and Taglioni (2009).

3 Jon Eaton, Sam Kortum, Brent Neiman and John Romalis make similar arguments with data from many nations in an unpublished manuscript dated October 2009.

Synchronicity effect

The synchronicity effect helps explain why the great trade collapse was so great in an even more direct manner; almost every nation's imports and exports fell at the same time. There was none of the averaging out that occurred in the three other postwar trade drops. But why was it so synchronised?

There are two leading explanations for the remarkable synchronicity. The first concerns international supply chains, the second concerns the ultimate cause of the Great Recession.

The profound internationalisation of the supply chain that has occurred since the 1980s - specifically, the just-in-time nature of these vertically integrated production networks - served to coordinate, i.e. rapidly transmit, demand shocks. Even a decade ago, a drop in consumer sales in the US or Europe took months to be transmitted back to the factories and even longer to reach the suppliers of those factories. Today, Factory Asia is online. Hesitation by US and European consumers is transmitted almost instantly to the entire supply chain, which reacts almost instantly by producing and buying less; trade drops in synch, both imports and exports. For example, during the 2001 trade collapse, monthly data for 52 nations shows that 39% of the month-nation pairs had negative growth for both imports and exports. In the 2008 crisis the figure is 83%. For details on this point, see Di Giovanni, Julian and Andrei Levchenko (2009), Yi (2009), and the chapters by Rudolfs Bems, Robert Johnson, and Kei-Mu Yi, and by Kiyoyasu Tanaka.

The second explanation requires a bit of background and a bit of conjecture (macroeconomists have not arrived at a consensus on the causes of the Great Recession). To understand the global shock to the demand for traded goods, we need a thumbnail sketch of the global crisis.

How the subprime crisis became the global crisis

The "Subprime Crisis" broke out in August 2007. For 13 months, the world viewed this as a financial crisis that was mainly restricted to the G7 nations who had mismanaged their monetary and regulatory policy - especially the US and the UK. Figure 3 shows that world trade continued growing apace in 2007 and early 2008.

The crisis metastasised from the "Subprime Crisis" to the global crisis in September 2008. The defining moment came when the US Treasury allowed the investment bank Lehman Brothers to go bankrupt. This shocked the global financial community since they had assumed no major financial institution would be allowed to go under. Many of the remaining financial institutions were essentially bankrupt in an accounting sense, so no one knew who might be next. Bankers stopped lending to each other and credit markets froze.

The Lehman bankruptcy, however, was just one of a half dozen "impossible events" that occurred at this time. Here is a short list of others:[4]

- All big investment banks disappeared.

4 See the excellent timeline of the crisis by the New York Fed at *http://www.newyorkfed.org/research/global_economy/policyresponses.html* .

- The US Fed lent $85 billion to an insurance company (AIG), borrowing money from the US Treasury to cover the loan.
- A US money market fund lost so much that it could not repay its depositors capital.
- US Treasury Secretary Paulson asked the US Congress for three-quarters of a trillion dollars based on a 3-page proposal; he had difficulties in answering direct questions about how the money would fix the problem.
- The hereto laissez-faire US Securities and Exchange Commission banned short selling of bank stocks to slow the drop in financial institutions stock prices. It didn't work.
- Daniel Gros and Stephano Micossi (2009) pointed out that European banks were too big to fail and too big to save (their assets were often multiples of the their home nations' GDPs);
- Congress said "no" to Paulson's ill-explained plan, promising its own version.

As people around the world watched this unsteady and ill-explained behaviour of the US government, a massive feeling of insecurity formed.

Extensive research in behavioural economics shows that people tend to act in extremely risk averse ways when gripped by fears of the unknown (as opposed to when they are faced with risk, as in a game of cards, where all outcomes can be enumerated and assigned a probability). Fall 2008 was a time when people really had no idea what might happen. This is Ricardo Caballero's hypothesis of "Knightian Uncertainty" (i.e. the fear of the unknown) which has been endorsed by the IMF's chief economists Olivier Blanchard.[5]

Consumers, firms, and investors around the world decided to "wait and see" - to hold off on postponeable purchases and investments until they could determine how bad things would get. The delaying of purchases and investments, the redressing of balance sheets and the switching of wealth to the safest assets caused what Caballero has called "sudden financial arrest" (a conscious reference to the usually fatal medical condition "sudden cardiac arrest").

The "fear factor" spread across the globe at internet speed. Consumers, firms and investors all feared that they'd find out what capitalism without the capital would be like. They independently, but simultaneously decided to shelf plans for buying durable consumer and investment goods and indeed anything that could be postponed, including expensive holidays and leisure travel. In previous episodes of declining world trade, there was no Lehman-like event to synchronise the wait-and-see stance on a global scale.

The key points as concerns the trade and GDP collapse:

- As the fear factor was propagating via the electronic press; the transmission was global and instantaneous.
- The demand shock to GDP and the demand shock to trade occurred simultaneously.
- "Postponeable" sector production and trade were hit first and hardest.

5 Caballero (2009a, b) and Blanchard (2009).

There are a number of indications that this is the right story. First, global trade in services did not, in general, collapse (see the chapter by Aditya Mattoo and Ingo Borchert). Interestingly, one of the few categories of services trade that did collapse was tourism - the ultimate postponeable. Second, macroeconomists' investigations into the transmission mechanisms operating in this crisis show that none of the usual transmission vectors - trade in goods, international capital flows, and financial crisis contagion - were responsible for the synchronisation of the global income drop (Rose and Spiegel 2009).

Supply-side effects

The Lehman-link "sudden financial arrest" froze global credit markets and spilled over on the specialized financial instruments that help grease the gears of international trade - letters of credit and the like. From the earliest days of the great trade collapse, analysts suspected that a lack of trade-credit financing was a contributing factor (Auboin 2009).

As the chapter by Jesse Mora and William Powers argues, such supply-side shocks have been important in the past. Careful research on the 1997 Asian crisis (Amiti and Weinstein 2009) and historical bank crises (see the chapter by Leonardo Iacovone and Veronika Zavacka) provide convincing evidence that credit conditions can affect trade flows. The Mora and Powers chapter, however, finds that declines in global trade finance have not had a major impact on trade flows. While global credit markets in general did freeze up, trade finance declined only moderately in most cases. If anything, US cross-border bank financing bounced back earlier than bank financing from other sources. In short, trade financing had at most a moderate role in reducing global trade.

Internationalised supply chains are a second potential source of supply shocks. One could imagine that a big drop in demand combined with deteriorating credit conditions might produce widespread bankruptcies among trading firms. Since the supply chain is a chain, bankruptcy of even a few links could suppress trade along the whole chain.

The chapters by Peter Schott (on US data), by Lionel Fontagné and Guillaume Gaulier (on French data), and by Ruyhei Wakasugi (on Japanese data) present evidence that such disruptions did not occur this time. They do this by looking at very disaggregated data (firm-level data in the Fontagné-Gaulier chapter) and distinguishing between the so-called "intensive" and "extensive" margins of trade. These margins decompose changes in trade flows into changes in sales across existing trade relations (intensive) and changes in the number of such relations (extensive). If the supply-chain-disruption story were an important part of the great trade collapse, these authors should have found that the extensive margin was important. The authors, however, find that the great trade collapse has been primarily driven by the intensive margin - by changes in pre-existing trade relationships. Trade fell because firms sold less of products that they were already selling; there was very little destruction of trade relationships as would be the case if the extensive margin had been found to be important. This findings may be due to the notion of "hysteresis in trade" (Baldwin 1988), namely, that large and sunk market-entry costs imply that firms are reluctant

to exit markets in the face of temporary shocks. Instead of exiting, they merely scale back their operations, waiting for better times.

Protectionism is the final supply shock commonly broached as a cause of the great trade collapse. The chapter by Simon Evenett documents the rise in crisis-linked protectionist measures. While many measures have been put in place - on average, one G20 government has broken its no-protection pledge every other day since November 2008 - they do not yet cover a substantial fraction of world trade. Protection, in short, has not been a major cause of the trade collapse so far.

Prospects

The suddenness of the 2008 trade drop holds out the hope of an equally sudden recovery. If the fear-factor-demand-drop was the driver of the great trade collapse, a confidence-factor-demand-revival could equally drive a rapid restoration of trade to robust growth. If it was all a demand problem, after all, little long-lasting damage will have been done. See the chapter by Ruyhei Wakasugi on this.

There are clear signs that trade is recovering, and it is absolutely clear that the drop has halted. Will the trade revival continue? No one can know the future path of global economic recovery - and this is the key to the trade recovery. It is useful nonetheless to think of the global economic crisis as consisting of two very different crises: a banking-and-balance-sheet crisis in the over-indebted advanced nations (especially the US and UK), on one hand, and an expectations-crisis in most of the rest of the world on the other hand.

In the US, UK and some other G7 nations, the damage done by the bursting Subprime bubble is still being felt. Their financial systems are still under severe strain. Bank lending is sluggish and corporate-debt issuances are problematic. Extraordinary, direct interventions by central banks in the capital markets are underpinning the economic recovery. For these nations, the crisis - specifically the Subprime crisis - has caused lasting damage. Banks, firms and individuals who over-leveraged during what they thought was the "great moderation" are now holding back on consumption and investment in an attempt to redress their balance sheets (Bean 2009). This could play itself out like the lost decade Japan experienced in the 1990s (Leijonhufvud 2009, Kobayashi 2008); also see the chapter by Michael Ferrantino and Aimee Larsen.

For most nations in the world, however, this is not a financial crisis - it is a trade crisis. Many have reacted by instituting fiscal stimuli of historic proportions, but their banks and consumers are in relatively good shape, having avoided the overleveraging in the post tech-wreck period (2001-2007) that afflicted many of the G7 economies. The critical question is whether the damage to the G7's financial systems will prevent a rapid recovery of demand and a restoration of confidence that will re-start the investment engine.

In absence of a crystal ball, the chapter by Baldwin and Taglioni undertakes simple simulations that assume trade this time recovers at the pace it did in the past three global trade contractions (1974, 1982 and 2001). In those episodes, trade recovered to its pre-crisis path 2 to 4 quarters after the nadir. Assuming that 2009Q2 was the bottom of the great trade collapse - again an assumption that would require a crystal ball to confirm - this means trade would be back on track by mid 2010. Forecasts are

never better than the assumptions on which they are built, so such calculations must be viewed as what-if scenarios rather than serious forecasts.

Implications

What does the great trade collapse mean for the world economy? The authors of this Ebook present a remarkable consensus on this. Three points are repeatedly stressed:

- Global trade imbalances are a problem that needs to be tackled.

One group of authors (see the chapters by Fred Bergsten, by Anne Krueger, and by Jeff Frieden) sees them as one the root causes of the Subprime crisis. They worry that allowing them to continue is setting up the world for another global economic crisis. Fred Bergsten in particular argues that the US must get its federal budget deficit in order to avoid laying the carpet for the next crisis.

Another group points to the combination of Asian trade surpluses and persistent high unemployment in the US and Europe as a source of protectionist pressures (see the chapters by Caroline Freund, by Simon Evenett, and by Richard Baldwin and Daria Taglioni). The chapter by O'Rourke notes that avoiding a protectionist backlash will require that the slump ends soon, and that severe exchange rate misalignments at a time of rising unemployment are avoided.

- Governments should guard against compliancy in their vigil against protectionism.

Most authors mention the point that while new protectionism to date has had a modest trade effect, things need not stay that way. The chapter by Simon Evenett is particularly clear on this point.

There is much work to be done before economists fully understand the great trade collapse, but the chapters in this Ebook constitute a first draft of the consensus that will undoubtedly emerge from the pages of scientific journals in two or three years time.

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SECTION I

CAPSTONE ESSAYS

1. The dollar and the budget deficit

C. Fred Bergsten
Peterson Institute for International Economics

Current US fiscal policy is likely to produce current account deficits rising to $1 trillion by 2015 and $3 trillion by 2025; net foreign debt would reach $15 trillion by 2020, taking the US's foreign-debt-to-GDP ratio far beyond the threshold that normally triggers currency crises and forces painful economic retrenchment. To avoid catastrophic risks stemming from soaring foreign debt, the US needs a plan for long-run fiscal sustainability.

The dollar is under attack on two fronts:

- Private investors are driving it lower in the foreign exchange markets.
- Monetary authorities are questioning its role as the world's key currency.

There is an obvious linkage between the two attacks – expectations of further falls in the dollar's value accelerate the prospect that central banks will switch to euros, Special Drawing Rights at the IMF, gold, and other "real" assets. There is plenty of ammunition to fuel the attacks – over $20 trillion in dollar instruments held outside the US and much more owned by Americans themselves.

Root cause

The common cause of these attacks on the dollar is the prospect of US budget deficits near or above $1 trillion annually for the next decade or even longer. Such deficits, especially in tandem with the unprecedented expansion of money and credit by the Federal Reserve to counter the current crisis, ignite fears of renewed inflation. More subtly, but at least as poisonous for the dollar, they suggest a crowding out of private investment that will lower productivity growth, economic output and corporate profits.

Such massive budget deficits would almost certainly produce massive trade and current account deficits as well. The enormous government spending, along with normal private consumption and investment after recovery from the current crisis, would far exceed potential domestic production and drive up imports of goods and services. Financing the fiscal and external red ink would require huge capital inflows that would sharply expand our foreign debt.

Projections

My colleague William Cline (2009) has projected that, with the present budget outlook, the US external imbalance could rise to $1 trillion per year by 2015 and to $3 trillion – almost four times its record level to date – by 2025. The net foreign debt of the US, which already exceeds $3 trillion, would reach $15 trillion by 2020. The expected doubling of the ratio of US government debt to GDP, to a level well above any prior US peacetime experience, would be matched by a doubling of our foreign debt to GDP ratio and take it far beyond the threshold that normally triggers currency crises and forces painful economic retrenchment. We would become even more perilously beholden to China, Japan, Russia, Saudi Arabia and our other foreign creditors (Bergsten 2009).

Hence there is an international as well as domestic imperative for bringing the budget deficit under control. There are two plausible, equally undesirable, scenarios if we do not.

- If the rest of the world proved unwilling to finance us, the dollar would fall sharply and perhaps crash. US interest rates, and probably inflation, would climb and the Federal Reserve would be unable to continue stimulating both the economy and recovery of the banking system. Stagflation or worse could result, as in the 1970s, and our currency would lose much of its remaining international status.
- If the foreigners did finance our profligacy for a while, as in the pre-crisis years, the conditions that brought on the current meltdown could easily be replicated.

Huge capital inflows would keep the economy excessively liquid and hold down interest rates. Even if financial reform is extremely ambitious, this could once again encourage excessive lending and borrowing. Large external deficits, and thus large budget deficits, will be extremely costly to the US whether or not they can be funded by international investors.

Implications for the dollar

We do need a modest further fall in the dollar, mainly against the Chinese renminbi and a few other Asian currencies, to restore full price competitiveness for the US in world trade and to sustain the decline in the current account deficit that has accompanied the recession. We should welcome a modest and orderly reduction in the international role of the dollar, which is inevitable because of the growing dispersion of economic and financial power around the globe, and because the "automatic financing" through which it encourages our external deficits is no longer in the national interest. We should in fact set a national policy goal of limiting our current account deficits to a maximum of 3% of GDP, which would keep our foreign debt from rising any further as a share of the real economy.

We must get our fiscal house in order to enable us to pursue these important national objectives in a reasonably stable environment as well as to avoid the catastrophic risks that would result from letting our foreign deficits and debt soar once again. Premature tightening, however, could choke off the fragile recovery. We thus

need budget decisions in the near future whose implementation will mainly phase in over the next several years, as the economy returns to normal, but with sufficient "down payments" to be credible to both the markets and foreign authorities. The best candidates are reductions in medical costs as the central component of comprehensive health care reform; strengthening Social Security by further raising the retirement age and re-indexing the benefit formula; and initiating a consumption tax, perhaps on gasoline or carbon usage, that would achieve energy and environmental as well as fiscal goals and promote private saving.

Conclusion

The Obama Administration has rightly emphasised the need to rebalance the world economy and the shape of our own recovery, rejecting a return to the large trade deficits that have come with our being the "consumer of last resort." It has made little effort, however, to enact or even propose domestic policies that would do so. Credible and lasting correction of the budget deficit is essential to protect our national currency against further attacks on its international value and its continuing vital role in the global monetary system.

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About the author

Fred Bergsten is director of the Peterson Institute for International Economics since its creation in 1981. He served as Assistant Secretary for International Affairs of the US Treasury (1977–81) and also as Undersecretary for Monetary Affairs (1980–81) representing the US on the G5 Deputies and in preparing G7 summits, having coordinated US foreign economic policy in the White House as assistant to Henry Kissinger at the National Security Council. He was chairman of the Eminent Persons Group of the Asia Pacific Economic Cooperation (APEC) forum from 1993 to 1995, authoring its three reports that recommended "free and open trade in the region by 2010 and 2020" as adopted at the APEC summits in 1993 and 1994. He was also chairman of the Competitiveness Policy Council created by the Congress from 1991 through 1995, and a member of the two leading commissions on reform of the international monetary system: the Independent Task Force on The Future International Financial Architecture, sponsored by the Council on Foreign Relations (1999), and the International Financial Institutions Advisory Commission created by Congress (2000, on which he led the dissenting minority). He is an honorary fellow of the Chinese Academy of Social Sciences (1997). His recent writings include: "The Dollar and the Deficits: How Washington Can Prevent the Next Crisis" (*Foreign Affairs*,

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2. Prospects for the global trading system

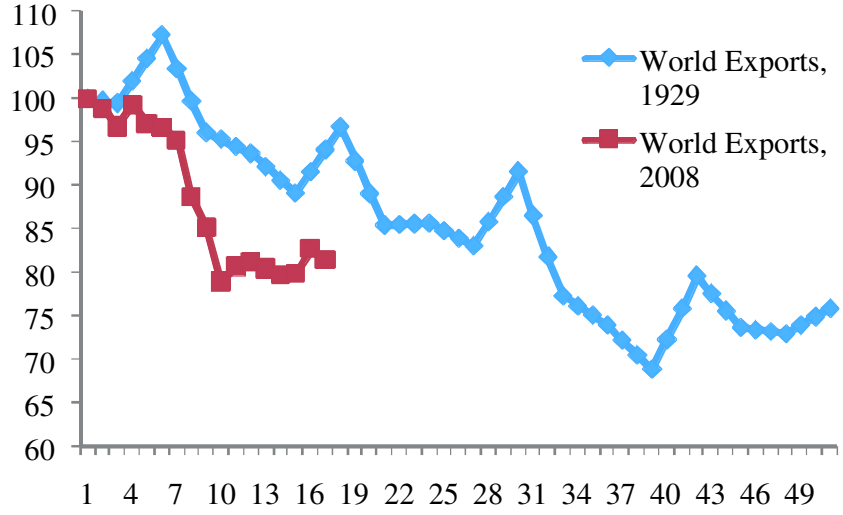
Anne O. Krueger
Johns Hopkins University

Collapsing trade worsened the crisis, but trade's revival could do much to shore up prospects for a sustained upturn. Unlike many stimulus measures, reviving the Doha Round and strengthening the open multilateral system could be achieved with little, if any, fiscal cost. It is also essential to 'rebalance' the global economy. Successful emerging markets and other countries with large current account surpluses will have to shift gradually toward more reliance on domestic demand and less on export growth.

The collapse of trade in the immediate aftermath of Lehmann Brothers took the entire world by surprise. It was unprecedented in the sharp rate of decline – even though trade dropped more during the Great Depression (Eichengreen and O'Rourke 2009), it took years to achieve what was done in a few months in 2008!

Trade has revived from its low, although growth in trade is not yet by any means robust. And, despite the pledge of the G20 in November 2008 to eschew any protectionist measures for the 12 months, 145 were initiated through September 2009 and some have already been implemented (Evenett 2009).

Figure 1. World exports, 1929 and now (June 1929 =100, April 2008 = 100)



Source: Eichengreen and O'Rourke (2009).

Looking forward

On the surface, that spells bad news for the global international trading system, and therefore for the growth prospects for the world economy. Robust growth of international trade has been an engine of growth for the world as a whole since the end of the Second World War.

Beneath the surface, there are glimmers of hope. Economies are more closely interconnected than at any time in the past. The supply chains for many goods and services stretch across a number of countries, and the truth of this statement has been vividly demonstrated to politicians and businessmen alike. And, while there have been a large number of protectionist measures, the volume of trade affected has, to date, been much smaller than might have been anticipated given the severity of the downturn. That probably reflects recognition of the extensive benefits of the multilateral trading system.

If one views the glass as half full, the trauma and effects of last year's abrupt decline in trade reawakened recognition of the importance of trade and could serve as a catalyst to finish the Doha Round of multilateral trade negotiations and to strengthen the multilateral trading system. The huge gains to open multilateral trade became evident to all as the system choked temporarily. Completion of the Doha Round would strengthen the WTO (whose credibility has been damaged by the delays in negotiations), and reinforce the upturn in economic activity, as exporters would no longer hesitate to invest for lack of assured future levels of market access. It would also enable low-income countries to accelerate their growth rates once again, as access to markets is critical for their prospects. No poor country has been successful in accelerating growth without opening its markets and integrating with the world economy. For the still-poor countries, a vibrant open multilateral trading system would offer the best platform for enhancing their growth rates and alleviating poverty.

Rebalancing is necessary

At the same time, it is increasingly recognised that global imbalances, and the low real interest rates that resulted from them, were a major contributory factor to the crisis. While strengthening the open multilateral trading system, it will also be essential to begin "rebalancing" the global economy to prevent the repetition of this past decade. That will mean that successful emerging markets, and other countries with large current account surpluses, must shift gradually toward more reliance on domestic demand and less on export growth as they continue their growth.

It is to be hoped that the G20's proposed "peer review" process, overseen by the IMF, will enable the necessary changes. Increases in domestic demand in the countries that were earlier incurring large current account surpluses, while simultaneously enabling the deficit countries to reduce their current account deficits through enhanced exports, will be central to this effort.

If the open multilateral trading system is revitalised and the issues associated with global imbalances and the international financial system are addressed, it is reasonable to expect that the international economy can continue the current upturn and accelerate growth.

The protectionist threat is still there

The more pessimistic view might be that the severity of the recession has disillusioned many, and that the future will witness additional protectionist pressure and measures. That this is not likely is largely because all economies have experienced the impact of the downturn, and learned the degree to which they were interdependent and gained from trade.

But, should protection intensify, the consequences over the longer term will be dire:

- Exporters will invest less, and real incomes will grow more slowly.
- The efforts at policy reform in poor countries will be more difficult, and the payoff smaller, than in a more prosperous international economy.
- There would be likely to be resort to increasing regionalism, and preferential trading arrangements, without the necessary strengthening of the open multilateral trading system.

Concerns about the formation of trading blocs, with the associated risks of trade wars, would not be unwarranted. Yet even if it is only trading blocs with no increase in tit-for-tat trade measures, concerns are very real. Without the rules-oriented basis for the international trading system, it is hard to imagine healthy growth of the international economy.

Trade revival: One economic stimulus without fiscal cost

Many of the measures that governments would like to undertake to strengthen the upturn would be costly, and awareness of fiscal challenges is growing. Reviving the Doha Round and strengthening the open multilateral system can be achieved with little, if any, fiscal cost. So, while the trade collapse was one of the most dramatic and costly features of the global recession, trade revival could also do much to shore up prospects for a sustained upturn, and at virtually zero fiscal cost.

The GATT and then the WTO have underpinned the international trading system for sixty years, but they were each in turn largely invisible to ordinary businessmen. One lesson coming out of the crisis, visible to all, has been their importance. It is to be hoped that that lesson spurs the rapid completion of the Doha Round and strengthens the international economic system.

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She has published extensively on economic development, international trade and finance, and economic policy reform. In addition to her writings on these topics, she has written a number of books and articles on economic growth, international trade, and economic policy in India, South Korea, and Turkey.

3. Global trade in the aftermath of the global crisis

Jeffry Frieden
Harvard University

Re-balancing global trade will be difficult, generating substantial protectionist pressures. To manage these pressures, governments must maintain domestic political support for an open world economy. This in turn requires flexible responses to national political pressures. Rigid, unrealistic insistence on exemplary behaviour will be less fruitful than efforts at modest, feasible cooperation on trade policies. Above all, governments singly and jointly need to address the underlying macroeconomic causes of the imbalances to prevent serious trade confrontations.

The world trading system seems to have weathered the worst of the current crisis, but serious challenges are still to come. As the world moves toward recovery, adjustment to the new macroeconomic reality will create economic and political tensions both within and among nations. These tensions – and not the stalled Doha Round, or the proliferation of regional agreements, or specific protectionist pressures – constitute the most serious threat to an open trading order.

The effects of the post-crisis rebalancing on political controversies over international economic relations are the most immediate challenges we face in the international trade arena. As we move out of the immediate phase of recovery, the world's major economies face serious problems whose unfolding will have important implications for global commercial relations.

The post-crisis environment

To understand the environment we face as we emerge from the crisis, it is important to clarify the background to the crisis itself. The ultimate cause of the current crisis was the global macroeconomic imbalances that accumulated over the course of more than a decade. The US, along with several other countries, ran major current account deficits and built up large external debts. This led, as is typical in the case of capital inflows, to an acceleration of economic activity, including a rise in the local relative price of nontradables; in particular, it led to a boom in financial and housing markets. External debt financing created consumption-led expansions, then booms, then bubbles; these eventually burst.

As the deficit countries adjust, they will have to compress consumption, investment and government spending, and they will have to increase output, savings, and government revenue. They will need to restrain wages. They will also, perforce, have to reduce their current account deficits. Governments will thus be under substantial pressure to reduce imports and increase exports.

These adjustment requirements are mirrored in the surplus countries. The run-up to the crisis was enabled by the policies of countries that had come to depend on substantial trade surpluses as their engines of growth. Many of the surplus countries' governments pursued explicit macroeconomic policies to encourage trade surpluses, such as keeping their currencies artificially weak or otherwise pushing producers toward export markets. Now that this pattern is no longer sustainable, at least to the degree that has prevailed for the past decade, they will have to reorient their economic activities, relying more on domestic markets and less on exports.

Adjustment difficulties

Both kinds of adjustment efforts, in deficit and surplus countries, will be difficult. Economic agents in the deficit countries, accustomed to easy credit and booming consumption, face austerity and slow growth at home. The search for new sources of growth will lead them to look more eagerly at export markets – and to look less favourably upon imports. In surplus countries, producers who have become accustomed to easy exports and little trade competition are likely to find the international environment much less welcoming. Markets that had previously absorbed all that they could produce are now much more constrained. At the same time, the traditional export-led economies are likely to face much less enthusiasm about openness to their products.

Protectionist pressures

In this context, there will be substantial domestic and international tensions over trade policy. In deficit countries, there will be protectionist pressures to try to reduce imports, and pressures to open foreign markets to increase exports. In surplus countries, there will be pressures from previously economically and politically dominant exporters to maintain government support for them in the face of external hostility. In all instances, the potential costs of adjusting to new economic conditions will create demands for government support.

These domestic pressures will inevitably lead to inter-state disagreements over trade. Over the next decade, it will be a major challenge to manage these disagreements. It is important to look at trade policy, and trade conflicts, as part of the broader international economic terrain upon which adjustments to new conditions are taking place.

The "re-balancing" through which the world will be going for the foreseeable future will put serious strains on the international trading system. Some of the most powerful influences on world trade come from outside the narrow trade policy arena. One such area is currency policy. The impact of monetary relations on international trade is widely recognised; the ability of countries' monetary policies to impose (commercial) externalities on others is clear. In this context, there is a need for the major countries and international institutions to attempt to work toward a common understanding of how to deal with currency misalignments in a way that does not exacerbate underlying trade disputes (see Frieden 2009a).

Lesson from history

The historical record is particularly clear on how important currency misalignments can be for trade policy. As Barry Eichengreen and Douglas Irwin (2009) have recently shown, many of the protectionist measures adopted during the Great Depression of the 1930s were responding to developments in currency markets (Eichengreen and Irwin 2009). National producers who found themselves under substantial pressure due to "competitive devaluations" on the part of other countries demanded, and often received, countervailing support in the form of protectionist trade barriers. It is easy to imagine how currency movements – and in particular, the maintenance of very weak exchange rates on the part of major surplus countries – could provoke a protectionist backlash in other countries and regions.

Fix macro problems to avoid trade problems

This analysis suggests two important points for policy makers:

- First, governments singly and jointly need to address the underlying macroeconomic causes of the crisis, and to work together to attempt to smooth the way toward macroeconomic adjustment.

Some of the most trying tensions in international trade relations are likely to be the result of macroeconomic pressures, such as exchange rate misalignments; international collaboration to address and reduce these pressures will be central to lowering pressure on the trade regime itself. Ironically, then – but not for the first time – one of the most important ways to avoid a deterioration of international trade relations will be to pursue appropriate and collaborative macroeconomic policies.

- Second, given heightened political sensitivity to international trade relations, attempts to extend or expand the rule-making features of the WTO or other elements of the international trading system, while well-meaning and laudable, are likely to be irrelevant at best, and harmful at worst.

In an environment in which governments face powerful pressures to support their exporters and import competitors, simply insisting on adherence to the rules is of little or no avail. Governments owe their primary allegiance to their constituents, and demands that they address domestic economic distress will always outweigh demands to abide by international commercial obligations.

Adjustment to the aftermath of the crisis, and to the unwinding of the global macroeconomic imbalances, will put major domestic political pressures on governments. As these pressures spill over into trade policy, a rigidly legalistic response is likely to be counterproductive. While international legal or normative economic considerations might always insist on strict compliance with WTO and other commercial commitments as the notional first best, in the real world of political economy, insistence on the 'first best' can be a formula for disaster. Success in responding flexibly to powerful protectionist pressures – whether at the national or regional level – is better than failure at opposing them rigidly.

When countries collapse into conflict, it is not usually out of a purposive desire to harm their partners, but rather out of a desperate attempt to address pressing domestic political demands, demands which cannot be ignored without threatening nation-

al social and political stability.

In these circumstances, it would be a mistake to allow the best to be the enemy of the good. It would be counter-productive to be unyielding about abstract principles or pre-conditions for attempts to improve cooperation among governments. Governments facing severe domestic political constraints will find it impossible to make sacrifices on behalf of an intangible payoff. Truly multilateral agreements and rigorous compliance with international trade rules would be best, and highly desirable; but we should be prepared to settle for what governments find feasible in their current circumstances.

The way forward

The most productive way forward is likely to be to encourage imaginative and flexible policies on the part of major trading partners and international institutions. This means:

- Accommodating the needs of countries facing substantial payments difficulties as they attempt to reduce their current account deficits.
- Adapting to the concerns of strongly export-oriented countries being asked to open their markets more fully.

In both instances, the goal should be to achieve forward motion – or at least to avoid going backwards – while recognising legitimate concerns about domestic social and political cohesion (Frieden 2009b).

Conclusions

The world is going through a difficult re-balancing, with important economic, social, and political implications for almost all major nations. It is crucial for the world to maintain and strengthen an integrated international trading system. But simply insisting on playing by existing trade rules will have little impact.

As the world moves toward recovery, it confronts important issues with profound implications for the world's trading system – issues that risk inflaming political tensions within and between countries. Governments will have to address the underlying macroeconomic sources of the crisis, and build the bases for a healthier recovery and rebalancing of the international economy. Cooperation among major governments on macroeconomic policies will go a long way toward reducing pressure on international trade relations.

But governments will only be able to sustain their general commitment to international cooperation and economic integration if they can muster domestic political support for an open world economy. This in turn requires a nuanced, flexible, response to national political pressures. While uncooperative trade policies should be identified and combated, policymakers should recognise that governments cannot ignore their domestic constraints, but must work within them. Rigid, ultimately unrealistic, insistence on exemplary behaviour will be less fruitful than efforts at modest, feasible cooperation on macroeconomic and trade policies.

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About the author

Jeffry Frieden is Professor of Government at Harvard University. He specializes in the politics of international monetary and financial relations. Frieden's most recent book is *Global Capitalism: Its Fall and Rise in the Twentieth Century* (2006). He is also the author of *Banking on the World: The Politics of American International Finance* (1987), of *Debt, Development, and Democracy: Modern Political Economy and Latin America, 1965-1985* (1991), and is the editor or co-editor of over a dozen other books on related topics. His articles on the politics of international economic issues have appeared in a wide variety of scholarly and general-interest publications.

4. Government policies and the collapse in trade during the Great Depression

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Trinity College Dublin and CEPR

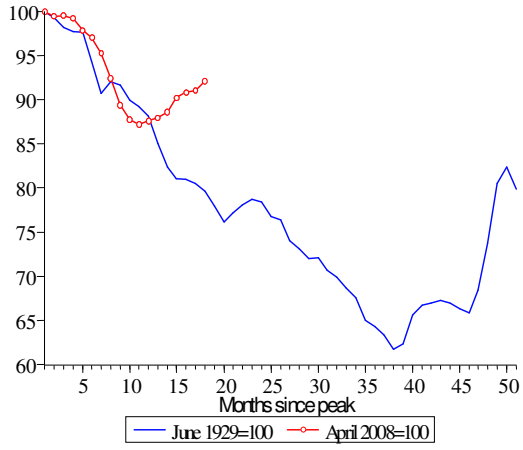
Today's great trade collapse has brought world trade to a point that is still substantially below the corresponding period during the Great Depression. The collapse, however, seems to be turning around along with the economic recovery. This chapter draws two critical Great-Depression lessons for today. First, policy makers must ensure that the recovery continues; many of the worse political and economic-policy transformations only came after the Great Depression was into its second and third years. Second, recent research shows that severe exchange rate misalignments teamed with rising unemployment lead to much of 1930s protectionism. The issue of the renminbi peg to the dollar is one that needs to be confronted sooner rather than later, for everyone's sake.

During the winter of 2008-2009, the world economy contracted at rates that had not been seen since the Great Depression.

Figure 1 plots world industrial output during the two crises, measured from the peaks in world output, which occurred in June 1929 and April 2008.

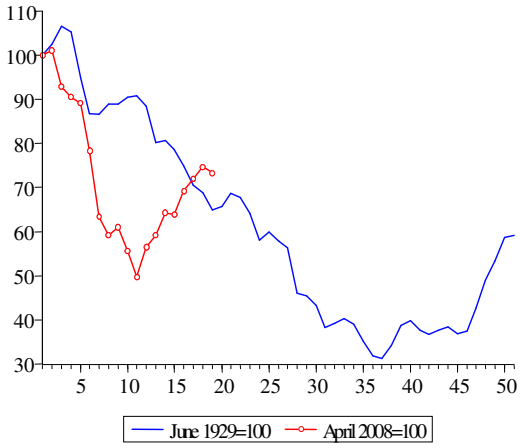
During the first 12 months of our own "Great Credit Crisis," global industrial output fell at about the same rate as was experienced during the first 12 months of the Great Depression. Since the late spring of 2009, however, there has been an impressive recovery, thanks to the unprecedented actions of finance ministries and central banks.

Figure 1. World industrial output, now vs then



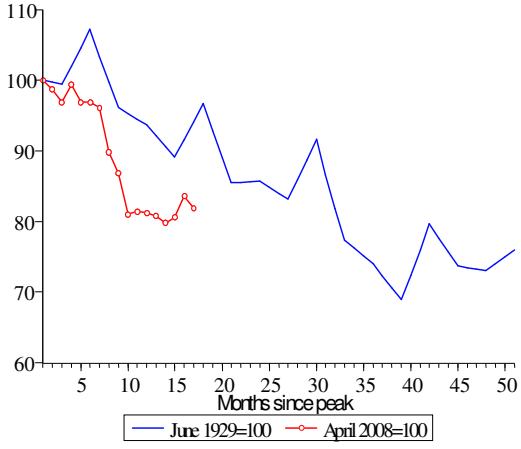
Source: Eichengreen and O'Rourke (2009), updated with data graciously provided by the IMF.

Figure 2. World stock markets, now vs then



Source: Eichengreen and O'Rourke (2009), based on data from Global Financial Database.

Figure 3. The volume of world trade, now vs then



Source: Eichengreen and O'Rourke (2009), updated with data from the CPB's data www.cpb.nl.

As Figure 2 shows, the recovery in world equity markets has been even more impressive, to the point where concerns are now being raised about a potential new bubble. The question now is to what extent these recoveries in global economic activity and asset markets will be sustainable, given their dependence to date on government stimulus.

The great trade collapse

The most notable feature of the Great Credit Crisis, however, has been the collapse in international trade. As Figure 3 shows, trade fell much more steeply after April 2008 than it did in the year after June 1929, and the recovery to date has been relatively

anaemic. World trade fell in August 2009, following three successive months of growth, and still remains 18% below peak. By contrast, trade fell in three successive years during the Great Depression.

What explains the length and depth of the trade slump experienced after 1929, and what are the crucial lessons that policymakers should draw from that experience? This chapter briefly surveys the literature on the relationship between trade and economic policy during the Great Depression, drawing some conclusions for our own period.

Trade's collapse: Lessons from the 1930s

To begin with the beginning, consider the causes of the Great Depression. At the time of the Depression itself, observers such as Keynes put the blame squarely on excessively tight monetary policy. The US Federal Reserve started tightening in 1928 in an attempt to halt runaway stock markets, and this lowered investment and aggregate demand. This contractionary impulse was then spread internationally, as other countries were forced to follow suit because of their commitment to the gold standard.

It is important to stress that this monetary interpretation of the Depression is not just Keynesian, since it was given a major intellectual boost by Milton Friedman and Anna Schwartz, writing about the US experience in the 1960s (Friedman and Schwartz 1963). More recent scholarship (e.g. Temin 1989, Eichengreen 1992) has retained the monetary interpretation of the Great Depression, but moved from a purely American to a worldwide perspective.

Eichengreen (1992) and Temin (1989) both agree with Friedman-Schwarz that the Great Depression was largely a monetary phenomenon, but they regard it as an international phenomenon rather than a primarily American one, and as being due to a variety of structural factors, notably the gold standard, rather than to isolated policy mistakes. This interpretation is largely accepted by authors such as Bernanke (2000), whose analysis is essentially complementary to that of Eichengreen and Temin, providing evidence of additional channels through which contractionary monetary policy depressed the economy.

The gold standard spread the initial contractionary impulse and it implied that policy makers were unable to combat the Depression effectively. They could not lower interest rates when this was required in order to combat unemployment, since this would have led to their currencies depreciating. Furthermore, expansionary fiscal policies were also regarded as dangerous, since by increasing imports they threatened to lead to a drain in foreign reserves, which was again incompatible with countries' gold standard commitments.

The consequences of adherence to gold could be clearly seen in 1931, when several countries raised interest rates as their currencies were attacked, thus prolonging the Depression. It was only when countries left the gold standard that they were able to adopt appropriate monetary policies, and started to recover. Britain did this in 1931, the US in 1933. A small 'gold bloc' centred on France resisted until 1936, and experienced the longest Depression of all.

Under the circumstances, it is hardly surprising that countries resorted to wholesale protectionism. With export markets gone in any event – because of falling

demand and protectionism elsewhere – the perceived opportunity costs of protecting one's home market seemed much smaller than usual. In recent work, Eichengreen and Irwin (2009) have shown that it was those countries who stuck to gold the longest who ended up protecting the most. Faced with overvalued currencies and contracting economies, and bereft of other policy options, they imposed higher tariffs, and tighter non-tariff barriers to trade. Countries which abandoned the gold standard and allowed their currencies to depreciate used monetary policy to reflate their economies rather than protection.

Flawed macroeconomic policies, therefore, can explain both the extent of the Great Depression, and the shift to protectionism. But what was the impact of protectionism, in particular, on the extent of world trade?

Consistent with its emphasis on monetary policy mistakes, the existing literature has not been kind to the argument that the Smoot-Hawley tariff created the Great Depression. Indeed, the extent of falling income and output during the period was so great that Smoot Hawley was not even a major factor underlying the trade collapse of the time. For example, Irwin (1998) finds that even in the absence of any change in tariff rates (but accounting for the income declines of the period), US imports would have declined by 32% between 1930:II and 1932:III, as compared with the 41% reduction that actually took place. Even in the absence of the Smoot-Hawley revisions to tariff schedules (but accounting for the impact of income declines, and of deflation on average tariff levels), US imports would have fallen by 38% over the period, or by almost as much as actually occurred. Trade declines were primarily due to falling income, with deflation also playing an important role; Smoot-Hawley tariffs were a bit-player in the trade collapse.

Today's experience

All of this is consistent with the experience of the Great Credit Crisis. The collapse in world trade has occurred without a wholesale outbreak of protectionism. Falling output, rather than rising barriers to trade, seems to have been the main culprit on this occasion as well.

What about the impact of protectionism on GDP? Once again, the existing literature has tended to find that tariffs in the 1930s were not such a big deal, in the context of the general collapse of the period. In some peripheral countries, such as Ireland, protection may even have had some beneficial effects in the short run, giving rise to a burst of import substitution which created jobs at a time of mass unemployment and limited opportunities abroad.

The real impact of interwar protectionism

However, none of this should be taken to imply that interwar protectionism was a benign phenomenon. It was not.

As a beggar-thy-neighbour policy, any short-term gains achieved by one country were at the expense of others. More seriously, protection created new political constituencies opposed to free trade who, in many cases, were able to successfully lobby

for a continuation of protection after the crisis was over. Ireland remained inward-looking through the 1950s with disastrous effects on growth and employment. In other regions of the world, such as Latin America, the protectionist legacies of the Great Depression can still be discerned as late as the 1970s.

Even worse were the geopolitical consequences of protectionism. These helped to fuel the international tensions of the period. For example, in Japan the Smoot-Hawley tariff and British imperial protectionism helped to undermine the political position of the more liberal elements, and strengthened the hand of those who claimed that imperialism, rather than trade, was the right way to ensure adequate supplies of primary products.

Today's crisis and international politics

Thus far, the impact of the Great Credit Crisis on the international political system has probably on balance been positive. The impetus which it has given to the rise of the G20, at the expense of the G7, has been an especially welcome development, at the start of a century in which the world will have to face the twin challenges of climate change and a rapidly shifting geopolitical equilibrium. An outbreak of trade tensions would undo a lot of these achievements, and make the world a riskier place.

The lesson of the interwar period is that if we want to avoid such a scenario, we need to avoid two things:

- The first is a slump which continues into 2010 or 2011.

Human systems are resilient, and can surmount crises of only one year's duration with relative ease. It is when these crises continue for several years that radical change occurs. It was only in 1931 that the British abandoned free trade, a decision which gave rise to a wave of tit-for-tat retaliation elsewhere. It was only in 1932 that the Nazis became the biggest party in Germany. Our present world economic system, with its generally liberal orientation, will presumably survive relatively unscathed if the present recovery proves durable. A double-dip recession, however, would have unpredictable consequences. Policymakers have a responsibility to minimise the possibility of such an eventuality, for example, by not withdrawing stimulus too early.

- The second thing we need to avoid is severe exchange rate misalignments, at a time of rising unemployment.

The evidence in Eichengreen and Irwin (2009) shows clearly that exchange-rate overvaluation and protectionism went hand in hand during the interwar period. The issue of the renminbi peg to the dollar is one that needs to be confronted sooner rather than later, for everyone's sake.

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5. Crisis-era protectionism one year after the Washington G20 meeting

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Drawing upon the latest data on protectionism from the Global Trade Alert database, this chapter reports the extent to which governments have altered the discrimination against foreign commercial interests during the sharp global downturn and nascent recovery of the past 12 months. Tariff increases have been relatively rare - contemporary discriminatory policies come in murkier forms, such as financial bailouts.

On 15 November 2008, world leaders gathered in Washington DC for the first of a series of G20 summits on the global financial crisis and its economic fallout. At that meeting, G20 leaders pledged to eschew protectionism for 12 months. Subsequently, international trade experienced its sharpest ever contraction since WWII, raising concerns in the minds of some that failure to meet this pledge had reinforced the harm done to international trade by falling demand and limited trade finance.

Evaluating such concerns requires information on state-led changes in the discrimination against foreign commercial interests. The purpose of this chapter is to report the latest available information on such discrimination from one widely-used source of data on state measures undertaken since 1 November 2008, the Global Trade Alert.[1] I also discuss the implications of this evidence for the proper analysis of trade's recent collapse.

Crisis-era protectionism one year after the November 2008 summit

To coincide with the first anniversary of the Washington DC summit, a substantial update of the Global Trade Alert (GTA) database was conducted. It now contains reports on 606 state measures[2] whose implementation was thought – prior to investigation – to possibly affect foreign commercial interests.[3]

State measures – for example, a national budget – can include changes in a num-

1 The GTA was launched on 8 June 2009. Information on state measures that might have implications for foreign commercial interests are reported on the GTA's website, www.globaltradealert.org. In its short lifespan the results of the GTA have been mentioned in over 100 newspaper articles and media reports. A substantial report was published before the G20 Summit in Pittsburgh in September 2009, see Evenett (2009a). As of 23 November 2009, the number of users of the GTA website that have returned 9 or more times exceeded 4,500, suggesting widespread usage of the information contained therein.

2 To get some sense of the extent of the update it may be useful to know that in mid-September 2009, prior to the Pittsburgh G20 summit, the GTA database contained reports on 428 state measures.

ber of policy instruments that might affect foreign commerce. Some of those measures have been implemented, some are only announced. To the extent that information on the latter provides a guide to the state measures likely to affect the world trading system over the next 6 to 12 months, then the GTA database provides some sense of the likely future course of crisis-era protectionism, as well as its recent trajectory.

Summary of the principal findings

Of the 606 state measures investigated, 402 have already been implemented.[4] Far from every measure hurts foreign commercial interests. In fact, the GTA database includes 51 state measures that benefit importers and the like. Much of that liberalisation involves freeing up foreign direct investment regimes and lowering tariffs on non-finished goods.[5] However, nearly three-quarters of implemented measures (294 to be precise) have almost certainly discriminated against foreign commercial interests. The harm done by these measures is not confined to a limited number of sectors, product categories, or countries. Another 56 state measures were likely to involve some discrimination against foreign commercial interests.

These facts can be illustrated in various ways:

- Since taking their pledge to eschew protectionism, G20 governments have together implemented 179 measures that harm foreign trade, investments, workers, and intellectual property.
- On average, every other day a G20 government has broken the pledge made in Washington DC last November.

Further interpretation of this and other findings is presented in the next section.

The GTA database also contains 204 state measures that have yet to be implemented. Investigation has revealed that only 18 of these measures are likely to liberalise international commerce. In terms of the number of measures involved, implementation of what might be referred to as this protectionist overhang would expand the number of discriminatory measures by 50%. This finding is important as it implies that over the next 12 months economic recovery may be associated with an intensification of discrimination against foreign commerce.

The form of discrimination employed by governments is likely to change substantially from what is likely to be regarded as unusual from the first 12 months.

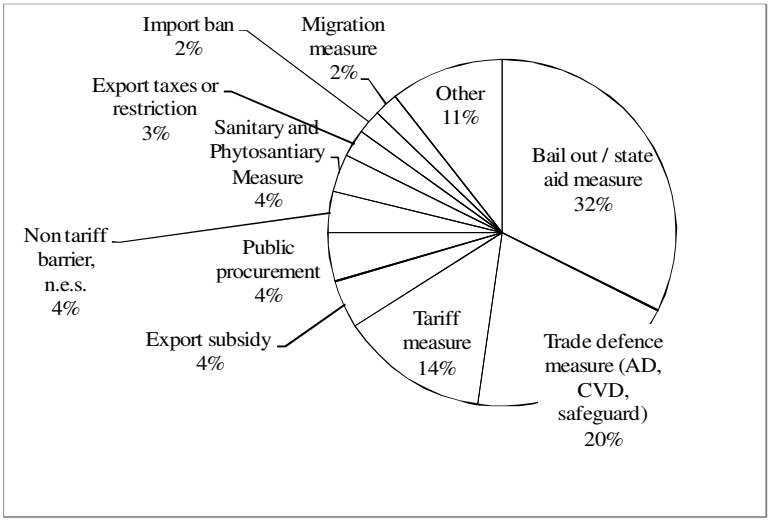
Figure 1 contains a pie chart of the 10 most popular forms of discriminatory measures implemented since 1 November 2008.

3 These interests are taken not just to be imports and exports, but also foreign direct investments, foreign workers, and foreign-owned intellectual property. For a description of the methodology employed in constructing the GTA's database, see section 2 of Evenett (2009b).

4 Readers can easily replicate most of the statistics reported in this section by using the "statistics" page of the GTA database, available at: http://www.globaltradealert.org/site-statistics

5 Lowering tariffs on intermediate goods, raw materials, and other non-finished goods may well increase the effective rate of protection of some domestic producers. Care is needed here in interpreting state measures.

Figure 1. Financial assistance is the most prevalent form of discrimination implemented to date



Source: GTA database, www.globaltradealert.org.

- Financial assistance packages (state aids, bailouts) are the most popular discriminatory instrument, accounting for a third of all harmful measures employed.
- This is followed by anti-dumping, countervailing duty, and safeguard actions, which collectively account for 20% of harmful measures implemented.
- Tariff increases account for one-seventh of the total, and every other form of discriminatory state measure for less than 5% of total measures.

Given the media attention to bank bailouts and the like, the share of financial assistance packages may not seem that surprising.

- Of the 101 such packages found to be discriminatory in the GTA database, just under 60% (59) targeted sectors other than banking, finance, and insurance.

Of the state measures likely to be implemented over the next 12 months, the so-called trade defence measures account for more than the majority and the share of bailouts is much smaller. The conventional pattern of protectionism in business cycle downturns may well reassert itself during 2010, implicitly highlighting just how unusual 2009 has been in this regard.

Nations implementing discriminatory state measures

In a perfect world, accompanying each GTA investigation would be an analysis of the impact on international commerce and welfare of every discriminatory state measure.[6] Less computationally expensive indicators of the harm to foreign commercial

6 In this regard, for more on the foolishness of making the perfect the enemy of the very good see Evenett (2009b).

interests done by a government are, however, available. These include:

- The number of harmful measures undertaken,
- The percentage of tariff lines and sectors affected by such measures, and
- The number of trading partners hurt by these measures.

For each trading jurisdiction, the GTA calculates all four indicators.

The naming-and-shaming figures

Data on the top 10 most discriminatory countries on each metric are reported in Table 1. This is the table for those interested in "naming and shaming."

The key points are:

- Irrespective of the indicator used, the Russian Federation is in the top 5 trading jurisdictions doing the most harm.
- Whether China and Indonesia share this dubious distinction with Russia depends merely on how one interprets the former two countries appearing in joint fourth or fifth place on some of the indicators.
- Argentina is in the top 10 on all 4 indicators.

Table 1. Which countries have inflicted the most harm?

<table>
<tr><td colspan="5">Rankings (worst offender is #1)</td></tr>
<tr><td rowspan="2"></td><td rowspan="2">Ranking by number of discriminatory measures implemented</td><td colspan="3">Ranking by likely adverse harm done by discriminatory measures, various metrics</td></tr>
<tr><td>% tariff lines affected</td><td>% sectors affected</td><td>% trading partners affected</td></tr>
<tr><td>1</td><td>Russian Federation (37)</td><td>Russian Federation (39%)</td><td>Algeria (68%)</td><td>China (71%)</td></tr>
<tr><td>2</td><td>Argentina (20)</td><td>China (27%)</td><td>Ecuador (38%)</td><td>India (61%)</td></tr>
<tr><td>3</td><td>Germany (16)</td><td rowspan="2">Indonesia, Ecuador (25%)</td><td>Indonesia (31%)</td><td>Russian Federation (57%)</td></tr>
<tr><td>4</td><td rowspan="4">China, Indonesia, India, UK (11)</td><td>Russian Federation (30%)</td><td>Indonesia (53%)</td></tr>
<tr><td>5</td><td>India (17%)</td><td rowspan="3">China, Belarus, Mexico (29%)</td><td>UK (52%)</td></tr>
<tr><td>6</td><td rowspan="2">Japan, UK (11%)</td><td>USA (52%)</td></tr>
<tr><td>7</td><td>France (51%)</td></tr>
<tr><td>8</td><td>Brazil (10)</td><td>USA (10%)</td><td>Germany (26%)</td><td>Germany (50%)</td></tr>
<tr><td>9</td><td rowspan="2">Italy, Spain (9)</td><td>Argentina (7%)</td><td>USA (25%)</td><td>Argentina (49%)</td></tr>
<tr><td>10</td><td>France (6%)</td><td>Argentina (24%)</td><td>Spain (46%)</td></tr>
</table>

Note: There is no single metric to evaluate harm in the GTA database. Different policy measures affect different numbers of products, economic sectors, and trading partners. The GTA reports four measures of harm, see below.

- Among the industrialised countries, Germany, the UK and the US are in the top 10 worst offenders on 3 of the 4 indicators.

On several indicators then, these 7 countries appear to stand out in terms of their discriminatory response to the global economic downturn experienced during the past 12 months.[7]

Bad, but not a repeat of the 1930s

Table 1 also implies that, however widespread is the harm done by contemporary protectionism, it is unlikely to have been as far-reaching as its 1930's counterpart. For only 4 nations is the percentage of tariff lines affected by their state's discrimination equal, or in excess of, 25%. Across-the-board tariff increases were not a general feature of the past 12 months.

Victims of crisis-linked murky protectionism

Table 2 reports information on the 10 jurisdictions whose foreign commercial interests have been harmed the most during the past 12 months by others, and the number of jurisdictions responsible for that harm.

At first glance the table's contents would appear to support the hypothesis that China's foreign commercial interests have been singled out during the recent global economic downturn.

Table 2. Top 10 most targeted jurisdictions

Jurisdiction (ranked in descending order)	Top 10 targets of discriminatory measures	
	Number of foreign measures harm this jurisdiction's commercial interests	Number of trading partners responsible
China	141	58
USA	112	49
Germany	110	32
France	101	32
Belgium	96	30
Japan	94	47
Netherlands	94	31
UK	91	30
Italy	89	27
Sweden	85	23

Source: GTA database, *www.globaltradealert.org*

7 Although the four top 10 rankings of harm differ, further investigation revealed strong positive correlations all indicators of harm (correlation coefficients between 0.40 and 0.66). Using raw measures of harm for rankings across all countries, correlation coefficients are between 0.65 and 0.81. Thus the key conclusion does not rely on any one indicator of harm.

- China's foreign commercial interests have been harmed 141 times, with 59 of its trading partners being responsible for this harm; both figures far exceed those of other nations.
- No other developing country appears in the list of 10 most harmed jurisdictions.

Interpreting crisis-era protectionism

Since the GTA started producing reports – in particular the numerical measures reported above – a number of thoughtful observers have wondered how best to interpret this evidence. Some have worried about the appropriate benchmark from which to compare the discrimination observed over the past 12 months (Messerlin 2009). Here are the main critiques and replies:

Critique: One reaction has been to argue that contemporary discrimination is not as bad as during the 1930s, often with the implication that today's protectionism is not a concern.
Reply: The first part of the claim is almost surely correct (see above), but it doesn't imply the second part. Just because a pot of water isn't boiling doesn't mean that it's cold; indeed, many temperatures in between can cause great harm.

Critique: Another reaction is to argue that the proper benchmark is the "typical" rate of protectionism witnessed before the crisis. For some, the zero benchmark implied by a literal reading of the G20 declarations is too stringent (Messerlin 2009). On this view contemporary protectionism should be compared to the "routine" total number of tariff increases and reductions. Messerlin (2009) embraces a 4% figure for the routine number of tariff-line changes.
Reply: Leaving aside for the moment the possibility that what is routine may vary across countries, which, if any, countries in the GTA database have seen discriminatory policy changes affecting 4% or more of tariff lines? It turns out that at least 14 nations meet this criterion for the past 12 months. The 14 nations include China, India, Indonesia, Russia, Turkey, the USA, the UK, Germany, France, and Japan; in other words, just about every major emerging market and industrialised country! On the basis of this evidence, protectionist dynamics were far from typical in the major trading powers during the past 12 months.

As far as the propensity to impose discriminatory measures and the propensity to be targeted by the discriminatory measures are concerned, taking account of the huge variation in national exposure to international commerce may be called for. It could be, for example, that large exporters, such as China, are targeted more often precisely because of their pre-crisis presence in world markets. Likewise, countries that import more goods and services may impose more measures against such commerce.

Statistical tools can be readily employed to ascertain whether, having controlled for engagement in international trade, a country is unusually prone to imposing (or to being the target of) discriminatory measures. Using the most recently-available pre-crisis comparable data, the author was able to confirm that the number of discriminatory measures imposed increases with total national imports (and with total

national incomes).[8] Whatever the control variable, Argentina and the Russian Federation still have an unusually high propensity to impose discriminatory measures. As for the propensity to be targeted, this rises in line with total exports and total national income. Interestingly, once the impact of scale is washed away, there is no evidence that China or any of the other top 10 most targeted countries (reported in Table 2) are specifically targeted by their trading partners.

What it means for protectionist dynamics

Taken together, what does the GTA evidence and the analysis mentioned above imply for the interpretation of contemporary protectionist dynamics? Five conclusions follow:

- Since the first G20 crisis-related summit in November 2008, the largest trading nations have undertaken above-trend levels of discrimination against foreign commercial interests.
- Unlike previous recessions, during the sharp global economic downturn of the past 12 months, by far the most frequently used form of protectionism was financial bailouts, mainly to the manufacturing sector. Across-the-board tariff increases have been very rare; tariff increases themselves only account for one-seventh of all discriminatory measures.
- The next 6-12 months are likely to see a return to a resort to trade remedies, which is the traditional discriminatory tool used in recent recessions.
- Argentina and the Russian Federation have imposed far more discriminatory measures than their exposure to imports would suggest. In contrast, while China, Indonesia, Germany, the UK, and the USA impose a lot of discriminatory measures, the levels of such measures are not out of line with their propensity to import and their economic size.
- The extent to which a nation's commercial interests are targeted by other trading partners is well accounted for by its total exports and national income. This is particularly true of the most targeted nations.

Implications for quantifying the impact of discriminatory state measures

Some words of caution are in order in conducting and interpreting studies of the impact of contemporary state discrimination against foreign interests on commercial flows.

- One risk is that some analysts might charge ahead with what little data is available and produce findings that could well be overturned later.

Readily available tariff and bilateral trade data may make it irresistible for some to focus on the impact of recent tariff changes to the exclusion of everything else.

8 These econometric estimates are available upon request.

Worse, they might compare the impact of tariff changes now with estimates from previous eras, without taking into account that recent tariff changes have quite probably played a smaller role in contemporary protectionism than, say, in the 1930s. Only 1 in 7 of the implemented measures in the GTA database is a tariff change. It seems unwise to characterise the impact of the unusual pattern of contemporary protectionism using a trade policy instrument that is simply not representative of this era's interventions. Estimates of the impact of tariff changes require substantial caveats. Readers beware.

Implied by the last paragraph is the suggestion that a satisfactory account of the impact of contemporary protectionism is going to require estimates of the impact of the various forms of subsidy and financial assistance offered to the manufacturing industry. This in turn will require an understanding of the effects of different forms of subsidy on welfare, trade flows, and the exit of firms. The latter is particularly important for, as noted by some industrialists, contemporary subsidies may have forestalled capacity reduction and, in so doing, potentially sustained trade. This is in direct contrast to raising tariffs, where typically the impact is to reduce imports.

It may well be the case that contemporary state aids have mitigated the fall in international commerce while they simultaneously reduced national economic well-being. This is an unwelcome thought for those analysts who implicitly assume that expanding trade and welfare improvements go hand in hand.

Worse, the likely changes in the composition of discriminatory instruments over the next 12 months imply that any satisfactory explanation of contemporary discrimination and associated research strategy will have to consider the possibility that most influential discriminatory policy instruments changed during the global economic downturn and its subsequent recovery. Thus, the time contingency of any current findings is a concern.

Finally, readers should be aware of the "political value" of small estimates of the impact of contemporary protectionism, generated by the selective examination of discriminatory measures undertaken by governments. Analysts might well wonder whose interests – commercial, bureaucratic, etc – are served by the production of small estimates, and in particular if their successful marketing encourages the media and others to shine the torch away from the murkier, contemporary forms of protectionism.

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6. The great trade collapse and trade imbalances

Richard Baldwin and **Daria Taglioni**
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The global crisis has been accompanied by an unprecedented collapse in world trade driven by an unusual, globally-synchronised drop in demand. The resulting collapse of imports and exports rapidly improved global imbalance since the gap between exports and imports ineluctably falls at the same pace as underlying export and import flows. As import and export growth resume, large global imbalances will return unless both surplus and deficit economies undergo structural changes. Even with such change, recovering trade is likely to be the dominate effect in coming quarters.

The global crisis has been accompanied by an unprecedented collapse in world trade. The emerging consensus is that this was a demand-driven collapse. The nature of the demand shock, however, was somewhat special. The ultimate source, we believe, was the unsteady and ill-explained policy actions by the US in the events surrounding the Lehman Brothers bankruptcy. This produced an immediate panic in global short-term credit markets; overnight lending among banks dried up. This turmoil, which was not instantly observable to the general public, soon tumbled over into other financial markets. Stock markets plummeted, corporate debt issuances evaporated, and credit markets of most descriptions became dysfunctional.

As consumers, firms and investors around the world watched their TV and computer screens, the world's pundits discussed what capitalism without the capital might look like. Policy makers eventually stepped up to the challenge and engaged all the tools of government policy that have fixed past banking crisis (bank nationalisations, deposit guarantees, purchase of bad assets, recapitalisation, forced mergers, etc.). But the damage to confidence was already done. The world had suffered "sudden financial arrest", as Ricardo Caballero called it in his recent IMF speech (Caballero 2009).

The upshot was a global and synchronised "fear of the unknown", also known as Knightian uncertainty; people just did not know what was happening. To be on the safe side, they waited. They postponed purchases and investments, and other things that could be put - everything ranging from taking holidays to changing jobs.

As far as trade was concerned, this Lehman's-induced wait-and-see reaction acted as a massive and globally synchronised drop in the demand for "postponeable" goods and services.

As it turns out, most of world trade is composed of postponeables, so the demand shock manifested itself as a sudden, severe and synchronised trade collapse. While the "financial crisis" or "subprime crisis" had been percolating since August 2007, the

effects were not felt until October and November 2008. Each of the 104 nations on which the WTO reports data saw their imports and exports fall during the second half of 2008 and the first half of 2009. Tellingly, most of the these nations have banking and financial sectors that are far too "primitive" to have been involved in any of the financial follies that brought down Lehman and all the other North-Atlantic financial titans. For these nations, the trade collapse arrived with the label: "Made in New York".

The trade and production collapses

Table 1 shows the total drop for the world and a selection of nations and regions. Most are in the range of 25% to 30%. The table also shows the month with the lowest record value of trade since the crisis began. These facts show that the recovery has begun. The collapse bottomed out in May 2009 for most of the rich nations and earlier for Asian emerging markets.

For comparison, the table also shows the declines in industrial production. We see that the trade drop was sensibly higher and more sudden than the fall in industrial production. World industrial production fell by 13% between April 2008 (its relative peak) and March 2009 (its nadir). The world trade contraction from peak-to-low was faster paced (8 months) and deeper (25%) than the fall in industrial production.

This pattern of trade falling deeper and faster than industrial production is seen in every country. In emerging economies the divergence was particularly striking; the drop in industrial production was equal to 9% and spread over a period of 7 months, while the trade fall was three times bigger (28%) and took as little as 3 months to materialise; differences for individual countries are even more striking.

As much of GDP involves output that was unaffected by the fear factor (services, etc.), the falls in GDP were greatly mitigated compared to the industrial production figures.

Table 1. Rates of contraction from peak to trough, 2008-2009

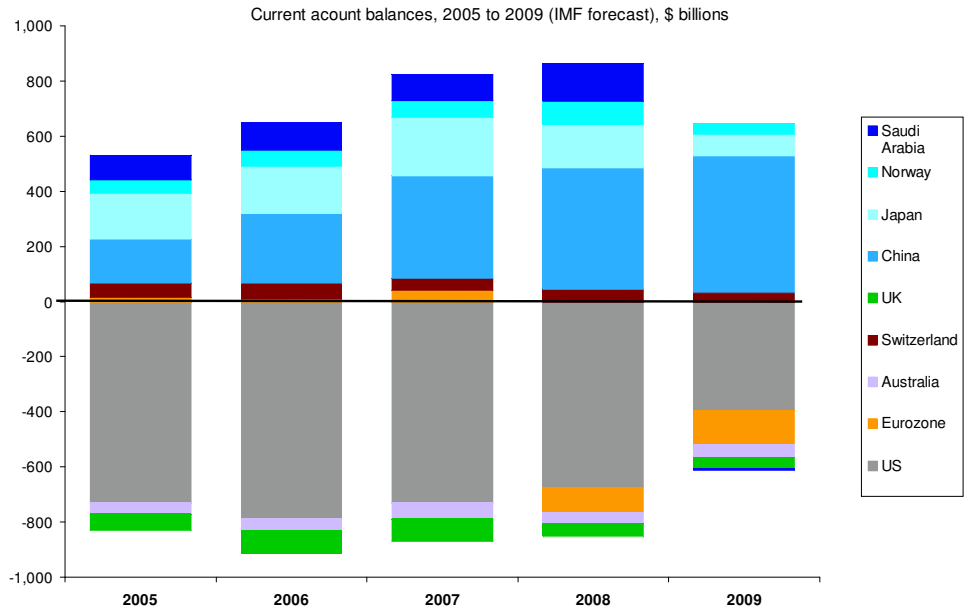
	Goods exports (cumulative change)	No. months (peak to trough)	Trough month	Industrial production (cumulative change)	No. Months
World	-25%	8	2009M05	-13%	11
Industrialised	-24%	8	2009M05	-17%	12
US	-23%	7	2009M05	-14%	14
EU27		7	2009M05	-14%	12
Japan	-22%	8	2009M06	-36%	12
Emerging	-28%	3	2009M01	-9%	7
China	-26%	3	2009M01	-2%	5
Korea	-25%	3	2009M01	-22%	6
Taiwan	-38%	2	2008M12	-36%	5
Brazil	-34%	11	2009M11	-20%	5
Mexico	-26%	9	2009M07	-14%	8

Source: Authors' calculations using CPB data; Cumulative change is calculated from peak to through lowest observation (i.e. differs from country to country)

Impact on global imbalances

The rapid collapse of trade between the third quarter of 2008 and the first quarter of 2009 improved most balances of trade. It could not have done otherwise. As a matter of pure logic, a rapid fall in both imports and exports produces an equally rapid drop in the absolute gap between them

Figure 1. Recent improvements in global imbalances



Source: IMF, World Economic Outlook, online database.

The result is clear from Figure 1. The deficit nations like the US and the UK saw remarkable improvements as did the surplus nations, especially Japan.

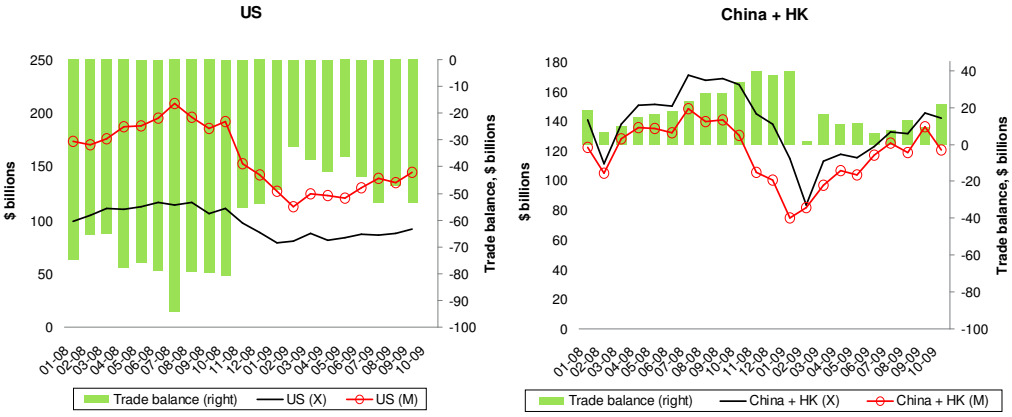
The great trade collapse was not the sole driving force behind the improvements. There has been some adjustment especially in China, Japan and the US. But as Table 1 illustrates, regardless of any fundamental changes, a large measure of the improvements must be due to the trade collapse.

More detail on the biggest imbalance nations

To get at these issues, we turn to monthly data from the WTO (this data is not adjusted for seasonality or inflation). We start with the two largest imbalance nations - the US and China (Figure 2).

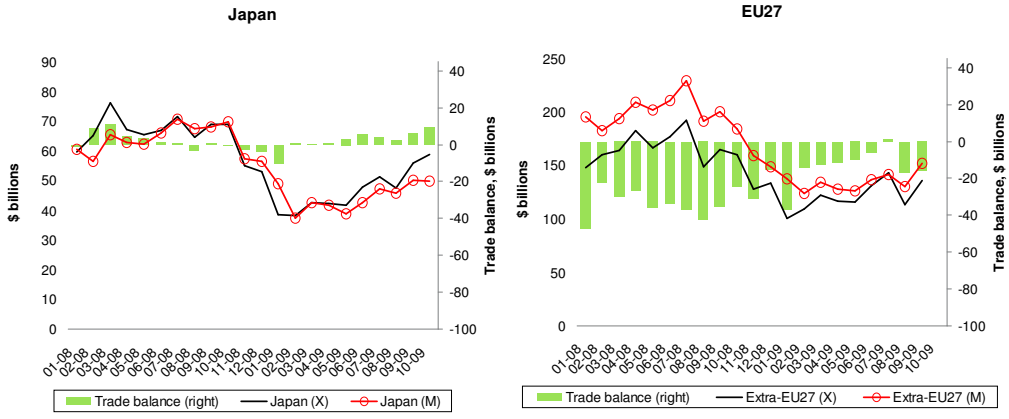
The trade collapse for the US meant a rapid fall in both its exports and imports, but a more rapid fall in its imports. The result - as is clear in Figure 2 - was a spectacular improvement in the monthly trade deficit. From a peak of almost $100 billion in July

Figure 2. US and Chinese trade balance, 2008 to most recent



Note: Goods ($ billion)
Source: WTO online database.

Figure 3. Japanese and EU27 trade balance, 2008 to most recent

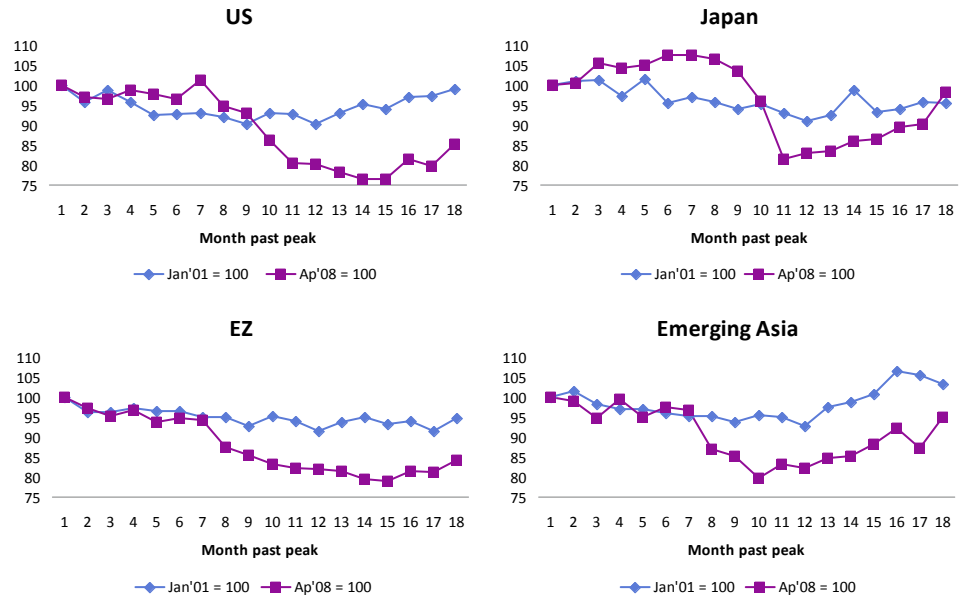


Note: Goods ($ billion)
Source: WTO online database.

2008 (shown as 07-08 in the chart), the monthly deficit dropped to just $30 billion in February 2009. Since then however it has been rising again. The latest data, for August 2009, indicate that it is back up at about $50 billion, about half way back to its pre-crisis high. The source of the deterioration is not merely an equiproportionate growth in imports and exports. The chart shows that US imports dropped faster and farther than exports, but the recovery in imports is also faster.

The right panel of Figure 2 shows the trade and trade balance of China and Hong Kong. We combine the two since many of China's exports and some of its imports are channelled through Hong Kong. The figures echo the US story but on the surplus side. The trade collapse lowered China's trade balance in a mechanical fashion (both flows fell, so the difference fell as well). For China, there also seems to have been

Figure 4. Collapse and recovery, real exports, 2001-'02 vs. 2008-'09



Note: Real exports, seasonally adjusted, indexed to equal 100 at September 2008; EZ is Eurozone.
Source: CPB database.

some adjustment since its exports fell more than its imports up until February 2009. Since that month, however, Chinese trade has recovered rapidly with exports growth somewhat faster. This has turned the monthly balance from approximately zero in February 2009 to about $20 billion in October 2009 - about half way back to its pre-crisis high, as in the US case.

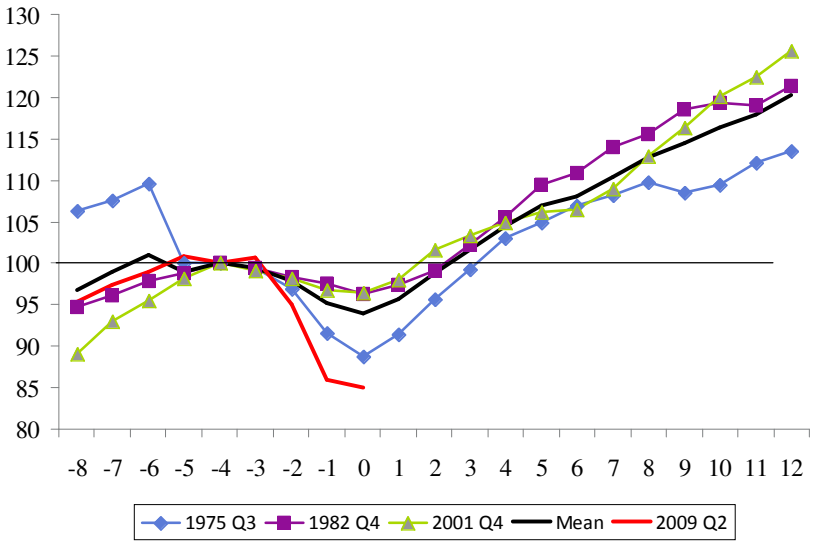
Germany's trade balance (not shown) also improved with the trade collapse. From a 2008 peak of $30 billion, the surplus fell to under $10 billion. As trade has recovered, the surplus is well on its way back to its 2008 high. The latest figure (August 2009) show it at about $15 billion.

Looking forward

The great trade collapse was primarily driven by a sudden, synchronised and severe drop in demand. This suggests that trade may recover rapidly as demand recovers. Indeed, as we have already seen, trade has been on the mend since mid-2009, as Figure 6 shows.

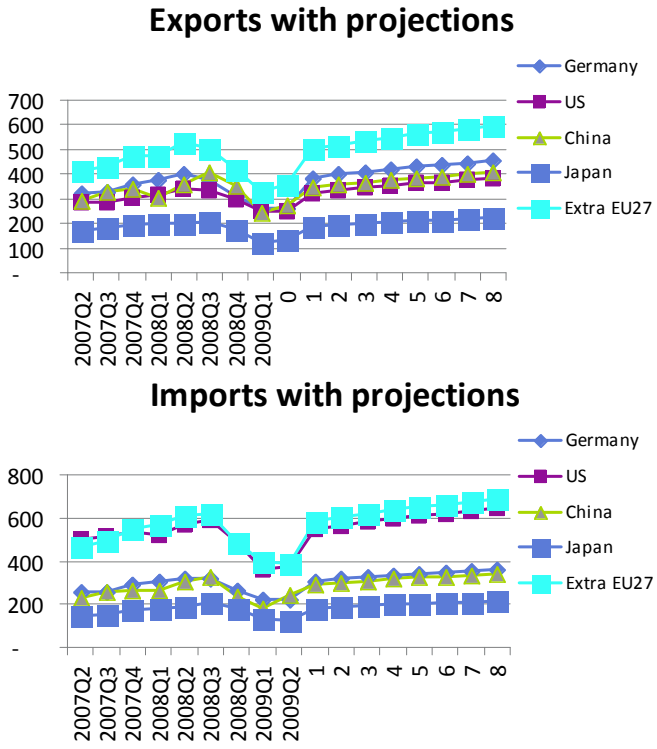
The charts show the path of the collapse and recovery in the 2001 downturn and the current one. We see that today's collapse was much larger for all the nations shown (US, Japan, Eurozone and Emerging Asia), but the shape of the recovery is broadly similar. The recent collapse bottomed out at the end of 2009Q2 for the advanced nations and a quarter earlier for Emerging Asia. The notable exception is Japan; the collapse from fall 2008 was far steeper and far deeper than the 2001 drop.

Figure 5. Historical trade collapses and recoveries



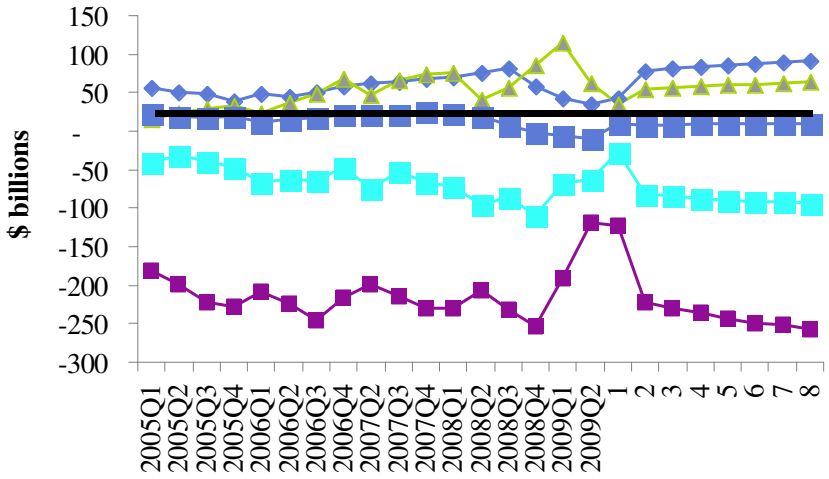
Source: Authors' calculations on OECD real monthly trade data

Figure 6. Simulated recovery of exports and imports



Source: Authors' calculations

Figure 7. Simulated trade gaps with rapid trade recovery



Source: Authors' calculations.

Japan's export recovery has also been much steeper.

In conclusion, it seems that the "Great Trade Collapse" may be turning into the "Great Trade Revival". How will recovery affect global imbalances? One thing is clear, regardless of any domestic and real exchange rate adjustment that may occur, trade gaps will grow if trade recovers rapidly. A key question is: How fast will trade recuperate?

History is one source that can guide us. All the post-war trade collapses have been followed by very rapid recoveries in trade flows, as Figure 5 shows. The chart plots the three postwar trade collapses. In the 1982 and 2001 episodes, trade returned to its pre-crisis level in two or three quarters after the nadir; the 1975 crisis took four quarters. The figure also plots the track of world imports during the great trade collapse.

Using the mean of these historical adjustment paths, and assuming that the demand recovery follows the pattern of previous recoveries, we can provide a tentative simulation of the future evolution of world trade in the next few quarters. If 2009Q2 turns out to be the nadir - as the monthly data suggests - world trade may be back to its 2008Q2 level by 2010Q1 or Q2. To work out this point more concretely, we use the fitted trade collapse from the three post-war episodes to simulate the path of exports and imports for the world's main trading nations.

Figure 6 shows the results of the simulations for some big traders. Note that in order to compare the current collapse with previous episodes, we need to use real trade data. Such data are not available for all nations on a monthly basis back to 1974, so we use quarterly data. Unfortunately the third quarter of 2009 was not available from the data source used (the OECD) when this chapter was finalised.

Simulated trade imbalances implied by these figures are shown in Figure 7. These numbers are very rough and ignore any major structural and real exchange rate adjustments that might change their course. Nevertheless, they tell a very clear story.

The global collapse of trade - most nations' imports and exports falling by 25% or more - led to a rapid improvement in trade imbalances according to a logic as irresistible as arithmetic.

Since the trade shut-down was not due to supply-side shocks that might hinder a rapid recovery, it is a good bet that trade flows - both imports and exports - will regain their pre-crisis growth rates as the world's economy is nursed back to health. The trade gap deteriorations that this will create will be as ineluctable as the improvements we saw last year. The trade rebound will be far from the only factor guiding imbalances, but in the coming quarters it is likely to be one of the most powerful - assuming the economic recovery continues.

Macroeconomics and supply chain trade

Some of the key factors behind the great trade collapse point to a change in trade's role in macroeconomics. International supply chains have changed the nature of international trade and its role in the transmission of shocks. It has blurred the distinction between supply and demand. Consider for instance a fall in UK spending on cars assembled in Slovakia. It not only lowers Slovakian exports, but also the trade in parts and components that come from many other countries and sectors. According to the Deutsche Bundesbank (2009) a fall in car sales is accompanied by a 2.2 times higher fall in purchases (and therefore both imports and exports) of inputs from many other sectors ranging from casting of metals to electrical engineering, chemicals as well as many services sectors.

The old Keynesian world - where my imports depend on my GDP and my exports depend upon your GDP - is gone. Much of the world's imports are intermediate inputs into exports, so foreign demand - especially in the great buyer markets (US and EU) - determine many nations' exports and imports. This has several implications for macroeconomic transmissions.

Since Keynesian aggregate demand depends on net exports, the simultaneous collapse in virtually every nation's imports and exports had much less impact on aggregate demand than the nominal figures might suggest to an economist with the old Keynesian model in mind. In the old Keynesian world, the fall in Japan's exports by 60% would have been considered catastrophic. In today's world, the sharp export fall causes a sharp import fall - not via incomes and budget constraints, but via the input-output matrix.

Moreover, the supply chains have quickened the trade transmission channel since trade no longer works its way through an old-fashioned "J-curve"; manufacturing trade flows are more like conveyor belts connecting the various production bays of a global factory. When final sales fall off, the whole factory slows down in synch. The sharper connections should, for example, increase the correlation of hours worked in related industries in different nations - say the auto industry in Japan and Malaysia or Thailand.

Conclusions

The global crisis has been accompanied by an unprecedented collapse in world trade. It is mostly a demand side phenomenon. Looking forward, it is to be expected that imports and exports will recover along with the recovery of global demand.

This trade growth is likely to bring back the large global imbalances observed in recent years. The balance of two factors will govern the outcome in the medium run:

- Structural changes necessary to rebalance trade accounts.

The US has seen its private savings rise and the dollar fall. However, Chinese spending growth seems largely driven by government stimulus spending - a force which is unlike to affect a long-term shift in domestic absorption. Moreover, as the renembi is pegged to the dollar and the dollar is depreciating, the necessary effective exchange rate appreciation is not occurring - just the opposite.

- Rapid export and import growth, that will worsen trade accounts.

As we showed, trade flows have already started to pick up. Just as the fall in trade far exceeded the fall in income going into the trade collapse, the rise in trade is likely to far exceed the rise in incomes. If this holds, the recovery will be rapid.

Given a rapid expansion of imports and exports, the trade recovery operates immediately to expand imbalances, but structural adjustments typically work at a pace measured in years rather than quarters, it seems likely that the bigger-imbalance forces will win the race in the next few quarters - assuming the economic recovery continues.

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SECTION II

CAUSES OF THE CRISIS

7. The trade response to global downturns

Caroline Freund
The World Bank

Previous global trade collapses provide insight into why trade has dropped so dramatically this time - and the future of trade and global imbalances. The findings suggest that the real trade drop in 2009 is likely to exceed 15%, but it should rebound very rapidly. Global imbalances have also moderated in crises, but this tends to be temporary unless the downturn alters investment attitudes and/or government policies. Today, governments should use the transition to install policies that will ensure that imbalances do not revert to pre-crisis trends – policies to encourage saving in the US and prevent an overvalued dollar, and policies to stimulate spending in China and other parts of Asia and prevent undervalued currencies.

The financial crisis is wreaking havoc on the global economy. In the first quarter of 2009, nominal trade fell by 30% on average since last year. The world trade volume is estimated to have fallen by 18% during this period (World Trade Monitor 2009). The declines have been widespread across countries and products, largely reflecting the sharp drop in global demand.

We examine historical data on global slowdowns to look for similarities that may offer insights into the large decline in trade that has already begun.[1] There are four such events in recent history: 1975, 1982, 1991, and 2001.

While these events were on average modest compared to the current crisis, they may offer some guidance for what to expect in the coming months. We focus on global downturns, as opposed to financial crises, because these share the current environment's key characteristic (for international trade) of low global demand[2]. In contrast, during regional financial crises, demand in the rest of the world tends to remain strong, limiting the trade impact of the crisis.

1 The research on which this chapter is based was supported by funding from PREM Trade and is part of a World Bank research project on exports and growth supported in part by the governments of Norway, Sweden and the UK through the Multidonor Trust Fund for Trade and Development. I am very grateful to Matias Horenstein for excellent research assistance and to Simeon Djankov, Thomas Farole, Leonardo Iacovone, and Juan Sebastien Saez for comments on an earlier draft of this paper. This article reflects the views of the author and not the World Bank.

2 The approach is similar in spirit to Reinhart and Rogoff (2008), who examine previous financial crises for information on the macroeconomic implications of the current crisis. While our focus on global downturns and international trade is quite different from, there is one important similarity in our results. Our results point to a sharp but relatively short-lived decline in trade, akin to what they find for output. A significant difference is that unlike the expanding government debt they observe, we find that international borrowers often reduce international debt following global downturns.

We also examine a handful of countries, which experienced financial crises during the 1991 global downturn, in order to determine whether banking crises significantly exacerbate weak trade performance during slowdowns.

Key findings on the historical episodes

The first issue we address is how much does trade contract when the global economy falters? We find that (see Freund 2009a for details):

- The trade contraction follows the GDP decline and that the trade volume declines by about 1% on average in the first year of its contraction.
- The decline in the growth rate of trade (from historical average to trough) is sudden and is on average more than 4 times as large as that of income.
- On average, trade growth returns as quickly as it disappears and contemporaneously with the rebound in GDP growth.
- Still, it takes more than three years for pre-downturn levels of openness to be reached.

As a result of the collapse in trade, crises moderate global imbalances. Since trade contracts by more than GDP, a country's trade balance as a share of GDP (whether surplus or deficit) typically declines in absolute value. Moreover, because of falling commodity prices during downturns, the deceleration in trade value tends to be far greater than in trade volumes. We show that the reversal of trade deficits tends to persist for Asia, Europe, Latin America, and the Middle East. In North America, the improvement in the trade balance has been temporary, with deficits worsening following the downturn. In contrast, surplus regions tend to see only a temporary reversal.

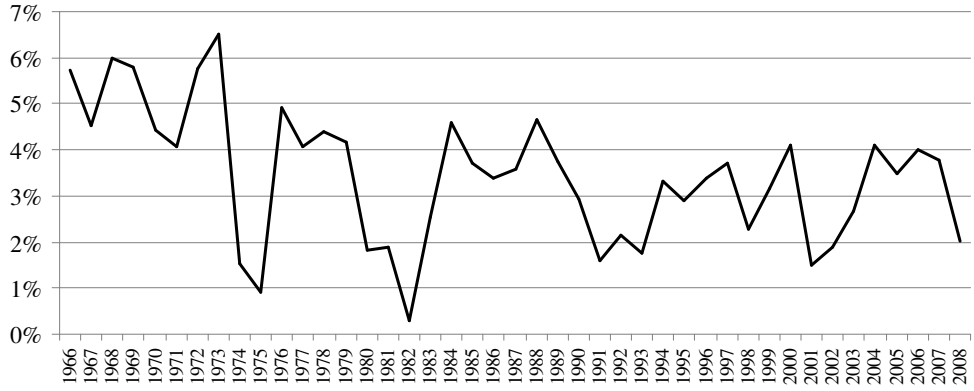
The results have important implications for trade during the current financial crisis. Given current GDP forecasts and trade data available through June, our results imply that the decline in real trade in 2009 could well exceed 15%. In addition, global imbalances are likely to be mitigated during the crisis, and this may persist even after the crisis is resolved.

Methodology

Following Milessi-Ferretti and Razin (1998) and Freund (2005) on current account reversals, we use a filter to identify episodes of global downturns. Specifically, a global downturn must satisfy the following criteria:

- World real GDP growth below 2%.
- A drop of more than 1.5 percentage points in world real GDP growth from the previous 5-year average to current rate.
- Considering the previous 2 years and the following 2 years, growth is at a minimum.

Figure 1. Real GDP growth



Source: World Bank, World Development Indicators.

The first two conditions ensure growth is low and has dropped sharply. If the first two conditions identify consecutive years, i.e. prolonged recessions, the final condition chooses the minimum growth rate as the event year. Using data on real GDP (in constant $US, base year 2000) and real imports (in constant $US, base year 2000) from the World Development Indicators since 1960, four events are identified: 1975, 1982, 1991, and 2001. These events are readily seen as the sharp downturns in Figure 1. In the remainder of this note, the downturn year is denoted as year zero.

What happens to trade during downturns?

To estimate trade effects of recessions, we need an estimate of the elasticity of trade to income – the ratio of the percentage change in trade over the percentage change in income.

Most forecasters use an elasticity of about 2, i.e. real trade growth should grow by 2 percentage points for each 1 percentage point deceleration in real income growth.[3] This leads to relatively small estimates of the decline in trade relative to what we have seen. For example, in January 2009, the IMF predicted a 2.8% decline in real trade (IMF (2009). In June, the World Bank revised its March forecast from a 6.1% decline to a 9.7% decline, after reducing sharply its forecast for global growth (World Bank 2009). The World Bank estimates are larger because it predicts a larger decline in incomes and includes the potential effects of trade finance problems.

Freund (2009b) re-examines the relationship between trade growth and income growth and finds that the elasticity of trade to income has increased from under 2 in the 1960s to over 3½ (also see Irwin 2002). Overall, the results imply that trade should fall (in %) about 3½ times as much as GDP, assuming crises are not special.

3 A number of papers have estimated income elasticities of imports or exports for individual countries and generally find them to lie between 1 and 3½ (see, for example, Hooper et. Al 2000 and Kwack et. Al. 2007).

Global supply chains and lean retailing as fundamental shifts

The significant increase in the elasticity of trade to income may be attributed to the fragmentation of production and/or lean retailing. Because many new goods use small inputs that are nearly costless to trade (e.g. cell phones and digital cameras), the production process of these goods has become fragmented across countries. Many traditional goods such as shoes and cars are also increasingly incorporating imported inputs. The elasticity of trade to GDP will rise if there is more incentive to outsource part of the production chain when demand is high. This is because GDP is measured in value added while trade is a gross measure. So an increase in GDP may lead to more outsourcing and much more measured trade, as an increasing number of parts travel around the globe to be assembled, and then again to their final consumer.

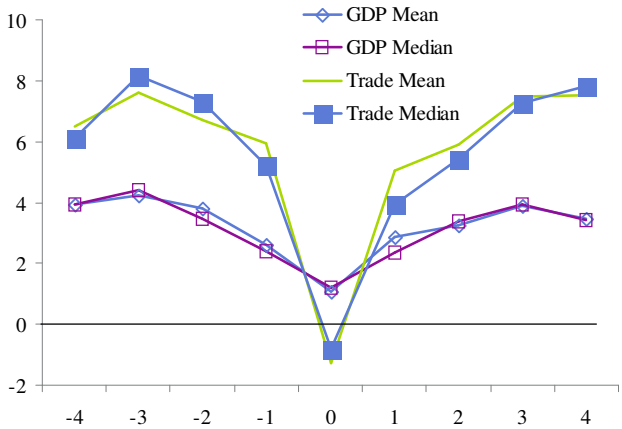
The expansion of lean retailing in recent years implies that supply responds almost immediately to changes in demand. Rapid technological advances make computers and other electronics almost perishable, and many companies have started selling straight to the consumer and producing only for realized demand. For example, Dell sells directly to its customers and builds a made-to-order computer as orders arrive (Arthur 2006, Chapter 2, p. 25). This type of retailing implies that a drop in demand will show up immediately in trade statistics.

Freund (2009a) examines the elasticity of a region's exports to global income. The intuition for looking at regional trade and global income (instead of regional income) is to see how tied a region's exports are to the global economy.

To the extent that the increase in the world elasticity of trade to income is a result of greater fragmentation we should see especially large numbers for East Asia. Indeed, with an elasticity of 4½. East Asia records the largest elasticity in the recent period, as well as the largest increase in elasticity, suggesting that fragmentation of production is in part responsible. It also implies that East Asia may be the most affected region during the current downturn but among the first to pull out when conditions improve.

The growth in the elasticity in this region is also likely connected to China's phe-

Figure 2. Real world trade and real GDP growth rates in crises



Note: Years before and after the nadir year for each of the four crises.

Source: World Bank, World Development Indicators (see Freund 2009a for details).

nomenal growth in assembly of manufactures over the period. Still, as the OECD is responsible for the bulk of world trade, the global elasticity also closely mirrors that of the OECD. In contrast, trade in the low-income countries does not significantly respond to world income.

Trade-GDP response during global downturns

Figure 2 shows real trade growth and real GDP growth in the years around the previous global crises.

We report the mean and the median to ensure that results are not driven by an outlier. While income growth falls to 1.5%, trade tends to decline by about 1%. (Real trade growth was negative only in 1975 and 1982.) In addition, the decline in growth from the previous year to the crisis year is much larger for trade. GDP growth declines on average by 1.5 percentage points from previous year, while real trade declines on average by 7.2 percentage points, nearly 4.7 times as much. If during this downturn, we see a similar ratio there would be a decline of about nearly 20% in real trade this year, given the World Bank's current GDP forecast.[4]

These results imply that trade responds more sharply to GDP during global slowdowns than during tranquil times. There are a number of potential explanations:

- Firms may draw down accumulated inventories sharply when the forecast worsens in an unexpected and dramatic way.
- When global GDP drops sharply, protectionist policies kick in which exacerbate the decline in trade.
- During downturns, goods decline by more than services and services make up the bulk of GDP, while goods make up the bulk of trade.

Moreover, the share of services in GDP has increased over time, magnifying this distinction.

- Trade is measured in gross value and GDP in value added.

A large decline in trade could reflect a much smaller decline in the value added if production is done across countries at the margin and, as demand falls, international production chains break down.[5]

- People may tend to source relatively more from home country suppliers during downturns because of trust or financing problems, or simply because many imports serve excess demand in good times.

On the positive side, we find that trade tends to achieve most of its adjustment in a single year also when it rebounds. The quick rebound likely reflects the reversal of

4 Using an elasticity of trade to income during the downturn of between 4.7 and a deceleration in real world income growth of 4.8 percentage points (the World Bank estimate), the deceleration is real trade growth would be 23 percentage points. World real trade growth in 2008 was about 4%, yielding a contraction this year of 19%.

5 An example of this is Porsche which is cutting outsourcing to Finland during the crisis, while maintaining German production (New York Times, April 4, 2009). Note that increasing vertical specialization can explain why trade has expanded faster than income in recent years, but a higher level of vertical specialization cannot explain why the elasticity of trade to income is higher.

many of the conditions above. Figure 3 looks at trade's share of income over the episodes to see how global openness changes over time. We find that it takes about 4 years for trade to pass pre-downturn levels.

Finally, we examine whether countries with banking crises are affected more severely or differently during a downturn. We focus on three countries – Finland, Sweden, and Japan – that experienced severe banking crises around 1991, when there was also an episode of slow world income growth.[6]

The results – see Freund (2009a) for details – show that income and imports fell much more sharply for the crisis countries than for the rest of the world. Exports fell by just about the same amount as world trade, suggesting that the aggregate exports of the crisis countries were no more affected by the global downturn than exports in the rest of the world.[7] Exports rebounded far more rapidly than income, rejoining world growth rates after just one year. Even imports expanded more than one-third of the full amount in the first year after the downturn began, despite negative income growth. All three variables, exports, imports, and GDP, returned to average world growth levels after 3 years. This suggests that the relatively quick rebound in trade remains intact in financial crisis countries.

How are trade balances affected?

Given that trade falls more than income, it is likely that global imbalances as a share of GDP improve. This will be true unless exports fall by much more than imports in deficit countries and imports fall by much more than exports in surplus countries. In this section, we examine whether there is an improvement in global imbalances and whether it is short-lived or persistent.

To evaluate global imbalances we examine the trade balance as a share of GDP across regions and income groups, and also whether the countries tend to be surplus or deficit countries.

Figure 3 and 4 show movements in the aggregate trade deficit and surplus for international borrowers and lenders, respectively. Specifically, Figure 3 is the aggregate trade deficit relative to GDP over time of all the countries that had a deficit before the downturn.[8] Similarly, Figure 4 is the aggregate trade surplus relative to GDP over time of all the countries that had a surplus before the downturn. On aggregate, there is only a temporary improvement, and the position quickly returns to where it was before the episode. This suggests that there is not an overall rebalancing between pre-downturn surplus countries and pre-downturn deficit countries.

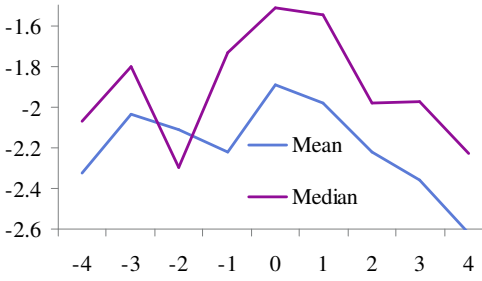
However, the pictures are very different when we look across regions (Figures 5 and 6) or income groups (Figures 7 and 8).

6 Finland 1991, Sweden 1991, and Japan1992 are included in the "big five" crises, the other two are Spain 1977 and Norway 1987.

7 Iacovone and Zavacka (2009) find that there are compositional effects of banking crises on exports. Export growth in sectors that depend relatively more on external finance declines relative to growth in other sectors in the aftermath of the crisis.

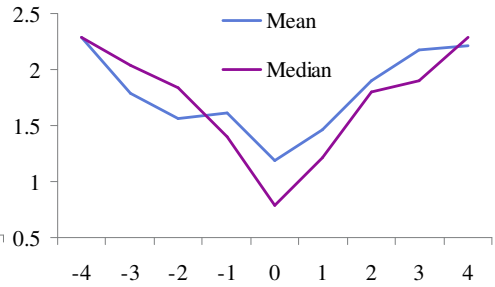
8 Specifically, we use the value of deficit or surplus four years before the episode to characterize country as a surplus or deficit country. Data are from the IMF BOP Statistics for a balanced sample of countries reporting.

Figure 3. Aggregate trade balance – deficit countries (% of GDP)



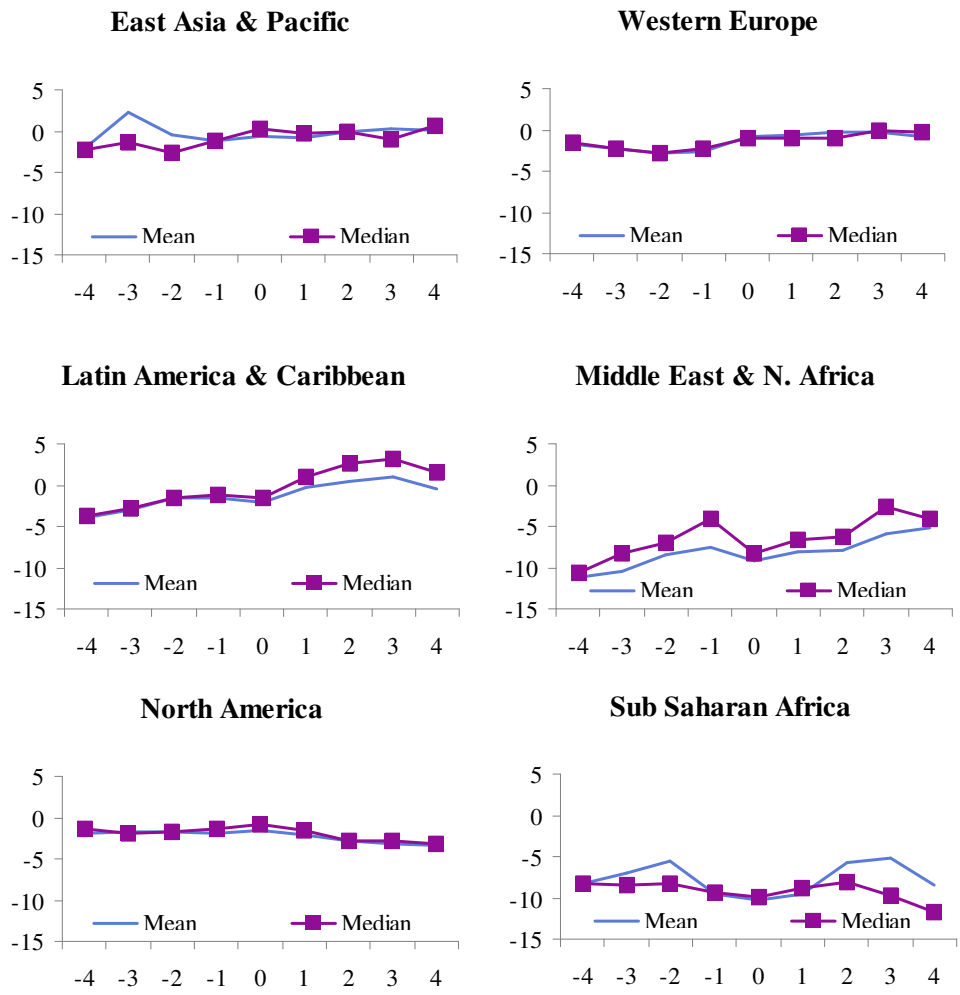
Source: World Bank, World Development Indicators.

Figure 4. Aggregate trade balance – surplus countries (% of GDP)



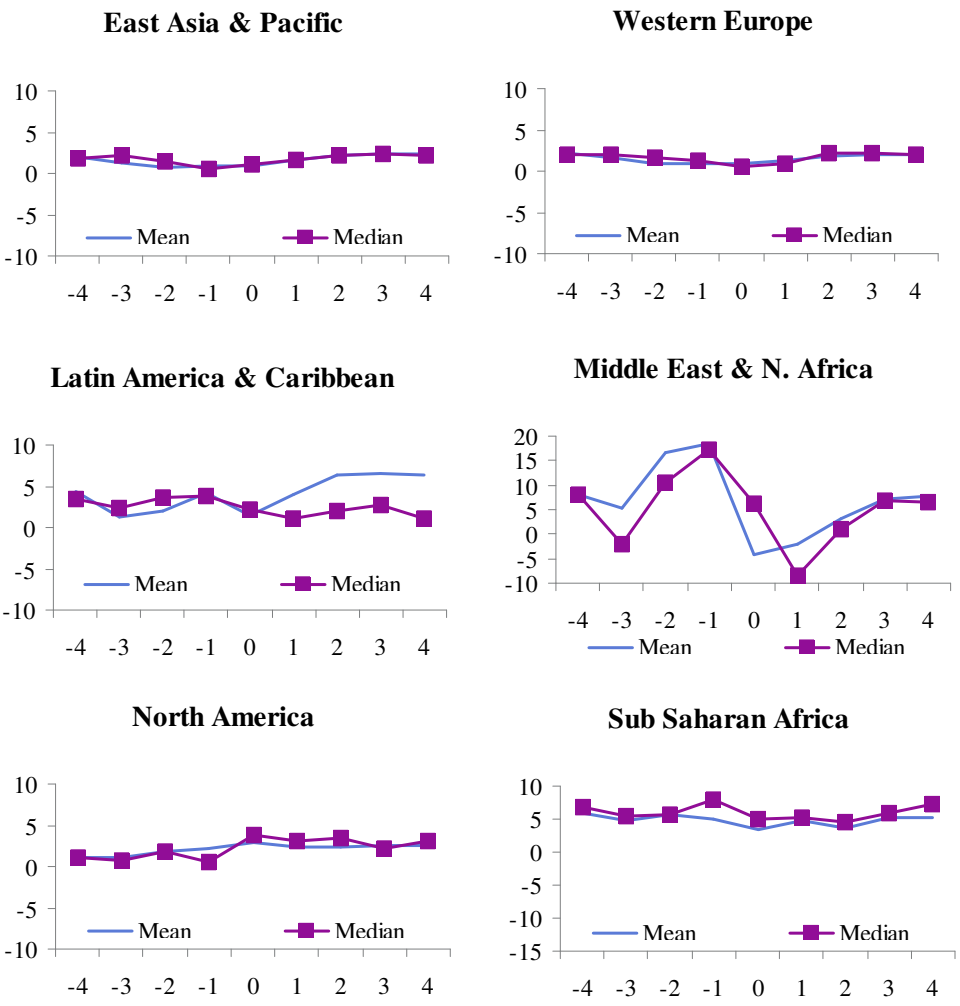
Source: World Bank, World Development Indicators.

Figure 5. Aggregate trade balance – deficit countries by region



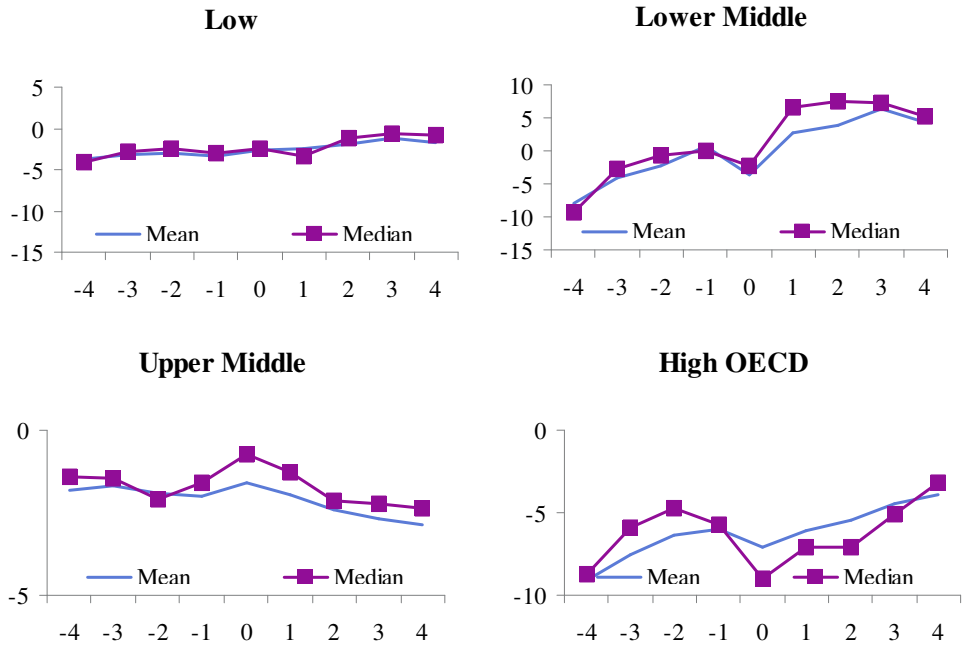
Source: World Bank, World Development Indicators.

Figure 6. Aggregate trade balance – surplus countries by region



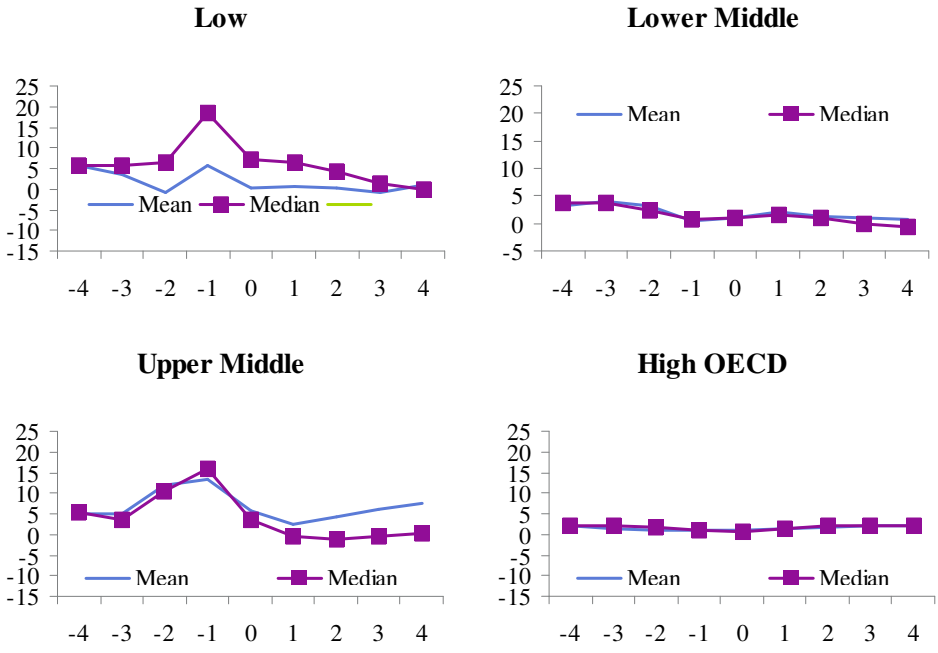
Source: World Bank, World Development Indicators.

Figure 7. Aggregate trade balance – deficit countries by income level



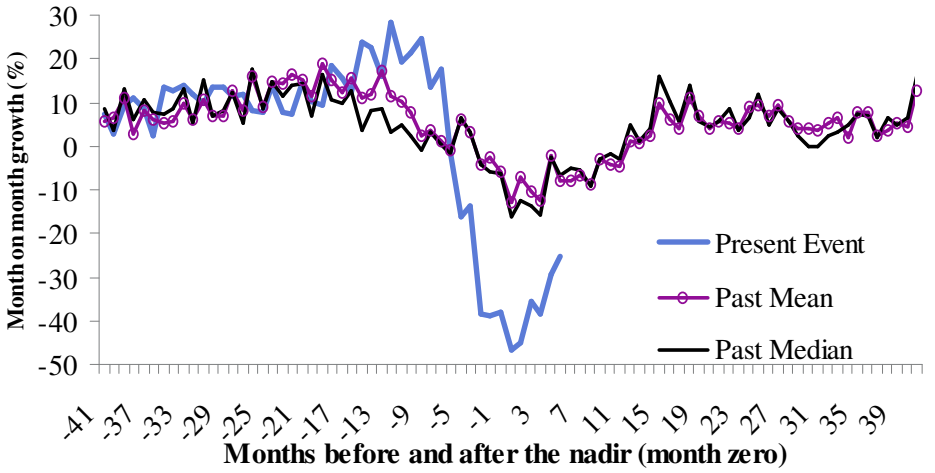
Source: World Bank, World Development Indicators.

Figure 8. Aggregate trade balance – surplus countries by income level



Source: World Bank, World Development Indicators.

Figure 9. The decline in trade now and then



Source: Datastream. Data in $US for a balanced sample of 31 countries, deflated using the US CPI.

We find that in Latin America, East Asia, Europe and the Middle East, and North Africa, there is a tendency to reduce sharp deficits following downturns. These are regions where the imbalances were deemed dangerous, and the government put policies in place to ensure they did not re-emerge. These included savings' incentives and maintaining an undervalued exchange rate to strengthen the BOP position. In addition, weakened firm fundamentals during a global downturn may induce a drop in investment.

In contrast, North America tends to show a relatively stable account that improves slightly during the downturn, but worsens in its aftermath. This may reflect the flexibility of the U.S. economy and the safety of dollar assets. This may also be related to the downturns not having been severe enough to change U.S. government policies and firm fundamentals, as happened in middle-income and developing borrower countries.

Surplus countries, by contrast, in general show only temporary reversals. Unlike deficit countries, where there may be pressure to change policies and investment behaviour following a costly recession and capital outflow, surplus countries do not experience such an impetus for change.

Conclusion and looking forward

Trade has fallen dramatically since the onset of the financial crisis. Figure 8 compares trade growth (month over same month the previous year) in this crisis and in the previous downturns, using monthly data in constant $US, for a balanced sample of 31 countries that report data from 1960 – March 2009.[9]

9 Month zero is the minimum trade growth during previous downturns. The series for the current period is matched to previous downturns using the minimum trade growth. Specifically, the minimum trade growth is superimposed over the minimum trade growth on average in the previous downturns.

While growth leading up to the crisis was a bit higher in this episode, it still looked quite similar to the previous downturns. What is most evident from the picture is that the trade drop over the last few months has been much steeper and more severe than other recent episodes. Perhaps of greatest import now is that the rebound also looks like it may be rapid.

Concluding remarks

This chapter – based on an update of Freund (2009a) – offers some background on why the trade drop has been so large.

We argue that the elasticity of trade to income has been increasing over time and that trade is especially responsive to income during recessions. On the positive side, we note that trade tends to rebound sharply when growth picks up. Given especially high elasticity of exports to world income in Asia, it is not surprising that trade is now expanding rapidly in the region. The swift turnaround in trade is similar to the result in Reinhart and Rogoff (2008) that output declines resulting from a financial crises last only two years, as compared with about four years for employment and equity drops.

We have also seen that downturns tend to moderate global imbalances. However, the moderation tends to be temporary unless the downturn alters investment attitudes and/or government policies. Given that the downturn will get the process started, we hope that governments can use the transition to install policies that will ensure that imbalances do not revert to pre-crisis trends. This will include policies to encourage saving in the US and prevent an overvalued dollar, and policies to stimulate spending in China and other parts of Asia and prevent undervalued currencies.

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8. The collapse of US trade: In search of the smoking gun

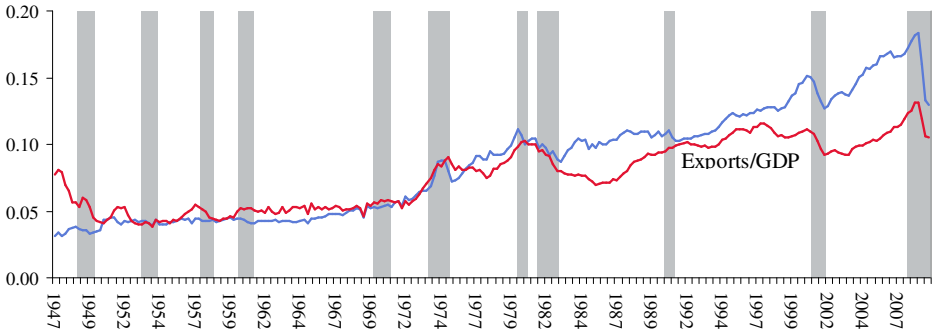
Andrei A. Levchenko, Logan T. Lewis and **Linda L. Tesar**
University of Michigan

US trade has experienced an unexpectedly large drop – seven standard deviations more than that predicted by theory. We evaluate three leading hypotheses on its causes: the vertical linkages effect, the compositional effect, and the credit effect. Using highly disaggregated US trade and production data, we show that between 50% and 100% of the drop is due to a "compositional effect", i.e. that trade fell systematically more in sectors that also experienced larger domestic output reductions. The trade drop was also particularly concentrated in sectors marked by strong vertical linkages. We find no evidence that US trade was significantly hindered by trade credit problems.

A remarkable feature of the recent crisis is the collapse in international trade. This collapse is global in nature and dramatic in magnitude (WTO 2009).

During the crisis, US GDP declined by 4% from its peak, while its real imports fell by 19%, and real exports fell by 15%. This is unprecedented in the postwar period, as Figure 1 shows. Though protectionist pressures inevitably increased over the course of the recent crisis, it is widely believed that the collapse is not due to newly erected trade barriers (Baldwin and Evenett, 2009).[1]

Figure 1. US trade to GDP ratio, 1947-2009



Note: Shaded bars show recessions.

Source: National Income and Product Accounts.

1 For detailed descriptions of the various features of the current collapse in trade, see Francois and Woerz

Is the trade collapse a puzzle?

Though the reduction in international trade flows has been drastic, it is not a priori clear that it is in any sense exceptional or represents a puzzle. Trade tends to decline during global recessions. The key question is:

- Is this trade drop in some sense abnormal?

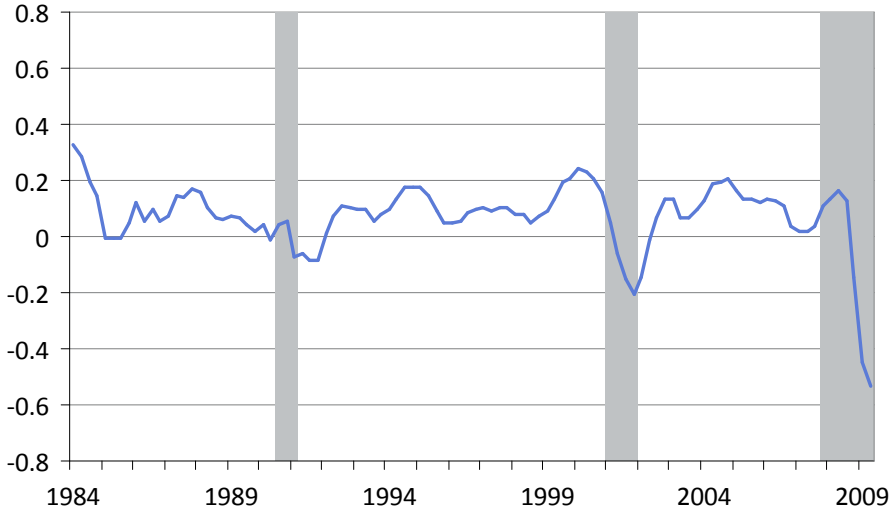
To evaluate this question, we need a benchmark to establish "normal". To this end, we follow a simple "wedges" methodology – an approach that is standard in open economy macroeconomics (Cole and Ohanian 2002 and Chari, Kehoe, and McGrattan 2007).

We derive a simple import demand equation, where imports depend upon total domestic demand (absorption) and relative prices (import and domestic prices). The "wedge" is the extent to which actual imports deviate from what the import demand equation predicts. (Details can be found in our underlying research – Levchenko, Lewis, and Tesar 2009 – which was prepared for the IMF Economic Review special issue, "Economic Linkages, Spillovers and the Financial Crisis.")

Figure 2 depicts the wedge's evolution from 1984 to the second quarter of 2009. Two features of this series stand out:

- The current value of the wedge exhibits a drastic deviation from the norm; by the second quarter of 2009 it reached 54%.
- Compared to the historical experience this is indeed exceptional; over the past 25 years the mean value of the wedge is less than 9%, with a standard deviation of 8.7%.
- SInce the current value of the wedge is at seven standard deviations away from the mean, and six standard deviations away from zero, we can say that the recent trade collapse is a puzzle.

Figure 2. The international trade wedge



Source: Levchenko, Lewis, and Tesar (2009).

In short the collapse in trade is abnormal; it is well in excess of what the pace of economic activity and prices would predict.

Why did trade collapse? Three leading suspects

We focus on the three main hypotheses that have been mooted:[2]

1) Trade is collapsing because of the transmission of shocks through vertical production linkages.
2) The collapse in trade is due to compositional effects.
3) Trade is collapsing because of the contraction in credit.

To confront this hypothesis with data, we compare the behaviour of disaggregated trade data with characteristics of the sectors concerned. Specifically, we look at US exports and imports at the 6-digit NAICS level of disaggregation (about 450 distinct sectors) and see the extent to which the differential export performance can be explained by sector-specific characteristics that proxy for the three main hypothesis.

The supply-chain/vertical linkages hypothesis

When demand for final goods drops, the demand for intermediate inputs suffer. In sectors marked by extensive international supply chains, this logic means that the value of trade drops more than final demand; a dollar drop in imported final-goods purchases can lead to more than a one dollar drop in total trade.[3] To test for this possibility, we build several measures of intermediate input linkages at the detailed sector level based on the US Input-Output tables.

- We find strong evidence in favour of the vertical linkages explanation. After controlling for a variety of other industry characteristics, trade fell systematically more in sectors that are used intensively as intermediate inputs.

Compositional effects hypothesis

If international trade occurs disproportionately in sectors whose domestic absorption (or production) collapsed the most, we should expect trade to fall more than GDP.[4]

2 Another possibility is a rise in trade barriers (see, e.g. Campbell, Jacks, Meissner, and Novy, 2009). However, so far there is no evidence that countries are adopting protectionist measures severe enough to generate a reduction of this magnitude. In addition, actual shipping costs have plummeted, following a collapse in oil prices and a drop in demand for shipping (Economist 2009).

3 Hummels, Ishii, and Yi (2001) and Yi (2003) document the dramatic growth in vertical trade in recent decades, and di Giovanni and Levchenko (2009) demonstrate that greater sector-level vertical linkages play a role in the transmission of shocks between countries.

4 Two special cases of the compositional story are investment goods (Boileau, 1999, Erceg, Guerrieri, and Gust, 2008) and durable goods (Engel and Wang 2009). Since investment and durables consumption are several times more volatile than GDP, trade in investment and durable goods would be expected to experience larger swings than GDP as well.

To explore this, we collect measures of US industrial production at the most disaggregated level available, and correlate them with reductions in trade.

- We find strong evidence of compositional effects. As it turns out, trade in this crisis fell systematically more in sectors that also experienced larger domestic output reductions.

The credit crunch hypothesis

Firms need credit – capitalism without capital doesn't work. As the global crisis – especially the period that coincidences with the steepest decline in trade – is marked by a massive and global credit crunch, it is natural suppose that the lack of credit contributed to the great trade collapse. Indeed there is evidence of this in past crises. Raddatz (2009) shows that there is greater co-movement between sectors that have stronger trade credit links, while Iacovone and Zavacka (2009) demonstrate that in countries experiencing banking crises, exports fell systematically more in financially dependent industries. Amiti and Weinstein (2009) show that exports by Japanese firms in the 1990s declined when the bank commonly recognized as providing trade finance to the firm was in distress.

To evaluate whether this channel mattered in the current crisis, we use US firm-level data from the COMPUSTAT database to construct measures of the intensity of trade credit use in each sector. Taking as given that credit became scarce at the end of 2008 and first half of 2009, we should expect to see trade falling particularly much in sectors that rely particularly heavily on trade credit.

- By contrast to the previous two explanations, we find no evidence that trade credit played an independent role in the trade collapse. Sectors that receive, or extend more trade credit did not experience systematically larger reductions in either imports or exports during the current episode.

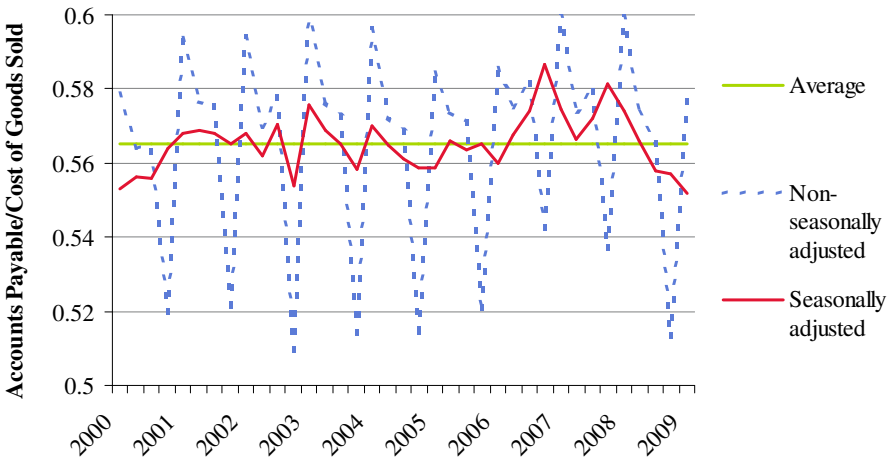
We can also examine the time evolution of trade credit directly.

Figure 3 depicts the evolution of the most standard measure of trade credit extended to firms, i.e. 'Accounts Receivable' relative to the 'Cost of Goods Sold' for the firms in COMPUSTAT data. The dashed line represents the raw series. As there is substantial seasonality in the raw series, the solid black line represents this following seasonal adjustment. The horizontal line plots the mean value of this variable over the entire period.

While there is indeed a contraction in trade credit during the recent crisis, its magnitude is very small. It was 55% in the first quarter of 2009, just 1% below the period average of 57%, and only 3 percentage points below the most recent peak of 58% in the fourth quarter of 2007.

In summary, the typical firm in the COMPUSTAT data experienced at most a small contraction in trade credit.

Figure 3. The evolution of US trade credit



Source: Levchenko, Lewis, and Tesar (2009).

How much does each factor matter?

We can push our reasoning further and assess how far each effects accounts for the trade collapse. As it turns out, the compositional effect is by far the most important. We compare percentage reductions in exports and imports that would be expected if compositional effects were the only effect in operation (i.e. the reduction in trade that should have occurred if exports and imports fell by the exact same percentage as domestic industrial production).

- Our work suggests that compositional effects account for between 50% and 100% of the reduction in US trade, depending on the details of how the measure is constructed.

A number of caveats should however be considered in order to interpret the results. Most importantly, this is an accounting exercise rather than an economic explanation.

We do not know why trade flows are systematically biased towards sectors that experienced larger output reductions, nor do we know why some sectors experienced larger output drops than others. Nonetheless, this exercise suggests further evidence of compositional effects.

Summary and implications

Using a theory-based benchmark, we demonstrate that the US cross-border trade has indeed experienced a significant disruption: it fell much more than what would be expected given the observed reduction in aggregate demand. We also find that part of the collapse can be accounted for by compositional effects and vertical linkages.

The result that the state of international trade today is far from "business as usual" underscores the importance of resisting protectionist pressures (that are also on the

rise in the current crisis). Going forward, we simply do not know how long it will take for international trade to recover. Policymakers should therefore be especially careful not to impede this recovery process further.

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9. The collapse of global trade: Update on the role of vertical linkages

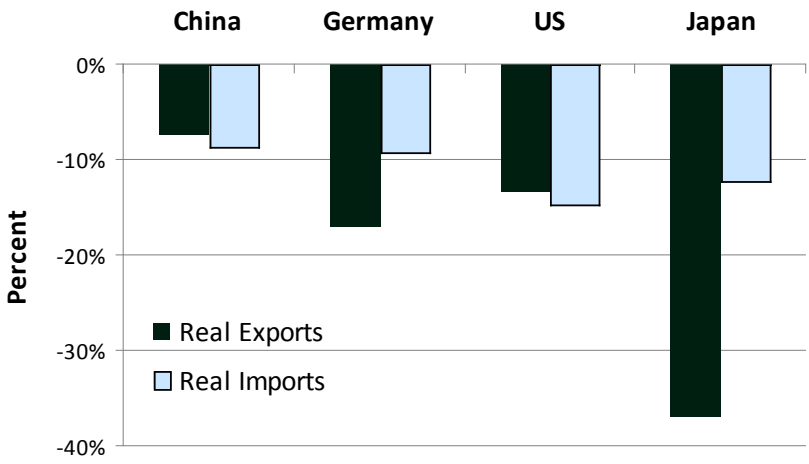
Rudolfs Bems, Robert C. Johnson and **Kei-Mu Yi**
IMF; Dartmouth College; Federal Reserve Bank of Philadelphia

International supply chains – or vertical linkages – are a leading contender for explaining why the great trade collapse was so great. This chapter presents on-going research aimed at quantifying the consequences of intermediate goods import linkages for the transmission of shocks and declines in trade. It highlights the importance of vertical linkages and specific sectoral shocks in accounting for the sudden, severe, and synchronised collapse of global trade in the aftermath of the Lehman debacle.

Between September 2008 and mid-2009, global trade suffered a sudden, severe, and synchronized collapse.[1] Figure 1 illustrates that both real exports and imports declined substantially in the world's four largest trading countries.

The experience of these countries was not unusual. According to the IMF, global (PPP-weighted) real exports declined by 14% between 2008 Q3 and 2009 Q1. While there has been a recovery in trade recently, 2009 is still likely to be the first year in

Figure 1. Change in real exports and imports: 2008Q3 to 2009Q1



Source: MF GDS database. Data are seasonally adjusted

1 The views expressed in this paper are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia, the Federal Reserve System, or the International Monetary Fund.

which global trade has declined since 1982, and only the third such year in the past half-century.[2]

Vertical specialisation and intermediate goods trade

In a Vox column earlier this year, Yi (2009) suggested that vertical specialization provides a real transmission mechanism that may help explain the widespread decline in trade. The vertical specialization transmission mechanism is subtle, with several ways in which it could help generate a large and widespread collapse in trade:

- First, there could be re-nationalisation of international production chains (triggered perhaps by an increase in protectionism).
- Second, growing vertical specialization implies that more cross-border transactions occur between separate stages of the production process. If the elasticity of substitution across stages is very low, then shocks to production in one country could be transmitted forcefully to other stages undertaken elsewhere.
- Third, if demand shocks are concentrated on goods that are vertically specialized, then trade is highly sensitive to changes in demand (as in the Barbie example of O'Rourke 2009).

While all these channels seem plausible and many analysts have asserted that they have played an important role in the trade collapse, there has been, to date, little evidence supporting the notion.

New evidence on vertical linkages

In this chapter, we provide examples of some of the results emerging from our research on quantifying the consequences of intermediate goods import linkages for the transmission of shocks and collapse in trade. Our approach is based on measuring bilateral imported intermediate goods linkages using trade data combined with national input-output tables.

Imported intermediate-goods linkages arise any time a manufacturer uses imported intermediate inputs in its production process. When the manufacturer subsequently exports some of the resulting output, we say the production process is vertically specialized.[3] This creates a tight connection between imported intermediate linkages and vertical specialization.

The importance of imported intermediate goods linkages

Imported intermediate goods linkages have several distinct implications for the

2 Source: World Bank, WDI database, World exports in 2000 $U.S.

3 Note that it is possible to have imported intermediate goods linkages across countries without having vertical specialization. But it is not possible to have vertical specialization without having imported intermediate goods.

response of trade to changes in final demand. These effects operate independently of, and in addition to, standard trade transmission channels that work through the endogenous response of final demand to shocks.

- First, imported intermediate goods linkages imply that a country's exports and imports tend to move in the same direction in response to changes in either domestic or foreign demand.

For example, a decline in US demand for cars will typically imply decreased demand for cars imported from Canada. Since Canadian cars are produced using imported inputs from the US, a decline in the production of Canadian cars will mean fewer US exports of car parts to Canada; both US imports and exports fall. This does not happen if the imported intermediates channel is absent.[4]

- Second, imported intermediate goods linkages influence each country's exposure to foreign shocks.[5]

This effect is subtle but nonetheless important.

The standard way to measure the extent of the international trade spillover of a shock in one country to another country is the amount of trade between the two countries, normalized by GDP or by total trade. Thus, if US import demand falls, a particular country, say Korea, may be hit hard because a large share of Korea's exports goes to the US. However, Korea's export share to the US actually underestimates the strength of this linkage. Because Korea exports large amounts of intermediate goods to China, which then processes these goods into final goods and re-exports them to the US, the true bilateral linkage between Korea and the US is larger than the simple Korean export share to the US. To measure the true linkage, one needs to know the intermediate goods linkages between countries, as well as the final destinations of exports.

To this end, Johnson and Noguera (2009) have developed a global input-output system that facilitates the measurement of these "true" linkages.

Johnson-Noguera measures

A typical input-output table provides information linking industry output, demand, and trade vis-à-vis the rest of the world. Thus, it indicates, for example, the value of imported vehicle parts that are embodied in US motor vehicles that are either sold domestically or exported.

The contribution of Johnson and Noguera is that their input-output system links countries and sectors bilaterally. Thus, it indicates, for example, the value of Japanese

4 The standard "demand spillovers" trade transmission mechanism implies that exports fall in response to changes in foreign, not domestic, demand. This standard mechanism generates positive co-movement between exports and imports only if domestic and foreign demand are positively correlated. In contrast, imported intermediate goods linkages cause exports and imports to move together in response to changes in domestic demand alone.

5 Though we focus on the implications of imported intermediate linkages for measurement of bilateral linkages in the main text, these links are also important for measuring aggregate openness and hence overall exposure to foreign shocks. Typically, the aggregate intermediate goods consistent measure of openness does not equal either exports to GDP or exports to total output.

motor vehicle parts that are embodied in US motor vehicles that are either sold domestically or exported to Canada.[6]

This is precisely the type of information that one needs in order to accurately measure how shocks propagate across countries and sectors, as it facilitates a calculation of the true impact of a reduction in demand in the US on Korea's exports, imports, and GDP. Bems, Johnson and Yi (2009) draw from, and update, the system in Johnson and Noguera (2009) in order to examine the importance of vertical linkages in the propagation of the current global downturn.[7]

However, the global input-output system is not a panacea. It is an accounting framework, rather than a fully specified economic model. Final demand in this system is taken as exogenous. Thus there is no direct connection between final demand in one country and final demand in another country; endogeneity operates only through intermediate input channels.

This limitation, for example,rules out the situation where US demand for cars can affect Canada's purchases or production of steel and rubber is through intermediate linkages. In contrast, our accounting framework does capture all of the effects arising from an initial final demand shock, holding all other final demands constant. This is somewhat restrictive, but at least it captures important inter-country and inter-sectoral linkages via intermediates trade.

Three applications of the global input-output system

A few examples from Bems, Johnson and Yi (hereafter, BJY) help to illustrate that basic importance of vertical linkages.

In the first exercise, we subject final demand in each sector of the US (or the European Union) to a -1% shock. Table 1 reports the resulting decline in exports, GDP, and imports in nine different regions of the world; for multi-nation regions like the EU, we define exports ignoring intra-regional trade.

As the figures show, US GDP falls 0.92% following the shock, which is not surprising given the small share of trade in GDP. US Imports in the US fall 0.95% – again not surprising, as a drop in final demand usually results in a large drop in imports. US exports, by contrast, fall by only 0.06%, reflecting the fact that the US is not, in the aggregate, tightly integrated into cross-border production networks.

The impact on other regions is more varied. China's exports fall by 0.28%, very similar to the decline in Japan's exports, which are 0.25%. These export responses are similar despite the fact that China exports approximately 60% more goods to the US than Japan in our data.[8] The response is similar because a good deal of Japanese value-added is exported to the US through China and other countries.[9] Importantly, the

6 Also, see Wang, Powers, and Wei (2009) and Fukao and Yuan (2009), among others, for related work using Asian input-output tables. Daudin, Rifflart and Schweisguth (2009) also work with a global input-output system.

7 Specifically, we employ the GTAP7 database, which has data through 2004 and covers 94 countries plus 19 composite regions.

8 In 2004, the base year in our data, China exported about $211 billion of goods to the United States, while Japan exported $133 billion.

9 See Ruyhei Wakasugi's chapter in this Ebook for an elaboration of this point.

Table 1. Impact of a -1% aggregate demand shock

	(A) in USA			(B) in EU		
Change in (percent) : Country/region:	Exports	GDP	Imports	Exports	GDP	Imports
China	-0.28	-0.09	-0.07	-0.24	-0.08	-0.06
Japan	-0.25	-0.03	-0.02	-0.20	-0.03	-0.02
USA	-0.06	-0.92	-0.95	-0.27	-0.02	-0.01
South America	-0.32	-0.06	-0.04	-0.27	-0.05	-0.03
Emerging Asia	-0.23	-0.09	-0.07	-0.23	-0.09	-0.07
Emerging Europe	-0.08	-0.02	-0.02	-0.63	-0.18	-0.12
EU (as of 2003)	-0.24	-0.03	-0.02	-0.05	-0.88	-0.92
NAFTA (excl. US)	-0.76	-0.22	-0.14	-0.09	-0.03	-0.02
The rest of the world	-0.21	-0.05	-0.03	-0.41	-0.10	-0.05

Source: Authors' calculations

overall effect on China's GDP is three times that of the effect on Japan's; this reflects the fact that China's GDP is considerably more dependent on exports.

Looking at Mexico and Canada – combined into NAFTA in the table – we see the US shock leading to substantial drops in both GDP and exports. GDP in Mexico and Canada falls by 0.22% and exports by 0.76%, reflecting the very large share of these nation's exports that go to the US. Note that NAFTA imports fall by only 0.14%, but this is still larger than any other region because of relatively strong intermediate goods linkages within North America. Elsewhere, the US shock has more modest effects on GDP and exports abroad.

The simulation results for a hypothesised drop in EU by 1% are presented in the last three columns of Table 1. The results are broadly similar, but with Eastern Europe taking the place of NAFTA.

Sector-specific shocks

We believe that these effects, induced by a symmetric demand shock hitting all sectors equally, greatly understate the true role of trade in transmitting the global recession. In the current global downturn, there is ample evidence that some sectors have been hit harder than others.

The manufacturing sector, in particular, has suffered more than overall GDP in most countries. This asymmetry is important because manufacturing is more intensively engaged in trade and international production networks than the rest of the economy.

To assess the effects of an asymmetric sector-level shock, we consider a second exercise in which we hit only industrial sectors (i.e., manufacturing, construction, and utilities) with a shock calibrated to generate a 1% decline in aggregate final demand, thereby matching the overall decline in the first exercise. Table 2 presents the results.

Turning first to the simulated results of a shock of this type that affects only the US (see first three columns of Table 2), we note immediately that, in comparison with Table 1, the effects on exports are considerably larger, usually about three to four

Table 2. Impact of a decline industry equivalent to a -1% aggregate demand shock

Change in (percent) : Country/region:	(A) in USA Exports	GDP	(B) in EU Imports	Exports	GDP	Imports
China	-0.95	-0.27	-0.31	-0.53	-0.15	-0.17
Japan	-0.87	-0.10	-0.14	-0.44	-0.05	-0.07
USA	-0.29	-0.70	-2.71	-0.45	-0.04	-0.04
South America	-0.90	-0.17	-0.17	-0.47	-0.09	-0.08
Emerging Asia	-0.69	-0.24	-0.29	-0.45	-0.16	-0.18
Emerging Europe	-0.23	-0.06	-0.06	-1.30	-0.34	-0.32
EU (as of 2003)	-0.63	-0.08	-0.08	-0.13	-0.77	-1.69
NAFTA (excl. US)	-2.34	-0.58	-0.66	-0.16	-0.04	-0.04
The rest of the world	-0.61	-0.14	-0.10	-0.77	-0.17	-0.13

Source: Authors' calculations

times larger. For example, NAFTA exports fall by 2.34%, in contrast to the 0.76% fall in the symmetric shock case. This magnified effect stems, by and large, from the fact that industrial goods tend to be more widely traded than non-industrial goods and services. Additionally, exports by China and Japan fall by about 0.90% each.

With the export declines about three to four times larger, it is no surprise that the GDP declines in the different regions are also about three to four times larger than in the symmetric shock case. For example, GDP falls by 0.27% in China and by 0.58% in the NAFTA countries. Finally, the import effects are also considerably larger. This primarily reflects the fact that a larger decline in exports implies, through the imported intermediate linkages, a larger decline in imports.

The results for the EU shock, shown in the last three columns of Table 2 are broadly similar. These results are evidence that the international transmission mechanism can be quite strong when shocks are concentrated on internationally engaged sectors.

Simulation of industry-specific shocks in a world without vertical linkages

In the third exercise, we attempt to assess the importance of the imported intermediate linkages by conducting the following counterfactual. Suppose there are no imported intermediate linkages. Rather, all international trade is trade in final goods.[10] We feed an industry-specific demand shock through this counterfactual model as in the previous scenario. Table 3 presents the results.[11]

Looking at the effects of a US shock in Panel A, we highlight first that US exports now experience zero decline. To understand this result, note that because the shock

10 We implement this counterfactual by re-defining all imported intermediates as imported final goods, and by "zeroing" out the imported intermediates matrix. In doing this, we preserve gross output, exports and imports, but value-added is no longer consistent with the original matrices. No rearrangement of the input-output tables that eliminated imported intermediate linkages can preserve all the variables.

11 We do not examine GDP, because our counterfactual leads to pre-shock GDPs that are no longer consistent with the original GDP (see footnote 8)

Table 3. Decline in industry sectors equivalent to -1% aggregate demand shock with no intermediate input linkages

	(A) in USA		(B) in EU	
Change in (percent) : Country/region:	Exports	Imports	Exports	Imports
China	-0.64	0.00	-0.30	0.00
Japan	-0.55	0.00	-0.21	0.00
USA	0.00	-1.82	-0.20	0.00
South America	-0.29	0.00	-0.16	0.00
Emerging Asia	-0.40	0.00	-0.21	0.00
Emerging Europe	-0.09	0.00	-0.76	0.00
EU (as of 2003)	-0.36	0.00	0.00	-0.86
NAFTA (excl. US)	-1.56	0.00	-0.05	0.00
The rest of the world	-0.23	0.00	-0.25	0.00

Source: Authors' calculations

begins with US domestic demand, only US imports fall when all trade is in final goods. As discussed above, US exports can only be affected by US demand shocks through imported intermediate goods linkages in our framework, which have been eliminated in this counterfactual scenario. In the other countries and regions, export declines are typically one-third to one-half lower than in the second exercise. As a corollary to the zero decline in US exports, imports are unchanged in all regions other than the US. This again is due to the fact that other countries would only suffer a decline in imports if the production of their exports required imported intermediates. Hence, we can interpret the declines in imports in the previous exercises as the effect of vertical specialization. The results for the EU are again broadly similar.

Final notes

We believe that our analysis points to the importance of cross-country intermediate input linkages. It also points to the importance of specific sectoral shocks. We suspect that our framework understates the importance of these linkages, because, as we noted, we employ an accounting framework that does not capture feedback effects from final demand shocks to other countries' final demand. If these feedbacks were operative, there would be additional transmission of demand changes via imported intermediate input linkages. Last, it should be noted that our results suggest that much of the trade collapse is a result of falling final demand. Thus, as demand recovers, we expect trade to recover as well.

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10. Follow the bouncing ball – trade and the great recession redux

Joseph F. Francois and **Julia Woerz**
Johannes Kepler University and CEPR; Oesterreichische Nationalbank

By some measures, the trade collapse that started in late 2008 has shifted into a rapid recovery phase. The simplest explanation that fits the facts is that trade has followed the sectoral composition of the recession. The recession has been hardest on heavy manufacturing – machinery, vehicles, and related raw materials. This has translated into a deep manufacturing recession and an even deeper drop in trade. US and Chinese data show that these sectors are far more important in the composition of trade than they are in the composition of GDP.

The current recession has been accompanied by dramatic changes in trade. Figure 1 presents the pattern of OECD trade as the crisis unfolded.

There is a time lag in these data and real-time analysis that followed it.[1] The trends in trade in late 2008, first spotted in early 2009, invited a mix of consternation and hyperbole in the business and economics press and blogosphere alike. Through the summer of 2009, discussion ranged from worries about export credit shortfalls to resurgent import protection. The focus has been on finding the cause, and the assumption has been that the collapse in trade is unprecedented, inconsistent with the general level of economic downturn, and indicative of a trade-related set of problems calling for trade-specific solutions.

There may actually be two puzzles:

- The dramatic fall in trade as the recession deepened, and
- The apparent rebound in trade in the most recent data.

What we may be witnessing is an exaggerated collapse and bounce, greater than the corresponding drop and recovery in OECD GDP levels. Applying 'Occam's Razor', the simple explanation fits the data nicely – trade has followed the sectoral composition of the recession.

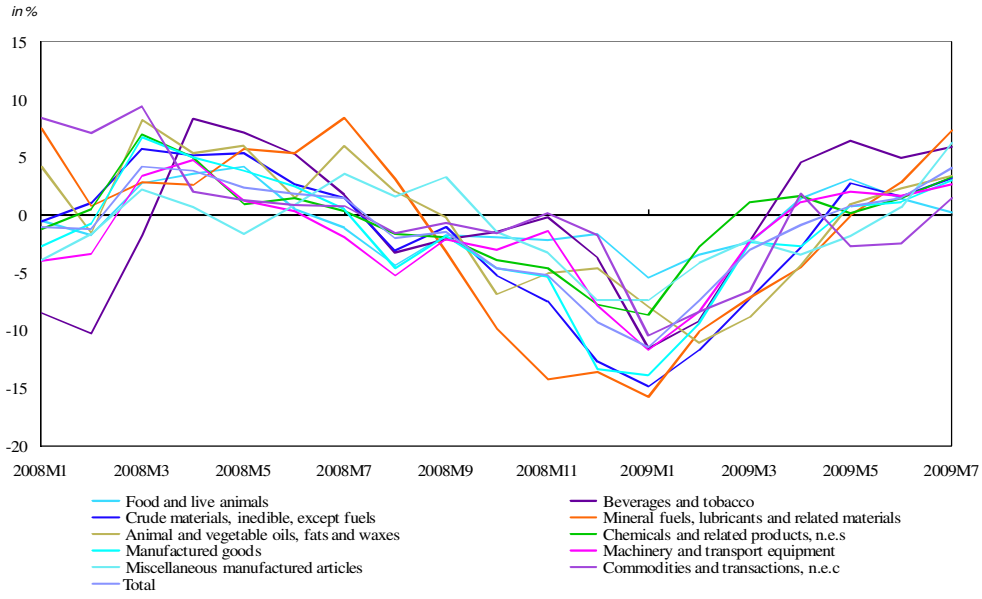
The composition effect

In the emerging academic literature on trade and the crisis, the papers closest to the points we highlight here focus on the sectoral composition of the downturn and trade.

One set of explanations for the increased sensitivity of trade to GDP swings includes

1 This chapter builds on our earlier VoxEU column, Francois and Woerz (2009)

Figure 1. OECD import growth (month on month, 3-month moving averages)



increased complexity in production. Freund (2009), for example, highlights fragmentation in production. She also notes that durable goods are most affected, historically, by financial downturns. This includes iron and steel. McKibbin and Stoeckel (2009) work with a CGE model modified to include elements of the financial crisis. They find that the drop in durables is much higher than for non-durables. In addition, the bursting of the housing bubble was identified as being most responsible for the drop in consumption and imports, while the change in the assessment of risk was largely responsible for the drop in investment. Also working with a CGE model, Bénassy-Quéré, Decreux, Fontagné, and Khoudour-Castéras (2009) emphasize that a large part of the recent drop in the level of trade is linked to price rather than volume effects. They also stress the importance of using appropriate price deflators. GDP price deflators can lead to substantial overestimating of trade volume changes in economic downturns. Willenbockel and Robinson (2009) also use a CGE model, focusing on developing countries and the collapse in global commodity prices as the downturn unfolded. Borchert and Mattoo (2009) focus instead on the relative stability of trade in the crisis. Indeed, in the case of India, the relative service intensity of India's trade profile served to dampen swings in total trade during the crisis.

Figure 2 presents a quarterly breakdown for the US of GDP and export trends as the recession unfolded in 2008 and early 2009. In the first quarter of 2009, GDP was down at an annual rate of 6.5%, while exports fell 29.9% at an annual rate. The key point is the composition of the fall in US GDP. The production of goods was down at an annualized 16.4% in the fourth quarter of 2008 and another 8.7% in the first quarter of 2009. Services production, on the other hand, only fell at an annualized 0.9% in the first quarter of 2009. Correspondingly, the exports of goods were down a striking 25.5% in the fourth quarter of 2008 and 36.9% in the first quarter of 2009, while services exports fell at a rate of 13.6%, roughly one-third of the fall in goods trade in the same period.

Figure 2. Quarterly changes in U.S. GDP and exports, annual rate

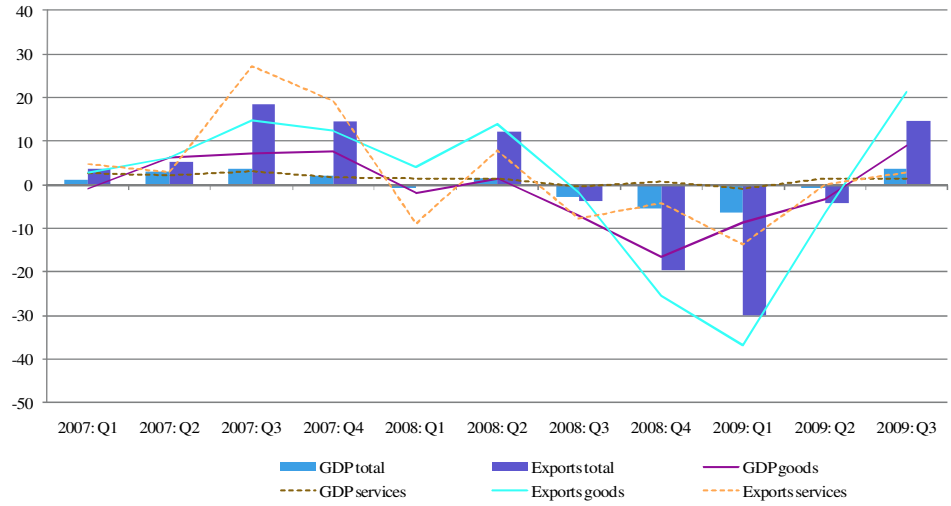
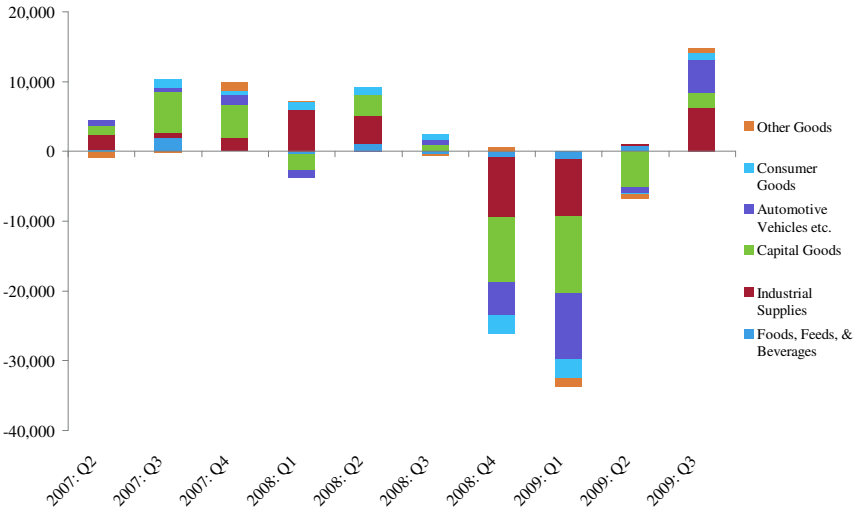


Figure 3. Quarterly changes in US goods exports by major use category, millions 2007 dollars



This pattern is similar to the observations made by Borchert and Mattoo (2009) regarding India. Even at this level of aggregation, it is clear that the goods side of the US economy has been hit harder than the services side, both in terms of production, and also trade volumes.

A more detailed decomposition of production and trade

Figure 3 presents the change in real US goods exports by quarter, in 2007 dollars, by major end-use category. The key points are:

- Almost all of the drop has been in investment and durable goods, and industrial supplies.
- Motor vehicles alone account for roughly one-third of the total decline.

Basically, the recession has been hardest on heavy manufacturing – machinery, vehicles, and related raw materials. This has translated into a deep manufacturing recession, and a correspondingly deep drop in trade.

- On the import side, roughly half of the drop in US import values at the depth of the trade collapse was actually due to a drop in raw materials like oil (Francois and Woerz 2009).
- The drop in motor vehicle trade actually maps almost exactly to the drop in US production (more on this below).

The compositional effect

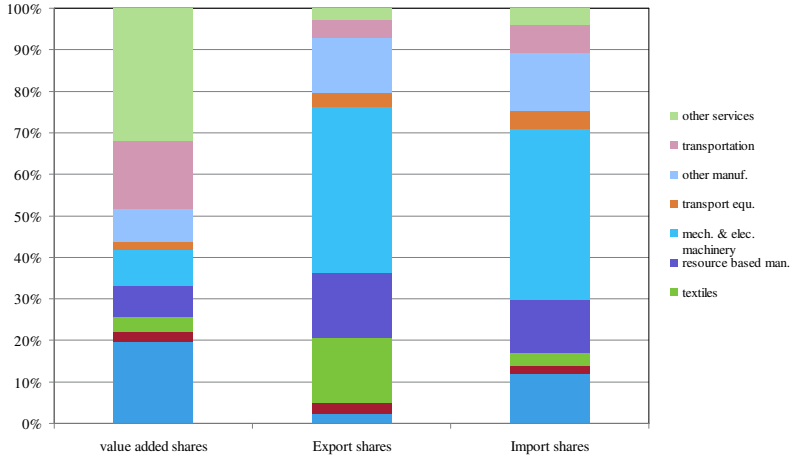
An important point to keep in mind is that manufacturing has a much greater weight in total trade values than it does in value added. While this is obviously true for the OECD countries (where services are typically 70% of value added but only 20% of trade values), it also holds for major developing economies as well.

This is illustrated in Figure 4, which presents a breakdown of China's patterns of production and trade by major sector.

The first column presents value-added shares, while the second and third present export and import shares. The salient features are:

- Transportation and other services account for almost half (48%) of value added in China, but only 11% of imports and 7% of exports.
- Mechanical and electrical machinery dominates both imports (41%) and exports (40%) yet is only 9% of value added.
- Textiles and clothing, and resource-based manufacturing, account for another 31% of exports, yet only 11% of value added.

Figure 4. China: structure of value added and trade in 2004



Indeed, a great deal of China's value added is in sectors that, on a gross value basis, contribute relatively little to the external accounts.

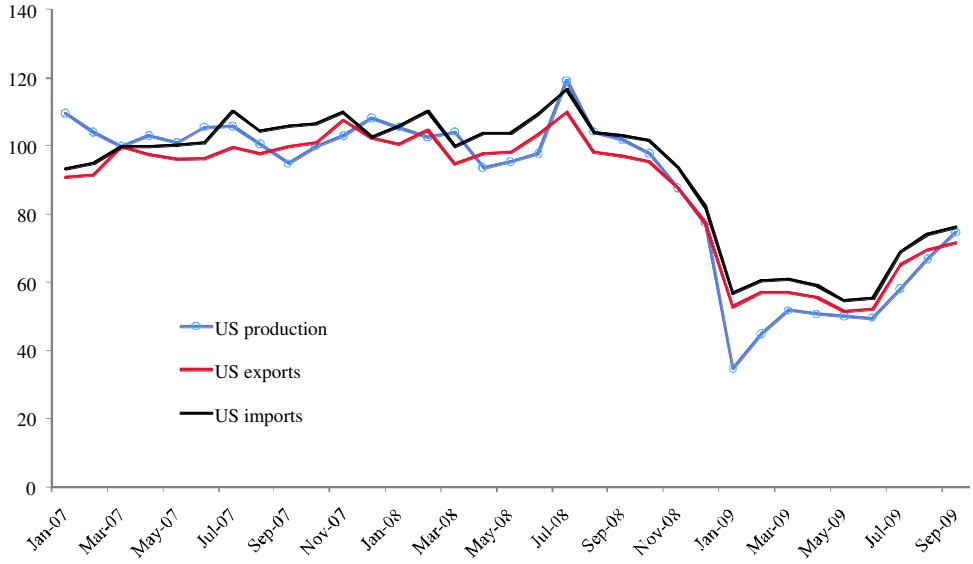
Like the OECD, such patterns mean that for China, a global recession that hits industrial goods sectors the hardest will also have a disproportionate impact on trade relative to GDP. In contrast, for countries where, for historical reasons, value added is concentrated in industrial supply and machinery sectors (like much of Eastern Europe), the impact of the recession on GDP has been much greater.

Detailed finding from the US auto sector

Finally, Figure 5 presents the evolution of US production, imports, and exports in the motor vehicles sector. These are all indices of production, and so reflect "real" trends from 2007 to 2009. Production is based on the number of vehicles, while the trade data are deflated using BEA real and nominal price data for Census-based trade categories.

What is clear from the figure is that, at the sectoral level, we have an almost exact mapping between trade and production trends. The collapse of US trade in motor vehicles corresponds to the global crisis in the vehicles sector. Because the motor vehicle sector is a large share of US trade, this has also helped drive the collapse in total US trade (again, see also Figure 4). Indeed, the recovery of US vehicle trade in the third quarter of 2009 – as restructuring has progressed and credit lines have been re-established – has also contributed to almost half of the annualized 21.4% increase in US goods exports in the third quarter of 2009.

Figure 5. US production and trade in motor vehicles, March 2007=100



Public policy questions

There are potentially important public policy questions lurking behind the trade-recession linkages.

- Has the recession been compounded by a set of trade-specific problems and issues? If so, how big are these, and should we be worried?

In confronting these questions, we need to be careful when comparing real and nominal changes in trade.

We have clearly witnessed a dramatic drop in world trade, and may also see an equally dramatic surge. For policy purposes though, an important question arises:

- Is the decline out of line with the global shock to GDP and the underlying credit crisis?

At the moment, trade seems to be a victim, but one that reflects non-trade weaknesses in credit and demand. The countries with the greatest trade shocks were also more exposed to sectors hit hard by the recession. They are victims, so far, of the general pattern of recession rather than of systemic protection.

Remaining risks of protectionist pressures

This does not mean we should let down our guard against protection. There may be risks for protection on the upside of the trade cycle that did not materialize on the downside. Antidumping regimes are backward looking, using recent trends in data to establish causal links between injury and trade.

If trade surges on the upside as rapidly as it fell on the downside, it may be relatively easily to establish spurious links between recovering import volumes and recession-related ill health at the firm level. Indeed, there is evidence that findings of injury in past business cycles have been a function of general macroeconomic conditions in both OECD and developing country regimes. (Feinberg 1989, Knetter and Prusa 2003, Francois and Niels 2006). So, while the cure for the symptoms lies in curing the underlying illness – recession linked to a deep credit crisis – it is important to maintain a rearguard action on the import protection front.

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11. Resilient to the crisis? Global supply chains and trade flows

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The precise role of supply chains in the trade collapse is an unsettled matter. This chapter marshals evidence behind the notion that trade within international supply chains has been more resilient than other trade during the great trade collapse.

According to the most recent IMF estimates (IMF 2009), the ongoing recovery will drive a wedge between output and trade. Output is supposed to shrink by 'only' 1.1% at the end of 2009 (-3.4% in advanced economies), but world trade is forecast to still experience a drop of -11.9%. While other estimates put the latter figure at -9% (WTO, World Bank), it is indisputable that during 2009 official figures recording trade flows will fall much more than GDP.

Apart from its magnitude, the fall in trade in 2009 has also been quite homogeneous across all countries (more than 90% of OECD countries have exhibited simultaneously a decline in exports and imports exceeding 10%, as noted by Araujo and Olivera Martins 2009). This fall has also been very fast, with trade virtually grinding to a halt in the last month of 2008[1]. These facts led Baldwin and Evenett (2009) to qualify the drop in trade during the crisis as "severe, sudden and synchronised".

It's the global supply chain, stupid! Or is it?

A number of transmission mechanisms have recently been proposed to account for these three attributes of the contraction of trade flows, many of which impinge upon the role that global supply chains might have played in exacerbating the drop in global demand.

The basic argument is that in a world characterised increasingly by vertical specialisation, goods are produced sequentially in stages across different countries – so-called international supply chains. The constituent parts and components of a final good crosses borders several times before the final product reaches the consumer; at each border crossing, the full value of the partially assembled good is recorded as trade. As a result, for a given reduction in world income, trade should decline "not only by the value of the finished product, but also by the value of all the intermediate trade flows that went into creating it".

1 The annualised rates of growth between October and December 2008 were -43% for the US, -81% for Germany, -38% for China (Yi, 2009), with an OECD average negative growth rate between October 2008 and March 2009 of -21% (Araujo and Oliveira Martins 2009).

O'Rourke (2009), with his Barbie-doll example, has been the first to doubt whether, as a result of fragmentation, changes in world trade should necessarily outweigh changes in world GDP.[2] Even if the Barbie parts cross the border twice in the production of a final doll that sells for $20 in the US, the final sales and total trade should contract by the same percentage; a 50% drop in US Barbie sales reduces world Barbie trade by 50%.

More recently, Fontagnè et al. (2009a) have provided a more structured analysis confirming the insight of the Barbie-doll example. First of all, they give a very simple accounting example showing that, if relative prices are held constant, fragmented trade flows within global supply chains should react proportionally to a fall in world GDP. Then they validate and generalise this finding via a simulation based on a multi-country, multi-sector CGE model. Their simulation shows that, if all trade flows are deflated by their specific prices (rather than the world GDP deflater) and GDP flows are aggregated at the world level using current exchange rates (as done for trade flows) rather than PPIs, the measured drops in trade volumes and GDPs converge to roughly comparable values, -2.4% and -2.6% respectively.

This implies that the extensive presence of supply chains does not automatically explain why world trade overshot the world GDP drop; other explanatory factors are needed. These may include:

- The collapse in internal demand and production, affecting current and future level of (tradable) inventories worldwide;
- Fiscal stimulus plans with a relatively stronger support of non-tradable sectors, like construction and infrastructures (Bénassy-Quéré et al. 2009);
- The rise of 'murky' protectionism; and
- The problems of trade finance with financial spreads still well-above 'normal' (i.e. pre-crisis) market rates (Auboin, 2009).

Trade finance and liquidity constraints

Do the above arguments mean that global supply chains are totally neutral as a transmission mechanism of the crisis from GDP to trade? Of course not. In all likelihood, however, the channels are much more complex than originally thought, and entail important compositional effects.

For the sake of argument, let us take the following story based on the idea that a relatively large part of the overreaction of trade has been caused by the sudden drying up of liquidity in trade finance. Auboin (2009) notes that, in the second part of 2008, spreads on short-term trade credit facilities suddenly soared to between 300 to 600 basis points above LIBOR, compared to 10 to 20 basis points in normal times, leading to a virtual freeze of important trade deals throughout the globe, with supply chain operations being disrupted by lack of financing, especially for developing country suppliers.

Under this assumption we would have a scenario in which the liquidity channel

2 Kevin O'Rourke makes this point in a famous blog entry that uses the example of a Barbie doll; see http://www.irisheconomy.ie/index.php/2009/06/18/collapsing-trade-in-a-barbie-world/.

has led trade to overshoot the fall in demand, with the effect being larger within supply chains, as the trade financing of these operations is typically managed by large international financial institutions, particularly hit by the crisis.[3]

In this scenario, we would still obtain a severe, sudden and synchronized drop in trade flows, with the effects *correlated with* (but not *caused by*) the behaviour of global supply chains.

Moreover, under the same scenario, we would also observe that, during the crisis,trade falls more along the *intensive* margin (i.e. value per trader) than the extensive margins (i.e. number of traders). The reason being that, if the overreaction of trade was caused relatively more by liquidity constraints than by a disruption of supply chains, the above effects would lead to a reduction in the volume of trade, but not necessarily to a similar reduction in the number of traders worldwide.

This is exactly what Bricongne et al. (2009) find in a paper analysing the behaviour of French exporters during the crisis. Relying on monthly data for individual French exporters observed until April 2009, the authors find that the drop in French exports is mainly due to the intensive margin of large exporters, with small and large firms evenly affected once sectoral and geographical specialisation are controlled for. Interestingly, they also find that firms (small and large) in sectors more dependent on external finance are the most affected by the crisis.

Long-lasting relations

Equally plausible stories suggest that trade flows within supply chains are more, rather than less, resilient to large adverse shocks like the current crisis. Such resilience would derive from the fact that setting up organised supply chains entails some sunk costs, so firms would prefer to adjust the entire chain along the intensive margin (i.e. reducing volumes), rather than the extensive margin (i.e. disrupting part of the supply chain).

Moreover, even if some adjustment along the extensive margin has to be made (e.g. by dropping some suppliers), it could well be that some long-term contractual relationships within supply chains are more difficult to sever in the short run. Finally, it is also possible that large multinational corporations at the centre of several supply chains could alleviate the liquidity constraints of suppliers, thus protecting the entire supply chain from external finance shortages.

Although a precise distinction between general trade flows and those flows happening within supply chains is difficult to make, on the basis of the available macro data, the foregoing considerations are consistent with two pieces of evidence observed in US and European data.

3 Moreover in years before the crisis some supply chains had abandoned the traditional instruments of letters of credit, preferring to regulate transactions directly through an open account balance, given the abundance of liquidity. With the financial crisis, and the ensuing drying up of liquidity, those supply chains had to rely again on traditional instruments of trade finance (e.g. letters of credit), but at much higher costs.

New evidence

In Europe, the process of east-west integration has triggered the emergence of international networks of production involving, in particular, German and Italian companies investing in the new member states of Central and Eastern Europe (CEECs).[4]

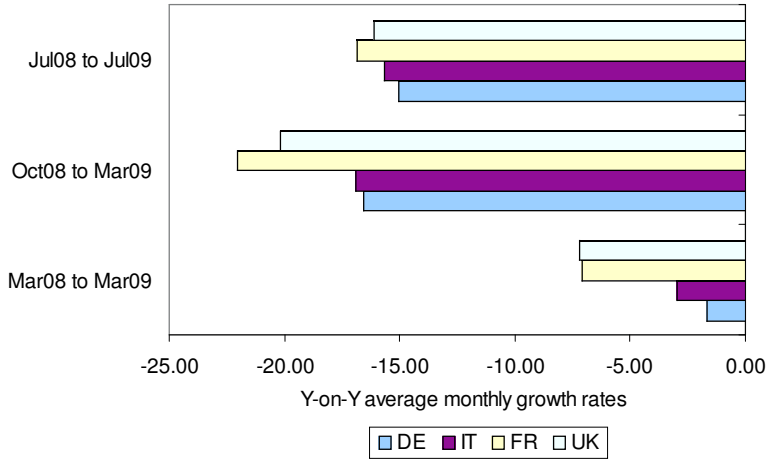
Figure 1 looks at the most recent trade data on average year-on-year monthly growth rates for the four biggest European economies (France, Germany, Italy and the UK), which are also the biggest exporters to the CEECs. At the world level, all these countries have experienced negative growth rates in their total exports, with little differences among them (average monthly rates ranged from -12% and -15% from July 2008 to July 2009.).

However, when looking at the trade flows with the CEECs, the figure shows that, until March 2009 (the worst moment of the crisis), Italian and German exports had fallen much less than those of France and the UK. Since trade between Germany, Italy and the CEECs takes place within supply chains to a larger extent than that of France and the UK, one may find here an indirect confirmation of the resilience of supply-chain-related trade flows during the crisis.

Clearly, resilience does not necessarily mean that trade within these international value-added chains is insulated from the crisis (differences between German and Italian trade flows on one hand, and French and UK ones on the other, have recently disappeared). The supply chain trade, however, might have reacted later to the shock.

Along the same lines, Bernard et al. (2009) analyse the behaviour of US exports at the time of the Asian crisis, when trade slumped rapidly and trade finance was also severely hit. They show that, overall, US exports to Asia declined by 21% between 1996 and 1998, while exports to the rest of the world increased by 3%. Within Asia,

Figure 1. Growth rates in exports to Central and Eastern Europe



Source: Authors' calculations on Eurostat data

4 Germany and Italy are the two largest investors in Central and Eastern Europe, and their trade flows with the area, contrary to other EU countries, are mainly driven by trade in intermediates.

however, the decline in arm's length exports was substantially greater than the drop of trade undertaken within supply chains (-26% versus -4% by 1998), while two figures evolved in a similar way in the case of exports to the rest of the world. This is again evidence consistent with the idea that, in a crisis context, trade undertaken within supply chains does not necessarily overreact to a drop in demand, but rather exhibits some degree of resilience.

Special interests and sheer luck

While any conclusion must wait for more data to become available, there are good reasons to believe that the rise of global supply chains has not necessarily been the main cause of the recent "severe, sudden and synchronized" fall in global trade flows. Based on the available evidence, one may even be tempted to conclude that, under certain circumstances, international networks of production may also display some degree of 'resilience' to adverse shocks like the current crisis: supply-chain-related trade flows may react later (rather than sooner) to an adverse shock. Their fall may be smaller and, eventually, their recovery may happen faster relative to overall trade flows.

The observed resilience of supply chains may arise from some intrinsic attribute of production chains, as argued above. Alternatively, it may be the outcome of the political economy. Fearing that a collapse of supply chains would set off a sudden process of de-globalisation and implosion of international trade, governments may intervene in favour of supply chains. For example, the massive bail-outs of large financial institutions have helped their best customers, among them the big players within supply chains. Finally, of course, this indirect support of supply chains may have also been an unintended consequence of financial bailouts implemented for very different reasons.

De-regulation vs re-globalisation

There are too many blind spots in our current understanding of the nature and operation of international supply chains. Once data become available, the current crisis should give us material to substantially improve our understanding. In the end, it may well be that we discover that without supply chains, things would have been much worse than they actually were; and that this crisis may eventually boost rather than cripple the globalisation process.

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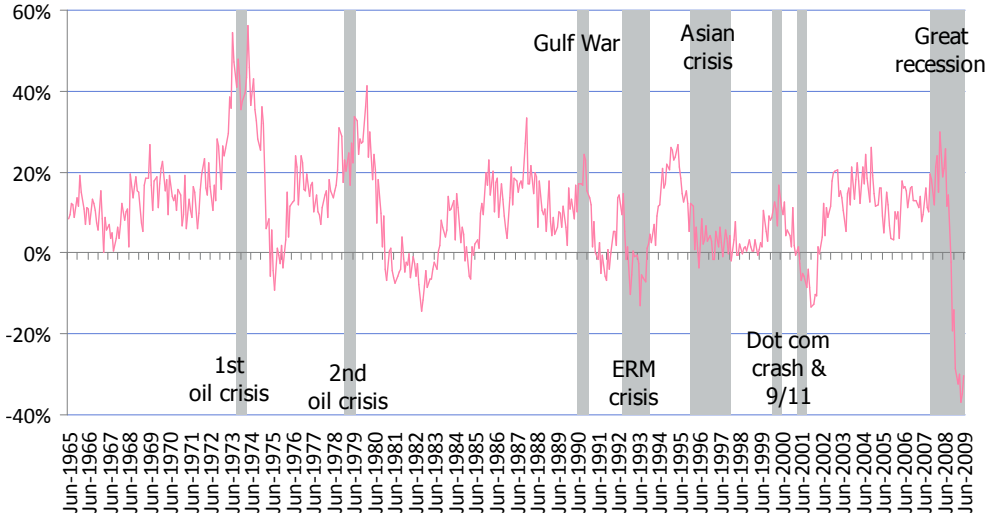
12. The Great Synchronisation: tracking the trade collapse with high-frequency data

Joaquim Oliveira Martins and **Sónia Araújo**
OECD

Using monthly trade data for OECD nations, this chapter first highlights the very exceptional nature of the great trade collapse. It then presents evidence to suggest that the magnitude of the global decline reflects greater synchronisation of trade flow declines across countries.

Trade flows during the global crisis have fallen much more sharply than they did during the Great Depression (Barry Eichengreen and Kevin O'Rourke 2009). Figure 1 depicts total trade for OECD nations' (nominal values) changes since 1965. Although there have been periods of sharp and sudden trade declines in the past, the one that took place at the end of 2008 is unique. After more than six years of positive trade growth, trade dived in October 2008, reaching a record negative growth of -37% in April 2009.

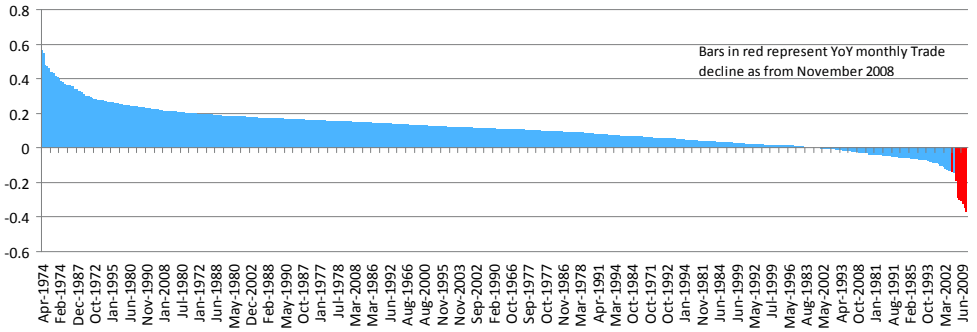
Figure 1. Trade, year-on-year monthly growth rates, January 1965 to June 2009



Note: the OECD 23 group excludes the Czech Republic, Hungary, Republic of Korea, Mexico, New Zealand, Poland and Slovak Republic. These 23 OECD countries represent the bulk of international merchandise trade (approximately 88% of total OECD trade and 71% of total world trade). The blue bands identify major turning points associated with crisis episodes.

Source: OECD MSIT database

Figure 2. Monthly year-on-year growth rates (sorted by decreasing order), January 1965 to June 2009



Note: Bars in red represent year-on-year monthly trade decline as from November 2008.
Source: OECD MSIT database

The magnitude of the current trade crisis stands out in comparison with previous drops in trade flows. Past crises averaged 13 months and -2% growth, with the worst negative growth rate being registered in October 1982 (at -14%).[1] In comparison, the average negative growth rate between October 2008 (the first month of negative year-on-year growth rate in trade turnover for the 23 OECD economies) and June 2009 was -25%.

Such drops in nominal trade values are rare events. Of the 534 months from January 1965 to June 2009, trade growth was negative in only one-sixth of the months. Today's trade collapse is extraordinary in its magnitude and duration. Figure 2 plots all of the 534 monthly growth rates – sorted by size, not chronologically – with the changes in OECD trade since November 2008 shown in red. The seven months since October 2008 are in a class of their own: they are the seven biggest monthly drops since 1965, and the only ones where the drop exceeded 20%.

A large, although less unique, fall for individual countries

When looking at trade series for individual countries, the current collapse also appears to be the sharpest by historical standards, though perhaps in a less unique way. Several OECD countries have experienced drops of large magnitudes in the past. In July 1993, France's total trade decreased by 23% relative to its value in July 1992. In the same year, trade declined by more than 20% in January and July in Italy, and in Germany, with Italy registering four more months of negative trade growth below 20%. In Japan, trade dropped by approximately 25% relative to the same month in the previous year in December 2001. In the US, trade dropped by 34% and 24% in

1 Here, periods of trade crisis are identified as periods of negative growth, which end in the month predating three consecutive months of positive trade growth.

January 1965 and 1969, respectively.[2]

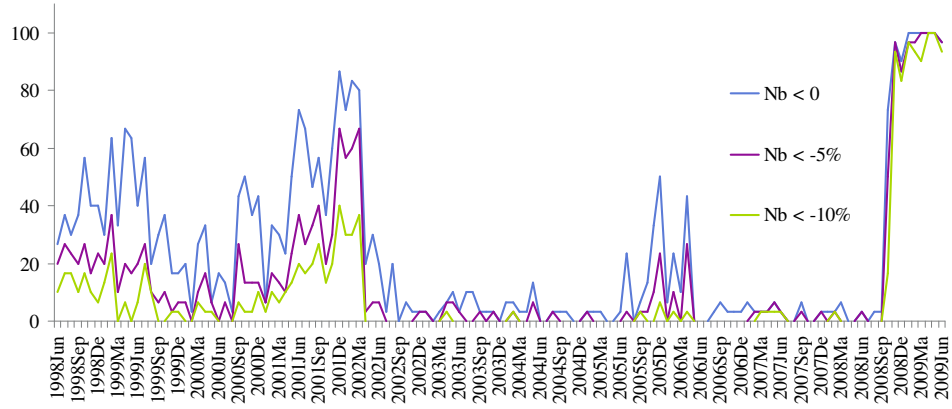
Araújo and Oliveira Martins (2009) published a similar analysis in July 2009. At that time, however, trade data were only available up to March 2009 and the collapse of trade, by individual country, did not emerge in the same way as the most recent figures. This means that in the early months of the crisis most of the pattern observed at the aggregate level was due to a very strong synchronisation of the trade drops across countries.[3] During the first half of 2009, the crisis propagation mechanisms strengthened and country collapses became much larger, reaching nearly -40% in several cases.

The global trade collapse is uniquely synchronised

Figures 3 and 4 illustrate how strikingly synchronised the collapse has been. The figures display, for exports (Figure 4) and imports (Figure 5), the percentage of OECD countries that exhibit monthly year-on-year trade growth rate that is either: (i) negative; (ii) below -5%; or (iii) below -10%.

This remarkable degree of synchronisation emerges rather neatly. Althoughthere have been previous episodes of synchronised trade declines, namely following the 'dot.com' crisis in 2001, the fraction of nations with negative trade growth by the end of 2008 is astounding. More than 90% of OECD countries simultaneously exhibit a decline in exports and imports exceeding 10%. This share reached 100% at the end of the 2009Q1.

Figure 3. "Great Synchronisation": % countries with negative export growth



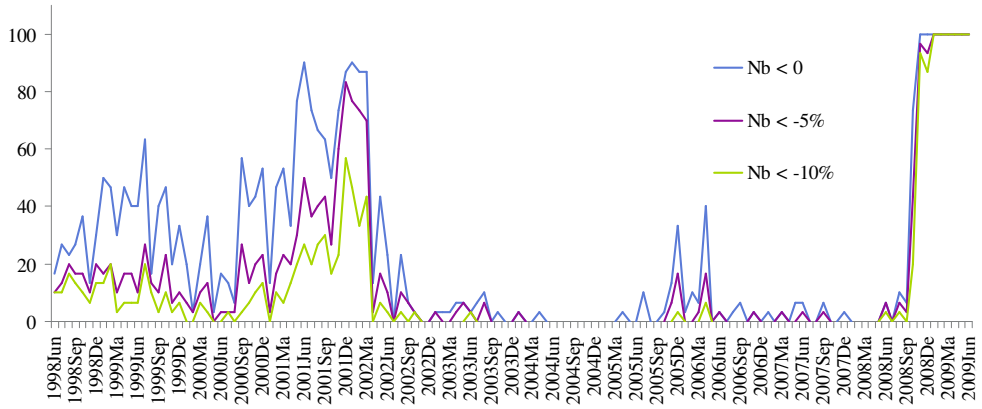
Note: The analysis includes all 30 OECD member countries since January 1998.

Source: OECD MSIT database

2 Note that months of negative growth below 10% are much more frequent: 35 for Italy, 34 for France, 32 for Japan, 29 for Germany and the UK and 23 for the USA, while total trade for the 23 OECD countries under analysis dropped by more than 10% in 13 of the 531 months between January 1965 and March 2009, inclusive.

3 See Burstein et al. (2008) for a discussion on international trade propagation mechanisms.

Figure 4. "The Great Synchronisation", % of countries with negative import growth



Note: The analysis includes all 30 OECD member countries since January 1998
Source: OECD MSIT database

Not only are the drops large, but they have also been longer lasting than usual. Drops in exports growth of more than 10% occurred in more than 90% of the OECD countries in seven out of the nine months since the beginning of the 'trade crisis' (Oct 2008 – June 2009). On the import side, all OECD countries have registered negative growth values of more than 10% since January through to June 2009. In summary, it is the synchronised and large drop in trade, in every OECD country, that explains the collapse in international trade.

Which sectors have contributed the most to the trade collapse?

The current trade collapse has not occurred evenly across all products. Table 1 displays the contribution of the top four product categories to the collapse, from the first quarter of 2008 to the first quarter of 2009. The largest contribution is from the drop in 'machinery and transport equipment' – roughly one-third of the decline for the OECD. A possible explanation for this pattern is the high degree of fragmentation in

Table 1. Top-4 contributions to trade decline by product categories, 2009Q2 to 2008Q2

Product categories	US	Germany	Japan	OECD Total
Machinery and transport equipment	-11.4%	-14.1%	-15.5%	-12.3%
Mineral fuels & related products	-9.4%	-3.4%	-9.5%	-6.9%
Manufactured goods	-4.0%	-6.1%	-4.2%	-5.9%
Chemicals & related products, n.e.s	-1.8%	-3.5%	-1.6%	-2.9%
Memo item: all other SITC categories	-4.7%	-6.4%	-3.9%	-5.7%
Total	-31.4%	-33.6%	-34.7%	-33.7%

Note: Contribution of each product category to the aggregate growth rate.
Source: OECD MSIT database

this sector's production chains (Escaith and Gonguet 2009). Additional factors could be the excess supply existing in mature OECD automobile markets, as well as the end of a technological product cycle in the automotive industry. Another sector that has contributed significantly to the collapse is 'mineral fuels and related products'. Here both price and demand volume effects associated with the economic recession explain most of the larger drop.

Service trade has been more resilient than trade in goods

Using quarterly data from the OECD Balance of Payments database, we see that the impact on traded services has been quite different. Trade in services also exhibited a synchronised decline in the last quarter of 2008. The decline in services, however, has been much less sharp than the decline in goods. In the last quarter of 2008 and the first quarter of 2009, trade in goods and services declined at similar rates in only a small group of OECD countries (Korea, New Zealand, Norway and Poland). In the second quarter of 2009, exports and imports of both goods and services seem to be rising in a few OECD countries: Austria, France, Germany, Ireland, Netherlands, New Zealand, Portugal and Sweden. In Hungary and Spain, only exports are increasing. In the UK, all series seem to be rebounding, with the exception of services' exports, which seems to have stopped its downward trend. In other countries, services appear to be more resilient, as their exports and imports of services exhibit, in the second quarter of 2009, an upward trajectory compared with their trade in goods. The latter are still declining or stagnating. This is the case for Canada, Finland and Italy.

Summary

While several culprits have been proposed to explain the current trade collapse (e.g. the credit crunch, global production chains, generalised loss of confidence), the great synchronisation underlying the collapse suggests that it is very probably their interaction, rather than each individual effect, that might best explain why international trade has taken such an epic hit in this global crisis.

The high-frequency pattern of trade flows also reveals systemic propagation effects during the crisis that would be interesting to analyze further, as well as new patterns in the structure of trade flows. All these issues open interesting research questions for international trade economists.

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13. Banking crises and exports: Lessons from the past for the recent trade collapse

Leonardo Iacovone and **Veronika Zavacka**
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Was the global credit crunch a cause of the great trade collapse? This chapter examines twenty-three historical banking crises and shows that export growth was particularly slow in sectors reliant on external finance. The findings suggest that negative demand shocks are amplified by banking crises, particularly in durable goods industries. The same combination of factors (financial constraints coupled with a demand slump) may have been central to the great trade collapse

For most countries in the world, this is not a financial crisis – it is a trade crisis. In 2009, for the first time since 1982, global trade flows will not grow. The latest IMF projections expect global trade in goods and services to drop by 11% this year and stagnate next year. This collapse in trade has spread the global recession far beyond the relatively few nations whose banks were involved in the financial wizardry that sparked the crisis.

The size and synchronicity of the trade collapse raises new and pressing questions concerning the relationship between banking crises and exports growth (Freund 2009a).

- Are the supply shocks stemming from the banking system and credit markets responsible for the export decline?
- Or, is what we observe completely attributable to the demand side, where we have also observed unprecedented drops, particularly in developed countries?

This chapter tackles these questions from the perspective of historical crises that occurred between 1980 and 2000.

Supply-side effects of credit crunches on exporters

Financial constraints that arise during periods of banking crises are important for all producers, but they are particularly relevant for exporters who, in addition to production costs, have to face the additional expense of penetrating foreign markets – a fact well documented by various firm-level studies (Roberts and Tybout 1997, Iacovone and Javorcik 2008, Muuls 2008). Additionally, exporters are likely to be more exposed to financial shocks than domestic companies because international transactions normally involve higher working capital requirements and default risks (Auboin 2007).

Previous industry-level studies have shown that countries with more developed financial systems can develop comparative advantages in industries that rely more on external finance or tend to have lower shares of tangible assets (Manova 2008, Beck 2003). The latter matters. When financial markets are not sufficiently developed, industries with above-normal shares of tangible assets tend to have an advantage in accessing finance. At the same time, it has been shown that – in countries with less developed financial systems – sectors that rely more on trade finance (as opposed to bank finance) tend to grow relatively faster (Fisman and Love 2003).

Evidence from recent banking crises

To extend and update these analyses, we put together a database on 23 past banking crises episodes that occurred in developed and developing countries from 1980 to 2000.

We view the banking crisis as an adverse shock to that reduces the availability of finance from private banks to firms in the affected country. The spotlight is on how firms' export growth is affected by the crisis and how changes in export growth are related to firm characteristics. The key characteristics are the firms' ability to finance their operations through internal cash flow, their ownership of assets that could be used as collateral, and their sector's overall dependence on external finance.

We expect that growth in industries that are highly dependent on finance will fall when a crisis strikes, while the growth of other firms will be relatively unaffected.

There are two main lines-of-argument behind this a priori expectation that exporters will be more heavily affected in sectors with greater dependence on external finance. This first depends upon the general need for working capital. For any given exporter, financing production-related variable costs becomes increasingly difficult in a banking crisis period. The second is specifically related to exporting. New exports must pay a sunk cost in order to penetrate foreign markets. Thus the credit crunch may deter some firms that would have otherwise become exporters, or expanded the range of products export and range of destination markets. This reasoning also suggests that a firm's ability to provide collateral could become more important during a crisis. (See the original study, Iacovone and Zavacka 2009, for details.)

The results in Iacovone and Zavacka (2009) confirm that this is exactly what happened during the 23 banking crises under investigation. Specifically, the results show that during a crisis:

- The export growth of a sector with a relatively high reliance on external finance, such as electric machinery, is reduced on average by 4%, compared to a sector like footwear, whose dependence is relatively low.
- The exports of industries that tend to have more tangible assets grow relatively faster during a banking crisis; this confirms the hypothesis regarding the importance of collateral.
- Using a proxy for trade-credit dependence (Fisman and Love, 2003), we show that exports of industries that are relatively more reliant on inter-firm finance are less affected by a banking crisis.

A potential explanation for this finding is that some exporters may still be able to access trade credits, or favourable payment conditions, through their foreign counterparties, who, being located abroad, are probably less affected by the crisis (we look at country-specific crises – most of which affected only a handful of nations at most). The interpretation is that the inter-firm credit channel does not 'dry up' when a banking crisis strikes the exporting country.

The importance of demand shocks during a financial crisis

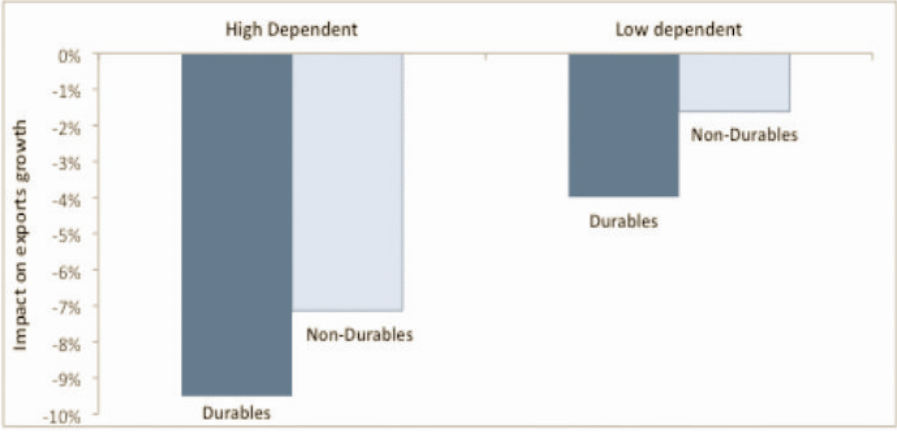
Even though banks were not adversely hit in all countries, the current crisis has affected import demand in most nations. For this reason it is important also to evaluate the effect of demand shocks.

In our study, we evaluate the demand channel by analysing how exports respond to GDP changes in export markets. We find evidence that demand shocks operate independently of, and in addition to, the financial channel.[1]

In fact, when a banking crisis is simultaneously accompanied by a drop in demand, the exporters are hit twice. Based on our results, Figure 1 simulates a situation in which a country simultaneously faces a banking crisis and a recession in its only importer. The drop of 2.8% that we choose for our simulation corresponds to the IMF projection for the US in 2009.

As the figure shows, the effect of finance is amplified by the demand shock, and the latter is particularly pronounced in sectors producing durable goods (e.g. automobiles, domestic appliances) whose growth drops by as much as 10%. Our finding is in line with the recent Vox column by Caroline Freund (2009b), which concludes that the impact of demand shocks on trade are particularly important in the context of global downturns.

Figure 1. Export collapse in response to financial and demand shocks



Source: Authors' calculations.

1 We build a "demand shock index" for each individual country at sectoral level equal to the weighted sum of GDP changes in export markets where the weights are equal to the relative exports share (for

Crises are not the same: Some countries are hit harder

It is important to mention two additional results, partly because they go some way towards confirming our hypothesis, and partly because of the potential implications with respect to the current crisis.

- The first result is that not all crises are the same; deeper crises have more profound consequences.

We use the GDP loss during the crisis as a measure of the deepness of the shock, and confirm that the deeper the crisis the more adversely exporters who rely on banking finance are affected.

- Additionally, we find that countries with a less developed financial system (generally the poorer countries) suffer more during a financial crisis.

The results show differential impacts for sectors that are highly dependent on finance, relative to those able to finance investments with internal funds, amongst countries with different levels of financial development. The impact on countries with less developed financial systems is clearly more negative than on countries with more developed financial systems.

Implications for the 2008-2009 crisis

Before discussing the implications that can be derived from our study for the 2008-2009 crisis, it is important to mention some caveats.

- First, our analysis focuses only on manufacturing industries; our results do not translate directly into conclusions regarding the effect of the crisis on trade flows of agricultural products or natural resources.
- Second, our analysis focuses on the "relative" impact of the crisis on sectors that are relatively more dependent on finance. Therefore our results do not have immediate implications for aggregate trade.

In fact, focusing on aggregate trade volumes, Freund (2009) finds that countries that had a banking crisis during past global downturns have not seen their exports decline by more than what was observed globally. This could be explained both by relative price changes, due to exchange rate movements, as well as by relative sectoral composition. In aggregate, therefore, the effect is not clear and is crucially dependent on the sectoral composition, as well as on external demand conditions surrounding the crisis.

Notwithstanding these limitations, there are several informative conclusions that can be derived from our study in order to help explain the sudden drop in trade that was initiated in the final quarter of 2008.

- First, the financial crisis that preceded the trade collapse can certainly be considered a systemic crisis in various countries; it reduced the confidence of financial institutions and sparked a severe credit crunch.

Despite the reduced availability of data to confirm the findings of our study, we expect that those sectors characterised by a high dependence on external finance, or those sectors with lower shares of tangible assets, are the ones more exposed to the crisis.

Recent work by Bricongne et al (2009) on the very latest data lends support to this conjecture. Specifically, they show that French firms in sectors that are more dependent on external finance have been hurt more.

Based on the evidence from Bricongne et al (2009), the latter adjustment at the extensive margin seems to be particularly relevant in the case of French firms. One possible reason, but with limited evidence, for the impact of the financial crisis on entry, could be due to the limited time-span of the data. In fact, it is likely that the fixed costs to enter export markets are paid more than one year before becoming an exporter, therefore suggesting that 2009 data are too premature to detect this effect.[2]

- Second, our results suggest that the inter-firm financial channel does not dry up in a crisis for exporters; we argue that is a consequence of the fact that importers were not affected simultaneously in the historical crises we studied. The financial crises were isolated events affecting one country, or a small group of countries at a time.

In such crises exporters – particularly those involved in international production chains – could rely at least partially on credit from trading partners abroad – as long as these did not face a crisis themselves (Kyotaki and Moore 1997).

The situation in 2008-2009, however, is different. The credit crunch was planetary; even normally deep-pocketed firms experienced a credit crunch, limiting their ability to support the rest of the supply chain.

However, the importance of trade credit as a channel affecting the current crisis has also been put under discussion by a recent study by Levchenko et al (2009). This paper analysed disaggregated US trade data in order to shed light on the anatomy of the recent trade collapse. It concluded that no support sectors that were dependent on trade finance, defined similarly as in our study, were more adversely affected during the recent crisis.

- Third, a key characteristic of the current crisis has been a sharp drop in demand, particularly in the US.

Our results show that demand shocks not only affect sectors more dependent on external finance, but more broadly have a negative impact on all sectors, and in particular, those producing durable goods.

This result may be important in understanding why almost all industries experienced trade collapses in the current crisis. The credit crunch amplified the demand drop in finance-intensive sectors, but demand drop hit all sectors. This is also consistent with Freund (2009), who points out that during global downturns sectors that produce durable goods have typically suffered the most.

A similar pattern has been confirmed by the preliminary analysis based on monthly data analysed in the "World Bank Trade Watch" by Freund and Horenstein (2009).

2 The existence of a preparation of period spanning more than one year before entering export markets is confirmed by Iacovone and Javorcik (2009).

These results show that in the US and Japan – for which high-frequency sectoral trade data are available – the main adverse effect has been observed in industries such as transportation and metals where external finance matters. Food products, by contrast, have been little affected. Bricongne et al (2009) find a similar pattern in the French firm-level data; the most affected sectors are investment goods and automobiles.

Conclusion

Our research on historical crises shows that demand shocks have amplified the effects of the financial crunch, producing particularly adverse effects on durable-goods sectors.

Although the data is so far scarce when it comes to the current trade collapse, we conjecture that the same combination of factors (financial constraints coupled with a demand slump) have been central to the great trade collapse – but this time it is operating on a vastly larger scale.

The global drop in demand has affected all industries, with very few exceptions, but it has been particularly harsh on sectors that produce capital goods and durables. In the current crisis the effect from finance and lack of demand has been most likely magnified by the presence of supply chains, thus deepening the impact on the global trade drop. Under a global financial shock, when financial constraints affect several, if not all firms along the production chain, shocks become easily transmitted and can potentially pull down the entire supply chain.

It is, however, difficult to evaluate whether the supply chain effects have primarily propagated through the financial or the demand side. In fact, many durable goods, such as cars or electronic appliances, are produced within global supply chains involving several countries. Therefore, under an adverse demand shock, when the demand for the final-durable good decreases, so does the demand for all intermediates, thereby substantially reducing global trade flows. Future research is needed in order to clarify the relative importance of these factors.

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14. Did trade credit problems deepen the great trade collapse?

Jesse Mora and **William Powers**
US International Trade Commission

The giant and global drop in trade was concurrent with an equally colossal and global credit crunch. Did the financial market turmoil directly disrupt trade by reducing the availability of trade financing? This chapter marshals the best available evidence on the importance of trade-credit financing as a cause of the crisis. Surveys of participants indicate that trade-credit problems were the number two cause of the trade collapse (after demand). Europe and North America experienced bigger problems early in the crisis, but by mid-2009, the problem was mainly felt in Eastern Europe and Africa. The scant direct evidence, however, suggests that the drop in trade credit was shallower than the drop in trade. Policy responses to shore up trade credit were early and massive; these may have dampened credit problems.

The collapse of Lehman Brothers in September 2008 is widely viewed as the spark that triggered the global economic crisis – what has come to be known as the "Great Recession." Global credit markets froze and this may have affected the specialized financial instruments - letters of credit and the like – that help grease the gears of international trade finance. Some analysts view this as contributing to the drop in global trade that occurred between the third quarter of 2008 and the second quarter of 2009 (Auboin 2009).

Careful research on historical episodes does reveal a link between credit problems and trade; see especially Amiti and Weinstein (2009) on the 1997 Asian crisis, and Iacovone and Zavacka (2009) on historical bank crises. Evidence presented in this chapter, however, suggests that declines in global trade finance have not had a major impact on trade flows. While global credit markets in general did freeze up, trade finance declined only moderately in most cases. If anything, US cross-border bank financing bounced back earlier than bank financing from other sources. Trade financing had at most a moderate role in reducing global trade.

Trade financing

It is challenging to disentangle supply and demand when it comes to trade and trade financing. Trade and trade financing plummeted; how can one know which caused which? (See Box 1 on the mechanics of how trade is exposed to financing shocks.) Much of the difficulty lies in the paucity of data.

The best available measures of trade financing add up to little more than 10% of global export values. Yet all exports must be financed, if only by the exporter itself. This means that the global reduction in trade financing must match the global reduc-

tion in exports.

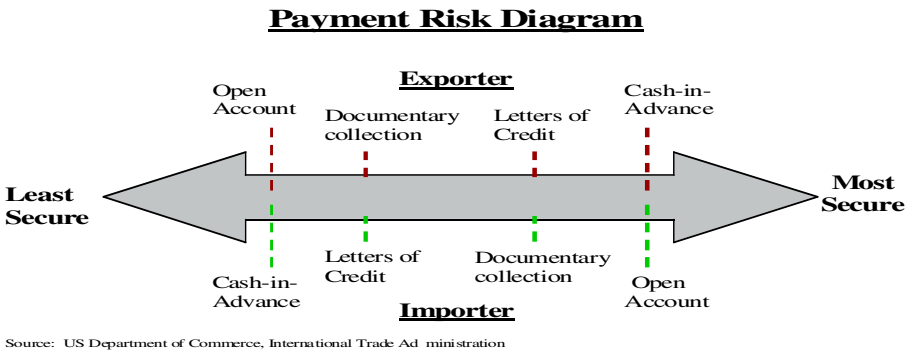
As mentioned, there are specific historical estimates of the impact of financial crises on trade. For example, Amiti and Weinstein 2009 use Japanese firm-level export data matched to the performance of the firms' banks to show that a damaged bank harmed its customers' exports even more than its customers' local sales. Drawing lessons, however, is perilous. The epicentre of this crisis was the global credit market, so the situation of global trade financing may be very different this time.

Box 1. Common types of trade financing and the risk for exporters

Worldwide, firms exported about $16 trillion of goods in 2008. Firms finance the majority of exports through open accounts, i.e. the importer pays for goods after they are delivered - just as is the usual practice for sales among firms in the same nation. This is the riskiest form of financing for an exporter (see diagram below). Estimates vary, but sources report that open accounts are used for between 40% and 80% of world trade (Scotiabank, 2007 and ICC, 2009a). Cash-in-advance, which is the least risky form of financing for exporters, accounts for a small share of total financing.

Banks finance the remaining 10% to 50% of global trade. Most bank financing involves a letter of credit; a transaction in which a bank assumes the non-payment risk by committing to pay the exporter after goods have been shipped or delivered. This method provides greater security to the exporter, and is particularly popular with small firms and in developing countries. Regardless of the type of financing used, exporters can also buy export insurance to reduce risk; about 9% of world trade was insured in 2008

The role of bank financing is increased if one includes working-capital loans, i.e. short-term loans used to buy the inputs necessary to produce goods ordered by foreign customers. Working-capital loans are more important for financing export shipments than for domestic shipments, because of the increased time between production and payment for exports. (Amiti and Weinstein, 2009)



Source: US Department of Commerce, International Trade Ad ministration

New evidence on trade financing

This section compares the timing and regional composition of global merchandise exports with available data on trade financing. The comparisons highlight several facts:

- Cross-border financial flows declined substantially from all sources. Declines of US-based financing were neither particularly early nor disproportionately large.
- Reduced trade financing played a moderate role in the trade decline. Banks and suppliers judge reduced trade financing as the number two contributor to the decline in global exports, after falling global demand.
- The crisis has led to a compositional shift in trade financing. Because of heightened uncertainty and increased counterparty risk, exporters shifted away from risky open accounts towards lower-risk bank-intermediated financing and export credit insurance.
- Trade and its financing rose in the second quarter of 2009 for both developed and developing countries. US-sourced trade financing may have returned to markets relatively early.
- Development banks and government agencies worldwide have played an important role in improving access to trade financing, aiding the recovery of trade.

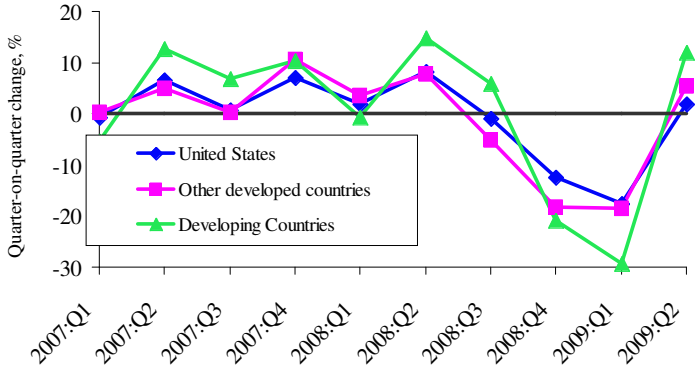
Trade and financing rose and fell together

Nominal global merchandise exports fell 32% between the second quarter of 2008 and the same quarter in 2009. Figure 1 breaks out the changes in more detail for the US, other developed countries, and emerging markets. Developed countries led the downturn, with export declines beginning in the third quarter of 2008. Emerging markets had a sharper downturn and faster recovery. Relative to other countries, US trade changes have been more gradual, with a shallower decline through the first quarter of 2009 and smaller gains in other periods.[1]

The decline in global banking activity preceded the failure of Lehman Brothers in September 2008, and so preceded the merchandise trade decline (Figure 2). The decline in global cross-border lending, and the subsequent decline in domestic lending in most countries, directly reduced the availability of funds for trade financing. Domestic lending also decreased throughout the world; for example, US commercial and industrial loans began to decline in the first quarter of 2009 (Federal Reserve, 2009). US-based international financial outflows recovered earlier than those of other countries, illustrating a return to interbank dollar-denominated lending, and highlighting the need for dollar funding even as real GDP around the world continued to contract (McGuire and von Peter, 2009).

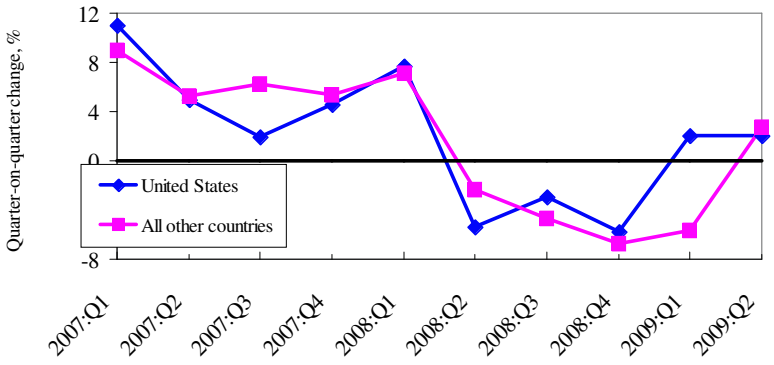
1 As noted, the trough in real US exports occurred later, in the second quarter, as did the trough in real world trade (CPB, World-Trade Database), but nominal values are presented here for comparison with the financial data below.

Figure 1. Global merchandise exports, 2007:Q1 to 2009:Q2



Source: IMF's International Financial Statistics.

Figure 2. External positions of banks, 2007:Q1 to 2009:Q2



Source: Bank for International Settlements

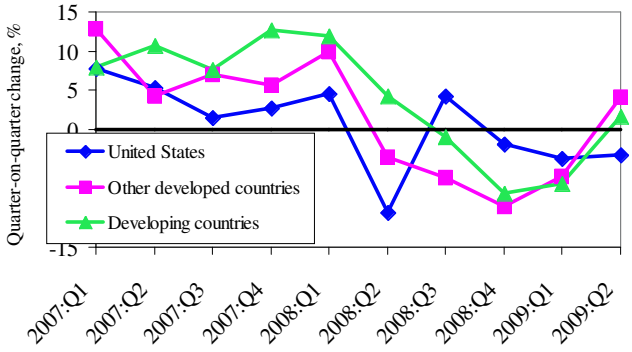
Cross-border lending (Figure 3) is more directly related to trade financing than global financial "positions", which include categories such as bank holdings of securities. Because much of trade is dependent on short-term lending (either directly through bank-intermediated export financing, such as letters of credit, or indirectly through working capital financing), the decline in short-term banking activity is also an important indicator (Figure 4). The key conclusion from inspection of these charts is that:

- The contraction of financial flows mirrors, but was shallower and more protracted than the decline in merchandise trade.

Strong demand supported trade financing during the crisis

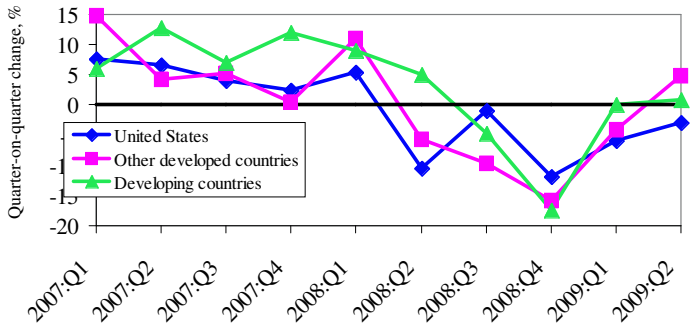
In many ways, the changes in trade financing during the crisis reflect conditions in overall credit and banking markets during the period. The cost of trade financing, for example, briefly reached several hundred basis points (bp) in some markets, reflect-

Figure 3. Loans received, 2007:Q1 to 2009:Q2



Source: Bank for International Settlements

Figure 4. Short-term financing received, 2007:Q1 to 2009:Q2



Source: Bank for International Settlements

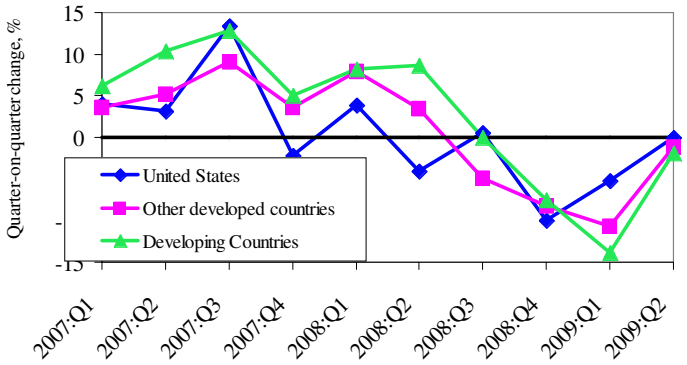
ing abnormally high financing costs throughout the financial system during in the fourth quarter of 2008. Availability declined and credit standards tightened for all types of financing to firms worldwide in the period.

Trade financing does have some characteristics that differ from other types of financing. Trade financing is generally priced as a share of the value of goods shipped, so trade financing is more directly tied to the level of exports than are other financial markets, and trade financing generally reflects the seasonality exhibited by a country's exports. Furthermore, as discussed below, global demand for trade financing increased during the crisis, in contrast to falling demand for other corporate financing (ECB 2009).

These differences affected the timing of the decline in trade financing. Although overall financial flows declined before the trade collapse, trade-specific financing moved together with trade. Short-term export credit insurance exposure is a measure of the amount of trade financing provided by countries.[2] Such insurance fell by 22%

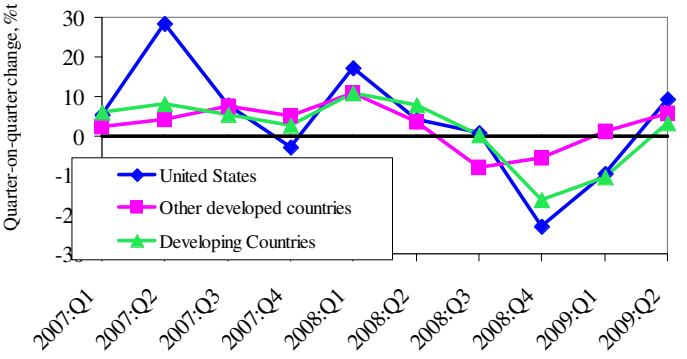
2 The United States, Germany, Italy, and France are the top providers of this insurance, accounting for about 25% of the global total. Globally, firms and agencies had close to $900 billion of such exposure prior to the crisis. About 90% of the credit guarantees are provided by private companies. (Berne Union 2009a)

Figure 5. Export credit insurance exposure, 2007:Q1 to 2009:Q2



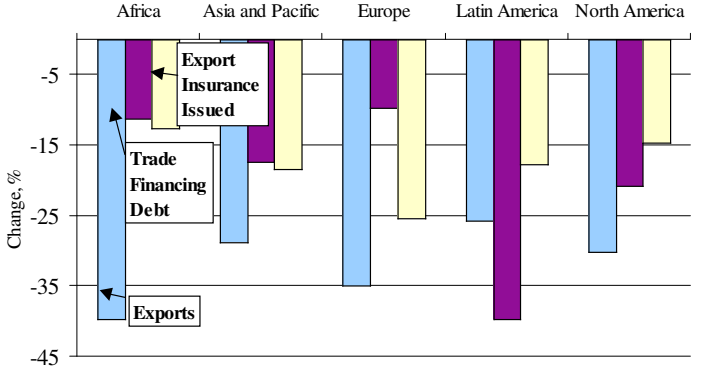
Source: Berne Union through the World Bank's Joint External Debt Hub.

Figure 6. Trade financing debt incurred by country, 2007:Q1 to 2009:Q2



Source: Berne Union through the World Bank's Joint External Debt Hub.

Figure 7. Drop in trade financing smaller than drop in exports, 2008:Q2 to 2009:Q2



Source: World Bank, IMF, and Berne Union through the World Bank's Joint External Debt Hub.

between the second quarter of 2008 and the same quarter of 2009. Trade financing debt incurred by countries is an imperfect proxy for the amount of financing that countries receive.[3] Such debt fell by 12%, a considerably smaller decline than for credit insurance provided.

Comparing Figures 1, 5, and 6 the key observations are:

- Quarterly declines in trade financing generally, but not always, were smaller than the respective export decline.
- Figure 12 shows that the 4-quarter decline in either measure is smaller than the decline in trade for all regions except Latin America and the Caribbean.

Survey results

Because much of trade financing is not distinguishable in official statistics - and the available data account for only about 10% of total global trade - data comparisons are intrinsically imperfect and incomplete. To address this, the IMF and WTO have sponsored surveys of global participants in the trade credit world. We turn now to a summary of the key findings from six recent surveys of international banks, suppliers, and government agencies.

Surveys show that declines in trade financing contributed directly to the decline in global trade in the second half of 2008 and early 2009. In general:

- Banks and suppliers report that trade financing is the number two cause of the global trade slowdown, after falling international demand (Table 1).
- Among international suppliers, 30% cited reduced trade financing as the key factor in lower foreign sales.
- Separately, 57% of banks reported that lower credit availability contributed to declining trade earlier in the crisis, but this share fell in later surveys.

Table 1. Trade financing was the number two reason for declining exports

Rank	Exporter Survey	Bank Surveys
1	Lower global demand	Lower global demand
2	Reduced trade financing	Less credit available from own institution
3	Reduced working finance	Less credit available from foreign banks

Sources: IMF/BAFT (2009a), IMF/BAFT (2009b) and World Bank (2009).

3 The figure includes only short-term non-governmental trade financing debt, which had a global value of $572 billion prior to the crisis. Debt depends on trade financing received as well as repaid, so debt may under-represent the decline in trade financing in countries that experienced fiscal difficulties during the downturn.

Surveys confirm the trends shown in Figures 5 and 6 regarding the timing and regional distribution of trade financing during the crisis.

- Banks reported that the global impact of the financial crisis on trade financing peaked in the first half of 2009.
- Regarding differences across countries, surveys agree that Europe and North American experienced a larger decrease in trade financing than other geographic regions (with the exception of Eastern Europe) early in the crisis.[4]
- By mid 2009, however, some emerging markets were experiencing the detrimental effects of reduced financing, with Eastern Europe still declining and Africa not yet recovering, although Latin America had stabilized and expectations for most of Asia were positive (ICC 2009b).

Early in the crisis, rising uncertainty increased demand for some trade financing, even as banks reduced supply. After September 2008, the risks of exporting and financing rose substantially because of downgraded credit ratings of firms, banks, and countries. Macroeconomic difficulties also mattered - declining GDPs, fluctuating exchange rates, and falling prices.

Demand for export credit insurance rose, and the covered value has risen for capital goods during the crisis despite substantial trade declines (Berne Union 2009b). Surveys show:

- Nearly half of banks surveyed experienced increased demand for products such as letters of credit, while banks wanted to restrict financing to limit lending risk.
- Most surveyed banks (47% to 71%, depending on the survey) reduced the supply of trade financing in the last quarter of 2008. For example, the value of letters of credit fell 11% in that quarter even as prices on those instruments rose.
- Increased demand and reduced supply combined to drive trade financing prices higher during the crisis.
- Banks raised prices throughout the crisis, with substantial increases in the price of letters of credit (70 bp) and export credit insurance (100 bp).
- The increase reflects only the price above banks' own cost of financing, which moved sharply higher before falling later in the crisis (Bloomberg, LIBOR). Even so, the survey results do not appear to match the widely reported examples of 300 to 500 basis point increases that occurred in some markets at the height of the crisis.
- Surveys report that trade financing conditions had improved or stabilized by the second quarter of 2009. Although prices remain high, financing costs are not perceived as being a major impediment to trade, and trade financing remains the cheapest form of financing available to many companies.

4 The number of international transactions relayed through the SWIFT financial telecommunications system (both received and supplied) fell in all regions in 2008. This may indicate an early decline in trade credit volume not visible in data on trade credit values. (ICC 2009a)

Multilateral support efforts

An important reason for the recovery of trade financing is the implementation of much of the $250 billion in additional trade financing announced at the April G-20 meeting. Surveys and government reports show that the additional liquidity provided by multilateral development banks (MDBs), national governments, and export credit agencies is playing a positive role.

MDBs have announced or put in place over $9 billion in new financing (Table 2). The short maturity of most trade financing will allow these funds to be rolled over multiple times per year, providing more than $80 billion in new trade financing between 2009 and 2011. A majority of surveyed banks (55%) were utilizing trade facilitation programmes implemented by MDBs by the summer of 2009 (ICC 2009b).

Table 2. Additional trade financing through MDBs, $ million

Source	Initial funding	Additional funding announced	Additional trade supported through 2011
Global Trade Liquidity Fund	0	5,000	45,000
International Finance Corporation (World Bank)	1,000	2,000	18,000
European Bank for Reconstruction and Development	1,200	1,050	9,450
Asian Development Bank	580	420	3,780
Inter-American Development Bank	400	600	5,400
Total	3,180	9,070	81,630

Sources: World Bank, EBRD, ADB, and IDB

National governments have also increased availability of trade financing. For example, 15 of 18 APEC countries surveyed have expanded trade financing programmes, most commonly through additional export credit insurance or working capital guarantees (APEC 2009). The total value of new government measures is not known, but among major economies, the US announced its intention to provide $4 billion in annual new short-term insurance and $8 billion in longer-term financing for the export of US goods and services to emerging markets; China announced $8 billion of additional annual financing; and Japan will provide up to $22 billion over the next two years.[5]

Conclusions

The state of trade financing appears to be largely independent of US developments. However, because most trade is probably financed by open accounts (i.e. customers

5 Not all announced commitments will be fully realized. For example, the U.S. commitment led to a doubling in the value of short-term financing in the first 9 months of its fiscal year 2009 relative to the same period in 2008. Medium- and long-term guarantees did not increase, however. (Ex-Im Bank 2009)

pay after receiving the trade goods, just as they do for most domestic purchases), firms rather than banks are providing most of the trade financing. A recovery in exports will require improvement in general financial market conditions, particularly to provide working capital to exporters. Here, US financial market conditions may play an important role.

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15. US trade margins during the 2008 crisis

Peter K. Schott

Yale School of Management

If the current "shock" to US trade is similar to previous ones, most of the decline in exports and imports stems from a decline in sales of previously exported goods rather than a decline in the number of products exported. To the extent that is true, trade will bounce back relatively quickly once conditions improve. The alternative view is that the severe credit crunch produced a higher-than-usual share of harder-to-reverse firm exits - potentially dampening the speed of recovery. Even if this did occur, history suggests that it will be concentrated amongst small firms which account for only a small fraction of US exports; US multinationals dominate US trade and these firms have the wherewithal to weather the credit crunch. Should the dollar continue to decline, US firms will broaden the range of products exported and the range of markets reached, putting further downward pressure on the trade deficit.

Since the onset of the current recession in December 2007, seasonally adjusted monthly US merchandise exports and imports have fallen sharply, by 15% and 26% respectively, as of August 2009. As a consequence, the monthly US trade deficit has fallen dramatically during this period, by $29 billion, or 41% of its December 2007 level.[1]

Figure 1 provides context for these declines by comparing the trends during the current recession with those the US experienced during the last two recessions (which begin July 1990 and March 2001).

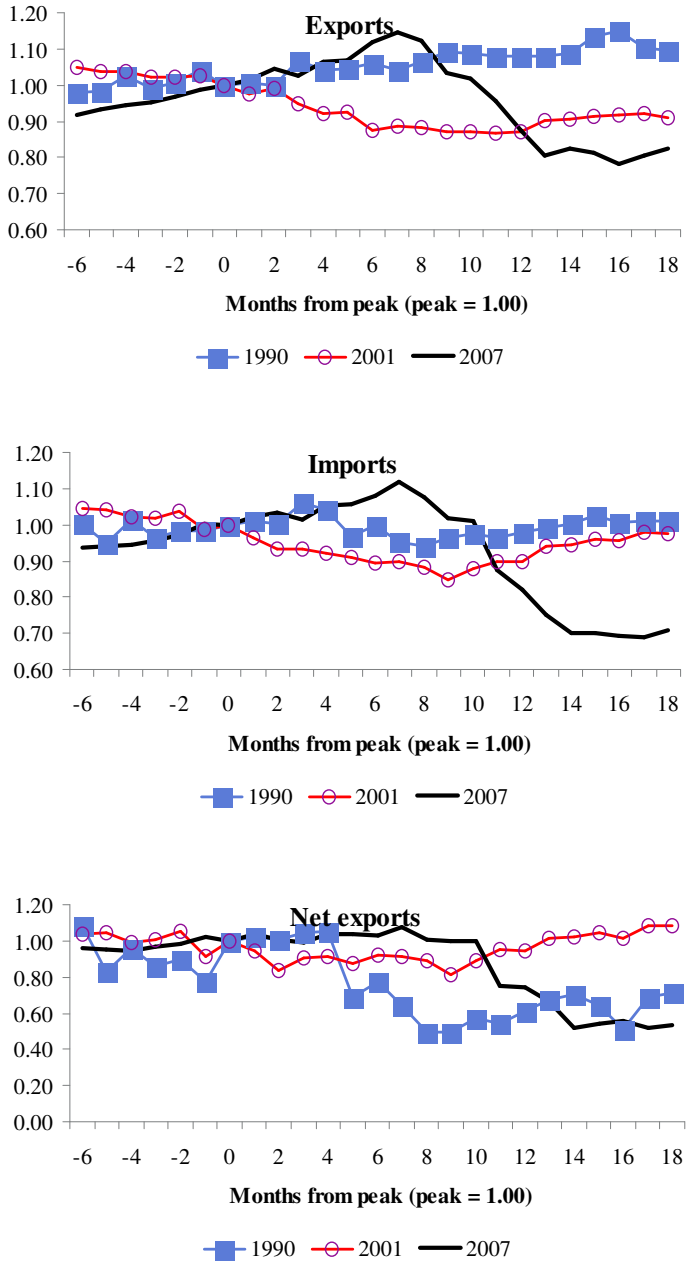
While the magnitude of the decline in exports and imports during the current crisis is without precedent, similarities with the previous recessions do exist. For example, a similar sharp proportionate reversal of the US trade deficit also occurred, though more quickly, during the 1990 recession. Then, however, the deficit fell due to a combination of *rising* exports and *falling* imports. In this respect, the current crisis looks more like the 2001 recession, where the improvement in the trade deficit was more muted, but where exports and imports declined in tandem.

Table 1 highlights another similarity between the 2001 and 2007 recessions, namely the relatively large contribution of falling commodity imports to the improvement in the trade deficit. In the table, each row summarises the contribution of a particular industry to the overall growth in net exports noted in the final row. Sharp reductions in metals imports - primarily steel (HS 72) - contributed 61% and 73% of the improvements in overall deficit during the 2001 and 2007 recessions, respectively.[2]

1 Seasonally adjusted monthly aggregate trade figures are available starting in 1989 from the U.S. Census Bureau's website at http://www.census.gov/foreign-trade/balance/c0004.html. As illustrated in Figure 1 below, the declines are even larger if one starts from the post-recession-onset peak exports and imports.

2 2In Table 1, petroleum is included in mineral products (HS 27). For a similar breakdown with respect to exports and imports, see Appendix Table 1.

Figure 1. US trade during the last three recessions



Notes: Data are from the US Census Bureau's website (see text) and are seasonally adjusted. Data are available through August 2009.

Table 1. Industry contribution towards reducing the US trade deficit, by recession

	1990	2001	2007
Animal & Animal Products	-11	-1	3
Vegetable Products	5	3	-1
Foodstuffs	-5	12	5
Mineral Products	4	9	5
Chemicals	0	0	5
Plastics / Rubbers	-3	0	0
Raw Hides, Skins, etc	20	-1	0
Wood & Wood Products	16	12	9
Textiles	33	14	7
Footwear / Headgear	9	0	1
Stone / Glass	-1	1	0
Metals	-15	61	73
Machinery / Electrical	1	1	1
Transportation	20	-12	-5
Miscellaneous	25	-2	-3
Special Classifications	2	2	0
Total	100	100	100
Total Improvement ($ billion)	1.3	6.9	27.2

Notes: Table records industries' contributions in percentage terms to the change in US net exports across noted in final row across recessions. Positive shares indicate contributions toward increasing net exports. The intervals associated with each recession are 1990.7 to 1991.1, 2001.3 to 2001.12 and 2007.12 to 2009.8). Data are seasonally adjusted by author using the US Census Bureau's X12 method in Eviews and are available on request. See Appendix for analogous breakdown of exports and imports.

Comparison with the Asian crisis

An alternative context for the current decline in US trade - one that focuses on currency devaluation and a severe drop in foreign demand - is the 1997 Asian financial crisis.

Bernard et al (2009) examine the evolution of US trade with five crisis-struck Asian countries (Indonesia, Korea, Malaysia, the Philippines and Thailand) in the months around the 1997 Asian crisis. Seasonally adjusted US net exports fell 50% after the crisis, due to a sharp decline in exports and a moderate increase in imports. The largest export declines occurred among wood, textile and transportation products. Most of the adjustment occurred on the intensive margin.

Another perspective: Extensive versus intensive margins of trade

Another way of decomposing changes in US trade focuses on the degree to which they occur via what has become known as the "extensive" versus "intensive" margins, namely changes in the value of goods that are already imported and exported, and changes in the number of goods exported and imported.

2 In Table 1, petroleum is included in mineral products (HS 27). For a similar breakdown with respect to exports and imports, see Appendix Table 1.

More specifically, the "intensive" margin refers to changes in trade that take place within surviving trade relationships, e.g., the same firm exporting more or less of the same product to the same country. The "extensive" margin, by contrast, tracks changes in trade due to entry and exit, such as a new firm entering the export market, or an existing firm narrowing the range of its export products or destination countries.

Analysis of trade's extensive and intensive margins increases our understanding of trade patterns and the relative efficiency with which economies allocate resources. To the extent that engaging in international trade requires firms to incur non-recoverable expenses, or develop relationship-specific human capital, high levels of entry and exit may imply greater diversion of resources away from production. On the other hand, relatively fluid entry and exit may reflect re-allocations of resources towards their most efficient use as business conditions change.

A large and growing body of theoretical and empirical work in international trade suggests that trade liberalisation raises aggregate productivity via the extensive margin; as trade costs fall, the least productive firms exit, while the most productive firms expand, and, within surviving firms, the least productive products are dropped. (See, for example, Tybout and Westbrook (1995), Pavcnik (2002), Melitz (2003) and Bernard, Redding and Schott (2009)).

Three lessons

Three lessons emerge from the broader research on the margins of US trade.[3]

- First, variation in trade *across countries* is due mostly to the extensive margin.

The well-known negative "gravity" relationship between trade and distance, for example, is driven almost exclusively by the extensive margin. Both the number of trading firms and the number of traded products decline significantly with distance. If anything, the intensive margin appears to *increase* with distance.

- Second, variation in trade *across time* is dominated by the intensive margin.

This dominance is illustrated in Appendix Table 1, which breaks down year-to-year changes in total US exports or imports in billions of US dollars (row 10) into the contributions of:

- Net firm entry and exit (row 3);
- Net adding and dropping of products and countries (row 6); and
- The intensive margin (row 9).

As indicated in the final three rows of each panel - which express these contributions in percentage terms - the intensive margin accounts for the largest share of annual trade growth in every year. Across 1993 to 2003, it averages 101% for exports and 114% for imports. Among extensive margins, firm entry and exit is less influential

3 The results described in this section and the next are from Bernard, Jensen, Redding and Schott (2007, 2009). The detailed, firm-level data for such analyses are from the U.S. Census Bureau's Longitudinal Firm Trade Transactions Database (LFTTD); see Bernard, Jensen and Schott (2009) for further details. These data are currently available for 1992 through 2005.

than product-country adding and dropping.

While the intensive margin dominates year-to-year trade growth, its influence declines over longer time periods. Indeed, as indicated in the last column of Table 2, the intensive margin accounts for just 35% and 23% of ten-year export and import growth, respectively.

This waning influence of the intensive margin is intuitive. Because entering and exiting firms (and added and dropped products) tend to be small relative to established incumbents, their entry and exit does not contribute much to changes in exports or imports in the year they enter or exit. On the other hand, because new firms tend to grow relatively fast if they do manage to survive, they get large, thereby increasing the contribution of the extensive margin in the long run.[4]

- Third, the intensive margin is more influential in explaining variation in trade between "related" parties (i.e. when the buyer and seller have some sort of corporate relationship) than variation in trade between arm's-length firms.

This result is also intuitive, as multinationals tend to be large and relatively stable participants in international trade compared with non-multinationals. Thus, while their intensive margin may respond to shocks, they are less likely to enter and exit than non-multinationals.[5]

US margins during the current crisis

Unfortunately, the detailed, firm-level trade data required to analyse US firms' responses to the current crisis are not yet available. However, analysis of firms' reactions to two previous crises encompassed by the data that are available - the 2001 recession and the 1997 Asian financial crisis - suggests that most of the response will be on the intensive margin.

Lessons from the 2001 recession

As illustrated in Figure 2 and Figure 3, the $60 and $72 billion drops in exports and imports over the 2000-2001 episode are mostly due to the intensive margin, i.e., smaller increases and larger decreases among incumbent trading relationships than in non-recession years.[6]

For both exports and imports, the contribution of firm exits rises, both in the year of the recession and for one or two years afterwards. The product-nation margin - namely the introduction or withdrawal of products to new destinations - is more important for exports than for imports. For exports, the contribution of product-country additions falls and product-country drops rises.

The relative importance of the intensive margin is also evident in the 2001 reces-

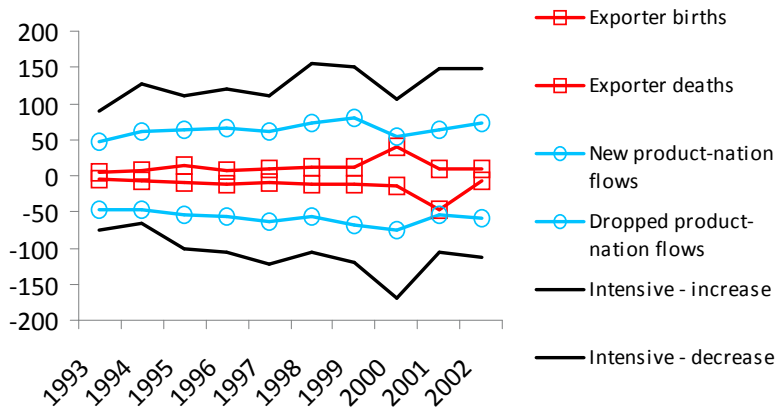
4 See, for example, Eaton et al. (2008).

5 See also Obashi (2009).

6 Differences between the decline in net exports in Table 2 versus Table 1 are due to their coverage of different periods as well as the exclusion of trade data in the former table for transactions that cannot be matched to a firm. For more information, see Bernard, Jensen and Schott (2009).

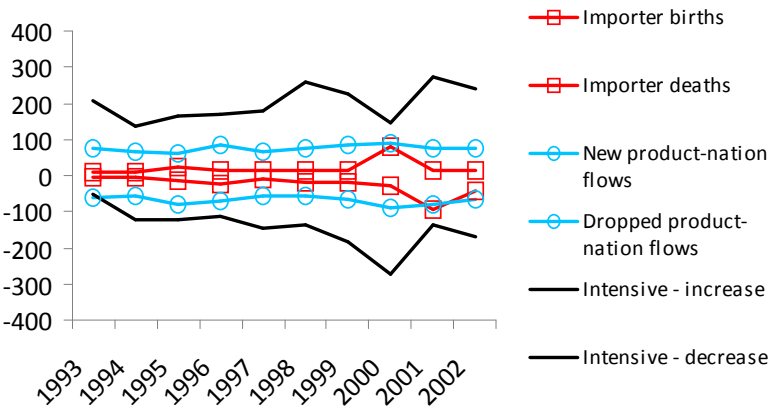
sion. Appendix Table A2, for example, provides a similar decomposition but is restricted solely to US exports and imports between related parties.[7] A comparison of the final three rows of Tables 2a and 2b reveals relatively modest contributions of the extensive margin in the years around the recession.

Figure 2 Export intensive and extensive margins, 2001 recession



Notes: Tables are from Bernard, Jensen, Redding and Schott (2009). See appendix tables for details.

Figure 3 Import intensive and extensive margins, 2001 recession



Notes: Tables are from Bernard, Jensen, Redding and Schott (2009). See appendix tables for details.

7 In U.S. trade data, exporting firms are considered "related" to their foreign counterparty if either owns at least 10% of the other. For imports, the threshold is 6%.

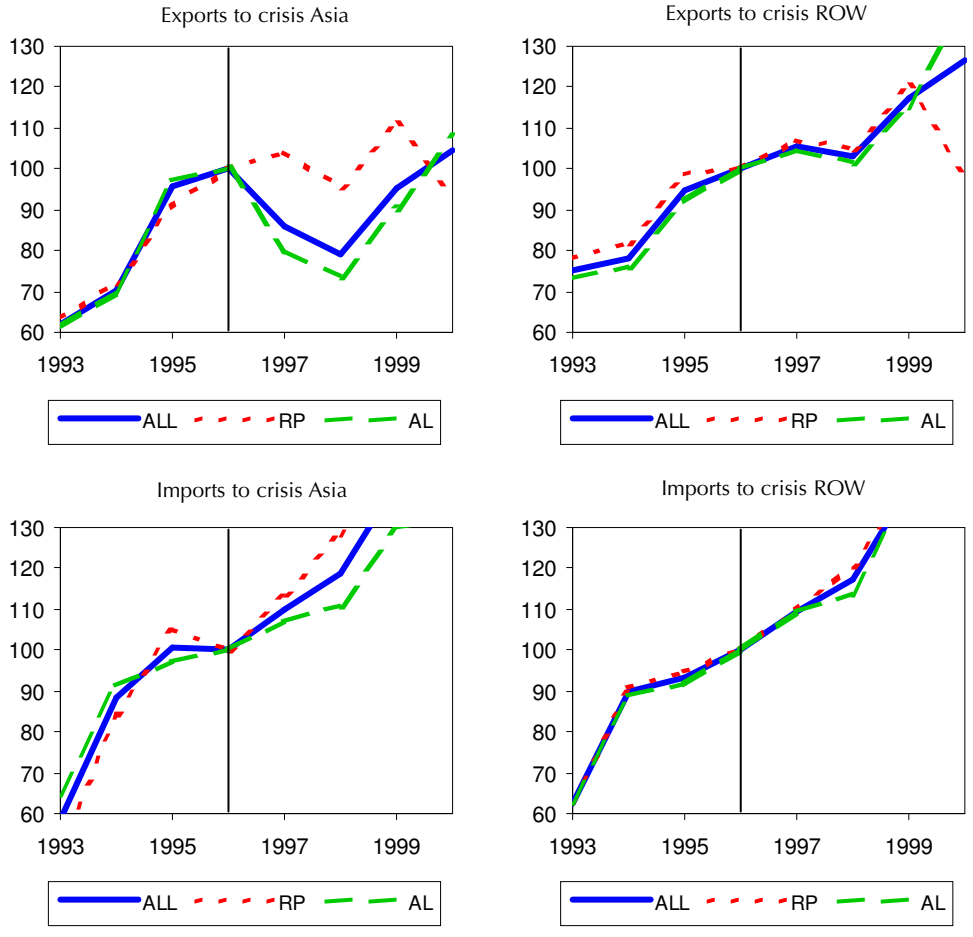
Lessons from the 1997 Asian Financial Crisis

While there are substantial changes in extensive margins around the Asian crisis, here, too, the intensive margin is most influential, and related-party trade is more resilient to the crisis.

These trends are readily apparent in Figure 4 and Figure 5, which compare US trade with the crisis countries identified above, to trade with Rest-of-World (RoW) in the years around July, 1997.

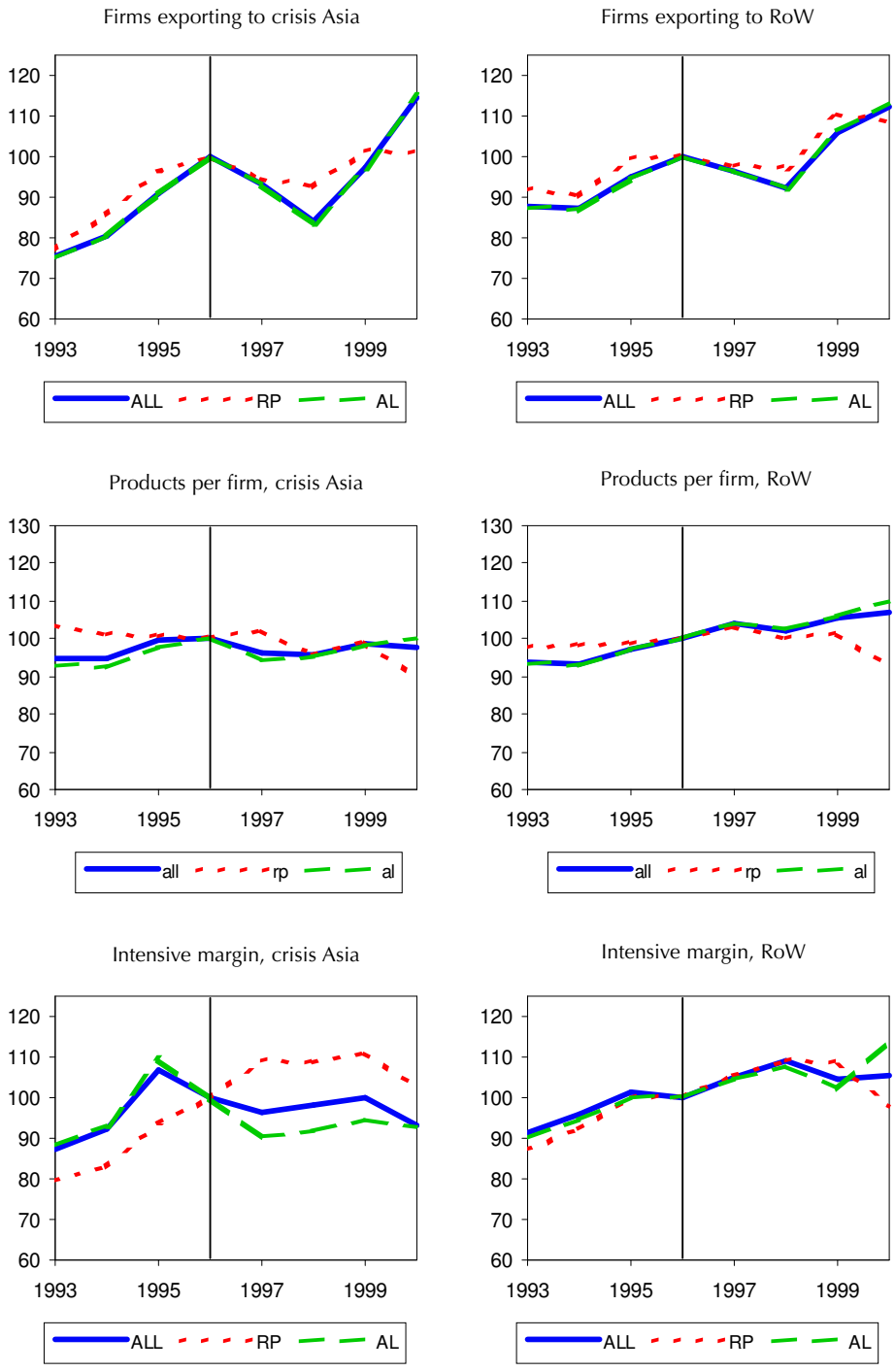
Plots in the first row of the figures display the evolution of three types of trade around the crisis year, 1997. The first is total trade, the second is related-party, or RP, trade (i.e. trade that takes place between a buyer and seller who have a corporate relationship), and "arm's-length" (AL) trade, which is trade among parties that do not

Figure 4 US exports and imports during the 1997 Asian financial crisis



Notes: Figures display margins for Asian crisis countries (Indonesia, Korea, Malaysia, the Philippines and Thailand) versus RoW from 1993 to 2000.. All series normalised to 100 in 1996.

Figure 5 Decomposition of US exports during the 1997 Asian financial crisis



Notes: Figures display margins for Asian crisis countries (Indonesia, Korea, Malaysia, the Philippines and Thailand) versus RoW from 1993 to 2000.. All series normalized to 100 in 1996.

share corporate ties. The charts on the left show the facts for US exports to the crisis-stricken Asian nations (Indonesia, Korea, Malaysia, the Philippines and Thailand). For comparison, the charts on the right show the same for other nations. For comparability, each series is normalised to 100 in 1996. The salient points are:

- Overall US exports to Asia declined by 21% between 1996 and 1998, while exports to RoW increased by 3%.
- Within Asia, the decline in AL exports was substantially greater than the drop in RP exports, i.e,, 26% versus 4% by 1998.
- For exports to RoW, the experience of RP and AL trade is similar. The increase in US imports from 1996 to 1998, reported in the last two columns of the figure, roughly mirrors the decline in exports in the first two columns.

Taken together, the two previous points suggest that trade within supply chains is more robust to shocks.

- Import growth is slightly stronger for Asia than RoW (19% versus 17%), and, within Asia, is stronger for RP than AL trade (28% versus 11%).
- AL and RP trade differ most in terms of the reaction of their intensive margins (+26% versus -1%).

When interpreting these facts, it is important to bear in mind that massive real devaluations by the crisis nations accompanied the Asian crisis.

Evolution of the margins

To investigate the behaviour of trade in this period more closely, Figure 5 and Figure 6 decompose the total impact on exports and imports into the intensive and extensive margins. Thus, each row of Figure 5 separates the aggregate response of exports into three mutually exclusive and exhaustive components - firms, products per firm, and the intensive margin. That is, changes due to the number of firms engaged in trade, changes due to variation in the number of products exported per firm, and changes due to the average amount exported per product per firm. Figure 6 shows the same for US imports in this period. As a control for general trends - i.e. to help identify the impact of the crisis itself - each figure shows the corresponding figure for US trade with the RoW.

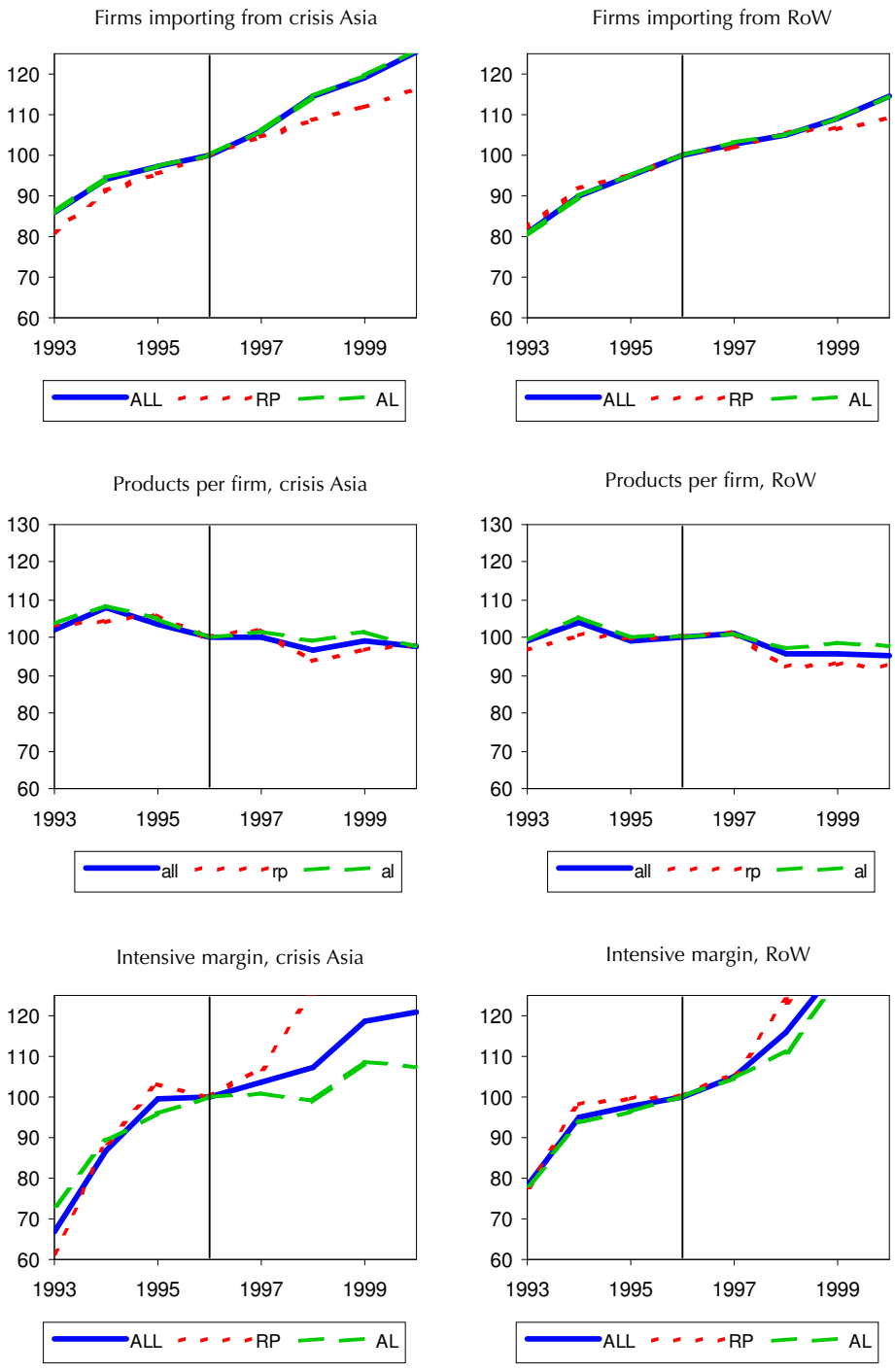
As the first and final rows of the Figure 6 show, the number of firms exporting, as well as their intensive margin, declines substantially more for exports to crisis-hit Asia. The number of firms exporting dropped by -16% (Asia) versus -8% (RoW). The corresponding number for the intensive margins are -2% and +9%. These movements are consistent with the aggregate response associated with the 2001 recession referred to above.

The number of US arm's-length firms exporting to the crisis countries declines more sharply than the number of related-parties exporters: by -16% versus -7% from 1996 to 1998. Again this suggests that within-firm trade relations are more robust than outside-the-firm relationships, in times of crisis.

A comparison of the intensive margins is even starker: -8% versus +9% for arm's-length and related-parties, respectively.

The shallower decline in the number of firms exporting to related parties, as well

Figure 6 Decomposition of US imports during the 1997 Asian financial crisis



Notes: Figures display margins for Asian crisis countries (Indonesia, Korea, Malaysia, the Philippines and Thailand) versus RoW from 1993 to 2000.. All series normalized to 100 in 1996.

as this increase in the intensive margin, explains the less severe impact of the Asian crisis on overall RP exports. By comparison, the average number of products exported per firm, changes relatively little between 1996 and 1998, for either Asia or RoW.

Contribution of each margin

While the figures are useful for summarising the behaviour of the margins of trade relative to their own past, they do not describe the relative contribution of each margin to overall changes in export or import value.

A decomposition of the margins of US trade with the Asian crisis countries (see the bottom panels of the appendix tables for specifics) reveals that:

- Exports to the crisis countries declined by $5.6 and $2.7 billion in 1997 and 1998, respectively, before recovering in 1999.
- Imports from the crisis countries increased by $5.8, $5.1 and $12.6 billion in the three years following the crisis.

In both cases, we find the intensive margin to be most influential in these changes, though the contribution of the extensive margin to 1998 export declines was substantially higher than in other years.

More broadly, the pattern of relatively large percentage changes on the extensive margin, accounting for relatively small shares of the changes in the value of overall trade, is consistent with the idea that exiting firms are small relative to those that survive.

Concluding Remarks

If the current "shock" to US trade is similar to those that have occurred before, most of the decline in exports and imports we've seen is due to less intense trade rather than firm and firm-product exit.

To the extent that this is true, trade will bounce back relatively quickly once conditions improve. It is of course possible that the severe shortage of credit available to firms over the past year has led to a higher-than-usual share of harder-to-reverse firm exit, potentially dampening the speed of recovery (see Dougherty 2009, and Chor and Manova 2009). On the other hand, if history is a guide, such exits are most likely concentrated among relatively small firms, compared with the multinationals that dominate US trade and have the wherewithal to weather the credit crunch.

Another factor which may speed recovery is the continued depreciation of the dollar. The decline and increase in the US dollar in the current crisis is similar to, but greater in magnitude than, the trend followed by the dollar in the 1990 recession. In both cases, the dollar was in long-run decline before the recession and increased in value during the recession. Should the dollar resume its decline as the recovery proceeds, the US might experience relatively high firm entry into export markets, putting further downward pressure on the trade deficit.

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About the author

Peter K. Schott is Professor of Economics at the Yale School of Management and a Research Associate of the National Bureau of Economic Research. Overall, his research focuses on the impact of globalization on countries, firms and workers. His most recent papers examine the relative sophistication of Chinese exports, transfer pricing by U.S. based multinational corporations and product upgrading by firms in response to trade liberalization.

Appendix Table 1a: Decomposition of US exports, extensive and intensive margins, 1993-2003 (annual, 5-year & 10-year horizons)

			1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	1993-1998	1998-2003	1993-2003
1	Exporter Entry and Exit	Exporter Births	6	8	14	8	9	12	11	40	10	9	60	131	166
2		Exporter Deaths	-6	-6	-9	-13	-9	-12	-11	-15	-47	-8	-38	-108	-112
3		Net Entry	0	2	5	-5	0	0	0	26	-38	1	22	24	55
4	Product-Country Switching	New Product-Nation	48	62	62	65	62	72	79	55	65	73	127	138	181
5		Retired Product-Nation	-47	-47	-55	-57	-64	-56	-69	-76	-55	-59	-92	-103	-85
6		Net Extensive	1	15	8	8	-2	16	10	-21	10	14	35	35	96
7	Intensive Margin	Product-Nation Increase	90	126	112	121	111	156	150	106	147	148	144	158	142
8		Product-Nation Decrease	-75	-66	-101	-107	-122	-107	-120	-170	-106	-112	-80	-107	-62
9		Net Intensive Margin	15	60	11	14	-11	49	30	-64	42	36	64	51	80
10	Total Change in Exports		16	77	24	17	-13	65	41	-60	14	50	121	110	231
11	Percent of Annual Growth Due to:														
12	% Net entry and exit (rows (3/10)		2	2	22	-29	-2	-1	1	-42	-265	2	18	21	24
13	% Net add and drop (rows 6/10)		7	20	32	47	15	25	26	35	71	27	29	32	42
14	% Net intensive (rows 9/10)		91	78	46	82	87	76	74	107	294	71	53	46	35

Notes: Tables are from Bernard, Jensen, Redding and Schott (2009). Data are from the LFTTD. Panels decompose total change in US exports or imports ($ billion) during the noted periods according to noted firm activities. Rows 1 to 3 summarise the contribution of firm entry into and exit. Rows 4 to 6 summarise changes in firms' product-country combinations. Rows 7 to 9 summarise the growth and decline of continuing product-country exports or imports at continuing importers. Bottom panel reports percentage contribution of each net margin in terms of the total change in imports. Each column summarises growth over the noted time interval. Years are July to June, e.g., 2001-2 is July 2001 to June 2002.

Appendix Table 1b: Decomposition of US imports along extensive and intensive margins, 1993-2003

			1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	1993-1998	1998-2003	1993-2003
1	Importer Entry and Exit	Importer Births	9	10	23	16	16	14	13	80	16	16	142	249	318
2		Importer Deaths	-7	-7	-13	-24	-12	-19	-17	-28	-94	-43	-61	-253	-149
3		Net Entry	2	3	9	-8	4	-5	-5	52	-79	-27	81	-4	169
4	Product-Country Switching	New Product-Nation	75	65	62	84	68	77	83	91	77	77	252	262	401
5		Retired Product-Nation	-62	-56	-79	-70	-58	-58	-66	-88	-80	-65	-139	-141	-131
6		Net Extensive	13	9	-17	14	10	20	17	3	-4	12	113	121	270
7	Intensive Margin	Product-Nation Increase	205	137	165	168	181	261	224	146	273	241	206	245	175
8		Product-Nation Decrease	-51	-123	-120	-114	-148	-137	-184	-273	-134	-168	-60	-127	-41
9		Net Intensive Margin	154	14	44	54	33	124	40	-127	139	73	146	118	135
10	Total Change in Imports		169	26	37	60	47	140	52	-72	56	59	339	235	574
11	Percent of Annual Growth Due to:														
12	% Net entry and exit (rows (3/10)		1	13	25	-13	10	-3	-9	-72	-139	-46	24	-2	29
13	% Net add and drop (rows 6/10)		8	34	-45	24	21	14	32	-4	-7	21	33	51	47
14	% Net intensive margin (rows 9/10)		91	54	120	90	69	89	77	176	246	125	43	50	23

Notes: See previous table.

Appendix Table 2a: Decomposition of US 'related parties' exports along extensive and intensive margins, 1993-2003

			1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	1993-1998	1998-2003	1993-2003
1	Exporter Entry and Exit	Exporter Births	2	3	3	3	4	5	3	6	3	2	17	24	38
2		Exporter Deaths	-2	-2	-2	-3	-3	-4	-4	-4	-7	-2	-9	-24	-27
3		Net Entry	0	1	1	0	1	1	-1	2	-4	0	7	0	11
4	Product-Country Switching	New Product-Nation	10	13	13	14	15	21	13	13	13	14	38	50	62
5		Retired Product-Nation	-10	-11	-13	-12	-14	-13	-18	-12	-13	-12	-30	-35	-32
6		Net Extensive	-1	3	1	2	1	8	-5	1	0	2	9	15	31
7	Intensive Margin	Product-Nation Increase	33	45	38	45	40	53	32	49	52	49	59	60	59
8		Product-Nation Decrease	-27	-22	-36	-38	-45	-38	-60	-36	-39	-40	-31	-48	-31
9		Net Intensive Margin	7	24	2	8	-5	15	-28	13	14	9	27	12	28
10	Total Change in Exports		6	27	3	10	-3	24	-34	15	10	11	43	26	69
11	Percent annual growth due to:														
12	% Net entry and exit (rows (3/10)		1	2	24	4	-31	2	3	12	-41	0	17	-2	15
13	% Net add and drop (rows 6/10)		-8	10	17	23	-21	33	15	5	-1	16	20	57	44
14	% Net intensive (rows 9/10)		107	89	59	73	152	64	82	83	141	84	63	45	41

Notes: See previous table.

Appendix Table 2b: Decomposition of US 'related parties' imports along extensive and intensive margins, 1993-2003

Related-Party Imports ($Billion)

			1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	1993-1998	1998-2003	1993-2003
1	Importer Entry and Exit	Importer Births	3	4	5	9	7	8	6	23	6	5	52	86	124
2		Importer Deaths	-2	-3	-5	-5	-5	-8	-9	-13	-27	-5	-18	-85	-45
3		Net Entry	1	2	0	4	3	0	-3	11	-21	0	34	1	79
4	Product-Country Switching	New Product-Nation	29	27	21	31	24	27	29	29	25	26	123	144	235
5		Retired Product-Nation	-26	-19	-39	-26	-18	-21	-22	-28	-23	-19	-64	-70	-71
6		Net Extensive	3	8	-18	4	7	6	7	1	2	7	59	74	163
7	Intensive Margin	Product-Nation Increase	105	66	83	74	93	124	109	80	129	129	116	146	105
8		Product-Nation Decrease	-24	-60	-52	-52	-69	-69	-90	-119	-70	-88	-31	-78	-26
9		Net Intensive Margin	82	6	31	22	24	55	20	-38	59	41	85	69	80
10	Total Change in Imports		86	16	13	30	33	60	23	-27	40	48	178	144	322
11	Percent annual growth due to:														
12	% Net entry and exit (rows (3/10)		1	11	1	13	8	-1	-15	-39	-53	-1	19	1	24
13	% Net add and drop (rows 6/10)		3	54	-136	15	20	9	30	-3	5	15	33	51	51
14	% Net intensive margin (rows 9/10)		95	35	235	72	72	91	85	143	148	86	48	48	25

Notes: See previous table.

16. French exporters and the global crisis

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Detailed firm-level data on French exporters suggests most of the trade collapse occurred in exporters' volumes rather than the number of exporters. Small exporters suffered similarly to their larger counterparts. There is clear evidence that the impact was greatest on firms in sectors that rely most heavily on external finance. Thus, the crisis may not have long-lasting effects on aggregate export capacity - the reservoir of small and promising firms has not been decimated- but firms may reorganise to reduce vulnerability to external financing.

The last quarter of 2008 and the first quarter of 2009 witnessed a sudden, severe, and synchronised drop in world trade (Baldwin and Evenett 2009). Both industrial production and trade fell faster in 2008-2009 than during the Great Depression (Eichengreen and O'Rourke 2009). The annual volume of world trade in 2009 will drop by 9%.

In this chapter, we explore the mechanisms that led to such a dramatic collapse in exports, using firm-level data on French exporters. The key questions are:

- Have different firms been differently affected by the crisis, based on their size, their degree of globalisation, or their access to external financing?
- Has the sectoral and geographic composition of firms' exports played a role in the trade collapse?

Channels of transmissions of the financial crisis to the real economy

The transmission channels in the real economy are key to understanding this episode. In addition to the synchronised nature of the reduced activity in the OECD, the national economic policies adopted to cope with this depression may have played a role.

- First, fiscal stimulus packages have been oriented towards non-tradeables such as construction and infrastructure, with the exception of fiscal incentives for domestic purchase of new cars.
- Second, while protectionist tensions have been controlled by the big players in world trade, there is evidence of some 'murky' protectionism.
- Third, the observed increase in the long-run income elasticity of trade may also be playing a part.

This change can be explained by globalisation in general, and more specifically by the fragmentation of supply chains whereby the same component is traded several times before being included in the final product. But, if global value chains amplify value added, they do not explain the change in the value of trade. Fragmented supply chains may be consistent with world trade reacting proportionally to a fall in world GDP (Bénassy-Quéré et al 2009). Only a composition effect - where changes in trade fall on the more fragmented sectors - can generate a more than proportional reaction of trade to a drop in GDP.

On this point, the sectoral evidence is contradictory. Equipment and capital goods, the car industry, and intermediate goods have been particularly affected by a combination of the inventory cycle, a credit crisis that has been detrimental to durable goods, and a confidence crisis leading to postponement of purchases. Some of the trade crisis is ultimately attributable to a crisis in credit markets that caused investments to fall more than in previous economic cycles.

Fewer exporters or reduced export sales?

The precise significance of such a decline in the value of exports, in terms of the extensive and intensive margins of trade, is unknown. Do we have fewer firms, exporting to fewer markets (extensive margin)? Or do we have the same number of firms exporting lower values in all their markets (intensive margin)?

The intuition might suggest that the smallest and most fragile exporters have been pushed out of the market, while the larger and more diversified firms have taken advantage of their size and market power to adjust and eventually pass part of the burden onto suppliers and wholesalers. Also, we would expect that the restriction on trade credit would affect small firms' exports first. Other dimensions of the dynamics of trade need to be examined. Churning (i.e. rapid change in firm's export status) is a common feature of the firm-level data. Hence a reduction in the number of exporters could be the result of an increased number of exits, fewer entries, or a combination of the two.

To address these issues, we exploit a dataset of individual exporters located in France. Such data enable two types of investigation: a precise description of the characteristics of individual exporters (turnover, employment, productivity, profitability, etc.) relying on information from the best-documented firms, which are also the largest ones; and an examination of the dynamics of the distribution of exporters, based on the whole universe of exporters and observing their individual contributions to the value or diversity of exports in the sector to which they belong. Since we are interested in precise descriptions of the extensive and intensive margins, we adopt the latter approach.

The distribution of French exporters

We start by characterising the distribution of French exporters. France is broadly similar to other countries, in that exporting is limited to a very select club of "champions", flanked by a large number of marginal competitors exporting on an irregular

basis (Mayer and Ottaviano 2007).

To illustrate this in the French case, consider the largest exporters (1%) in each sector, using the HS 2 digit system for classification of products into 98 sectors. Accordingly, we use the criterion of total value of a firm's exports relative to the exports of all other firms exporting in the same sector.

We find that the top 1% of firms represents 63% of total French exports. The next four percentiles represent 24% of total exports. The smallest exporters (80%) represent only 3% of the total value. In a nutshell, some 1,000 individual exporters represent two-thirds of the total exports of the 5th largest world exporter.

The second main characteristic, directly linked to the very large presence of small exporters in the distribution, is churning (numerous entries and exits). Since not every firm exports every month, we look at annual export activity. Some 20,000 exporters enter each year, and as many exit. Thus, over ten years, it is possible to observe 300,000 different exporters, with a maximum of 100,000 each year, and a maximum of 50,000 each month. What are the dynamics related to these switchers? Only 35% of entries correspond to firms that are observable in the following year's statistics. But three years after entry 20% of entrants have survived. Hence, the survival rate increases very quickly after a very low start in the first year.

Crisis impact on individual firms - the theory

Against this empirical evidence, the expected impact of the crisis on individual exporters is uncertain.

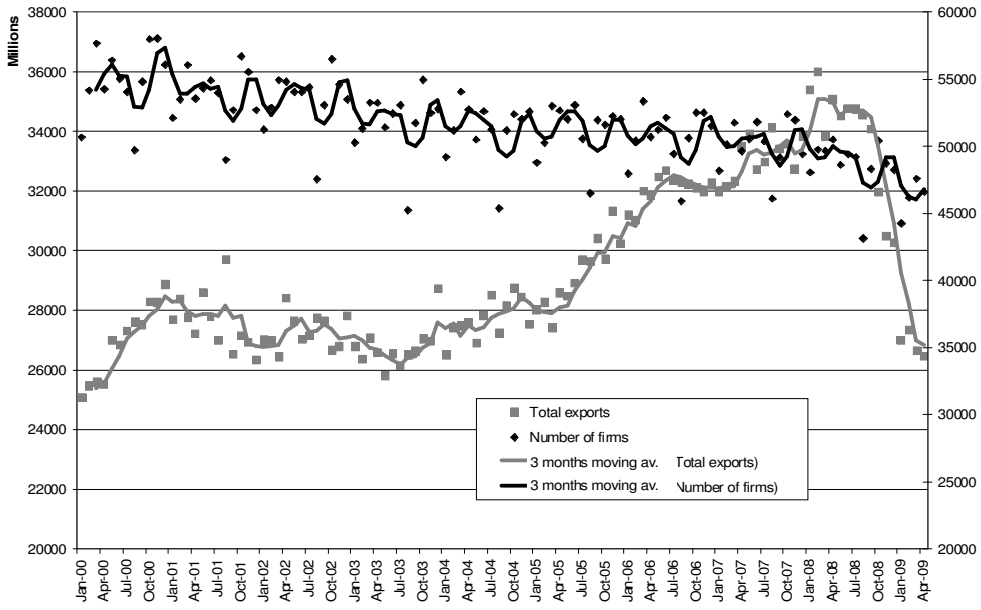
The very large presence (in terms of numbers) of small exporters may well lead to the decimation of this group. However, the large concentration of exports (in terms of value) should lead the largest firms to contribute to the overall decline more or less in proportion to their overwhelming presence in total exports. All in all, a story of numerous small exporters exiting the market, and the large ones contributing to a large share of the observed drop, is what we would expect.

The policy implication is clear. Such an outcome would have long-lasting, detrimental effects on exports. Small firms, often entrants, could be expected to grow rapidly in the future as their probability of death would decline significantly as time passes. From today's small players the market will sort out the champions of tomorrow. If these small players are massively hurt by the crisis, for instance due to finance drying up, then the crisis will leave its footprint on export performance for many years to come.

Crisis impact on individual firms - the facts

However, if we look at the data, we see something quite different. Detailed data on French exporters during the turmoil show that the number of exporters has been only slightly reduced by the crisis, while the value of total exports has sunk significantly (Bricongne et al. 2009). The extensive margin of trade has only slightly contributed to the drop in French exports, with the bulk of the observed decline affecting the intensive margin and, more precisely, the drop in the value exported by the top 1% of exporters.

Figure 1. Value of and number of French exporters, 2000-M1 to 2009-M4



Note: Chapters 98 and 99 of the HS2 are dropped. 3-months moving averages. Left scale: million euros. Right scale, number of exporters in monthly data.

Source: French customs data, Bricongne et al (2009).

This is illustrated in Figure 1. From 2004 to the end of 2007, the value of French exports has increased regularly, notwithstanding the downward trend in the number of exporters. During the full semester of turmoil, i.e. from the last quarter of 2007 to the first quarter of 2009, the value of French exports declined dramatically, while the reduction in the number of exporters was more or less in line with the pace observed since 2000. Our first conclusion then, is that most of the adjustment has taken place at the intensive margin, via a reduction in the value exported.

However, we cannot simply count the number of exporters. In a multi-market setting - where exporters start by serving the most profitable markets and export up to the marginal market where entry costs are only just covered by local sales - a violent shock in world demand should lead exporters to re-focus on their most profitable markets. The pertinent extensive margin of trade in this case would be the elementary market (a firm exporting to a destination market within the same sector).

There are about 95,000 individual French firms exporting at least once a year, but only 50,000 exporting firms in the monthly data (not all exporters export each month as already stressed). Monthly exports by destination and product category are observed for the period January 2000 to April 2009. There is considerable seasonality in these data and the number of working days is also an important determinant of monthly exports. Accordingly, we apply the coefficient of adjustment used by the French customs to broad categories of products, and focus on year-on-year variations (month m of year t is compared to the same month of year t-1).

With monthly data, churning is amplified and consequently the calculation of

growth rates is more difficult. Indeed, at the detailed level of a firm exporting to a market in the same sector, in a given month, calculating growth rates by considering only flows observed in two subsequent months would lead to a large and undesirable selection of flows.

To get around such problems, we rely on the so-called mid-point growth rates. With this method, elementary trade flows in a sector each month can be classified into four types:

- Created (positive extensive margin);
- Destroyed (negative extensive margin);
- Increased (positive intensive margin); and
- Decreased (negative intensive margin).

Ultimately, we need to match two dimensions of analysis - distribution of exporters by size, and trade margins at the elementary flow level.

With these tools in hand, we investigate the causes of French export failure.

The microeconomic causes of export engine failure

The worse month in our sample was February 2009, with a recorded 28% year-on-year drop in exports. At most, 20% of this drop is due to missing flows, that is, to exporters having stopped serving at least one destination market in a given sector, or due to lack of entry of new exporters.

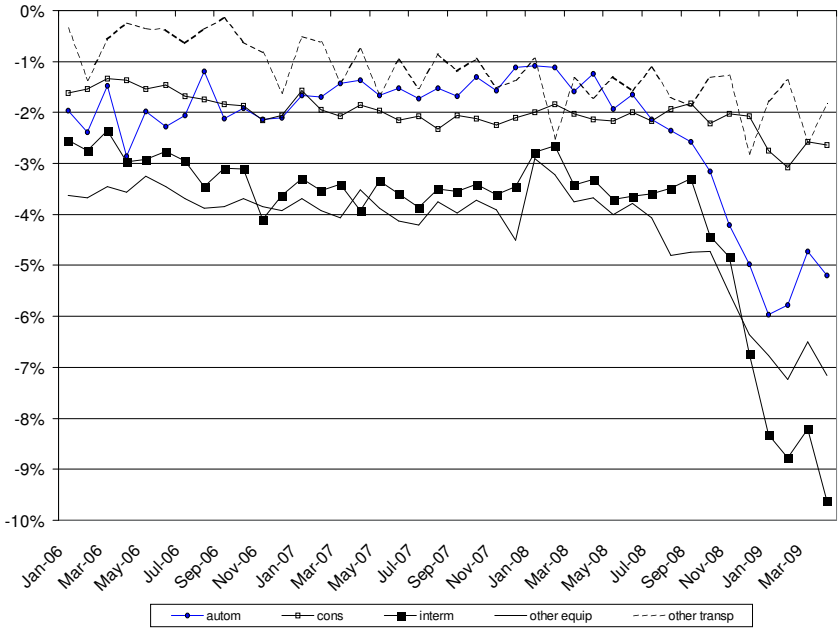
Decomposing these latter effects, we observe that entries have not so much been reduced, but that the key explanation is lack of additional exits, compared to the "good times". The remaining and main part of the drop is accordingly due to the intensive margin, with a dominant contribution of the top 1% of exporters. More than a third of this deterioration is attributable to trade in intermediate goods. Equipment goods (excluding aircraft) and the automobile industry are the next two broad contributors. These three sectors overall account for 82% of the champion's losses, as illustrated in Figure 2.

Overall, the top 1% of exporters contributes to 67% of the drop in sales in existing markets, which is not so very different from their overall contributions to exports. This suggests that the drop in the value shipped by exporters may be quite evenly distributed.

No conditional differences between small and big firms

To check the respective contributions of the geographic and sectoral orientation of exports, and the size of exporters, we can decompose the variance of the drop into monthly exports. While the uncorrected growth rates of exports exhibit large differences between small and large exporters (large exporter being more severely hit), after correcting for the orientation of exports these differences vanish. There is ultimately no difference between small and large firms, with the exception of the black February already referred to, where the largest firms were actually the most affected.

Figure 2. Contribution to *negative growth*, top 1% exporters sales' growth rates, January 2008 to April 2009, by broad sector



Note: Chapters 98 and 99 of the HS2 are dropped. Exporters are ranked according to the value of their exports within a sector.

Source: French customs data, Bricongne et al (2009) calculations.

As well as this descriptive analysis, it is useful to perform multivariate regressions to identify the respective roles of the various suspects. We control for sectoral and geographical determinants of the drop in individual French firms' exports (such as demand in foreign markets, by sector) during the crisis and investigate the impact of the sectoral dependence on external finance. We control whether this impact is robust to controlling for the degree of globalisation in the sector.

We can confirm that the differences in year-on-year growth rates for monthly exports of individual firms (to individual destinations) are not significantly different across size groups.

Three facts are worth highlighting:

- Firms of all sizes have been affected fairly equally by the crisis when destination country and the sector dimensions of the decline are controlled for.
- The second empirical fact is that the crisis has hit firms in sectors relying on external finance more severely, regardless of firm size.
- The third piece of evidence is that this effect of external finance is robust if we control for the fact that more globalised sectors (where intermediate imports account for a larger share of the value of final production), have also been hit more severely.

Conclusion and implications for the future

Detailed evidence on what has happened to individual exporters during the turmoil suggests that most of the adjustment has taken place at the intensive margin, through a reduction in the value of existing flows. Clearly, the exit of exporters from the market is not the explanation. If we differentiate among exporters of different sizes, it appears that the largest ones have been the most affected. This unexpected outcome is due to the presence of the largest exporters in the most affected sectors and in the most affected destination markets. If we take this into account, then all firms have been evenly hit.

This result has several implications:

- First, our results cast doubt on the case for the withdrawal of trade credit hurting the smallest players first.
- Second it suggests that being more globalised may not be an advantage in the context of a global crisis.

The big players are typically more global and this has not helped them. On the contrary, firms belonging to more globalised sectors, other things been equal, have suffered more.

- Third, the blow to exporters may not have long-lasting effects on aggregate export capacity, since the reservoir of small and promising firms has not been decimated by the crisis.

Our micro-analysis produces some less good news. The other side of the coin in terms of the evolution observed, may be that the bulk of exits has been delayed and may appear later, this time concentrated on the smallest exporters. Given the delay between the decision to enter and first export, some entries may materialise. Also, sectors dependent on external finance have been more severely hit.

Were this result to be confirmed by other studies, it would mean that, at some point, the financial sector stopped fulfilling its traditional role. This would produce long- lasting effects. Firms, and especially large firms, may be tempted to reorganise their activity in order to get rid of future problems, and the future growth of international supply chains will be threatened. While the trade crisis is not the result of de-globalisation, the role of external finance in the differentiated impact of the global crisis on individual sectors may lead to industrial strategies departing from the pre-crisis global factory.

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17. Services trade – the collapse that wasn't

Ingo Borchert and **Aaditya Mattoo**
The World Bank

Goods trade has collapsed; services trade hasn't. The likely reasons are that demand for many traded services is less cyclical and their production is less dependent on finance. As services trade seems inherently less affected by crises, services should play a more prominent role in developing countries' diversification strategies.

The gloom and doom about goods trade has obscured the quiet resilience of services trade. Services account for over one-fifth of global cross-border trade; for countries such as India and the US, it is close to one-third of all exports. Data on cross-border trade from the US reveals that since mid-2008, trade in goods declined drastically but trade in some services held up remarkably well.[1] More aggregate data available for other OECD countries also suggests that services trade suffered less from the crisis than goods trade.

Within services, trade in goods-related transport services and crisis-related financial services shrank, as did expenditure on tourism abroad. But trade in a range of business, professional, and technical services remained largely unscathed. Hence, developing countries like India, which are relatively specialised in business process outsourcing and information technology services, suffered much smaller declines in total exports to the US than countries like Brazil or regions like Africa which are specialised in exports of goods, transport services, or tourism services.

US services imports and exports

In what follows, we focus mainly on the markedly different behaviour of goods and services trade flows between the onset of the crisis and the point in time when the impact of the crisis seemed to have bottomed out. (See Borchert and Mattoo 2009 for a broader analysis.)

Both goods and services trade peaked in July 2008, after which both declined until the trough was reached in May 2009.[2] While monthly US imports of goods fell by nearly 40%, service imports fell by 17%. Similarly, while US monthly US goods

1 This data also includes consumption of services abroad (in the category "travel") but does not encompass sales through foreign affiliates or through the presence of foreign natural persons. See Maurer et al (2008) for details.

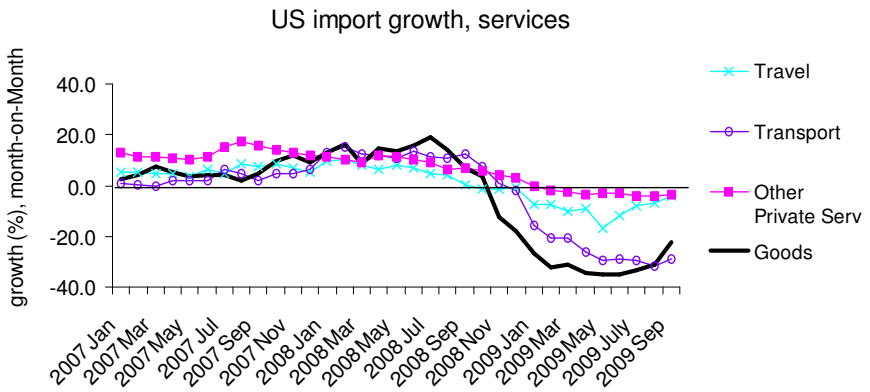
2 Part of the decline in the value of goods imports could be due to the fall in commodity prices. But note that US goods exports also declined by about one-quarter.

exports declined by 32%, its services exports declined by 15%.[3]

Within services trade, interesting patterns emerge (Figures 1 and 2):

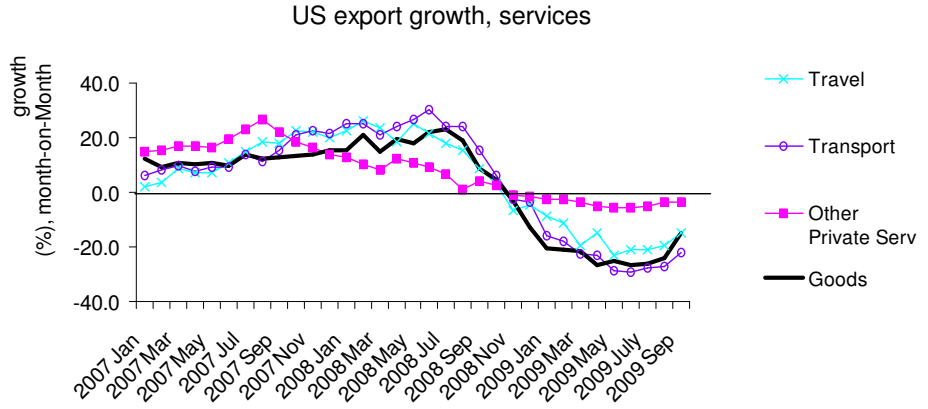
- The value of imports and exports of goods-related services such as international transport shrank by 39% (on an annual basis) between peak and trough, very much in line with goods trade as one would expect.
- Expenditure on US tourism abroad (a US import of services) and foreign tourists in the US (a US service export) contracted as well by 18%, and 29% respectively.
- Trade in 'Other Private Services' - mainly business services, declined by only 7% on both the import and export sides.

Figure 1. Year-on-year growth rates of US monthly imports of goods and services, January 2007 - September 2009



Source: BEA, US International Trade in Goods and Services, months seasonally adjusted.

Figure 2. Year-on-year growth rates of US monthly exports of goods and services, January 2007 - September 2009



Source: BEA, US International Trade in Goods and Services, months seasonally adjusted.

3 In annualised terms, this decline in the value of imports corresponds to 46.4 and 23.5% (goods and services, respectively), while exports fell by 42.3 and 17.8%.

There are contrasting trends within 'Other Private Services'. On the one hand, trade in financial services contracted sharply in the first quarter of 2009 (year-on-year imports by 32% and exports by 17%). On the other hand, trade in a range of other services continued to grow, with US exports growing even faster than US imports. This pattern is evident in insurance (imports by 12%, exports by 19%) and in a range of business, professional and technical services (imports were virtually unchanged while exports grew by 2%).

Trade of other OECD countries

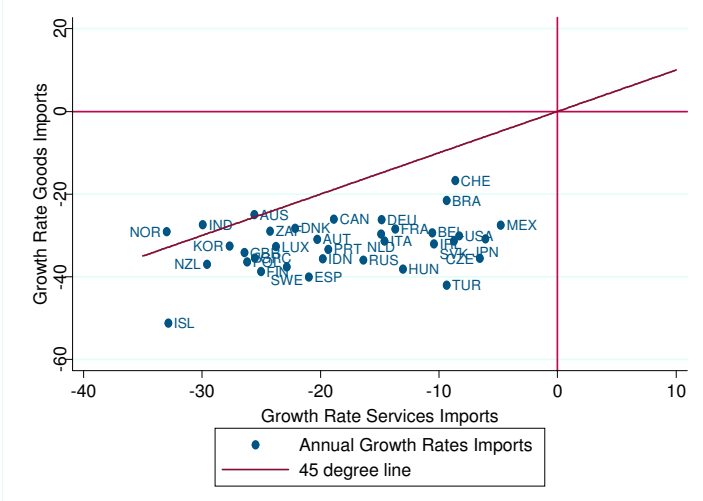
The US accounts for 17% of all OECD imports of services and 20% of all OECD exports of services. How far does its experience reflect that of the OECD countries more generally?

Trade data covering the first quarter of 2009 shows that services trade flows were also more robust across a number of OECD countries, although this data is only available for services trade as a whole and not for its subcomponents.

Figure 3 compares changes in goods and services trade. The chart displays data for OECD nations plus Brazil, Indonesia, India, Russia, and South Africa. For each country, the annual growth rate during the crisis of goods imports is plotted on the vertical axis while the growth in services imports is plotted on the horizontal axis. Both rates are negative for all countries but, interestingly, imports of goods are contracting faster for all countries except for Norway and India (these are just slightly above the 45 degree line).

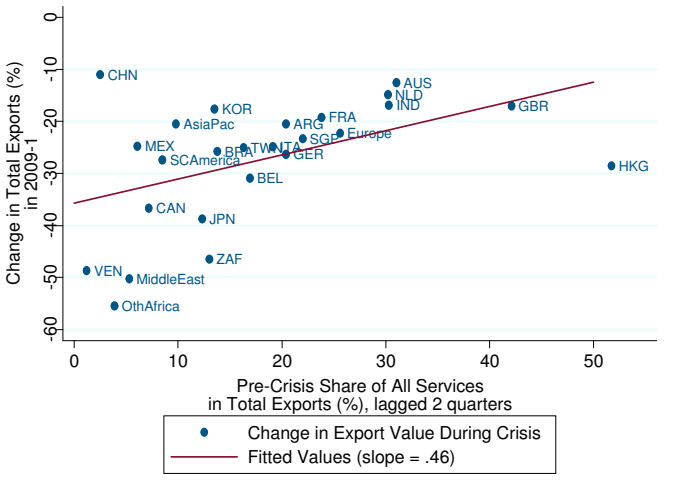
Until more detailed data becomes available, we can only conclude that evidence from other OECD countries does not contradict the picture of the relative resilience of services trade emerging from US data.

Figure 3. Growth of goods and services imports of 29 OECD and 2 non-OECD countries, annual growth rates, 2009-Q1



Source: OECD, Balance of Payments Statistics, Trade in Services by Partner Country, millions of dollars, seasonally adjusted. Iceland has been dropped.

Figure 4. Change in the value and growth rates of exports to the US and share of services in exports, selected countries and regions, 2009-Q1



Source: BEA, US International Transactions Accounts Data, Tab.12: US International Transactions by Area, millions of dollars, not seasonally adjusted. The slope coefficient in the graph is significant at the 2% level.

The impact on developing countries

Overall exports to the US from developing-countries that are specialised in services, like India (31% share of services in total exports), declined less than exports of countries and regions for which services are less important, such as Brazil (14% share) and Africa (4% share, excluding South Africa, the share of which is 13%).

Figure 4 makes the point. The contractions in their total exports (goods and services) to the US in the first quarter 2009 were:

- India (17%),
- Brazil (26%),
- Africa (55%; South Africa: 46%).
- China is an exception to this pattern as the share of services in its exports to the US is rather low (2.5%) yet its overall exports declined by only 11%.

For India, the relatively positive outlook is corroborated by Indian industry sources, which suggest that employment in the export-oriented IT and business process outsourcing services was expected to grow by about 5% (around 100,000 jobs) in 2009. Thus even during the crisis the industry continues to be a net hirer. While growth rates of both sales and employment are expected to be cut in half, this still leaves the sector with growth rates that would be considered buoyant in many manufacturing sectors.

Understanding the resilience of services trade

Based on new evidence from Indian services exporters, we find that services trade is

buoyant for two reasons; low dependence on external finance and limited cyclicality of demand.

Differences on the supply side

On the supply side, services trade was less affected than goods trade by the crisis-induced scarcity of finance. In stark contrast to the manufacturing sector, tightening credit conditions did not noticeably constrain the production and export of services, for three reasons.

- First, the fact that many services are delivered electronically across borders, as digitised products, and occasionally through the movement of individuals to provide consulting onsite, obviates the need for traditional trade finance, the deteriorating availability of which hurt goods trade.
- Second, and apart from trade finance, when external funds are needed, e.g. working capital, factoring as a financial instrument continues to help meet financing needs for small and large firms alike.

Receivables in business process outsourcing are fungible and easily factorised because they typically involve a short-term transaction, a buyer who is creditworthy, and disputes over the service rendered are rare.

- Third, even before turning receivables into cash, many IT firms are able to leverage contracts in order to pre-finance working capital at the time when the order is placed, provided the contract involves a recognised party or government.

Generally, services-producing firms have even in normal times tended to be less dependent on external finance than goods production because they have limited tangible collateral. For example, two of India's largest exporters of software and business-process services, Infosys and Tata Consultancy Services, have no external debt at all and rely completely on retained earnings for their operations.

Differences on the demand side

On the demand side, services exporters are still vulnerable to adverse demand shocks. However, demand for a range of traded services seems to have contracted less than demand for goods.

- One reason is that services are not storable and so are less subject to the big declines in demand in downturns that affect durable goods like shoes and televisions.

This is because many services suffer neither from the "vintage effect" - i.e. the willingness to wear an older pair of shoes or drive an older car - nor from the "inventory effect" - i.e. the fact that cuts in final demand translate into bigger immediate cuts in demand for factory output because of inventory adjustment.

- Another reason is that a larger part of international demand for services - e.g. outsourced back-office services - is less discretionary than demand for goods such as computers.

It is estimated that 70-80% of business in IT-enabled services can be characterised as non-discretionary. Trade in these services is likely to be insulated from negative demand shocks because they involve activities that must be carried on even during a crisis. For instance, in health care, a system-upgrading project (IT) is discretionary whereas the processing of claims (IT-enabled) has to continue. In banking, a project to realise end-to-end automation of payments (IT) is discretionary even though it might be cost saving, whereas transaction processing is non-discretionary.

- A third reason for the relative stability of services trade flows turns on the fact that a larger part of services trade seems to involve long-term relationships (e.g. because of relationship-specific investments by buyers and sellers).

There are also signs that the crisis is itself generating new tasks to be outsourced, such as legal process outsourcing or debt processing, as well as creating pressure generally to reduce costs through outsourcing.[4]

The subtle threat of protectionism

The relative buoyancy of services trade cannot be taken for granted. Over it too hangs the Damocles sword of protectionism. But protection is taking a subtle form, perhaps in deference to the invisibility of services and the fact that they are increasingly delivered electronically. First, explicit discrimination through preferential procurement seems at this stage less damaging than the implicit social and political disapproval of outsourcing. Developing country service exporters argue that it is the latter that has in some instances had a chilling effect on demand for their services. Similarly, the few visible explicit restrictions on employing or contracting foreign services providers in specific areas (e.g. financial services) are not as costly for both host and source as the increasing social and political aversion to immigration.

Another worry is the widening boundary of the state as a result of increased government ownership of firms during the crisis. Even though there is as yet no concrete evidence, there is a fear that state ownership could induce a national bias in firms' choices on procurement and location of economic activity. In the longer term, subsidies to banks are probably less damaging than financial protectionism. The former are temporarily necessary to ensure the stability of the financial system. The latter seriously erode the case for openness. Inducing national banks to lend domestically in a crisis deprives developing countries in particular of capital when they most need it and greatly strengthens the case for financial self-sufficiency.

4 Combinations of these factors may also lead to dynamic effects. Say, the pressure to reduce costs during the crisis induces outsourcing. Once a firm incurs sunk costs in establishing the new arrangement and relationship, it does not make sense to reverse the arrangement even after the crisis has passed. The temporary shock might thus permanently ratchet up outsourcing activity. The recent tendency of outsourcing providers to engage clients in multi-year framework agreements, under which individual transactions are being carried out, may also lead to a greater durability of business relationships.

Conclusion

Findings from our ongoing research suggest that the buoyancy of services trade relative to goods trade was for two reasons:

- Demand for a range of traded services is less cyclical, and
- Services trade and production are less dependent on external finance.

Clearly more thorough investigation of these is needed, but if they hold up then there may be additional benefits to diversifying a country's export structure towards services activities.

The apparent resilience of services trade may still be jeopardised by protectionism. Even though few explicitly trade-restrictive measures have so far been taken in services, the changing political climate and the widening boundaries of the state in crisis countries could introduce a national bias in firms' choices regarding procurement and the location of economic activity. This is obscuring the economic stake that all countries have in open global services markets. While developing countries like India have seen rapid export growth, by far the largest exporters of these services are the US and EU members; the EU and US account for 65% of world services exports; China and India for 6%.

The US and EU have both consistently run a huge annual surplus on services trade, currently nearly $160 billion for the US and $220 billion for the EU. While US services imports from India and China have indeed grown to around $22 billion in 2008, US exports to these countries have expanded even faster, to over $26 billion. Even during the crisis US exports of key services are growing faster than its imports.

The US and EU have been powerful advocates of open services markets all over the world. Many developing countries have begun to reform their markets for communications, transport, financial, distribution and other business services. A retreat from openness in services in industrial countries could undermine reform efforts in developing countries, and even trigger a costly spiral of retaliatory protection.

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18. The role of trade costs in the great trade collapse

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Trade has declined massively during the crisis. This chapter assesses the relative roles of falling demand and rising trade costs in explaining the collapse and compares it to the Great Depression. Surprisingly, the authors calculate that the increase in trade costs today is as large as in 1929 despite the absence of any modern protectionism resembling Smoot-Hawley. If their calculations turn out to be correct, reviving global demand alone will be insufficient to revive world trade.

The largest global trade collapse in the last 150 years (outside of wartime) occurred between early 2008 and mid-2009. The decline in trade was larger than during any one year in the Great Depression.

The unique size of the trade collapse suggests that the structure of global trade has been significantly altered over recent years, to the extent of rendering trade more sensitive to changes in the cost of international trade. The research of Kei-Mu Yi (forthcoming) emphasises that international supply chains, or production sharing, can magnify the sensitivity of trade to a given rise in trade costs.

Our evidence suggests that larger collapses occurred where such production sharing was more prevalent.[1] In this essay, we pair state-of-the-art theoretical and empirical economic models of bilateral trade with cross-country comparative data, in order to gain a perspective on the issue and to shed light on the diversity of experiences in response to the global shock.

The worst trade collapse in 150 years?

Between the second quarter of 2008 and the first quarter of 2009, the nominal value of world exports plummeted by around 50%. Even after accounting for the massive decline in commodity prices, deflationary tendencies and seasonal variation, world trade has suffered an enormous blow that is unprecedented in peacetime history.

1 We thank Douglas L. Campbell for excellent research assistance and Alan M. Taylor for helpful comments. We gratefully acknowledge research funding from the United Kingdom's Economic and Social Research Council (ESRC), grant RES-000-22-3112.

The data show that real, seasonally-adjusted aggregate bilateral exports, for a sample of 16 countries, have fallen by 20% on average in less than a year.[2] This far outpaces the average decline in real GDP over the same period (roughly 4%). By way of comparison to the Great Depression, which is the only quantitatively comparable shock in modern times, Eichengreen and O'Rourke (2009) report a 10% decline of world trade from June 1929 to June 1930 and an approximately 20% decline in world industrial output. The discerning feature this time around is that trade has fallen much faster than output.

For the Great Depression, a large percentage of the trade decline has been attributed to commercial policy (Madsen, 2001). Fortunately, lessons were learned from the past and policy makers have avoided large and ostentatious rises in tariffs.[3] Still, the rapid transformation of global trade to a heavy reliance on cross-border supply chains leads to the possibility that even small changes to trade policy can have a large impact on trade flows. This feature of the new global economy has sharpened the focus on trade costs more generally. These costs include tariff and non-tariff commercial policy, as well as a myriad of other frictions such as trade credit, transportation costs, and so forth.

Possible reasons for the trade slump

Various explanations for the trade decline have been put forward.

- Freund (2009) has suggested that world trade has become more sensitive over time to output movements, although theory lags behind this empirical observation.

One possible mechanism relates to the types of goods that are most heavily traded. A significant share of trade among the largest economies consists of consumer durables and investment goods. These components of aggregate demand are more volatile than total output, with the effect that international trade may suffer disproportionately in times of economic crisis. The fact that major exporters of these goods, such as Germany and Japan, have seen some of the sharpest falls in exports appears consistent with the phenomenon that Freund has highlighted.

- Yi (2009) suggests that with the rise of cross-border supply chains or *vertical specialisation* in recent decades, trade has become increasingly sensitive to changes in the costs of international trade.

2 The average is a weighted average using total pair real GDP as weights. We include 16 countries for which the International Monetary Fund's International Financial Statistics provide real GDP and export deflators. We use the latter (at the country level) to deflate bilateral exports. We use seasonally adjusted quarterly data. The countries include the United States, Japan, Germany, Korea, the United Kingdom, New Zealand, Greece, Switzerland, Finland, Poland, Denmark, Sweden, Mauritius, Australia, Colombia, and Austria. We have also generated results using nominal data on a much broader sample. These results run qualitatively parallel to those presented here.

3 However, as the Global Trade Alert (www.globaltradealert.org) initiative reminds us, commercial policy has become stiffer, non-tariff measures have cropped up and government bailouts have enacted stimulus plans which typically favour domestic goods and services and have thus cut the wind from the sails of international trade.

These costs are broadly defined and include transportation costs, commercial policy variables, insurance costs, financing costs and a range of other frictions. Incipient protectionism and the drying up of trade credit associated with the financial meltdown, could have triggered a magnified fall in trade even if they imply seemingly small rises in the relative costs of trade (Eichengreen and Irwin, 2009; Baldwin and Evenett, 2009).

- Francois and Woerz (2009) emphasised the collapse in the prices of heavily traded commodities.

Indeed, the US import price deflater index dropped by 21% from Q3:2008 to Q1:2009 – a mild drop compared to the 36% fall of the price of Japanese imports.

The gravity of the situation

In recent research we explore a structural model of bilateral trade (Jacks, Meissner and Novy, 2009) that is consistent with the leading trade theories in the literature. This model suggests a precise way to measure the relative contribution of declining output and increasing trade costs to the trade collapse. Bilateral trade (measured as the product of exports in both directions) is a function of country-pair GDP, bilateral trade costs, or frictions and factors affecting all the trade partners of the two countries in the pair. Trade costs are unobservable, but theory yields a measure of the tariff equivalent of these costs as the deviation of total bilateral trade from what economic size alone – that is, frictionless trade – would predict. Our theory is valid for any supply-side structure and all models of trade that predict specialisation in production.

Trade costs include tariffs, international shipping costs, non-tariff barriers, trade finance costs and many other such frictions, both observable and unobservable. For instance, they can also be interpreted as the interaction of vertical specialisation forces and rising trade costs, so long as the elasticity of trade with respect to GDP itself is constant.[4] Below, we analyze the correlation between our measure of trade costs and observable proxies for the frictions described here in order to make our key point.

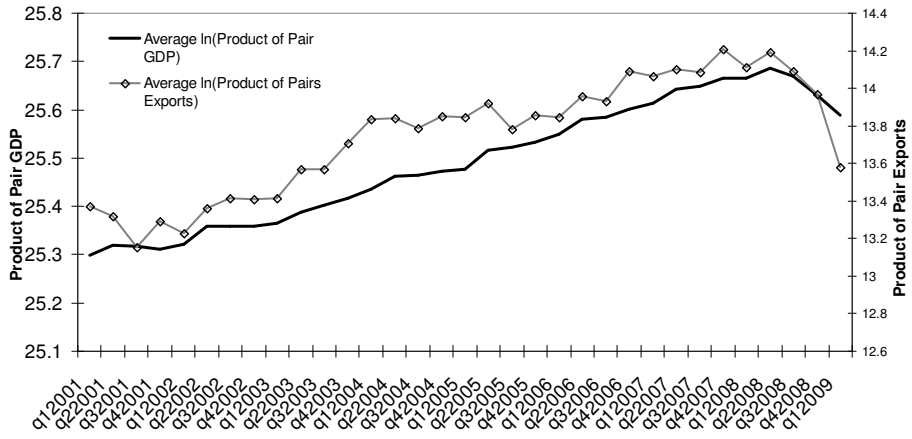
Trade costs have risen

First, we focus on the evolution of average aggregate bilateral trade and average GDP in our sample of countries. All data are measured in constant 2005 US dollars and trade flows are deflated using aggregate country-level export deflaters. All series are also seasonally adjusted. The vertical scales of Figure 1 imply, as theory predicts, that trade has grown roughly twice as fast as average bilateral GDP between 2001 and 2008.[5] There are two exceptions:

4 In fact, trade models based on homothetic preferences, as is most frequently the case in the literature, yield GDP elasticities of one, but the unit elasticity is not a necessary condition for our methodology.

5 See Jacks, Meissner and Novy (2008 and 2009) for details.

Figure 1 Bilateral trade and GDP, Q1:2001-Q1:2009



Notes: Authors' calculations based on data from the International Monetary Fund's (IMF) Direction of Trade Statistics and International Financial Statistics. Averages are weighted averages using the sum of country pair GDP as weights. All data are in real 2005 U.S. dollars and are seasonally adjusted.

- Trade grew much faster than output movements would have predicted between 2003 and 2005: and
- During the recent trade collapse trade has declined roughly six times faster than real output.

Table 1 uses an accounting decomposition, as in Jacks, Meissner and Novy (2009), to see how much of the trade fall can be accounted for by declines in output. For the entire sample, the fall in output can explain, on average, 15% of the fall in trade. The exercise reveals similar numbers for the US and Germany, a slightly lower number for the UK (11%), while about a quarter of Japan's trade collapse can be accounted for by the fall in output.

The rest of the fall in trade is by construction chalked up to trade costs, broadly defined, since output declines cannot account for it. For example, a possible mechanism could be that consumer durables and investment goods were particularly hard hit by evaporating credit, and since trade disproportionately consists of such goods, this adverse shock most clearly manifests itself in the trade data. We next explore the

Table 1 The Role of Output Declines in the Recent Trade Bust, Sample Average and Selected Countries

	Sample average	USA	Japan	Germany	UK
% of trade bust explained by by decline in the product of pair output	15.62	16.97	26.40	17.44	11.92

Notes: Authors' calculations. The sample includes 16 countries and 107 bilateral pairs as stated in the text. The sample average is a weighted average, and for each country a pair weighted average across all trade partners is given.

magnitude of the tariff equivalent of these frictions and then look at some possible determinants.

A closer look at trade costs

Figures 2a, 2b and 2c, track indices of the tariff equivalent of trade costs for the US, Japan and Germany, with key trading partners.[6] We also include the average trade cost index for our sample. Altogether we have 3,531 observations on 107 unique country pairs, representing 16 separate countries with data spanning 33 quarters (Q1:2001 to Q1:2009).[7] The following observations can be made:

- The large drop in world trade has been accompanied by a historically unprecedented rise in the tariff equivalent of aggregate trade costs across nearly all trade partners.
- Average bilateral trade costs (weighted by pair GDP) rose by an approximate 11% cumulatively from the end of the second quarter of 2008 to the end of the first quarter of 2009. The standard deviation was 9% with the 5th percentile being a rise of 2.5% and 95th percentile 25%.
- Certain pairs have seen sharper rises than others. Notably, pairs involving the UK in our figures show much larger increases.
- Similar methods reveal a rise in the tariff equivalent of barriers to trade of 5% to 6% between 1929 and 1930 in the Great Depression (based on annual data).

These figures indicate that a sizeable fraction of today's trade drop is due to non-tariff trade policy and other trade frictions, e.g., evaporating trade credit, and home bias in purchases associated with government stimulus plans in the larger countries.

The best evidence available on policy-induced trade barriers, the Global Trade Alert initiative (GTA), suggests much activity but no rise in measured protectionism anywhere near that observed in the 1930s. One possibility is that these measures are interfering with trade in combination with a lack of trade credit and uncertainty about the future.

A first look at the determinants of trade costs: A role for the international fragmentation of the supply chain?

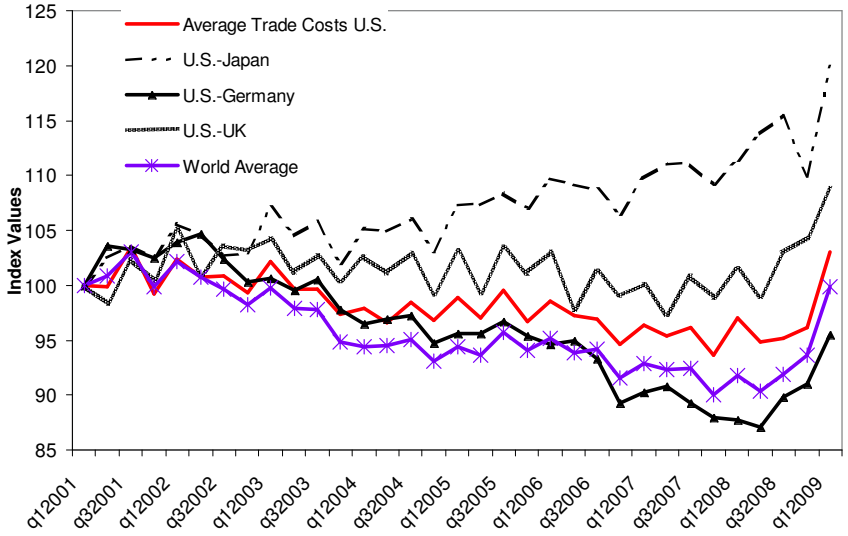
We have examined the relative impact of three possible determinants of the change in our measure of bilateral trade costs. These touch on several of the leading hypotheses that have been emphasised in recent analysis.

The first variable attempts to see to what extent vertical specialization is related to

6 Deflaters for recent quarters for China were unavailable in the IMF's International Financial Statistics. As these become available we will incorporate this important country.

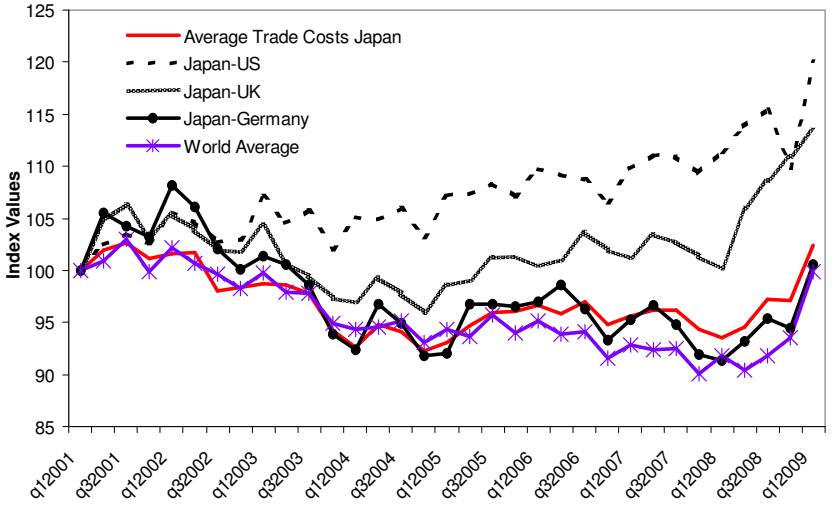
7 13 possible pairs for the 16 countries have some missing data during the period and hence are not included. This would have yielded another 429 pair observations. Our trade cost measure captures bilateral relative to domestic trade costs. The finding that trade costs between the U.S. and Japan have increased over the period means that their bilateral trade costs dropped less than their domestic trade

Figure 2a The evolution of trade costs, Q1:2001-Q1:2009: US and partners



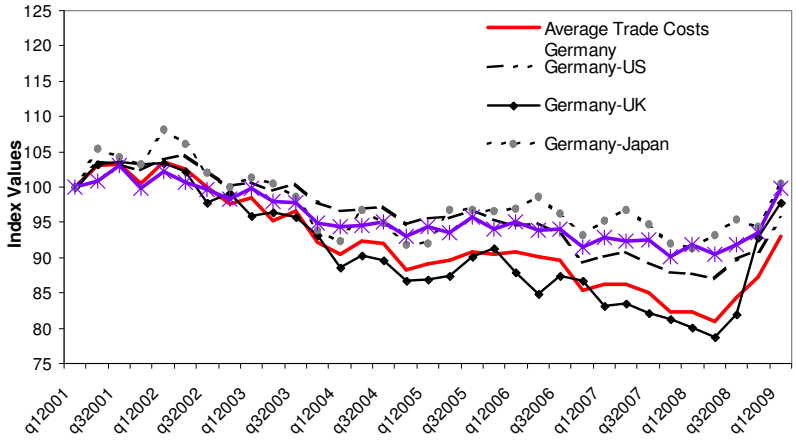
Source: Authors' calculations.

Figure 2b The evolution of trade costs, Q1:2001-Q1:2009: Japan and partners



Source: Authors' calculations.

Figure 2c The evolution of trade costs, Q1:2001-Q1:2009: Germany and partners



Source: Authors' calculations.

our measure of trade costs. We use the data presented in a recent paper by Johnson and Noguera (2009), who provide country-level ratios of value-added in exports relative to total exports (traditionally measured as total value). The ratio is often below one for many countries, due to the fact that countries import unfinished intermediates and then re-export these after processing. Traditional accounting methods count gross value every time merchandise shipments cross a border and therefore exaggerate the amount of world trade when production in vertical specialisation networks is important. The lower the Johnson-Noguera ratio is, the more the country is involved in production networks. We use the product of the ratio for each country in the pair.

The second variable uses information from the GTA database. This is the log product of one plus the number of 'red' trade measures undertaken at the bilateral level.[8] The third variable uses calculations by Engel and Wang (2009) on the share of trade accounted for by durables and investment goods. This is the geometric average of the share of imports and exports for each partner accounted for by durables, excluding materials and energy.

We ran GDP-weighted regressions of the percentage change (Q2:2008 to Q1:2009) in the tariff equivalent of trade costs on these three variables and have found that only one variable stands out. The Johnson-Noguera measure of the domestic content of total trade is negatively related to the rise in trade costs – the only variable found to be statistically significant. This implies that the lower the domestic value-added of the pair's trade flows, or the greater the involvement in vertical specialisation, the higher the associated rise in trade costs.

In terms of the other variables, we found that the GTA measure was positively related to trade cost rises but not statistically significant. The share of durables in imports was not significant, even when included by itself, and it always has the 'wrong' negative sign.

8 'Red' measures are trade policies that have been implemented and which 'almost certainly discriminate against a country's interest.'

Conclusions

Our results suggest that an increase in trade costs has played an important role in the recent trade collapse. We find that trade costs, broadly defined, increased on average by around 11% between the second quarter of 2008 and the first quarter of 2009.

Furthermore, we present evidence that might help to identify a particular mechanism of how the economic crisis translated into such a tremendous trade collapse. In particular, we find that the country pairs hit hardest are those whose production networks engage in greater levels of vertical specialization and cross-country shipping of intermediate goods. This finding suggests that the slicing up of the production chain into international stages magnifies the impact of hard-to-quantify trade cost rises associated with evaporating credit, non-tariff barriers and home bias in government stimulus plans.

The magnification effect can also work in the opposite direction. Once the adverse conditions surrounding international trade ease back and global demand resurges, we expect international trade to rise strongly, particularly in those industries characterised by vertical specialisation.

In future research, we will aim to assess how much of the rise in trade costs between 2008 and 2009 was due to commercial policy changes, financial frictions, and other observable barriers to trade. We also aim to improve our understanding of the interaction between these trade costs and international production sharing. Such information should be valuable for those seeking to understand how to revive global trade and how to avoid yet another trade collapse in the future.

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Section III

REGION AND COUNTRY EXPERIENCES

19. Transmission of the global recession through US trade

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US International Trade Commission

The US was critical to the global trade collapse and will be pivotal to the sustainability of the ongoing trade revival. This chapter documents the US role in the great trade collapse. It warns that the US trade recovery is relatively fragile, started late, has been dependent on a one-time stimulus for autos, and has not stimulated demand for imported capital goods as much as consumer goods. It is thus unclear whether US import demand can support other economies' recoveries without a significant improvement in US business confidence.

The US has been central to the international transmission of global shocks in the current recession and recovery.[1]

- It is a large country in global trade, acting as a major supplier and market for many countries.
- The trigger of this recession – the financial fallout of Lehman Brothers' collapse in September 2008 – occurred in the US.

In retrospect, the global transmission of demand shocks through US trade has been substantial. The real linkages through exports and imports feature prominent roles for sectors such as construction (tied to the subprime crisis), motor vehicles and petroleum which have been important in the current business cycle.

US merchandise trade

In tracing down the US's impact on global transmission of the trade shock, the key facts are:

- Imports from China dominated the US real import decline; falling Chinese exports impacted exports Asia-wide along global supply chains.
- Canada and Mexico figured disproportionately in US export declines.
- The subprime crisis impacted US housing markets, in turn affecting US imports of construction materials. Prices of sawn wood declined well before US home prices. Canada lost nearly half of its global exports of sawn wood as a result.

1 this piece solely represents the views of the authors and does not represent the views of the US International Trade Commission or any of its Commissioners.

- The motor vehicle sector has been unusually prominent in the current business cycle, with an unusually sharp downturn and recovery of trade on both the import and export sides. The high degree of North American integration in this sector caused falling demand for autos to reverberate in regional auto parts trade.
- US imports of capital goods and intermediate inputs have continued to be weak, consistent with the pattern in US GDP data which show a consumption-led recovery with investment lagging.

When did US trade start to recover? Prices and seasonality

Tables 1 and 2 show the changes in real, deflated US trade on both a non-adjusted and seasonally adjusted basis.

Trade data show a high degree of seasonality, with above-average growth in the spring months. Moreover, the current recession has featured a sharp collapse in oil and commodity prices, which have since partially recovered. Both of those features have made the boom and bust in trade appear unusually large and short.

- The recovery in US real trade, often reported to have started in the beginning of 2009, looks quite different when price changes and seasonality are taken into account;
- US exports start to recover in April 2009, while US imports turned up only in June 2009.

These facts are is consistent with income growth:

- US GDP did not begin to grow until the 3rd quarter of 2009;
- The GDP of some US trading partners began to recover earlier, in the 2nd quarter of 2009.

Table 1. Changes in real US trade, not seasonally adjusted

	Peak	Trough	% change peak to trough	% change Oct. 2008 - trough	% change trough-Aug 2009
Imports	Oct. 2007	Feb. 2009	-35.91	-33.85	12.69
Exports	Jun-08	Jan. 2009	-30.03	-27.40	10.44
Total Trade	Oct. 2007	Jan. 2009	-32.32	-26.37	3.98

Table 2. Changes in real seasonally adjusted US trade

	Peak	Trough	% change peak to trough	% change Oct. 2008 - trough	% change trough-Aug 2009
Imports	Sep. 2007	Jun-09	-25.09%	-21.98%	3.49%
Exports	Jul-08	Apr-09	-25.67%	-16.60%	4.34%
Total Trade	Jun-08	Jun-09	-22.88%	-19.57%	3.25%

US import and export peaks

The sectoral timing of US real import peaks is markedly different from that of US real export peaks. US export peaks tend to cluster around the general peak, reflecting the synchronisation of the global peak in GDP in mid-2008. US import peaks, by contrast, show a great deal of sectoral dispersion, with some sectors turning down much earlier than others.

This diversity suggests that the decline in US import demand, as well as its depth, was significantly influenced by specific sectoral weaknesses, in particular the timing of global events related to housing and oil.

The facts are summarised in Figure 1 and Figure 2. The figures show the size of each sectors trade in 2008 with the size of the bubble; the placement of the bubble shows the timing of the peak (horizontal axis) and the size of the decline (vertical axis). Figure 1 does this for US imports; Figure 2 for US exports.

Figure 1. Sectoral timing of decline, real seasonally adjusted US trade

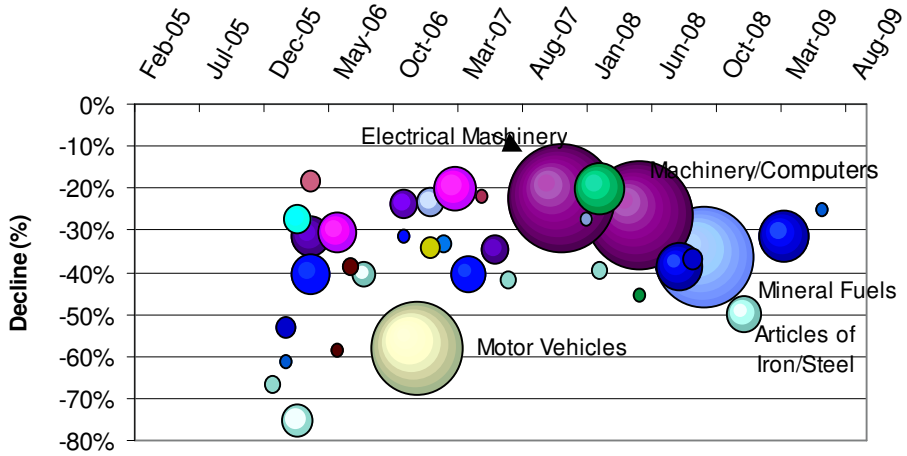
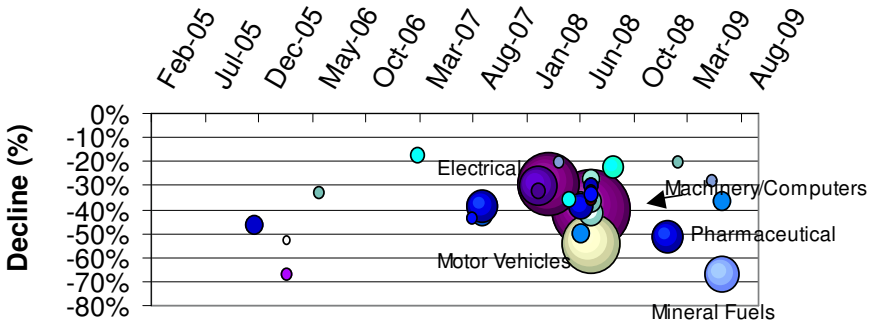


Figure 2. Sectoral timing of decline, real seasonally adjusted US trade



One clear point that emerges is that the demand for imported motor vehicles and parts peaked in December 2006, well before the peak in aggregate imports. This suggests some response to rising gasoline prices. Inputs into autos and/or construction, including aluminium, iron and steel, and plastics, also began to show real import declines in 2005 and early 2006. By contrast, US imports of computers and industrial machinery and crude and refined fossil fuels did not decline until relatively late in the cycle.

Country-specific linkages: Exports to North America, imports from Asia

The particular linkages through which global declines in demand are transmitted across countries are driven by pre-existing geographic and sectoral trading patterns, as well as by the particular structural weaknesses in each country and its trading partners.

One expects countries to "catch" recessions from the countries to which they disproportionately export and to transmit recessions to the countries from which they disproportionately import. The pre-existing patterns of specialisation with these trading partners will in part determine the sectoral distribution of the transmission of the business cycle though trade. These patterns are further influenced by contractions in the specific sectors which played a key role in triggering the recession.

Geographically, US exports go disproportionately to the EU and Canada, while US imports come disproportionately from China, Japan, and the rest of Asia. More precisely, from 2006-2008, the EU and Canada accounted for 43% of US exports and 34% of US imports on a nominal basis, while Asia accounted for 36% of US imports and only 26% of US exports. China alone accounted for 16% of US imports but only 6% of US exports.

Asymmetric trade linkages

Tables 3 and 4 provide further information on the asymmetric pattern of trade linkages. They show imports and exports from July 2008 to their respective seasonally adjusted troughs. For 7 of the top 10 HS chapters in US import declines, China is a principal supplier, while Japan is a principal supplier in four cases. On the export side, US export declines are heavily concentrated in the Canadian and Mexican markets. Thus, Asia is particularly vulnerable to declines in US demand, while the US is most strongly affected by declines in demand in North America.

The fairly aggregated categories shown below mask considerable two-way trade in parts and finished products, often within a single HS chapter. US import declines have been sharpest among products that are used as intermediate goods or inputs into other products (Levchenko, Lewis, and Tesar 2009). The fragmentation of production – through the development of long supply chains that divide the production of final goods across geographic locations – has likely intensified the response of trade to GDP in the current recession (Freund 2009).

Table 3 Largest declines of seasonally adjusted real imports from July 2008 to trough

	Change	Principal Suppliers
Total U.S. Imports	-22%	Canada, China, Mexico
Motor Vehicles & their parts	-49%	Japan, Canada, Mexico, Germany
Machinery & computers	-25%	China, Japan, Mexico
Electrical machinery & equipment	-18%	China, Mexico
Mineral products	-18%	Canada, Saudi Arabia
Organic Chemicals	-28%	Ireland, China
Iron & Steel	-63%	Canada, Brazil
Optical, photo & medical instruments	-18%	Mexico, Germany, Japan, China
Toys, games & sports equipment	-31%	China, Japan
Articles of iron & steel	-35%	China, Canada
Furniture & stuffed furnishings, lamps	-26%	China, Mexico, Canada

Table 4 Largest declines of seasonally adjusted real exports from July 2008 to trough

	Change	Principal Suppliers
Total US Exports	-25.67%	Canada, Mexico
Machinery & computers	-36.85%	Canada, Mexico
Motor vehicles & their parts	-50.65%	Canada, Mexico
Electrical machinery & equipment	-28.84%	Mexico, Canada
Plastics & articles thereof	-23.13%	Canada, Mexico
Organic Chemicals	-21.94%	Mexico, Canada
Miscellaneous chemical products	-35.84%	Canada, Netherlands
Iron & Steel	-29.48%	Canada, Mexico, China
Articles of iron & steel	-35.78%	Canada, Mexico
Paper & paperboard, and related	-19.99%	Canada, Mexico
Inorganic Chemicals	-30.74%	Japan, Canada

In the case of imports from China, declines in US demand are particularly likely to reverberate to third countries, particularly in Asia. China's exports are increasingly dominated by goods produced by foreign-invested firms under "processing trade" incentives that favour importing components and exporting goods after final assembly. These conditions are particularly pervasive in computers and peripherals, telecommunication equipment, and office equipment (Koopman, Wang, and Wei 2008). The US participates in the trans-Asian electronics trade as a provider of semiconductors and other technology-intensive electronic components (Ferrantino et al. 2007). Thus, the drop in US imports of computers and cell phones leads indirectly to a drop in US exports of semiconductors and components.

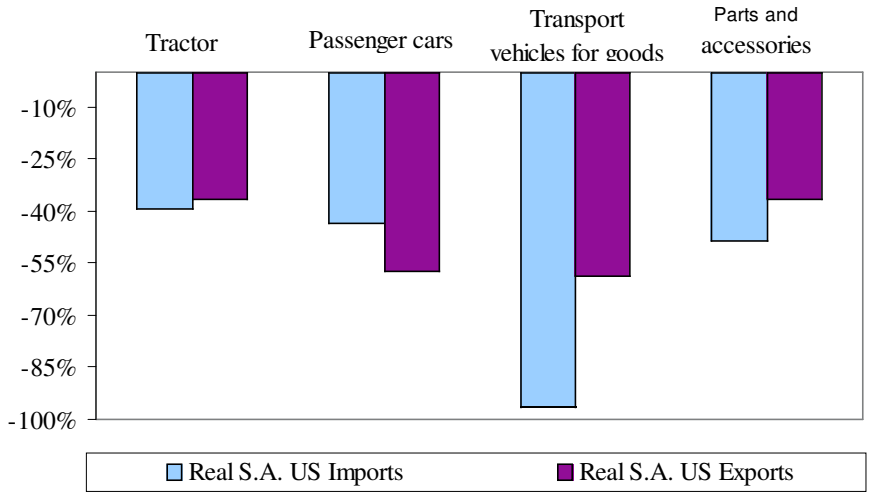
A big bang in motor vehicles and parts – down and up

The particularly dramatic drop in US two-way trade in motor vehicles and parts is also influenced by production fragmentation. As seen above, US imports and exports of motor vehicles and parts have fallen at approximately twice the rate of US trade as a whole. The network of parts manufacturers and assemblers in North America is par-

ticularly interconnected, with a shock in demand causing multiple reductions in trade throughout the NAFTA region.

These reductions magnified the trade effect of shocks like rising gasoline prices (real imports began to decline early in 2007, while fuel prices were still rising) and the reorganisations of GM and Chrysler in 2008/09; the effect was felt in all subsectors of vehicles (Figure 3).

Figure 3. Collapse of vehicle imports and exports from peak to trough



Note: S.A. indicates seasonally adjusted.

Tables 5 and 6 show the recovery of US exports and imports from their troughs in April 2009 (for exports) and June 2009 (for imports). The response of passenger vehicles and parts in the decline is even more marked in the recovery, accounting for 77% of the recovery in imports and 45% of the recovery in exports. Passenger vehicles imports rebound shortly before the implementation of the CARS stimulus programme (popularly known as "Cash for Clunkers"), which provided vouchers of $3,500-$4,500 for purchases of eligible vehicles associated with trade-ins of certain less fuel efficient used cars (Figure 4).

Not all sectors yet show a real trade recovery. Notably, US imports of capital goods (mostly in HS 84 and 85) lag behind the overall increase in US imports. This is consistent with 3rd quarter data for US real GDP, which show purchases of equipment growing more slowly than consumption.

Table 5. Largest absolute changes in S.A. real imports from trough to August 2009

	Change	Principal Suppliers
Total U.S. Imports	3%	China, Canada, Mexico
Motor Vehicles & parts	35%	Japan, Canada, Mexico, Germany
Toys, games & sports equipment	32%	China, Japan
Machinery & computers	3%	China, Mexico
Organic Chemicals	11%	Ireland, UK
Pharmaceutical Products	5%	UK, Germany, Ireland
Plastics & articles thereof	10%	China, Mexico
Optical, photo & medical instruments	4%	Mexico, Germany, China
Articles of apparel knitted or crocheted	5%	China, Vietnam
Mineral Products/Petroleum	-3%	Canada, Venezuela
Electrical machinery & equip	-1%	China, Mexico

Table 6. Largest absolute changes in S.A. real imports from trough to August 2009

	Change	Principal Suppliers
Total U.S. Imports	3%	China, Canada, Mexico
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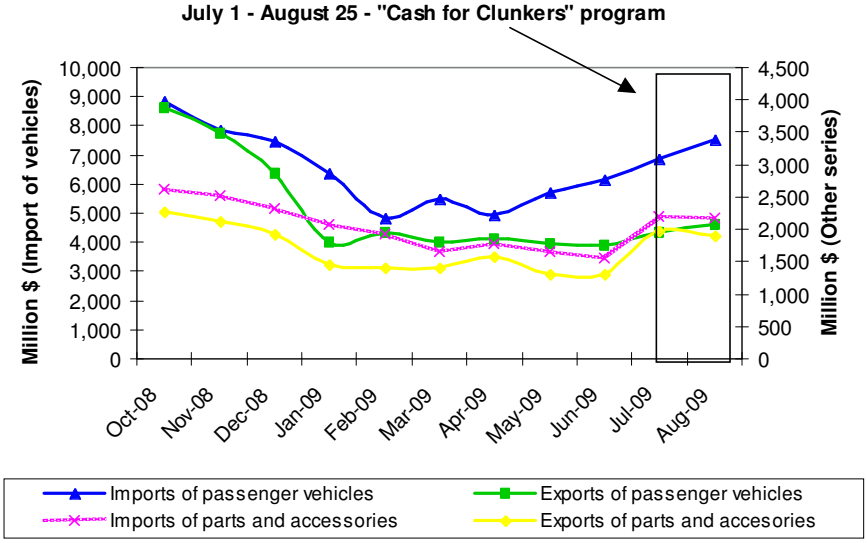
Mineral Products/Petroleum	-3%	Canada, Venezuela
Electrical machinery & equip	-1%	China, Mexico

Figure 4. US trade, passenger vehicles and parts (real seasonally adjusted)



Construction and petroleum

US imports may have been an early indicator of the problems in the US housing market that later affected the financial system and the economy as a whole. Import prices of sawn wood, mostly from Canada, began to turn down in early 2005, leading a number of other indicators of the declining housing market (the Case-Shiller index of housing prices is shown below, in Figure 5). Both housing prices and prices of imported wood began to rebound together starting in June 2009, providing a positive linkage from the US housing recovery to at least some Canadian exports.

Figure 5. Prices of sawn wood imports and Case-Schiller housing index (seasonally adjusted)

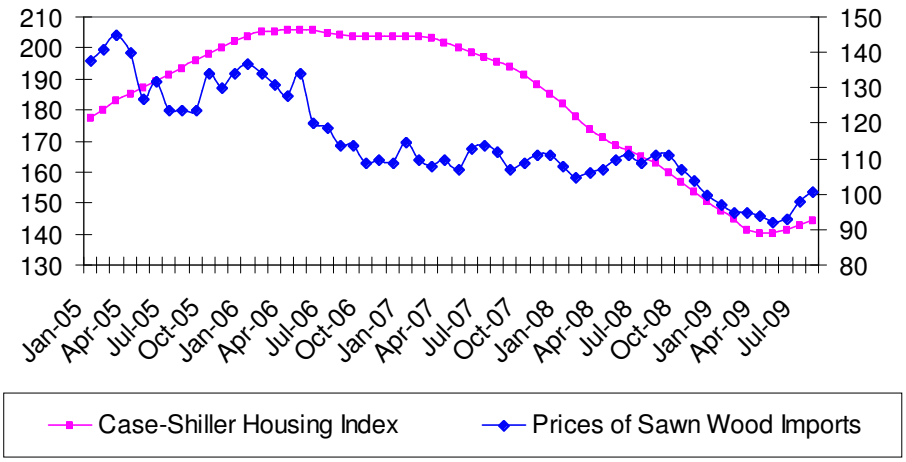
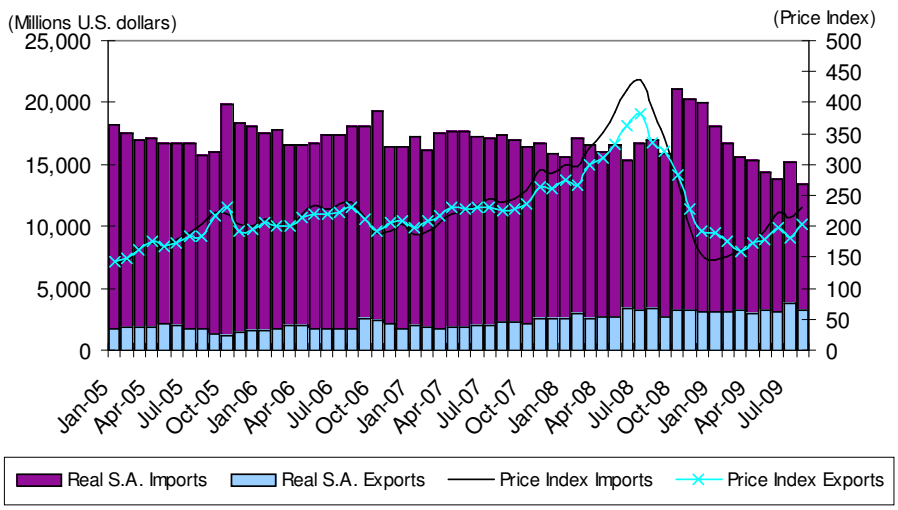


Figure 6. US imports and exports of mineral fuels



Note: "S.A." stands for seasonally adjusted.

The role of oil prices

The run-up of global oil prices in 2007 and the first half of 2008 was a contributing factor to the global recession. Much of the nominal trade collapse in the Great Recession was due to the effects of falling oil prices, as has been often noted.

The weakness in US demand for mineral fuels may also have a supply-chain component; petroleum and natural gas are major inputs into chemicals and plastics, which are in turn intermediate inputs for many other industrial sectors.

Conclusions

Recovery of trade worldwide is strongly linked to the US recovery. A closer look at the US trade recovery indicates that it is relatively fragile.

- It has started late;
- It has so far been heavily dependent on a one-time stimulus for autos; and
- Demand for imported capital goods lags consumer goods.

These features call into question the ability of US import demand to significantly support recovery in other countries. The world might have to wait until US business confidence strengthens further.

Disclaimer: This piece solely represents the views of the authors and does not represent the views of the US International Trade Commission or any of its Commissioners.

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20. Africa and the trade crisis

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Africa has been hard hit; its export revenue collapsed as both prices and volumes of commodity exports dived, and capital inflows shrunk. National budgets were hit as tariff revenue fell with imports and overseas development assistance slumped. Developed countries' responses to the crisis have fed a growing backlash against the Washington Consensus, but major reversals of reforms seem unlikely. African policy makers tend to see the crisis as a temporary setback and are adopting coping strategies that reflect that view.

During the period of the "Great Moderation," Africa's aggregate economic growth fuelled some optimism that the continent was at last on its way to meeting its Millennium Development Goals (MDG) targets. As with most regions, however, that optimism has given way to pessimism in the wake of the financial crisis.

Diagnosing crisis drivers in Africa

Impacts on the continent can be traced through, inter alia two broad channels:

- Reduced exports and commodity prices; and
- Declining capital inflows.

We address each in turn, in the process considering the broader macroeconomic impacts, and conclude with some thoughts about what this means for Africa in light of the wider consequences for global trade.

Commodity prices and trade

African economies rely on commodity exports to generate foreign exchange and fuel domestic economic growth (Table 1). This fits with the continent's comparative advantage in resource endowments, particularly of mineral and agricultural products; the only manufacturing centre of any significance is South Africa which accounts for the bulk (more than 50%) of the manufactures represented in Table 1.
Commodity receipts boomed through the early part of this millennium as China's (and to a lesser extent, India's) economic growth sucked in enormous quantities of raw materials, and demand in the traditional developed country export markets – the US and Europe – remained strong (Table 2).

Table 1. Structure of Africa's exports, 2008

Product Group	$ billion	Share
Mineral products	341.6	67.0%
Base metals	29.1	5.7%
Precious stones and metals	21.7	4.3%
Chemical products	18.2	3.6%
Machinery	16.7	3.3%
Textiles & clothing	15.1	3.0%
Vegetable products	14.5	2.8%
Food, beverages & tobacco	13.6	2.7%
Transport equipment	12.6	2.5%
Other	27.1	5.3%
Total	510.1	100.0%

.
Source: SAIIA's calculations based on International Trade Centre data, 2009

Table 2. Destination of Africa's exports, 2008

Region	$ billion	Share
EU-27	174.1	34.1%
NAFTA	121.7	23.8%
Asia	120.9	23.7%
Other	78.6	15.4%
Mercosur	14.9	2.9%
Total	510.1	100.0%

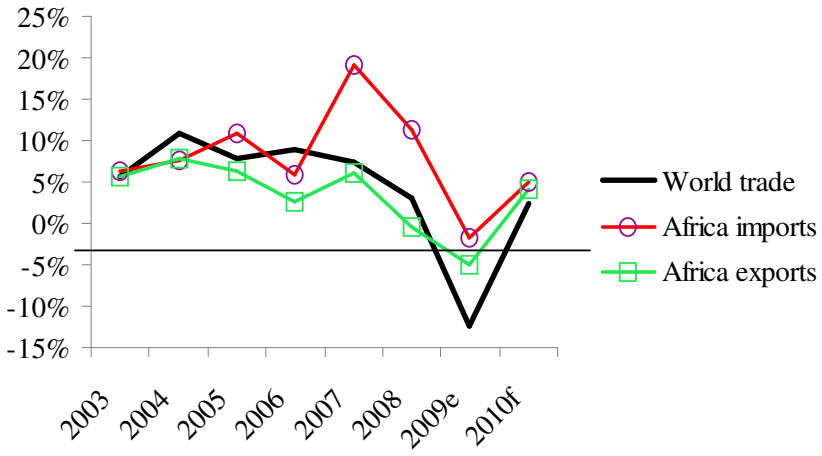
Source: SAIIA's calculations based on International Trade Centre data, 2009.

The commodities boom created some challenges, especially for those countries reliant on imported food and energy, as witnessed in the price spikes in these two commodity groups in 2008. However, since commodities prices had boomed across the board and export receipts also increased in most countries, the effects had been ameliorated to some extent.

The initial impact of the crisis was to reduce demand in the major export markets for African commodity exports, especially in the epicentre economies: the US and EU (Figure 1). Those impacts were differentially experienced since some countries benefited from lower prices for imported energy and food, which decreased inflationary pressures. Furthermore, on aggregate the decline in export volumes experienced by African economies was not as severe as the global average, which probably reflects the fact that African economies do not participate in the manufacturing processing trade and therefore were not subjected to the rapid deceleration in demand as were the Asian economies.

Nonetheless, declining demand for commodity exports impacted negatively on investment decisions, and therefore economic growth, across the continent. This probably explains why import volumes were also heavily hit by the crisis.

Figure 1. Annual export & import growth by volume (% change), World and Africa, 2003-2009



Source: SAIIA's calculations based on IMF World Economic Outlook Database, 2009.

Finance and capital flows

Broader macroeconomic impacts on Africa depend on the country in question's balance of payments position, foreign exchange reserves, and fiscal position. In relation to the first two criteria, the African situation in general is problematic.[1] Furthermore, as developed countries strive to rebalance their economic growth by reducing consumption, the resultant tempering of global demand will impact negatively on Africa.

The financial impacts

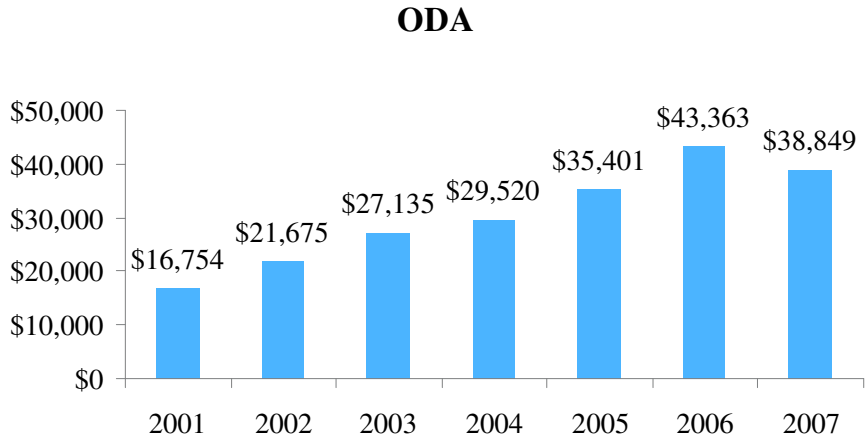
Since many countries in the sub-continent rely on import taxes (tariffs) to sustain government revenues, the trade collapse will worsen fiscal positions. This means that sustaining access to financial flows is critical, albeit this faces severe challenges too. The challenges come from at least four sources:

- Trade finance,
- Official development assistance (ODA),
- Foreign direct investment (FDI), and
- Remittances.

Concerning trade finance, the commitments made at the G20 Leaders' summit in London to substantially increase the World Bank's capacity to underpin extension of trade finance are very important. The public debate on this issue has receded, which we take to be a sign that the problem has moderated.

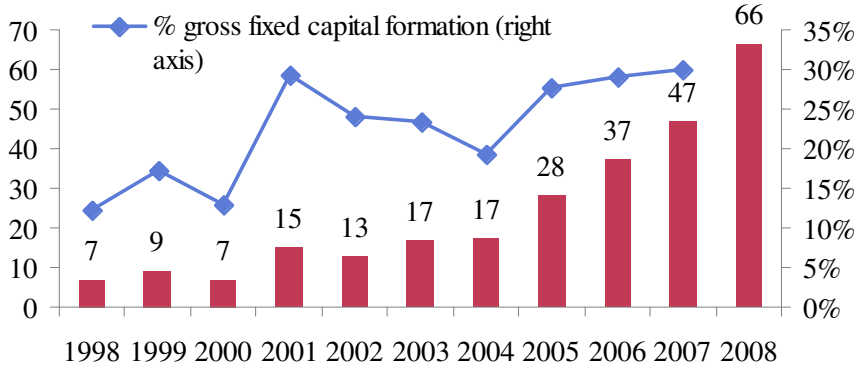
1 Approximately 40 African countries have current account and fiscal deficits, whilst exchange rates across the continent are weak. See the African Development Bank presentation at the SAIIA conference on the G20 Leaders' London Summit, here http://www.saiia.org.za/development-through-trade-events/g20-summit-workshop.html.

Figure 2 Aggregate ODA to Africa, 2002-2007, USD million



Source: SAIIA's calculations based on OECD Stat database, 2009.

Figure 3 FDI inflows to sub-Saharan Africa, by value and as a percentage of gross fixed capital formation, 1998-2008



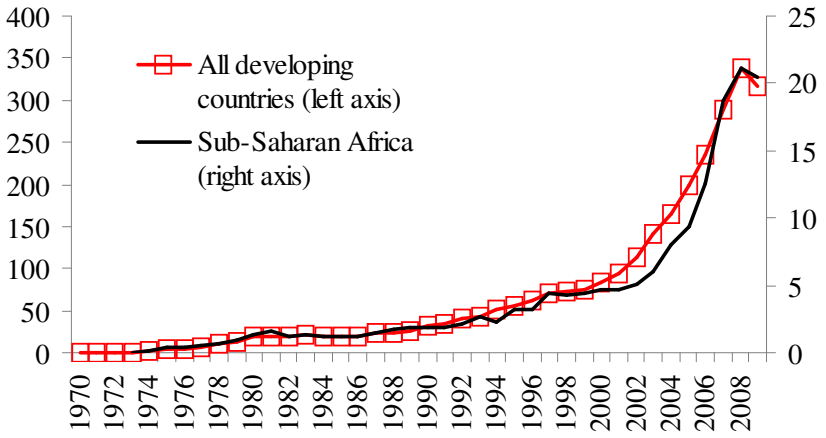
Source: SAIIA's calculations based on World Investment Report database, 2009.

ODA, however, is very unlikely to increase; the major donor-countries are engaged in financial sector bailouts and refloating their economies. Figure 3 shows that prior to the onset of the crisis such flows had moderated in any event.

This is likely to be compounded by decreasing inflows of private capital, but as of the end of 2008 this had not shown up in official figures (Figure 4). UNCTAD, however, projects that it will be manifest in the 2009 figures; their FDI projections suggest that a number of pipeline projects have been cancelled (UNCTAD 2009). Mostly this concerns resource investments, which has implications for resource exports in the future and, by extension, for macroeconomic imbalances in particular.

Since FDI now accounts for a major proportion of capital formation in Africa this drop is not welcome news. It is likely, therefore, those already vulnerable revenues are likely to come under more stress in many African countries in the months ahead.

Figure 4 Remittances flows, 1970-2009, USD billion



Source: SAIIA's calculations based on World Bank data, 2009.

Furthermore, reduced remittances from African diasporas resident in the developed world are likely for the next couple of years (Table 3; Figure 4). In recent decades these financial inflows have alternately cushioned the ill-effects of macroeconomic mismanagement or underpinned positive structural transformation stories. This will exacerbate foreign exchange shortages, dampen domestic growth prospects through reduced consumption, and further sharpen revenue pressures.

Table 3 Outlook for remittance flows, 2009-11

Remittances growth rate (%)						
Year	2006	2007	2008	*2009e*	*2010f*	*2011f*
World	15.3%	21.3%	15.3%	-5.3%	1.2%	3.7%
Developing countries	18.3%	22.9%	16.7%	-6.1%	1.4%	3.9%
Sub-Saharan Africa	34.7%	47.6%	13.4%	-2.9%	1.8%	3.9%

Source: Ratha et al, 2009.

Africa and the bigger picture

Altogether the cumulative impacts of the crisis on Africa, already arguably the most vulnerable region of the global economy, are serious. The crisis impacts described above reinforce the point that African economies are still integrated into the global economy as suppliers of raw materials to manufacturing industries located elsewhere – albeit some new sources of services revenues (remittances and tourism primarily) have contributed to diversification in recent years. Any major changes to global trade and investment patterns that the crisis may engender are unlikely to substantially transform this structural feature.

At the policy level, additional impacts are possible too. Since the crisis originated in the developed world, principally the US, many commentators are now questioning the utility of economic management models sourced from those countries. This

feeds into what had been a gathering backlash against the so-called "Washington Consensus" set of policy "prescriptions" – practiced particularly by the IMF and earlier by the World Bank – via "structural adjustment" policies (Sally 2007). African observers in particular are wondering why it is that they were obliged to cut budget deficits and pursue monetary orthodoxy yet the purveyors of such advice are pursuing macroeconomic policies seemingly at odds with earlier advice.

These concerns resonate with Asian reactions to the Asian financial crisis in the late 1990s when the IMF in particular proffered austerity policies in return for funding, at a time when the economies concerned required economic stimulus – as the Western world is conducting on a massive scale now. The Asian countries' subsequent reaction fuelled the growth of foreign exchange reserves as insurance against future financial crises, which to some extent underpin the global macroeconomic imbalances that contributed to the current crisis. Consequently African policy makers are taking a keen interest in current discussions in the G20 and the Bretton Woods Institutions concerning reform of IMF conditionalities.

Some observers fear that there will be policy reversals in Africa, potentially undoing decades of hard reform. So far, however, this scenario has not come to pass. As things currently stand, African policy makers in Finance Ministries and Central Banks seem to realise, in the aggregate, that the crisis is essentially a temporary liquidity problem requiring extraordinary but temporary policy responses in the countries concerned. Furthermore, there does not seem to be a major appetite in Africa to reverse reforms, since it is highly unlikely that policy reversals will lead to substantial changes in their countries' economic circumstances.

African policy makers are pursuing a two-pronged strategy:

- Petition the IMF and World Bank to maintain capital flows into the continent on reasonable terms; and
- Waiting for the developed world's growth to resume and lift their economies.

And – just in case progress is slow on both fronts – they continue to deepen engagement with China.

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21 Africa, the trade crisis and WTO negotiations

Tonia Kandiero and **Léonce Ndikumana**
African Development Bank

The trade collapse hit Africa hard, particularly its exporters of natural resources and manufactured goods. As commodity prices have started to recover, so has African trade. This chapter recommends concluding the Doha round of WTO negotiations and investing in Aid for Trade initiatives to make the revival sustainable and support developing economies' long-term interests.

As WTO trade ministers gather next week in Geneva -- one full year after the financial crisis exploded into the global economic crisis - the full impact of the crisis on African countries is yet to be quantified, and while global economic prospects are improving, it is too early to talk of a genuine recovery.

In February, the *African Economic Outlook 2009* projected that real GDP growth in Africa for 2009 would decline drastically to 2.3%, barely half that of the preceding two years. The growth rate has since been downgraded as the crisis continues to take its toll on African economies; the latest forecasts predict growth of 2% for the continent. The growth outlook for 2010 is more optimistic (3.9%), but still falls short of the 6.1% growth achieved prior to the crisis.

The Great Recession and the great trade collapse

This sharp economic downturn worldwide has led to an immense contraction in international trade.

- African export volume growth is expected to decrease to 4% in 2009, from a buoyant rate of 11% in 2008, translating into a 45% loss.[1]
- The biggest slump is for middle-income countries, as their exports depend heavily on commodities (e.g. oil and precious metals) whose price and demand has been severely hit; their manufactures exports have also suffered.
- Oil and precious metals were affected mainly by a slump in global commodity prices, while manufactures suffered due to contraction in demand as the real sector in key markets shrunk.

1 United Nations (2009), World Economic Situation and Prospects 2009. New York: UNDESA

- Low-income countries show some resilience, considering that their exports are in "soft" commodities - such as tea, coffee, etc. - which did not experience a drastic decline in prices or demand on the global market.

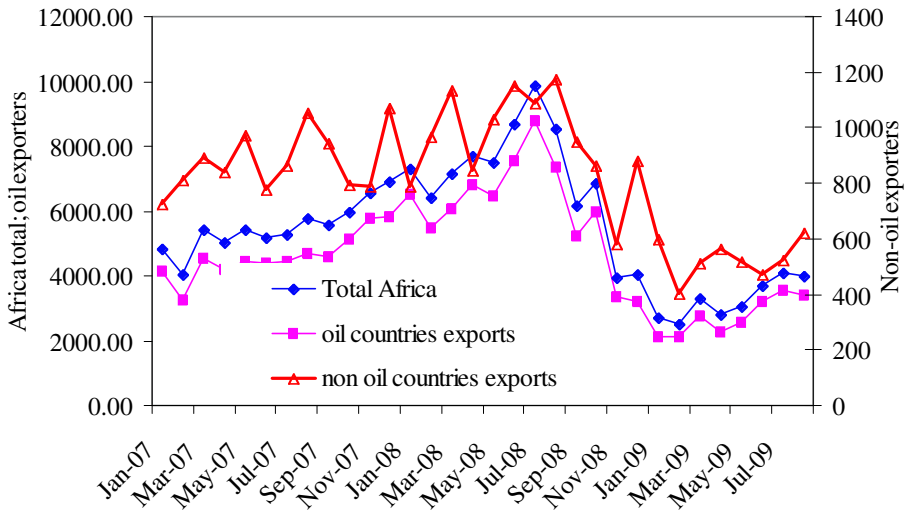
This chapter discusses the trade situation in Africa in key global markets and the impact of the global economic crisis on different income groups and sectors. In addition to market access issues, the paper highlights the importance of initiatives such as "Aid for Trade" in helping African countries realize the full gains from trade liberalization.

Trade collapse in the midst of the financial crisis in major markets

The slowdown in major trading partners, coupled with Africa's undiversified exports, has severely affected the continent's trade. This is exemplified by the drastic fall in exports to the US, which fell by more than 50% between August 2008 and August 2009, from $8,525 million to $4,017 million (Figure 1).

The fall in US demand for African products has especially affected oil exporters (Nigeria, Angola, Chad, Equatorial Guinea, Republic of Congo, Gabon, Côte d'Ivoire, Cameroon, and the Democratic Republic of Congo). The collapse in oil exports accounts for the sharp swing in growth rates in these countries, with Angola, for example, going from a double digit growth rate over the past years, to a projected zero growth in 2009.

Figure 1. African exports to the US, January 2007-August 2009 ($ million)



Source: US Department of Commerce.

Table 1 presents the trends in exports from middle-income African countries to the main global markets (European Union, US, Japan and China). The key points are:

- Algeria, Egypt, Morocco, Nigeria and South Africa experienced the sharpest deterioration in exports, starting in the fourth quarter of 2008, when the impact of the financial crisis on the real sector became evident.
- South Africa suffered a sharp decline in manufacturing products and precious metals, such as gold and platinum. With the increases in the price of gold and platinum of around 14% and 19% respectively, in the first quarter of 2009, the sector has started showing signs of early recovery.
- As an exporter of mainly agricultural products, Tanzania was spared, with an increase in exports of 12.13% in the second quarter of 2009.

For low-income countries the largest contractions were experienced in Angola, Rwanda, the Seychelles, Sierra Leone and Uganda. Table 2 shows that:

- Oil importing countries, such as Angola, were hit the most compared to countries that are mainly exporters of agricultural products.
- Angola's exports (mainly oil) declined by 59.3% in the second quarter of 2009.
- Countries such as Burundi and, to some extent, Ethiopia, experienced substantial growth in exports during the financial crisis, with exports in the second quarter of 2009 growing at 94.5% and 8.3% respectively.

Table 1. Middle-income countries' exports to EU, US, Japan & China, 2007Q1 to 2009Q2 (% change)

Country	2008Q1	2008Q2	2008Q3	2008Q4	2009Q1	2009Q2
Algeria	47.35	58.23	34.38	-17.76	-25.93	-46.01
Egypt	17.18	27.44	45.53	6.67	-14.58	-39.82
Kenya	25.43	28.76	4.89	-2.25	-13.52	-16.76
Mauritius	-0.08	13.97	-5.25	-4.17	-19.32	-16.76
Morocco	11.09	33.33	26.67	-16.34	-33.47	-38.12
Nigeria	53.40	67.12	50.08	-23.95	-62.67	-57.55
South Africa	23.25	34.89	18.93	-6.62	-35.17	-42.53
Tunisia	31.82	30.49	31.60	-24.58	-30.64	-35.66
United Republic of Tanzania	-13.49	-6.63	6.24	-2.49	-1.64	12.13

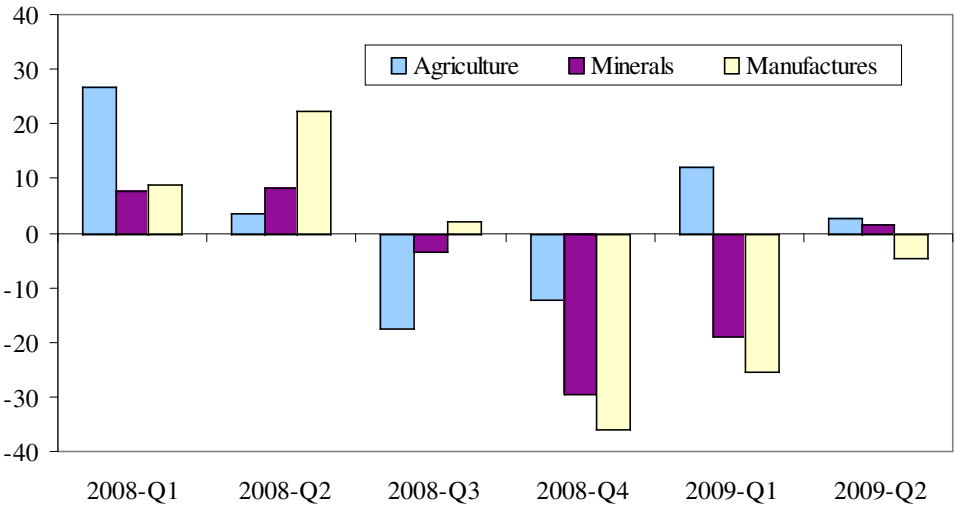
Source: ITC calculations based on National Government Statistics

Table 2. Lower income countries' exports to the EU, US, Japan and China, 2007 Q1 to 2009 Q2 (% change)

	2008Q1	2008Q2	2008Q3	2008Q4	2009Q1	2009Q2
Angola	96.69	120.82	111.79	-6.04	-51.39	-59.38
Burundi	-53.78	-37.35	-51.66	-36.22	128.46	94.53
Cape Verde	58.56	-26.15	178.45	-9.07	-21.36	1.46
Ethiopia	-3.71	29.44	26.57	19.74	14.18	8.26
Rwanda	-3.77	4.65	43.04	30.21	12.76	-5.49
Seychelles	-4.28	25.75	29.40	-11.81	0.07	-17.63
Sierra Leone	-10.02	-19.05	-15.14	-18.11	-26.78	-17.64
Uganda	58.33	30.23	25.32	9.32	-24.76	-14.75

Source: ITC calculations based on National Government Statistics

Figure 2. Exports of African countries to major global markets



Source: ITC calculations based on National Government Statistics

Figure 2 shows that the impact on African exports becomes evident as global markets entered a recession in 2008 Q3. Not surprisingly, manufactured goods from Africa contracted by 36% as consumers' demand shrunk, due to declining incomes and expectations of a worsening global economic condition. Likewise, mining exports also followed with a decline of 25%. The impact lessens in the second quarter of 2009, with mineral exports showing resilience as the price started to rebound for key products such as oil and gold. The agricultural sector was the least directly affected by the financial crisis.

The DDA

The tentative recovery of African trade should not distract global leaders from the task of locking in long-term progress by completing the Doha Development Round Agenda (DDA).

The DDA is an opportunity to improve global growth prospects from which all economies and societies can benefit. Most importantly, trade negotiations offer a chance for African countries to catch up with their competitors by:

- Locking-in domestic or unilateral reforms; and
- Getting the advanced economies to open up to their markets, thus levelling the playing field for Africa with respect to its key competitors.

Failure of the DDA to meet its objectives will not only undermine the importance of the WTO, but will also jeopardise the trade and growth prospects of developing economies; if this happens, Africa - with its reliance and commodity exports - will be amongst the biggest losers.

As agricultural issues are central to the successful completion of the DDA, Africa should continue to push for more progress on agriculture's three main contentious

issues: (i) agricultural tariffs; (ii) trade distorting, domestic support provided by developed countries to their farmers; and (iii) export subsidies. The leadership of developed countries is critical in ensuring progress on these issues.

Gains from a Doha success

The economic gains that Sub-Saharan Africa stands to reap from the DDA are large - although their exact magnitude remains a conjecture. Studies show that:

- Sub-Saharan Africa would see a modest $5,000 million increase in merchandise trade (some 1.1% of the region's GDP);
- Agriculture would account for 78% of this total gain;
- African cotton farmers are likely to boost their exports by $1,900 million.

A more ambitious target of full merchandise trade liberalisation, with a supportive domestic policy environment, is estimated to result in gains of approximately 5% of income in developing countries, which would lift some 300 million people out of poverty by 2015.

Should they accrue, such benefits will be unmatched by those from all other forms of international economic cooperation, including debt relief and official development assistance. It is therefore critical that developed countries take a leadership role and commit to ensuring that these potential gains are realized. The DDA must be concluded.

Going beyond market access: Championing the Aid for Trade initiative

In this current economic environment, the Doha Round, if concluded on time, will provide an opportunity for African countries to make strategic decisions to boost economic performance, which is critical for recovery.

It is important, however, for the international community to recognize that market access alone is not enough; supply-side constraints need to be addressed in order to enable developing countries, especially Least-Developed Countries (LDCs), to take advantage of trade opportunities. Coordinated efforts by all the key stakeholders to identify and address supply-side constraints - especially both "hard and soft infrastructure", such as roads, ports, rail networks, one-stop border posts, harmonisation of custom systems, training of customs officials and simplification of regulations and documentation - are of utmost importance. These reforms will require adjustment financing, for which countries rely heavily on Aid for Trade.

Aid for Trade is an initiative that has emerged from the Doha Round of trade negotiations. The initiative, however, is not dependent on a successful conclusion of the Doha Round. It is a mechanism through which the development community can assist developing countries, especially LDCs, to take advantage of trade opportunities by enhancing market access and helping these countries alleviate structural supply-side constraints.

Under the leadership of the WTO, significant progress has been made in mobilizing Aid for Trade, with the clear commitment of the international community. According to the *Aid for Trade at a Glance 2009* by the OECD, Aid for Trade commitments increased to $25.4 billion, a rise of $4.3 billion from the baseline period 2002-2005. However, it is important that Aid for Trade be not only driven by donors and the international community, but that African countries remain proactive in designing a coherent set of policy options targeted toward their own development objectives. The Aid for Trade initiative must also complement and strengthen Africa's regional integration efforts, particularly through an increase in intra-African trade. This leaves a clear role for regional institutions, such as the African Development Bank, the African Union Commission and the United Nations Economic Commission for Africa, as well as regional economic communities (RECs), to support the regional integration agenda.

Regional distribution of Aid for Trade

Aid for Trade to Africa stood at $9.5 billion (37.5% of total Aid for Trade) in 2007, while commitments to Asia and the Americas amounted to $10.7 billion (42.2%) and $2.2 billion (8%), respectively (Table 3). For Africa, this represents an increase of 23% from 2006 and 49% from the baseline of 2002-2005 (Figure 3), which is the largest increase relative to other regions. The 5 major recipients of Aid for Trade in Africa in 2007 were Kenya, Ghana, Mali, Uganda and Egypt. In terms of sector distribution of Aid for Trade flows, economic infrastructure dominated, accounting for 62% of total flows to Africa (Figure 4). Other areas that the African Development Bank has financed include building productive capacity, agriculture in particular, as well as trade policy and regulation.

Table 3. Regional distribution of Aid for Trade ($ and % of total), 2007

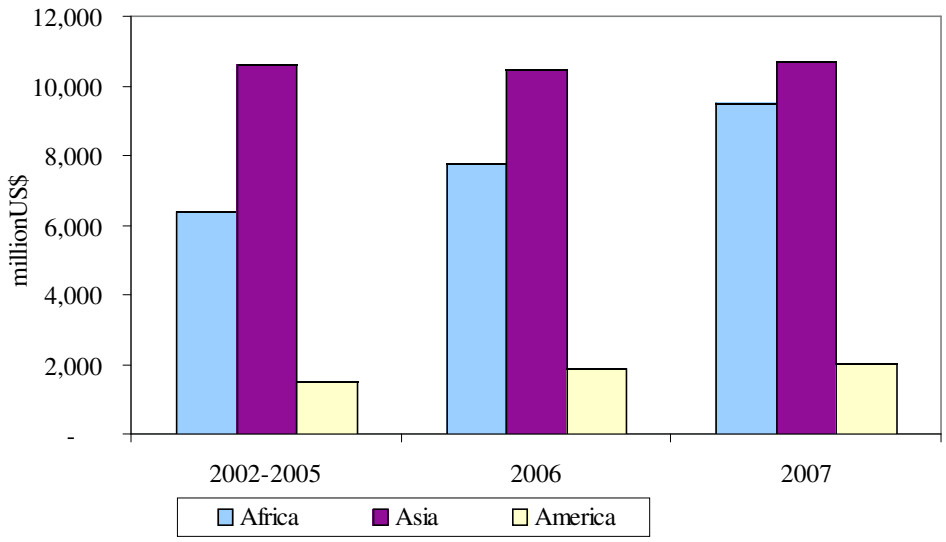
	Volume ($ billion)	Percent of total
Africa	9.5	37.5
Asia	10.7	42.2
Americas	2.2	8.2

Source: Calculations based on OECD Data

The role of the African Development Bank in the Aid for Trade agenda

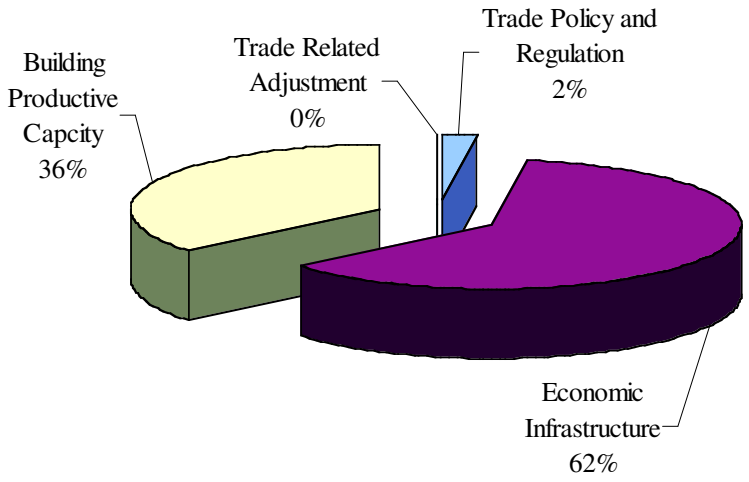
The African Development Bank (ADB) also recognizes that market access opportunities in the global market have the potential to offer African countries long-term sustainable income, which can be used to increase unemployment, boost economic growth and reduce poverty. At the same time, the ADB acknowledges that any form of trade liberalization through tariff reduction can be expected to trigger a restructuring of activities that may lead to, for example, loss of fiscal revenue, loss of competitiveness and changes in the distribution of employment. It is therefore the

Figure 3 Aid for Trade by region, 2000- 2007 ($ million)



Source: Calculations based on OECD Data

Figure 4 Sectoral Distribution of Aid for Trade Flows in Africa



Source: Authors' calculations based on OECD Data

responsibility of the ADB and policy makers to anticipate these potentially negative economic and social outcomes, thereby making the Aid for Trade initiative an important instrument in addressing some of these undesirable effects. The ADB, in particular, through its increased focus on both physical infrastructure and private sector development, recognizes its important financing role in Aid for Trade.

The African Development Bank believes it is essential for African countries to get a good trade deal in the Doha Round, rather than depend on any adjustment funds they may be able to secure in the form of Aid for Trade, in the event of a bad outcome. Therefore, the ADB's main obligation is to harness the areas where opportunities for African countries are most expected. This includes supporting capacity building in trade negotiations as well as the critical trade policy areas, such as rationalizing the best tariff structure that accommodates Doha and other trade agendas.

In addition, the ADB is supporting trade-related infrastructure (i.e. transport, energy, logistics), financial and capital market development, as well as other areas in order to reduce transaction costs. Promoting improvements in infrastructure and the business environment is opening up opportunities for the foreign private sector, both in terms of trade and of investment. After all, it is the private sector that trades. According to the Aid for Trade data reported by the ADB, new commitments for infrastructure, the largest sector in terms of contribution, amounted to $232 million in 2006 and $831 million in 2007, accounting for 54% and 78% of the ADB's total Aid for Trade contribution. As part of its commitment to the Aid for Trade agenda in the continent, the ADB pledged $600 million to support infrastructure and other related activities on the North-South Corridor during the April 2009 meeting in Zambia, which was convened by the East African Community (EAC), the Common Market for East and Southern Africa (COMESA) and the Southern Africa Development Community (SADC). The ADB is anticipating that this important initiative will be replicated in other regions in Africa. The ADB also contributes to other categories of Aid for Trade, including trade policy and regulation, adjustment and capacity building.

Furthermore, in times of economic distress, institutions such as the ADB are called upon to assist their regional member countries. At the height of the global financial crisis in 2009 the ADB responded swiftly and approved the Trade Finance Initiative to the amount of $1billion in support of trade; $500 million came in the form of lines of credit to African financial institutions to support trade finance operations; $500 million came in the form of the Global Trade Liquidity Programme (which was jointly implemented with other global financial institutions). Trade finance also falls under Aid for Trade.

Conclusion

The recent contraction in international trade clearly shows that trade was one of the casualties of the global financial crisis. Middle-income countries, such as South Africa, Algeria and Morocco, were most affected, mainly due to the decline in exports in manufacturing goods and minerals. However, low-income countries, such as Burundi, which are exporters of agricultural products, were less affected by the crisis. Without a doubt, the global agenda for recovery from the global contraction will

involve strong commitments on the international trade front, and concluding the Doha Trade Round should be at the top of the agenda.

Furthermore, initiatives such as Aid for Trade offer opportunities for the relevant countries to make investments in infrastructure, improve trade policy and regulation as well as productive capacity, with the view to expanding trade and consequently to boost economic growth. Therefore, Aid for Trade needs to involve long-term, predictable aid flows that can be fed into budgeting processes. More importantly, Aid for Trade must be a complement, rather than a substitute, for working towards a more progressive world trading system, which is one that does not prejudice the interests of developing countries. On the recipient side, the success of Aid for Trade will also entail strong political leadership at the country level, which is essential for the support of regional and national priorities.

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22. Trade collapse and international supply chains: Japanese evidence

Kiyoyasu Tanaka
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Japan's trade was particularly hard hit by the great trade collapse. This chapter marshals evidence for the idea that Japan's extensive involvement in international supply chains was a major reason for its larger and faster than average trade collapse.

Global trade flows collapsed at a historically unprecedented rate between the end of 2008 and beginning of 2009 (Baldwin and Taglioni 2009). Trade, however, did not collapse evenly across the globe.

Among the worst hit was Japan (Sommer 2009). Why was this? To help understand the causes of the great trade collapse, this chapter places international supply chains of manufacturing production at the centre of the reasoning. Specifically, the composition of the collapse of Japan's trade provides clear evidence on the role of vertical specialisation in the trade collapse.

Trade collapse

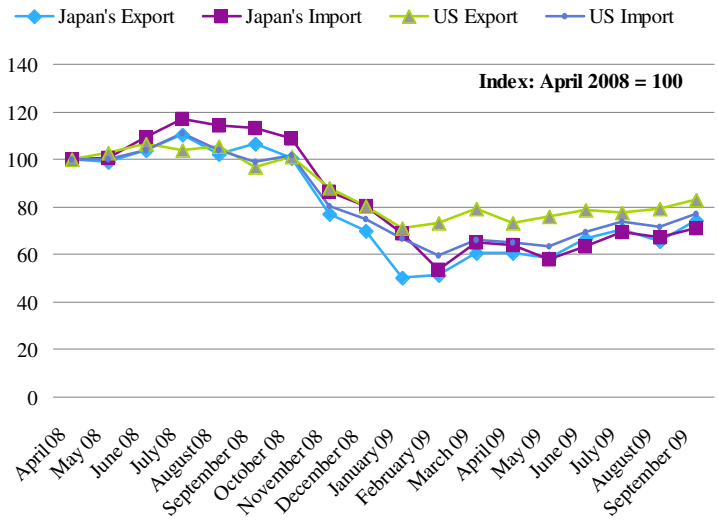
The stunning drop of global trade stemmed ultimately from the subprime crisis. The US subprime mortgage crisis inflicted high capital losses for domestic and foreign financial firms that had invested in securities backed with US real estate loans. This triggered a severe credit crunch in the US, which grew into a full-blown financial crisis of global proportions and later ended up affecting the entire global economy. The prime characteristics of the global economic crisis were plummeting stock and equity prices, and skyrocketing bank failures. The recessionary spiral in OECD countries brought international trade to a grinding halt in the fourth quarter of 2008; a 9% contraction in global merchandise trade, by volume, is already underway for 2009 (WTO 2009).

Such a collapse in trade could be a natural consequence of high levels of interdependence in finance, trade, and FDI. Indeed, some consider that falling trade is caused by a massive decline in final demand and a shortage in trade credit (see for example Baldwin and Evenett 2009).

Shortcomings with the standard explanation

I believe, however, that these explanations fail to account for key peculiarities of the unprecedented contraction in world trade, notably that the trade contraction has

Figure 1. The collapse of trade in goods for Japan and the US, 2008-2009



Note: The volume of trade in goods is expressed as an index with the figure for April 2008 being 100; export and import are reported in f.o.b and c.i.f. prices, respectively; US trade on the basis of total balance of payments is not seasonally adjusted.

Source: Trade Statistics of Japan, Ministry of Finance; US Census Bureau

been rather asymmetric across industrial economies. Another important piece of evidence is that this asymmetric fall in trade is not correlated with exposure to the crisis in any simple and straightforward way.

For example, Japan's trade declined much faster than the US's. The impact of the economic crisis on Japan has so far been relatively moderate - at least in financial institutions - yet Japanese trade has been badly hit. Figures for February 2009 indicate a 50% year-on-year contraction in Japanese export volumes and a 43% decrease in volumes of imports.[1] Meanwhile, comparable trade figures at the epicentre of the crisis, the US, show a mere 24% decrease in exports and 34% decrease in imports.[2]

For a further perpective on the uneven drop in foreign trade between Japan and the US over time, Figure 1 shows exports and imports in goods for Japan and the US from April 2008 through September 2009. For comparability, the volume of trade is expressed as an index, with the figure for April 2009 being 100. What is clear is that Japan's exports started to fall from October 2008 at a dramatic pace. Such a decline was much more severe than that of US exports. Both of their exports appeared to have bottomed out around March 2009. On the other hand, the imports also declined suddenly for the corresponding period.

1 Value of Exports and Imports February 2009, Trade Statistics of Japan, Ministry of Finance.

2 US Census, Bureau, Foreign Trade Statistics: US International Trade in Goods and Services (Current Release, February 2009).

Vertical specialisation

What explains such a difference in the speed of trade collapse across Japan and the US? One suspect is the differential importance of international supply chains.

The emergence of global production networks has promoted the vertical specialisation of countries and increased trade in both intermediate and final goods. Manufacturing firms increasingly specialise in particular stages of the production process and export intermediate inputs for further processing. Products may cross national borders several times and endure several transformations before they reach their final consumer.

The link between vertical specialisation and international trade enjoys strong empirical backing. In fact, back in 2001, Hummels, Ishii, and Yi showed that vertical integration could account for almost one-third of the export growth in OECD countries. Yi (2009) clarifies that this link can work in both directions. In fact, he suggests that vertical integration accounted for much of the trade collapse - though does not provide an estimate.

Vertical specialisation boosts the values and volumes of foreign trade for statistical reasons. Trade is measured in gross value-added terms, rather than net value- added terms, as is GDP. This measurement technique partly explains that flows in trade increase (decrease) at an accelerating rate when demand rises (falls).

From this point of view, the trade collapse could result from a breakdown of vertical trade chains. While vertical specialisation can account for possible differential impacts of trade, a full explanation of the disproportionate scale of trade contraction in response to demand shocks across Japan and the US requires examining the different strategies of US and Japanese multinationals.

Vertical foreign direct investment

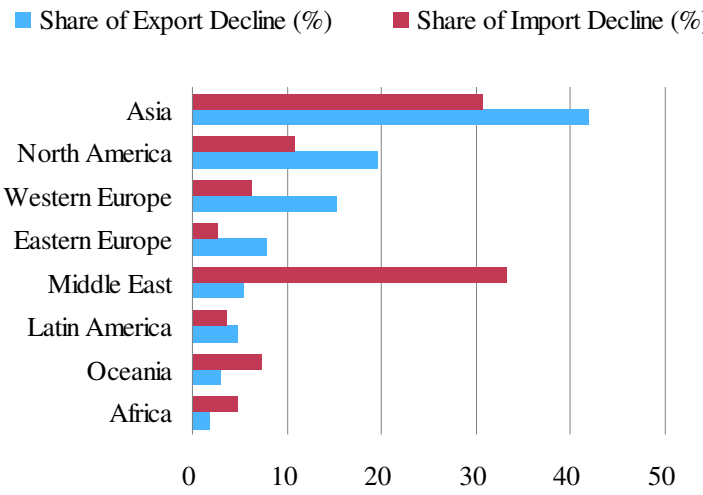
The growth of vertical specialisation was driven in part by investments of multinational firms bent on taking advantage of the lower costs of unskilled labour in some countries (Tanaka 2009). Multinationals established offshore production plants in unskilled-labour-abundant countries to conduct the unskilled-labour-intensive stages of production. Under these schemes, parent firms supplied intermediate inputs to their foreign affiliates, which performed the final assembly, and subsequently exported the final products back to the home market, or third markets.

Vertical specialisation is particularly clear in the case of FDI by Japanese multinationals, but is less so in the case of FDI by US multinationals.[3] The vertical specialisation of Japanese multinationals has been spread broadly across many countries; the vertical FDI of US multinationals, by contrast, is concentrated on a narrow set of countries, notably Canada and Mexico.

In my view, the difference in vertical FDI strategies between US and Japanese multinationals is one possible cause of the disproportionately large collapse of trade flows

3 Using panel data on sales of foreign affiliates by Japanese and US multinationals in manufacturing sectors for the 1990s, Tanaka (2009) finds that relative skill abundance has a large negative impact on Japanese affiliate sales, but little effect on US affiliate sales. Results are robust to various tests.

Figure 2. The regional share of trade collapse for Apr.-Sep. 2009 relative to 2008



Note: The volume of export and import for Apr.-Sep. 2009 relative to that for Apr.-Sep. 2008 decreased by 15.6 and 16.8 trillion yen, respectively.

Source: Trade Statistics of Japan, Ministry of Finance

in Japan in response to global demand contraction. As Japanese firms have embraced vertical FDI, Japan has been more fully immersed in vertical specialisation patterns than the US

Further evidence from Japan's trade statistics

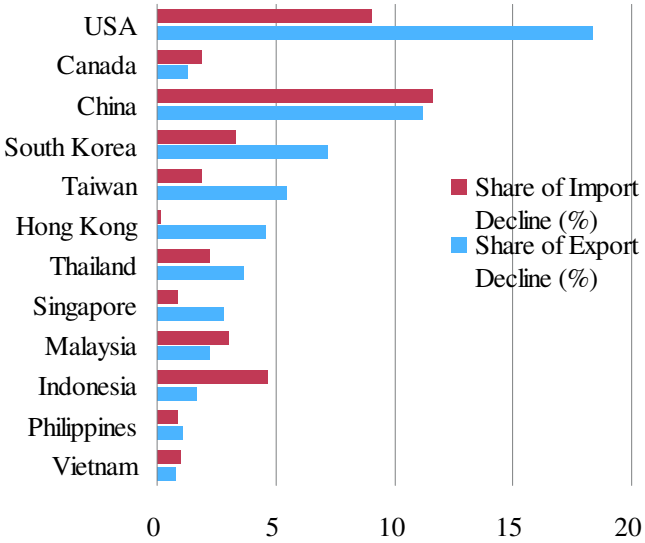
In order to get further insights on trade patterns in the wake of the trade collapse, I focus on the decline of Japanese trade for April-September 2009 relative to that for 2008. Figures indicate a 36% decrease in the volume of Japanese export and a 40% contraction in import volumes; the volume of these declines reaching a whopping 15.6 and 16.8 trillion yen, respectively. What commodity and partner country accounted for the decline?

Figure 2 shows the regional composition of the trade volumes that declined during April-September 2009, as compared to April-September 2008. Clearly, Asia plays the largest role in the collapse of Japan's trade for the recent period, with a pronounced share in the export decline.

On the export side, North American is the second largest region that reduced exports from Japan, followed by Western Europe. These observations indicate the importance of Asia and North American in explaining the causes of the extremely rapid collapse of trade in Japan. On the import side, the Middle East accounts for a surprisingly large composition of the import decline. The recession significantly decreased Japanese demand for imported goods from the Middle East.

As Figure 2 points to the substantial decline of Japan's trade with Asia and North America, Figure 3 further decomposes the regional share of the trade contraction by country for these regions. The recent fall in Japanese exports to the US is the largest among individual countries. This indicates the great dependence of Japanese exports

Figure 3. The country share of trade collapse for Apr.-Sep. 2009 relative to 2008



Note: The volume of export and import for Apr.-Sep. 2009 relative to that for Apr.-Sep. 2008 decreased by 15.6 and 16.8 trillion yen, respectively.

Source: Trade Statistics of Japan, Ministry of Finance

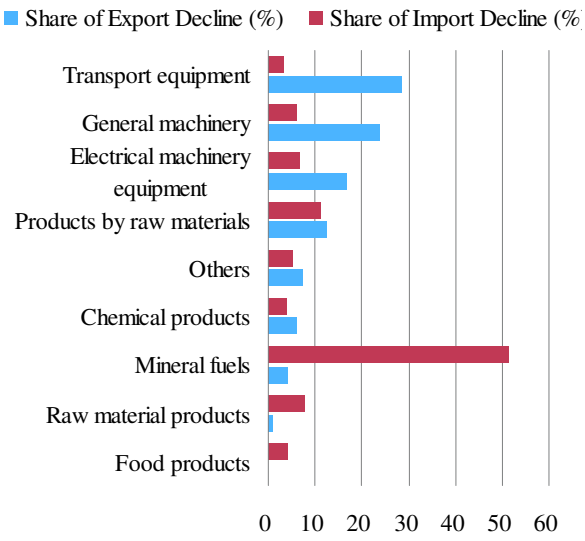
on the US market. In other words, an economic downturn in the US economy dampens sharply the US demand for imported goods from Japan. Looking at Asian countries, China accounts for the largest decline of Japan's exports and imports. Japanese export volumes also declined substantially for South Korea, Taiwan, and Hong Kong. Although China is the major market for Japanese trade, individual countries in Asia have an equally significant impact on the collapse of Japan's trade.

To further explore the characteristics of trade contraction, Figure 4 displays the commodity share of decreased volume of trade. The export contraction was most sizeable in transport equipment, general machinery, and electrical machinery equipment. On the other hand, the import decline was explained mainly by the declined volume of imported mineral fuels, which would in part reflect a drop in the price for crude oil. The commodity composition of the collapse of trade differs significantly by export and import. Manufacturing products are crucial in explaining the cause of the sudden collapse of Japan's export.

Another key question is what commodity accounts for a large drop of Japan's exports to Asia and the US? Export volumes decreased by 6.5 and 2.8 trillion yen for April- September 2009 relative to 2008, respectively. Figure 5 shows the commodity share of Japanese export declines in Asia and the US. Manufacturing products, such as general machinery, electrical machinery equipment, and chemical products, explained a relatively large share of export drops in Asian markets. As these goods involve particular stages of the production process that can be geographically fragmented, the large contraction of trade flows for these goods suggests the wide development of vertical specialisation across Japan and Asian countries.

In contrast, transport equipment has the disproportionately large composition of decreased exports to the US; motor vehicle's share is dominant relative to parts and

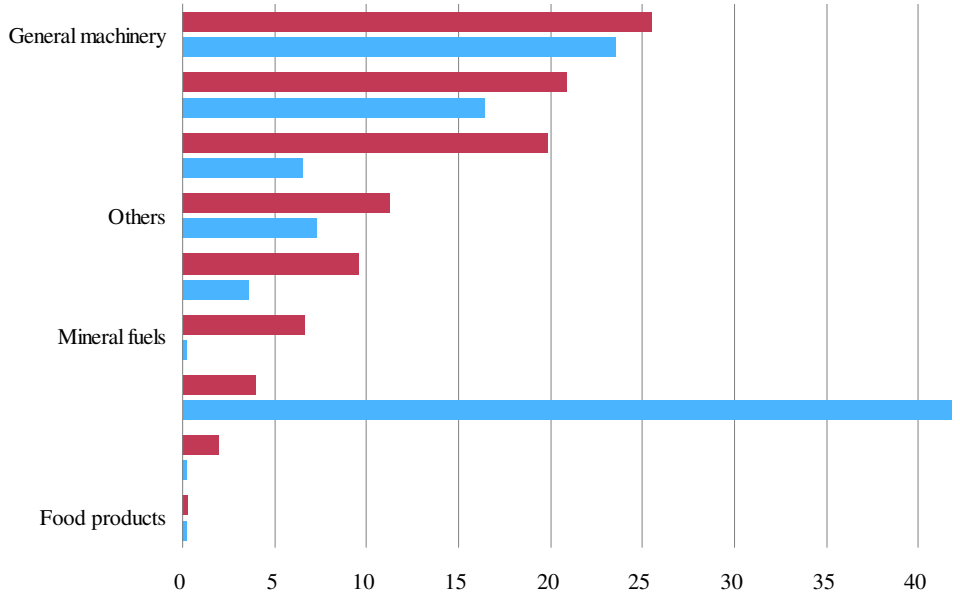
Figure 4 The commodity share of trade collapse for Apr.-Sep. 2009 relative to 2008



Note: The volume of export and import for Apr.-Sep. 2009 relative to that for Apr.-Sep. 2008 decreased by 15.6 and 16.8 trillion yen, respectively.

Source: Trade Statistics of Japan, Ministry of Finance

Figure 5 The commodity share of export collapse in Asia and the US for Apr.-Sep. 2009 relative to 2008



Note: The volume of export to Asia and the US for Apr.-Sep. 2009 relative to that for Apr.-Sep. 2008 decreased by 6.5 and 2.8 trillion yen, respectively.

Source: Trade Statistics of Japan, Ministry of Finance

components for the vehicle. This point accords with the contraction in demand of US firms and households for any type of motor vehicles. A sudden drop in Japanese exports was also in part driven by the collapse of US demand for Japanese motor vehicles.

Implications of trade collapse

Overall, the latest trade statistics indicate that the sudden contraction of Japan's exports was primarily explained by a large drop in manufacturing exports to Asia and the US, even though a substantial decline in the value of oil imports from the Middle East also played a large role on the import side. As the collapse of Japan's manufacturing exports to Asia has been most prominent in magnitude, Japan's drop in trade should have been amplified by the global production networks that Japanese multinational firms have extensively established over Asian nations.

Whilst a sudden drop of trade has clearly hit the Japanese economy hard, it is of interest to conjecture a lesson from the trade collapse on international supply chains. One key point concerns the just-in-time system of modern manufacturing production. Manufacturers receive only the components and parts they need immediately in order to reduce the cost of inventory holdings. The flexible logistics in the production system allow for a quick response to defective components and customer orders. Global production networks are in fact now dominated by just-in-time logistics systems. The consequences are a much tighter connection between imports and exports.

The sudden fall of exports clearly illustrates that Japanese firms have been highly responsive to a fluctuation in final demand, possibly through the flexible production network. In this respect, the amplification of Japan's fall in trade may suggest that Japanese firms have been successful in building flexible international supply chains in manufacturing production. When final demand falls, Japanese companies can slow down a cross-border circulation of parts and final products at the regional level. Once the demand recovers, they would start to expand production capacity abroad by taking advantage of international factor-cost differentials.

Concluding remarks

As fiscal stimulus plans deployed by OECD countries contributed to a recovery in global demand, the sudden collapse of global trade flows have already bottomed out and started to recover in recent periods. Japanese trade volumes also appear to turn up gradually since April 2009, although there is still no clear indication of the trade amplification effects by the international production networks. Still, many economies, including the Japanese economy, continue to suffer from a rising unemployment rate, growing bankruptcies, and mounting budget deficits. An important lesson from the trade collapse is that national governments must coordinate international economic policies, and indeed, have been successful in preventing a collapse in the international division of labour.

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23. Why was Japan's trade hit so much harder?

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Japanese exports were hit particularly hard by the crisis. This chapter shows how tumbling US import demand hurt Japanese exports both directly and via indirect exports of goods assembled in China for the US market (the so-called "trade triad"). An investigation into the extensive and intensive margins during Japan's recent trade collapse shows that most adjustment occurred in existing trade relationships; there is very little evidence of deeper harm to Japan's export capability via damage to its international supply chain. That means the ongoing recovery of the US economy should produce an especially speedy revival of Japanese exports.

The world economy has been in serious recession since the financial crisis began. According to IMF, world GDP grew 3.2% in 2008, is expected to shrink 1.3% in 2009, and will remain low in 2010. Among the many nations harmed by the crisis, Japan has been one of the most seriously affected. Japan's GDP fell by 0.6% in 2008, and is predicted to fall by 6.2% in 2009. US GDP, by comparison, grew 1.1% in 2008 and is predicted to fall by only 2.8% in 2009.

In the early stages of the crisis, it seemed that Japan might escape a serious recession, since its financial sector was relatively small. However, Japan's economic recession eventually became the most serious among OECD countries in terms of GDP growth rates.

The seriousness of the Japanese recession stemmed mainly from the sharp decline in Japanese exports as well as the reduction of private capital investment. The decline in US import demand sent shockwaves through export-dependent countries around the world. But the impact of the reduction of US demand on trade varied across countries because of differences in comparative advantage. This chapter presents new evidence on why Japanese exports declined so massively due to the change in US demand

Variation of the US imports by partner and product

After recovering from the recession caused by the crash of the IT bubble, the US economy recorded a significant increase in imports – almost 10% annually since 2002. This boom reversed suddenly when the financial crisis hit US demand. The shock affected many nations, but in an uneven manner (Table 1). For example:

- US imports from Japan dropped by 40% in the first quarter of 2009, while total US imports were off by 30% (quarter on quarter).
- Imports from China decreased by only 10%.
- Imports from Canada decreased almost as sharply as those from Japan.

These differences reflect bilateral exchange rate movements but also partner-specific effects that stem from a combination of an uneven drop in imports by product-group, and an uneven distribution of these product-groups that the various partners' export to the US.

As shown in Table 1a, some of the biggest drops in US imports occurred in the products that account for a very large share of Japanese exports to the US (especially automobiles, electronics and electric goods, and machinery industries). US import demand plummeted by over 45% for automotive vehicles, parts, and engines, and industrial supplies and materials between the 1st quarter of 2009 and 1st quarter of 2008. Oil imports dropped even more – by more than 50% -- but the reduction in imports of food, consumer durables and nondurables was comparatively small.

In 2008, the share of automobiles and parts in Japanese exports to the US was one-third, electronics and electric machinery 16%, and machinery one-fifth of total exports to the US. In total, exports in these three product categories amounted to over 70% of total bilateral exports.

As Table 1a shows, Canada – whose exports to the US depend heavily on automotive vehicles, parts, and engines – experienced a drop of sales to the US almost as large as Japan's. By contrast, the relatively small response of consumer goods to the US drop in income helps explain why Chinese exports to the US fell by much less.

Table 1a. Change in US imports, by country and product (%).

	2008:I	2008:II	2008:III	2008:IV	2009:I/p/
US imports by regions/countries					
All countries	12%	15%	13%	-9%	-30%
Japan	3%	3%	-7%	-16%	-41%
Canada	12%	15%	16%	-14%	-38%
Europe	13%	14%	10%	-7%	-27%
Mexico	8%	10%	4%	-11%	-26%
China	2%	7%	10%	1%	-10%
US imports by goods					
Petroleum and products	60%	60%	59%	-15%	-54%
Automotive vehicles, parts, and engines	0%	-2%	-12%	-24%	-49%
Industrial supplies and materials	34%	35%	37%	-10%	-45%
Capital goods, except automotive	5%	7%	3%	-6%	-20%
Consumer goods (nonfood)	1%	5%	5%	-6%	-13%
Foods, feeds, and beverages	8%	12%	10%	6%	-5%

Source: US data from Statistics of International Transaction, US Department of Commerce.

Table 1b. Change in Japanese exports by country and product (%)

	2008:I	2008:II	2008:III	2008:IV	2009:I
Japanese exports by regions/countries					
All countries	6%	2%	3%	-23%	-47%
US	-7%	-11%	-15%	-30%	-54%
Europe	7%	-4%	-3%	-30%	-53%
ASEAN	14%	9%	11%	-14%	-46%
China (including Hong Kong, Taiwan)	5%	4%	4%	-25%	-44%
Korea	3%	1%	13%	-28%	-42%
Japanese exports by goods					
Automotive vehicles, parts, and engines	10%	3%	1%	-26%	-57%
Capital goods, except automotive	0%	-2%	-1%	-22%	-47%
Consumer goods (nonfood)	2%	0%	-2%	-28%	-44%
Industrial supplies and materials	7%	2%	9%	-20%	-39%
Foods, feeds, and beverages	-1%	-3%	8%	-15%	-20%

Source: Japanese data are from Trade Statistics, Ministry of Finance.

Table 1b shows directly that Japanese exports to the US and Europe declined significantly more than average. This US-specific impact was especially important for Japan; the US is Japan's largest export market, absorbing one-fifth of her exports in 2008. The figures also confirm that the US's big drop in auto trade is also found in Japanese export statistics. While the average drop was 47% in 2009 Q1, it was almost 60% in autos and parts. Capital goods more generally fell in line with the average, but the fall-off was less severe in consumer goods and industrial supplies.

Reflecting the internationalisation of Japan's industrial supply chains, Table 1c shows that the decline of US demand indirectly caused a sharp decline of trade between Japan and East Asian countries. Japan's imports of auto and parts fell almost as much as its exports.

Table 1c. Change in Japanese imports by country and product (%)

	2008:I	2008:II	2008:III	2008:IV	2009:I
Japanese imports by goods					
Automotive vehicles, parts, and engines	8%	-12%	5%	-32%	-44%
Capital goods, except automotive	-4%	-5%	-5%	-21%	-39%
Industrial supplies and materials	-3%	-1%	8%	-8%	-38%
Foods, feeds, and beverages	0%	5%	9%	-2%	-16%
Consumer goods (nonfood)	-1%	-6%	-1%	-8%	-12%
Japanese imports by regions/countries					
All countries	11%	11%	21%	-10%	-37%
Korea	2%	-5%	5%	-20%	-42%
ASEAN	13%	9%	16%	-4%	-36%
US	-1%	-1%	4%	-16%	-33%
Europe	1%	-1%	-3%	-16%	-29%
China (including Hong Kong, Taiwan)	-2%	-1%	5%	-8%	-27%

Source: US data from Statistics of International Transaction, US Department of Commerce; Japanese data are from Trade Statistics, Ministry of Finance.

The "triad trade" and offshore sourcing

The changing source of US imports since 2000 are noteworthy. The facts reflect the internationalisation of Japan's manufacturing, especially China's growing role in Japanese firms' value-added chains.

Table 2 shows that between 2000 and 2007, the US import share from East Asia hardly changed. This overall stability, however, hides a big shift within the region. China's increase – from 8% to 16% – was offset by declines in the shares from Japan, the Asian newly industrialized economies (NIEs), and the largest ASEAN nations.

Table 2. Shifting source of US imports: China's rise and Japan's fall

	2000	2007
Europe	21%	21%
Canada	19%	16%
Latin America and Other Western Hemisphere	17%	18%
East Asia	35%	33%
China	8%	16%
Hong Kong	1%	0%
Taiwan	3%	2%
Japan	12%	7%
Other East Asia*	10%	7%
Members of OPEC	5%	9%
R.O.W.	2%	3%

Source: Statistics of International Transaction, Department of Commerce, US.
Note: * Other East Asia includes Indonesia, Korea, Malaysia, Philippines, Singapore, and Thailand

Matching this shift in US import patterns is the shifting geographical distribution of Japan's exports. In 2000, the share of Japanese exports was 30% to the US and only 6% to China. In 2007, these shares switched to 20% to the US and 15% to China. This trend has continued and the most recent data shows that China is Japan's largest export market.

One of the driving forces behind the geographical reorientation of trade has been the development of a "trade triad" between the US, China, and Japan. Under triad trade, Japan exports parts and intermediate goods to China where they aprocessed into final goods and then exported to the US. This type of triad is typically organised by Japanese MNCs in China[1]. According to the statistical facts presented in Ito, Tomiura and Wakasugi (2009) outsourcing to China exceeds 50% of all Japanese outsourcing. Moreover, offshore assembly of final goods in China has reached 20% of all the offshoring of Japanese firms.

Direct and indirect exports to the US

What this triad trade means is that Japanese multinationals export to the US both

1 As for the triad trade between the US, China, and Japan, see Wakasugi, Ito, and Tomiura (2008), and Dean, Lovely, and Mora (2009).

directly (from Japan) and indirectly (via China). Those goods coming directly from Japan tend to be high-end, knowledge- and skilled-labour-intensive. Lower-end goods, which are intensive in the unskilled labour, which is so abundant in China, tend to come to the US via China.

As far as Japan's export collapse in concerned, the main point is that the drop in US imports from China hurt Japanese exports to China, thus magnifying the direct effect discussed above.

Variation of Japanese exports: Extensive and intensive margins

The so-called 'new-new trade theory' alerts us to the fact that total export changes can be driven by two very different adjustments – changes in the number of products exported, and changes in the amount of exports per product exported.

Recent research points out that these two margins may act very differently during gradual expansions and rapid contractions such as the 1997 Asian crisis.[2] Bernard, Jensen, Redding, and Schott (2009) show that although an expanding extensive margin plays a very important role in gradual trade growth, most of the sudden reduction in trade during the 1997 crisis came from the intensive margin. (The chapter by Schott in this volume provides preliminary evidence that the same thing has happened in the US during the Great Trade Collapse.)

Following up this suggestion, we investigate the behaviour of the two margins in Japan's recent trade collapse. We do this by using the well-known gravity relationship (which links bilateral trade to bilateral distance and their economic mass) extended to consider the extensive and the intensive margins.

Due to data constraints, we cannot follow the procedure that has been applied to US data. We do not have access to the number of exporting firms by destination country and the number of products for Japan. Therefore, we use total trade data disaggregated at the HS6 level (about 5000 products). Specifically, we decompose the total bilateral trade volume into the number of products (the extensive margin) and the average trade value per product (the intensive margin).

Details of the estimates are gathered in the appendix. Comparison of the results for Japanese exports to the US and Japanese exports to China suggests that changes in Japanese export structures from 1990 to 2007 are as follows:

- Japanese exporters to the US have narrowed the product range of the goods exported to the US;
- Japanese exporters have expanded the range of goods they exported to China, along with its rising income;
- The reduction of the range of exports to the US, with the expansion of the range of exports to China, coincides with the development of the trade triad due to the expansion of sourcing in China by Japanese multinationals.

2 Also see recent theoretical and empirical studies of international trade including Melitz (2003), Bernard, Eaton, Jensen, and Kortum (2003), Bernard, Redding, and Schott (2006) and Chaney (2008) highlighted the number of exported goods and the number of destination countries. Bernard, Jensen, Redding, and Schott (2007) presented the intensive margin of average import or export value per firm-products increased.

In summary, our estimates confirm the notion introduced above that one of the reasons Japan's exports were hit so hard is that exports to both the US and China were linked in an important way to US demand patterns. When US demand fell sharply for the type of goods in which Japan has a comparative advantage, Japan's sales to both the US and China drop precipitously.

Extensive and intensive margins in the crisis

The estimated results of the variation of Japanese exports after 1990 provide a standard to evaluate the changes of Japanese exports after the financial crisis.

Japanese exports to the US

Specifically, Figures 1a and 1b show the extensive and intensive margins predicted by the estimated gravity equations (see appendix), comparing them to the actual Japanese exports to the US from 1990 to 2008.

After 1990, the extensive margin (both actual and predicted) displays a downward trend, with the tendency becoming more marked from 2003. Observe that both the actual and predicted fell sharply with the US recession in 2008; there is some disparity between actual and predicted values during the crisis year, but not one which is particularly out of line with earlier, in-sample deviations. The results are quite different for the intensive margin. After 2003, when the US economy had recovered from the IT recession, the actual value of the intensive margin grew remarkably faster than the predicted value before 2007.

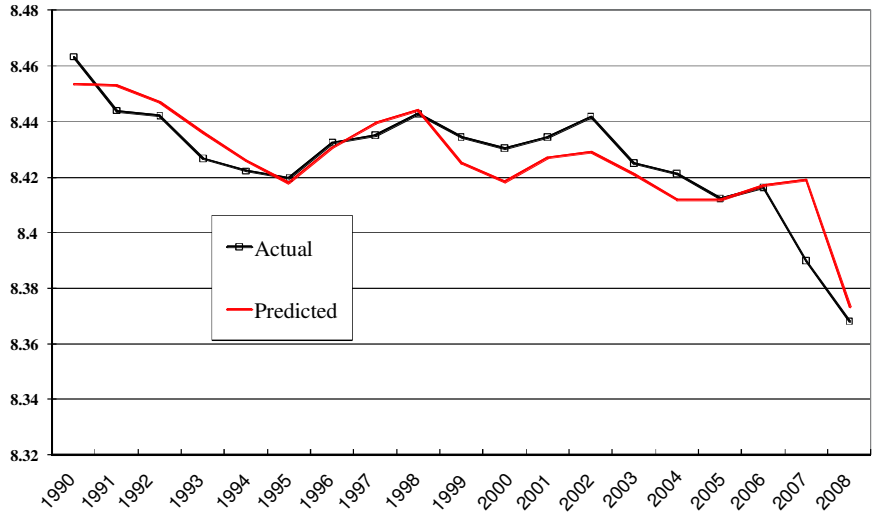
We find a marked deviation between predicted and actual when it comes to the extensive margin in the crisis year 2008. Although the average export value from Japan to the US showed the increase far exceeding a trend before the financial crisis, in 2008 it fell sharply and is now below the predicted trend.

The decline came most from the intensive margin

This means that the downturn of Japanese exports to the US, due to the demand contraction following the financial crisis, was far larger than expected according to recent historical experience. Importantly, this unexpectedly large drop came from the intensive margin, not the extensive margin. This is in line with the findings of Bernard, Jensen, Redding, and Schott (2009) in their investigation of US imports from crisis-stricken Asia during the 1997 crisis.

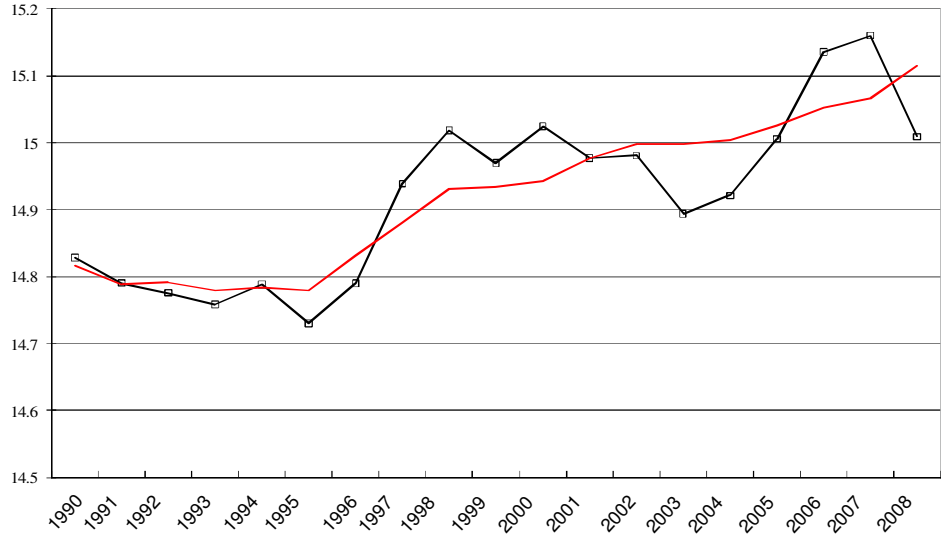
With regard to the exchange rate's role, before the financial crisis the yen depreciated, but more recently it has appreciated significantly. The estimation results in the Appendix to this paper show that the significant upward trend of the intensive margin after 2003, and the sharp drop after 2007, are related to the exchange rate changes of yen per dollar.

Figure 1a. Extensive margin, exports to US, actual vs. predicted



Source: Authors calculations.

Figure 1b. Intensive margin, exports to US, actual vs. predicted



Source: Authors calculations.

Japanese exports to China

Figures 2a and 2b show similar numbers for Japan's exports to China, specifically the actual and predicted values of the extensive and intensive margins for exports to China.

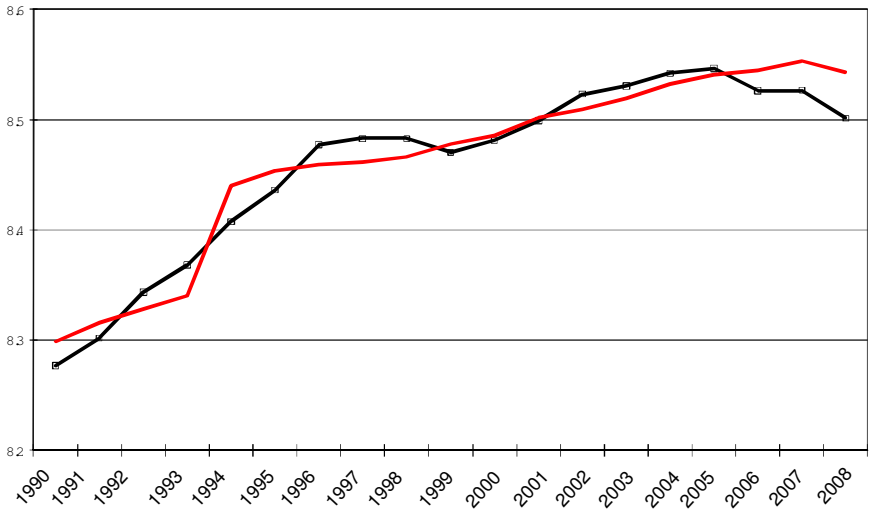
Although the extensive margin for exports to China increased continuously between 1990 and 2005, it began to decrease slightly from 2006 onwards. The number of export goods from Japan, which has expanded through the international divi-

sion of labour in production process with China, has not increased since 2006 (see Figure 2a).

The intensive margin, by contrast, has continued to increase from 1990 until now (Figure 2b). We do not find a significant difference between actual and predicted values in either the extensive or intensive margins in the case of exports to China. In the trend of the intensive margin of exports to China, we do not observe a sharp drop of the actual value far exceeding the predicted value that appeared for exports to the US.

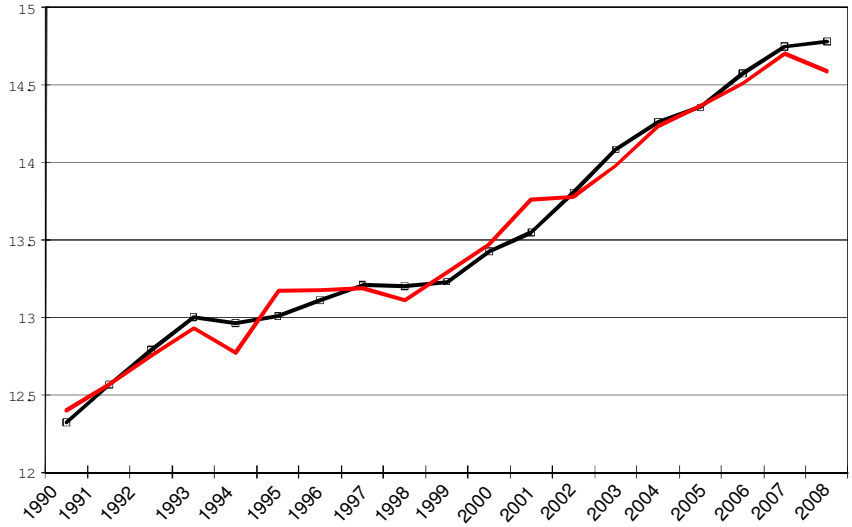
This suggests that the recession since the financial crisis did not bring about a serious impact on Japanese exports to China.

Figure 2a. Extensive margin, exports to US, actual vs. predicted



Source: Authors calculations.

Figure 2b. Intensive margin, exports to US, actual vs. predicted



Source: Authors calculations.

Conclusion: Towards sustainable international trade

Before the financial crisis, Japanese exporters narrowed the range of export goods to the US and specialised in high-end goods – goods with high-income elasticities; products like automobiles and capital goods. During the process, they formed a trade triad between the US, China, and Japan. To China, they have widened the range of goods exported through the development of an international division of labour with China.

This development was market driven and thus probably cost-saving. Nevertheless, it made Japanese exports to the US more vulnerable to sudden demand shifts for high-end durable goods, such as the one we have recently observed. This trend is a major part of the reason that Japanese exports to the US dropped so sharply. In short, the financial-crisis shock to US demand came after a gradual structural change of Japanese exports.

This helps to explain why the average value of Japanese exports to the US behaved so differently from those of China. In the short-run, this matching of Japanese exports to the demand of the US – Japan's largest export destination – was one of the factors that led to such a serious recession of the Japanese economy following the financial crisis. The flip-side of this is that the ongoing recovery of the US economy should produce a speedy revival of Japanese exports to the US.

Global imbalances

From a long-run perspective, we have two features of the world economy to note:

- Global imbalances in the world economy, in particular in the US and China; and
- Significant changes of the world distribution of purchasing power.

It is doubtful that international trade can sustain its rapid expansion in the face of huge trade imbalances, especially the US current account deficit and the Chinese current account surplus.

The share of nations with per capita GDPs ranging from $2,000 to $10,000 has dramatically increased, from 16% in 1996 to 40% in 2006. The high rate of growth in these economies (which includes China and East Asia) is likely to be one of the engines that will help world trade to recover – especially given the US's huge current account deficit. In short, trade expansion between OECD and middle-income countries is essential for the sustainable development of international trade and the recovery of the world economy. The inclusion of middle-income countries into the talks for multilateral trade liberalization is thus more important than ever before, and the ongoing WTO talks (the Doha Development Agenda, DDA) are a key part of this. The successful completion of DDA, with the full involvement of middle-income countries, must therefore be given the highest priority..

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Appendix: Details of the estimates

In our empirical work we define the extensive and intensive margins using the following identity:

$$V_{i,t} = N_{i,t} \times \left[\frac{V_{i,t}}{N_{i,t}} \right]$$

Here V is the total exports to partner-i in year-t; and N is the number of HS6 product categories exported to the same partner and in the same year.
The coefficients are estimated on the basis of the gravity equation in which the size of trade partners determines the trade volume. For the estimation, the extensive margin and the intensive margin are dependent variables; GDP, the exchange rate, and institutional factors such as WTO membership are included as the explanatory variables. The estimating equations are:

$$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln GDP_{i,t} + \alpha_2 \ln GDP_{J,t} + \alpha_3 \ln EX_{i,t} + \alpha_4 WTOdummy_i + \varepsilon_t$$

$$\ln N_{i,t} = \beta_0 + \beta_1 \ln GDP_{i,t} + \beta_2 \ln GDP_{J,t} + \beta_3 \ln EX_{i,t} + \beta_4 WTOdummy_i + \mu_t$$

$$\ln \left[V_{i,t} / N_{i,t} \right] = \gamma_0 + \gamma_1 \ln GDP_{i,t} + \gamma_2 \ln GDP_{J,t} + \gamma_3 \ln EX_{i,t} + \gamma_4 WTOdummy_i + \upsilon_t$$

where $V_{i,t}$ is the Japanese export to country i in the year t, $N_{i,t}$ is the number of exported goods from Japan to the country i which are counted on the basis of HS 6 digits product categories, $GDP_{i,t}$ is GDP of country i in the year t, $GDP_{J,t}$ is the GDP of Japan in the year t, $EX_{i,t}$ is the nominal exchange rate expressed by yen per the currency of country i in the year t , WTO dummy captures China's WTO accession with it equally one if China is the member of WTO in the year t. As the estimation is on the time series data, the country-pair specific factors such as language and distance are subsumed in the constant term. The estimation is conducted for Japanese exports to the US and China for 18 years (1990 to 2007).[3]

Exports to the US

The results are shown in Table A1. The first column shows the results for the standard gravity equation where the dependent variable is the value of export. The sign and size of the coefficients are roughly in line with priors. (Note that since we use only bilateral trade between the US and Japan, we cannot estimate the impact of distance.) The second column shows our results for the extensive margin. Interestingly, the income elasticity is negative for the extensive margin (i.e. number of products exported) while the income elasticity for the intensive margin (average export per product) is positive. The negative income effect for the extensive margin of Japanese exports to the US is somewhat unexpected. It probably reflects development of the triad trade noted above whereby the number of exported goods from Japan decreased along with

3 For collection of data and estimation in this section, I acknowledge Tomoyuki Iida, a graduate student of Keio University, for his excellent assistance.

the increase of the US demand during the years from 1990 to 2007. In line with priors, the income elasticity to the intensive margin shows a large and positive coefficient.

Taken together, these results suggest that the export strategy of Japanese firms has been to concentrate on a narrowing range of product when it comes to their exports to the US. As for the effects of exchange rate changes on extensive and intensive margins, we find that the yen depreciation has a positive effect to increase both extensive and intensive margins at a high statistical significance.

Export to China

Our results for bilateral exports to China show a very different trend; both the extensive and intensive margins increased with Chinese income (Table A2). That is, the Japanese exporters increased the number of exported goods and also raised the average export value according to the expansion of the market demand in China. It is notable that the yen depreciation vis-à-vis the yuan also has a significantly positive effect on the increase of intensive margin.

Table A1. Extensive & intensive margins, Japan to US, 1990-2007

	Total Value of Export	Extensive margin (No. of products)	Intensive margin (exports per product)
GDP of US	0.645**	-0.069**	0.714**
	(8.60)	(-4.32)	(9.14)
GDP of Japan	0.3408	0.110*	0.230*
	(1.96)	(2.99)	(1.28)
Exchange rate (yen/$)	0.867**	0.199**	0.668*
	(4.10)	(4.44)	(3.03)
Constant	3.453	4.912**	-1.458
	(0.58)	(3.92)	(-0.24)
Number of observations	18	18	18
Adjusted R2	0.817	0.727	0.823

Note: The figures in parenthesis are t-statistics; * and ** indicate 5% and 1% significance.

4 The notion is strengthen by the estimate for the Japan-China extensive margin over the same period (Table 4 second column).

Table A2. Extensive & intensive margins, Japan to China, 1990-2007

	Total Value of Export	Extensive margin (No. of products)	Intensive margin (exports per product)
GDP of China	0.922**	0.078**	0.844**
	(9.95)	(4.76)	(9.45)
GDP of Japan	2.328**	-0.185	2.512**
	(4.18)	(-1.86)	(4.69)
Exchange rate (yen/yuan)	1.022**	-0.201**	1.224**
	(3.46)	(-3.83)	(4.30)
WTO dummy	0.394**	0.008	0.386**
	(3.76)	(0.43)	(3.82)
Constant	-74.214**	12.203**	-86.418**
	(-4.28)	(3.95)	(-5.17)
Number of observations	18	18	18
Adjusted R2	0.978	0.941	0.975

Note: The figures in parenthesis are t-statistics; * and ** indicate 5% and 1% significance.

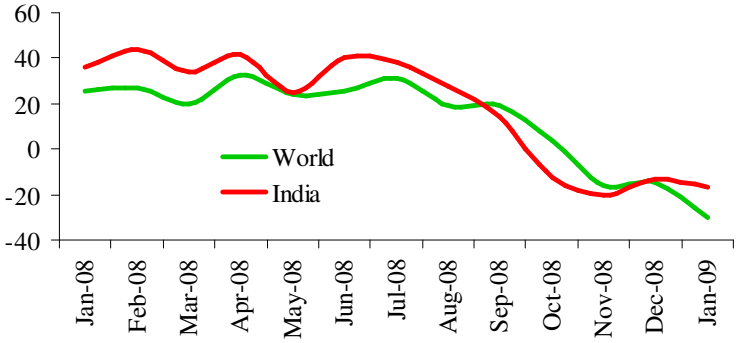
24. The Great Recession and India's trade collapse

Rajiv Kumar and **Dony Alex1**
ICRIER

India's trade collapsed alongside global trade, although its decline started earlier due to a concerted effort by the Reserve Bank of India to cool the economy in 2008. Demand-side factors seem to be the primary causes. Looking forward, India should overhaul its export promotion mechanisms, shifting the focus to the binding constraints - physical infrastructure problems, skill shortages, procedural complexities, and inadequate access to commercial bank credit especially for the small and medium exporters.

India escaped the direct adverse impact of the Great Recession of 2008-09, since its financial sector, particularly its banking, is very weakly integrated with global markets and practically unexposed to mortgage-backed securities. However, India's "real economy" is increasingly integrated into global trade and capital flows. It thus did suffer "second round" effects when the financial meltdown morphed into a worldwide economic downturn.
As seen in Figure 1, Indian exports fell in line with global trade flows. This should firmly dismiss the decoupling myth for the Indian economy. Collapsing foreign trade, capital flows, and exchange rate movements all transmitted negative impacts to the Indian economy

Figure 1. Exports, India and the world



Source: IFS

1 We would like to acknowledge the excellent research assistance by Ritika Tewari and useful comments given by Shravani Prakash.

The synchronised trade collapse in the aftermath of the current recession has been steeper than overall economic activity and more severe than during the Great Depression. This is surely the result of a higher trade intensity of global GDP, which raised the rate of global growth during the past three to four decades.

In this respect, globalisation, of which the rising trade intensity is one of the features, has emerged as a double-edged sword and in the words of Paul Krugman "world trade acted as a transmission mechanism," spreading economic distress "even to those countries that had relatively healthy financial systems" (WSJ 2009). The Frankel and Rose (1998) hypothesis - that tighter trade links leads to higher business cycle correlation - has been forcefully demonstrated. The contraction in world trade between July 2008 and February 2009 has been estimated around 42% in nominal terms.

What caused the trade collapse

A plausible explanation for the severe contraction in global trade during the present Great Recession can be the increased income elasticity of world trade which has risen from around 2 in the 1960's to around 4 in 2008 (Freund 2009)[2]. This increased elasticity of world trade is due to the emergence of cross-border production and supply networks. Economies are increasingly characterised by vertical specialisation and this has resulted in a major expansion of intra-industry trade, thereby amplifying contagion during the crisis.

Trade finance is the other major factor that has been proposed. Some estimates say that trade finance contributes to 80% of trade flows and hence it has contributed to around 10% to 15% fall in world trade (Auboin 2009).

Other factors through which exporters were hit hard were the sharp reduction in the prices of the major traded commodities. As Figure 2 shows, world commodity prices crashed between August 2008 to February by an average of 49%.[3] Thus, the decline in world trade was a combined effect of both volume and price decline.

The Indian trade collapse

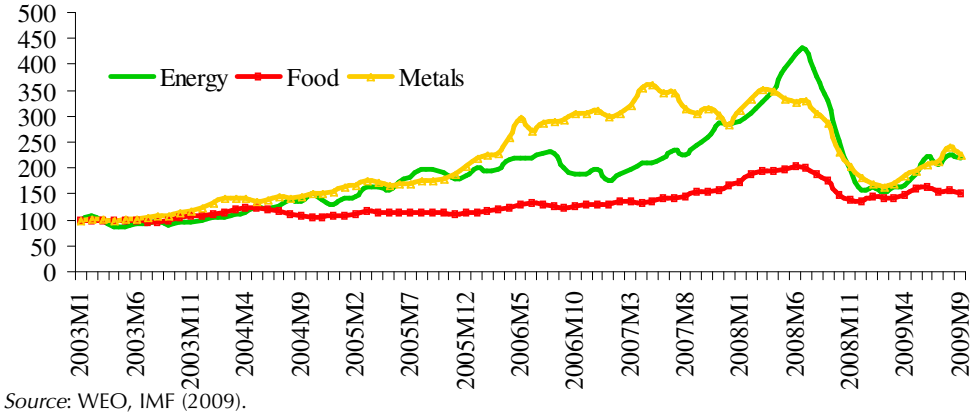
As Figure 3 demonstrates, Indian exports and imports fell in line with global trade flows. In terms of year on year growth rates, the export contraction started from October 2008; imports started contracting a little later, from December 2008. During the core period of the crisis, the average contraction in exports and imports has been around 20% in the first phase (October 2008-September 2009) and 28% in the second (December 2008-September 2009).

The trade collapse triggered by this global crisis is more severe than previous major episodes such as the 'balance of payment' crisis (1991), the Asian crisis (1997), and the

2 She also found comparing four earlier large recessions (1975, 1982, 1991 and 2001) that real trade growth had declined by five times as compared to the drop in real income growth.

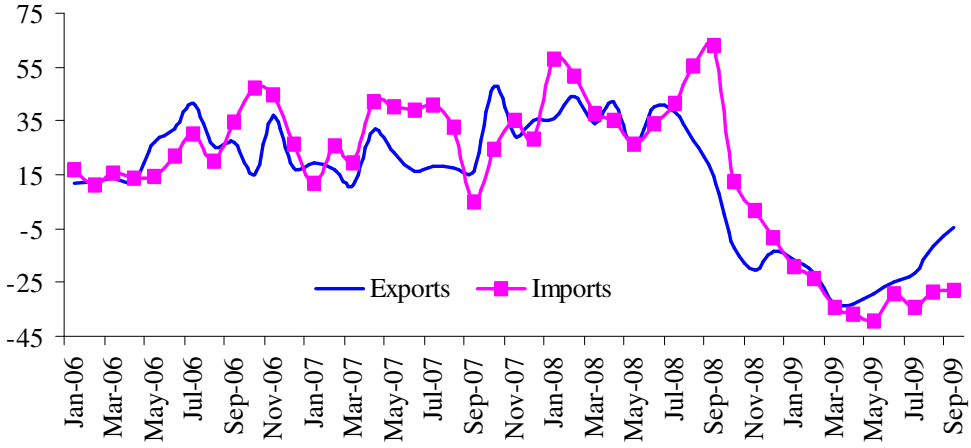
3 Taking an average of energy, food and metal it was found that between August 2008 to February 2009 they fell by 64, 31 and 51%respectively

Figure 2. Commodity prices plummeted



Source: WEO, IMF (2009).

Figure 3. Indian trade, yearly growth rates, month-on-month



Source: Ministry of Commerce and Industry.

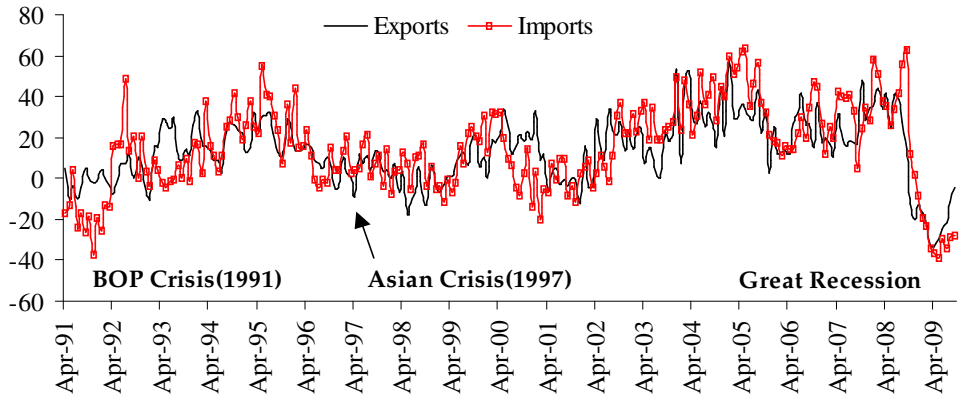
'dot com' bust (2000-01). This point is illustrated in Figure 4.

The 1991 Balance of Payment crisis, saw a sharp contraction in imports primarily due to the sudden spike in the value of petroleum imports with imports plummeting by 38% (November 1991). This was fortunately not accompanied by a decline in exports, which benefited from the marked rupee devaluation of July 1991.

Before the crisis, India's exports and imports (from September 2003 to August 2008) had been growing robustly at 28% and 35% respectively. The slowdown in India's trade flows, however, started even prior to the post-Lehman crisis as is reflected in the de-seasonalised month-on-month trade data. Exports had begun to decline from June 2008 when they went down by 13% and import contraction started in September 2008 when they contracted by 83% on a month-to-month basis.

This was surely the consequence of a policy-induced economic slowdown. Driven

Figure 4. Past crises and Indian trade trends (growth rates, %)



Note: Month on month growth rates.

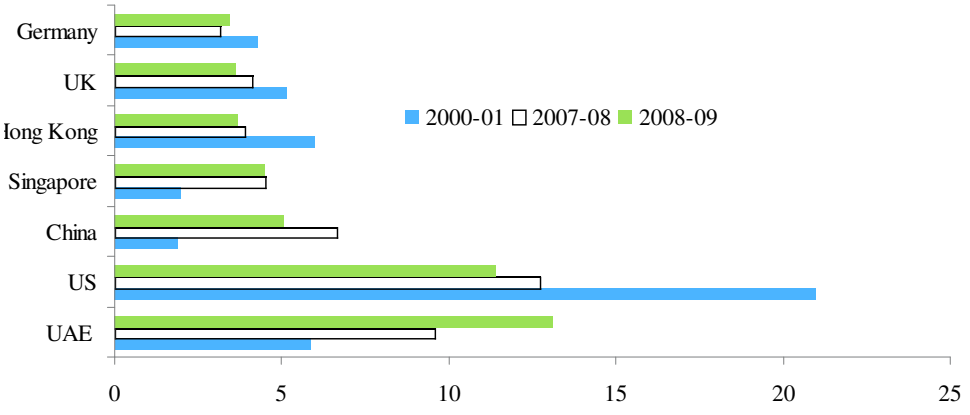
Source: Reserve Bank of India.

by inflationary concerns, the RBI pushed up interest rates until August 2008. On a year-on-year basis, exports started contracting from October 2008 (12%) whereas the import contraction started a little later, from December 2008 (8%). These initial declines were pushed to the subsequent collapse by the global economic crisis.

India's merchandise exports

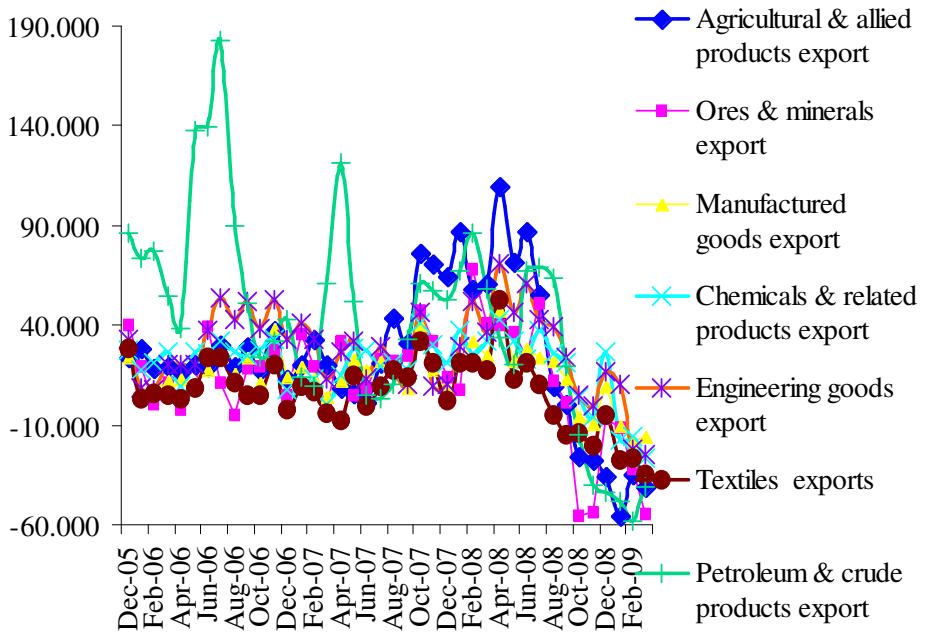
The traditional export destinations for India have been Asia, EU and North America. Within Asia, ASEAN is the largest export destination (52%) followed by the EU27 (21%), and the US (13%). The US's share, however, has recently fallen to 11% (March 2009), even lower than that of the United Arab Emirates (13%). This sudden decrease can be considered an aftermath of the financial crisis.

Figure 5. Major export destinations of India (share of total exports, %)



Source: DGFT, Ministry of Commerce and Industry.

Figure 6. Major export commodities (growth rates, month-on-month)



Source: DGFT, Ministry of Commerce and Industry.

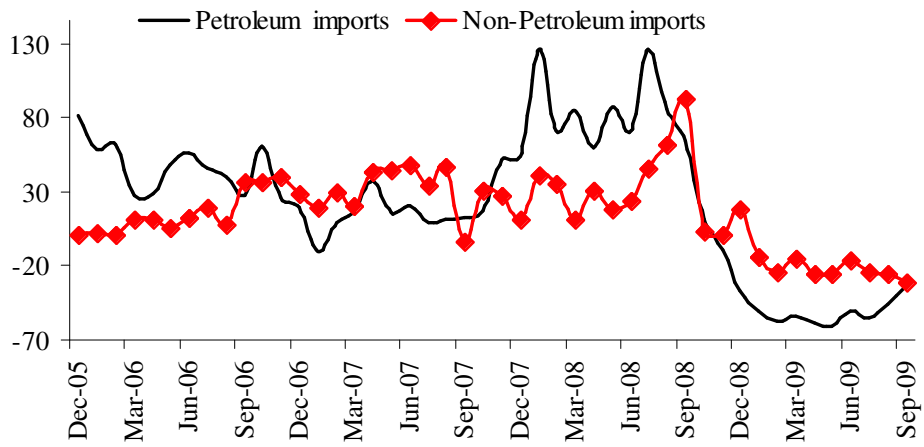
One of the core reasons for the sharp fall in India's exports is the high income demand elasticity for its exports which makes exports highly sensitive to GDP movements. India's exports have been found to be more sensitive to income than to price changes. The income elasticity of demand for India's exports has been found to be highest for the US (2.5) while, for India's global exports, it is estimated at about 1.9 (UNCTAD 2009). This is consistent with the fall in the US' share in total Indian exports from 2008-09.

In terms of the structure of exports, engineering goods has the highest share of exports (22%) followed by gems and jewellery (15%), petroleum products (15%), chemical and related products (13%), textiles (11%), and agriculture and allied products (8%). These six categories constitute of about 84% of India's total merchandise exports. All of these products (except gems and jewellery) experienced a major contraction during the post-Lehman period. Petroleum and petroleum products saw the largest contraction (about 45%), but agriculture and allied products contracted by 28%, chemical and related products by 9%, textiles by only 2%, and engineering goods exports, which account for 22% of India's exports, actually grew robustly at first, becoming negative only February 2009.

The export slowdown in India has been a demand-side phenomenon. Petroleum exports which registered the biggest decline have the highest income (5.4) and price elasticity (-1.3) in India's export basket (UNCTAD 2009).[4] Petroleum exports also have

4 In terms of volume, petroleum exports contracted by 10% as compared to the robust growth of 21% last year (2007-08) where in terms of prices it contracted by around 5%(2008-09) as compared to previous years huge growth of 54% (2007-08).

Figure 7. Oil and non-oil imports growth rates



Source: Reserve Bank of India.

the highest price elasticity in the export basket. High price elasticity may mean that these products have close substitutes and can serve as a blessing during a crisis if the exporting country lowers its prices more than its competitors. However, most of the products in the major commodity group do not have high price elasticity.

Imports of goods and services

Crude oil, petroleum and petroleum products constitute the largest share (32%) of India's imports. This high share of hydrocarbons in both India's exports and imports perhaps needs some explanation.

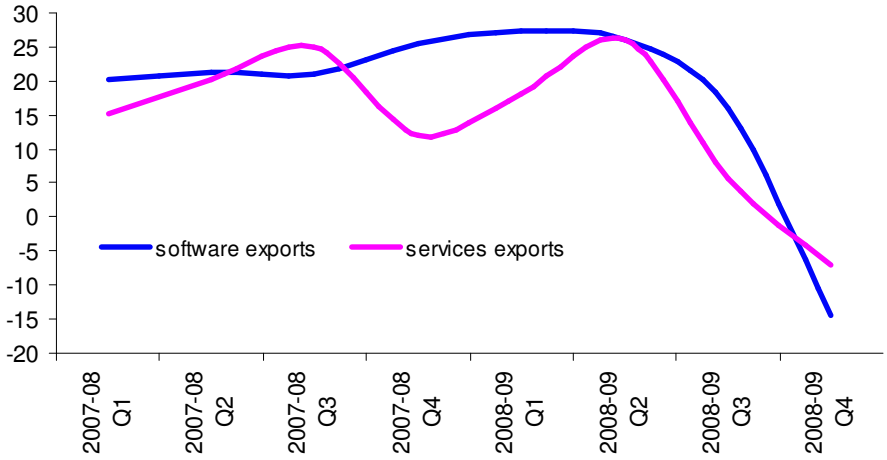
India is structurally deficit in terms of domestic availability of crude oil, having to import nearly half of its requirements. Over the years, however, Indian corporate giants like Reliance, Essar, and the Indian Oil Corporation have established globally competitive refining capacities. These are presently in excess of the country's requirements so they import crude and export refined products. The expansion of this processing activity has contributed to the rather sharp increase in the share of crude oil and petroleum products in recent years.

India's oil imports which had been growing robustly at around 40% (2007-08) saw a decline in growth of about 17% during 2008-09. India's merchandise imports started contracting from November 2008 onwards on a year on year basis along with oil imports whereas the contraction in non-oil imports started from January 2009. During the period from October 2008-September 2009, imports have contracted more (22%) than exports (20%).

Trade in services

India is a major services exporting country with about 3% of the world total service exports. India's exports of services are mainly to the EU and the US. The latter alone

Figure 8. Quarterly growth rates, total services, and software service exports



Source: Reserve Bank of India.

accounting for around 11% of India's total services exports.

Services exports have not been as affected as exports of merchandise. The sub-sectors within services exports that have registered some contraction are travel, insurance, business and communication services. Software services exports, which are for some reason classified under miscellaneous receipts for India have been a major contributor to the growth of services exports, accounting for as much as 45% of total exports, goods and services combined (2007-08). However the intensity of the adverse impact of the global economic downturn on India's exports is perhaps best demonstrated by noting that even India's software exports recorded a contraction in the fourth quarter of 2008-09 by more than 15%. While the actual decline was confined to only a single quarter, the growth of software exports in 2008-09 has been far from the levels achieved in the years preceding the global crisis.

During the crisis most businesses cut costs to cope with the declining revenues. This in turn meant a reduction in IT spending by advanced economies and a negative impact for the growth of Indian software exports. The financial crisis reflected in the slowdown of foreign business visitors and brought down foreign travel receipts by 4% (2008-09). As a related incidence, business and communication services also experienced contraction of 3% and 10% respectively.

In terms of imports of services software, miscellaneous, business and financial services were adversely affected suffering a decline of 10% and 8% respectively in 2008-09.

While India's services exports have not been as adversely impacted as merchandise trade, an increasing number of legislative measures and restrictive conditions included in the stimulus packages of the US, the UK, etc. may aggravate the negative impact in the coming period. In the context the agreement at the successive G20 summits to prevent any move towards competitive protectionism is of major importance.

The Indian policy response to the plummeting of its exports has been principally to provide fiscal incentives in the form of reduced import duties on imports needed for exports and raising the rates of duty drawback available to exporters. In addition, exporters have been given a 2% interest rate subsidy on the refinancing of trade

finance as well as for their working capital requirements. This may have helped in the slight recovery that is now being seen in the month on month de-seasonalised data. However, the refinance facility has been recently withdrawn and could affect the export effort.

Conclusion: Strengthening the green shoot of recovery

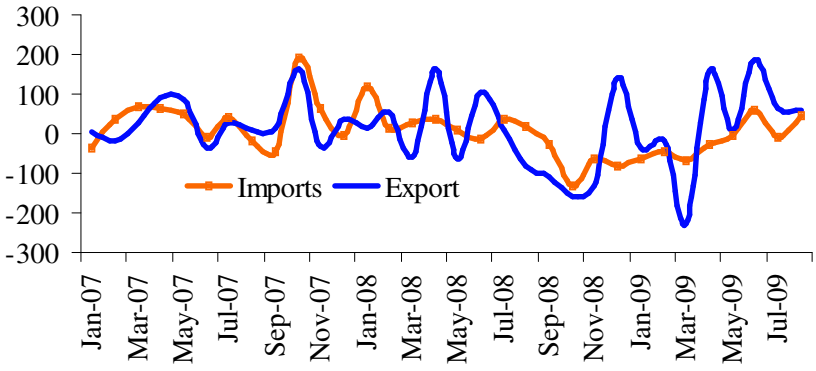
Recent data points to an incipient recovery in India's exports, perhaps in line with the fragile beginning of a recovery in global trade (Eichengreen and O'Rourke, 2009). The de-seasonalised month-on-month export data (Figure 9) shows that the recovery seems to have started in April 2009 with exports registering a month on month growth of around 59% from April to August 2009.

The import data is not less encouraging. Further evidence of a recovery in India comes from the growth in industrial sector output, which has seen a year-on-year growth of above 7% from June to September 2009. However, as the rather weak import data reveal, and given that exports in August 2009 were still lower than in the same month in 2008, it is clear that the recovery is still weak. Urgent and concerted policy attention is necessary to take exports back to their pre-crisis robust growth trajectory.

These policy efforts would have to go significantly beyond the rather ad hoc and sporadic fiscal incentives that are regularly doled out to exporters in times of export downturn.

There is sufficient evidence that these fiscal incentives have high transactions costs and are often not availed of by the exporters. For example, a recent survey (Srinivasan and Archana 2009) showed that up to 30% of exporters do not avail of their duty drawback entitlements and nearly 70% reported the incidence of transactions costs in availing of these incentives. Moreover, the inherent uncertainty in the continuity of these fiscal measures does not provide the necessary basis for exporters to plan their production capacities and marketing expenditures on a sustained basis.

Figure 9. Trade since 2007, seasonally adjusted



Source: Ministry of Commerce and Industry.

Given that the coming period is most likely to see a relatively weak recovery of global trade, India will have to try and achieve a robust growth in its exports by expanding its share in major markets rather than simply depend on the previous growth of global trade. This will require a major overhaul of the country's export promotion mechanisms. The focus should shift to addressing the binding constraints currently imposed by physical infrastructure, skill shortages, procedural complexities and inadequate access to commercial bank credit especially for the small and medium exporters.

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23. Mexico and the great trade collapse

Raymond Robertson
Macalester College

One of the hardest hit nations from the great trade collapse is Mexico – its trade falling over 40% in the six months following September 2008. Mexico's imports and exports, however, have both recovered remarkably in recent months and are now three-quarters of the way back to peak values. This chapter argues that Mexico's close engagement with the US industrial supply chain accounts for these unusually sharp movements.

The great trade collapse of 2008 raised concerns worldwide about the viability and the progress of globalisation. It had ramifications across the globe, but some developing countries, such as Mexico, were especially affected. This chapter considers the collapse from a North American perspective, evaluating some of the implications for developing countries. Taking a purely North American perspective on the dramatic drop in world trade during 2008 and the first half of 2009 could easily lead one to potentially overemphasize the role of the US recession in the drop in trade. But US trade statistics are timely, high-quality and publicly available and, of course, the US is the world's largest importer, so it has a great impact on developing countries' trade flows.

The crisis from a North American perspective

Figure 1 illustrates two key facts concerning the US's recent trade performance:

- It shows that the dramatic drops in imports and exports closely track US GDP between September 2007 and September 2009.
- It shows that the recovery is underway. While it might be too soon to declare a reversal with confidence, the figures for September 2009 seem to suggest that the worst may be over. US imports have been rising since May 2009.

These two facts are consistent with the view that the "great trade collapse" has been a cyclical phenomenon rather than a symptom of stumbling globalisation. This does not mean, however,that the great trade collapse has been without consequence.

Mexico has been hit especially hard

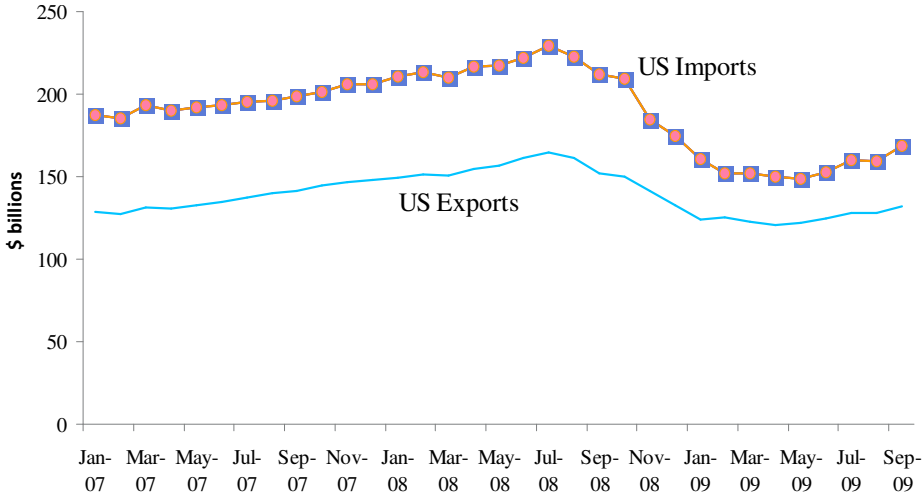
Countries closely linked to the US have been hit especially hard. Mexico, for example, suffered more than many other countries. In the last quarter of 2008, Mexico's

GDP contracted at an annualised rate of 10%. According to the Federal Reserve Bank of Dallas, Mexico's GDP is expected to contract by 6% in 2009 (Skelton, and Quintin 2009).

Mexico's trade has historically been closely related to the US. In 1993, the monthly average share of Mexican exports going to the US was over 80%; 5 years after NAFTA, it rose to almost 90%. In 2008-2009 (through September) that average was back down to 80% – consistent with a shift away from a market that was contracting especially vigorously.

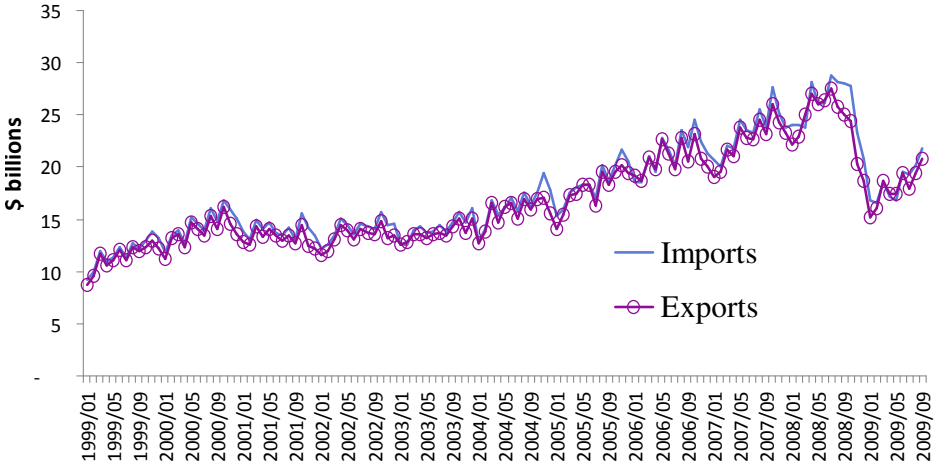
Figure 2, which shows Mexico's nominal imports and exports since 1991, presents

Figure 1. US imports and exports



Source: http://www.census.gov/indicator/www/ustrade.html.

Figure 2. Mexico's iImports and exports



Source: Banco de Datos INEGI. Years mark September of reference year. Several factors played a role in Mexico's contraction. An intensified drug war, the swine flu outbreak, and trade disputes have all contributed, but the contraction of Mexico's largest export market is especially prominent.

two stand-out facts:

- Mexico's total exports have been rising dramatically since 1991.

  In nominal dollar terms, Mexico experienced an eight-fold increase in total trade between 1991 and 2007.

- Mexico experienced a dramatic drop in total trade during the great trade collapse.

Total trade fell from a peak of about US$56 billion in July 2008 to US$32 billion in January 2009 – a decline of 43%. Given Mexico's reliance on the US market, it is unsurprising that this drop corresponded closely with the drop shown in Figure 1.

Why did Mexican trade fall so much?

One of the possible, if not most likely, explanations for Mexico's especially dramatic drop in trade has to do with the changing nature of Mexican manufacturing.

Supply chain industries

A dominant feature of Mexico's industry is the so-called 'maquiladora' sector. Also known as the "in-bond" industry, maquiladora trade is very similar to what is called export processing in Asia. Parts and components are imported for assembly and then exported with very little of the assembled products remaining inside Mexico. Automobile dashboards provide a good example. They are assembled from imported parts and re-exported as components that are then assembled into the final vehicle. Mexican trade became increasingly dominated by maquiladora trade since Mexico's liberalisation of foreign investment at the end of the 1980s and beginning of the 1990s.

On November 1, 2006, the Mexican government formally integrated the firms in the maquiladora industry into the PITEX programme (Programa Importación Temporal para Producir Artículos de Exportación) thus ending the practice of separating maquiladora trade from other manufacturing trade statistics. Statistics prior to that date, however, reveal a great deal about changes in Mexican manufacturing. Between January 1991 and December 2001, the maquiladora share of total exports rose from 29% to 52% before settling down to 46% in December 2006 (the last date maquiladora trade is separately identified).

This pattern implies a very close relationship between imports and exports – a feature which is apparent in Figure 2. Mexican imports and exports track each other very closely – supporting the hypothesis that Mexico's trade is characteristic of being an integral part of an international production process.

Maquiladora trade and volatility

Bergin et al. (2009) suggest that the maquiladora sector is much more volatile than the corresponding US industries, raising the possibility that Mexico's extreme drop may simply be a result of specialisation in volatile stages of production.

But the excess volatility seems to have extended beyond the maquiladora sector to the rest of the Mexican economy. Consider again Figure 2. The span covered in Figure 2 covers three US recessions, roughly corresponding to the years 1991, 2001, and 2008. Mexico's trade response to the 2001 recession is also observable in Figure 2, but there is little or no response detectable to the 1991 recession. Robertson (2009) offers one possible explanation – a change in production structure that followed the North American Free Trade Agreement (NAFTA) in 1994.

One of the goals of NAFTA was to increase foreign investment in Mexico. Not surprisingly, there was a significant increase in foreign investment – and a corresponding rise in maquiladora employment and output – following NAFTA in the late 1990s. Furthermore, however, it is possible that non-maquiladora manufacturing may have moved towards being part of the North American production chain. Evidence for this change could be found by evaluating whether non-maquila Mexican and US production workers were substitutes or complements.

By matching US and non-maquila Mexican employment of production workers, for all available manufacturing sectors, and estimating dynamic labour demand equations, Robertson (2009) finds evidence that prior to NAFTA, US and Mexican production workers were substitutes. After 1994, when NAFTA went into effect, the relationship reversed, suggesting that US and Mexican production workers are complements.

In other words, it seems that NAFTA integrated Mexico more fully into the US production structure, making it more responsiveness to changes in US production.

Supply chains and Mexico's trade collapse

This line of analysis suggests that Mexico's integration into the US supply chain is one reason Mexico's trade collapsed so far and so fast when the US manufacturing sector was hit by the crisis.

A final, more subtle point is evidence of economic recovery (see Figure 2). Preliminary statistics reveal that Mexico's exports to the US hit a local minimum of about US$12 billion in January 2009. They have been generally increasing since then. Mexico's exports to the US in September 2009 hit almost US$17 billion – an increase of over 36%.

Further evidence can be found in the way Mexico's trade seems to be recovering along the same path as the US trade shown in Figure 1. Trade may be recovering and the adverse shock to Mexican trade during the great trade collapse may be on the wane, if not over entirely.

Long lasting consequences: Big shocks and hysteresis

The great trade collapse may be temporary, but some of the consequences may be permanent and widespread.

Quasi-permanent shifts in production across countries may be linked to the great trade collapse of 2008 because adjusting production is costly. For example, a simple graph of US manufacturing employment over the last 30 years shows that manufac-

turing employment drops sharply in recessions and then levels off during expansions. In other words, in the presence of adjustment costs, a global recession can provide the shock necessary to "push" firms to restructure production in ways that may have been less attractive during expansionary periods. The contraction forces firms to overcome the fixed costs of shifting production and therefore it is very likely that the great trade collapse will coincide with a significant change in the location of production worldwide.

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When the investment bank Lehman Brothers filed for bankruptcy in late 2008, the news sent shockwaves across the global economy. The drop in confidence decimated world trade, leading to what the authors of this book call the Great Trade Collapse.

The fall in trade was sudden, severe and synchronised – falling faster than during the Great Depression and by more than at any time since the Second World War; more than during the oil-price hikes of the 1970s, the recession of the early 1980s and the bursting of the dotcom bubble in 2001. It affected all 104 nations on which the WTO reports.

This book, first published as an eBook on VoxEU.org to inform world leaders ahead of the WTO's Trade Ministerial conference in Geneva in late 2009, presents the economics profession's received wisdom on the causes, consequence and prospects of the Great Trade Collapse – a wisdom that continues to serve the trade community today.

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