1. Has the crisis left a lasting mark on global trade?

International trade expanded substantially during much of the past decade, boosted by underlying globalisation trends and supported by a benign global environment (‘the Great Moderation’). But when the global financial and economic crisis hit in 2008, global trade collapsed, with merchandise trade contracting significantly more than global output. Supported by swift policy reactions and helped by the fact that protectionism was contained, the ensuing recovery of world trade was fairly rapid, but trade levels are still below their pre-crisis path, raising the question of a possibly longer-lasting impact of the Great Recession of 2008-09 on trade dynamics. The analysis presented in this chapter shows that there is no clear evidence of a structural break in the relationship between trade and GDP although the recession may have left its mark on the geographical and sectoral composition of trade. In a number of advanced economies, substantial adjustment due to fiscal consolidation and deleveraging in the private sector is constraining import growth in the short and medium term. By contrast, emerging market economies have been left relatively unscathed by the Great Recession. They account for a steadily growing share of global demand and are expected to cushion, at least partially, the demand shortfall in advanced countries, while the supply of trade finance does not appear to be a limiting factor at the current juncture. There are some indications that international supply chains in some sectors have embarked on a consolidation process, with fewer production stages involved and consequently less cross-border trade, but there is no broadly-based evidence for such a development. Overall, global trade seems to be approaching its long-term growth trend and will likely expand at lower rates than in the boom years of the previous decade.

1.1. The boom, collapse and recovery of world trade

Following the 2001/2002 recession world trade registered an unprecedented boom driven by a dynamic world economy. The boom began to falter at the onset of the financial crisis and turned into a sharp downturn in the fourth quarter of 2008 after the Lehman meltdown. Global trade plummeted by 17% in real terms between October 2008 and March 2009. Historical evidence suggests that trade is strongly correlated with output fluctuations and quite sensitive to financial crises, but the most recent trade slump appears exceptionally steep. It was about two times steeper than in 1930, the first year of the Great Depression, and was highly synchronised across countries around the world.

Underpinned by swift policy reactions and with protectionism contained, the ensuing initial recovery of world trade was fairly rapid. World trade bottomed out in the second quarter of 2009, and grew steadily thereafter, regaining its pre-crisis peak already in mid-2010. But the strong trade recovery was interrupted in the spring of 2011, when the global economy was hit by a series of adverse shocks, most notably the production disruption in Japan following the Tohoku earthquake, the escalation of the sovereign-debt crisis in the euro area and the increasing uncertainty concerning US fiscal policies. Given the recent slowdown of trade growth, world trade is still far below levels that would have been achieved if global trade had continued to follow its growth path experienced during the period 2002-08. However, trade benefited during that period from a significant, and possibly exceptional, expansion of the world economy. To the extent that global growth was partly fuelled by a global liquidity glut and excessive consumption in several advanced countries, it is far from certain that global trade will return to a similar steep growth trend. The most recent trade expansion is actually more in line with the trend growth observed between 1991 and 2008 than with the trend of the period 2002-08 (Graph 1.1).

<table>
<thead>
<tr>
<th>Graph 1.1: Global merchandise trade (volumes: 2000 = 100) (1)</th>
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<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>1991</td>
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<td>1993</td>
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<td>1995</td>
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<td>2007</td>
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<tr>
<td>2009</td>
</tr>
<tr>
<td>2011</td>
</tr>
</tbody>
</table>

(1) Trend 1 is based on the period January 1991 - February 2008, while trend 2 is based on the period January 2002 - February 2008.

Source: CPB
Compared with the highly synchronised downturn, the recovery of world trade since mid-2009 has been diverse across regions. Advanced economies such as the US and in particular the euro area have experienced sluggish import growth and were still below their pre-crisis peaks in early 2012. In contrast, countries less burdened by the repercussions of the global financial crisis in terms of deleveraging needs have registered robust investment and consumption growth. In particular, imports of Asia and Latin America are almost back on the rapid growth path of the 2002-2008 boom period (Graph 1.2).

Finally, distress in some segments of financial markets may have affected the supply of bank-intermediated trade finance.

**Regional shifts in world income growth and import demand**

Since the 1990s, emerging market economies have gradually increased their share of global output, accounting for about half of world GDP in 2011 (based on purchasing-power parity valuation). As a result, the growth of the world economy is substantially more broad-based than three decades ago when global output expansion was largely driven by advanced economies. The decreasing regional concentration of world GDP growth is reflected in the declining trend of the Gini coefficient of countries’ contributions to world GDP growth. This downward trend was briefly halted by the global crisis when a large part of the world economy — mostly advanced economies — was actually shrinking and thus contributed negatively to global growth. (1) However, results based on recent IMF projections for global GDP suggest a return of the coefficient to the pre-crisis level by 2012 (Graph 1.3). (2)

Income growth in emerging markets has also translated into a rising share of emerging markets in global import demand. As shown in the previous section, emerging markets have been pulling the trade recovery from early 2009 on, but even more so since the economic recovery has slowed in advanced economies. Since mid-2010 imports of advanced economies have been almost flat and are still below the pre-crisis level, whereas imports of emerging economies have continued to grow. The comparatively strong dynamics of emerging markets’ import demand in the trade recovery have been visible for all broad product categories. Annual world trade data at the product level available up to 2011 indicate that demand for all types of goods has recovered faster in emerging markets than in advanced economies (Graph 1.4). Not only intermediate goods used in production, but also imports of final goods have rebounded more strongly in emerging market. The

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1. By construction, the coefficient exhibits large values in recessionary periods, as a relatively large number of countries are contracting and thus offset positive growth contributions from other economies.

2. Gini coefficients, which are calculated on the basis of Lorenz curves, can range between 0 and 1, with a value of 1 indicating the highest concentration and 0 reflecting an equal distribution. For the calculation of Gini coefficients with negative values, for example negative growth contributions, see Chen, C.-N. and T.-W. Tsaur (1982), ‘The Gini coefficient and negative income’, *Oxford Economic Papers*, Vol. 34, No 3, pp. 473-478.
Has the crisis left a lasting mark on global trade?

Evolution of export shares and product composition

The rising importance of emerging markets in world trade has been associated with a growing trend in south-south trade that has been only briefly interrupted by the global financial crisis. The trend has made emerging markets less dependent on demand in advanced economies. However, with advanced economies still accounting for two thirds of emerging markets’ exports, global trade dynamics are unlikely to fully decouple from output growth in high-income countries in the near future (Graph 1.5).

Another remarkable feature of the development of global trade is many emerging markets’ successful effort to move up the value chain and improve the quality of their export portfolio. Mostly countries in emerging Asia, notably China, and in Central and Eastern Europe are increasingly able to enter export markets that were previously the exclusive preserve of advanced countries (Graph 1.7).

Font sizes and styles have been preserved as much as possible.
Since the mid-1990s, low- and middle-income countries have expanded their market share in intermediate product categories such as chemicals or medium- to high-tech manufacturing such as machinery and transport equipment, where they increased their relative export share from below 10% in 1995 to 31% in 2010. This evidence suggests that emerging market economies have entered a new phase of export-led growth, with a shift from being pure volume exporters of low- to medium-technology goods to becoming sophisticated global providers of more high-tech products.

Sectoral composition of the export recovery

Besides regional disparities, the trade recovery has also been rather uneven when looking at different product categories (Graph 1.6). In nominal terms, exports of crude materials, which are subject to large price fluctuations, had exceeded their pre-crisis peak by 30% in 2011, while fuels exports were 23% below levels seen in 2007. However, the latter development is largely due to base effects related to the high oil price prevailing until the summer of 2008. But also several other product categories, primarily in the medium- to high-technology segment of the product range, have not yet fully reached their respective pre-crisis level of 2008. Most notably, exports of machinery and machine parts, telecommunication equipment, road vehicles and other transport equipment are still between 2.5% and 8% below previous peak levels. Given that production of these high value-added manufacturing products still tends to be concentrated in advanced countries, the relatively subdued export dynamics in a number of high-income countries can be partly attributed to the sluggish export recovery in these product categories.

The evolving role of global supply chains and trade elasticities

Over the last decades, global supply chains have played an increasing role in industrial production as trade and capital flows were liberalised and transportation and communication costs declined. According to available empirical evidence, vertical specialisation in high-technology products has increased substantially over the last two decades, especially in East Asia. Moreover, vertical supply integration is estimated to account for nearly a third of total trade growth.

It is often argued that the prevalence of production chains increases the sensitivity of trade to changes in global demand (Graph 1.8). It is therefore not surprising if attention quickly focused on global supply chains as a possible explanation of the great trade collapse. Production chains allow quick adjustment to changes in market demand, but consequently also act as channels for rapid transmission of real and financial shocks. However, the prevalence of

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(1) Figures in brackets denote SITC, Rev. 4 product categories.
Source: UN COMTRADE, Commission services' calculations

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global supply chains in world production should only affect the level of trade to GDP and not its elasticity. (\textsuperscript{5}) Only in cases where new supply chains are developed during upswings or disrupted during downturns can the elasticity of trade to GDP be influenced by the fragmentation of the production structure.

Graph 1.8: World trade growth and world output growth (y-o-y change, 1962 - 2011)

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{graph1.8.png}
\caption{World trade growth and world output growth (y-o-y change, 1962 - 2011)}
\end{figure}

Source: OECD

Yet supply chains did play a role in the recent collapse of trade. Firstly, the financial crisis induced a sharp drop in demand concentrated in consumer durables and investment goods, which are produced in globally integrated sectors. Secondly, the abrupt drop in demand and shortage of credit supplies are likely to have caused a sudden breakdown of some supply chains, which amplified the trade collapse. But in contrast to the sudden demand slump, supply-side disruptions seem to have played only a minor role. (\textsuperscript{6}) The key explanation behind the trade collapse is the composition of the drop in domestic demand (concentrated in highly traded goods), as shown by the sharp trade rebound observed when demand recovered in 2009. In particular, the strong rebound in intermediate goods trade suggests a fairly quick re-establishment of production chains (Graph 1.9). Furthermore, as discussed further in Box 1.1, there is no clear evidence of a structural break in the relationship between trade and GDP since the crisis.

1. Has the crisis left a lasting mark on global trade?

Graph 1.9: World imports across product types (2000 = 100) (1)

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{graph1.9.png}
\caption{World imports across product types (2000 = 100) (1)}
\end{figure}

This evidence contradicts suggestions, at least for the time being, that the crisis has caused a ‘degloabalisation’ of production in terms of a consolidation of global supply chains. Empirical studies of production structures in subsectors suggest that supply chains were gradually consolidated in some sectors already before the financial crisis. Initial observations indicate that this tendency towards fewer production stages across borders has been in some cases accelerated by the global crisis. (\textsuperscript{7}) For some products, the downturn in demand may have triggered a shift towards domestic production or the possibility among surviving suppliers to expand capacity and create entry barriers for the successors of firms that did not survive the trade downturn. Geographically, East and South Asia — and especially China — have gained significant market shares in the global production network at the expense of less-developed countries. However, on the aggregate level, the experience of the recent collapse and recovery of trade suggests that any amplification effects due to global supply chains are broadly symmetric across the cycle.

Banking crises and import growth

Economic history shows that financial crises depress imports durably in affected countries as

(\textsuperscript{1}) A change in the production of final goods requires a proportional increase in the demand for all inputs, domestic and imported. Hence, the presence of supply chains only affects the absolute level of trade, and not the sensitivity of trade to changes in total demand.


Box 1.1: Global income elasticities and structural stability

Following Irvin (2002) (1) and Milberg and Winkler (2010) (2), we estimate a simple autoregressive distributed lag (ARDL) model with quarterly data on world trade (goods and services) (x_t) and global GDP (y_t) from 1991Q1 to 2008Q3 (3). In practice, we employ an ARDL bounds testing approach pioneered by Pesaran et al. (2001), (4) which is particularly helpful when a level relationship among variables is assumed, while it is not known with certainty whether regressors are trend- or difference-stationary. In contrast to other co-integration techniques, pre-testing for unit roots and co-integration is not required and it is not necessary that all of the regressors are integrated of the same order. The ARDL model of global trade is represented by the following equation:

\[ \ln x_t = \alpha_0 + \sum_1^4 \beta_j \ln y_{t-j} + \sum_1^4 \gamma_j \ln x_{t-j} + \epsilon_t \]

where \( \alpha_0 \) is a constant and \( \beta_j, \gamma_j \) are coefficients of lagged variables. For the testing of co-integration relationships, it is convenient to transform the equation into the error-correction form:

\[ \Delta \ln x_t = \alpha_0 + \sum_1^4 \beta_j \Delta \ln y_{t-j} + \sum_1^4 \gamma_j \Delta \ln x_{t-j} + \delta_1 \ln y_{t-1} + \delta_2 \ln x_{t-1} + \epsilon_t \]

In a first step, the lag lengths of the distributed lag functions are set to one according to the Schwartz criterion and the equation is tested for the existence of a level relationship between \( y_t \) and \( x_t \) based on standard F- and t-tests. The calculated F-test statistic exceeds the critical value (upper bound) provided by Pesaran et al. (2001) and the null hypothesis of no relationship can be rejected. Next, the equation can be estimated by ordinary least squares (OLS), which yields consistent long-run coefficients, and parameter inference is valid using asymptotic normal theory. (5)

<table>
<thead>
<tr>
<th>ARDL regression results (long-run coefficients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>(0.103917)</td>
</tr>
<tr>
<td>( \ln y(t) )</td>
</tr>
<tr>
<td>(0.217942)</td>
</tr>
<tr>
<td>( \ln y(t-1) )</td>
</tr>
<tr>
<td>(0.219899)</td>
</tr>
<tr>
<td>( \ln x(t) )</td>
</tr>
<tr>
<td>(0.018731)</td>
</tr>
<tr>
<td>Long-run elasticity</td>
</tr>
</tbody>
</table>

Standard errors in parenthesis.
Note: Elasticities for 2008Q4-2009Q1 calculated as \( (\Delta \text{TRADE}/\Delta \text{GDP}) \times (\text{GDP}/\text{TRADE}) \).

Given that the endogenous and exogenous variable has only one lag, the long-run elasticity of world trade with respect to global income can be estimated by \( (\beta_1 + \beta_2)/(1-\gamma_1) \). Splitting the sample into a pre-crisis and a post-crisis period, estimates yield 1.58 for the period 1991Q2-2008Q3 and 3.16 for the period following the trade collapse, 2009Q2-2011Q3. These results suggest that the Great Recession might have shifted the historical global trade-income relationship. When divided into different sub-periods, elasticity estimates exhibit a remarkable pattern, with rather high trade responsiveness to global income in the 1990s and a lower level in the 2000s up to the trade collapse (see table above). These results are in line with findings by Escaith et al. (2010), who attribute the temporarily higher

(3) Data on trade flows are from the OECD. Global GDP is calculated as a weighted average of 34 countries accounting for about 90% of global output over the estimation period.

(Continued on the next page)
income elasticities in the 1990s to the transition between two underlying economic models which resulted in an expansion of international supply chains. (1) By contrast, other studies find that the income elasticity of global trade gradually increased from the 1960s to the 2000s. (2)

In order to identify possible structural breaks in the relationship between global output and world trade, coefficients are estimated over the whole estimation range and are subsequently subjected to the stability tests. Using a Chow breakpoint test, the null hypothesis of constant parameters (no structural break) can be rejected at the 5% confidence level for the possible breakpoint in 2008Q4, but also for a structural break in 2001Q1. In general, searching for the most likely breakpoint tends to artificially increase the F-statistic of no break and rejection probabilities might exceed the type-one error even if only one structural break is tested. (3) Therefore, we follow Candelon and Lütkepohl (2001) (4) and employ bootstrap versions of the Chow sample-split and Chow forecast tests. In both tests, there is no indication of a structural break in 2008Q4-2009Q1 at the 5% significance level (albeit at the 10% level in the case of the sample-split test) (see graphs below). However, based on the sample-split test statistically significant structural changes can be identified for example in 1998 and 2000.

An alternative way to test for structural breaks is based on the cumulated sum of recursive forecast errors (CUSUM). If the CUSUM moves too far away from the zero line, this is an indication of a structural change. In fact, there is a tendency of the CUSUM test to wander off since the late-1990s, which might suggest structural changes in the underlying ARDL model. But these developments do not seem to be particularly pronounced since the null hypothesis of no structural break cannot be rejected at the 5% level (left panel of graph below). A major shortcoming of the CUSUM test is its possibly low power if various parameter shifts compensate each other in their impact on the means of the recursive residuals. Thus, under the assumption that global trade has possibly been subject to more than one structural break, the CUSUM-of-squares (CUSUM-SQ) test may be more appropriate. In contrast to the Chow tests, they do not give any clear indication of model instability since the CUSUM and the CUSUM-SQ stay within the critical bounds of the 5% significance level (right panel of graph below).

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1. Has the crisis left a lasting mark on global trade?

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(Continued on the next page)
aggregate investment is constrained by credit supply restrictions and the worsening economic situation, while negative income effects weigh on private consumption. As historical evidence and recent experience suggest, banking crises often coincide with busts in real estate booms, which additionally force non-financial companies and private households to repair their balance sheets and compound the demand slump. Furthermore, crisis-induced capital outflows and lower foreign investment due to increased risk aversion have a longer-lasting impact on imports. On the positive side, capital outflows can also entail large exchange-rate depreciations that can pave the way for a post-crisis export recovery. (*) Thus, the rather slow import recovery observed in many crisis-affected countries in the last couple of years seems to follow a typical pattern. An exception is the US, where imports were already approaching pre-crisis levels in autumn 2011. (**) By contrast, a country’s export performance appears to be significantly less affected by financial distress.

To illustrate the adjustment path of imports after a financial crisis, Graph 1.10 compares recent import growth in a number of crisis-hit countries with the import recoveries in Sweden and Finland in the 1990s. Sweden and Finland had to cope with severe banking crises in the early 1990s triggered by the burst of credit-fuelled real-estate and stock-market bubbles. Investment and consumption in both the private and the public sector collapsed during the subsequent recession. As a result, imports decreased by 8% in Sweden and plummeted by more than 21% in Finland in the first year after the crisis and were back to pre-crisis peak levels only after about 4 years. (***) During the same time, exports soared on the back of structural reforms to improve competitiveness, but were also supported by a depreciating currency.

If a similar recovery pattern could apply to the current situation, imports of current crisis countries can be expected to fully recover from the previous downturn by spring 2012. This seems, however, to be a very strong assumption. The economic environment in the 1990s was much more benign, with a buoyant world economy and robust US import demand. Exchange-rate depreciation also helped to ease the adjustment burden. Bearing these caveats in mind


(***) However, this benchmark of pre-crisis peaks could also be misleading as pre-crisis import levels might have been inflated due to an overheating economy and unsustainable, credit-fuelled consumption and investment growth.
and recognising the recent worsening of the global economic situation, the trade-related recovery in crisis countries is very likely to be even more protracted. Hence, with the large dispersion of financial distress across advanced countries the impact on global trade might be quite prolonged.

1. Has the crisis left a lasting mark on global trade?

Show that short-term export credits declined by 13% between 2008 and 2009, but have recovered since the first quarter of 2010 (Graph 1.11). The fact that the volume of short-term export credits is still 12% below its pre-crisis level suggests that private credit insurers may have reduced credit limits due to the deteriorated risk environment. Nevertheless, the largest share of global merchandise trade is financed on an open account basis or by cash-in-advance arrangements, which are not officially recorded.

The available evidence on the impact of trade finance conditions on trade is rather mixed. Recent empirical studies suggest that liquidity contractions and the tightening of financial conditions are likely to have restricted trade finance and thus reduced demand in trade-intensive sectors that are most credit-dependent. Thus, tight credit conditions have probably amplified the trade collapse, even though most of the trade downturn seems to be explained by the slump in world demand.

Given that financial conditions have not yet returned to pre-crisis levels, stressed credit markets are still likely to dampen world trade in the near future. Even more importantly, several advanced economies are facing substantial deleveraging needs. With both firms and households winding down debt levels and necessary fiscal consolidation under way, the global impact on trade growth is likely to be tangible and persistent.

Impact of financial distress on trade finance

The financial crisis and the ongoing bank funding stress have raised concerns that deteriorating trade finance conditions might put the trade recovery in jeopardy. Surveys conducted by the Bankers’ Association for Finance and Trade (BAFT) jointly with the IMF and the International Chamber of Commerce confirm that especially large banks that were hit by the financial crisis have been tightening lending conditions and charging higher prices following the global credit crunch in late 2008. Nevertheless, the overall decline of trade finance observed during the crisis is generally assumed to be mostly the result of lower demand, with supply constraints only playing a relatively minor role. Statistics on insured export credits

(1) Insured export credits account for about 10% of the global volume of trade finance, albeit the more risky segment of the market.
concentration of banking activities, with e.g. French and Spanish banks accounting for about 40% of bank-intermediated trade finance to Latin America and Asia. Overall, large euro-area banks account for 36% of the market for bank-intermediated trade finance, whereas US and Japanese financial institutions hold market shares of only 5% and 4% respectively. (14)

It is too early to draw strong conclusions as to the extent to which the latest (and moderate) decline in trade finance since 2011 is supply- or demand-driven. However, there is a risk that the ongoing tensions in some segments of the financial market could eventually spill over to trade finance, with detrimental consequences for global trade if the funding problems of major European banks exacerbate. Additionally, the particular structure of the trade finance market exposes emerging markets more than others to the risk of a retrenchment of trade finance.

1.3. Concluding remarks

International trade recovered remarkably from the recession-induced trade collapse in 2008-09. But as the world economy began to slow down in the middle of last year, concerns were raised that world trade could still be bearing the marks of the Great Recession of 2008-09. In fact, trade volumes have exceeded their pre-crisis peaks, but are still substantially below their potential trend path. However, the evidence presented in this chapter does not lend conclusive support to the thesis that the Great Recession has systematically and profoundly changed the underlying patterns of international trade in terms of a structural break in the relationship between trade and GDP. This notwithstanding, there are indications that the ensuing crisis might have accelerated the shift in the regional and sectoral composition of merchandise trade. The substantial adjustment due to fiscal consolidation and deleveraging in the private sector has constrained import growth in a number of advanced countries and these repercussions of the financial crisis in advanced economies will continue to weigh on global trade prospects in the short and medium term. By contrast, the disruption of trade finance does not appear to be a limiting factor at the current juncture. But given the structure of the trade finance market, with the large market share of European banks centred on specific regions, there is a non-negligible risk that increased tensions in financial markets and further needs for bank deleveraging will impair the availability and conditions of trade finance.

On the positive side, emerging market economies were left relatively unscathed by the Great Recession and account for a growing share of world income, global demand and international trade. Thus, low- and middle-income economies can be expected to cushion, at least partially, the demand shortfall in advanced countries by gradually increasing their imports, especially of consumption goods. But emerging market economies will also continue to play an important role in international supply chains. Even though there are some indications that international supply chains in some sectors have embarked on a consolidation process, with fewer production stages involved and consequently less cross-border trade, there is no broadly-based evidence for this process so far. Moreover, the strong global recovery in intermediate goods trade after the Great Recession suggests that the international division of labour in terms of the cross-border distribution of different production stages still tends to shape the pattern of world trade.

With global demand growth predicted to accelerate again in the course of the current year, world trade in 2013 is projected to pick up and approach its long-term average. However, the expected growth is largely insufficient for trade to recover its pre-crisis trend volume, i.e. the level that would have been achieved if global trade had followed its pre-crisis growth path also after 2008. Overall, global trade seems to be approaching the long-term growth trend prevailing before the boom years of 2002-08 and is likely to expand on average at lower rates than registered in the previous decade.