

# E. Increased synchronization and globalization of macroeconomic shocks

This section describes the increased synchronization and spread of macroeconomic shocks in the last few years after what appeared to be a general moderation of volatility. It examines the role of global value chains in the transmission of macroeconomic shocks and looks at how export structures influence volatility. It describes how the economic crisis spread from developed to developing countries and how a coordinated response helped to limit the use of protectionist measures in the wake of the crisis. Despite suffering the greatest economic downturn since the 1930s, the world did not see a widespread resort to protectionism. Among other explanations for this was the existence of a set of multilateral trade rules.

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### Some key facts and findings

- Macroeconomic volatility is bad for development because it reduces economic growth and adversely affects the distribution of income. Before the onset of the economic crisis in 2008, volatility had been declining in developing countries.
- The dramatic decline of trade in 2008–09 illustrated the dependency of developing economies on cyclical economic developments in developed countries, and vice versa. Beyond the fall in demand, other factors, such as the functioning of global value chains and the drying up of trade finance, explain the trade collapse.
- Despite the severity of the global economic crisis, it produced no large-scale outbreak of trade protectionism. Empirical evidence suggests that being a member of the WTO has acted as a restraint to the use of trade-restrictive measures during the crisis and its aftermath.
- G-20 developing countries contributed to the coordinated response to the crisis by using macroeconomic tools to stimulate their economies and by committing to refrain from erecting new trade barriers.
- The spread of global value chains has increased linkages among countries, creating a common interest in preventing the spread of protectionism. Raising trade barriers would have proven to be ineffective in promoting economic recovery in the medium to longer term.

## 1. Macroeconomic volatility of developing economies

Macroeconomic volatility is bad for development because it can reduce economic growth, make it difficult for households to smooth their consumption and adversely affect the distribution of income. Macroeconomic volatility is defined here as volatility in the cyclical component of GDP, i.e. volatility around the trend growth of GDP.<sup>1</sup>

Beginning with the pioneering work by Ramey and Ramey (1995), a significant stream of literature has showed a negative relationship between macroeconomic volatility and growth (Martin and Rogers, 2000; Aghion and Banerjee, 2005; Hnatkowska and Loayza, 2005). The principal channel through which volatility reduces growth is through its damaging effect on capital accumulation as it makes the returns on investment in human and physical capital more uncertain. Welfare losses may also arise because of the difficulty in smoothing consumption as a result of investment constraints which tend to be more severe in developing countries (Loayza et al., 2007). A number of empirical studies have also found that volatility worsens income inequality (Inter-American Development Bank, 1995; Breen and Garcia-Penalosa, 2005; Laursen and Mahajan, 2005).

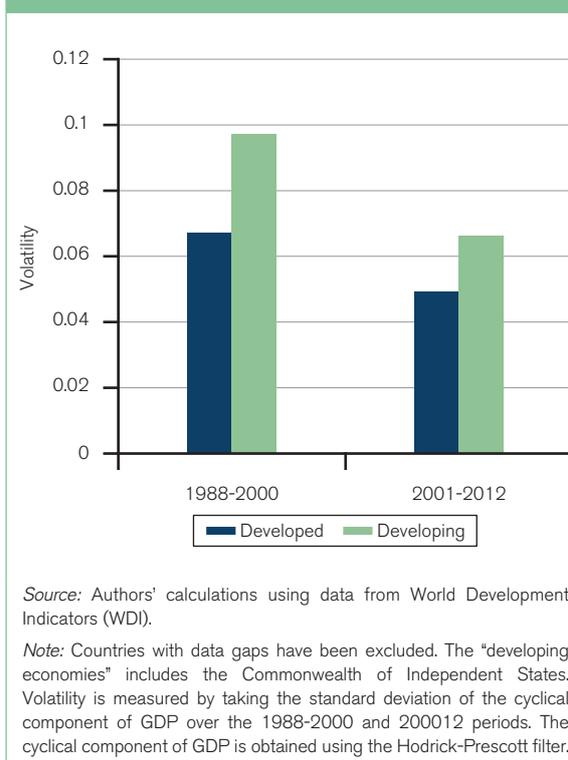
Developing countries as a group exhibit more macroeconomic volatility than developed countries (Agénor and Montiel, 2008). This is shown in Figure E.1 where the volatility of developed and developing countries before 2000 is compared with the period since then. In both time periods, developing countries had higher volatility than developed countries. For both groups of countries, volatility was lower in the later period. The sources of this volatility in developing countries can be broken down into domestic and external factors (Loayza et al., 2007).

External factors refer to the openness of a country to trade and its integration with the global economy in the areas of goods, services and finance. Domestic factors include the economic structure, particularly the supply side, institutions and the conduct of fiscal, monetary and exchange rate policy (Fatás and Mihov, 2013). These domestic and external factors are not necessarily independent. For instance, supply-side constraints may make a country dependent on a narrow range of commodities for export and fiscal revenues. If the country is open to trade and is a price taker in international markets (i.e. not sufficiently big to influence market prices), commodity price volatility can easily translate into macroeconomic turmoil. The following sections focus on trade openness and the interaction between sectoral concentration and openness as channels of macroeconomic volatility.<sup>2</sup>

### (a) Trade openness and volatility

First, we examine trade openness and its effect on macroeconomic volatility. The trade literature suggests that openness can in some circumstances accentuate

Figure E.1: Volatility of developing countries, 1988–2000 and 2000–12

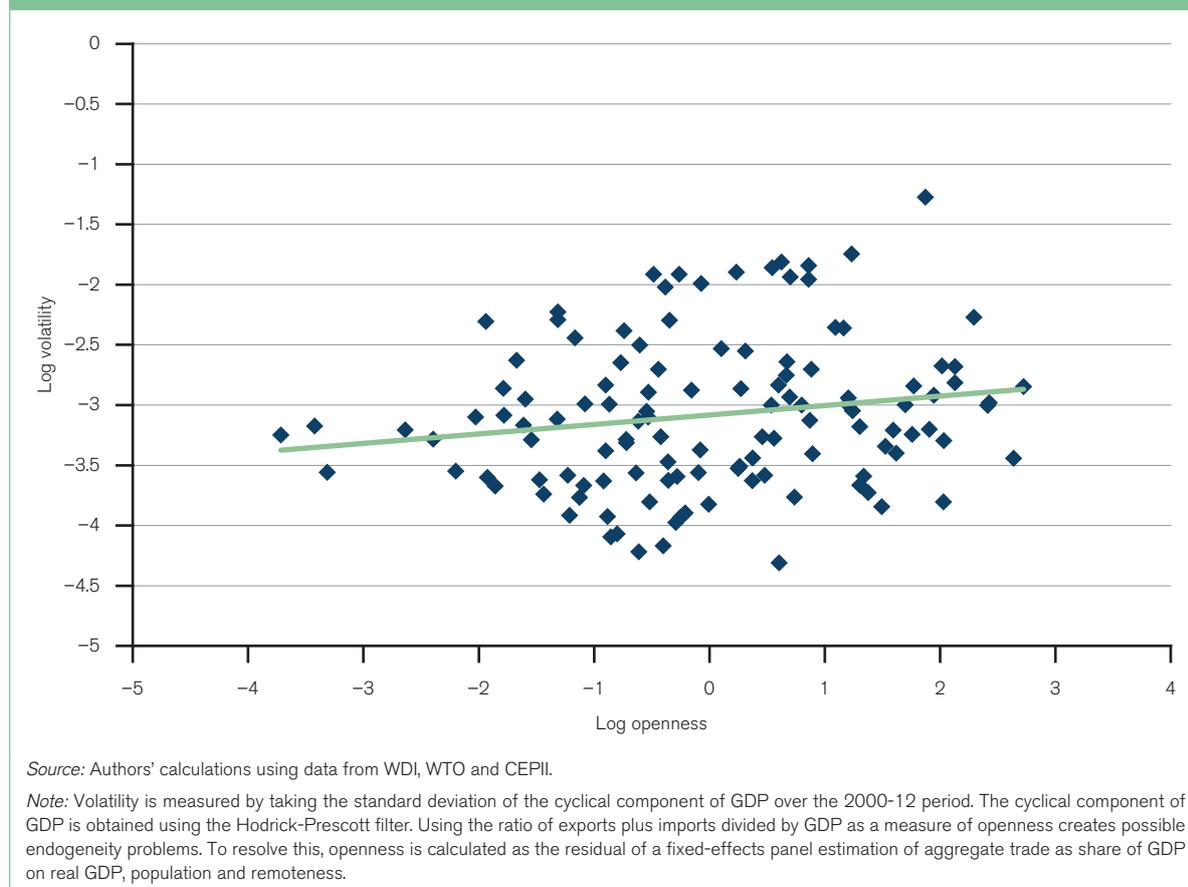


macroeconomic volatility but that it might also have a dampening effect. Countries with closer trade links tend to have more tightly correlated business cycles (Frankel and Rosen, 2008). This suggests that trade acts as a transmission mechanism for spreading a country-specific shock to others. In the context of the recent economic crisis, some have argued that trade was a major channel of transmission that made the crisis global (Lane and Milesi-Ferretti, 2010).

A number of authors have highlighted the role of global value chains in the transmission of macroeconomic shocks. For instance, Lee et al. (1997) have pointed to the "bullwhip effect",<sup>3</sup> which refers to how small changes in final demand can cause a big change in the demand for intermediate goods along the value chain. Higher volatility can be driven by the increased vertical integration of value chains, which synchronizes business cycles (Di Giovanni and Levchenko, 2010). Greater trade openness also means more exposure to external economic shocks, with the most outward-oriented industries being the most vulnerable. Some empirical evidence for this is based on industry-level data (Di Giovanni and Levchenko, 2009). Focusing on small economies, Easterly and Kraay (2000) find that these countries exhibit greater macroeconomic volatility and that this is explained by their greater openness and sensitivity to terms-of-trade shocks.

Figure E.2 shows the relationship between trade openness of developing countries and volatility. For this particular sample of countries and time period, we obtain a positive

Figure E.2: Volatility and trade openness, 2000–12



relationship between openness and macroeconomic volatility although, as discussed below, one must be careful about this relationship.

However, there is also evidence that trade openness can reduce volatility. If country-wide shocks are dominant, the impact of trade on volatility can be negative because trade becomes a source of diversification (Tenreyro et al., 2012). For example, trade allows domestic goods producers to respond to shocks to the domestic supply chain by shifting sourcing abroad. Similarly, when a country has multiple trading partners, a domestic recession or a recession in any one of the trading partners translates into a smaller demand shock for its producers than when trade is more limited. The effect of openness also interacts with the underlying structure of exports, which is noted by Haddad et al. (2012). They show that, for a significant proportion of countries that have relatively diversified exports, the effect of openness on volatility is negative.

#### (b) Export structure matters

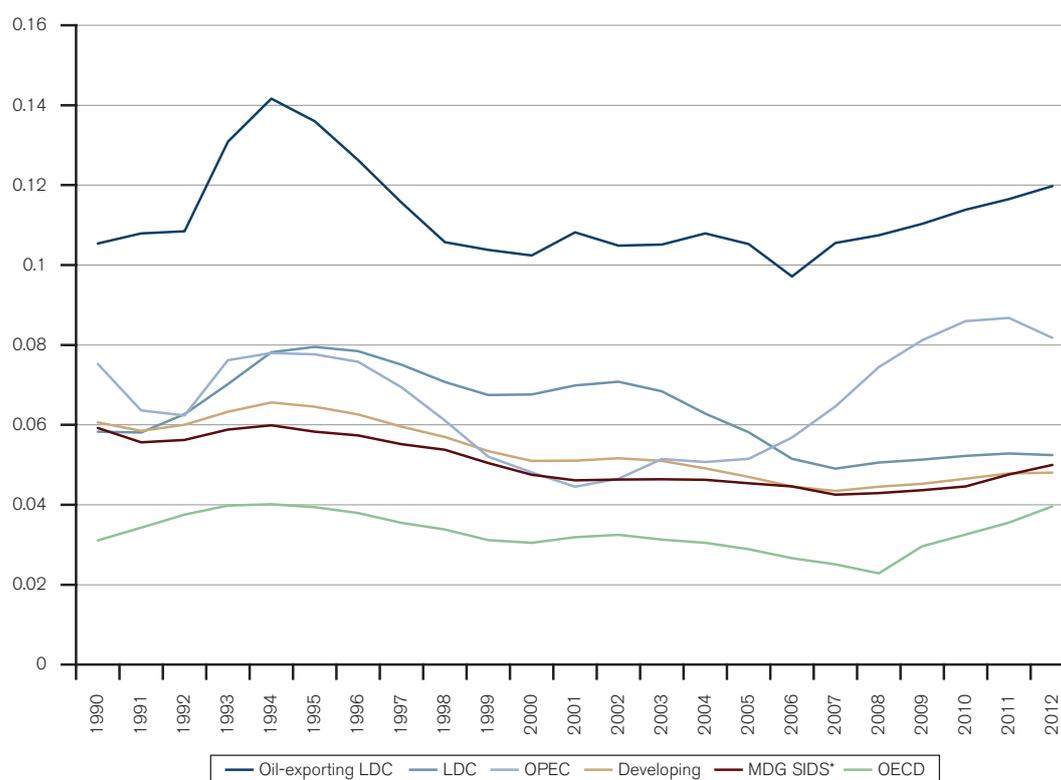
The link between macroeconomic volatility and the structure of a country's export basket has been examined in a number of studies. In the case of African countries, Kose and Riezman (2001) find that, because a significant proportion of their exports are concentrated in a narrow range of

primary commodities, terms-of-trade shocks account for 45 per cent of the volatility in their aggregate output. Moreover, adverse trade shocks cause prolonged recessions since they lead to a significant decrease in aggregate investment. In the context of the recent global crisis, commodity exporters faced demand and price declines that translated into greater output volatility. For developing countries that are part of manufacturing global value chains, producers of durable goods were badly affected by the global crisis because long-term investments were postponed (Baldwin, 2009). This translated into GDP volatility due to the large role of capital expenditures in aggregate demand.

#### (c) Declining volatility over time

Another feature of macroeconomic volatility in developing countries has been its decline since the mid-1990s before it spiked up again around the time of the Great Recession of 2008–09. Figure E.3 shows macroeconomic volatility over time by groups of countries. Members of the Organisation for Economic Co-operation and Development (OECD) are used to represent developed countries. The figure includes all developing countries as well as sub-groups of them – least-developed countries (LDCs), LDC oil exporters, members of the Organization of the Petroleum Exporting Countries (OPEC), and small island states. All the groupings of developing countries show higher volatility than OECD

Figure E.3: Volatility over time and country groups



Source: Authors' calculations using data from WDI.

Notes: Volatility in any given year is measured as the moving average of the last ten years of the standard deviation of real GDP per capita. The standard deviation is the most conventional way to measure volatility (e.g. Aizenmann and Pinto (2005)).

\*MDG SIDS stands for Millennium Development Goals in Small Island Developing States.

members but there is a clear downward trend for all the groupings beginning around 1995.

This picture is consistent with the “great moderation”, the term used to describe the long-term decline in output and inflation volatility in the G-7 group of industrial countries that began at about this time (Kim and Nelson (1999); Blanchard and Simon (2001); Stock and Watson (2003); Stock and Watson (2005); Del Negro and Otrok (2008)). Figure E.3 suggests that the great moderation extended to developing countries as well. This may not be all that surprising given how developed countries are major export markets and principal sources of finance for developing countries. The moderation in volatility in industrial countries may have been transmitted through these channels to developing countries. Equally important, structural transformations occurring as part of the development process – Koren and Tenreiro (2007) refer to diversifying away from volatile sectors – contributed to make them less volatile over time.

To summarize, while developing countries are subject to more macroeconomic volatility than developed countries, this has been declining over time. More trade openness does not necessarily mean greater volatility as openness could also provide a source of diversification. However, concentration in a small number of exported

goods, particularly if they involve commodities or natural resources, is associated with more volatility. As explained in great detail in Section C, participation in global value chains bring great economic opportunities but it may also increase exposure to economic shocks.

## 2. Developing economies in the 2008–09 crisis

### (a) More intertwined business cycles under the influence of global trade, finance and production

The 2008–09 trade collapse illustrated the dependency of developing economies on cyclical economic developments in developed countries, and vice versa (see Box E.1). Trade has been the transmission belt, at a global level, of the fall in the United States' and Europe's demand to producers in developing economies. The fall in US demand would have remained typical in its macroeconomic effects had it not been amplified by complex financial and microeconomic links. As noted by some authors (e.g., Baldwin, 2009), traditional demand models failed to explain the magnitude of the trade collapse as a result of the standard demand slump; other potential factors, partly on the supply side, are

## Box E.1: Contagion and the limited understanding of interconnectedness at the time of the crisis

The 2008–09 crisis revealed an underestimation of the growing spill-overs between developing and developed economies. The concept of “decoupling” between developed and developing economies had even become popular prior to the collapse of Lehman Brothers in 2008, although some authors had embraced a more nuanced view of “divergence but not decoupling” (International Monetary Fund (IMF), 2008). Akin and Kose (2007) had estimated that spill-overs from advanced economies to developing economies had “decreased substantially” since the 1990s. In an effort to improve its understanding of “global interconnectedness” – in particular the spread of shocks – the International Monetary Fund (IMF) introduced a new macroeconomic surveillance framework in 2012 at the multilateral level, with the objective of better evaluating spill-overs in a world more open to trade and capital movements (International Monetary Fund (IMF), 2011a, 2011b, 2012a). One of the new approaches is to “connect the dots” of economies through “cluster network analysis”, focusing on the relations between three categories of actors: the global core group of economies (the “systemic-5”); clusters of economies within which connections are closer than outside (e.g. Nordic-Baltics); and “gatekeepers” or connectors that link clusters to one another and the core of the clusters (e.g. China appears as a gatekeeper to the Asian supply chains).

Table E.1: World exports of manufactured goods by product, 2001Q1–2010Q4  
(year-on-year percentage change in current US\$)

	2008				2009				2010			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Manufactures</b>	<b>16</b>	<b>19</b>	<b>13</b>	<b>-10</b>	<b>-28</b>	<b>-30</b>	<b>-22</b>	<b>0</b>	<b>20</b>	<b>23</b>	<b>18</b>	<b>16</b>
Iron and steel	16	30	48	7	-36	-54	-54	-30	7	43	33	23
Chemicals	20	25	22	-6	-23	-24	-17	8	26	20	12	11
Office and telecom equipment	10	13	7	-14	-28	-22	-15	8	31	30	24	17
Automotive products	16	16	4	-25	-47	-46	-28	5	42	37	18	15
Other machinery	20	22	14	-7	-26	-30	-25	-7	12	19	22	20
Textiles	10	9	3	-13	-27	-26	-17	0	17	18	17	14
Clothing	11	11	8	-2	-10	-15	-12	-7	-1	5	10	18

Source: WTO Secretariat estimates based on mirror data from the GTIS Global Trade Atlas database.

examined below (the drying up of trade credit, workings of modern supply chains and the wait-and-see attitude among consumers throughout the world).

The macroeconomic outcome of this crisis propagation has been the synchronization of business cycles across regions, including between developed and developing countries – during both the downswing and the upswing (see Figure E.4), in a mutually reinforcing manner.

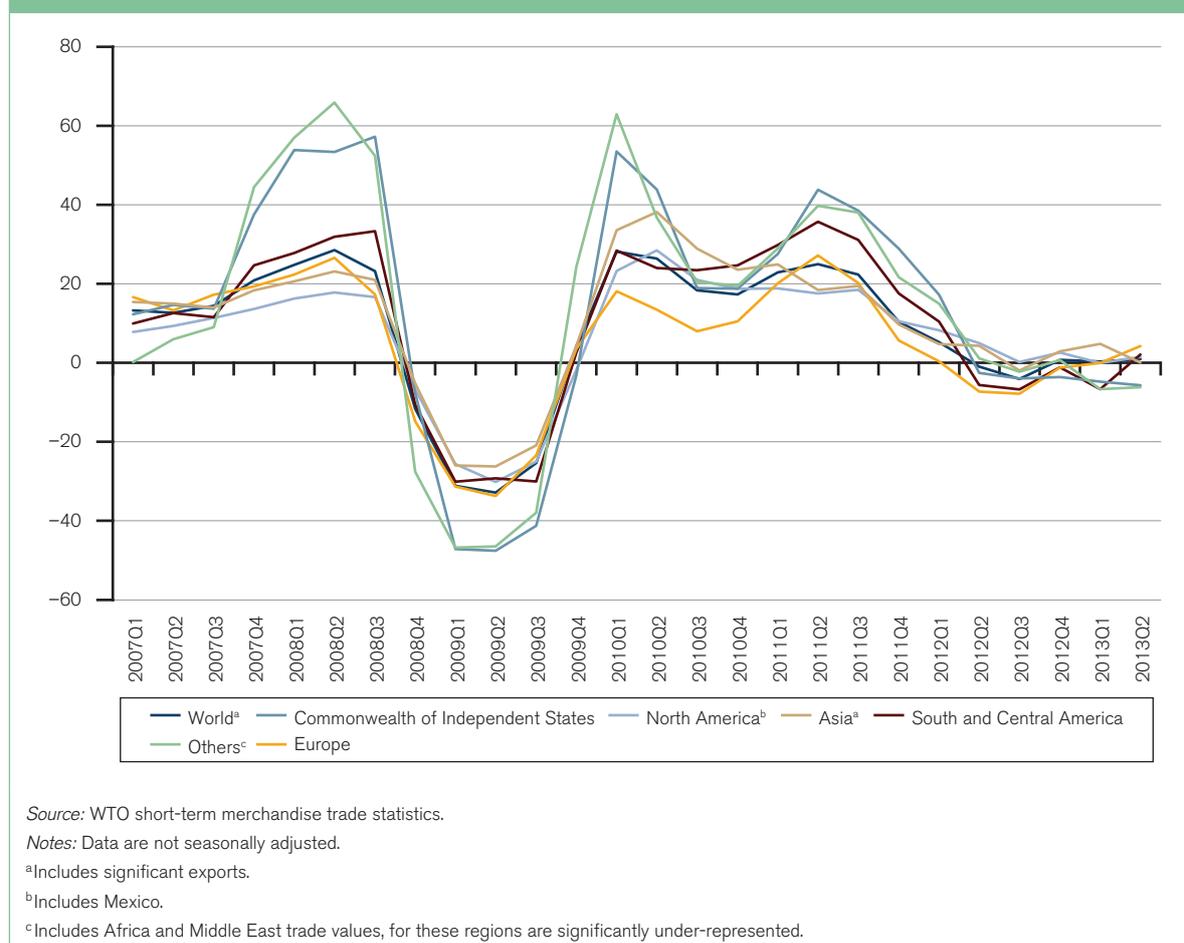
As indicated in Table E.1 and by Baldwin (2009), the “compositional” and “synchronized” nature of this dramatic fluctuation in demand explains, in part, its peculiar nature. The compositional effect is linked to the fact that the demand shock was large but very concentrated in a narrow category of goods (machinery, electronic and telecommunications equipment, automotive products) and intermediate products which are key components of today’s supply chains for the production of durable goods. During the crisis, global trade proved to be more cyclical than GDP because of the high density of such products (60 per cent of trade) in total trade. The trade collapse spread from downstream to upstream production as large developing countries, in which demand for manufactured

goods had fallen, reduced their purchases of commodities and raw material, often exported by low-income countries.

As noted above, research has suggested that only a share of the “great trade collapse” could be attributed to the drop in aggregate demand – 70 per cent, according to Eaton et al. (2011), leaving some 30 per cent to be attributed to other factors.

Among the other factors is the contraction of trade finance, linked to the credit crunch that resulted from the wider crisis of the international financial sector. Trade finance is the lifeblood of trade as most trade transactions are financed by some form of credit, guarantee and/or insurance. The role of trade finance has been highlighted by a growing stream of literature confirming the links between external (trade) finance vulnerability and the performance of traders (Chor and Manova, 2012; Amiti and Weinstein, 2011; Auboin and Engemann, 2012). The importance of this channel was discussed in the World Trade Report 2013 (Section II.D.3). Developing economies have been primarily affected by the contraction of trade finance, in line with the reassessment by global banks of their counterparty risk. In certain cases, big buyers ceased to extend payment or financing facilities to

Figure E.4: Quarterly merchandise exports per region, 2007Q1–2013Q2  
(Year-on-year percentage change in US\$ values)



their suppliers in developing countries, which, in turn, could not rely on the local banking sector to support them (Auboin, 2009). Shortages of trade finance in some developing countries prompted the G-20 to provide US\$ 250 billion in trade finance liquidity and guarantees over two years.<sup>4</sup>

A consensus has also developed about the role of the “supply-chain” channel, which accounts for another important cause of the “great trade collapse”. With the unbundling of production, the “just-in-time nature” of vertically integrated production networks (as described by Baldwin) tends to lead to the spread of demand shocks more rapidly through “factory online”. Better information flows between links in the supply chain was another reason for the trade collapse, with real-time information on sales by retailers quickly becoming known to upstream producers. Di Giovanni and Levchenko (2010) and Li and Lu (2009) have described the process of vertical integration of production across countries.

Engel and Wang (2011) have documented the role of the composition of trade, notably that of durable goods, in the volatility of trade. Alessandria et al. (2012) have focused on the movement of trade that cannot be accounted for by composition. They have found that inventories account

for a sizable fraction of import collapses in the recent global recession. Partly because international trade takes time and is costly, firms engaging in it tend to hold larger stocks of inventories. These movements in inventories generate larger fluctuation in international trade than in GDP. Inventory movements among suppliers may actually be larger than for producers of final goods – inventory movements may be less optimal too.

Trade protectionism has had a much smaller influence than any of the factors mentioned above. Section E.3 analyses in depth the patterns of trade-restrictive measures taken since the economic crisis. The response appears to be muted given the severity of the crisis. Thanks to governments’ heightened awareness of the economic risks of protectionism, the existence of multilateral trade rules, which have made resorting to “open” protectionism more difficult, and the WTO’s commitment to increase trade monitoring, the rise of protectionism has been of limited intensity. Using product level data, Henn and McDonald (2011) show that protectionist measures on aggregate may have reduced global trade by only 0.2 per cent but they also highlight that backdoor or “murky” protectionism, through the use of behind-the-border non-tariff measures rather than tariff increases, as witnessed since 2009, still remains possible.

(b) Developing economies are part of the policy response

To be effective, a coordinated policy response requires the participation not only of developed economies but also of developing economies, given their weight in world output and trade. At the G-20 summit meeting in London (April 2009), G-20 developing countries agreed to participate with developed countries in the announced programme of fiscal and monetary stimulus to boost domestic demand (by some 2 per cent of GDP). They also committed to respecting the “stand-still” clause on protectionism, thereby refraining from using policy space allowed by their WTO commitments (such as raising tariffs to their “bound” limits and using flexibilities in the area of non-tariff measures). By keeping their markets open and allowing some predictability of market access in difficult times, G-20 developing countries have played their part in the resolution of the crisis (see Section F.3(d)).

Low-income countries have been on the receiving end of the global economic shock, despite having little or no responsibility for its origins. They have suffered from knock-on effects such as reduced trade finance availability (Auboin, 2013), reduced remittances from workers living abroad, and lower demand for raw materials and commodities. Dabla-Norris and Gündèz (2012) have showed that the amplitude and frequency of economic shocks tend to be higher in low-income countries than in advanced and developing country G-20 members. The authors argue that standard models in which negative shocks result in a quick bounce back to earlier levels of income do not apply to low-income countries, which do not have the policy instruments, adequate reserves and diversified economic structures to mitigate the impact of such large external crises.

(c) Low-income countries

Thanks to macroeconomic stabilization achieved in the decade leading up to the economic crisis, coupled with improved fiscal control and debt relief received under the Heavily Indebted Poor Countries Initiative set up by the International Monetary Fund (IMF) and the World Bank in 1996, low-income countries have been in a better position to use fiscal space and stimulate their economies in the face of falling international demand than in previous downturns. Also, the long period of commodity price increases, peaking in late 2007, has allowed many low-income countries relying on such resources to substantially improve balance of payments positions and foreign exchange reserves and, in certain cases, build up fiscal funds to cushion against future crises.

However, in the face of strong macroeconomic stress in 2009, it was clear that a prolongation of the crisis would threaten the remarkable achievements of low-income countries. In asking for additional resources to support

them, the IMF argued that the “financial crisis, coupled with the sharp rise of food and fuel prices in 2007, has (already) created much higher financing needs (for low-income countries) that the international community has to meet” (International Monetary Fund (IMF), 2009).

(d) Faster recovery for developing economies in the wake of the crisis

Developing economies have been able to recover appreciable rates of growth since 2010. This is due in part to the continuation of their internationalization and the fact that their exports have rebounded, on average, faster than those of developed countries thanks to the higher demand from other developing countries. As indicated by Figure E.5, India and Indonesia benefited from higher export growth than the United States and the European Union in the recovery period immediately after the crisis – i.e. 2010. China represents the average as demand for its exports is shared between the US and EU markets, on the one hand, and other G-20 developing countries, on the other hand. During 2010 and until mid-2011, Brazil’s exports recovered at roughly the same pace as the best performers.

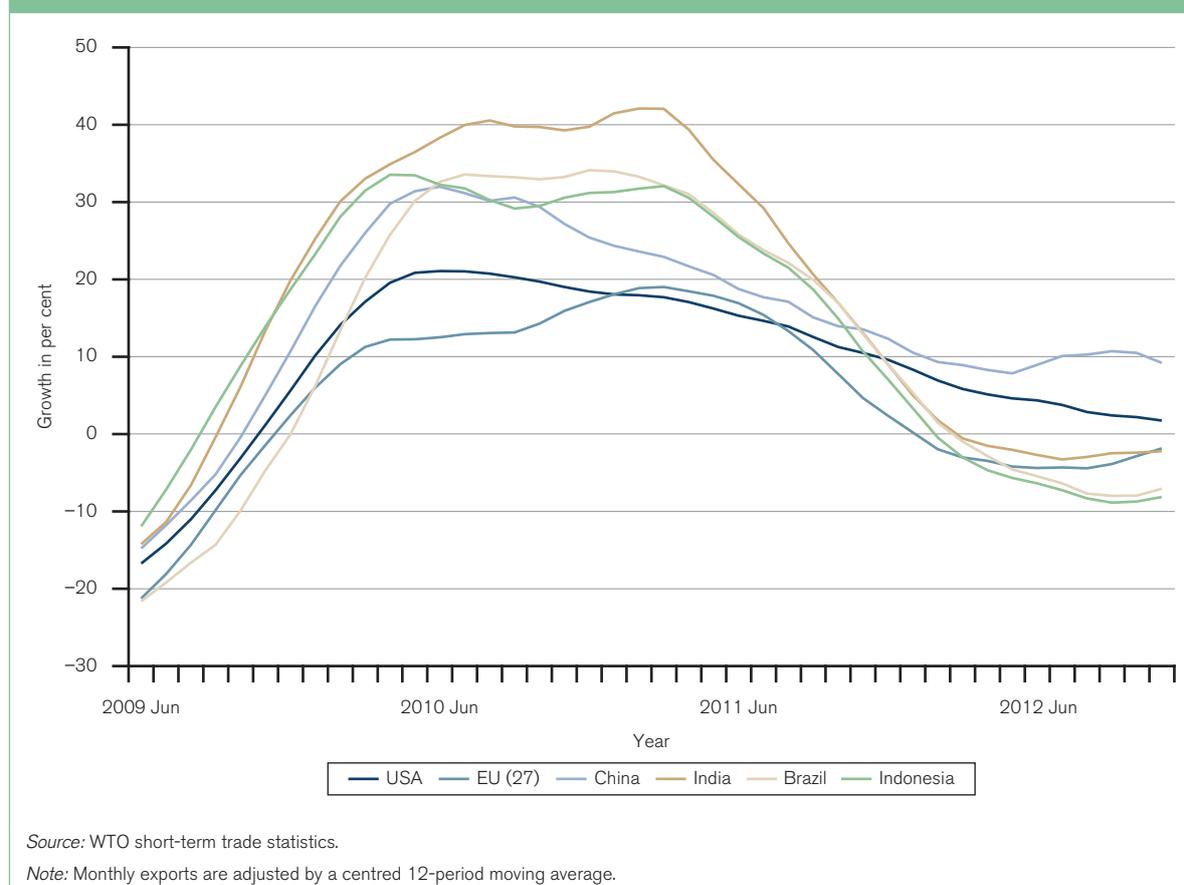
There is little doubt that the combination of strong internal growth (including domestic demand), the growing share of G-20 developing countries in global trade and particularly in intra-regional trade, and better macroeconomic fundamentals have contributed to ensuring higher growth levels in developing economies than in developed countries since mid-2011. As noted by Cattaneo et al. (2010), large corporations are reorienting their production and exports from developed towards G-20 developing countries, where demand is the most dynamic. Smaller developing countries, in the vicinity of the larger developing countries, are also orienting their exports to these regional clusters to benefit from their higher growth.

Figure E.6 underlines this finding via bilateral trade growth rates of selected G-20 developing countries. In all four of these countries (Brazil, China, India and Indonesia), export growth to other G-20 developing countries was significantly higher than growth to developed countries. This is the case for China and India especially. In the recovery period immediately after the crisis, China’s exports to Brazil and Russia were particularly high. In the same period, India’s exports to Indonesia and Brazil peaked.

### 3. Trade policy reaction to the crisis

A number of trade theorists have argued that when trade agreements are self-enforcing,<sup>5</sup> levels of protection are likely to be counter-cyclical, i.e. in the opposite direction to the business cycle (Bagwell and Staiger, 2003a). The explanation offered by Bagwell and Staiger is that when economies and trade are booming and expected

Figure E.5: Recovery of total exports after the crisis, 2009–12  
(current US\$)



to continue to do so, the long-term gains of partners keeping to their commitments are substantial and so countries have a strong incentive to maintain open trade policies. However, when economic growth is slow or contracting, future benefits will be much lower. Under these circumstances, countries tend to shift towards protectionism, since retaliation from trading partners for disregarding commitments does not impose as much of a cost. Put another way, the ability of a trade agreement to constrain countries from taking protectionist actions diminishes as a downturn deepens. Evidence of this behaviour – particularly the use of trade remedies such as anti-dumping, countervailing and safeguard measures – can be found in Takacs (1981), Grilli (1988), Knetter and Prusa (2003), Feinberg (2005), and Bown and Crowley (2013a; 2013b). The most notable dissent to this hypothesis comes from Rose (2012), who claims to find no such pattern in a panel of data covering over 60 countries and three decades.

Given the presumption of the counter-cyclical nature of trade protectionism, it is striking that the Great Recession of 2008–09 did not trigger a protectionist surge similar to what was experienced in the Great Depression of the 1930s or even to what could have been predicted based on countries' past experience. Instead, developing (and developed)

countries adopted a coordinated response characterized by strong macroeconomic stimulus programmes and low levels of trade restrictions.

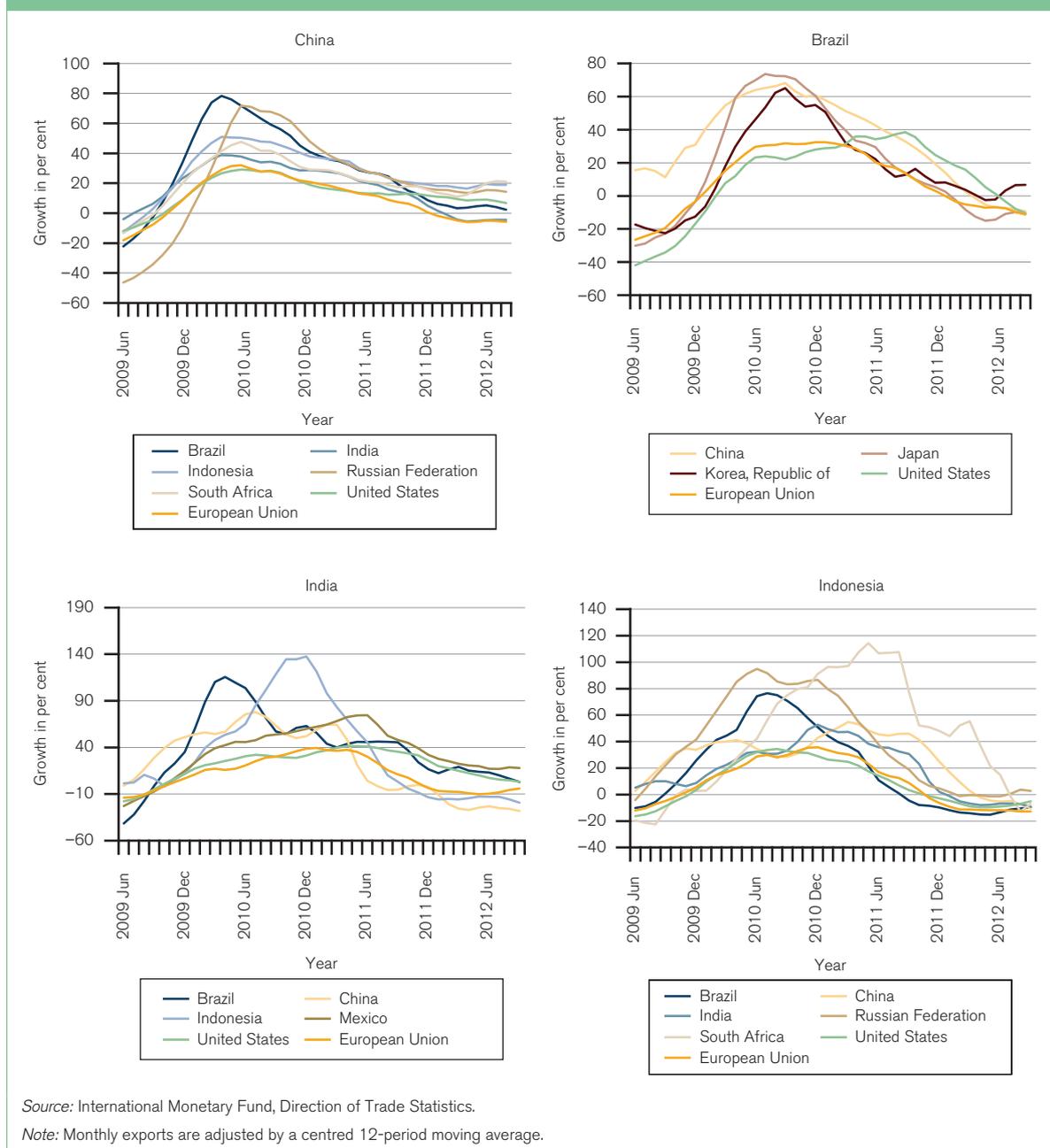
#### (a) Trade policy response

As indicated above, the trade policy response to the economic crisis was marked by the absence of a surge of protectionism. Box E.2 illustrates the potential risks involved if wide-scale protectionism had erupted. Some developing countries took trade-restrictive measures, but not to the extent that past behaviour would have suggested. Furthermore, data show that developing countries also took trade-opening measures. The focus of the analysis below is on the developing countries in the G-20, not only because they are economically important but also because a lot more information is available on their trade actions.

##### (i) Pattern of trade-restrictive measures

We begin by looking at recent empirical research on the trade policy response of developing countries in the wake of the crisis. The study by Bown and Crowley (2013a) focuses on the trade remedy actions (anti-dumping, countervailing and safeguard measures) taken by a group of

Figure E.6: Annual growth of bilateral exports after the crisis, 2009–12



economically important developing countries – Argentina, Brazil, China, Colombia, India, Indonesia, Malaysia, Mexico, Peru, the Philippines, South Africa, Thailand and Turkey. From 1995 to 2010, they find a counter-cyclical pattern in the use of trade remedy measures during economic downturns. This is consistent with the predictions of Bagwell and Staiger (2003a). When they focus, however, on the crisis period of 2009–10, the counter-cyclical relationship is reversed as these developing countries actually imposed fewer trade restrictions during this period of economic weakness.<sup>6</sup> If a wider set of measures is taken into account, the data suggest that there was not a big surge in these measures either. Gawande et al. (2011) look at both applied tariffs and anti-dumping initiations by

seven large G-20 developing countries and also arrive at a similar conclusion: “Strikingly, despite the trade collapse, the 2008 crisis and its recessionary aftermath did not fuel protectionism.”<sup>7</sup>

Confirmation of these conclusions can be sought by examining the database of trade measures recorded by the WTO through its regular trade monitoring reports. The WTO produces two series of reports: WTO reports on trade-related developments covering the WTO membership and observers, and joint reports with the OECD and the United Nations Conference on Trade and Development (UNCTAD) on trade and investment measures taken by G-20 economies. These series of reports were started

### Box E.2: How extensive could trade protectionism have been during the crisis?

A number of different scenarios could have unfolded during the global crisis. If the trade policy response of the Great Depression had been followed, the impact would have been massive and prolonged. Eichengreen and Irwin (2010) describe the effect of the beggar-thy-neighbour policies of the era as “destroying”. Between 1929 and 1932, world trade fell 25 per cent. Nearly half of this reduction was due to higher tariffs and non-tariff barriers to trade. They estimate that global trade failed to regain its 1929 peak (in volume terms) until after the Second World War. Even if the response to the recent crisis had been less dramatic, the effects would still have been severe. Bouët and Laborde (2008) simulate a situation where the tariffs applied by major countries are raised up to their WTO bindings. In this scenario, no WTO member would be violating their commitments since tariffs would not exceed the country’s “bound” levels, yet there would be a huge impact on trade. They estimate that applied tariff rates would double, with world trade declining by 7.7 per cent (about US\$ 1.8 trillion) and world welfare by 0.5 per cent (US\$ 353 billion). This estimated reduction in trade does not include what the consequent fall in demand would have engendered.

in the wake of the 2008 crisis. Four types of measures are collected in the database: (a) trade remedy measures (anti-dumping, countervailing and safeguard measures); (b) import measures (tariffs, taxes, customs procedures, quantitative restrictions and other import measures); (c) export measures (duties, export restrictions and other export measures); and (d) other measures (local content requirements in domestic production and other measures). The database allows one to distinguish whether an action is trade liberalizing or trade restrictive.

Two qualifications need to be made. First, the WTO’s monitoring reports only include trade policy measures covered by multilateral trade rules and consequently omit other measures that can have discriminatory trade effects. Governments intent on raising barriers to trade and prevented from using a particular policy instrument because of multilateral rules have the leeway to use other measures, unconstrained by WTO rules, which will have similar discriminatory trade effects (the problem of “policy substitution”).<sup>8</sup> This is an important point when the issue of financial sector bailouts is discussed below. Secondly, as suggested by Gregory et al. (2010) and Henn and McDonald (2011), while the coverage of trade-restrictive measures may be small, the impact of the measures on the affected trade can be significant. They estimate that trade between partners subjected to the measures decreased by 5 per cent to 8 per cent relative to trade in the same product among partners not subject to similar measures.

Figure E.7 shows the number of new restrictive trade measures taken by G-20 countries in 2009–12. For the G-20 economies, the most utilized measures against imports are trade remedy measures. However, Bown and Crowley’s research makes it clear that use of trade remedy measures during the crisis was significantly less than what would have been predicted based on past responses to business cycles.

While useful, the number of measures may not give a good indication of the measures’ possible impact on trade. To complement these data, we calculate the amount of trade covered by the restrictive trade measures implemented that year, while recognizing that this is also an imperfect measure of their impact. To see this, suppose the trade-restrictive

measure manages to eliminate imports altogether. In this case, the trade covered by the restrictive measure is zero which can lead to the mistaken conclusion that the measure has no effect on trade. The trade data are matched with the trade measures in the WTO monitoring database and are shown in Figure E.8. Note that the trade coverage data exclude exports and are available only for 2010–12.

In contrast to the count data, which suggest that the most utilized measures were trade remedy instruments, the trade coverage data imply this finding is only true for developed G-20 countries. G-20 developing countries, in contrast, tended to rely on other measures, such as import duties, customs procedures and even local content requirement rules. Interestingly, the trade coverage of their restrictive measures appeared to grow over time. Nonetheless, in any given year the new measures covered only a small amount of world imports. In 2012, for example, the new measures enacted that year by the G-20 economies amounted to about 1.3 per cent of world imports. G-20 developing countries’ restrictive measures affected a larger share of world imports than developed countries’ measures.

#### (ii) Liberalization measures

The analysis of trade-restrictive measures only gives half of the story since the other feature of the policy response to the crisis is the simultaneous lowering of trade barriers. Figure E.9 shows the number of liberalizing measures taken by G-20 countries in the midst of the crisis. It shows that liberalization by developed and developing G-20 countries took the form of reductions in tariffs and quantitative restrictions and terminations of trade remedy measures.

The amount of trade covered by these liberalization measures is shown in Figure E.10. The first point to note about the figure is that trade coverage data of liberalizing measures in the WTO monitoring database are only available from 2012. Based on this, it appears that most of the liberalization by G-20 developing countries has been in the area of reductions in tariffs and quantitative restrictions while for developed countries it has been in

Figure E.7: Number of restrictive trade measures, 2009–12

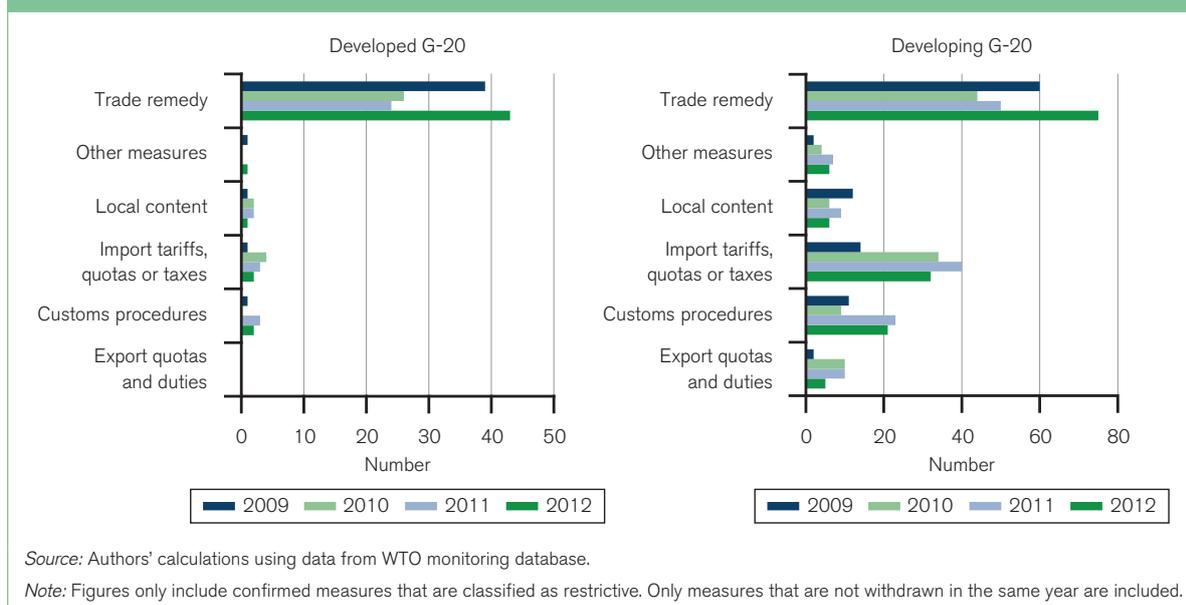
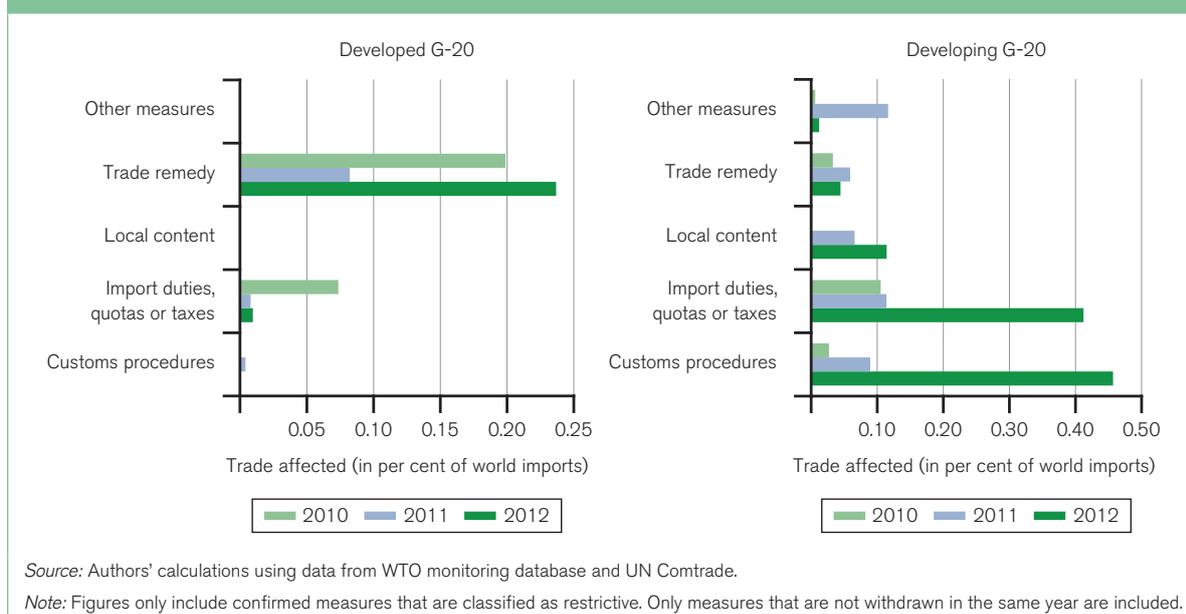


Figure E.8: Share of world trade covered by trade-restrictive measures, 2010–12 (per cent of world imports)



the area of trade remedy instruments. Secondly, G-20 developing countries appear to have undertaken more liberalization than the developed G-20 countries. In 2012, for example, the amount of trade covered by their liberalization measures was about 0.9 per cent of world imports while the corresponding amount for developed countries was about 0.1 per cent.

This focus on the annual flow of trade-restrictive measures is ultimately less illuminating than understanding what is happening to the total number of measures. The WTO's Monitoring Report on G-20 Trade Measures, issued on 18

December 2013, observes that, of all the trade-restricting measures imposed since October 2008, only about 20 per cent have been rolled back. The result is that the measures remaining in place are estimated to cover around 3.9 per cent of world merchandized imports and around 5 per cent of G-20 imports. Thus, while the number or trade coverage of trade-restrictive measures in any given year may be small, they can become a serious impediment to trade if they are not rolled back.

Overall, the trade flow information from the WTO monitoring database suggests that the share of world trade affected

Figure E.9: Number of liberalizing trade measures, 2009–12

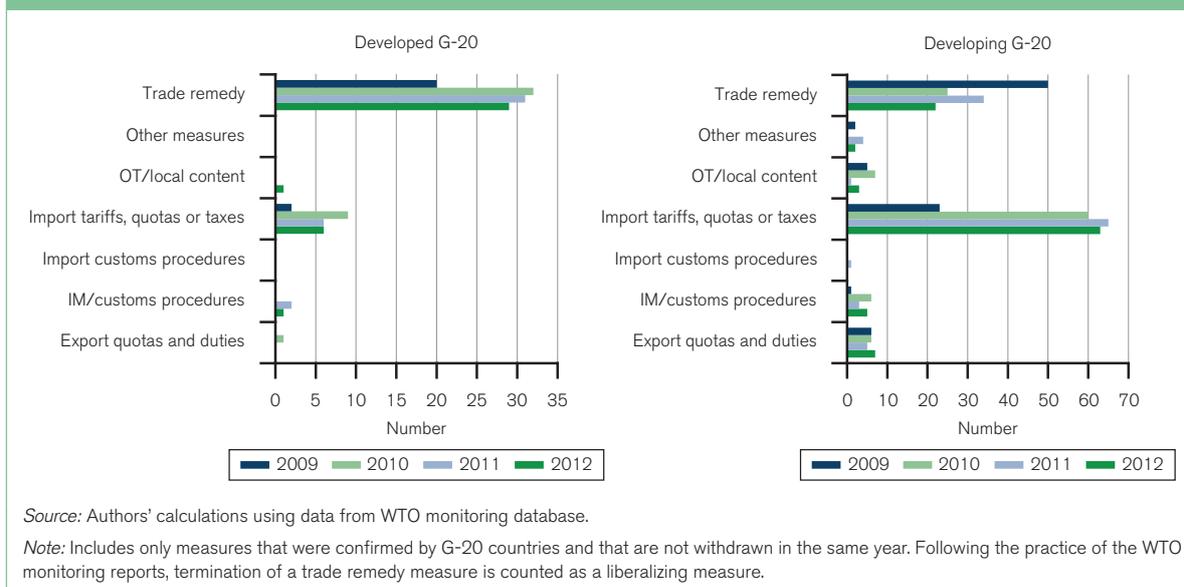
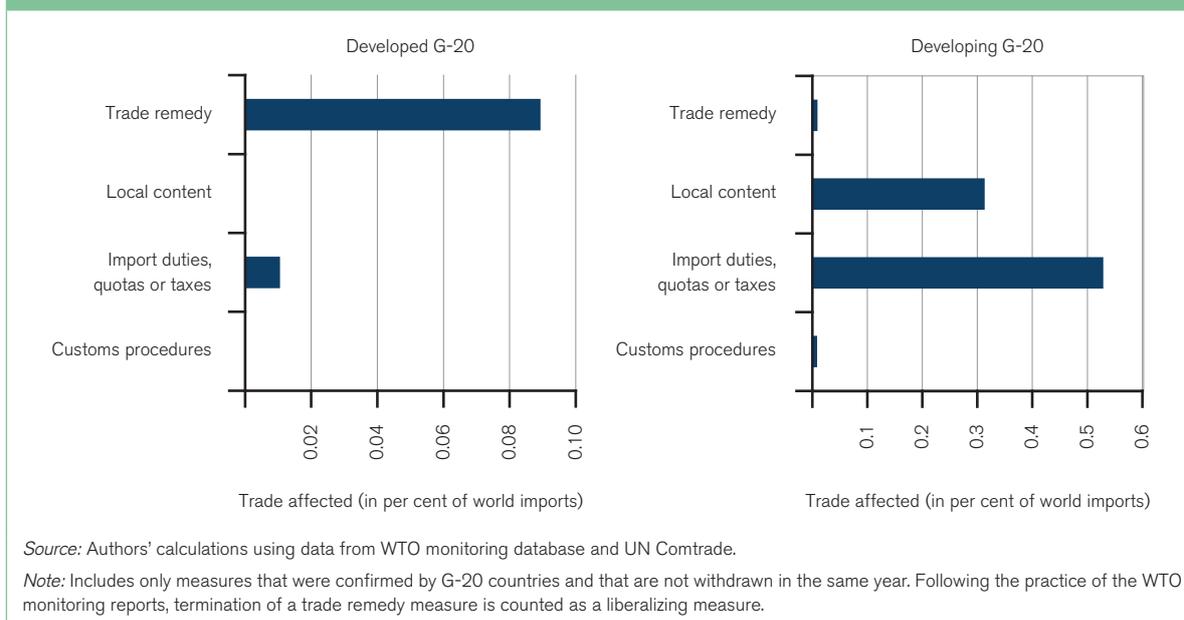


Figure E.10: Share of world trade covered by trade-liberalizing measures, 2012 (per cent of world imports)



by restrictive trade measures is not high and that G-20 developing countries also liberalized their trade during this period much more than developed countries. The analysis is consistent with the conclusions drawn by many others that there was no significant increase in trade protectionism during the crisis.

(b) Coordinated macroeconomic response

One possible reason for this result is countries' use of macroeconomic policies which would have dispensed with the need to use trade policy to manage the adverse impact

of the crisis on incomes and jobs (Eichengreen and Irwin, 2010). In the early phase of the crisis, this macroeconomic response was quite coordinated.

The early post-crisis period (2009–10) saw the G-20 countries increase discretionary fiscal expenditures by an average of 2 per cent of GDP (see Table E.2), although a few countries' stimulus programmes exceeded 5 per cent of GDP. Based on the evidence in this table, the amount of fiscal stimuli (as a share of GDP) did not differ significantly between developed and developing country members of the G-20.

Table E.2: G-20 economies' crisis-related discretionary fiscal stimulus programmes<sup>a</sup>  
 (per cent of GDP)

Country	2009	2010	2011
G-20 average <sup>b</sup>	2.1	2.1	1.1
Developed	1.9	2.1	1.2
Developing	2.4	2.0	0.9

Source: Authors' calculations using data from IMF Fiscal Monitor, November 2010.

<sup>a</sup> Discretionary spending is calculated relative to pre-crisis IMF baseline.

<sup>b</sup> PPP-GDP weighted.

 Table E.3: Amounts pledged or utilized for financial sector support  
 (per cent of 2009 GDP unless otherwise noted)

Country	Capital injection		Purchase of assets and lending by treasury <sup>a</sup>		Direct support <sup>b</sup>	Guarantees <sup>c</sup>	Asset swap and purchase of financial assets, including treasuries, by Central Bank
	Pledged <sup>d</sup> (A)	Utilized	Pledged <sup>d</sup> (B)	Utilized	Pledged <sup>d</sup> (A+B)	Pledged <sup>d</sup>	Pledged <sup>d</sup>
G-20 average	2.6	1.3	1.4	0.9	4.0	6.4	4.6
Developed	3.8	2.0	2.4	1.4	6.2	10.9	7.7
<i>(US\$ billions)</i>	<i>1,220</i>	<i>639</i>	<i>756</i>	<i>461</i>	<i>1,976</i>	<i>3,530</i>	<i>2,400</i>
Developing	0.7	0.3	0.1	0.0	0.8	0.0	0.0
<i>(US\$ billions)</i>	<i>90.0</i>	<i>38.4</i>	<i>18.0</i>	<i>5.0</i>	<i>108.0</i>	<i>7.0</i>	<i>0.0</i>

Source: IMF Fiscal Monitor, May 2010.

<sup>a</sup> Excludes treasury funds provided in support of central bank operations.

<sup>b</sup> Includes some elements that do not require up-front government financing.

<sup>c</sup> Excludes deposit insurance provided by deposit insurance agencies.

<sup>d</sup> "Pledged" indicates announced amounts and not actual uptake.

A salient feature of the fiscal policy response was the enormous assistance given to the financial sector and some manufacturing industries (e.g. the auto industry). In the financial sector, the support measures included the injection of capital and extension of loans to banks, provision of guarantees, and swapping government securities for the illiquid assets held by banks. There was a huge difference in the amount of support extended by developed G-20 countries and that provided by G-20 developing countries. In part, this reflected the fact that the crisis originated in and was centred on a number of the developed economies. The pledged amounts were quite sizeable, with guarantees given by the developed G-20 countries to the financial sector, for example, estimated to equal 11 per cent of their GDP (see Table E.3). On none of the support measures listed in Table E.3 did the amount pledged by G-20 developing countries reach 1 per cent of their GDP.

To the extent that the financial sector bailout prevented a financial meltdown and shored up aggregate demand, it helped sustain developed countries' demand for

imports, including those originating from G-20 developing countries. However, one concern is whether these measures represented a form of policy substitution where, in lieu of trade measures subject to multilateral rules, other measures which can have similar discriminatory trade effects were used instead. Rose and Wieladek (2011) have argued that one consequence of the bailouts has been to reduce cross-border lending and to lead to a form of financial-sector protectionism. Furthermore, these financial sector bailouts may have had discriminatory effects on merchandise trade as well.

Chor and Manova (2012) have shown that countries experiencing greater financial stress, as reflected for example by higher interbank lending rates, exported less to the United States during the peak of the crisis. These effects were especially pronounced in sectors that required extensive external financing, with few collateralizable assets or limited access to trade credit. This suggests that countries which provided sizeable support to their financial sector, which were primarily the advanced economies, would have

been able to better maintain their level of exports, thus potentially displacing exports from developing countries.

The monetary response to the crisis was more pronounced, particularly in developed countries. Short-term interest rates were reduced as expected. In addition, central banks in advanced countries turned to unconventional monetary instruments – “quantitative easing”. This involved purchases not only of long-term government securities but of more risky and illiquid assets such as mortgages and mortgage-backed securities held by troubled financial institutions. The chief reason for using unconventional policy was that the traditional instrument of monetary policy, the short-term interest rate, had already been reduced to its lowest limit. Some understanding of the magnitude of this unconventional monetary response can be gleaned from the expansion in the size of the balance sheets of the Federal Reserve and the Bank of England.

One side of the balance sheet reflects the assets owned by the bank – government securities, mortgages, mortgage-backed assets, etc. – while the other side reflect its liabilities, the monetary base and equity. The expansion of the central bank’s balance sheet therefore reflects an increase in its asset holding (and a corresponding increase in monetary creation). Based on the information available between the end of July 2007 and early 2013, this expansion was enormous as the balance sheets of the Federal Reserve and the Bank of England grew nearly fourfold (from US\$ 877 billion to US\$ 3.2 trillion) and fivefold (from £82 billion to £404 billion) respectively.

### (c) Why was there no increase in trade protectionism?

In the Bagwell-Staiger (2003) model of counter-cyclical trade policy, there are no other instruments apart from trade policy for countries to manage the business cycle. This suggests a way to reconcile the theory with the facts. What the coordinated macroeconomic response did was to mitigate the downturn in the business cycle. The fact that nearly all the G-20 countries ramped up fiscal spending and cut interest rates meant that the stimulus was global and coordinated, thus helping to mitigate more effectively global economic weakness. Box E.3 discusses the role of global policy coordination and trade reform in addressing current account imbalances, which has been identified as one of the possible factors that contributed to the global crisis. In the context of the Bagwell-Staiger model, this means that the long-term benefits from trade cooperation remain substantial so the incentives remained tilted towards cooperation and against short-term opportunism.

An alternative explanation for the limited trade protectionism in response to the crisis is provided by Limão and Maggi (2013). In their view, the usual terms-of-trade motivation of countries to deviate from a trade agreement is counteracted by an aversion to risk or uncertainty. This uncertainty is greater during times

of economic volatility and made worse if there are no restraints on the behaviour of trade partners. Since trade agreements place constraints on that behaviour, agreements become more valuable during periods of economic volatility when uncertainty rises. The implication is that governments have more to gain by sticking to a trade agreement as the economic environment becomes more volatile.

At the height of the crisis in 2008, G-20 leaders made a commitment (“standstill commitment”) to “refrain from raising new barriers to investment or to trade in goods and services, imposing new export restrictions, or implementing World Trade Organization (WTO) inconsistent measures to stimulate exports”.<sup>9</sup> There is some empirical work that finds support for the role of trade agreements in containing protectionism during the crisis. Gawande et al. (2011) find that WTO membership curbed increases in the tariffs applied by several large G-20 developing countries during the crisis and may even have been responsible for actual declines.<sup>10</sup> Baccini and Kim (2012) show that countries which shared membership in the WTO as well as preferential trade agreements had a lower number or frequency of trade-restrictive measures taken during the economic crisis.

Another issue taken up in the Gawande et al. (2011) study is the role that global value chains may have played in limiting the extent of the protectionist response to the crisis. The operation of global value chains requires upstream firms that are participating in the production network to have access to imported intermediate goods. Home governments keen to advance the interests of these exporters will not want to increase tariffs on the imported inputs that they use. Furthermore, in global value chains, a country’s exports are also inputs to producers in foreign countries. These foreign producers will have an interest in seeing low or zero tariffs in the source country as this will keep their input costs low and so will lobby against trade restrictions. The Gawande et al. study finds strong empirical evidence that the demand for cheap inputs by downstream users and the demand for a country’s exports by vertically specialized exporters in partner countries exerted countervailing pressure against increases in applied tariffs.

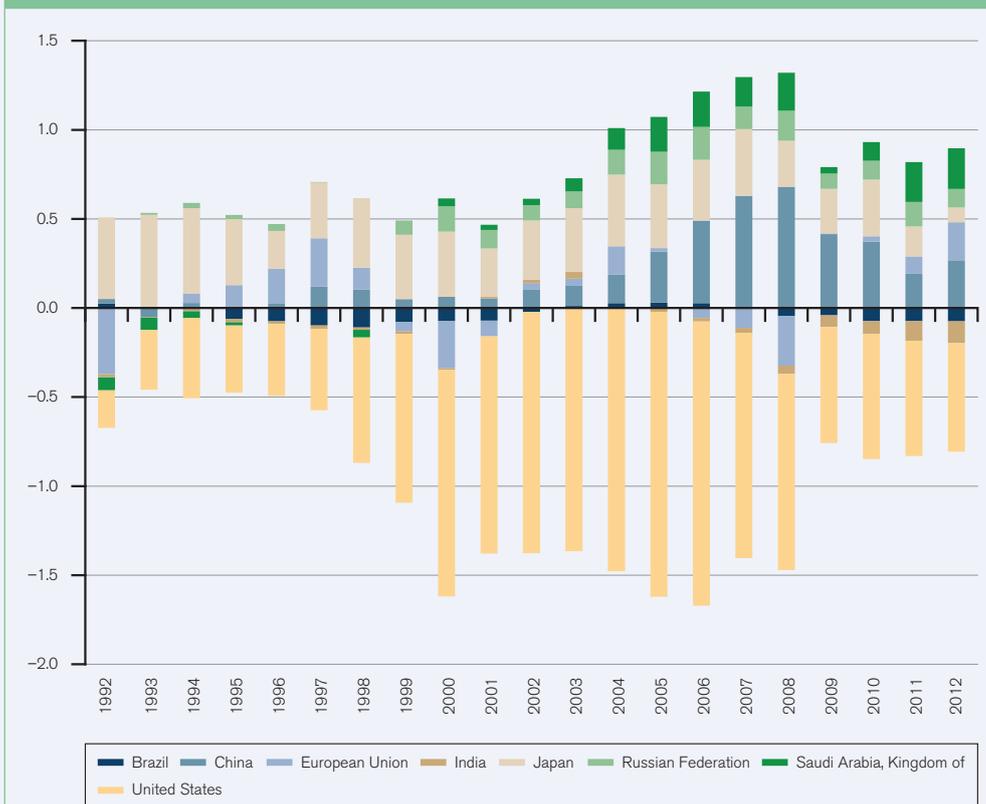
Finally, another perspective on the muted protectionist response by developing countries is whether protectionism would have been helpful in promoting economic recovery. If it would not, this would provide another explanation for why we have not seen a reincarnation of Depression-era protectionism. The crisis has still to run its full course so any conclusions will be preliminary in nature.

One measure of economic recovery is the growth in trade. The relationship between export performance and G-20 developing countries’ trade policy stances, represented by the number of trade-restrictive measures, is shown

Box E.3: Policy solutions to global imbalances

Large and enduring current account<sup>11</sup> imbalances (both surpluses and deficits) have been observed in many leading economies since the 1980s. The evolution of global imbalances since 1990 is illustrated by Figure E.11, which shows current account surpluses and deficits as a percentage of global GDP for large developed and developing economies, including Brazil, China, the European Union, India, Japan, Russia, Saudi Arabia and the United States.<sup>12</sup>

Figure E.11: Current account surpluses/deficits of selected countries (in per cent of world GDP)

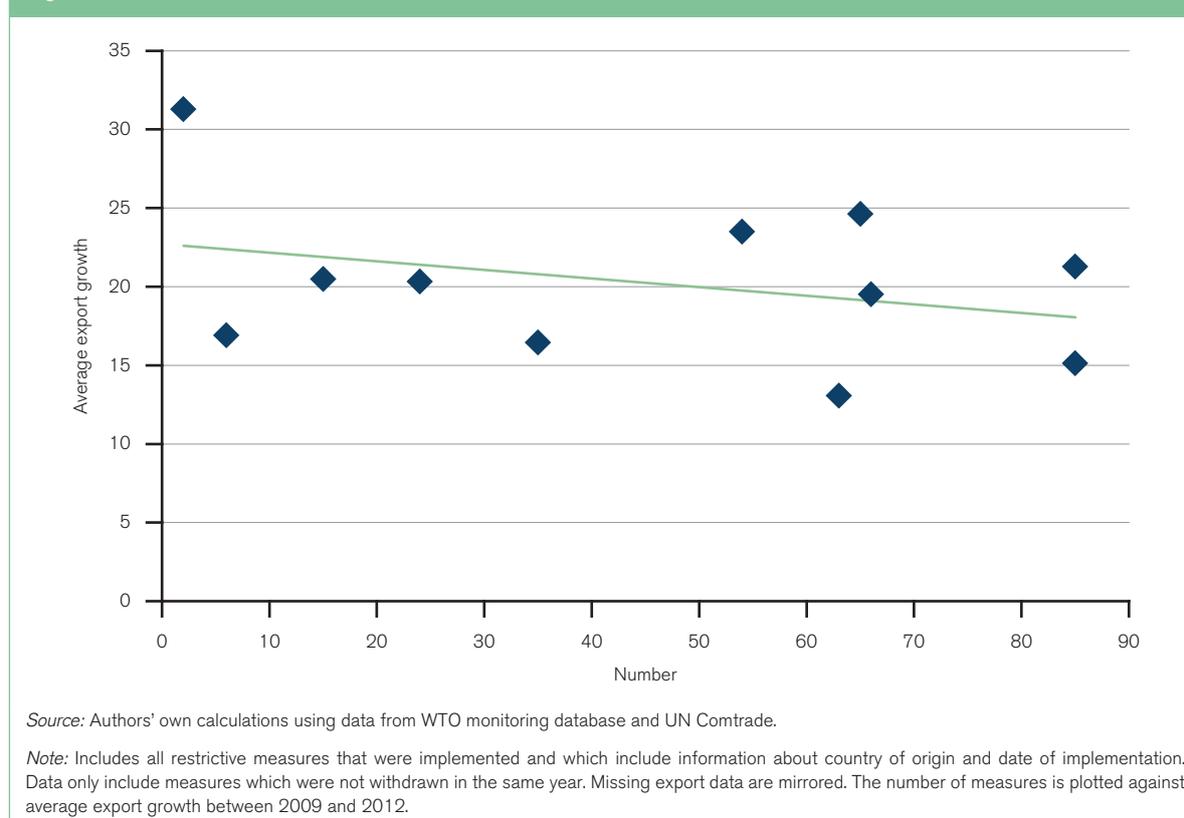


Source: Authors' calculations using data from IMF World Economic Outlook.

Perhaps the most striking aspect of this figure is the growth of imbalances between the mid-1990s and 2006. Imbalances narrowed in 2009 during the financial crisis and global recession, and have only partly grown since then. An explanation for the rise of surpluses is the “savings glut” in developing East Asia, which can be explained by its demographic structure (Wei and Zhang, 2011), a still fledgling social welfare system (Blanchard and Giavazzi, 2006; Chamon and Prasad, 2010), the lack of financial and capital market development (Forbes, 2010), and the build-up of foreign exchange reserves to guard against a repeat of the Asian financial crisis of the 1990s (Gruber and Kamin, 2007). Deficits in developed countries, specifically in the United States, have arisen because of the low personal savings rate and federal government deficits (Chinn and Ito, 2008). The United States has also proven to be a magnet for global savings because of its attractiveness as an investment destination, the depth and sophistication of its financial markets and the role of the dollar as a leading international reserve currency (Bernanke, 2005).

Blanchard and Milesi-Ferretti (2009) have argued that large imbalances create systemic risks because the eventual adjustment tends to be disorderly and may create global macroeconomic and financial instability. This has led some to claim that while these imbalances may not be the ultimate cause of the global crisis, they reflected and magnified the ultimate causal factors behind it (Krugman and Obstfeld, 2009). There is, therefore, a good basis for reducing them. Marchetti et al. (2012) have made two suggestions in this regard. First, market-opening efforts in services in the WTO, including in the area of financial and health services, can reduce policy-related distortions and market imperfections in surplus-developing countries that have led to the build-up of unsustainable imbalances. Multilateral services liberalization can also contribute to economic diversification in oil-exporting economies and to a more domestic, demand-driven growth in other surplus countries, such as China. Secondly, since the first-best solution to large and persistent global imbalances is international cooperation in macroeconomic, exchange rate and structural policies, the reduction of global imbalances should continue to remain high on the international agenda.

Figure E.12: Number of trade-restrictive policy measures and export performance, 2009–12



in Figure E.12. Judging by the negative slope of the line plotting export performance against the number of trade-restrictive measures applied by a country, there is no evidence that G-20 developing countries which took a more restrictive stance performed better than countries which took less restrictive measures.

#### 4. Conclusions

Trade openness in itself has ambiguous effects on the macroeconomic volatility of developing countries. Nevertheless, in the 2008–09 crisis, trade proved to be a transmission mechanism of economic shocks originating in developed markets to producers and traders in developing economies. The dramatic reduction in international trade in the wake of the crisis would have been a lot worse if trade protectionism of the scale experienced in the Great Depression had been seen. For developing countries, this could have erased a big part of the development gains from the last decade.

On the whole, there was no large-scale outbreak of trade protectionism during the crisis, particularly in comparison with the experience during the Great Depression. With respect to developing countries,

four reasons may explain why these countries did not systematically raise trade barriers during the crisis. If governments are risk averse, they have more to gain by sticking to a trade agreement, i.e. abiding by their WTO commitments, when the economic environment becomes more volatile. Empirical evidence suggests that being a member of the WTO acted as a restraint to the use of trade-restrictive actions during the crisis.

Secondly, other policy instruments better suited to managing falling demand and macroeconomic volatility were available to developing countries. There was a coordinated response by the G-20 countries on macroeconomic policy and on trade with their commitment to refrain from erecting new trade barriers. Thirdly, the spread of global value chains increased linkages among countries, creating a common interest in preventing the spread of protectionism. Finally, raising trade barriers would have proven to be ineffective in promoting economic recovery in the medium to longer term.

Despite the positive role of the WTO and its trade monitoring exercise in keeping traditional instruments of protectionism at bay, the possibility of using other measures unconstrained by WTO rules – or policy substitution – suggests that the world should remain vigilant.

# Endnotes

- 1 This trend rate of growth is not deterministic and can vary over time ("stochastic"). Various ways of decomposing the trend and cyclical components of GDP have been developed in the macroeconomic literature (Hodrick and Prescott, 1980; Baxter and King, 1999; Christiano and Fitzgerald, 2003).
- 2 Financial openness is of course the other channel through which international shocks can be propagated to other economies. However, financial markets also offer the possibility to absorb shocks via diversification and inter-temporal substitution. It is, therefore, interesting which effect dominates. The full effect of financial development and integration is most likely to be positive for countries above a certain development threshold (Ayhan Kose et al., 2011). Therefore, there is a large body of literature which recommends the need to strengthen domestic financial markets before opening them up (Rodrik and Subramanian, 2009).
- 3 The "bullwhip effect" is also sometimes referred to as the "whiplash" or "whipsaw" effect.
- 4 For example, the 2009 survey by the Bankers' Association on Trade and Finance (BAFT), covering the period from the third quarter of 2008 to the first quarter of 2009, indicates that the flows of secured and unsecured trade finance to developing countries had fallen more than the flows of trade in 2008, calculated on a year-on-year basis.
- 5 A self-enforcing trade agreement is one where the short-term gains of a country violating its trade commitment is outweighed by the long-term cost of foregoing all future benefits of cooperation from its trade partner(s).
- 6 This differs from the result of their analysis of the experience of five industrialized countries/customs territories: Australia, Canada, European Union, Japan, Republic of Korea and the United States (Bown and Crowley, 2013b). They establish a counter-cyclical pattern in these countries' use of trade contingent measures and this behaviour remained the same during the Great Recession (2008-09). Despite this, there were also only a small number of restrictive actions taken by the developed countries and they attribute this to the simultaneous weakening of growth in their trade partners.
- 7 The seven G-20 developing countries are Argentina, Brazil, China, India, Mexico, Turkey and South Africa.
- 8 See the discussion by Evenett (2009).
- 9 Declaration of the Summit on Financial Markets and the World Economy, Washington D.C., 15 November 2008.
- 10 The role of the WTO is reflected in the relationship between bound tariffs (one of the explanatory variables) and applied tariffs (dependent variable), which were generally positive but small in magnitude. When the bound tariffs were interacted with an economic crisis dummy variable, the resulting coefficients were actually negative for some countries, suggesting that WTO membership led them to liberalize rather than to increase applied tariffs.
- 11 The current account measures a country's net exports of goods and services plus net factor payments and transfers from abroad.
- 12 In principle, surpluses and deficits should add up to zero since every country's export is another country's import. However, exports and imports tend to diverge somewhat in practice due to differences in data recording across countries. Despite minor discrepancies, the bars in this chart remain roughly symmetrical around zero, which demonstrates that large surpluses in some countries are matched by large deficits in others.