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The role of China in the trade slowdown

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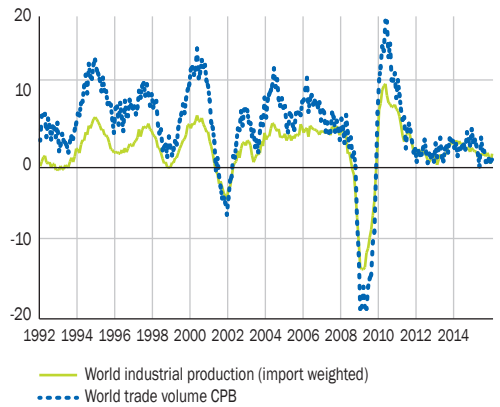
Many analysts worry about the recent international trade slowdown. After the 2008 financial crisis, international trade of goods and world industrial production grew nearly at the same pace implying a trade elasticity of one. This stands in sharp contrast to the pre-crisis period when global trade increased more than two times faster than industrial production. This Rue de la Banque *argues that (1) the long-run elasticity of world trade to income is one indeed, but (2) structural changes in China go a long way to explaining changes in trade elasticity; the trade acceleration observed before the crisis was largely driven by the supply-side shock of China integration in the world trade while the recent trade deceleration is closely linked to the shift of China's production towards domestic demand.*

Growth in international trade has decelerated significantly since its sharp recovery in 2010. From 2011 to 2016, international trade of goods and global industrial production grew nearly at the same pace yielding an implicit trade elasticity of one (Chart 1). This stands in great contrast to the two decades preceding the crisis in 2008. From 1991 to 2007, global trade increased more than two times faster than global output (6.8% versus 3% in annual terms). In this paper, we argue that in all periods (the pre-crisis period, the trade collapse in 2008-2010 and the recent trade slowdown) the relationship between trade and production can be best accounted for by a model featuring a long-run elasticity of one.

Theoretically, there is no reason to assume a (fundamental) elasticity higher than one (relative to economic activity). The observed acceleration/deceleration pattern of global trade relative to global GDP can therefore be attributed to reductions in trade costs induced by (trade-biased) technological innovation and/or trade liberalisation, rather than to changes in the fundamental elasticity of trade to economic activity. In this paper, we highlight another factor that may lead to persistent deviations of the observed trade elasticity from a value of 1, namely country-specific supply

C1 Changes in World industrial production and trade volumes
(year % change)



Source: Authors' computations using CPB data.

NB: The authors would like to thank Daria Taglioni and Gianluca Santoni as co-authors of a previous work, and especially Gianluca for providing updated results of Gaulier et al. *(2015).*

shocks in large trading nations. Our analysis is in line with the recent literature examining the role of cyclical versus structural factors behind the trade slowdown (see the eBook edited by Hoekman, 2015). Among structural explanations, Escaith and Mirodout (2015) argue that in the pre-crisis period, increased openness in emerging markets and the associated changes in global trade patterns led to income convergence between countries and to a trade elasticity larger than one. However, more recently, the world trade has been deprived of the main structural driver of the pre-crisis period, namely China. Constantinescu *et al.* (2015), and Gaulier *et al.* (2015) also argue that China's integration into global trade played a major role in the acceleration as well as in the deceleration of global trade.

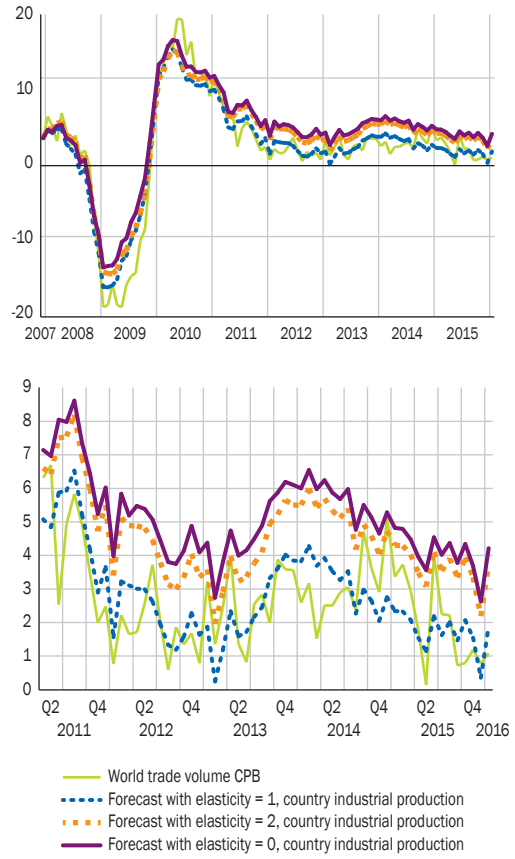
A unitary long-run elasticity of trade to industrial production

To shed light on the trade elasticity, we use monthly time series from the CPB's World Trade Monitor, from 1991 to 2016, to explain changes in volumes of world trade by global industrial production.[1] Cointegration tests are not entirely conclusive as some of them do not reject the null hypothesis of no long-run relationship between the two variables. More tests point to a long-run elasticity of one but we cannot dismiss alternative values. The speed of convergence to the long-run relationship is always very low: deviations are very persistent. Henceforth, we compare the forecast properties of the estimated model with three different long-run elasticities. The first one is the baseline model with a long-run elasticity of 1 (blue in Chart 2), the second considers a long-run elasticity of 2 (orange) and the third model assumes no long-run relationship between global trade and output (purple), i.e. a long-run elasticity of zero. We account for compositional effects by including, in the short-run part of the models, country or regional specific industrial productions rather than the aggregate world production time series. Note that we put no restriction on the short-run elasticity, which is estimated to be around 1.5 in all models.

Given the observed global output, Chart 2 shows the predicted time series of global trade by each model (blue, orange and purple) together with the actual series (green). The first panel of Chart 2 shows the predicted forecast over the whole period, while the second panel of Chart 2 focuses on the period 01/2011 onwards. All models fit the data equally well in the pre-2007 period used for estimation, and track reasonably well trade in the forecast period. However, the two models that feature a non-unitary trade elasticity significantly over- estimate trade flows by 2 to 3 percentage points per year during the recent period.

C2 Observed and predicted global trade

(year % change)



Source: Author's computations using CPB data.

The origin of short-run elasticity fluctuations: a Granger causality perspective

Having established that a long-run elasticity of one, consistent with theory, is not rejected by the data, we now investigate the underlying reasons behind the short-run fluctuations that kept the trade elasticity well above one for most of the pre-crisis period. This high non-unitary trade-output elasticity may be the consequence of country specific asymmetric shocks hitting the global economy, for example, accelerating followed by decelerating

1 *First we test for cointegration on levels of global trade and global output, then we estimate Error Correction Models where the growth rate of trade adjusts to the growth rate of industrial production, and reverts, at an estimated speed, to the long-run relationship between trade and output. Global industrial production is weighted by countries' total imports.*

T1 Granger causality tests between industrial production (IP) and imports (M)
(%)

		Emerging Asia		United States		Euro area		Global Trade
		IP	M	IP	M	IP	M	
Emerging Asia	IP		4.5	7.5	8.1	8.5	9.2	4.6
	M	2.7		4.6	9.6	2.8	4.8	1.4
United States	IP	2.8	2.4		9.8	3.2	3.9	5.7
	M	1.3	0.9	1.3		4.5	3.1	4.6
Euro area	IP	1.4	2.1	3.5	11.0		13.8	8.7
	M	1.5	1.6	3.2	8.4	3.3		4.8
Global Trade		2.3	4.2	4.9	14.9	8.7	7.6	

Note: Fisher test statistic for each pair of variables. The null hypothesis is that "variable in row does not cause variable in column". A high Fisher means that non causality can be rejected. Significant statistics at the 1% level are in bold.

growth in emerging Asia, or because of low demand in the euro area (see Ollivaud and Schwellnus, 2015, for the latter). In order to determine which time series in our sample gives rise to the short-run fluctuations in global trade, we use Granger causality tests for all pairs of variables in our dataset (see table 1): (monthly) changes of the log of industrial production, imports and exports (not reported in Table 1) of the three main trading regions, Emerging Asia, the United States and the euro area, plus global trade. The sample period is the same as before, 1991m1-2016m1, and we include 6 monthly lags. Table 1 reports the Fisher test statistic for each pair of variables. A high Fisher means that non causality can be rejected.

Looking at the last column in Table 1, our analysis indicates that the industrial production of Emerging Asia, the United States and Europe were the main driving forces in the global trade expansion.[2] However, the industrial production of Emerging Asia is the only "autonomous" variable, i.e. it causes all other series (first row) and is not caused by any other variable (first column). On the contrary, United States' imports are caused by all other variables (in particular Emerging Asia's exports, not reported in Table 1, see column of US imports), but do not cause any other variable (row of US imports). Also note that Emerging Asia's exports and imports do not cause global trade, only industrial production does. This result is consistent with the fact that exports and imports, are not exogenously determined and mainly depend on foreign demand (other countries' imports) and own supply conditions (industrial production).

China, or the 'large country' effect in international trade

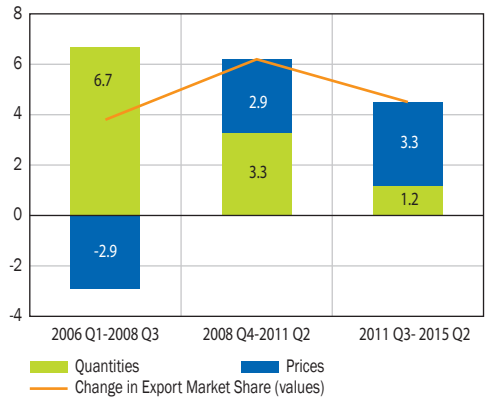
Previous results suggest that the expansion of global trade was mainly driven by supply shocks in Emerging Asia and particularly in China. By which channels does the integration of low-cost exports from a large country such as China result in an increase in the elasticity of global trade to economic activity (GDP or industrial production)? Why does an increase in Chinese domestic demand lead to a reduction of this elasticity?

China is big enough to suggest that its growth path could have driven the elasticity of trade to GDP to increase, and more recently, to fall.[3] When China integrated the global economy, it did so by specialising in labour-intensive activities for which it had a comparative advantage in production (low labour costs). As China continued its integration in the world economy, its rapid technological progress drove down world prices of goods in which China was specialised. The continuous fall of Chinese export prices was made possible by an export-oriented growth strategy that prevented the exchange rate to fully adjust. As a result, China experienced successive current account surpluses and accumulated large foreign exchange reserves. Overall, these developments reinforced specialisation patterns based on Ricardian comparative advantages and prolonged the reallocation of global demand towards Chinese exports.[4] But these developments stopped after the crisis: the Chinese growth model started to shift towards domestic demand and (relative) export prices in which China is specialised started to increase.

The previous argument can be illustrated using the indicators provided at the World Bank's "Measuring Export Competitiveness" website (https://mec.worldbank.org/), following Gaulier *et al.* (2013). Trade changes are decomposed into country-specific changes and compositional effects, as well as in volume and price effects.

2 *The driving role of industrial production validates its use as a right hand side of the Error Correction Model in the previous section.*
3 *Discussions about the macroeconomic aspects of international trade are often based on the 'small country' assumption. This implies that even a complete elimination of trade for a country would have an imperceptible effect upon world demand and supply for a given product, and thus would not affect global trade. But, in reality, a handful of large countries dominate both global imports and exports.*
4 *In addition, the relative world price of tradable versus non-tradable goods decreased, which resulted in higher demand of tradables and a trade elasticity larger than one.*

C3 Decomposition of China's export market shares growth
(volume)



*Source: Authors' computations using Measuring Export Competitiveness website data (*https://mec.worldbank.org/*).*

Chart 3 reports this latter decomposition of Chinese export growth for three periods: pre-crisis; crisis and rebound; and post-crisis. Chart 3 confirms that volumes largely drove China's exports expansion before the crisis, while Chinese prices declined. Since 2008, these dynamics have changed and Chinese prices started to increase, while the expansion of volumes decelerated. Since 2011, these effects are even more pronounced.

As previously mentioned, the decomposition of Gaulier *et al.* (2013) provides an 'adjusted export (import) growth measure, which controls for geographical orientation and sectoral specialisation. The adjusted growth rates are a proxy for changes in demand (import decomposition) and supply (export decomposition).

T2 Adjusted contributions to global trade growth
(%)

	Pre-crisis 2006 Q1 2008 Q3	Crisis and rebound 2008 Q4 2011 Q2	Post-crisis 2011 Q3 2015 Q2
	Adjusted exports		
Euro area	1.4	0.1	0.4
United States	0.2	-0.1	0.1
Other OECD	1.2	-0.2	0.3
China and Hong-Kong	1.6	0.6	0.6
Rest of the World	1.0	0.2	0.4
World	**5.4**	**0.7**	**1.7**
	Adjusted imports		
Euro area	1.7	-0.4	0.0
United States	0.0	-0.3	0.2
Other OECD	1.3	-0.1	0.2
China and Hong-Kong	0.8	1.0	0.6
Rest of the World	1.6	0.7	0.6
World	**5.4**	**0.7**	**1.7**

Source: Updated computations from Gaulier et al. (2015) by Gianluca Santoni.

Table 2 gives these indicators for five countries/regions: the euro area, the United States, an aggregate for China and Hong Kong, other OECD countries, and the rest of the World.

As shown in Table 2, a drop in the global supply of exports by China in the post-2011 period is the most notable change on the supply side. Before the crisis, China was contributing on average 1.6% to 'adjusted' export growth every year (first panel, first column). After the Crisis, its contribution fell dramatically (0.6%). These results are consistent with the recent literature documenting a reorientation of Chinese production towards its domestic market (Kee and Tang 2012, Koopman *et al.* 2012, Lemoine *et al.* 2015). the euro area is the single most important contributor to cross-country reallocations of demand, consistent with the findings in Ollivaud and Schwellnus (2015).

The recent trade downturn seems therefore to be not only associated with a natural phasing out of the impact of lower trade costs worldwide, but also strongly influenced by a negative demand shock in the euro area and by the reorientation of Chinese growth towards consumption goods for domestic demand instead of supplying tradable goods for the rest of the world. As trade within countries is not recorded, the rebalancing of the Chinese growth model translates into a contraction of international trade and, in further instance, the elasticity of trade to GDP.[5]

Any new Chinas emerging?

Going forward, while in principle new accelerations of global trade growth could materialise – as countries like India, Russia, Brazil as well as entire regions such as Sub-Saharan Africa and South Asia are still largely marginal to the global economy – it is unlikely that they would unleash the same acceleration/deceleration patterns as observed in the past two decades. This is primarily because these countries will face a different type of competition on global markets to that which China has faced in recent decades. While China was competing mainly against incumbents with a comparative advantage in knowledge-, technology- and skill-intensive activities, new potential trade juggernauts would compete on international markets with a country having similar comparative advantages to theirs (i.e. labour) and whose presence in global markets is pervasive.

5 *Note that the Chinese shift of growth towards the domestic sector could be partly driven by the deceleration of trade in Global Value Chains (GVC), as suggested by Gaulier* et al. *(2015) and Los* et al. *(2016). However, due to data limitation, we cannot quantify the contribution of GVC trade on growth rebalancing in China.*

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