What Lies Behind the Global Trade Slowdown?[1]

Global trade performance has been disappointing in recent years. Except for a solid post-recession rebound in 2010, when global trade rose 13 percent, it has been relatively subdued in recent years, averaging 3.4 percent annual growth rate between 2012 and 2014. This rate is well below the pre-boom average growth of about 7 percent per annum. If global trade had continued to expand in accordance with the historical trend, it would have been some 20 percent above its actual level in 2014 (Figure 4.8). This essay reviews the key cyclical and structural factors that are likely to have contributed to the slowdown in global trade. Specifically, the essay addresses two questions:

- What has been the role of weak demand in the recent trade slowdown?
- Is the weakness in global trade a reflection of a weakening sensitivity of trade to GDP, and if so, what are the underlying reasons?

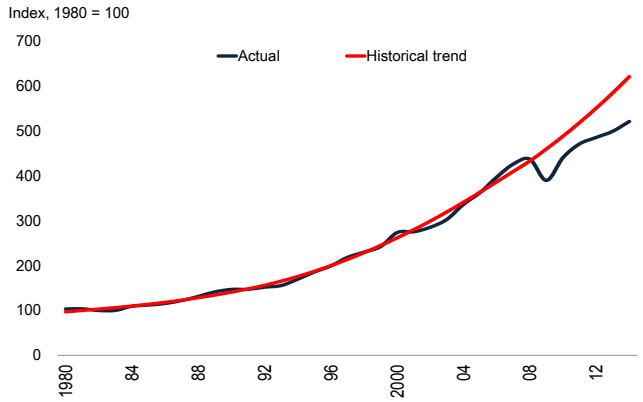
A Cyclical Factor: Weak Demand

Weak demand was one of the main reasons for the dramatic collapse of trade in 2009, with some studies reporting that it accounted for up to 90 percent of the contraction[2]. Historically, the negative effect of a crisis on trade performance is not limited to the crisis period, but persists through the medium term (Freund, 2009; IMF, 2010). In fact, five years after a crisis, import demand is typically 19 percent below its predicted level in the absence of a crisis.

This weakness in import demand is symptomatic of overall weakness in aggregate demand. Some five years after the global financial crisis, global GDP is about 4.5 percent below what it would have been had post-crisis growth rates been equivalent to the pre-crisis long-term average. Not surprisingly, weakness in demand has been most pronounced at the epicenter of the crisis, in high-income countries: GDP levels in the United States and the Euro Area are some 8 percent and 13 percent, respectively, below levels that would be suggested by historical average growth rates (Figure 4.9). Though other factors are at play, the implication of soft demand in high -income countries is reflected in the weakness of their import volumes, which deviates from trend by more than 20 percent in both the United States and the Euro Area. With high-income economies accounting for some 65 percent of global imports, their lingering weakness inevitably impacts the recovery in global trade.[3]

FIGURE 4.8 World trade: Actual and trend

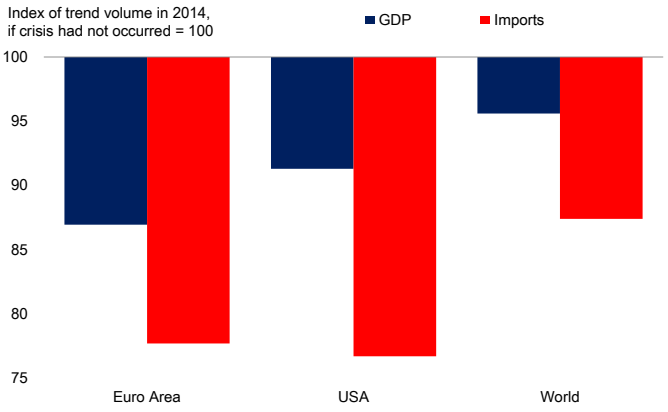
World trade growth has been significantly subdued in recent years.



Source: World Bank.
Note: World trade refers to total world imports. The historical trend is computed over the 1970-2014 period, smoothed using a Hodrick-Prescott filter.

FIGURE 4.9 GDP and imports

Global demand remains well below trend levels.



Source: World Bank.
Note: The post-crisis trend growth is assumed to be equivalent to the average growth rate during 1980-2008. Using this, the trend level for 2014 is rebased to 100. The 100 mark reflects where GDP and imports would have been in 2014 if pre-crisis trends continued into the post-crisis period. Hence, bars below 100 show deviations from trends in 2014.

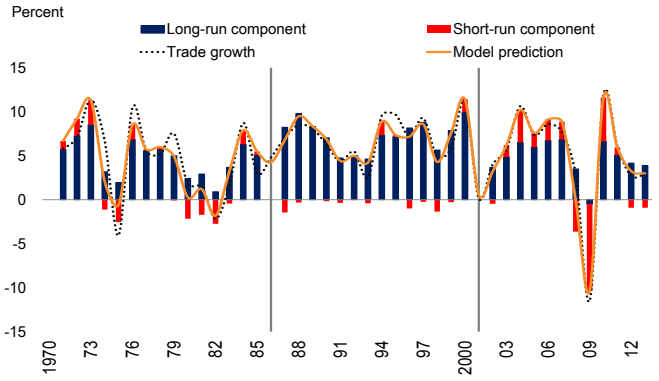
[1]The main authors of this essay are Ileana-Cristina Constantinescu, Allen Dennis, Aaditya Mattoo and Michele Ruta.

[2]An extensive literature has examined the sources of trade collapse in 2009 (Baldwin, 2009; Borchert and Mattoo, 2009; Levchenko, 2010; Eaton et al., 2010; Bems et al .2010; Amiti and Weinstein, 2011; and Bussiere et al., 2013).

[3]There are differences across economies (see Chapter 1). The recoveries in the United States and the United Kingdom are on a much more solid footing than that in the Euro Area.

FIGURE 4.10 Contributions to world trade growth, 1970–2013

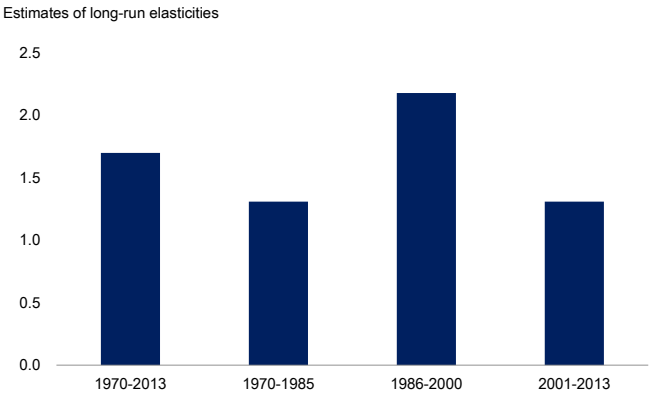
Both short-run and long-run factors have contributed to the recent slowdown in trade.



Source: Constantinescu, Mattoo and Ruta (2014).
Note: The model-predicted series are from an error correction model. The short-run component of import growth is obtained by subtracting the predicted long-run growth of imports from the total import growth predicted by the model.

FIGURE 4.11 Estimates of long-run trade elasticity

The decline in the long-run trade elasticity has contributed to the weakness in world trade.



Source: Constantinescu, Mattoo and Ruta (2014).
Note: Each bar represents the long-run elasticity estimate from an error correction model, retrieved from the residual of the cointegration equation between imports and GDP. See the Technical Annex for details of the estimation methodology.

It is unlikely, however, that weak demand alone explains the slow growth of global trade. Indeed, a decomposition analysis using an error correction model, estimated over the period 1970–2013, suggests that while short-term factors (including weak demand) were dominant during the crisis and the first year of the recovery, their contribution has subsided in recent years.[4] Short-term factors account for a shortfall in global trade growth of about 1 percentage point (Figure 4.10). This brings to the fore the importance of long-term factors. Indeed, the decomposition analysis shows that the contribution of the long-term component to global trade growth over 2012–13 was about 2 percentage points lower than its contribution in the two preceding decades.

A Structural Factor: Changing Relationship Between Trade and Income

In recent years, world trade has become less sensitive to changes in global income. Estimates from an error correction model for the period 1970–2013 yield a long-run elasticity of 1.7, although the response of trade to income differs considerably across decades. For the period 1986–2000, a 1 percent increase in world real GDP is associated with a 2.2 percent increase in the volume of world trade (Figure 4.11). This "elasticity" of 2.2 is substantially higher than that in preceding (1970–85) and subsequent (2001–13) years; for both of these periods, the trade elasticity was about 1.3. Formal tests confirm that there was a significant structural break in the trade-income relationship in the period 1986–2000 relative to the preceding and subsequent periods.[5] These results suggest that global trade is growing more slowly not only because world income growth is lower, but also because trade has become less responsive to income growth.

What Explains the Lower Elasticity of Trade?

Four possible reasons for the decline in trade elasticities are examined: the changing structure of global value chains, changes in the composition of demand, weak trade finance, and increased trade protection.

Evolution of global value chains. The rise in trade elasticities in the 1990s has been explained by an acceleration of the international fragmentation of production processes.[6] This process was triggered by trade liberalization and sharp declines in shipping times and costs (due to the container revolution and bigger shipping vessels) and further boosted by the information and communication technology revolution and the spread of just-in-time production techniques. As a result, the production process increasingly involved a number of intermediate stages in various countries along the production chain, increasing the importance of

[4]See the Technical Annex for details of the error correction model specification. The results of the model are taken from Constantinescu et al. (2014).

[5]These results are broadly consistent with those from other studies, e.g., Irwin (2002); Freund (2009); and Escaith, Lindenberg and Miroudot (2010).

[6]For details on this, see Freund (2009) and Escaith et al. (2010).

international trade compared to previously, when the domestic value-added of a final good was relatively high.[7]

Just as the growing fragmentation of production across countries supported the rise in the elasticity of trade, the maturation of global value chains, at least among some of the major countries involved in the process, could help explain the weaker responsiveness of trade to GDP. An estimation of trade elasticity by major trading blocs over time suggests that much of the contribution to the decline in global trade elasticity has come from China and the United States. This is in contrast to the trade-income relationship in the European Union, which has remained fairly stable over the past decade.

The decline in China's trade elasticity can be explained by the rising amount of domestic value added in its exports. For instance, the share of Chinese imports of parts and components in China's total exports has declined from a peak of 60 percent in the mid-1990s to the current share of approximately 35 percent, implying a diminished fragmentation of the production process (Figure 4.12a). Further evidence of this change is the substitution of domestic inputs for foreign inputs by Chinese firms, which underpins the rise in domestic value added to trade (Kee and Tang, 2014).

The experience of the United States mirrors that of China along several dimensions. The United States was the primary source of the boom in Chinese and other emerging economies' imports of parts and components. At the same time, the United States was the major destination for China's exports of assembled goods. Since 2000, however, U.S. manufacturing imports as a share of GDP have been stable at about 8 percent, after nearly doubling over the prior decade and one-half (Figure 4.12b).

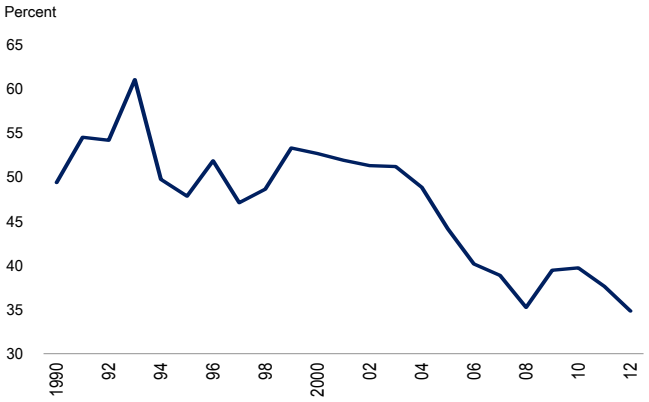
The changing patterns of trade in both China and the United States tentatively suggest that global value chains have played a role in the rise and subsequent decline in trade elasticities.

Changes in the composition of demand. Overall trade-income elasticity may be viewed as the weighted average of import elasticities of individual aggregate demand components. To the extent that different components of aggregate demand have different import elasticities, a change in the composition of aggregate demand would shift the overall elasticity.[8] In general, investment spending is the most import-intensive component of domestic demand, followed by consumption, with government spending being the least import intensive.[9] Hence, the weak recovery in the post-crisis period in the components of aggregate demand that have a higher import intensity could help explain the relatively weak post-crisis elasticity.[10]

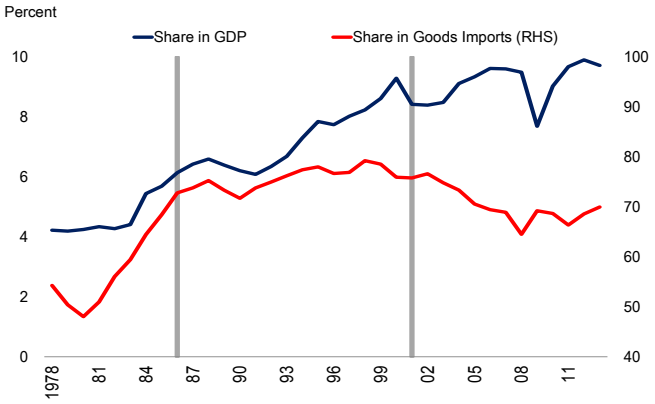
FIGURE 4.12 Changing structure of imports in China and the United States

Growth of imports supportive of the international fragmentation of production in China and the United States is not expanding as rapidly as before.

A. China's imports of parts and components as a share of total exports of merchandise



B. U.S. manufacturing imports



Source: Constantinescu, Mattoo and Ruta (2014).
Note: Parts and components are the sum of three UN Comtrade broad economic categories: 42 (parts and accessories of capital goods, except transport equipment), 53 (parts and accessories of transport equipment), and 22 (processed industrial supplies not elsewhere specified).

[7]While there is an economic aspect to the amplification of trade due to changes in production processes, part of the amplification can be attributed to how trade flows are recorded. In particular, trade is typically measured on a gross basis (hence intermediate goods are double counted), whereas GDP is measured on a net or value-added basis.

[8]For detailed discussions about the linkages between international trade and the components aggregate demand, see Bems, Johnson and Yi (2013,) Anderton and Tewolde (2011), and Bussiere et al. (2013).

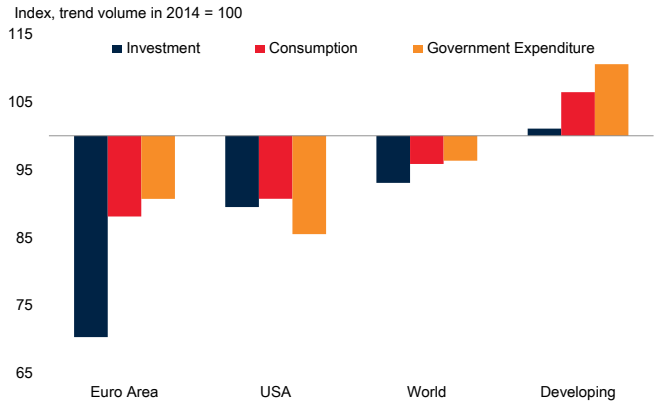
[9]This is mainly because the bulk of government spending is on services (which are in large part nontradeable). Exports have high import intensities because of the increased importance of global value chains.

[10]Boz et al. (2014) argue that most of the weakness in global trade has been due to cyclical factors, although structural factors, including global value chains and trade protectionism, may have played a role as well.

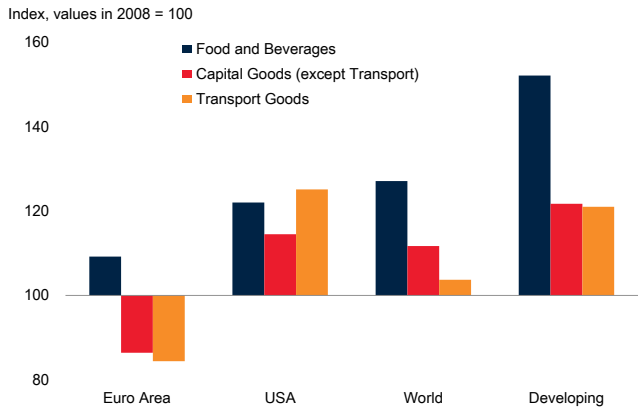
FIGURE 4.13 Recovery in aggregate demand and imports

Globally, the recovery in investment, which has a high import intensity, has been weak. This is reflected in the subdued capital goods import recovery.

A. Recovery in aggregate demand components[1]



B. Recovery in imports by product[2]



Source: World Bank, using UN Comtrade data.
1. The post-crisis trend level growth is assumed to be equivalent to the average growth rate during 1980-2008. Using this, the trend level for 2014 is rebased to 100. Hence, bars below or above 100 show deviations from trends in 2014.
2. The 100 mark reflects the 2008 (or pre-crisis) level of imports. Hence bars below 100 show that import levels had not fully recovered to their pre-crisis (2008) level by 2013, while those above 100 show that import levels had more than fully recovered by 2013.

During the post-crisis recovery, investment (the component of aggregate demand that is most import intensive) has been particularly weak, most notably in the Euro Area (Figure 4.13a). This weakness in investment demand is mirrored in the relatively low imports of capital goods and transport equipment compared to pre-crisis levels. Further, given the high internationally traded value-added content of capital goods as compared to other products (e.g., food and beverages), the weak recovery of investment also impinges on the pick-up in global trade (Figure 4.13b). Thus, the uneven composition of the recovery in demand has also contributed to the decline in the trade elasticity.

Weak trade finance. Although not necessarily independent from the role of weak demand, impaired credit channels could be another important driver of trade performance, given that trade finance becomes costlier and less available during financial crises and their aftermath (Martin 2012; Chor and Manova 2012). Financial institutions facing deleveraging pressures are forced to cut back on credit growth in order to boost their liquid assets. Trade finance instruments, which are often short-term and self-liquidating in nature, tend to be among the most susceptible to credit crunches. Indeed, exporters and importers, particularly small- and medium-sized firms, faced serious funding challenges during the most recent crisis (Amiti and Weinstein, 2011; Ahn, Amiti, and Weinstein, 2011).

Large-scale injections of central bank liquidity into banking systems after the crisis and the loose monetary policy stance of several major high-income economies helped ease trade finance constraints. Nonetheless, new or proposed regulations may be having a long-term dampening effect on trade finance. These include, prominently, the higher capital requirements for banks under the Basel III regulations, which are scheduled to come into force by 2019. For example, a survey by International Chamber of Commerce (2014) shows that some 71 percent of banks consider higher capital requirements to be negative for export finance, and another 84 percent indicate that such requirements have caused them to become more selective in lending. Further, recent financial crime regulations (e.g. Anti-Money Laundering and Know Your Customer—i.e, AML/KYC regulations) led 68 percent of leading banks to decline a transaction, and 31 percent of banks to terminate relationships, with counterparties with whom they are less familiar. There is however, little hard evidence on how much the dearth of trade finance may be weighing down on global trade performance.

Increased trade protection. If the dismantling of trade barriers supported the acceleration of trade in earlier decades, then conversely, a rise in trade barriers, or even a slowdown in the rate of liberalization, could contribute to a deceleration. In the case of the trade collapse in 2009, the general consensus suggests that it is unlikely that increased protection was a major factor (Bown, 2009; Kee, Neagu, and Nicita, 2013).

There are signs that protection continued to rise even after 2009. For instance, in the year leading to May 2014, Group of Twenty (G-20) members put in place 228 new trade restrictive measures (WTO, 2014). Worryingly, while the measures imposed since 2009 were meant to be temporary ones, the vast majority of trade restrictive measures taken

since the global financial crisis have remained in place: of 1,185 recorded since October 2008, only 251 (roughly one-fifth) of these had been removed by May 2014. The low removal rate and the continuing addition of new restrictions have resulted in an upward trend in the stock of trade-restricting measures (Figure 4.14).

However, according to the World Trade Organization (WTO), the net increase in import restrictive measures since October 2008 is estimated to affect only about 4.1 percent of world merchandise imports (Figure 4.13), so it is unlikely that increased protection has been the cause of weaker trade performance and the decline in the elasticity of trade. But the slower pace of liberalization in the 2000s, compared to the 1990s, may have contributed to the lower growth in trade and, hence, dampened trade elasticity.

Conclusion

The brief review of the evidence presented here suggests that both cyclical and structural factors have been important in explaining the recent slowdown in global trade. With high-income countries accounting for some 65 percent of global imports, the lingering weakness of their economies five years into the recovery suggests that weak demand is still impacting the recovery in global trade.[11] However, weak demand is not the only reason as trade had become much less responsive to income growth, even prior to the crisis. There is some evidence to suggest that part of the explanation may lie in shifts in the structure of value chains, in particular between China and the United States, with a higher proportion of the value of final goods being added domestically—that is, with less border crossing for intermediate goods. In addition, the post-crisis composition of demand has shifted from capital equipment to less import-intensive spending, such as consumption and government services.

As the world economy continues to recover, global trade growth can be expected to pick up. However, given the continued weak recovery projected (as discussed in Chapter 1), the contribution of demand to the pick-up in global trade is not likely to be substantial over the short and medium term. Assuming elasticity estimates over the past decade persist, global trade growth over the medium term would rise by less than 1 percentage point to about 5 percent, from the current rate, and considerably lower than the 7 percent rate typical of the pre-crisis expansion.[12]

FIGURE 4.14 World trade affected by new import-restrictive measures

New import restrictive measures have been continually imposed since 2008.

Source: World Trade Organization.
Note: Each bar represents the percent of world trade (in value terms) affected by new import restrictive measures imposed by G-20 WTO members during the respective time period. The analysis does not taken into account measures that were eliminated during the period.

Over the long term, even if the recovery accelerates and global growth returns to its trend, based on the diminished sensitivity of trade to income, global trade growth may not return to pre-crisis trend levels unless global trade relationships change. For instance, trade elasticities could pick up on account of a relatively robust pick-up in components of aggregate demand with stronger import intensities (e.g., investment) or on account of further changes in the organization of supply chains. Just as the high responsiveness of trade to growth in the 1990s reflected the increasing fragmentation of production driven primarily by developments in China and the United States, the scope for increasing international division of labor could reassert itself, especially in regions that have not yet made the most of global supply chains, such as South Asia, Sub-Saharan Africa, and South America. Drawing these parts of the world into a finer division of labor could lend renewed dynamism to trade.

[11]The strength of the recovery differs across countries. For example, the recoveries in the United Kingdom and the United States are on a much more solid footing than those in the Euro Area and Japan.

[12]This computation does not factor in any potential increase in elasticity resulting from compositional changes in domestic demand such as an acceleration of import-intensive investment.

Technical Annex: Estimation Methodology

The analysis here uses an error correction model to estimate the relationship between world trade volumes and real GDP. These models have been widely used in time series analysis, as they address the issue of non-stationarity (common for most macroeconomic variables), and hence the problem of spurious correlation (Box and Jenkins, 1970; Granger and Newbold, 1974; Nelson and Plosser, 1982).

In the specific context considered here, the error correction model allows both the long-run elasticity of trade with respect to income (which captures trend, or structural, factors) and the short-run elasticity (which is relevant to short run or cyclical developments). In addition, an estimate of the speed of convergence back to the long-run steady state relationship, following a deviation, can also be derived.

To provide some intuition for the model estimated in the text, the analysis commences with the simple relationship:[27]

$$M_t = QY_t$$

where M_t and Y_t are world imports and GDP, respectively, and Q is the share of imports in GDP.

Taking natural logs, the relationship may be restated as:

$$m_t = q + y_t$$

Lagged imports and GDP variables are added to the above equation to obtain the following expression:

$$m_t = a_0 + a_1 m_{t-1} + \beta_1 y_t + \beta_2 y_{t-1} + \mu_t$$

Where m_t is the volume of world imports, y_t is real global GDP, and μ_t is the error term: all variables are in logarithms, and the t subscript denotes time t.

In a steady-state equilibrium, the error term is zero and, where m^* and y^* are steady state equilibrium values, equation (1) becomes,

$$m^* = a_0 + a_1 m^* + \beta_1 y^* + \beta_2 y^*$$

Rewriting, this becomes:

$$m^* = a_0 / (1- a_1) + [(\beta_1 + \beta_2)/ (1- a_1)] y^*$$

where $[(\beta_1 + \beta_2)/ (1- a_1)]$ is the long-run trade elasticity.

To model short-run deviations from the equilibrium in the presence of stochastic shocks, first differences of m_t are taken and both $\beta_1 y_{t-1}$ and $(a_1-1)y_{t-1}$ are added and subtracted from the right hand side to get the error correction model below:

$$\Delta m_t = a_0 + (a_1-1)(m_{t-1}-y_{t-1}) + \beta_1 \Delta y_t + (\beta_1+\beta_2+a_1-1)y_{t-1} + \mu_t$$

which is equivalent to:

$$\Delta m_t = a_0 + (a_1-1)m_{t-1} + \beta_1 \Delta y_t + (\beta_1+\beta_2)y_{t-1} + \mu_t$$

The above equation can be presented in the reduced form:

$$\Delta m_t = a + \beta \Delta y_t + \gamma m_t - 1 + \delta y_{t-1} + \varepsilon_t$$

where $\beta = \beta_1$ is the short-term trade elasticity, and the long-run trade elasticity is $- \delta/\gamma$. The reduced form coefficient $\gamma = (\alpha_1 - 1)$captures lagged adjustment: a value of γ equal to zero implies instantaneous adjustment, a value approaching unity implies very long lags. In other words, $- \gamma$, the negative value, represents the speed of adjustment.

One limitation of this approach is that it treats GDP as exogenous to trade outcomes, whereas the two variables are endogenous. The results of the estimation should thus be interpreted with caution as the model does not capture the structural complexity of the trade-GDP nexus.

The model is estimated using annual data and the regression results are presented in Table 4A.1. For the entire sample, the long-run elasticity ($- \delta/\gamma$) is 1.7, but the response of trade with respect to income differs considerably across the three periods. In the period 1986 –2000, a 1 percent increase in world GDP at a steady rate is associated with an eventual 2.2 percent increase in the volume of world trade. This elasticity is substantially higher than in both the preceding (1970–85) and the later period (2001–2013), for both of which the trade elasticity is 1.3. There is a statistically significant structural break in the long-run trade-income relationship in the 1990s relative to the preceding and subsequent periods.

[27]This model is similar to that of Irwin, (2002), and Escaith et al. (2010)

TABLE 4A.1 Summary of regression results

	Without dummy variables[1]	With dummy variables for separate periods[2]		
	1970-2013	1970-1985	1986-2000	2001-2013
	(1)	(2)	(3)	(4)
α	-0.43**	-0.35	-3.17***	-0.52**
	(0.17)	(0.53)	(0.64)	(0.19)
Short-run elasticity (β)	2.82***	2.13***	2.77***	3.43***
	(0.36)	(0.60)	(0.35)	(0.21)
Speed of adjustment (-γ)	0.12**	0.18	0.58***	0.31**
	(0.05)	(0.31)	(0.13)	(0.13)
Coefficient of lagged GDP (δ)	0.20**	0.23	1.26***	0.40**
	(0.09)	(0.39)	(0.26)	(0.17)
Long-run elasticity[3] (-δ/γ)	1.70***	1.31***	2.18***	1.31***
Breusch-Godfrey LM test for serial correlation[4]	9.67**	10.52**	9.19*	7.43
Stationarity of the residual	yes	yes	yes	yes
		(2) vs (3)	(2) vs (4)	(3) vs (4)
Test that long-run elasticity differs across periods[3]		8.68***	0.00	291.21***
R-squared	0.740	0.957	0.957	0.957
N	43	43	43	43

Note: Standard errors in paranthesis; *** indicates a significance level of 1%, ** of 5%, and * of 10%.

[1] $dln(\text{total imports})_t = \alpha + \beta * dln(gdp)_t + \gamma * ln(\text{total imports})_{t-1} + \delta * ln(gdp)_{t-1} + \varepsilon_t$, w here total imports includes imports of goods and services

[2] $dln(\text{total imports})_t = \alpha_1 + \beta_1 * dln(gdp)_t * DV_1 + \gamma_1 * ln(\text{total imports})_{t-1} * DV_1 + \delta_1 * ln(gdp)_{t-1} * DV_1 + \alpha_2 + \beta_2 * dln(gdp)_t * DV_2 + \gamma_2 * ln(\text{total imports})_{t-1} * DV_2 + \delta_2 * ln(gdp)_{t-1} * DV_2 + \alpha_3 + \beta_3 * dln(gdp)_t * DV_3 + \gamma_3 * ln(\text{total imports})_{t-1} * DV_3 + \delta_3 * ln(gdp)_{t-1} * DV_3 + \varepsilon_t$, w here total imports includes imports of goods and services, and DV represents the period dummy variables.

[3] Significance established using non linear Wald test

[4] Null hypothesis states that there is no serial correlation in the residuals of the linear regression.

Source: Constantinescu, Mattoo and Ruta (2014)

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