# Shifts in International Trade and Value Added from 1995 to 2007: Insights into the Drivers of Growth

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*We decompose global export growth into a structural and a pure growth component in order to highlight the importance of structural change at the regional and industry level for the impressive growth performance of international trade. For this, we combine data on exports, output and sector-specific prices for a sample of roughly 150 countries and 22 manufacturing industries over the period from 1995 to 2007. While structural change played only a minor role for Western Europe, NAFTA and also Southeast Asia over this period, the region of Central, Eastern and Southeastern Europe shows an outstanding amount of restructuring at the industry level. Especially the new EU member countries were rapidly restructuring toward globally important industries despite their initial harmful specialization pattern. Furthermore, this region shows by far the highest elasticity of exports to output and demand changes at the industry level. While we do not observe an excessive reaction of exports to output expansion at the level of individual industries, exports react highly elastically to changes in global demand. However, elasticity differs greatly among individual regions and among industries. This corroborates the view that rapid growth in world trade arises from changes in the regional and sectoral composition of global production and trade, with faster-growing economies moving rapidly into more trade-intensive activities.*

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## 1 Introduction

For many years, the global trade volume expanded considerably faster than global output. While real annual export growth was at 6% on average over the past 15 years, global GDP and production grew only half as fast in real terms, namely by approximately 3% per annum (WTO, 2010). Similarly, trade fell disproportionately strongly in the recent crisis, which again triggered calls for explanations for the "overshooting" in the trade response to the economic crisis. What factors caused trade to grow faster than world output over the past decades? And are these factors going to shape world trade growth in the future? In this paper we attempt to identify the drivers of export growth by decomposing real world export growth into its regional and sectoral components. We will put special emphasis on Central, Eastern and Southeastern European (CESEE) economies. Their export orientation played an important role in their successful catching-up performance shown over the past two decades. Not only export growth was impressive for the region, CESEE export patterns were also subject to enormous qualitative upgrading and regional reorientation. In a recent time series analysis, Fidrmuc and Martin (2011)

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find empirical evidence for the export-led growth hypothesis in the new EU Member States. Hence, the recovery of the global trading system will continue to be of importance for the future development in the region (EBRD, 2010).

Several reasons have been identified to explain the continuously strong global trade growth prior to the recent collapse. One prominent strand of the literature focuses on the role of institutional factors, such as the dismantling of trade barriers within the GATT/WTO negotiations, the European economic integration process or similar developments in other regions (see Baldwin, Martin and Ottaviano, 2001). Strong trade growth is often attributed to, for instance, falling trading costs as a result of lower or abolished tariff and nontariff barriers, improved business conditions, falling transportation costs or technological progress (see e.g. Hummels, 2007, on transportation costs; Anderson and van Wincoop, 2004; and Jacks, Meissner and Novy, 2008, on trade costs more generally). Another explanation refers to the increasing fragmentation of production, also called international outsourcing, and the rising importance of global value chains (Feenstra, 1998). Although vertical specialization is more frequently studied within the context of foreign direct investment, it clearly has strong implications for traditional trade flows. Finally, another strand of the literature analyzes the income elasticity of trade (Baier and Bergstrand, 2001; Irwin, 2002). These studies usually report an income elasticity of trade of 2 or even higher. As to Central and Eastern Europe, a number of studies exist for individual countries. For example, Bobić (2010) stresses that the sensitivity of exports to income is rather high for Croatia (2.5), while the response to price changes is much more modest. Tomšík (2000) estimates the income elasticity of exports to be 5.3 for the Czech Republic, which is contrasted by Benáček, Podpiera and Prokop (2005), who report a value of 1.5. Wdowinski and Milo (2002) find an estimate of 2.1 for Poland, and Mervar (2003) of 0.9 for Croatia. All these studies analyze aggregate trade flows without differentiating between individual industries.

It is interesting to note that the explanations for the recent "trade collapse" are strikingly similar to those referred to as long-run determinants of global trade. The very recent, rich literature proposes the following reasons for the strong negative trade reaction in the crisis: sharply rising trade costs including problems with trade financing (Auboin, 2009; Chauffour and Farole, 2009), the increased importance of vertical specialization manifested in increasing global supply chains (Escaith, 2009; Yi, 2009) and falling demand (Bems, Johnson and Yi, 2010; Eaton et al., 2010; Freund, 2009). In addition, structural differences between domestic and external economic structures have lately been put forward as another explanation for the recent trade collapse in connection with an asymmetric crisis impact on different types of goods. Capital and investment goods were clearly affected more strongly in the crisis than nondurables and consumption goods, these goods also account for a large fraction of international trade (Francois and Woerz, 2009; McKibbin and Stoeckel, 2009).

In this paper, we take a long-term view on global trade and apply a sectoral decomposition to analyze the long-run growth of real world exports. Decomposing global export growth into its structural components, we find that the long-term rise in world export volumes largely reflects regional and sectoral shifts of emerging economies into more trade-intensive activities, such as machinery, electronic goods, motor vehicles, chemicals and textiles. In order to test our hypothesis that

world export growth can plainly be explained by decomposing aggregate trade flows into their structural and regional components, we estimate the elasticity of exports to supply and demand conditions at the detailed industry level. We take our rather low elasticity estimates as evidence that the export response to changes in demand and supply conditions is not unusually strong. Once we move the analysis to the level of individual industries, we observe a great differentiation depending on the region as well as on the industry under consideration. This suggests that changes in the country and industry composition of global trade are important in explaining the often cited rising elasticity of global trade to income at the aggregate level. When faster-growing economies are moving rapidly into more trade-intensive activities, this will cause an increase in the overall elasticity of trade to world GDP.[3]

A novel aspect of our analysis is the use of sector-specific price indices, which are used in deflating export and domestic production data. This seems to be important since radically different price developments were observed in different industries. While for instance prices for office and accounting machinery, including computers, fell drastically in the last two decades, prices for chemicals, food and beverages increased considerably.

The paper proceeds as follows: In the following section, we describe our database and provide some descriptive statistics of world export growth in a regional and sectoral perspective. In section 3 we develop a decomposition of export growth into a pure growth effect (abstracting from structural change) and two structural effects (the effect of initial specialization and the effect of changes in specialization patterns). In section 4 we use simple growth-accounting relationships to differentiate between the traditional trade-to-GDP elasticity and an export-to-output elasticity measure at the industry level. We moreover calculate export-to-demand elasticity. We have to differentiate between output and demand since there is no equivalent to GDP at the sector level. Section 5 concludes, placing special emphasis on the CESEE region.

## 2 Stylized Facts in World Trade since 1995

Our focus is on analyzing long-term regional and sectoral patterns of trade and the trade response to output growth. To this end, we take a look at the detailed industry level, which implies that we have to combine data from different sources. For trade data, we use the UN COMTRADE database. Using WITS,[4] we aggregate 6-digit HS export and import data directly into 2-digit ISIC (revision 3) industries. Data on domestic production (value added, output, wage and employment) are taken again at the ISIC (revision 3) 2-digit level from the UNIDO Industrial Statistics Database 2010. All data are given in U.S. dollar, converted at year-average exchange rates from the IMF's International Financial Statistics database. In total,

[3] *In other words, the apparent "puzzle" of extraordinary trade growth can be deconstructed in analogy to the demystification of the East Asian growth miracle by Young (1995), who showed that the extraordinary growth performance of the four East Asian "tigers" can be explained in a satisfactory way by rapid factor accumulation and structural shifts of labor from relatively unproductive (agricultural) activities into highly productive manufacturing sectors.*

[4] *WITS, short for World Integrated Trade Solution, is a software giving access to the UN COMTRADE database and was developed jointly by the World Bank and UNCTAD. It is possible to aggregate countries and goods prior to downloading data.*

we arrive at a sample consisting of a maximum of 196 countries over the period 1995 to 2007. The sample covers 22 manufacturing industries ranging from ISIC (revision 3) code "15" (food) to "36" (other manufacturing). On average, 150 exporters report trade data every year. Thus, we obtain roughly 40,000 observations spanning 13 years.

We classify countries broadly into seven geographic regions. The EU-15 comprise all EU Member States prior to the 2004 enlargement round. NAFTA includes the U.S.A., Canada and Mexico. CESEE countries are divided into two regions: the CEE-10 refer to the ten EU Member States which joined the EU in 2004 and 2007, while the remaining ten Eastern and Southeastern European countries are grouped as CIS & Balkans, including Russia. Southeast Asia contains ten ASEAN members plus China, India, Japan and South Korea. Latin America consists of 14 mainland Latin American countries. All remaining countries are classified as rest of the world (ROW). A list of all countries and their grouping is given in table A1 in the annex.

A major concern was to deflate all data in order to reflect different price developments within individual industries. Since industry-specific price deflators were not available for all countries in the sample, we use sectoral U.S. prices as a proxy. This implies the rather crude assumption that price developments do not vary across countries; however, it does take account of the fact that certain goods (e.g. computers) were becoming constantly cheaper over the observation period, while other goods (e.g. chemical products and food and beverages) were subject to continuous price increases. We use industry-specific U.S. import price indices to deflate export data. Since the U.S. imports goods from almost all countries in the world, we are confident that these price indices reflect average world price developments for traded goods. For domestic production data (value added, output and wages), we use the U.S. producer price index.

A detailed description of the major stylized facts in global trade flows from 1995 to 2009 is given in Francois and Wörz (2011). Regardless of the recent crisis, we observe a global shift of world output and trade toward emerging economies as a consequence of the large growth differential between the two groups of countries. Average real export growth amounted to 6.9% in advanced countries over the 1995 to 2007 period, only about half the 13.3% annual growth performance recorded for emerging markets' exports. The impressive growth of Southeast Asia's share in world exports is not least due to the rising importance of the Chinese economy. But also the CEE-10 and CIS & Balkans were expanding their world market shares rapidly over this period. The gains in world market shares by the emerging countries of Southeast Asia and the CEE-10 came mainly at the expense of Western Europe, NAFTA, Japan, but also Latin America.[5]

We furthermore observe a huge growth gap between exports and GDP. Several factors can explain this growth differential. One of them is related to structural differences between domestic output and the external sector: GDP largely consists of nontradables, the share of services in GDP is often around 70% and services continue to be considerably less suitable to trade than goods. Another explanation

[5] *Within Western Europe, Germany maintained its world market share remarkably well, which may be related to European integration and the accompanying rising importance of intra-EU trade.*

of this growth differential may be found in conceptual differences between GDP (which is a value-added concept) and exports (which are measured on a gross basis). Finally, the increasing importance of outsourcing and fragmentation is also frequently cited in this context.

The rising importance of individual players in global exports went hand in hand with a great deal of restructuring over the past two decades. When measured in constant prices of the year 2000, the five most important industrial activities in 2007 were machinery and equipment; radio, TV and communication equipment; motor vehicles; chemicals and related products; accounting and office machinery. Together, these industries accounted for 58% of world manufacturing exports, whereas in 1995 their cumulative share was 44%. Rather diverse developments were observed for each of these industries as from 1995: Motor vehicle exports represented the most important category in world trade, accounting for 12.5% of all manufacturing exports in 1995. This share fell to 10% in 2007. Also, the share of other transport equipment was on a moderate but continuous decline, from 4% to 3% of real manufacturing exports. The 2008–09 crisis reinforced these developments. Motor vehicles were hit most strongly among manufactured goods during the crisis. On the other hand, exports of office and accounting machinery showed a tremendous increase in real terms (i.e. accounting for the price decline in this category). The share of computers and related products in the global export volume rose from 2% in 1995 to 9% in 2007. Real export shares of machinery and equipment as well as radio, TV and communication equipment also increased from 9.4% and 8.4%, respectively, in 1995, to more than 13% by 2007, while the share of chemicals and chemical products remained rather constant at 11% in this period.

The regions reporting the highest real export growth rates – the CEE-10, CIS & Balkans and Southeast Asia – are also increasing their world market share in the most important trade categories. In particular, Southeast Asia is moving strongly into exports of machinery, communication equipment, and computers. In the latter category, this region is dominating the world market in real terms, with a world market share exceeding 50%. The CEE-10 increased their world market shares in all five globally most important categories. The increase was particularly strong in motor vehicles, where they held a market share of 7% in real terms in 2007. This is nearly twice as high as their market share in total merchandise exports of 4.4% in 2007 (up from 2.2% in 1995).

It should be noted that, out of all the regions in our sample, the CEE-10 region probably underwent the most dramatic structural change during the observation period. This is not surprising for transition countries. Interestingly, the impressive real export growth of the region went hand in hand with substantial structural change at the industry level. In the next section, we will systematically extract the contribution of structural change to export growth.

## 3 Decomposing Global Export Growth

We are interested in a decomposition of real trade growth along several dimensions, including the national and regional components of changes in trade, the sector composition of changes in trade, and finally also changes in the sector composition of regional trade. To do this in a more systematic way than in the previous section, we developed a simple decomposition of export growth into a pure growth component, the contribution of the initial industry structure and

the component added by structural change.[6] We start by defining exports $X_{i,c}$ very generally as exports $X$ in sector $i$ by region $c$. Total exports of region $c$ are then given by $X_c = \sum_i X_{i,c}$. We define export shares by region for each sector as:

$$\varphi_{i,c} = \frac{X_{i,c}}{\sum_i X_{i,c}} \tag{1}$$

Globally, we can also define global shares by industry, i.e. by summing up a given industry's exports over all exporters:

$$\Phi_i = \frac{\sum_c X_{i,c}}{\sum_c \sum_i X_{i,c}} \tag{2}$$

Our first decomposition is related to national deviations from the global composition of trade. By definition, the proportionate change in a region's exports from one time period to the next can be written as:

$$\dot{X}_c = \frac{X_c^1 - X_c^o}{X_c^o},$$

where we used $\dot{X}$ to denote a proportionate change. We can rearrange this basic definition as follows:

$$\begin{aligned}
\dot{X}_c &= \frac{X_c^1 - X_c^o}{X_c^o} = \sum_i \frac{X_{i,c}^1 - X_{i,c}^o}{X_c^o} = \sum_i \frac{X_{i,c}^1 - X_{i,c}^o}{X_c^o}\frac{X_{i,c}^o}{X_{i,c}^o} = \sum_i \frac{X_{i,c}^1 - X_{i,c}^o}{X_{i,c}^o}\frac{X_{i,c}^o}{X_c^o} = \\
&= \sum_i \varphi_{i,c}^0 \frac{X_{i,c}^1 - X_{i,c}^o}{X_{i,c}^o} = \sum_i \varphi_{i,c}^0 \frac{X_{i,c}^1 - X_{i,c}^o}{X_{i,c}^o} + \sum_i \left(\Phi_i^0 - \Phi_i^0\right)\left[\frac{X_{i,c}^1 - X_{i,c}^o}{X_{i,c}^o}\right] = \\
&= \sum_i \Phi_i^0 \left[\frac{X_{i,c}^1 - X_{i,c}^o}{X_{i,c}^o}\right] + \sum_i \left(\varphi_{i,c}^0 - \Phi_i^0\right)\left[\frac{X_{i,c}^1 - X_{i,c}^o}{X_{i,c}^o}\right]
\end{aligned} \tag{3}$$

In arriving at the final version of equation (3), we have employed a number of manipulations of the basic definition of rates of change, rearranging the total rate of change to reflect the contribution of each constituent sector $i$ to the total change for region $c$. The final version of equation (3) gives national exports, decomposed into a global effect, and an exporter effect based on regional deviations from the global industry pattern in the beginning. We can also specify a decomposition of changes in national exports based on deviations from global export growth rates within each industry. To do this, we define global exports of an industry as follows:

[6] *Our decomposition approach looks similar to, but differs conceptually from the traditional shift-share analysis or constant market share analysis, which is used to decompose world market shares, i.e. the changing importance of individual regions in world exports. Since we are interested in decomposing the growth of exports, we decompose the change in export volume. In either exercise, the total change in the variable of interest (growth or market share) is decomposed into a pure growth effect and different structural components.*

$$X_i = \sum_c X_{i,c} \tag{4}$$

Leaving implicit a manipulation similar to the one made explicit in equation (3), our second decomposition is related to national deviations from the global growth patterns within each industry. The change in a region's exports can thus also be written as:

$$\dot{X}_c = \frac{X_c^1 - X_c^o}{X_c^o} = \sum_i \varphi_{i,c}^0 \left[ \frac{X_i^1 - X_i^o}{X_i^o} \right] + \sum_i \varphi_{i,c}^0 \left[ \frac{X_{i,c}^1 - X_{i,c}^o}{X_{i,c}^o} - \frac{X_i^1 - X_i^o}{X_i^o} \right] \tag{5}$$

Finally, we can also define a combined or total decomposition based on (3) and (5) as follows:

$$\dot{X}_c = \frac{X_c^1 - X_c^o}{X_c^o} = A + B + C$$

*A:* global change in total exports = $\sum_i \Phi_i^0 \left[ \frac{X_i^1 - X_i^o}{X_i^o} \right]$ (6)

*B:* initial deviation from global industry structure = $\sum_i \left( \varphi_{i,c}^0 - \Phi_i^0 \right) \left[ \frac{X_{i,c}^1 - X_{i,c}^o}{X_{i,c}^o} \right]$

*C:* shift in composition = $\sum_i \Phi_i^0 \left[ \frac{X_{i,c}^1 - X_{i,c}^o}{X_{i,c}^o} - \frac{X_i^1 - X_i^o}{X_i^o} \right]$

In equation (6), the first term, A, captures changes in the global volume of exports. In the case where region *c* is identical in initial export structure and in structural change to the global average, this also represents the change in export volume for region *c*. Put differently, the term A captures the pure growth effect in the absence of changes in the underlying sector structure. The terms B and C capture reasons why region *c* may have export growth that is different from the global average. Both of these terms refer to a different impact of the sector structure of trade. In other words, a large contribution of these two effects to the region's overall export growth reflects a high importance of industrial structure or structural change for the region. The second term, B, captures differences in the importance of various sectors *i* for region *c* – for example if steel exports are more important for region *i* than they are for the world as a whole. This reflects the contribution of the initial export structure to subsequent export growth. A positive effect implies that the region's initial export structure is beneficial for future export growth. In contrast, a negative value would reveal that the initial industry structure has been a drag on subsequent growth. The final term, C, captures differences in the change in exports at the sector level for region *c* relative to the world – for example if steel exports fall or rise more for region *i* than they do for the world as a whole. This effect quantifies the importance of structural change for export growth. A positive value would again reveal a growing share of industries with a large share in global trade, which thus improves the region's trade performance.

Table 1

**Structural Decomposition of World Export Growth, 1995–2007**

| | Cumulative export growth | A – Pure global growth effect | B – Initial specialization effect | C – Effect of structural change |
|---|---|---|---|---|
| | % | *percentage points* | | |
| CEE-10 | 445 | 175 | –678 | 948 |
| CIS & Balkans | 283 | 175 | –142 | 250 |
| Southeast Asia | 260 | 175 | 36 | 50 |
| ROW | 242 | 175 | –90 | 158 |
| EU-15 | 125 | 175 | –7 | –42 |
| Latin America | 115 | 175 | –166 | 106 |
| NAFTA | 117 | 175 | 7 | –64 |

*Source: Authors' calculations.*

*Note: ROW denotes the rest of the world.*

Table 1 reports the results of this decomposition analysis applied to exports. While the EU-15, NAFTA and also Latin America recorded a cumulative growth performance over the 1995 to 2007 period which remained below the global export growth rate of 175% in the absence of structural change (i.e. they were relatively underperforming), both CESEE regions (the CEE-10 and CIS & Balkans) and the Southeast Asian countries posted export growth beyond the "pure growth" effect. Structural change played only a minor role for the two most advanced regions in our sample, NAFTA and the EU-15. In both regions the contribution of structural change to overall export growth was negative, i.e. they were growing more slowly than the world average in those economic activities whose importance in global trade was increasing.

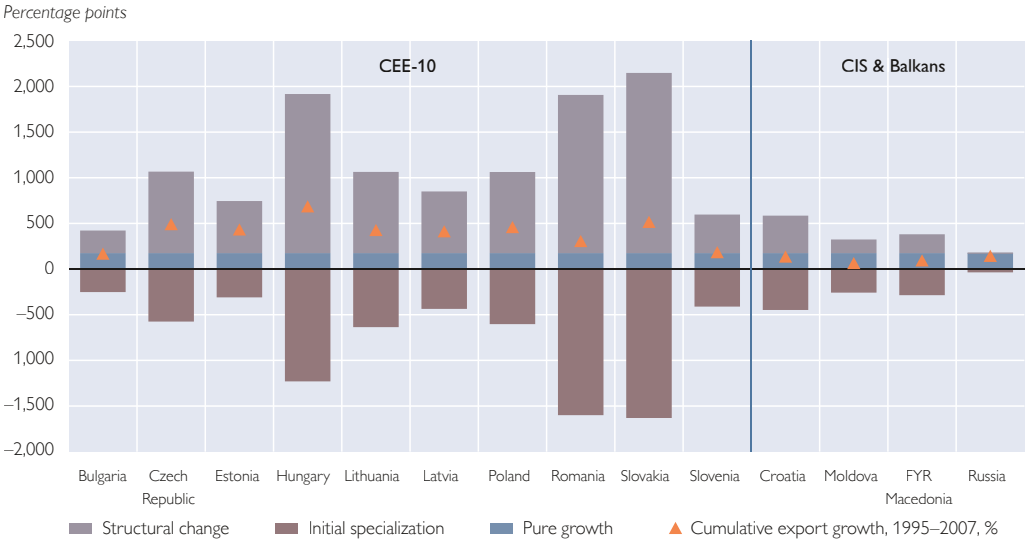
When looking into the two effects of industrial structure on the successful emerging regions' export growth, we find an interesting distinction between CESEE and Southeast Asia. The initial export structure of the CESEE countries was not conducive to future rapid export growth. However, the CEE-10 exhibited substantial structural change, showing particularly strong export growth in industries with great global importance. Thus, they managed to change their initially unfavorable export structure toward an export structure well aligned with world patterns. This reflects their structural catching-up process. In contrast, Southeast Asia shows less evidence of structural change over the period from 1995 to 2007. The already beneficial initial export structure was supported by favorable structural change, both effects were positive for this region and added about one-third to the above-average export performance over the period.

Latin America also showed some restructuring toward fast-growing industries, this effect was, however, not strong enough to offset the region's unfavorable initial export structure.

To summarize the global decomposition of real export growth in the recent past, the CEE-10 clearly represented the region characterized by the most substantial shift of export shares at the industry level. This region also exhibited the most dynamic export growth performance in real terms – despite the region's particularly strong specialization in motor vehicles, whose share in global trade flows has actually been declining gradually (although export growth is still high in this category in absolute terms and motor vehicles are one of the most important

Chart 1

**Structural Decomposition of CESEE Export Growth, 1995–2007**




*Source: Authors' calculations.*

export categories). At the same time, the CEE-10 moved strongly into globally fast-rising export sectors, such as machinery, communication equipment and office and accounting machinery. This longer-term trend can be attributed to the positive effects of EU integration. As observed also by Havlik (2008), the CEE-10 increasingly specialize in high-tech and medium-high-tech products, and EU accession and FDI inflows certainly promoted the industrial restructuring process and modernization. Fidrmuc and Martin (2011) furthermore show that exports were a major growth determinant in CESEE countries. Contrary to this development, CIS & Balkans showed hardly any signs of restructuring toward higher-tech activities and reinforced their specialization in resource-intensive industries, such as metals and petroleum refineries. Havlik (2008) attributes this to a delay of policy reforms and weak performance in attracting FDI.

Given the uniqueness of the CEE-10 region, chart 1 shows the contribution of all three effects to total cumulative real export growth in more detail. Structural change toward rapidly growing export sectors was most pronounced in Hungary, Romania and Slovakia. Owing to substantial restructuring over the observation period, these countries moved away from the initial disadvantageous specialization patterns prevalent in the mid-1990s. Poland and the Czech Republic likewise show significant structural change, while the CIS & Balkan countries (including Bulgaria) do not exhibit a great deal of structural change, which results in generally lower export growth in those countries. In Russia in particular, total export growth corresponds to the pure growth effect only.

## 4 Relative Changes in Exports and Output

Having described recent developments of global export flows, we now turn to the relationship between exports and economic activity. On a global basis, trade growth has outpaced output growth consistently in recent decades. Indeed, this has been used as proof of increased globalization and regional integration, and as

evidence of falling natural and man-made barriers to trade in the post-World War II period.

Similar to the upward trajectory of trade during periods of growth, the collapse of world trade in late 2008 and at the beginning of 2009 far exceeded the decline in world output. This seemingly excessive trade response caused a great deal of discussion and analysis. Most of the resulting literature adopted a demand-oriented explanation, besides placing emphasis on the role of trade credit during the recession. In our view, however, a valuable clue to the macro-relationship between global trade volumes and GDP growth can be found in the sector pattern of the recent recession. The collapse in trade was actually driven by shocks to demand and output at the sector level. Because some sectors are more important as a share of trade than they are for GDP, the same shock to trade and output at the sector level can lead to substantial divergence in aggregate measures. This means that changes in the composition of output at the sector level can drive an apparent divergence between trade and output at the aggregate level. Such a development will be reinforced further when the trade response to output changes differs between individual economic activities.

To better understand the role of sector composition in the pattern of relative trade and output growth, we examine exactly this trade response to output as well as to demand changes at the industry level in this section. We first develop a simple framework that allows us to look at the relative relationship between trade and output within the same sector. To the extent that trade does or does not prove over-responsive to changes in output at the sector level, we consider this as support for (or evidence against) the importance of changes in the composition of trade, as examined in the previous section, when relating output to trade at the aggregate level. We also apply this framework to estimate the elasticity of exports to changes in global demand at the industry level. Most studies dealing with this subject stop at the economy-wide level, where GDP offers a measure of both demand and supply. However, there is no equivalent measure at the industry level, given important interlinkages between individual sectors. Therefore we estimate two different elasticities of exports, with respect to either domestic output or global import demand, in each industry.

We are interested in the long-run relationship between exports and output, two variables that are both I(1) and likely to be subject to spurious correlation. In the panel it is possible to estimate consistently the long-run association between non-cointegrated I(1) variables and thereby avoid the spurious regression problem (see Phillips and Moon, 1999, and Kao, 1999, for asymptotic results and Coakley, Fuertes and Smith, 2001, for small sample evidence based on Monte Carlo simulations). Therefore we use the following model to estimate the output elasticity of exports:

$$\ln X_{ict} = \alpha + \beta_1 \ln Y_{ict} + \beta_2 \ln Y_{kct} + \gamma \mathrm{ulc}_{ict} + \delta \mathrm{prod}_{ict} + \varphi time + \mu_{ic} + \varepsilon_{ict} \qquad (7)$$

We employ a fixed effects estimator and include a time trend (see also Baltagi, Griffin and Xiong, 2000, for the use of the within estimator). The coefficient $\beta_1$ gives us an estimate of the output elasticity of exports by sector in response to output of the same sector. We then use the same model to estimate the elasticity of exports to foreign demand. Foreign demand is constructed by global imports in

the respective industry excluding the reporter region. We furthermore include output (and foreign demand, respectively) in all other sectors, apart from sector *i*, denoted by subscript *k*. This captures supply and demand linkages across sectors and is particularly important when estimating the demand elasticity.[7] We estimate equation (7) in a panel of 70 to 80 countries over the period from 1995 to 2007. We also include two control variables: differences in unit labor costs and labor productivity are important determinants of international competitiveness and therefore considerably impact exports.

The literature, focusing on the elasticity of trade to income, generally reports an elasticity of 2 to 4 for aggregate trade flows. In order to check the quality of our data, we start by summing up industry-specific exports to total manufacturing exports and relate this to GDP. We thus obtain an estimate for output elasticity (which coincides with income elasticity) of around 2, which is roughly in line with the existing literature.[8] The discrepancy between our coefficient and the higher estimates found in the recent literature (Irwin, 2002, and Freund, 2009) can be explained by differences in the underlying definition of exports. We use manufacturing exports here, while previous studies often used total economy-wide exports (including goods and services).[9]

However, when we focus on elasticity with respect to manufacturing output (instead of GDP), our estimated coefficient drops considerably. On average, manufacturing exports respond positively to an expansion of domestic output; elasticity remains, however, well below 1 (see table 2). Thus, within the same sector, we do not find an overshooting in the trade response to output changes.

This can be explained when taking into account that GDP is a composite of goods and services, whereby total GDP growth is the weighted average of value added growth in goods and services, with the weights representing the respective share of goods and services in GDP. Then, the growth differential between goods trade and GDP equals the sum of the growth differential between goods trade and value added in goods plus the growth differential between goods and services value added (i.e. productivity in goods and services), with the latter being weighted by the share of services in GDP. To the extent that productivity growth in services is lower than that in goods, the elasticity of exports to GDP will point to export growth that seems to exceed growth in GDP.[10] The magnitude of this productivity growth differential on the one hand and the share of services in GDP on the other

[7] *We would like to thank one anonymous referee for pointing our attention to these cross-sector linkages. The problem of cross-sector linkages does not arise in the results which are presented in table 2 and 4, as these are based on data aggregated over all sectors.*

[8] *We would like to stress that we work with a dataset that has been deflated using U.S. price deflators (albeit at the sectoral level). This implies that cross-country differences in price developments are not captured, which is less of a concern for traded goods, but may be relevant for nontraded goods, as their importance in developing countries may be understated. This might in turn introduce an upward bias in the trade elasticity to income, which corroborates our hypothesis that the high elasticity of trade to income found in the literature might be overstated. We thank one anonymous referee for pointing this out.*

[9] *A comparison of the elasticity based on nominal exports versus our exports deflated by sector showed no substantial differences arising from the specific deflation used here.*

[10] *According to WDI data, this indeed seems to be the case. World average annual growth in manufacturing value added was 4.1% from 1995 to 2007, while average annual growth in services was 3.3%. For low- and middle-income countries, the respective figures were 6.7% and 5.5%, while for the OECD the difference was smaller at 3.1% average annual growth in manufacturing value added and 2.9% average annual growth in services value added.*

hand determine the extent to which exports exceed GDP growth, with a higher services share in GDP increasing this elasticity.[11] With a services share of roughly 70% and a realistic growth differential between the service and goods sector, this elasticity can easily be around 2 or 3, as commonly reported in the literature (Irwin, 2002; Freund, 2009). The notably lower elasticity of exports to goods output corroborates our view that the impressive real trade growth rates which we witnessed in the past couple of years represent in fact structural change at the country and industry levels.

The literature in general regresses exports on a gross basis on GDP, with the latter being a value-added concept. In order to eliminate the conceptual difference between the net concept of value added and the gross measure of exports, we run the regressions, using manufacturing output instead of value added. As a sensitivity check of our results, we also estimated the elasticity with respect to industry-

Table 2

**Elasticity of Manufacturing Exports to Manufacturing Output, 1995–2007**

| | No time effects | | Common coefficient | | Regional coefficients | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| ln(output) | 0.839 *** | 0.782 *** | 0.409 *** | 0.429 *** | | |
| | 11.46 | 8.64 | 6.82 | 6.6 | | |
| CEE-10 | | | | | 0.637 *** | 0.647 *** |
| | | | | | 14.45 | 16.13 |
| CIS & Balkans | | | | | 0.353 *** | 0.371 *** |
| | | | | | 7.62 | 7.86 |
| Southeast Asia | | | | | 0.517 *** | 0.524 *** |
| | | | | | 7.32 | 7.34 |
| Other | | | | | 0.311 *** | 0.302 *** |
| | | | | | 3.67 | 3.34 |
| EU-15 | | | | | 0.286 *** | 0.274 *** |
| | | | | | 3.25 | 2.55 |
| Latin America | | | | | 0.517 *** | 0.517 *** |
| | | | | | 6.55 | 6.09 |
| NAFTA | | | | | 0.403 *** | 0.370 *** |
| | | | | | 6.65 | 5.57 |
| Time trend | | | 0.066 *** | 0.066 *** | 0.065 *** | 0.064 *** |
| | | | 13.7 | 13.15 | 14.41 | 13.38 |
| Unit labor costs | | 0.874 * | | 0.839 *** | | 0.522 ** |
| | | 1.7 | | 3.01 | | 2.12 |
| Productivity | | 0.001 *** | | –0.000 | | 0.000 |
| | | 2.24 | | –0.43 | | 0.64 |
| Constant | 2.299 *** | 3.059 *** | 9.067 *** | 8.689 *** | 9.231 *** | 9.224 *** |
| | 1.86 | 2.01 | 9.17 | 8.02 | 12.73 | 11.3 |
| Observations | 860 | 815 | 860 | 815 | 860 | 815 |
| No. of countries | 105 | 102 | 105 | 102 | 105 | 102 |
| R2-within | 0.579 | 0.587 | 0.803 | 0.812 | 0.819 | 0.830 |
| R2-overall | 0.916 | 0.917 | 0.897 | 0.899 | 0.165 | 0.132 |
| R2-between | 0.905 | 0.907 | 0.903 | 0.903 | 0.281 | 0.249 |
| F-value | 131.4 | 57.1 | 269.9 | 171.9 | 545.7 | 360.8 |

*Source: Authors' calculations.*

*Note: The dependent variable in this fixed effect panel regression is the log of real manufacturing exports; *, **, *** indicate that the coefficient estimate is statistically significant at the 10%, 5%, 1% significance level: t-values are given below the coefficients.*

[11] *The argument by O'Rourke (2009) posted in a blog in June 2009 is essentially identical to ours when we furthermore assume that trade in goods is more vertically integrated across countries than trade in services.*

specific value added instead of gross output. The results are broadly similar, suggesting that this conceptual difference does not induce a bias in the results. According to this reasoning, the conceptual difference between exports and GDP would be ruled out as a reason for the "puzzlingly" large trade response during the global recession.

In line with the existing literature, we can confirm a rising elasticity of exports to value added over time. The time trend is positive and highly significant. Our estimated elasticity falls substantially (from 0.8 to 0.4) when we control for time effects, which corroborates the rise in output elasticity over time.

We furthermore observe notable differences between regions. The elasticity for the CEE-10 is significantly higher than for all other regions at the 1% level. Moreover, Southeast Asia shows a higher elasticity compared to CIS & Balkans, the rest of the world and the EU-15. This simply reflects these regions' greater outward orientation, which has led to their strong integration in international production chains. As a general observation, we see a higher elasticity of exports to output in emerging regions (the CEE-10, Southeast Asia and Latin America) than in more advanced regions.

In table 3, we report the output elasticity coefficients of exports from regression (2) above, again controlling for differences in unit labor costs, productivity and a time trend. Thus, each entry in table 3 is based on a regression model, where manufacturing value added is interacted with a dummy for each region in our sample.[12] The first column represents the common coefficient (global average), the

Table 3

**Elasticity of Exports to Output by Industry**

| | World | CEE-10 | CIS & Balkans | South-east Asia | Other | EU-15 | Latin America | NAFTA |
|---|---|---|---|---|---|---|---|---|
| Food | **0.50** | **0.74** | **0.67** | **0.41** | **0.55** | 0.14 | **0.32** | –0.15 |
| Textiles | **0.54** | **0.52** | 0.34 | **0.34** | **0.69** | 0.27 | **0.42** | **0.54** |
| Clothing | **0.45** | **0.62** | –0.21 | 0.03 | **0.64** | **0.73** | **0.93** | 0.38 |
| Wood | **0.39** | **0.41** | **0.38** | 0.08 | 0.40 | **0.61** | 0.44 | 0.02 |
| Paper | **0.74** | **0.78** | **0.92** | 0.24 | **0.69** | **1.24** | **0.88** | **1.09** |
| Chemicals | **0.48** | **0.63** | **0.26** | **0.60** | **0.45** | **0.68** | **0.70** | 0.00 |
| Rubber | **0.45** | **0.54** | 0.19 | 0.04 | **0.45** | –0.25 | 0.44 | 0.26 |
| Minerals | **0.54** | **0.50** | **0.60** | 0.29 | 0.60 | 0.12 | **0.65** | **0.58** |
| Basic metals | **0.44** | **0.37** | **0.42** | **0.45** | **0.50** | 0.03 | 0.29 | **–0.68** |
| Fabricated metals | **0.60** | **0.76** | 0.21 | **0.39** | **0.52** | 0.21 | **0.70** | **0.48** |
| Machinery | **0.43** | **0.72** | 0.06 | **0.64** | 0.34 | 0.06 | **0.51** | 0.39 |
| Office & accounting machinery | **0.53** | **0.64** | 1.19 | –0.05 | –0.11 | –0.23 | –0.20 | 0.89 |
| Electrical machinery | **0.62** | **0.90** | **0.26** | **0.68** | **0.56** | 0.31 | **0.88** | **0.80** |
| Radio, TV & communication equipment | **0.56** | **0.95** | **0.61** | **0.41** | 0.09 | 0.23 | **0.88** | –0.67 |
| Precision instruments | **0.35** | **0.90** | 0.15 | **0.54** | –0.18 | **0.47** | 0.19 | 0.37 |
| Motor vehicles | 0.34 | **0.93** | 0.23 | **1.08** | –0.12 | 0.13 | 0.04 | 0.11 |
| Other transport equipment | **0.70** | **0.82** | –0.08 | **0.72** | **0.98** | 0.19 | **0.36** | –0.16 |
| Total manufacturing | **0.43** | **0.37** | **0.65** | **0.52** | **0.37** | **0.52** | **0.30** | **0.27** |

*Source: Authors' calculations.*

*Note: Elasticities are calculated by a fixed effects panel estimation of ln(exports) on ln(output) controlling for time fixed effects, output in other sectors, unit labor costs and labor productivity. Coefficients in bold are significant at the 5% level or higher.*

[12] *Full results for individual industries are available from the authors on request.*

Table 4

**Elasticity of Manufacturing Exports to Manufacturing Demand, 1995–2007**

| | No time effects | | Common coefficient | | Regional coefficients | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| ln(world imports) | 0.817 *** | 1.005 *** | 1.142 *** | 1.037 *** | | |
| | 15.85 | 15.67 | 6.32 | 6.2 | | |
| CIS & Balkans | | | | | 1.420 *** | 0.878 *** |
| | | | | | 6.46 | 4.37 |
| CEE-10 | | | | | 1.915 *** | 1.401 *** |
| | | | | | 9.23 | 8.98 |
| EU-15 | | | | | 1.148 *** | 0.613 *** |
| | | | | | 5.83 | 3.72 |
| Latin America | | | | | 1.236 *** | 0.884 *** |
| | | | | | 5.76 | 4.54 |
| NAFTA | | | | | 1.137 *** | 0.610 ** |
| | | | | | 4.92 | 2.03 |
| Southeast Asia | | | | | 1.596 *** | 1.026 *** |
| | | | | | 6.84 | 5.69 |
| Other | | | | | 1.063 *** | 0.930 *** |
| | | | | | 5.93 | 4.98 |
| Time trend | | | –0.030 * | –0.003 | –0.036 ** | 0.003 |
| | | | –1.7 | –0.2 | –2.05 | 0.2 |
| Unit labor costs | | 0.233 | | 0.232 | | 0.118 |
| | | 0.65 | | 0.65 | | 0.48 |
| Productivity | | 0.001 ** | | 0.001 ** | | 0.001 *** |
| | | 2.09 | | 2.02 | | 5.14 |
| Constant | –3.537 *** | –6.323 *** | –10.674 *** | –7.026 * | –11.985 *** | –4.681 |
| | –3.03 | –4.37 | –2.69 | –1.91 | –3.02 | –1.37 |
| Observations | 1,931 | 815 | 1,931 | 815 | 1,931 | 815 |
| No. of countries | 189 | 102 | 189 | 102 | 189 | 102 |
| R2-within | 0.435 | 0.753 | 0.437 | 0.753 | 0.478 | 0.800 |
| R2-overall | 0.000 | 0.019 | 0.000 | 0.018 | 0.119 | 0.066 |
| R2-between | 0.010 | 0.068 | 0.013 | 0.065 | 0.131 | 0.037 |
| F-value | 251.4 | 148.1 | 152.3 | 111.9 | 128.2 | 157.1 |

*Source: Authors' calculations.*

*Note: The dependent variable in this fixed effect panel regression is the log of real manufacturing exports; *, **, *** indicate that the coefficient estimate is statistically significant at the 10%, 5% and 1% significance level respectively; t-values are given below the coefficients.*

remaining columns report regional coefficients. Coefficients in bold print are significant at the 5% significance level. The first striking observation is related to the CEE-10 again: Here, the output elasticity of exports is found to be significant in all industries. As a second observation, the ranking of industries does not correspond to the relative importance of individual industries in total trade. The largest coefficients are found for activities such as paper, other transport equipment, electrical machinery and fabricated metals. In three industries, i.e. paper, chemicals and electrical machinery, almost all regions show a statistically significant reaction of exports to supply in the same industry. Out of these, two are also present among the top five export sectors. Ranging from 0.48 to 0.74, the global elasticity still lies below 1. Nevertheless, all these activities with a significant export response to output changes show a comparatively high elasticity coefficient. They are typical of developing and emerging economies, thus underlining a strong relationship between the emergence of new and rapidly growing players in world trade and the rapid expansion of world trade. Furthermore, metals, food and textiles show a significant coefficient in many regions. The CEE-10 exhibit a particularly high

export response to supply conditions in areas such as radio, TV and communication equipment, electrical equipment, precision instruments and motor vehicles (with an elasticity of over 0.9).

Finally, we estimate the elasticity of exports to changes in global demand (distinguishing between demand within the same industry and in other industries). Foreign demand is measured by global imports in the respective industry minus the imports of the reporting region. Table 4 displays the results. Clearly, exports react more strongly to changes in external demand than to changes in the underlying domestic supply. Nevertheless, the coefficient is close to 1 in general and also in all regions. Thus, again we do not find the strong over-reaction of exports here, once we focus on the industry level. The CEE-10 and Southeast Asia emerge again as the regions with the highest reagibility of exports. Controlling for supply-side characteristics (unit labor costs and productivity) does not lower the elasticity estimate in this case; also, the estimate is not as sensitive to the inclusion of a time trend as before. The time trend is sometimes negative, which is surprising, but not always significant.

Table 5 reports the estimated elasticities separately for each industry, allowing for a different reaction by each region. The differences between industries are far greater than between regions. Again, similar categories exhibit the highest elasticity estimates: food, paper and fabricated metals. In addition to those activities, the demand elasticity of exports is significant in all regions for chemicals and rubber. Also textiles and other transport equipment show a significant elasticity in all regions but one. It is interesting to note that the elasticity estimates for machinery are never significantly different from zero in any region. Exports of motor vehicles

Table 5

**Elasticity of Exports to Demand by Industry**

| | World | CEE-10 | CIS & Balkans | South-east Asia | Other | EU-15 | Latin America | NAFTA |
|---|---|---|---|---|---|---|---|---|
| Food | **2.65** | 3.73 | **3.74** | **2.40** | **2.38** | **2.87** | **2.04** | **1.48** |
| Textiles | 1.31 | **3.34** | **3.51** | 0.71 | **2.20** | **1.46** | **3.18** | **4.08** |
| Clothing | **1.15** | 0.40 | 0.28 | **0.87** | 1.12 | **2.50** | **2.19** | **–1.95** |
| Wood | **1.30** | **1.78** | **1.93** | 0.79 | 0.67 | **1.70** | 2.06 | –0.57 |
| Paper | **2.61** | **2.61** | 1.31 | **1.64** | **2.80** | **1.82** | **1.94** | **1.60** |
| Chemicals | **1.85** | **2.10** | **1.69** | **2.04** | **1.73** | **2.11** | **1.73** | **1.72** |
| Rubber | **2.42** | **3.26** | **1.55** | **1.30** | **2.63** | **1.68** | **3.07** | **2.04** |
| Minerals | **1.48** | **2.17** | 1.94 | 0.94 | 0.67 | **1.55** | **2.30** | **1.64** |
| Basic metals | **1.40** | **1.74** | 1.27 | **1.43** | 0.85 | 0.80 | **1.81** | 0.22 |
| Fabricated metals | **2.12** | **2.72** | 1.18 | **1.25** | **2.06** | **1.71** | **1.84** | **2.68** |
| Machinery | 0.55 | 0.92 | 0.19 | 0.19 | 0.66 | –0.12 | 0.88 | 0.32 |
| Office & accounting machinery | **1.04** | **2.15** | **2.49** | 0.19 | 1.31 | 0.44 | 0.24 | –0.81 |
| Electrical machinery | **1.52** | **1.73** | 1.04 | 0.80 | 1.15 | 0.33 | 0.87 | 0.61 |
| Radio, TV & communication equipment | 0.72 | 1.43 | **1.43** | 0.01 | 0.16 | –0.06 | 1.81 | –1.27 |
| Precision instruments | 1.05 | **2.01** | 1.98 | 0.87 | 0.40 | 1.14 | 2.30 | 1.34 |
| Motor vehicles | **1.67** | **2.86** | 1.38 | **2.53** | 1.77 | **1.32** | 0.15 | 0.93 |
| Other transport equipment | **2.82** | **2.62** | 0.99 | **2.49** | **3.45** | **1.70** | **2.37** | **2.53** |
| Total manufacturing | **1.04** | **1.40** | **0.88** | **1.03** | **0.93** | **0.61** | **0.88** | **0.61** |

*Source: Authors' calculations.*
*Note: Elasticities are calculated by a fixed effects panel estimation of ln(exports) on ln(demand) controlling for time fixed effects, output in other sectors, unit labor costs and labor productivity. Coefficients in bold are significant at the 5% level or higher.*

respond strongly to changes in demand only in the CEE-10 and Southeast Asia, the two most rapidly expanding regions in general economic terms.

In general, exports react more strongly to demand than to supply factors; the differentiation by economic activity is, however, much more pronounced as well. This underlines the transmission of the recent crisis through the trade channel and also explains the particularly strong downturn experienced by CESEE countries, which are highly open to international trade. The sharp drop in external demand in exactly those sectors where these countries are specialized affected the region particularly badly. By the same reasoning, differences in the demand elasticities of exports by regions and industries also provide an explanation of the more rapid expansion of world trade as compared to global output, despite the fact that at the individual industry level, the elasticity does not exceed 1 by far.

## 5 General Conclusions and Implications for Central and Eastern Europe

The historical strong rise and the recent deep fall of international trade have caused a great deal of debate among economists and policymakers alike in search of the reasons for and the implications of these developments. The CESEE countries were affected deeply by both developments. First, their impressive growth record over the past two decades was led by their favorable export performance (see e.g. Fidrmuc and Martin, 2011; wiiw, 2010). Second, their strong reaction to the global financial and economic crisis is likely to have been triggered to a large extent by the trade channel. The sharp drop in external demand for CESEE's major export goods (i.e. motor vehicles and machinery) coupled with the particularly strong elasticity of exports to changes in external demand for this region played an important role here. The most commonly cited factors behind the long-term rise and the crisis-related decline of international trade are surprisingly similar and relate to changes in trade costs (transportation costs, tariffs and nontariff barriers for the rise and trade financing for the decline), increasing fragmentation of production and an increasing elasticity of trade to output. Another factor mentioned in the context of the recent severe drop in international trade relates to structural differences between production and export structures. Interestingly, this has not been stressed much in explaining the long-term growth of international trade. In this paper, we take a closer look at the importance of structural change. We find that the long-term rise in world export volumes largely reflects regional and sectoral shifts of emerging and hence rapidly growing economies into more trade-intensive activities, such as machinery, electronic goods, motor vehicles, chemicals and textiles.

For our analysis, we construct a new set of trade and output data at the ISIC 2-digit industry level over the period from 1995 to 2007, using sector-specific price deflators for exports, imports and domestic value added to account for dramatically different price developments in individual industries over the sample period. The use of sector-specific deflators has an impact on the relative importance of individual industries in total exports. In particular, office, accounting and computing machinery experiences a steep expansion, which is not observed as clearly in traditional analyses that do not account for the relative price decline in this industry. Furthermore, the importance of motor vehicles in total world trade shows a more pronounced decline in real terms when deflated at sector-specific

prices than in traditional analyses. On the other hand, sector-specific deflators played no role for our results concerning the influence of restructuring on export growth. In addition, our estimates of the output and demand elasticity of exports were not affected by the form of deflation either.

Decomposing export growth into a pure growth component and two structural effects – the growth contribution of initial industry specialization and the effect of structural change at the industry level – we find that CESEE countries were subject to considerable structural change with an overall positive effect on their export growth performance. This result holds only for the countries that recently joined the EU (the CEE-10), thus suggesting that EU accession and related institutional and economic reforms played a positive role (see also Havlik, 2008). The CEE-10 showed successful restructuring toward globally successful sectors. This implied an increasing specialization of the region in machinery, electronic goods and motor vehicles. It should be noted that from a global perspective, trade in motor vehicles is becoming less important in relative terms, although trade flows remain at a high level. In a more short-term perspective, trade in machinery and cars was severely hit in the recent crisis, which corroborated the negative impact on Eastern Europe. As a consequence, continued domestic restructuring will remain important for the region, as global trade patterns partly move away from current specialization patterns of the CEE-10. Substantially less structural change toward globally important trade sectors has been observed for the CIS & Balkans region (which is clearly dominated by Russia), which suggests a large potential for industrial restructuring in the region.

It is an often-cited stylized fact that global exports grow faster than GDP. This would imply an elasticity of exports to output far beyond 1. An elasticity of 1 would imply that exports and demand expand equally strongly: the growth rate of exports corresponds exactly to the growth of global demand and hence output at the aggregate level. The existing literature often reports elasticity in the range of 2 to 4 (Irwin, 2002; Freund, 2009). We also find evidence for large output or income elasticity of trade. However, at the sector level we cannot confirm an excessive reaction of exports to output or income in all of the industrial activities studied. The high elasticity of exports to output drops to far below 1 when we limit our attention to individual industries. Of course, such a narrow focus does not capture the effects of outsourcing and increasing fragmentation. Nevertheless, this result offers an alternative explanation for the rise of global exports, namely changes in the regional and industrial composition of exports. A great deal of export growth may simply be related to the fact that fast-growing, emerging countries are moving into trade-intensive sectors, rather than to a change in the nature of trade and production (i.e. changes in global supply chains). This may also imply that we overestimate the effect of falling trading costs and global supply chains on export growth. As such, our results may also be of relevance for explaining the developments that had led to the sharp contraction of trade in early 2009. Restructuring and structural upgrading thus remain vital features of a successful growth and catching-up strategy for export-oriented, emerging economies such as the CESEE countries.

Export elasticity to external demand is in general much higher than the sensitivity to supply conditions. But again, it is much lower than standard estimates reported for aggregate trade flows in the literature. The results are again highly

heterogeneous for individual regions and industries. All regions show significant demand elasticity of exports for total manufacturing, and in some sectors (food, paper, rubber, fabricated metals and other transport equipment) it even exceeds 2. However, at the detailed industry level we find highly different results. Only the CEE-10 region shows a high and significant export response to changes in foreign demand in all sectors. Also, Southeast Asia and Latin America exhibit a high sensitivity of exports to changes in demand in the same sector, when we control for demand from other sectors. In particular, exports of motor vehicles respond strongly to changes in demand only in the CEE-10 and in Southeast Asia, the two most rapidly expanding regions in general economic terms. We take this as evidence that the sector and regional composition of trade matters crucially for overall trade growth and that structural change at the sector and country level explains a substantial part of the apparent "trade puzzle."

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# Annex

Table A1

## List of Countries and Regional Grouping

| | |
|---|---|
| **EU-15:** | |
| AUT | Austria |
| BEL | Belgium |
| DEU | Germany |
| DNK | Denmark |
| ESP | Spain |
| FIN | Finland |
| FRA | France |
| GBR | United Kingdom |
| GRC | Greece |
| IRL | Ireland |
| ITA | Italy |
| LUX | Luxembourg |
| NLD | Netherlands |
| PRT | Portugal |
| SWE | Sweden |
| **CEE-10:** | |
| BGR | Bulgaria |
| CZE | Czech Republic |
| EST | Estonia |
| HUN | Hungary |
| LTU | Lithuania |
| LVA | Latvia |
| POL | Poland |
| ROM | Romania |
| SVK | Slovakia |
| SVN | Slovenia |
| **CIS & Balkans:** | |
| ALB | Albania |
| BIH | Bosnia and Herzegovina |
| BLR | Belarus |
| HRV | Croatia |
| MDA | Moldova |
| MKD | FYR Macedonia |
| MNE | Montenegro |
| RUS | Russian Federation |
| SER | Serbia |
| UKR | Ukraine |
| **NAFTA:** | |
| CAN | Canada |
| MEX | Mexico |
| USA | United States of America |
| **Latin America:** | |
| ARG | Argentina |
| BOL | Bolivia |
| BRA | Brazil |
| CHL | Chile |
| COL | Colombia |
| CRI | Costa Rica |
| ECU | Ecuador |
| NIC | Nicaragua |
| PAN | Panama |
| PER | Peru |
| PRY | Paraguay |
| SLV | El Salvador |
| URY | Uruguay |
| VEN | Venezuela |
| **Southeast Asia:** | |
| BRN | Brunei |
| CHN | China |
| IDN | Indonesia |
| IND | India |
| JPN | Japan |
| KHM | Cambodia |
| KOR | Korea, Rep. |
| LAO | Lao PDR |
| MMR | Myanmar |
| MYS | Malaysia |
| PHL | Philippines |
| SGP | Singapore |
| THA | Thailand |
| VNM | Vietnam |

*Source: OeNB.*