



ECFIN Economic Brief

Competing within global value chains

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1. Introduction

The increasing spread of global value chains (GVCs) worldwide has been one of the most prominent features of the global economy for the last three decades. Production of goods and services is sliced into stages so that intermediate inputs are sourced from most efficient producers often located across the globe. Although this phenomenon is not new, the intensity with which it shapes the current economic reality has increased recently.

The main objective of this paper is to look at the engagement of the EU and its major trading partners in global value chains and international outsourcing.¹ The paper is divided into three parts. Following a short introduction focused on some theoretical aspects of international outsourcing, in section 2, the position of the EU and its major trading partners in the GVCs is analysed. One of the methods used in this respect is to calculate the share of intermediate production in imports and its evolution over time. A country that serves as an assembly platform tends to register relatively higher shares of intermediate production in total imports, compared to its trading partners. Not surprisingly, this proved to be true for China for whom an outstanding proportion (over 70%) of intermediate production in non-oil imports has been registered. The results obtained for the EU (above 50%) show a relatively stable, close to the world average share but the aggregate, as stressed in section 2, masks important differences between Member States. The relatively low share of intermediate goods in non-fuel imports revealed for the US economy could be explained by the concentration of the US economy in 'upstream' activities (e.g. the production of high value-added intermediate inputs that are exported to low labour-cost countries for processing) rather than downstream activities (e.g. the final assembly of products).

International outsourcing stimulates competitive pressures between economies engaged in two-way trade within global value chains. In order to give complementary insight into how the economies cope with increased competitive pressures stemming from internationalisation of production, in section 3,

Summary

The increasing spread of global value chains (GVCs) worldwide has been one of the most prominent features of the global economy for the last three decades. Production of goods and services is sliced into stages so that intermediate inputs are sourced from most efficient producers often located across the globe. Although this phenomenon is not new, the intensity with which it shapes the current economic reality has increased recently. The magnitude and geographical reach of the great trade collapse in 2008-2009 and a rapid rebound of trade flows thereafter proved the important role of GVCs as 'the world economy's backbone and the central nervous system' that magnified and accelerated transmission of the crisis. In this context, it is more and more evident that a trade analysis based on gross measures has become less accurate. Intermediate goods (parts, components) which cross the border several times as they are used for further processing are counted several times. Therefore additional ways of looking at world trade flows would allow deeper understanding of the true trade linkages between countries.

The relatively stable evolution of the proportion of intermediate production in total imports over time in case of the EU contrasts with the outstanding increase in the case of China, due its role as a 'processing hub' in Asia. However, the increasing comparative advantage of China in research intensive goods partly reflects the gradual shift of its competitive position in the global production sharing. This change has an important policy implication for Europe going forward, as even more competitive pressures are to be expected.

revealed comparative advantages (RCAs) based on net trade flows (not exports only) of the countries in low, medium and high technology products are measured and compared geographically and over time. Interesting conclusions can be drawn on the initial question, namely on how the EU positions itself in the international specialisation process. Results of the analysis presented in section 3 show that the EU economy has a comparative advantage in research intensive (both difficult and easy to imitate) goods and capital intensive goods, while the US specialisation pattern is mainly based on research intensive goods. China's economic strength still lays in low cost labour, which clearly supports the view that there is a complementary relationship between the Chinese and the European economies. However, the increasing comparative advantage of China in research intensive, easy to imitate goods partly reflects the gradual shift of the competitive position of China in the global production sharing, implying an upgrade of the country's production pattern towards knowledge intensive goods. This change could have important policy implications for Europe going forward, as even more competitive pressures between China and European economies are to be expected. On the contrary, the specialisation pattern of the Russian economy is solely based on raw material intensive goods.

Although an analysis of the impact of the current economic crisis on global value chains functioning goes beyond the scope of this paper (as long-term data series are indispensable in order to disentangle cyclical from structural changes) some preliminary observations can be made. The redistribution of market shares in favour of emerging market economies, like China, continued during the crisis implying that the pre-crisis trend of strengthening of their positions within GVCs continues.

Additional, temporary factors like natural disasters, that hurt Japanese and Thai economies in 2011, caused significant disruptions within Asian global value chains spreading worldwide in the remaining part of the year. This could partly explain the slight fall in the share of intermediate production in Chinese imports in 2011, as presented in section 2, implying also some consolidation within regional and global production chains. However, it has to be seen, which developments persist, when the global economy recovers its stability and dynamism observed before the crisis.

2. Outsourcing, offshoring and global value chains

The international outsourcing process is motivated by a number of factors, of which enhancing efficiency is the most important. One way of achieving this goal is to source inputs from more cost-efficient producers, either domestically or internationally, and either within or beyond the boundaries of the firm.¹ Indeed, from the perspective of the traditional trade theory, the major motivation for partial reallocation of production process abroad would be to reduce costs. However new trade theories provide additional drivers of international outsourcing. The possibility to reap the benefits of scale economy, an increasing demand for product differentiation, imperfect competition and geographical distance are the most prominent examples. Moreover, international outsourcing allows to access markets often highly protected from external competition (for instance in case of non-WTO members), and therefore could be seen as a way firms avoid additional costs caused by protectionism. **Outsourcing and offshoring as well as vertical and horizontal specialisation** are the key concepts closely related to the notion of a global value chain and they need to be clearly distinguished. A global value chain describes the full range of activities undertaken to bring a product or service from its conception to its end use and how these activities are distributed over geographic space and across international borders.² According to the OECD definitions, domestic or international outsourcing takes place when parts of the production process are reallocated between firms, while offshoring occurs when firms source inputs from abroad, either from affiliates allocated abroad or from other international companies. Thus, international insourcing means reallocation of a certain stage of the production process abroad but within the same multinational company.³

1 OECD (2008), *Staying Competitive in the Global Economy*, Compendium of Studies on Global Value Chains, OECD Secretary General

2 Sydor A.(2012), *Global Value Chains: Impact and Implications*, Foreign Affairs and International Trade Canada, also: GVC Initiative at Duke University <http://www.globalvaluechains.org>

3 Fenestra R.C., Taylor A.M.(2008) *International trade*, Worth Publishers, New York

Graph 1: Outsourcing, insourcing and offshoring - defined



Source: OECD (2008), *Staying Competitive in the Global Economy. Compendium of Studies on Global Value Chains*, OECD Secretary-General

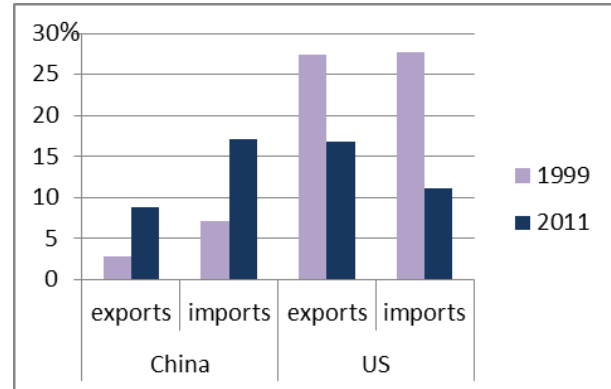
Vertical specialisation implies that countries specialise in subsequent stages of production in which they have a comparative advantage (the traditional trade theory) and the cost reduction arguments plays the major role. In the case of **horizontal specialisation**, the reallocation of production of goods and services takes place mainly between advanced economies where goods in question are of similar use and quality. Thus, horizontal specialisation is mainly driven by scale economy and demand for goods differentiations (again the arguments of new trade theories). The central point of attention in this paper is on vertical specialisation and the associated spread of global and regional value chains mainly between advanced and emerging economies.

2. Position of the EU and its major trading partners in GVCs

2.1 General trends in EU trade

The **geographical reorientation of extra-EU trade flows towards emerging economies** is one of the most striking features of the EU trade in the last decade. This is particularly visible for the EU trade with China which increased dramatically at the expense of advanced economies' shares in the EU market, most prominently the US.

Graph 2: Shares of the US and China⁴ in the extra-EU trade in 1999 and 2011



Source: Own calculation based on Comext.

Indeed, while the US was still the EU major trading partner in 2011, with the share of some 14% in the EU total extra-EU trade (average of exports and imports) compared to 27% in 1999, China, with some 13% was very close (5% in 1999). When separating exports and imports (graph 2), the share of China in EU total imports increased dramatically (to 17% in 2011 from 7% in 1999). Similarly from the US perspective, China became the major source of US imports, but Canada and the EU have remained by far the major destinations for US exports so far. These changes confirm that the rise of China as the exporting super-power is not independent of the relative decline of some traditional global players.

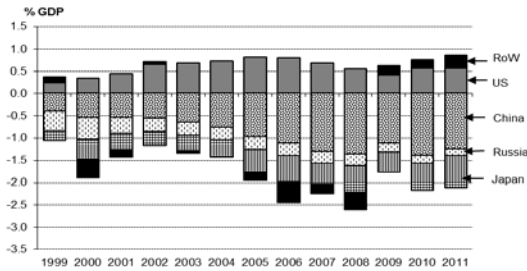
Despite large divergences between EU member states in terms of trade performance,⁵ the overall EU trade balance has remained relatively stable, compared to much larger and persistent trade imbalances registered by the US (in terms of deficits) or China (surpluses) in the last decade. Looking at the geographical breakdown of the EU trade balance, the deficit with China stands out, increasing gradually up to 2008. The picture for the most recent period is rather mixed (graph 3). The valid question is whether the persistent deficit with China can be explained by the complementarity of both economies and their specific positions in the global value chains. This issue is subject of a closer analysis in the following sections. Contrary to the EU-China trade deficit, the

⁴ Data for China Mainland is used in this study.

⁵ Analysis of trade performance at a Member State level can be found for example in: Quarterly Report on the Euro Area, Volume 11, no 2(2012), section 3.

EU trade balance with the US is marked by a long-term surplus. The surplus started to decline in 2007 when the US economy cooled down, but it increased again thereafter.⁶

Graph 3: Geographical breakdown of the EU trade balance in % of GDP



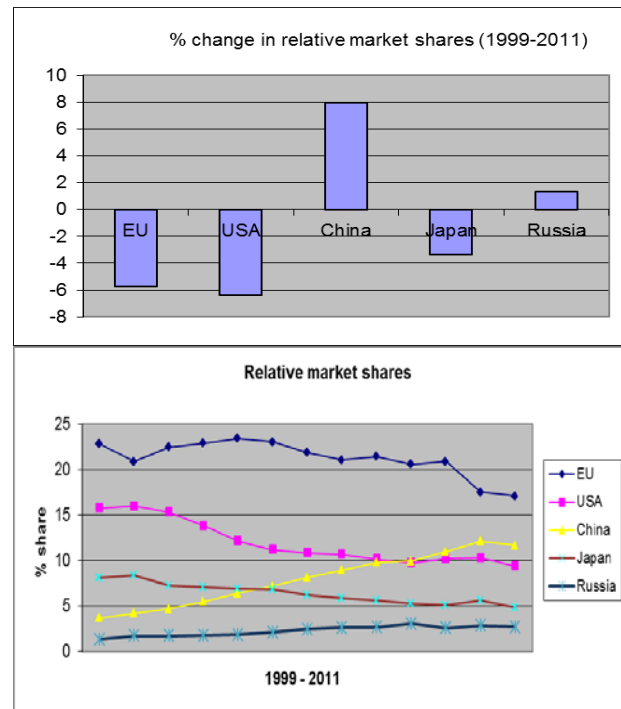
Source: Own calculations based on Comext and AMECO.

In the context of trade balance analysis, an important caveat should be kept in mind. Trade statistics are gross measured, meaning that the value of products that cross borders several times for further processing are counted multiple times. This applies particularly to bilateral trade between highly complementary economies. A report by Koopman (2008), for instance, reveals that the actual 2007 trade balance between the EU and China would be approximately 40% lower if estimated in value added terms.⁷ This example shows how far more disaggregated methods of measuring international trade flows could influence the understanding of global imbalances.

Looking at the evolution of relative market shares, it appears that the EU has managed to preserve its position as a global trade leader responsible for the largest relative export market share in the world. Over the pre-crisis period, the EU relative export market share remained rather stable, moving in the range of 23-21% (excl. intra-EU trade). On the contrary, for the last three years a substantial drop of the EU relative market shares has been registered. This phenomenon could be to a large extent explained by exchange rate and price developments as well as the relatively weaker trade

dynamism of the EU compared to its competitors, who were more successful in overcoming the crisis.

Graph 5: Evolution of relative export market shares (for the EU:*intra-EU trade excluded)



Source: Own calculations based on the IMF DOTS database.

The redistribution of market shares between developed and emerging economies is particularly visible. Although it is only a selective and limited snapshot of the global economy, it shows the magnitude of the on-going repositioning of major economies in the world market place. The loss of some 6pp that the US economy cumulated from 1999-2011 was more than counterbalanced by the 8pp. market share gain in favour of the Chinese economy in the same period.

To sum up, the analysis of the geographical breakdown of the EU overall trade balance reveals a relatively stable evolution over the last decade, with the deficit with China standing out. Also, the redistribution of export market shares within the global economy in favour of emerging economies, like China, provides evidence on how successful the economies are in term of competitiveness by specialising in certain stages of production (tasks rather than products) within global value chains. The analysis of the position of the EU and other

6 The countries presented in the graph were chosen taking into account the largest size of the EU deficit/surplus. For instance, in the case of other BRICS countries the EU trade balance was much less significant in the period under analysis.

7 Koopman R., Wang Z., Wei S-J. How much of Chinese Exports is Really Made in China? Assessing Domestic Value-Added When Processing Trade is Pervasive, NBER Working Paper 14109

economies within GVCs presented in the following sections will allow drawing conclusions on the possible complementary and competitive relations between the economies in question.

2.2. Trade patterns and the share of intermediate production in imports

Trade patterns in the world economy have been changing over the last decades reflecting new production structures influenced by new technologies, changing demand patterns and gradual integration of economies into global production chains. This trend has been supported by trade liberalisation resulting in higher proportion of trade in GDP in most countries in the world, including the EU. Such an economic environment created increased opportunities to reallocate parts of the domestic production process abroad. International outsourcing changed the way trade flows occurs nowadays with high import content of exports and an increasing proportion of intermediate goods in total imports. Therefore, given the increased two-way trade flows between countries, it is important to complement the gross measures of world trade by additional ones that would allow deeper understanding of true trade linkages between countries. The challenge of developing measures of trade in value added (like internationally comparable input-output tables) has been recognised at a multilateral level and caught a lot of attention in the last couple of years.⁸

One of the ways to look into the issue of GVCs is to measure trade in intermediate goods between countries. Trade in intermediate goods is perceived as the ‘blood stream that irrigates global and regional supply chains’.⁹ A high proportion of parts, components and other semi-finished goods in a country's total trade, indicates stronger integration of the economy in question into global and regional value chains. One of the ways used in the context of

trade in tasks is to look at the share of intermediate goods in a country's total imports. A common way to measure trade in intermediate goods is to use the UN Broad Economic Categories (BEC) classification, which groups commodities by main end-use, distinguishing between consumption, capital and intermediate goods (more information on specific sectors’ classification is provided in Annex 1).

The results for the EU show the overall share of intermediate goods in imports remaining stable and slightly below the world average (of 53-54% over the last 15 years)¹⁰. However, the aggregated figure for the EU masks important differences between EU Member States. While the intra-EU trade pattern goes beyond the scope of this analysis, previous studies indicate that in several of the newly acceded EU Member States (NMS) intermediate goods are by far the largest component of trade and their importance is growing over time. This trend suggests an increasing participation of NMS in the regional and global division of the production process.¹¹ The regional dimension seems particularly important given that in some cases close to 80% of overall exports is directed to the EU27 internal market.¹²

Table 1: The EU: intermediate and final goods in non-fuel imports 2000-2011(% and bn USD)

	2000	%	2007	%	2011	%
Intermediate production	381,93	49,54	771,81	50,58	890,29	52,45
Final goods:						
Capital goods	174,88	22,68	316,57	20,74	329,1	19,39
Consumption goods	161,18	20,91	366,21	24,00	410,46	24,18
Not classified	53	6,87	71,45	4,68	67,66	3,99

Source: Own calculations based on UN Comtrade

The relatively low and decreasing share of intermediate goods in non-fuel imports in the case of the US economy could be explained by the concentration of the US economy in ‘upstream’ activities (e.g. the production of high value-added intermediate inputs) rather than downstream activities (e.g. the final assembly of products). The former would imply a high share of intermediate inputs in total imports and this is the case revealed by the results obtained for China. Not surprisingly, the

⁸ For instance: the OECD –WTO ‘Made in the World’ initiative, see: WTO, OECD (2011) Trade in value-added: concepts, methodologies and challenges, also: Timmer M.P., Erumban A.A., Los B., Stehrer R., De Vries G. (2012), WIOD: World Input-Output Database New measures of European Competitiveness: A Global Value Chain Perspective, Background paper for the WIOD project presentation at the conference Competitiveness, trade, environment and jobs in Europe: Insides from the new World Input Output Database, Working Paper No 9

⁹ WTO, IDE-JETRO (2012) Trade Pattern and global value chains in East Asia: From trade in goods to trade in tasks

¹⁰ WTO, IDE-JETRO (2012)

¹¹ European Economy (2006)

¹² European Economy (2009), Five years of an enlarged EU. Economic achievements and challenges

outstanding share of more than 70% in 2011 confirms the role of China as assembler within global value chains. According to the WTO, China was not only the top importer of intermediate goods in Asia; it was the largest in the world. This reflects the recent development of processing activities in China, based on inputs from other Asian economies, as well as the development of a domestic industry.¹³ In the context of the EU trade balance and the persistent EU trade deficit with China presented in section 1, it should be kept in mind, that China is a 'hub' within Asia, trading intensively in semi-final goods (intermediate production) within the region. Therefore, the EU deficit with China could be interpreted as a deficit with other Asian economies (from which China also sources parts and components that following local processing are exported to Europe and the US). As noted by Baldwin (2012): *The booming intra-regional trade in Asia has transformed the region (...) into what is called 'Factory Asia' – a manufacturing powerhouse that turns millions of products at world-beating process.*¹⁴ The outstanding performance of China in terms of trade integration into the global economy over the last decade was accelerated by China's accession to the WTO in 2001.¹⁵

Table 2: The US: intermediate and final goods in non-fuel imports, 1995-2011(% and bn USD)

	1995	%	2000	%	2007	%	2011	%
Intermediate production	323,74	45,71	473,22	42,27	682,14	41,40	770,53	42,78
Final goods:								
Capital goods	201,77	28,49	336,47	30,06	461,63	28,01	506,48	28,12
Consumption goods	158,63	22,40	259,36	23,17	440,24	26,72	461,01	25,60
Not classified	24,04	3,39	50,43	4,51	63,84	3,87	63,13	3,50

Table 3: China: intermediate and final goods in non-fuel imports, 1995-2011 (% and bn USD)

	1995	%	2000	%	2007	%	2011	%
Intermediate production	84,27	66,33	154	75,21	632,77	74,17	1055,8	71,59
Final goods:								
Capital goods	34,68	27,30	40,26	19,66	184,14	21,58	302	20,48
Consumption goods	6,45	5,07	8,75	4,28	33,63	3,94	67,18	4,56
Not classified	1,65	1,30	1,74	0,85	2,6	0,30	49,72	3,37

Source: Own calculations based on UN Comtrade

13 WTO (2012)

14 Baldwin R (2012) Sequencing Asian Regionalism: Theory and Lessons from Europe, Journal of Economic Integration 27(1), Graduate Institute, Geneva University

15 World Bank (2003), The Impact of China's WTO Accession on East Asia, Policy Research Working Paper 3109, IMF (2004), China: International Trade and WTO Accession, WP/04/36 and others.

The results for Russia contrast with the findings for the economies analysed so far. The share of intermediate production in non-fuel imports remains well below the world average what reflects the limited integration of Russia into the global production structures. Also the uneven evolution of this share since the mid-90s cannot confirm any gradual internationalisation of the economy in the context of GVCs, particularly when comparing to China. A high proportion of capital goods in imports may indicate on-going industrialisation associated with the catching-up process of the Russian economy. The accession of the country into the World Trade Organisation could be seen as an important mile stone of the opening process of the Russian economy towards the global economy, possibly also international outsourcing.¹⁶

Table 5: Russia: intermediate and final goods in non-fuel imports, 1996-2011 (% and bn USD)

	1996	%	2000	%	2007	%	2011	%
Intermediate production	16,71	28,30	14,81	51,45	65,53	33,22	106,59	38,08
Final goods:								
Capital goods	9,62	16,28	6,71	23,32	73,24	37,13	90,38	32,29
Consumption goods	13,93	23,59	7,18	24,96	47,34	24,00	76,15	27,21
Not classified	18,8	31,84	0,08	0,28	11,12	5,64	6,8	2,43

Source: Own calculations based on UN Comtrade

3 Distribution of comparative advantages

The emergence of new centres of economic growth and the integration of new players into the global economy challenges existing comparative advantages and competitiveness of countries. The key driver is for countries to move up the value chain and become more specialised in knowledge-intensive, high value-added activities.¹⁷ Given the on-going redistribution of export market shares towards emerging markets and the permanent trade deficit of the EU and the US with China, it is important to explore in parallel the redistribution of comparative advantages between these economies. Therefore, in the following section, specialisation patterns of different

16 The WTO accession process in case of Russia took some 19 years to complete. The negotiations have been finalised and Russia became a full member of the WTO in August 2012.

http://www.wto.org/english/thewto_e/acc_e/a1_russie_e.htm

17 OECD (2008)

factor intensity categories will be analysed. The question to be answered is whether the EU has maintained its position in high-tech intensive areas and whether the Chinese economy remains complementary to the EU economy?

The most popular indicator of a country's trade specialisation is the revealed comparative advantage (RCA) index first proposed by Balassa (1965)¹⁸. It measures a country's exports of a commodity relative to its total exports and the corresponding export performance of a set of countries. However, in order to estimate the specialisation of economies which are involved in international outsourcing and, in order to take into account two-way trade flows between countries, a modified version of the RCAs index developed by CEPII will be employed.¹⁹ It is based on net trade and not exclusively on export performance. Studies based on traditional RCA index (solely on export side) usually overestimate the specialisation of such countries as China in research intensive and high-tech goods as high value-added components are often imported for assembly and they are re-exported to advanced economies.²⁰ The modified formula used for calculating the RCAs index is presented in Annex 2.

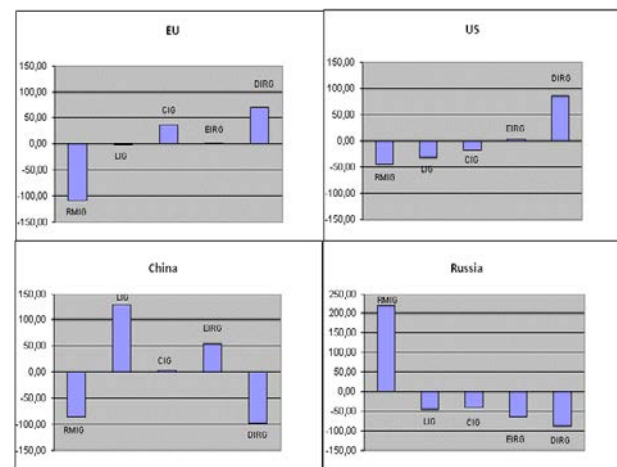
The higher (lower) the RCA index, the more (less) successful the trade performance of the country in question is in a particular area of industry. The methodology developed by CEPII gives the contribution of different product groupings to the cyclically adjusted trade balances of the particular country. The overall specialisation patterns can be compared between countries but not the absolute figures obtained for the different categories since the 'structural' trade balance is an indicator of how individual countries allocate resources to their own specific industries.²¹

Finally, in order to calculate the RCA indices for different goods, the SITC values have been divided into five different subsectors, accordingly to factor intensity used for production, following the method

developed by Hafbauer and Chilas (1974) and Yilmaz (2002). These five categories include: raw material-intensive goods (RMIG), labour-intensive goods (LIG), capital-intensive goods (CIG) and research-intensive easy to imitate (EIRG) and research-intensive difficult to imitate goods (DIRG). More detailed breakdowns of each of these product categories are presented in Annex 3.

As the focus of the analysis is on long-term structural trends in trade in goods and the impact of the crisis on the functioning of the GVCs' structures goes beyond the scope of the analysis, calculations have been made for the year 2006, in order to avoid significant data fluctuations before and after the trade collapse of 2008/2009 so that the data would closer represent steady state.²² Finally, the focus of the analysis is on structural trends in trade in goods, while trade in services is not included.

Graph 6: Revealed comparative advantages of the EU and its major trading partners



Source: Own calculations based on UN COMTRADE

The results presented in graph 6 show that the EU economy has a comparative advantage in research intensive (both difficult and ease to imitate) goods and capital intensive goods. The US specialisation pattern is concentrated in research intensive goods. As expected, both economies are disadvantaged in labour- and resource intensive goods. These findings

18 Balassa B. (1965) Trade Liberalization and Revealed Comparative Advantage, the Manchester School, no.33

19 CEPII (2008) Sectoral and geographical positioning of the EU in the international division of labour, Report for DG Trade, European Commission

20 ECB (2008) Globalisation, trade and the Euro area economy

21 European Economy (2006)

22 Although the impact of the crisis on the global value chains goes beyond the scope of this paper, it constitutes an interesting subject for future research as soon as longer-term data series will be available, enabling to disentangle structural shifts that may take place in the post-crisis period.

are broadly in line with results obtained while looking only at the export side.²³

China's economic strength still lays in low cost labour, which clearly supports the view about complementary relationship between the Chinese and the European economies. However, the comparative advantage of China in EIRG reflects the increasing competitive position of China in the global production sharing, implying an upgrade of the country's production pattern towards knowledge intensive goods.²⁴ When comparing the results to those obtained in former ECFIN studies²⁵, it is visible that the advantage in the EIRG category increased. This change has very important policy implication for Europe, translating into more competitive pressures between China and European economies. Furthermore, the dynamic increase of Chinese FDI flows confirms this statement. For instance, Chinese FDIs in Europe are nowadays less dominated by resource objectives and trade facilitation but more concerned with a full range of industries and assets spread widely across Europe.²⁶ Findings for China contrast significantly with results obtained for Russia. The specialisation pattern of Russian economy is solely based on raw material intensive goods.

Finally, an interesting question posed by a number of economists²⁷ is how the current economic crisis influenced the functioning of international trade including global value chains. While it is too early to analyse structural changes for which long-term data series are indispensable, some preliminarily observations can be made based on the analysis presented in this paper. First, the redistribution of

relative export market shares between emerging and developed economies continued during the crisis. The major Asian economies, for instance, managed to resist relatively well the severe impact of the financial crisis, i.e., thanks to their lower exposure to the US subprime mortgage market, but on the contrary, the trade channel played a significant role here, due to the overall high openness of emerging market economies. Additionally, natural disasters that hurt the Japanese and Thai economies in 2011 caused significant disruptions within Asian global value chains spreading worldwide in the remaining part of the year. This could partly explain the slight fall in the share of intermediate production in Chinese imports in 2011, as presented in section 2. However, it has to be seen which developments persist when the global economy regains the stability and dynamism observed before the crisis. With no doubts, the significant trade collapse in 2008-2009, particularly in intermediate goods, and a rapid rebound of trade flows thereafter proved the dynamic role of global value chains in the world economy.

4. Conclusions and policy implications

Despite increased competitive pressures between economies trading in tasks within global value chains, and notwithstanding the devastating impact of the current economic crisis, the EU has maintained its position as the largest trade power in the world economy. While highly integrated in both region-wide and global value chains, the overall specialisation of the EU economy remains concentrated in research and capital intensive goods. **To preserve its position as a global trade leader**, a significant effort in terms of competitiveness improvements of the EU as a whole²⁸ remains imperative given the rising role of emerging economies in global trade. The study results obtained for China with regard to an increased competitive advantage in research-intensive-easy-to-imitate goods confirm this statement.

Complementary methods of measuring trade flows gain in importance in the context of the on-going structural changes towards more intensive two-way

23 See for example: Quarterly Report on the Euro Area, Volume 11, NO 2(2012), where simple export shares by factor intensity are presented.

24 However, if parts and components imported by China for simple assembly are becoming more sophisticated in terms of high-tech content, the specialization of China in research-intensive goods could be overestimated.

25 Compare: Table 9 in European Economy (2006) where the averages of RCAs for factor intensity categories for the period: 1992-2003 are presented.

26 Hanemann T., Rosen H.(2012), China Invests In Europe. Patterns, Impacts and Policy Implications. Rodium Group

27 For example: World Bank (2010) Trade and Recovery. Restructuring of Global Value Chains or World Bank (2010) The Global Apparel Value Chains, Trade and the Crisis. Challenges and Opportunities for Developing Countries and others.

28 Although the focus of this paper is on global trade patterns, it should be stressed, that in particular EU-internal imbalances and persistent competitiveness divergences between Member States need to be addressed, for details see: European Economy (2010) Surveillance of Intra-Euro-Area Competitiveness and Imbalances

trade within GVCs which cannot be fully explained by gross measured trade statistics. For instance, the debate on global imbalances could be significantly influenced when trade balances were analysed at a more granular level. According to existing literature, if trade balances were estimated in value added terms, some trade imbalances (including the EU trade deficit with China) shown by gross measured trade data would be less significant. Finally, additional policy implications emerging from the analysis relate to the trade policy design. For instance, trading in tasks within GVCs implies that traditionally designed trade defence instruments need to be redefined in order to take into account the economic interest of European companies involved in international outsourcing.

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Annex 1 : Broad Economic Categories (BEC) classification of imports

THE CLASSIFICATION BY BROAD BASIC CLASSES OF GOODS

ECONOMIC CATEGORIES (19 BEC Categories) IN THE NATIONAL ACCOUNTS (SNA)

1 FOOD AND BEVERAGES

11 PRIMARY

111* Mainly for industry (1) Intermediate goods

112* Mainly for household

consumption (2) Consumption goods

12 PROCESSED

121* Mainly for industry (3) Intermediate goods (Semi-Finished)

122* Mainly for household (4) Consumption goods

2 INDUSTRIAL SUPPLIES N.E.C

21 PRIMARY (5) Intermediate goods

22 PROCESSED (6) Intermediate goods (Semi-Finished)

3 FUELS AND LUBRICANTS

31 PRIMARY (7) Intermediate goods

32 PROCESSED

321* Motor Spirit (8) Intermediate/Consumption goods

[Dual Use Goods]*

322* Other (9) Intermediate goods (Semi-Finished)

4 CAPITAL GOODS (Except Transport + parts and accessories)

41 Capital goods (ex. transport) (10) Capital goods

42 Parts and accessories (11) Intermediate goods (Parts & Components)

5 TRANSPORT EQUIPMENT AND PARTS AND ACCESSORIES THEREOF

51 Passenger motor cars (12) Capital / Consumption goods

[DUAL USE GOODS]*

52 Other

521* Industrial (13) Capital goods

522* Non-industrial (14) Consumption goods

53 Parts and accessories (15) Intermediate goods (Parts & Components)

6 CONSUMER GOODS N.E.C.

61 Durable (16) Consumption goods

62 Semi-durable (17) Consumption goods

63 Non-durable (18) Consumption goods

7 GOODS not elsewhere specified (19) Mix of national accounts classes*

(Includes military equipment, postal packages and special transactions)

* These three BEC categories are not allocated to specified national accounts classes of end-use. They are dual use goods categories such as BEC 8 (motor spirit); BEC 12 (passenger motor cars); and BEC 19 (goods NES).

Annex 2: RCA indicator based on the trade balance (CEPII)

According to equation (0), the revealed comparative advantage is standardised by total trade for the exporting country considered.

$$RCA_{icl}^t = \frac{1000}{(X_{i..}^t + M_{i..}^t)} * \left[(X_{icl.}^t - M_{icl.}^t) - (X_{i..}^t - M_{i..}^t) * \frac{(X_{icl.}^t + M_{icl.}^t)}{(X_{i..}^t + M_{i..}^t)} \right] \quad (0)$$

with:

$X_{i..}^t$ and $M_{i..}^t$ respectively country i total exports and imports in year t

$X_{icl.}^t$ and $M_{icl.}^t$ respectively country i total exports and imports of products belonging to the cluster cl in year t

$(X_{icl.}^t - M_{icl.}^t)$ the observed trade imbalance of country i for the cluster cl in year t .

$\frac{(X_{icl.}^t + M_{icl.}^t)}{(X_{i..}^t + M_{i..}^t)}$ the weight of cluster cl in country i exports in year t .

$(X_{i..}^t - M_{i..}^t) * \frac{(X_{icl.}^t + M_{icl.}^t)}{(X_{i..}^t + M_{i..}^t)}$ the theoretical imbalance of country i for the cluster cl in year t .

Source: CEPII

Annex 3 : Breakdown of total trade by factor intensity

Raw Material Intensive Goods

- SITC 0 Food and Live Animals
- SITC 2 Crude Material, Inedible, Except Fuels (excluding 26)
- SITC 3 Mineral Fuels, Lubricants and Related Materials (excluding 35)
- SITC 4 Animal and Vegetable Oils, Fats and Waxes SITC 56 Fertilizers

Labour-Intensive Goods

- SITC 26 Textile Fibers
- SITC 6 Manufactured Goods Classified Chiefly by Material (excluding 62, 67, 68)
- SITC 8 Miscellaneous Manufactured Articles (excluding 88, 87)

Capital-Intensive Goods

- SITC 1 Beverages and Tobacco
- SITC 35 Electric Current
- SITC 53 Dyeing, Tanning and Colouring Materials
- SITC 55 Essential Oils and Resinoids and Perfume Materials; Cleansing Preparations
- SITC 62 Rubber Manufactures, n.e.s.
- SITC 67 Iron and Steel
- SITC 68 Non-Ferrous Metals
- SITC 78 Road Vehicles

Easy-to-Imitate Research-Intensive Goods

- SITC 51 Organic Chemicals
- SITC 52 Inorganic Chemicals
- SITC 54 Medicinal and Pharmaceutical Products
- SITC 58 Plastics in Non-Primary Forms
- SITC 59 Chemical Materials and Products, n.e.s.
- SITC 75 Office Machines and Automatic Data-Processing Machines
- SITC 76 Telecommunications and Sound Apparatus and Equipment

Difficult-to-Imitate Research-Intensive Goods

- SITC 57 Plastics in Primary Forms
- SITC 7 Machinery and Transport Equipment (includes semiconductors / excludes 75, 76, 78)
- SITC 87 Professional, Scientific and Controlling Instruments and Apparatus, n.e.s.
- SITC 88 Photographic Apparatus, Optical Goods n.e.s; Watches and Clocks.

Source: Yilmaz (2002) based on earlier work by Hufbauer and Chilas (1974)