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Trade in Value Added of Countries Involved in TTIP: EU-US Comparison

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INTRODUCTION

The proliferation of global production networks has fundamentally altered the geography and complexity of global production (Baldwin 2014; OECD 2013; Timmer *et al*. 2014; Johnson 2014), affecting the labour markets of both developed and developing countries (Stone and Bottini 2012). It is estimated that most trade today is in intermediate inputs – over 50 percent of goods trade and almost 70 percent of services trade.[1] However, what we observe goes beyond trade in intermediate goods – countries are specializing in particular stages of the production process, adding value along global value chain. Los *et al*. (2015) document that in almost all product chains, the share of value added outside the country-of-completion has increased since 1995. It is also argued that there are signs of a transition from regional production systems to so-called 'Factory World' (Baldwin and Lopez-Gonzalez 2014).

The aim of this paper is to present key facts concerning trade in the value added of those countries participating in the Transatlantic Trade and Investment Partnership (TTIP). In particular, we describe how involvement in global production networks (GPN) varies across EU countries with respect to the United States. After describing the key concepts, we locate them within recent economic literature and present the results of an empirical exercise, comparing the domestic and foreign content of the analysed countries' exports.

GLOBAL PRODUCTION NETWORKS (GPN), GLOBAL VALUE CHAINS (GVC) AND TRADE IN VALUE ADDED (TIVA) – KEY CONCEPTS

There is no unique understanding of these terms in the economic literature, but GPN can be understood as networks that combine concentrated dispersion of the value chain across the boundaries of the firm and national borders, with a parallel process of integrating hierarchical layers of network participants. The concept of GPN is strongly linked to that of global value chains (GVC) and trade in value added (TiVA). GVC involve "all the activities that firms engage in, at home or abroad, to bring a product to the market, from conception to final use" (OECD 2013, 8) and nowadays

[1] See: OECD remarks prepared for G20 Trade Ministers Meeting (6 October 2015), http://www.oecd.org/about/secretary-general/istanbul-g20-trade-ministers-meeting-remarks-at-session-on-the-slowdown-in-global-trade.htm.

reflect such characteristics of the global economy as: the growing interconnectedness of economies, the specialization of firms and countries in tasks and business functions; networks of global buyers and suppliers; the fragmentation of production and resulting labour market effects. In recent literature the term GVC tends to be employed more frequently. TiVA describes a statistical approach used to estimate the sources of value that is added in producing goods and services. It traces the value added by each industry and country in the production chain and allocates the value added to these source industries and countries (OECD, WTO and UNCTAD 2013).

IMPORTANCE OF GPN, GVC AND TIVA

The potentially uneven distribution of gains from GPN across countries, firms and workers has attracted attention in policy debates and in scientific research. Recent trade theories redefined production sharing as trade in tasks (e.g. Baldwin and Robert-Nicoud 2014), rather than in the common meaning of trade in intermediate products. This is linked to so-called supply chain unbundling: some production stages previously performed in close proximity were dispersed geographically because the ICT revolution made it possible to coordinate complexity at a distance and the vast wage differences between developed and developing nations made such separation profitable (Baldwin 2014).

There are many empirical studies on the labour market consequences of global production sharing. Empirical tests of 'trade in task' theories have mainly considered the impact on labour in developed countries. Unsurprisingly, much of the attention has been put on outcomes visible in US labour market, primarily considering the effects of offshoring to developing countries. Recent US-focused research seem to have been particularly concerned with: the results of occupational exposure to globalization due to rising import competition from China (Autor *et al*. (2013) called it 'the China syndrome'), the polarisation observed in the US labour market (that is, rising employment in the highest and lowest paid occupations – see Autor *et al*. (2013)) and the general impact of trade in value added on wages and job displacement (Crino 2010; Ebenstein *et al.*, 2014). Similar analyses were performed to assess the response of labour markets to global production sharing and TiVA in advanced Western European countries (such as Denmark: Hummels *et al*. 2014; Germany: Baumgarten *et al*. 2013).

HOW TO MEASURE TRADE IN VALUE ADDED?

The fragmentation of global production calls for a new approach to measuring trade, and particularly to measuring value-added trade. The involvement of different tasks and stages performed in distinct locations has made production segmentation more complex and almost impossible to measure using gross trade statistics. Vertical specialization measures decompose a country's exports into domestic and foreign val-

ue-added share based on a country's input–output (IO) table. The computation of input-output tables for several economies within the WIOD project (Dietzenbacher *et al.* 2013) facilitated further empirical work on GVC and TiVA. Koopman *et al.* (2014) proposed a more elaborated decomposition of gross exports into various domestic and foreign components, integrating previous measures of vertical specialization and value-added trade (such as: Johnson and Noguera 2012) into a unified framework. Wang, Wei and Zhu (subsequently referred to as WWZ; Wang *et al.* 2013) developed Koopman's methods to measure a sector's position in an international production chain that varies by country, and to quantify revealed comparative advantage that takes into account both offshoring and domestic production sharing. We shall rely on WWZ method in our empirical exercise.

TRADE IN VALUE ADDED IN THE EU AND THE UNITED STATES

Using WIOD's input-output data we have employed WWZ methodology to decompose gross export *(EXP)* into main four components: domestic value-added absorbed abroad *(DVA)*, value-added first exported, but eventually returned home *(RDV)*, foreign value-added *(FVA)* and pure double counted terms *(PDC): EXP = DVA+RDV+FVA+PDC. RDV* can be treated as a proxy of off-shoring. Right hand side variables can be further decomposed depending on whether they refer to final or intermediate goods, e.g. *FVA* is the sum of foreign value added used in final goods exports and foreign value added used in intermediate exports, while each can be sourced from the direct importer or other country. Similarly, *DVA* is the sum of domestic value-added absorbed abroad in final goods exports, absorbed by direct importers and intermediates re-exported to third countries. The following two figures show the effects of a basic decomposition performed for 14 EU countries and USA for the years limited by data availability (1995–2011).

Figure 1 shows that foreign value added (FVA) accounted (on average) for 18.45 percent of European gross exports in 2011 – approximately twice the figure in the case of the United States. It means that the analysed sample of EU economies was far more dependent on value added performed in other countries than the American economy. It is also clear that there is significant cross-country variability, with some EU economies (IRL, LUX, SVK, CZE) having considerably higher foreign content in their exports than, for instance, GER or FRA. Additionally, between 1995 and 2011 we observe the rise in foreign value added *(FVA),* implying a drop in domestic value added *(DVA),* visible both in the United States and in Europe.

The US economy relies more on offshoring than Europe. As shown in Figure 2, the *RDV* component of gross exports (value-added first exported and then returned home) for the United States is on average 6 times higher than for the analysed EU group. Off-shoring intensity varies greatly across EU countries,

Figure 1
**Foreign value added**
Sorted according to 2011 value
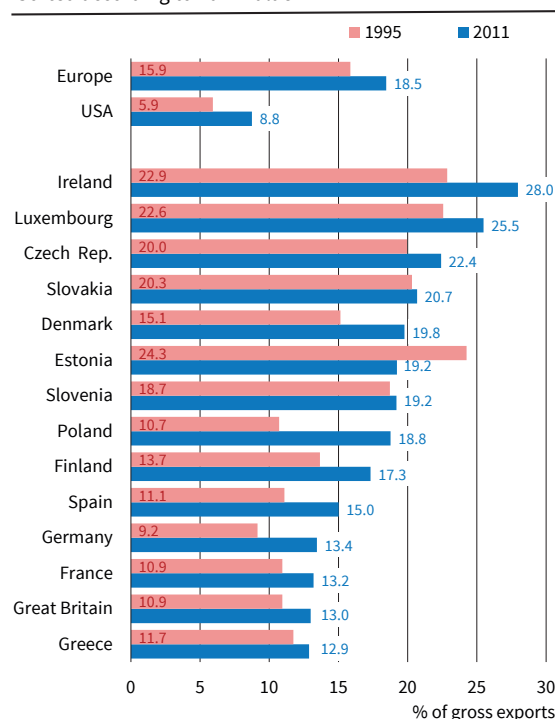
Source: Own elaboration based on WWZ methodology and WIDD data.
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with Germany (DEU) being the leader. As far as trends in time are concerned, only a slight change in *RDV* took place. Germany is one of the exceptions to this rule, as the dependency of its exports on offshored elements is decreasing.

Figure 2
Value added first exported - returned home
Sorted according to 2011 value
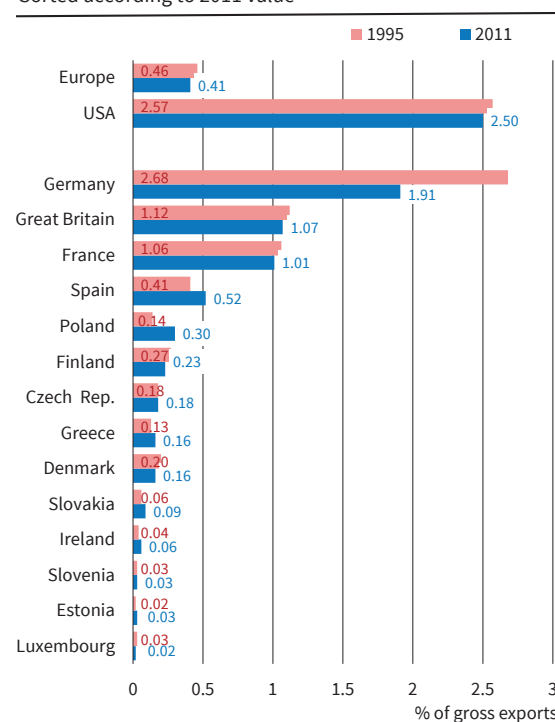
Source: Own elaboration based on WWZ methodology and WIDD data.
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Whether or not the above described trends will change after TTIP remains an interesting empirical question to be answered in the future. The resulting effects on the labour markets of the countries involved described by Felbermayr and Larch (2013) are also plausible.

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