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GLOBAL VALUE CHAINS AND THE  
TRANSFORMATION OF GLOBAL TRADE

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# Introduction

International trade has always been studied thoroughly for the positive and negative implications it could have on global welfare and economic growth.

Over the years, there have been several views in favour of and against trade liberalization, and this issue is still heavily discussed. Indeed, the world debate between liberals and protectionists in recent years has been extremely animated. The globalization and countries integration through Multinational Corporation, FDI, and GVC, is opposed to a spiral of protectionism and disintegration that is threatening the global economic convergence.

After the Second World War, free international trade expanded and started to be seen as desirable. On the ground of the studies of Smith and Ricardo, liberalism spread and trade started to be seen necessary to reach a better global efficiency and economic growth, allowing each country to focus and specialize in the more productive sector. The belief was that by trading what they are good at, both developed and developing countries could benefit from international trade and prosper.

However, there always have been some thoughts that did not see trade as a mean of improving social well-being. In particular, the need to recover from the Great Crisis of 2008 induced many countries to review their economic policies and go back to protectionist measures. From that point on, trade started to be seen as the main cause of several modern society's evils, such as the damage of emerging economies, unemployment, exploitation of child labour, and environmental impact.

Currently, a new phenomenon is entering this dynamic debate about the benefits and risks of trade liberalization. Global Value Chains are making economies increasingly interconnected and interdependent, affecting the way we think about trade and its opportunities and threats. Although doubts about free trade and its effects on developing countries, on employment and on the growth of several economies are still valid and deep, they should be reviewed in the light of GVCs emergence. It is necessary to take into account the effects that the dispersed production have and may have on the world economy and how this production pattern alters and amplifies

pros and cons of trade openness.

Within GVCs, several countries, each performing a different stage of production or task, collaborate to produce a final good. The dispersion of production causes intermediate goods to cross border multiple times in order to be collected and assembled into the final product. In this way, GVCs make countries increasingly interdependent and raise the cost of protection, seeming to be a further argument in support of the liberalization of trade.

The essay aims to provide, at first, an overview of the evolution of trade, the main economic trade theories, and the emergence and characteristics of Global Value Chains. It also analyses the development of this phenomenon and the opportunities and risks that it can bring to the countries engaged in the production chains. In particular, this essay examines the Asian experience and in which way Asia-Pacific region exploited the benefits offered by the integration into GVCs.

On these bases, the main objective of the essay is to support the belief that, despite the legitimate concerns on the side-effects, the integration of countries into Global Value Chains, if correctly addressed and facilitated, have the potential to tremendously benefit global growth.

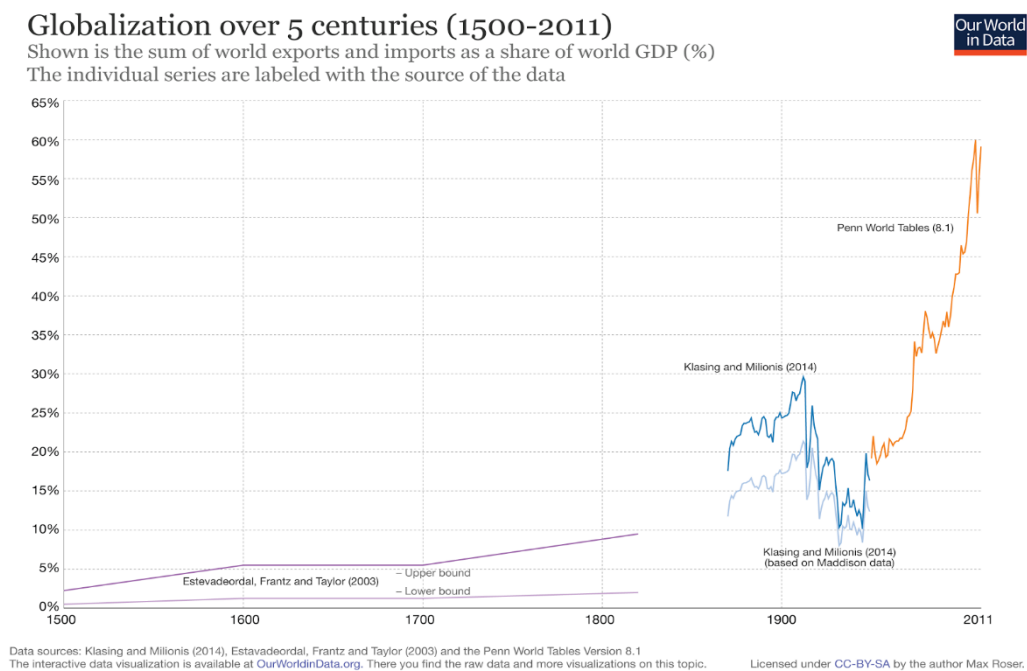
# 1. Trade Policy

International trade and the analysis of international dynamics have never been as crucial as they are in the 21st century. Managing the increasing interdependence of nations is critical for the well-being and stability of nations. This chapter intends to analyse and offer an overview of the evolution of international trade and of the most relevant past theories, to gain a structured view of the background that promoted the flourishing of GVCs.

## 1.1 Global Trade historical overview

International trade, growing remarkably in the last couple of centuries, has greatly changed our world in many divergent ways.

To understand the importance that international trade has acquired over the years and the future possible global impact that trade could have, a brief analysis on historical and recent trade patterns around the world has to be made.



This chart, representing the sum of global exports and imports as a share of world GDP (%), from 1500 to 2011, well sums up the exponential evolution of global trade. Calculating trade

openness through the sum of exports and imports across nations, usually expressed as a share of GDP is the most common measure of international integration. This sum is in 2011 higher than 50% of global production, an impressive result if compared with the below 10% at the turn of the 19th century.

Analysing the graph three main phases are identifiable: a persistently low-growth international trade phase (1500-1900), a collapse phase in the interwar period (1900-1950), and ultimately a trade explosion phase (1950-2011).

The phenomenon of international economic interdependence is relatively recent. Before the 19th century, trade was caused primarily by transoceanic flows of a modest amount of luxury goods (mainly sugar and spices) and slaves between empires and colonies. Even if dynamic, the level of trade was relatively low: as the graph shows, the sum of imports and exports in that period never exceeded 10%.

The first period of intensive growth in the level of international trade, the so-called “first wave of globalization”, was caused by the technological advances in the 19th century and succeeded a persistently low international trade phase. Over this century, trade became increasingly important even if in some countries, such as the Netherlands with the so-called Dutch Golden Age, it already was. Financial capital flowed between the various countries and the gold standard, around 1870, facilitated international trade in goods and capital. This trend continued until 1913, with an annual percentage of trade growth of more than 3%.

This “golden age” ended with the First World War and attempts to restore the previous status quo were definitively abandoned due to the great depression of 1929, when a trend reversion occurred. In the interwar period, the decline of liberalism and the rise of nationalism caused a considerable reduction of international trade and world economic integration collapsed.

After the Second World War, the decrease in transport and communication costs due to technological advances, and the spread of preferential trade agreements, made possible a growth in global trade openness faster than ever before. Free international trade, allowing countries to “do only what they do best”, expanded and became to be seen as desirable, leading to a better global efficiency and economic growth.

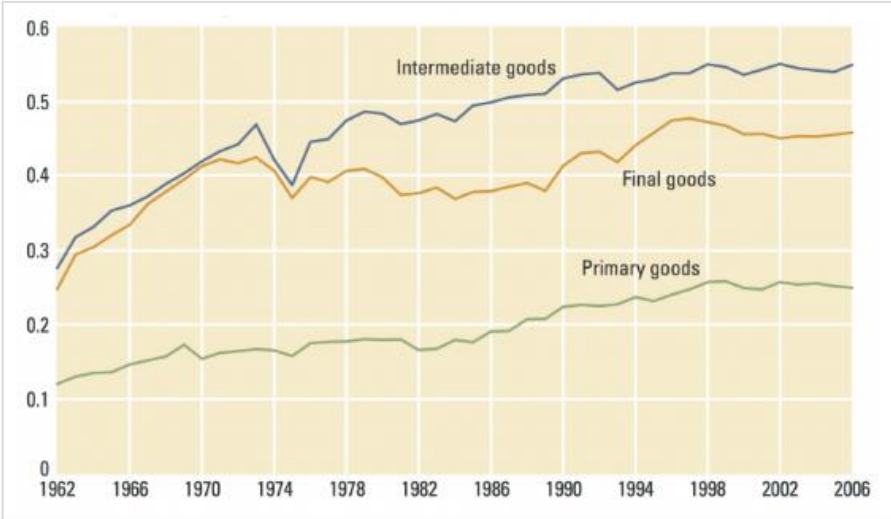


Some changes in the trade pattern occurred between the first and the second “wave of globalization”. The first was characterized by the exchange of different goods across countries, the second by the exchange of similar goods between similar countries with no comparative advantage differences.

With the second wave, intra-industry trade started to acquire more weight than inter-industry one. Because the proportion of this kind of exchange in world trade has continuously grown over the years, an analysis of the intra-industry trade is necessary to understand current patterns of global exchanges. In fact, intra-industry trade accounts for 25-50 % of global trade flows and is of paramount importance in the exchanges between developed countries, which represent the majority of world trade.

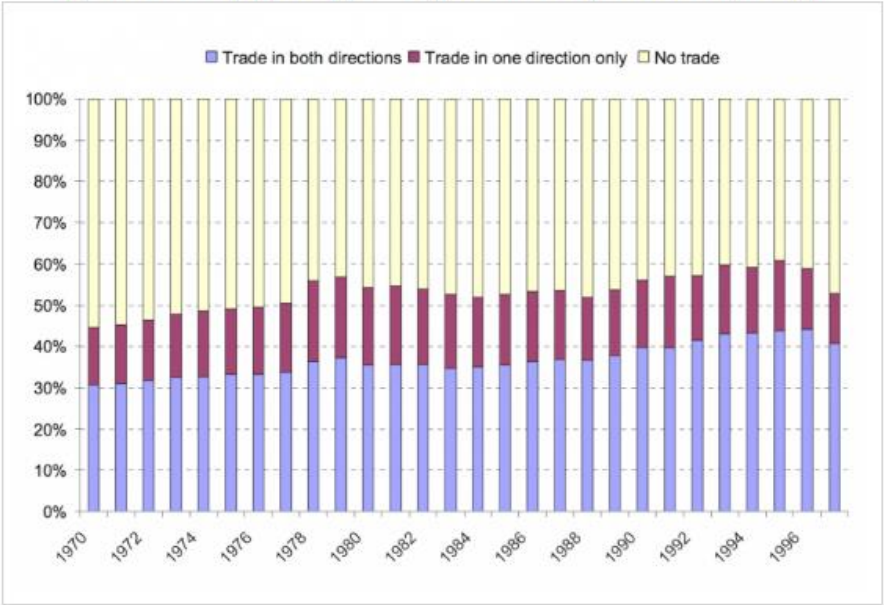
The graph below shows how intra-industry trade is composed, with respect to different type of goods: primary, intermediate and final. As it can be seen, intermediate goods account for the majority of intra-industry trade. Nowadays, the exchange of intermediate goods in international trade is far more important compared to the past. Intermediate goods trade is of great relevance as it allows countries to specialize in the production of specific parts of the finished product, and has granted the emergence of GVCs. This topic will be discussed in more detail, when getting to the heart of GVCs.

Share of intraindustry trade by type of goods – Figure 6.1 in UN World Development Report (2009)<sup>#</sup>



A noteworthy fact about international trade is that bilateral trade is becoming increasingly crucial. More and more countries that export goods to a country, also import goods from the same country. Evidence of this can be found in the study by Helpman et al. (2007). Country pairs are grouped in three categories: not trading, trading in both directions, and in one direction only. It can be easily seen that the majority of trading relationships - sum of middle and bottom fractions - are bilateral. The section representing bilateral trade concurs for a great portion of the growth in international trade in the second half of the 20th century. Bilateral trade has developed even thanks to the spread of bilateral trade agreements, which have the objective of improving the economic status of both countries through a mutual benefit obtained by the facilitation of exports and imports between them. However, multilateral trade agreements have juxtaposed bilateral trade in recent years. These agreements are more difficult to negotiate because they involve different countries but trade facilitation among many countries allowed and characterized the development of Global Value Chains. This topic will be deepened later.

Distribution of country pairs by type of trade (bilateral, unilateral, or non-trading), 158 countries, 1970-1997 – Figure 1 in Helpman et al. (2007)<sup>7</sup>



As it can be deduced from this brief overview, international trade has grown impressively until 2012. However, after 2012, annual import growth has halved compared to the level before the Great Recession and is recording a long period of below-trend growth. As the slowdown in trade level has not been reflected in economic activity, the ratio of imports to GDP has sensibly

declined. Possible causes of this registered trade slowdown could be deriving from *compositional effects* variations and from the alteration of the relationship between trade and GDP caused by changes in *structural factors* as trade liberalisation and the presence of Global Value Chains.<sup>1</sup> Compositional effects affect global income elasticity of trade and cause a shift of activity among countries or demand components with a different sensitivity of trade to GDP. Structural factors affect the relationship between trade and activity at the level of individual countries.

Although in recent years there have been reversals<sup>2</sup> in the international trade growth trend, the interconnected global economy is a reality that has gone too far to be reversed in the future.

## 1.2 International trade theory

Theoretical studies on international trade have always been of paramount importance in economic theory. In no section of the political economy exists such a large discrepancy of theoretical and practical opinions as the one that reigns in international trade.

At the same time, there is no other question in the field of this science of such a great importance for the well-being and stability of the nations. Due to their trade policy, poor countries have been able to transform themselves into empires and strong countries have fallen.

One recurrent feature of pure international trade theory<sup>3</sup> is the hypothesis that trade takes place in the barter form or that money has no influence on the underlying real variables. The consequence of this hypothesis is that there is a situation of continuous balance in the international accounts of each country with regard to all others: there are no balance-of-payments problems.

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<sup>1</sup> “Occasional Paper Series, Understanding the weakness in global trade. What is the new normal?” No. 178/ September 2016

<sup>2</sup> We can think of the “Great Collapse” (2008-2009), the biggest drop in trade over the past 20 years, and of the latest trade slowdown.

<sup>3</sup> Pure theory deals with the causes, structure and volume of international trade; the benefits of international trade and their distribution; the determination of relative prices of goods; the international specialization; the effects of the imposition of duties and quotas; etc.

Over time, several scholars have been questioning the advantages and disadvantages that international trade can bring to developed and developing countries; some being in favour of trade, as Hume, Smith, Ricardo, Heckscher and Ohlin, others skeptic about trade as the only mean of improving social well-being, such as Hamilton, Raymond and List.

In particular, Hume and Smith were the founding fathers of anti-mercantilist thought. From the 16th to the 17th century, the mercantilist doctrine rose, followed in practice by the great eighteenth-century absolute monarchies.

Mercantilism was based on the belief that the wealth of a nation was identified by the quantity of gold and silver held, and therefore importing these metals was critical for countries' development. According to the supporters of this theory, to reach a favourable balance of trade, with exports higher than imports, international trade must be regulated, encouraging exports and limiting imports.

To minimize imports, it was necessary to be self-sufficient and, consequently, to create an "internal trade" of natural resources and goods with colonies. At the same time, protectionism and regulation of both the foreign and the domestic trade, was used to stimulate domestic manufacturing.

With his work, "Of the Balance of Trade"<sup>4</sup>, Hume contrasted the protectionist policy promoted by mercantilism affirming:

*"It is very usual, in nations ignorant of the nature of commerce, to prohibit the exportation of commodities, and to preserve among themselves whatever they think valuable and useful. They do not consider that, in this prohibition, they act directly contrary to their intention."*

In his statement, Hume firmly supports trade openness, anticipating its importance for the achievement of a better global welfare.

The great philosopher and economist Adam Smith, in his masterpiece "The Wealth of Nations"<sup>5</sup>, likewise Hume, attacked mercantilism, laying the foundations for the classical

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<sup>4</sup> First published in 1752.

<sup>5</sup> "An Inquiry into the Nature and Causes of the Wealth of Nations", first published in 1776.

political economy. He identified three main causes of prosperity within a country: division of labour, nature of wages, and foreign markets. Smith refuted mercantilist doctrine demonstrating that trade benefits both countries engaged in it, and that specialization in production allows for economies of scale, which lead to an improvement in efficiency and growth. Smith's conclusion was that, by trading what they are good at, countries could benefit and prosper as a result, a theory resumed later by Ricardo.

Among those doubtful about free trade and its benefits, Hamilton, Raymond and List argued that openness to international trade, without any kind of regulation, could harm the emerging economies. Previous advances and economies of scale of other nations, foreign customs duties, and wars, have forced the nascent industries to use the restriction of trade to develop and achieve economies of scale, moving from the agricultural up to the industrial stage. However, the proponents of the "*Infant-industry argument*" affirmed that protectionism could be reasonable and efficient only until it hampers the economic development of the nation that adopts it.

Among all the problems of the political economy, with the increasing interdependence of nations due to trade in services, in intermediate and final goods, flows of money, and investment in each other's economies, international trade has acquired a preponderant interest. The study and interpretation of international dynamics has never been as crucial as it is in the 21st century, when international economic relations have acquired an unprecedented importance.

Part of the past trade theory remains relevant to the 21st-century world economy, such as the studies on gains from differences in resource endowment and opportunity costs between countries, and the importance of economies of scale in production.

However, is necessary to take in consideration and analyse emergent theories, such as Global Value Chains studies, to better understand current global trade dynamics and potential evolutions.

### 1.2.1 The concept of comparative advantage: the Ricardian Model

The British economist David Ricardo introduced the concept of comparative advantage in the early 19th century and illustrated the potential benefits from trade. In this model, the crucial variable to explain the existence and structure of international trade is technology. A difference in “comparative costs” reflects differences in production techniques.

The understanding of two main concepts is essential to analyse the Ricardo’s model of trade: opportunity cost and comparative advantage. Opportunity cost is the quantity of one good that could have been produced with the resources used to produce a given quantity of another good. When the opportunity cost of producing one good in terms of another is lower in one country than it is in other countries, the first has a *comparative advantage* in producing that good. The existence of differences in opportunity costs and comparative advantage among countries offer the possibility of a mutually beneficial rearrangement of world production.

The theory seeks to show that exchange is beneficial to all the participating countries, even when one of the two countries is superior to the other in the production of both goods. Indeed, the necessary condition that leads to the benefits of trade is not the absolute but comparative cost.

To briefly explain Ricardo’s theory we consider *two economies*, Home and Foreign, which can produce *two goods*, cheese and wine. For trade to occur we assume a barter economy and we assume that labour is the only factor of production. Labour force can freely and costlessly move only between the two markets within a country, not between the two countries. In this way, workers are allowed to move to the market with a higher wage. Moreover, the technology of production is measured in unit labour requirements ( $a_{LC}$ ,  $a_{LW}$ ) and differences in labour costs represent differences in technology among countries. Both countries face a resource constraint (total labour supply=L) when choosing which mix of the two goods to produce. The production possibility frontier (PPF) represents the different mixes of products the economy *can* produce<sup>6</sup>

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<sup>6</sup> In a one factor of production economy, the PPF is a straight line represented by the equation:

$$L \geq a_{LC}Q_C + a_{LW}Q_W$$

Its slope equals the opportunity cost of producing one good in terms of the other, for example cheese in terms of wine ( $a_{LC}/a_{LW}$ );  $a_{LW}$  and  $a_{LC}$  are the unit labour requirements in wine and cheese production;  $a_{LW}Q_W$  and  $a_{LC}Q_C$  represent the labour used in producing respectively wine and cheese.

but to evaluate what the economy is willing to produce we need to consider and compare the relative prices.

With no profits, the hourly wage in one sector will equal the value of what a worker can produce in one hour and thus workers would be willing to move to the more productive sector, because of its higher wages. In this way, the economy will specialize in the production of the good with the relative price that exceeds its opportunity cost in terms of the other good<sup>7</sup>. Without international trade, each country has to produce both goods and the relative prices of goods would be equal to their relative unit labour requirements.

Once we allow international trade and assume that Home country has a comparative advantage in producing one good, cheese for example, relative prices of goods would no longer depend entirely on domestic considerations.

When we consider the linkage between the markets of the two goods and thus the relative trade supply and demand curves in a general equilibrium analysis, we observe a convergence of prices as the result of specialization. World relative price of both goods would end up between its pre-trade levels in the two countries. International exchange is therefore beneficial for both countries. It is clear that the terms of trade should be between the two comparative costs without being equal to either of them. If it were equal to one of the two, the country with the comparative cost equal to the terms of trade would have no benefit from trade, as the internal exchange ratio would be the same as the international exchange ratio. This means that the country could get the other good at the same internal cost.

Ricardo got to the conclusion that trade can be mutually beneficial to the nations engaged in it through international specialization and, in spite of several misconceptions<sup>8</sup>, his model continues to be of great relevance in current economic theory.

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<sup>7</sup> Assuming no profits, the hourly wage will equal what a worker can produce and thus,  $P_c/a_{lc} = P_w/a_{lw}$  and  $P_c/P_w = a_{lc}/a_{lw}$ . When the relative price of cheese is higher, wages would be higher in the cheese sector and workers would be willing to move from the wine to the cheese sector. When this is the case, the economy will specialize in the production of cheese.

<sup>8</sup> Among the most common misconceptions: free trade is beneficial only if your country is strong enough to stand up to foreign competition; foreign competition is unfair and hurts other countries when it is based on low wages; trade exploits a country and makes it worse off if its workers receive much lower wages than workers in other nations.

### 1.2.2 The Heckscher-Ohlin Model

Ricardian framework of comparative advantage, previously explained, influenced most trade theories and continued to be developed in the following centuries. The Heckscher-Ohlin<sup>9</sup> theory is one example of international trade study influenced by Ricardo's comparative advantage. The main intuition of the model is that every country would specialize in the production of the good that uses relatively intensively the factor of production relatively abundant. This theory introduces two important assumptions: international identity of production function and individuals' preferences, and fixed intensity of use of factors of production in the identical production technologies. On the base of these assumptions, this model take in consideration differences in factor endowments as the only driving force of international trade. Each country would export the good that is relatively intensive in the use of the factor of production more abundant and imports the other good.

The Heckscher-Ohlin model puts the ground for two other fundamental prepositions: the Stolper-Samuelson theorem and the Rybczynski theorem. The first affirms that the rise of the price of one good, cloth for example, compared to another, food, causes an increase in the real wage, the price of the factor used intensively more, and a decrease in the rental rate of the other factor. This latter change, therefore, will reduce the proportion of labour used in the production of both goods.

The Rybczynski theorem asserts that, assuming fixed relative prices of goods, an increase in the quantity of one factor of production, lead to a reallocation of the factor of production across sectors. In particular, a biased expansion of production possibilities causes the supply of the good that uses this factor intensively to increase and the supply of the other to fall.

The above-analysed theorems are believed to be the core of the orthodox theory of international trade.

The Heckscher-Ohlin model more accurately describes the present-day intra-industry pattern of trade between developed countries compared to Ricardo's, as technological differences between them are no longer so definite to be the main cause of international trade.

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<sup>9</sup> Ohlin won the Nobel Memorial Prize, in 1977.



Since it is considered crucial, Heckscher-Ohlin's theory has been subjected to numerous studies aimed at ensuring its correspondence to reality. However, empirical data did not always support so closely the conclusions of H-O theory, as proved by one of the best-known results, “*Leontief paradox*<sup>10</sup>”. Leontief's complex elaborations and results indicated that the United States apparently exported high-intensity products and imported high-intensity capital products. Since the United States was considered the relatively more capital-abundant country, Leontief's results contradicted the Heckscher-Ohlin theory (according to which this country ought to have been an exporter of goods to High capital intensity).

Precisely this contrast between theoretical studies and empirical data pushed further theorists to deepen the studies on researches on international trade patterns, such as the new trade theorists and Krugman.

### **1.2.3 New trade theory**

International trade theory developed further thanks to the abandonment of the main simplification hypotheses, such as perfect competition. New trade theory (NTT) is a collection of international trade economic models, developed in the late 1970s and early 1980s, which focus on the role of increasing returns to scale and network effects. In these studies, the assumption of constant returns to scale is relaxed and sometimes arguments against totally free trade, such as “infant-industry” argument, are supported.

NTT focuses on the growing relevance of intermediate goods on total world trade and stresses the importance of firms rather than sectors in evaluating opportunities and challenges of international trade.

Among the various theories proposed, the theory of availability explained international trade by the fact that each country imports the goods that are not available on its market, because of the unavailability of natural resources or prohibitive production costs. The first aspect is similar to Heckscher-Ohlin's theory, while the second identifies the causes of international trade in

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<sup>10</sup> In 1953 Leontief, using the input-output scheme elaborated by himself, calculated - on the basis of the inter-sectoral matrix of the US economy in 1947 - the total capital and labour requirement per unit of composite commodity "exports US 1947 "and per unit of composite commodity "US replacement imports of 1947".

technical progress<sup>11</sup> and differentiation of products<sup>12</sup>.

One noteworthy theory, alternative to Ricardo's comparative advantage, is undoubtedly the one conducted by Paul Krugman<sup>13</sup>.

To understand intra-industry or horizontal trade that currently dominates global patterns of trade, a more detailed analysis of Krugman model is needed. The simultaneous import and export of goods from the same industry had been observed at the empirical level first, and then theoretically explained. According to the previously analysed neoclassical theory, a country imports or exports a given good, but cannot simultaneously be an importer and exporter. Contrariwise, Krugman developed a monopolistic competition<sup>14</sup> model that accurately explains nowadays trade between countries with nearly identical technology and factor abundance, and that trade similar goods to exploit economies of scale<sup>15</sup> potential benefits.

In this model, trade and integrating markets are analysed to have the same effect as growth of market size within a single country. A larger market is the leading force for the well-being of the economy. Larger economies with higher demand as well as production, and thus greater economies of scale, are wealthier. International trade between two countries would lead to a global greater efficiency. In fact, in a global larger market there will be more firms, more sales per firm and lower prices<sup>16</sup>. The total number of firms in the integrated market would be greater than the one of the closed economies, increasing the diversity of products offered, but lower than the sum of the firms of the two isolated economies since some of them would exit the

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<sup>11</sup> New products are a result of scientific research and the innovative country enjoys an initial monopoly. This is intended to end with the imitation of other countries, allowed by trade. Due to the continuous appearance of new products, this component is always present.

<sup>12</sup> Intended as an extension of monopolistic competition to international trade. Different countries produce goods perceived as differentiated by consumers, prices of rivals are given and each country ignores the impact of its own prices on the prices of the economy. Consumer demand for foreign differentiated products is the cause of international trade.

<sup>13</sup> For his analysis of trade patterns and location of economic activity, Krugman won The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2008.

<sup>14</sup> Graph in appendix.

<sup>15</sup> The economies of scale are divided in internal and external, the latter referring to the size of the whole industry. We are now referring to internal economies of scale, increasing returns that apply at the level of individual firms and lead to imperfect competition systems.

<sup>16</sup> When the market size ( $S$ ) increases, the cost schedule ( $CC$ ) rotates downward and the price schedule ( $PP$ ) is not affected.

market.

When firms face the same demand curve but different cost structures, increased competition lead the worst performing firms to exit the market or contract, and the better performing one to expand. The integration of the market would lead the demand curve to rotate, lowering the cost cut-off ( $c^{*17}$ ). In this way, the firms with low operating profits and with marginal costs over  $c^*$  would have to exit the market; the firms with  $c^o < c^{*'} < c^*$  would see their operating profit to contract; the best performing firms, with high profits and low marginal costs, would grow. Each surviving firm would produce more and, exploiting internal economies of scale, the price per unit would fall.

The internal economies of scale argument formalized by Krugman allowed explaining international trade aspects previously not explainable. With monopolistically competitive firms, differences in relative costs, tastes, or technology do not exist and there will be gains from trade in the form of lower prices and greater product diversity.

In a world of no transaction costs, even if there were no comparative advantage, internal economies of scale and its potential benefits would induce countries to entirely specialize in the production of the good offering the greatest internal economies and to trade.

In reality, transaction costs do exist and reduce the profitability of exports, thus limiting complete specialization. Therefore, countries are expected to produce multiple types of products and to trade them even if similar. Whereas neoclassical theory of Ricardo and Heckscher-Ohlin applies when there are differences between agents- in technology or in factor endowments-, economies of scale explain trade between similar agents, the so-called “intra-industry” trade.

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<sup>17</sup> Graph in appendix. The increase of  $n$  lowers the intercept; the increase of  $S$  flattens the demand curve.

### 1.3 Current trade and trends in global economy

The world debate between liberals and protectionists in recent years has been extremely animated. In fact, two contradictory trends are operating in the current global economy. On the one hand, globalization and countries integration through Multinational Corporation, FDI and GVC advance, and Global Value Chains are becoming the backbone of the global economic convergence. On the other hand, a spiral of protectionism and disintegration is threatening countries coalition.

The need to recover from the Great Crisis of 2008 induced many countries to review their economic policies. Spontaneous currency devaluation stopped to be seen as the only force needed to restore domestic goods competitiveness and trade restriction started to rise. The infant industry argument, unemployment problems, exploitation of child labour, damage to some domestic sectors, and environmental impact, have always tested the rampant liberalism and exactly this previous uncontrolled liberalism brought duties and protectionism to the fore. The United States, for example, currently announced the introduction of barriers to the import of European and Asian goods. Supporters of protectionist policies believe the "naive liberal vision" to be the cause of the extraordinary series<sup>18</sup> of foreign-deficits.

In this trend of decreasing foreign transactions, the "onshoring"<sup>19</sup> phenomenon has developed. Companies bring stages of production back inside or near their country, a movement opposed to offshoring, the relocation over the past 20 years of production operations mainly in Asia and Eastern Europe. These companies, more than for purely economic motivations, look for the "made in" added value, guaranteeing quality, control, authenticity and customer proximity<sup>20</sup>.

The increase in onshoring movements, partially motivated by protectionist policies, and the raise of labour costs of critical emerging markets, have even caused a partial contraction in GVCs, a phenomenon more and more important in recent decades.

Clearly, there is no agreement about the doctrine of free trade and about what is the most

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<sup>18</sup> In countries as the United States and Great Britain.

<sup>19</sup> Since the beginning of the great crisis, 376 cases of reshoring in Europe and 329 in North America.

<sup>20</sup> Retrieved from: <http://www.ilfattoquotidiano.it/2017/01/31/il-protezionismo-di-trump-indebolira-tutte-le-economie-compresa-quella-usa/3349848/>

effective way to restart stalled economies.

Some international institutions<sup>21</sup> proposed to limit foreign transactions unless countries meet certain “standards” to protect domestic workers and limit economic imbalance.

However, the resilience and increased interdependence of the global economy contained protectionism and made the G20<sup>22</sup> conclude that trade facilitation and measures against protectionism could tremendously benefit global growth. The importance of global production chains and the growing trade in intermediate inputs<sup>23</sup>, on which whole segments of domestic industries depend, boosted the cost of raising barriers on intermediate goods.

Countries are less and less self-sufficient and increasingly interdependent through the disintegration of the production chain among different countries. Nowadays, not colonies but different countries and companies are starting to be “members of the same team”, contributing to the production of the final good with the specialized intermediate good in which are more efficient.

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<sup>21</sup> For example, the International Labour Organization (ILO) and the International Monetary Fund (IMF).

<sup>22</sup> “Report prepared for submission to the G20 Trade Ministers Meeting. Sydney, Australia, 19 July 2014”.

<sup>23</sup> Representing more than half of the goods imported by OECD economies and close to three-fourths of the imports of large developing economies.

## 2. Global Value Chains

*“The cross-border flows of goods, investment, services, know-how and people associated with international production networks - call it “supply chain trade” for short - has transformed the world.”*

Global Value Chains are an increasingly critical driving force of international trade. Therefore, the study of this paradigm of production and of its evolution is the only way to understand fully the nature of the 21st century geographically dispersed production and trade. This chapter intends to analyse the emergence and development of GVCs, and in which way they connect firms and nations across the globe. Moreover, it aims to investigate the impact Global Value Chains are having on the international economy, and how to manage them to reach strong development benefits.

### 2.1 The concept of Global Value Chains

In the last years, a new paradigm of production emerged, affecting the world economy. The traditional production chain started to be vertically fragmented worldwide through Global Value Chains.

To understand this fragmentation, we need only consider the example of the number of countries involved in the production of an iPhone 4. Korea, Japan, Germany, United States are just some of the countries that perform a specific action or task and collaborate to produce the final good. For instance, Korea is responsible for iPhone’s application processor and battery, United States for its touch screen and Germany for the main device and the radio frequency<sup>24</sup>.

GVCs dramatically changed the organization of production, increasing the interdependence of countries and, thus, causing a breakdown of the mercantilist (“us” versus “them”) view of trade<sup>25</sup>.

The expansion of international trade of parts and components and foreign direct investment

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<sup>24</sup> Source: analysis by HIS-Isuppli (the teardown takes into account only components and does not include other expenses such as manufacturing, software, royalties and licensing fees).

<sup>25</sup> As Lamy (2011) emphasizes.

flows promoted the emergence and development of GVCs.

Currently, GVCs are perhaps the most prominent feature of globalisation. As reported in UNCTAD's 2013 World Investment Report, GVCs importance has been constantly growing. This can be easily deduced by the fact that about 60% of global trade is trade in intermediate goods and services, which are incorporated in different stages of GVCs production.

The complexity of GVCs networks and the large number of disparate analysis conducted on them, led to different definitions and measurements of this new paradigm of production.

The Global Value Chain Initiative at Duke University defined a global value chain as “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.” (DFAIT, 2011, p.86)

Thanks to GVCs, various inputs, coming from different firms (organizational unbundling) or different countries (geographical unbundling), are collected and assembled into a final product. Often the movement of intermediate goods across countries takes place within multinational companies (MNCs) but local enterprises also contribute adding value within the global network system.

A wide range of terms have been proposed to refer to this phenomenon, such as “vertical specialisation”, “outsourcing”, “offshoring”, “internationalisation of production”, “global production networks”, “fragmentation<sup>26</sup>” and so on. Indeed, offshoring, outsourcing and internationalisation of production are different concepts that partially overlap<sup>27</sup>. Outsourcing is a cost-saving practice used by different companies that purchase goods and services by outside suppliers<sup>28</sup> rather than completing it internally. Offshoring consists in the fragmentation of production within different geographical locations of the same firm and it is conducted via foreign direct investments (FDI). Firms purchase abroad goods and services through international outsourcing and international insourcing, with the foreign affiliates exporting to

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<sup>26</sup> Originally proposed by Jones and Kierzkowski, 1990.

<sup>27</sup> As discussed in Molnar et al. (2007).

<sup>28</sup> They can be located in the home country (domestic outsourcing) or outside (international outsourcing).

their domestic parent firms. The internationalisation of production refers to the establishment of affiliates abroad.

Another crucial concept to understand GVCs is the one of middle products, introduced by Sanyal and Jones in 1982. According to this notion, all traded goods incorporate domestic value-added, originated by manufacturing and assembly processes or transportation and retailing services.

From a theoretical point of view, traditional determinants of comparative advantage seems to lead the exchange of intermediate goods and the organisation of stages of production. A comprehensive theoretical framework of GVCs is still missing, but several scholars have studied the application and contributions of the Ricardian and the Heckscher-Ohlin models, discussed in the first chapter. In fact, the possibility of performing different stages of production in different countries allows countries to specialize in the task in which they have a comparative advantage. The specialization cause an increase in the productivity of firms and trade within GVCs partners help the exploitation of these advantages<sup>29</sup>.

In order to understand the economic consequences of this new paradigm of production on trade, labour markets and on topics like inequality and poverty, the emergence and evolution of GVCs have to be deepened.

## **2.2 Drivers and emergence of GVCs**

At this point of the essay, we must wonder what caused the emergence and development of global value chains.

It is undoubtedly difficult to isolate the GVCs drivers from the one which caused the increase in international trade or of foreign direct investment flows over the years<sup>30</sup>.

In fact, the causes that led to the first and second wave of globalization - steam power and ICT development, and the decrease of trade costs in general - are the ones that favoured the birth

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<sup>29</sup> It is advisable to read the article Antràs and Rossi-Hansberg (2009) for a closer look.

<sup>30</sup> As discussed in Hillberry (2011).



and emergence of GVCs. Nevertheless, GVCs not only involve the flows in parts and components but also imply the fragmentation of production and thus a different organisation of production with international flows of investment, people and technology.

So what did change in the nineties to allow the emergence of this new paradigm for the international organisation of production? In short, there was an acceleration of technological progress, a reduction of transport and communication costs and a strong economic and trade liberalisation. Moreover, the will to locate parts of production in low-cost locations by multinationals has greatly increased the volume of FDIs which have in turn affected the development of GVCs.

Several scholars and international organisations analysed these drivers and pointed out technological progress as a key driver of GVCs. As the majority of studies asserts, technological progress opened the door to the international fragmentation, allowing the perfect combination of parts and components produced in different factories and countries. Other drivers, common to different studies and crucial in the coordination of dispersed production activities, are the improved information, telecommunications and transportation technologies.

In 2008, the WTO detects the importance of the decline of international trade costs<sup>31</sup> and the advances in telecommunications technology, which led to lower managerial costs of offshoring<sup>32</sup>. Nonetheless, not the traditional transportation costs but the increased speed and reliability of transportation influence the most the growth of GVCs. As discussed in DFAIT (2011), time becomes a competitive factor. The timeliness of deliveries and thus an efficient international supply of inputs is critical for the smooth operation of the chain. The decrease in the cost and the effectiveness of rapid transportation allowed the growth in worldwide fragmentation of production and had a positive effect on the probability of entering a GVC. This argument is supported by the evidence that a growing share of trade in intermediate inputs is transported by air, a mean of transportation fast but relatively expensive. In fact, the rapid technological change in air shipping over the last decades and the adoption of jet aircraft

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<sup>31</sup> Including the reduction in tariff rates, lower transportation and communication costs and the reduction in the time required to exchange goods.

<sup>32</sup> Including searching costs and costs of monitoring and coordinating foreign activities.

engines led to a *faster* and *more reliable* air transportation<sup>33</sup>. Even Hummels and Schaur (2013) got to the conclusion that trade in parts and components is especially time-sensitive, studying firms' transport choices between air and ocean cargo.

A further driver of the strong increase of trade associated with the development of GVCs in the nineties is believed to be the low price of oil. Although there is little empirical evidence, a low oil price should indirectly affect transportation costs and thus trade. The fact that energy is an input to transportation difficult to substitute and transport costs are important for trade suggests that a low energy price would have a positive impact on trade volumes.

Baldwin<sup>34</sup> has carried out a noteworthy study, underlying the development of Global Value Chains. He studied the historical perspective behind the emergence of global supply chains and analysed factors likely to affect their future evolution. Globalization is thought to be driven by the gradual lowering of trade costs but, according to Baldwin, it should be viewed as two distinct processes.

The first process, the so-called "first unbundling", begun in the late 19th century when the steam power dramatically decreased the costs of trading goods. Before the introduction of the steam power in everyday life, costs of moving goods, ideas and people were prohibitive and few goods could be successfully traded. In this way, factories had an integrated production structure and production and consumption were geographically bundled. Steam power changed this pattern by lowering transport costs and thus making the spatial separation of production and consumption feasible. From that point on, scale economies and comparative advantage made the shipping of goods and resources between nations inevitable.

The international dispersion of production, allowed by the "first unbundling", was countered by its clustering within factories and industrial districts. This paradox can be easily understood if we keep in mind that low transport costs favoured a very complex large-scale production. The manufacturing process complexity needed to be coordinated and extreme proximity

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<sup>33</sup> According to Hillberry, air transportation is one of the main causes of growth in the international production fragmentation, together with the integration in the world economy of new Eastern Europe and East-Asian countries.

<sup>34</sup> Baldwin conducted this study in 2013.

lowered the costs of coordination, such as communication costs.

In the 20th century, ICT lowered the cost of moving ideas internationally and coordination costs, causing a second leap of globalization, the “second unbundling”. Cheaper and more reliable telecommunications allowed the fall of communication costs, and the geographic dispersion of production stages, due to the increasingly economical spatial unbundling of factories and industrial districts. The second unbundling allowed the two-way flows of people, investment, training, things and information, to take place across borders, giving rise to the “21st century trade”.

The first process of globalization was characterized by a “selling things” pattern of trade. This is the one regulated by most current national economic policies as well as WTO. In fact, the GATT/WTO agenda focuses on barriers to selling goods internationally and thus on tariffs, quotas etc.

Bearing in mind that this aspect is still important, WTO trade rules should incorporate and deepen the making things trade system. In fact, global value chains are the most dynamic aspect of current trade and involve a much broader range of policies and barriers, not investigated when regulating the “selling things” trade pattern. Moreover, the development of the nature of trade towards the predominance of trade in intermediate goods generated a greater demand for deeper agreements that could address new cross-border effects and overcome traditional market access problems.

Lawrence (1996) was the first to study the relation between the expansion of production networks in the global economy and the acceleration of the participation to deep agreements. To reach a smooth cross-border production and to facilitate coordination of international business activities, harmonization of policies is needed.

The need for coordination between the countries belonging to the value chains led to a higher demand for deep forms of integration. The relation between international production networks and deep integration between countries can be observed within the three major regional production networks in Europe, in Asia and in North America. The enlargements of the European Union, as well as the accession of China to the WTO in 2001, created an intense net of international trade linkages. Moreover, the North American Free Trade Agreement (NAFTA)

between the US, Canada and Mexico, boosted cross-border trade and foreign direct investments. Despite the commitment of WTO members in reducing global trade barriers, in facilitating business across borders and in improving market access for least-developed countries, WTO trade rules did not fully evolve in parallel with global trade. For this reason, the integration developed mostly through regional trade agreements (RTAs) and unilateral liberalisation by developing nations, such as the Bilateral Investment Treaties (BITs). Regional trade agreements promoted the development of regional value chains that determined the division of labour and specialization in different tasks within single regions.

The two-way relationship between deep trade agreements and production networks trade was investigated by Orefice and Rocha<sup>35</sup>. On the one hand, they pointed out that the greater the depth of an agreement, the bigger the increase in network trade among member countries. The facilitation of trade obtained by deeper agreements causes the expansion of the production networks between member countries, with a different impact across industries. On the other hand, they analysed the share of trade in intermediate goods over total trade to investigate the relation between countries already involved in the international fragmentation of production and their willing to sign deeper agreements with their partners<sup>36</sup>. Orefice and Rocha concluded that exists a strong positive relation between an increase in the share of production network trade over total trade and the depth of an agreement. Moreover, they proved that the likelihood of signing deeper agreements is higher for countries in the Asian region. Several papers<sup>37</sup> analyse and show the importance of production networks in this region. Unlike the “traditional” ones, Asian production networks happen between countries of different income levels, but a deeper integration is needed to let them prosper further. Indeed recent agreements, such as ASEAN’s economic partnership, demonstrate that Asia is already moving towards deeper integration. The Global Value Chain reality in Asia would be analysed in the third chapter of this essay.

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<sup>35</sup> "Deep integration and production networks: an empirical analysis" WTO 2011.

<sup>36</sup> A 10% increase in the share of production network trade over total trade increases the depth of an agreement by approximately 6%.

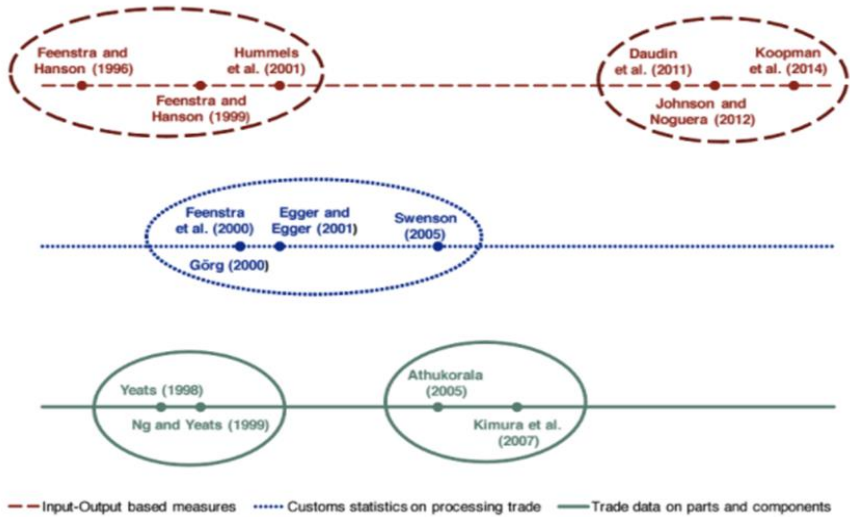
<sup>37</sup> Such as Athukorala and Menon (2010), Ando and Kimura (2005) and Kimura et al. (2007).

### 2.3 Measurement of GVCs

Given the high complexity and innovativeness of Global Value Chains, different methods and data sources have been used over the years to map and measure GVCs at the sectoral and, more recently, at the firm level.

Three main approaches have been used to analyse the *sectoral level*:

- International trade data on parts and components;
- Customs statistics on processing trade;
- Input-output (I-O) based measures.



Source: BCE, Global Value Chains surveying drivers and measures, Working paper series, no 1739/October 2014

The figure above shows a timeline of the main works in these three methodological approaches.

The *first* method uses international trade statistics on parts and components, and compares them to the ones of final products, to measure GVCs fragmentation. This approach is characterized by high coverage, low complexity and allows comparability across countries. However, it heavily relies on the product classification of the Standard International Trade Classification (SITC) and has a low level of accuracy. The most important studies in this approach are

represented in the image above. The first works which used this method of analysis are the ones of Yeats (1998) and Ng and Yeats (1999). Several posterior articles rely on this method to study production fragmentation focusing both in geographic areas and in specific industries. Athukorala (2005) examines the production fragmentation and its implications in East Asia; Lall (2004) measures the fragmentation within the electronics and automotive sectors in East Asia; Kimura et al (2007) examines international production networks in East Asia and Europe.

The *second* approach analyses custom statistics to evaluate fragmentation of production. A narrow measure of fragmentation could be outward or inward processing. Outward processing, for example, captures only the cases in which components or materials are exported for processing abroad and then reimported. Inward processing vice versa. Without this duty relief system, duty would have to be paid twice and this double counting would affect the evaluation of the fragmentation of production. Several studies rely on the use of customs statistics. The figure above represents as the main articles on customs statistics on processing trade, Feenstra et al. (2000), Görg (2000), Egger and Egger (2001) and Swenson (2005). The first underlines the relatively intense use of skilled labour in the US content of imports of machinery and transportation equipment from developed countries. The second examines the increase in US inward processing trade in EU countries, using Eurostat data. The third observes the greater strength in import-competing industries of EU outward processing trade. The last analyses the development of the US offshore assembly program between 1980 and 2000. Moreover, Clark<sup>38</sup> (2006) concludes that firms shift the easier assembly operations to unskilled-labour abundant countries and Baldone et al. (2007) observes that EU processing trade tends to be concentrated in few industries and regions.

The *third* decisive methodological approach is the use of input-output (I-O) tables to combine and compare international trade data. Its accuracy depends on the product classification available and, since very detailed data is typically inaccessible, is often difficult to reach. However, I-O tables enable a cross-industry and time analysis even with scarce and not regularly updated data.

Two main kinds of I-O based measures have emerged in the literature. The first measure,

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<sup>38</sup> For his studies, Clark examined the US tariff code.

computed by Feenstra and Hanson (1996), considers the share of imported inputs in gross output to weight the foreign content of domestic production. In 2012, Feenstra and Jensen updated the I-O sectoral measurements using firm data. The conclusion of most of the analysis that used this measure is an incessant increase of outsourcing of material inputs.

The second method, labelled “vertical specialization” by Hummels et al. (2001), measures direct and indirect import content of exports. It can be used to analyse situations where at least two countries produce goods traded, and thus that cross borders, at least twice. This measurement can be seen as both narrower and broader compared to the first I-O based measure. In fact, it adds the condition of the exportation of some of the output but it considers also that some imported inputs are indirectly used to produce exported goods. The finding of Hummels et al. (2001) that vertical specialization accounted for a good portion of exports of some<sup>39</sup> countries, and that it boosted<sup>40</sup> until 1990, have been updated by Chen et al. (2005). This type of I-O table has been widely used to study the evolution of GVCs. Recent studies of Antràs et al. (2012) and Antràs and Chor (2013), for example, used classical I-O data to evaluate the position of an industry in the production line.

The diffusion of GVCs transformed the world production process and made increasingly difficult to locate the “country of origin” of a specific good. When vertical specialization was limited, gross trade data was compared to value-added data but, with the emergence of GVCs, this assumption is no longer tolerable and gross trade becomes an increasingly misleading guide in analysing value-added exchanges. The participation in GVCs and the increasingly critical trade in intermediates make an integration of the analysis of gross trade flows necessary. To capture the country of origin of the value-added embodied in a product and to examine to what extent each country contributes to the value of the final good, the study of traditional flows has to be complemented with the examination of trade in value-added.

Domestic value-added and foreign value-added together contribute in the production of exports and countries that are large exporters of one product could not add any value to it. Since intermediate goods cross borders several times, the gross value of exports includes double

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<sup>39</sup> Ten OECD and four emerging countries.

<sup>40</sup> Almost 30 percent between 1970 and 1990.

counting and thus overstates the domestic value-added component of exports.

Global I-O databases have been used to measure and analyse trade in value-added. For instance, the Global Trade Analysis Project (GTAP) database has been used in the first measurements of the value-added of trade. Johnson and Noguera (2012a) use it to define value-added exports as the amount of domestic value added embodied in final expenditure in each destination. Daudin et al. (2011) adopt the GTAP database to assign to each country participating in the production of a good the value-added it conferred to it. They measured the share of imported inputs in countries' exports, the one of exports used as inputs in exports of other countries and the domestic content of imports. Koopman et al. (2014) use the same dataset to integrate several existing measures and decompose gross exports in its domestic and foreign value-added content. Furthermore, they broke down domestic value-added into exports ending up in the importer, returning to the exporting country, and exports sent to third countries.

Johnson in 2014 highlights five facts about gross and value-added exports. First, the ratio of value-added exports to gross trade declined from an 85 percent<sup>41</sup>, to around 70% in 2014. We can interpret this, remembering that in the same period the main drivers of GVCs let them spread. The importance of GVCs caused an increasing double counting, observable in the declined highlighted by Johnson. Second, gross trade data overestimates manufacturing trade. When measured in value-added terms, services trade is relatively larger<sup>42</sup>. Third, since the ratio of value-added to gross exports depends on the composition of trade, value-added exports widely change across countries. Fourth, Johnson showed that even between bilateral partners great differences between value-added and gross exports exist. Fifth, changes in this ratio have been heterogeneous across countries: it has declined more in developing countries, due to the rapid increase in the manufacturing share. For a more detailed analysis, a reading of the *Journal of Economic Perspectives* - Volume 28, Number 2 - Spring 2014 - Pages 119-142 is recommended.

Other studies focused on the World Input-Output database (WIOD) to study GVCs, and on OECD-WTO Trade in Value Added (TiVA) in policy-oriented works. The latter has been used to analyse the relative specialisation of countries and the evolution of GVCs, just to name few

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<sup>41</sup> In the 1970s and 1980s.

<sup>42</sup> 40% of total value exports compared to 20% of total gross exports.



examples. OECD (2014) outlines the main policy implications and challenges and opportunities deriving from Global Value Chains. This topic will be discussed later in this chapter.

Finally, a collaboration between UNCTAD and the Eora project brought to a multi-regional I-O dataset timeline on value-added in trade. Thanks to the combination of various data sources, the UNCTAD-Eora GVC database, a continuous database from 1990 to 2010, was produced. The 2013 UNCTAD used this valuable database to offer an overview of GVCs in the global economy and examine the contributions and threats of international production networks for a sustainable global development.

Despite the recent substantial progress, there are still important gaps in the availability of I-O tables. Moreover, the sectoral breakdown is still limited since it does not fully consider the production process complexity. The shortcomings of the I-O matrices measurements are even more visible in the *firm-level data*, more recent and still scarce.

The empirical studies on a firm level are expanding and use both qualitative and quantitative methods. The *qualitative method* uses cross-country firm-level survey data. Although the existence of these data is critical to obtain useful information and empirical evidence, it is very rare due to the confidentiality of data and the use of different criteria for collecting data across countries. Most of the surveys recently carried on, which focus on the internationalisation of production, had available only one-shot qualitative information on the offshoring status of firms. Although these data do not allow an analysis of the dynamics of offshoring, they offer a potential path to validate and examine theories of international fragmentation of production. For instance, Navaretti et al. (2011) use the EU-EFIGE/Bruegel-UniCredit dataset, a representative sample for the manufacturing industry of 7 European countries<sup>43</sup>, to study the internationalisation of production of European firms. The main result from the study is that European firms in different countries have similar behaviours, largely independent of the country in which are located. Although the structure of German firms is not markedly different from similar firms in other European countries, Germany is evidently the country more engaged in international trade, with high portions of exports to trade (39.9%)<sup>44</sup> and substantial FDI

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<sup>43</sup> Germany, France, Italy, Spain, UK, Austria, Hungary.

<sup>44</sup> Followed by Italy (23.4 percent), France (21.3 percent), the United Kingdom (17.2 percent) and Spain (16.7 percent).

flows. Moreover, Germany is deeply engaged in business relations with other European countries and international trade also through value chains. For the production of chemicals, basic metals, machinery, electrical and transport equipment, Germany relies on GVCs and on the supply of intermediates from foreign countries, especially European<sup>45</sup>. Veugelers et al. (2013), studying European GVCs, find out that few larger, more trade-intensive, more innovative and more productive firms are involved in GVCs.

*Quantitative methods* are also used to measure the offshoring status of each firm. Data on imports of intermediate goods is often used to obtain the ratio of imported inputs on the production process of each firm. This quantitative method has been used in several ways by different scholars who alternated the use of variables, the denomination, the type of transaction and the type of products considered.

Most studies use of imports of inputs in real terms as the numerator of the offshoring intensity of a firm, and some of them differentiate intra-firm and arm's-length transactions, since they have different causes and consequences. However, the greater difference between the above-mentioned different approaches concerns the products considered. Some studies measure only materials, others also services inputs, as consultancy, maintenance etc.<sup>46</sup> Even when considering only materials, a further distinction between parts and components, and all materials including raw materials, can be made.

As for the denominator, variables such as total inputs, material purchases, sales, wage bill, value-added and gross output are considered. For instance, Hummels et al. (2014) in their measures of offshoring use both total material purchases and gross output.

Despite the several methodologies adopted, many gaps and great room for improvement in the measurement of GVCs exist.

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<sup>45</sup> To deepen the strong regional production networks in Europe, please refer to the second EFIGE policy report: "The global operation of European firms".

<sup>46</sup> For more information, refer to Görg and Hanley (2005) e Görg et al. (2008).

## 2.4 The role of services in GVCs

The sharp progress in information and communication technology and the fall in telecommunication costs enhanced the development of GVCs also in the services sector.

A critical part of the fragmentation of production is the contribution of services, which have been thoroughly analysed over the years. Without services, as financial, information and business services, at each point of the fragmented production network, manufacturing GVC would not be able to work. Deardorff (2001) discuss that GVCs operations involve more services' inputs than final goods trade and therefore GVCs depend on the availability of efficient and low cost services. Vickery (2005) considers four criteria driving the offshorability of services: the intensive use of ICT, the production of a good transmittable via Internet, the knowledge content codifiability, and the need for no face-to-face interaction. Face-to-face interaction, as technology grows, becomes less and less necessary as well as the geographical proximity. In this way, distance as an international service transaction barrier declines. In the same year, Amiti and Wei examined the main trends in business services, and computing and information services, outsourcing and showed a steady growth in service outsourcing. Abramovsky and Griffith<sup>47</sup> in 2006, on the traces of Vickery, studied the importance of ICT on the cost of offshoring services and found that it facilitates firms' decision in purchasing business services from abroad.

Moreover, Debaere et al. (2013)<sup>48</sup> examine the relation between the availability of services and the offshoring in the manufacturing industry, finding that a greater availability has a positive impact on the ratio of imported intermediates to sales.

Sherry Stephenson in 2012 deepened the contribution of these critical activities within value chains and concluded that services are the “glue” which holds together the different phases of the value chain. Furthermore, competitiveness of GVCs relies on efficient and reliable services, as the “Logistics Performance Index” (LPI) demonstrates. Thanks to the reduction of time needed for each operation along the chain, efficient logistics services lead to more reliable, predictable and less expensive trade flows.

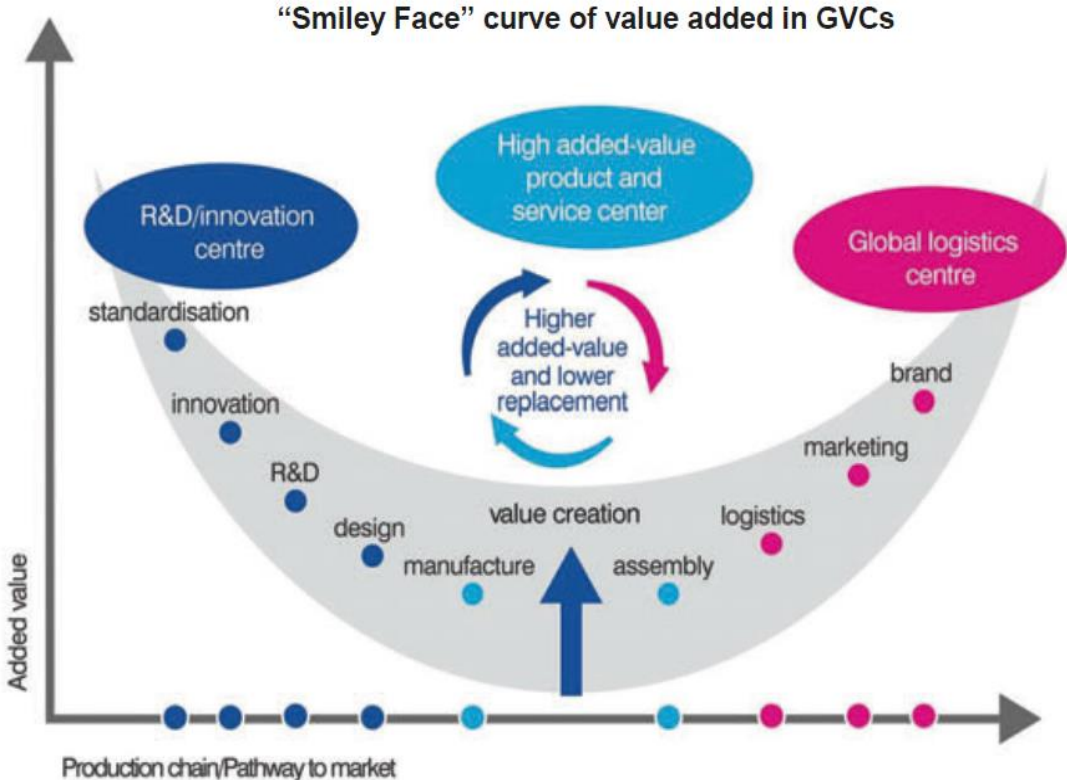
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<sup>47</sup> For their study used firm-level data for the UK.

<sup>48</sup> Using firm-level data for Ireland from 2000 to 2004.

Moreover, the comparison between the LPI and the DHL Global Connectedness Index, an index measuring the level of participation in world trade of a country, reveals that many countries, even if partially integrated, still have room to improve their participation in world trade through the reduction of their logistics costs. As we previously mentioned, the importance of services in world trade is underestimated when calculating the gross exports. In fact, gross exports do not consider that every exported product incorporates a large contribution of services, which is also rising. With the value-added method, services accounts for 40% of world trade and this result clearly shows the influence of services on world trade.

The Global Value Chain phenomenon has been represented by a “Smiley Face” curve. Its centre shows the low level of value added by manufacturing activities and the extremes represents the activities, which confer the highest value added within the production process. The idea at the base of the Smiley Face is that the highest value is provided by the services embodied in the product and this value added by services seem to be increasing over the years.



Source: The Smiling Curve of Stan Shih by the McGill University and the Conference Board of Canada. 12

The challenge for every multinational or country is to move up from manufacturing activities to R&D and logistics services.

Not only intangible goods are becoming more and more important for a smooth functioning of the manufacturing chains, but also they are also unbundled and individually traded. A transformation similar to the one that affected goods production is affecting services. Gary Gereffi studied the design of a services value chain and mapped information technology (ITO), knowledge process (KPO) and business process outsourcing (BPO), depending on the value they added within the chain. The objective of firms is to move up the services value chain, as for the manufacturing value chains, and to do so strong human capital, electronic infrastructure and open trade and investment policies are required. The implications of the emergence and development of services value chains for developing countries are similar to the ones of manufacturing value chains. These countries become able to participate in the chain, capturing only part of the “tasks” and not the entire spectrum of activities, otherwise too onerous. Likewise, singular firms in developing countries could be able to participate in international trade, not having the need for a cost advantage in the production of the final product. The implications of the development of services supply chains on growing countries and on trading rules will be later discussed in this essay.

## **2.5 Macroeconomic and trade implications**

The emergence and spread of Global Value Chains are undoubtedly not only the cause of the evolution of the traditional production system but also of the transformation of the global economy, with implications on topics like trade, growth, and labour market. As a consequence of the unbundling of production, countries specialize in specific business functions in which they have a comparative advantage, such as the assembly operations for China. Grossman and Rossi-Hansberg (2006) underlined that this is “no longer wine for cloth” and policymakers have to think beyond industries.

Different and disparate are the implications of this new production system even on the measures that traditionally shaped the policy debate, as bilateral trade balances.

The latter will be analysed taking into consideration the study conducted by Uri Dadush in 2012, which highlights four broad macroeconomic implications caused by the increase in the intermediate goods trade.

The effects on trade and on the economy as a whole will be deepened in the last two sections of this chapter and in the third chapter, concerning the opportunities for the emerging countries.

### **2.5.1 Overestimated importance of bilateral trade balances**

Data on bilateral trade balances, the value of exports minus the value of imports between two countries, have been always believed to be essentially meaningless. In fact, the existence of multilateral trade make relevant overall and not bilateral trade balances. The spread of Global Value Chains and of intermediates contributed in lowering the importance of bilateral trade balances.

Traditional measures of trade, as bilateral trade balances, do not reflect value added trade and therefore are no longer able to represent the current pattern of trade. Bilateral trade balances let exports of some countries appear greater than they effectively are and the ones of other countries less important. On the one hand, China's balance surplus with the United States could be overestimated since their exports are substantially composed by re-exported imports and modestly reprocessed intermediates. On the other hand, Japan's balance with the United States may be understated as Japan exports to China, which, in turn, re-exports Japan's import to the United States.

In order to avoid the overestimation of the importance of bilateral trade balances, and to better reflect the current structure of trade, it is necessary to develop better measures of trade into trade statistics.

### **2.5.2 Overestimated exports and underestimated importance of trade**

A further implication of the growing trade in intermediate goods is an overestimation of the importance of exports as a component of demand and an underestimation of the importance of trade.

In the last decades, the volume of global exports has grown much more than world GDP. We

can understand this by recalling that the emergence of GVCs extremely raised the exchange of intermediate goods. Uri Dadush showed that there is a positive correlation between the increase in exports and the imported intermediate input content in exports in one sector. Moreover, precisely because of the growth in intermediates, in the so-called re-export economies<sup>49</sup>, exports account for a huge percentage of GDP.

Not only policy makers tend to overestimate the relevance of exports in the demand, but they also tend to underestimate the influence that trade has on long-term global efficiency.

### **2.5.3 More volatile trade**

In the last decades, the evolution of Global Value Chains has strongly affected global trade and has made it more volatile and a larger source of shocks. As we discussed, intermediate imports are critical for exports of manufactures and these last account for a larger part in overall trade than in GDP. Since the demand for manufactures, in particular durable goods, fluctuates more than the one for services, trade is more volatile than GDP. Just think that, during the Great Recession, the fast decrease of durable goods<sup>50</sup> caused a much greater fall in trade volume, around 14%, compared to the decrease in world GDP, about 3 percent.

The increased interconnectedness of economies and the fragmentation of the stages of production imply that a shock in one country could lead to shocks in other countries, managing different stages of production. The crisis of a single country would lead to an interruption of the production chain and would require another country, certainly less efficient than the first, to substitute it in that stage of production. However, the increasing interdependence of countries participating in the chain is causing both a greater vulnerability to foreign shocks and a lower vulnerability to domestic demand shocks.

### **2.5.4 Higher costs of protection**

The spread of the new paradigm of production, as we already said, implied a strong increase in trade in intermediate goods.

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<sup>49</sup> Such as Singapore and Hong Kong.

<sup>50</sup> About 10 times faster than trade in consumer non-durable goods.

This different pattern of trade, in which the exchange of intermediate goods is more burdensome, means a higher and rising cost of protection. Since intermediate goods cross borders several times, an import tax would become enormously more expensive than would be in the traditional pattern of trade. Moreover, an import tax would also affect export volumes since imports increasingly feed into exports. Tariffs on intermediate imports, raising the cost of domestically producing an export good, might encourage the expansion of a firm in a foreign country through outward direct investment, and discourage inward foreign direct investment.

Trade barriers would be particularly dangerous for smaller economies with a high share of intermediate imports on total exports and within the intra-regional trade.

With the expansion of Global Value Chains, trade barriers different from the conventional ones have emerged. Participation in GVCs requires quick movements; trade becomes increasingly time-sensitive and inefficiency in logistics along the chain become at least as important as traditional tariffs. As we analysed in section “measurement and services” and as the “Logistics Performance Index” (LPI) clarifies, efficient and reliable services are crucial for a smooth operation and lower costs along the chain. Timing is particularly critical for the production of time-sensitive goods that quickly depreciate or have high inventory cost.

Conventional and unconventional barriers and their effects on trade will be better analysed in the next section, when it comes to policies to encourage participation to GVCs.

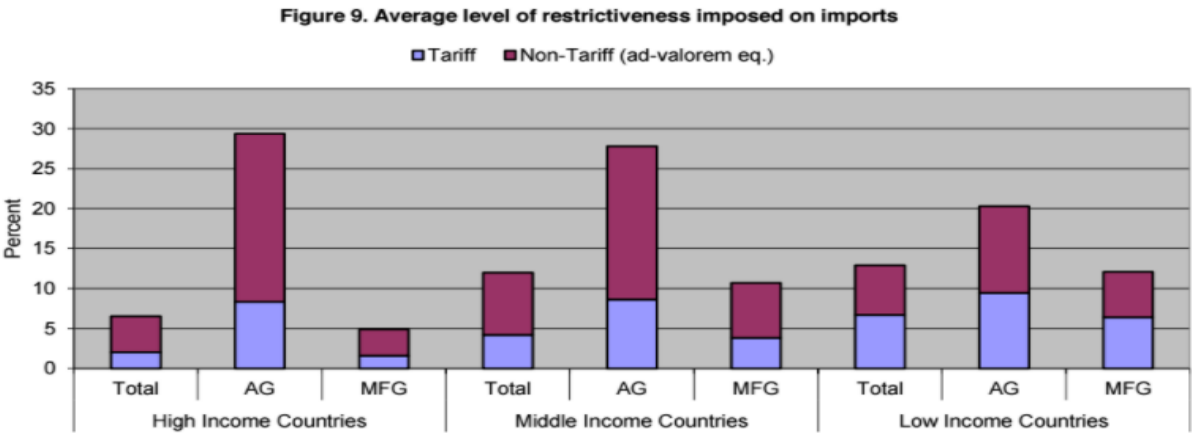
## **2.6 Trade and complementary policies**

Global Value Chain is a phenomenon capable of increasing the efficiency of the global economy, through an improvement of countries’ income, employment, and productivity. To exploit the benefits deriving from GVCs, open markets alone are not sufficient and the fragmented production network need to be complemented with appropriate policy frameworks. Global Value Chains gave birth to a new “trade-investment-services-knowhow nexus” and trade policy needs to reflect this new reality of global interconnectedness through a more holistic approach to trade and investment policies.



As has been mentioned in the section “2.2 Drivers and emergence of GVCs”, current trade rules do not reflect the 21st-century pattern of trade but are rather based on the first unbundling. Conventional policies, focusing mainly on tariffs and border measures, need to be revisited and “behind the border” factors, such as time delays, need to be taken in consideration. In fact, non-tariff measures (NTMs) influence trade flows and, affecting trade costs, are able to make the operations of GVCs less efficient. For instance, tariff trade costs in Asia and the Pacific account up to 10 percent of bilateral trade costs and non-tariff measures account for 60% to 90% of it<sup>51</sup>. Relevant examples of non-tariff measures are local-content requirements (LCRs), and various types of standards and technical regulations. Local-content requirements are policy measures supporting and protecting domestic manufactures. These requirements are a form of trade barrier apparently increasing, especially in the production of electricity from renewable energy, and could discourage the participation in GVCs. Another main barrier to trade is the existence of quality and safety standards different among countries. The complexity of the fragmented production process requires coordination and homogeneity not only in the timing of stages but also in the various standards needed in different countries. In order to lower costs and barriers to the participation in Global Value Chains, governments should address policies at promoting the convergence of standards and technical requirements.

As the graph below clearly shows, non-tariff measures often have a greater impact on trade costs than tariffs.



Source: UNCTAD (2013), based on UNCTAD TRAINS/WITS database.

<sup>51</sup> As the study of Duval and Utoktham shows.

However, despite tariffs are not the only barrier to trade, the structure of GVCs and the continuous exchange of intermediate goods, tremendously enhance their effects. The “tariff-magnification ratios” calculated by Koopman et al. (2010), demonstrates how the intricate structure of GVCs boosts the effective tariffs, keeping trade liberalisation crucial.

Furthermore, a revalidation and integration of policies is necessary in light of the importance of services in the value chains. Since services are the bond needed to coordinate and keep the stages of the chain together, policies to address and improve the quality and efficiency of services are critical. Even in the case of services, current trading rules are becoming irrelevant since they only consider the exchange of final services and do not reflect services GVCs or the role that they have within manufacturing GVCs. Policies aimed at facilitating access to the market of essential services as ICT, supply management services and logistic services, and at improving their quality, are required to support the growth of Global Value Chains and the efficient creation of value within them.

The inability of WTO trade rules to keep up with the emergence of Global Value Chains and with the transformation of trade has caused a sharp increase in deep trade agreements between the participants of the chains. Nevertheless, a comprehensive multilateral discipline is needed in order to facilitate the operation of these chains and to encourage the participation of a broader range of countries and firms.

Global Value Chains represent the 21st-century pattern of production and need to be complemented not only with appropriate trade policies but also with complementary policies. Social policies, investment policies, labour market policies and competition policies, become critical in order to leverage gains from GVCs, to make a country attractive for their location and to facilitate upgrading opportunities within the chain.

To achieve a more efficient economic equilibrium, regulation should not impose itself but go along with trade evolution and transformation.

Relevant and appropriate policies can facilitate the involvement of countries in GVCs by cutting costs, avoiding delays and reducing uncertainties. On the contrary, backward policies can be an enormous obstacle to integration and development of countries.

## **2.7 GVCs inclusion in the current debate of trade: opportunities and threats**

The dispersed production of Global Value Chains is making economies increasingly interconnected and interdependent, and its implications on world economy are unavoidably entering the current debate on trade.

As we discussed in the first chapter, after the Great Depression many countries started questioning whether trade restrictions could be an effective solution in order to restore their competitiveness. The return to protectionist policies has affected even the complete integration in Global Value Chains, and thus the exploitation of their potential benefits on global development. Indeed, doubts about free trade and its effects on developing countries, on employment and on growth of several economies are still valid and deep.

Despite these legitimate concerns, Global Value Chains and thus trade openness, have the potential to offer great benefits both to the global economy and to developing countries. In fact, developing countries are the one that have exploited better the advantages deriving from the fragmentation of production. Global Value Chains enabled a fast industrialization and growth of emerging economies, especially Asia<sup>52</sup>, leading a convergence between North and South economies. Thanks to this pattern of production, countries are able to simply join the chain rather than build their own industry, thus incurring in lower costs and risks.

A further opportunity offered by the participation in GVCs is the specialisation in the sector or task in which countries have a comparative advantage. The fragmented production shifts resources to more productive activities and most efficient inputs. Suppliers are able to upgrade production into higher-value segments, learn new processes, draw from new sources and increase their production efficiency. Specialisation, improved productivity, access to new technology and knowledge spill-overs within the chain lead to economic growth.

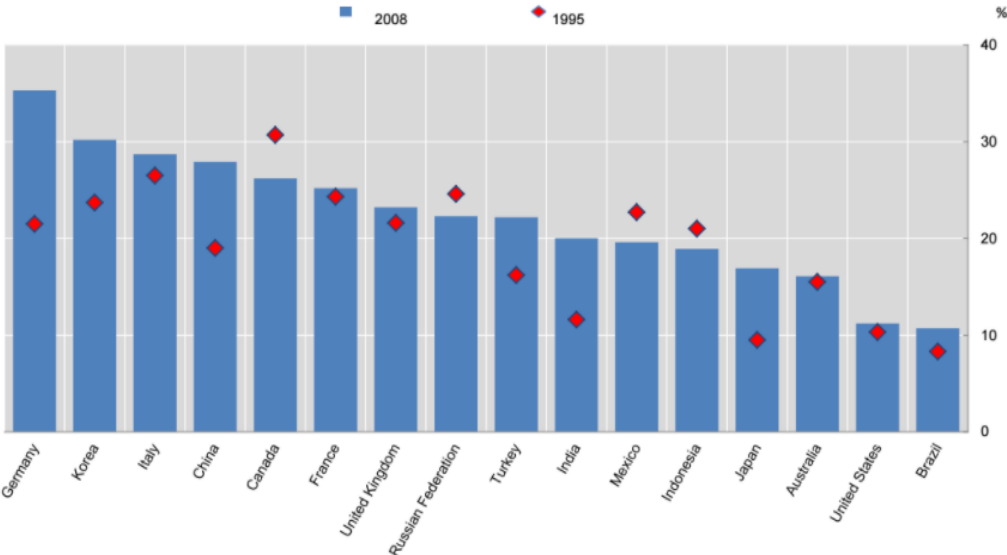
Employment issues, which always interested the global economic debate, have to be taken into consideration when evaluating costs and benefits of Global Value Chains. A great portion of workers of different countries is currently engaging in export activities, despite the “onshoring”

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<sup>52</sup> Opportunities for developing countries will be discussed further in the third chapter: “Lessons from the experience of Asia-Pacific region”.

policies. This high share of employment depending on foreign demand and on the functioning of GVCs has increased until 2008. As OECD estimates show, the share of workers of the business sectors dealing with exports activities is growing over time, with few exceptions.

Figure 5. Jobs in the business sector sustained by foreign final demand, 1995 and 2008



Source: OECD Science, Technology and Industry Scoreboard 2013, based on OECD Inter-Country Input-Output/Trade-in-Value-Added (ICIO/TIVA) database.

Despite the current attempts to bring back jobs to the country of origin, labour market policies need to take in consideration that labour markets are still internationalized and interconnected.

For instance, from the analysis of the graph above, it can be seen that a consistent share of German jobs relies on foreign aggregate demand.

The concerns on unemployment that partly led to onshoring should be analysed closer, in consideration of the potential full specialisation that GVCs could bring if effectively implemented. A risk deriving from the fragmentation of production could be the *unfair* distribution of its gains among countries. However, offshoring should not be considered as a threat to labour markets. In fact, the relocation of some jobs abroad due to offshore is offset by the presence of jobs depending on foreign affiliates and exports activities. It could be said that sourcing abroad could mean a less labour-intensive production in the home country, but with complete specialization, even this would not be a problem. The presence of a comparative advantage and hence the specialization in a more productive sector, would increase production,

labour demand and would reduce unemployment. In this way, the additional hiring due to improved competitiveness and higher sales could offset the job losses due to offshoring and to the fall in labour intensity.

However, a real risk exists: the disruption of value chains. In fact, the increased job reallocation caused by Global Value Chains, makes workers more vulnerable to shocks. Several other threats and costs deriving from the participation in GVCs exist. For instance, a country that specializes in a determined industry or task could get locked irreversibly into that industry, becoming dependent on the industry's performance and being exposed to great risks due to non-diversification. In addition, the pressures deriving from the need to reduce costs can lead to poor occupational safety and health standards. Because of the interconnectedness of economies, demand shocks in a country affect the economies of other countries. A crisis situation of a country involved in the supply chain could interrupt the chain or, at best, would oblige a country less efficient in that stage of production to substitute the original one.

Although many possible risks and costs exist, the benefits deriving from the participation in Global Value Chains, if adequately addressed with a broad range of pertinent policies, are enormous. However, the implementation of relevant policies and strategic investments in people and infrastructure are necessary steps to exploit all the benefits and opportunities that GVCs offer for global growth.

### **3. Lessons from the experience of the Asia-Pacific region**

Global Value Chains have taken on a key importance in the global economy. The fragmentation of production among countries will probably become even more crucial in future trade and growth opportunities.

The objective of every country is undisputedly the socio-economic upgrade, which takes place with an industrialization upgrade. This implies the achievement of better salaries, a more sustainable use of resources, and better governance and political stability.

To develop and industrialize, before the emergence of the fragmentation of production, countries had to build their own whole supply chain. Nowadays, the participation in global trade and industrialization are facilitated by Global Value Chains. More economies, especially the small emerging ones with limited capacities, become able to benefit from trade by specializing in just one specific stage of production or task. The specialization, enabled by the globally dispersed production process, leads to productivity improvements, a more efficient allocation of resources, competition pressures, and to a better international economic efficiency.

Interactions within regional and global chains have a positive impact in technological and knowledge spillovers, and the increased production, allowed by specialization, boosts employment and increases the availability of various intermediate goods.

Evidence of all these benefits can be found in the experience of the Asia-Pacific region and China, which has been able to achieve great economies of scale by the extraordinary increase in the production of goods intended for export. In order to exploit further this pattern of production, to allow less integrated countries to join the chains, and to succeed in contributing positively to global economic growth, the knowledge of Global Value Chains should be deepened. Analysing and understanding the GVCs presence and evolution in the Asia-Pacific region could be a good starting point to maximize the exploitation of benefits deriving from the integration into this pattern of production.

### 3.1 Asia-Pacific region

Initially, developed economies such as US, Europe and Japan were the only leaders of global production. Nowadays, suppliers from developing countries, especially from Asia, are becoming more and more powerful, playing an increasingly critical role in shaping GVCs.

Asia-Pacific region is one of the major regional block, together with “Factory Europe” and “Factory North America”, in which most of the activities of Global Value Chains are concentrated.

The division of labour, the heterogeneity of countries and their specialization in different tasks allow a very strong regional integration. Precisely the dense relationships among Asian countries and the coordination of complementary activities they perform are the major forces of this region. In the Asia-Pacific region, technology-intensive electronic intermediate and products are produced in the advanced countries of the region, such as Japan. Emerging economies as Vietnam, instead, deal with the assembly of intermediates into finished products.

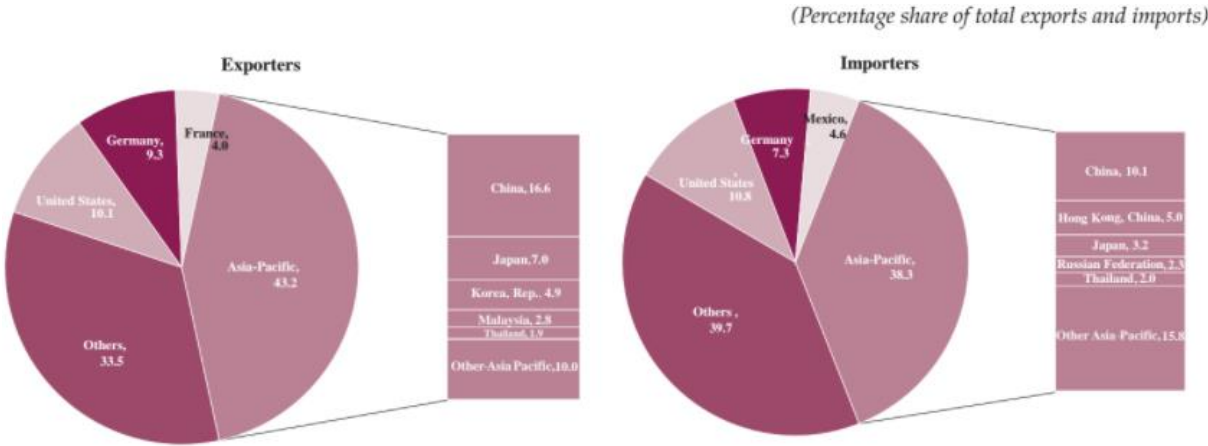
Global Value Chains link all these complementary activities and tasks, enabling the production and export of intermediate and final products all over the world. Indeed, Asia-Pacific region is a major exporter of both intermediate and final products, and these products mainly satisfy final demand that derives from developed economies outside the region. According to ESCAP<sup>53</sup> calculations, Asia-Pacific is responsible for almost half of global GVCs-related final exports but it only imports 26% of GVCs-related final products. Mostly developed countries, such as the United States and the European countries dominate final imports. Contrariwise, when dealing with trade of intermediate products, Asia-Pacific region is responsible for a consistent share of both exports (43.2%) and imports (38.3%).

These high shares of trade in intermediate goods well express the high level of engagement in Global Value Chains of Asia Pacific countries and the critical role that these play in global trade. However, GVCs-related activities and flows within the region are mainly concentrated in ten countries, China, Japan, the Republic of Korea, Malaysia, Thailand, India, Australia, Indonesia, Singapore, and Turkey. The pie chart below shows the countries more involved in

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<sup>53</sup> The ESCAP data refer to 2013.

GVCs in 2013 by representing the major exporters and importers of GVC intermediate goods in that year.



Source: ESCAP calculation based on data from the United Nations Comtrade database.  
 Note: See online appendix A for product list.

The participation of Asia-Pacific region in international trade and thus in Global Value Chains has not always been so high. Indeed, global demand started to shift towards developing countries with the economic crisis of developed countries in 2008. This shift has been heavier for some sectors, such as apparel, footwear and electronics, than for others.

By analysing the situation of Asia-Pacific region, it can be deduced that countries with different level of income specialize in different sectors. For instance, China is the major exporter of final products, such as electronic goods, Turkey and Thailand are specialized in the automotive sector and Malaysia is the largest exporter of processed agricultural intermediates.

**3.1.1 Made in China and ASEAN contribution**

In the last years, China exports have risen sharply allowing China to surpass Germany, Japan, and the US, and become the major global exporter in a short time period.

The IT revolution and the radical trade liberalisation allowed China to integrate in the global market in the late 1970s.



In order to develop fast and reach the level of industrialization of other countries, China undertook a phase of “compressed development”, in which it opened its market to foreign investment, not having the time to cultivate its infant industries. Over the years, these *inward foreign direct investment* flows allowed China to improve its management and technological skills, and to enter global markets. Moreover, the fast growth of the importance of China in GVCs was also due to *cheap labour*, strong demand from a new “middle class” in emerging economies and investments in infrastructures.

The Chinese massive *trade liberalization* and its advantages in term of cost of labour and natural resource endowments are the ground of the incredible importance that China acquired in the global economy over the years. China has become the major exporter of final goods, being responsible for 23.1% of global exports, and the world’s banker, having accumulated over 3 trillion dollars of foreign exchange reserves.

However, it is estimated that a significant share of its exports (around 70%) is generated by foreign firms. Chinese final products are mainly assembled in China but many different Asian countries, of different income levels, contribute in adding value in the stages of regional value chains. “Made in China” is based on a *sophisticated and highly coordinated production chain* between many Asian countries, such as Malaysia and Thailand. A clear example of this is the involvement of more than fifteen countries, other than China, in the production of the iPad, iPhone and iPod, which are practically only assembled in the Chinese factory in Shenzhen. Another example of the involvement of several countries in the “Made in China” labelled products, is the great part of the textile produced in Taiwanese and Hong Kong firms that reached Europe from China in 2005.

The strong relations that China developed with Asian countries in different economic development stages, also resulting in easier access to cheaper labour, and the low value of the Chinese currency, allows China to produce inexpensive goods and thus to maintain a competitive position in the global economic market. Several papers<sup>54</sup> analyze and demonstrate the importance of production networks and deep regional agreements within the Asian region. For instance, Orefice and Rocha proved that the involvement of Asian countries in signing deep

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<sup>54</sup> Such as Athukorala and Menon (2010), Ando and Kimura (2005) and Kimura et al. (2007).

agreements have a strong positive impact on the share of production network trade over total trade in those countries. *Deep regional agreements* are definitely one of the major causes that helped China, as well as other Asian countries, to successfully integrate in Global Value Chains. Countries aiming to engage in these chains need to analyse and learn which factors allowed the incredibly fast development of what was until recently a not developed country.

Not only Chinese production but also the GVCs-related production in Asia-Pacific region heavily relies on intra-regional trade, with differences of intensity depending on the sectors. The fact that in 2013 more than 65% of the GVCs intermediate imports came from within the region makes the strong regional connection and the engagement of these countries in GVCs evident.

A noteworthy production hub within the Asia-Pacific region is the one composed by ASEAN countries: Philippines, Indonesia, Malaysia, Singapore, Thailand, Brunei, Vietnam, Burma, Laos, and Cambodia<sup>55</sup>. For these countries, the integration within GVC-related production is impressive. This fact is evident when analysing data of jobs related to exporting activities, which grew two times faster than total jobs, and to the production of intermediates, which grew over six times faster, between 1995 and 2011<sup>56</sup>.

*Open trade and investment policies*, as well as policies to improve manufacturing and agriculture domestic performance, enabled ASEAN to have access to a more sophisticated and economic imported intermediates.

ASEAN engagement in GVCs is critical not only for South-East Asian countries but also for other countries: 14 million workers provide intermediates that ASEAN countries use in GVC-related production<sup>57</sup>.

Both ASEAN countries and China, as well as every country already engaged in GVCs, to grow at a sustainable rate need to upgrade within the chains. In fact, although the role of China continues to be fundamental within these chains, operations of Chinese factories still concern

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<sup>55</sup> Being Philippines, Indonesia, Malaysia, Singapore ASEAN founders (1976).

<sup>56</sup> Computations from OECD-WTO TiVA database 2015 and ILO data.

<sup>57</sup> Computations from OECD-WTO TiVA database 2015 and ILO data.

the “Third World” production. Its contribution in the addition of value decreases with the increase in the technological content of final products.

Updating policies and investing in education<sup>58</sup> could be fundamental for countries as China and ASEAN countries that need to maintain their international competitiveness.

However, Asian countries continue to play a critical role in international trade and this could not have been possible without the presence of the previously mentioned factors. The *flow of information* allowed by deep *regional agreements* and the *repartition of work and activities* according to the characteristic of each country are among the factors that most boosted Asian development and one of the major lessons that the Asia-Pacific region gives.

### **3.2 Elements that facilitate participation in GVCs**

As can be seen from Asian experience, GVCs enable the acceleration of the industrialization process of countries engaged in it. However, not every country has been able to participate in Global Value Chains and among those able, different degrees of participation can be observed.

These levels of engagement can be observed by the analysis of *backward participation*, the foreign value added content of exports, and *forward participation*, the domestic value added sold that is reused for the production of other countries’ exports.

Both natural and policy factors affect a country’s participation in GVCs and policies should create an environment that could enhance the integration and the exploitation of GVCs’ benefits.

In order to understand how to profitably integrate into GVCs, countries could learn from the successful experience of some countries and region, such as Asia-Pacific region. However, policymakers should keep in mind that different development levels, sectors and stages of production *respond differently* to the adoption of the same type of policy. In the following

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<sup>58</sup> As mentioned several times in the essay, countries could move up to higher value-added stages thanks to several other policies, such as domestic infrastructure improvement.

paragraphs, will be suggested both general and specific requirements, depending on the type of income group, in order to enhance GVC participation.

### **3.2.1 General requirements**

The complexity of GVCs' structure and functioning enforces countries willing to integrate in GVCs and improve their performance to implement several *coordinated policies*. Concentrating on a single area and eliminating tariffs without paying attention to non-tariffs measures is no longer sufficient. Contrariwise, policymakers need to focus on horizontal policies, such as human capital development and investments in national infrastructures.

The Asian experience supports a theme previously discussed: a comprehensive *trade liberalization* is needed. The first step to engage in global and regional value chains is to eliminate tariffs, liberalize trade through a revision of non-tariff measures and improve the efficiency of services. The results obtained in the study of Asia-Pacific exporting countries through the gravity model uphold these conclusions. In fact, a 1% tariff reduction causes an increase of about 1.4% of GVCs-related exports and an import tariff increase by 1% affects GVCs-related exports, causing a decrease between 2% and 5%. The decrease in a country's exports caused by its import barriers underlines the fact that a country's exports can suffer more from its protection measures than from the ones of the partners. The importance of tariffs impediment to trade is straightforward when thinking about the multiple cross-border movements of intermediate goods. However, non-tariff measures could be extremely more damaging than tariffs. Just think that in 2010, NTMs accounted for 60% to 90% of Asia-Pacific region trade costs and tariffs were an almost insignificant share of trade costs. The importance of services in manufacturing GVCs, which has been discussed in depth above, makes services liberalization and efficiency improvements necessary for countries that want to successfully integrate in the fragmentation of production.

Another important step to engage in GVCs is making customs and administrative procedures at the border efficient and simple. Improvements in the accessibility and quality of *physical infrastructures*, such as transport, logistics and communication networks, are required in order to connect easily to other stages of production and lower the overall trade costs. The International Supply Chain Connectivity (ISCC) index, which represents the efficiency of

moving goods from the factory to export markets, considers the availability and quality of different means of transport, Internet connection as a proxy for information and communication efficiency, and border procedures. It confirms that the quality and efficiency of national infrastructures positively affect participation in GVCs. A 1% increase in the ISCC implies an increase of about 1% of final exports, but there is no evidence of export in intermediates. The ISCC also demonstrates that variations of Internet availability do not have substantial effects on intra-regional trade. In fact, information flows within a single region, such as the Asia-Pacific, are enabled and facilitated by other factors, like the proximity of different stages of production.

An improvement in logistics and ICT connectivity of import partners could harm Asia-Pacific exporters. Since this improvement reduces the physical distance cost of trade, it may lead import countries to shift their import demand from Asia-Pacific region to a different, more distant, exporter.

An important step that helped the engagement of Asia-Pacific region in GVCs, highlighted by different works, is *regional integration and coordination*. As mentioned in the second chapter, Regional Trade Agreements (RTAs) seem to positively affect countries' participation in Global Value Chains. In particular, the exports within GVCs of Asia-Pacific economies could be at least 58% greater with deep RTAs than without them. This could mean that Asia-Pacific exports increase thanks to formal regional agreements or that the increase is due to other similar characteristics already connecting the countries that have an agreement. Moreover, since Asia-Pacific countries are strongly interconnected and interdependent thanks to geographical and historical factors, Asia-Pacific RTAs could focus on how to support international exports, both of final and intermediate goods.

RTAs effectiveness depends on the development level of involved countries. Since regional agreements are able to strongly improve exports from low-income and middle-income economies, developing countries, more than developed ones, should improve the engagement in RTAs.

### 3.2.2 Requirements for different income groups

Asia-Pacific region is composed of countries with different levels of development and that cover different roles within GVCs. For this reason, general policy conditions are not sufficient in order to enhance GVC participation by divergent countries. Different income countries respond in a different way to the same policy and thus, they have to be individually analysed.

Although *low-income economies* have advantages in natural resources endowments and/or low-cost labour, they often come across several obstacles when trying to participate in Global Value Chains. To enable the participation of these countries in the global production network, policies addressed at reducing tariffs and regional trade agreements with higher-income markets would be extremely effective. Moreover, policies aimed at improving connectivity and efficiency of national logistic system and ICT would significantly improve their GVCs-related exports.

*Lower-middle income* economies, which are already involved in GVCs, need policies that would help them to further exploit the gains offered by GVCs participation in order to improve their performance. These countries could further reduce tariffs, improve logistics and simplify rules and regulations to become major players in GVCs. Moreover, in order to preserve the advantages and the position obtained, lower-middle income economies need to match import partners in the infrastructure improvement.

The adoption of policies that are able to help low and lower-middle income economies could have a negative effect on upper-middle income economies, already well-integrated in GVCs. *Upper-middle income* economies, in order to shift up to higher value-added technologically-intensive stages within the production chain, need to implement policies related to skills upgrading, and heavily invest in innovation and technology. The specialization in technology intensive activities could adversely affect employment, but this risk could be mitigated with the implementation of horizontal initiatives.

With the movement toward higher value-added activities, the ICT becomes more and more critical. In fact, countries' activities become more communication-intensive since they need to respond quickly to changes in demand and adapt to new technologies.

### 3.2.3 Participation and opportunities of developing countries

When initially emerged, GVCs were dominated by developed countries such as US, Europe and Japan<sup>59</sup>. In the last years, the growth of South-South trade and of emerging economies has caused the development of new patterns of global production, led by African, Latin American, and especially Asian firms.

As previously mentioned, Global Value Chains could particularly benefit emerging economies. By joining GVCs, emerging countries could be able to overcome the limit of having a small domestic market, limited resources and experience, and become part of global trade.

Some large domestic markets, such as China and India, and some small economies, such as Costa Rica, that already have exploited the benefits of Global Value Chains could be a good example for emerging economies. The latter could emulate some of the successful policies of these countries, such as the opening up to trade, in order to benefit from integration in GVCs and thus, not only from inward flows of foreign direct investments but also from the possibility of an improvement of more advanced domestic operations.

Emerging economies usually have advantages in low-cost labour endowment, and once able to overcome obstacles, usually join GVCs by operating, at first, in low-skilled, labour-intensive segments. With the expansion of these sectors, labour demand would increase as well as real wages and thus workers would be better off by the participation of the country in the global production network. However, in order to grow further, countries need to improve their capabilities and skills to incur in a process, product, functional or intersectoral *upgrade* within the chain.

More and more developing countries are succeeding in the integration into Global Value Chains and in the exploitation of spillovers of production technology and know-how.

But how can further developing economies successfully integrate in Global Value Chains? In which tasks should they concentrate? Which policies should be designed and implemented?

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<sup>59</sup> Just think that in the early 1990's G7 countries held 67% of global GDP, by 2010 this fell to around 50%.

Although it is extremely difficult to answer to these questions in a univocal way, some policies could be relevant and effective for more than one developing country.

Indeed, the business and institutional environment in which firms operate strongly affect their possibilities to benefit from the participation in the global production network. Policymakers should pay closer attention to poorly functioning financial markets, inefficient infrastructures, unsatisfactory standards, and low-skilled human capital.

The inefficiency of *infrastructures* heavily impedes the participation of developing countries in GVCs. The Government of these countries, more than others, should invest in improving the quality and efficiency of physical infrastructure as roads, ports and airports. By avoiding bottlenecks in infrastructure, developing countries would easily attract inward FDI and would be facilitated in establishing global trade links.

The heterogeneity of health, safety and quality *standards* across countries is a barrier difficult to overcome. In fact, for developing countries that have usually a lower level of different standards, it could be particularly hard to meet international requirements and thus to fit into GVCs. To fulfil this prerequisite and to allow developing countries to enter the global market, policies aiming at improving public institutions are required.

Investments in *educational institutions* could be particularly important for long-term growth. As previously discussed, in order to continue to benefit from the participation in GVCs, countries try to move up to stages of the chain that add more value to products. However, low-skilled workers of developing countries would not be able to accomplish elaborated activities if the government does not drastically invest in the development of education and skills. Although industrial policies alone would not be sufficient, national plans to promote the flourishing of local suppliers, to finance and promote innovation and to upgrade production in priority areas would facilitate the long-term growth of developing countries within GVCs' stages of production.

However, finding the right industrial policy is not always easy and countries should learn not only from successes but also from failures of other countries.



Firstly, support programmes without an *ending clause* for companies in a critical situation have the undesirable effect of discouraging the efforts needed to increase their productivity. Secondly, factories should be built in locations full of competitors-partners, and “*Cathedrals in the desert*” should be avoided in order to gain from external economies of scale. Thirdly, *closed-door* policies enormously harm firms by preventing the generation of information flows and thus the possibility to innovate and learn from firms of other countries and stages of GVCs. Finally, once implemented, a specific policy need to be constantly monitored and revisited. The lack of *monitoring* has already reduced the effectiveness of several policies, which need to keep up with trade patterns in continuous transformation.

With the abolition of barriers, countries in different development stages and with various strengths would be able to cooperate and compensate the shortcomings and weaknesses of the others. Policymakers should evaluate the positive and negative lessons learned from other countries, but at the same time should keep in mind that every country has its peculiarities and thus could have a different reaction to the same industrial policy.

### **3.3 Current initiatives**

Given the great benefits that offer, Global Value Chains have been thoroughly studied in the recent years. The objective of several international institutions has become to deepen GVCs phenomenon and dynamics, in order to implement better measurements and policies that can allow the concrete exploitation of what can be called an opportunity.

In order to enable economic transformation and facilitate the integration into Global Value Chains, OECD<sup>60</sup> has encouraged experience sharing, policy dialogue and peer learning on several key areas.

The initiative on Global Value Chains is included in a broader objective of OECD: the implementation of the “*Strategy on Development*”<sup>61</sup>.

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<sup>60</sup> OECD, About the OECD Initiatives on Global Value Chains, Production Transformation and Development, retrieved from: <http://www.oecd.org/dev/abouttheinitiative.htm>.

<sup>61</sup> OECD Strategy on Development, Meeting of the OECD council at ministerial level, 2012.

The main goal of OECD’s strategy is to strengthen its contribution in facilitating sustained and sustainable growth for disparate countries, from the least to the most developed. Using the OECD sophisticated evidence-based approaches, policies and reforms need to be continuously improved to reflect the global realities and needs. Indeed, Global Value Chains are transforming global economy, implying new and increasingly complex challenges for development.

In order to reach this major goal, OECD is committed to improve measurement and evidence on globally dispersed production and on new trends in international trade. Moreover, on the belief that GVCs can be beneficial for economic growth and development, OECD aims at identifying policy recommendations to facilitate integration of disparate countries into GVCs.



*Source: About the OECD Initiative on Global Value Chains, Production Transformation and Development*

As mentioned previously in this essay, further studies and the implementation of new measurements are needed in order to explore how to achieve the desired effects from integration into GVCs. This is precisely the goal of OECD initiative.

In two meetings per year, OECD focus on the identification of effective metrics, practices and policies to promote peer learning and multi-dimensional dialogue between OECD and non-OECD economies. OECD employs a solid platform to identify future trends, relations with multiple stakeholders to focus on interactions and complementarities between policies, and a

unique space for peer learning and knowledge sharing. Moreover, OECD can count on the knowledge of its strong network of experts, OECD Committees and Working Parties, and International Organisations.

With this initiative, OECD expects to reach several outcomes.

*First*, it expects to improve Trade in Value Added (TiVA) database and identify new measures to study countries' engagement in GVCs and their development impact. *Second*, it predicts to improve the understanding of the conditions that facilitate the inclusion of countries in GVCs and to gain new evidence on successful policies to help the exploitation of benefits deriving from the participation in GVCs. *Third*, OECD foresees an improved knowledge of financing needs to promote GVCs and strengthen their development impact. *Finally*, concrete recommendations on how to develop strategies and policies for a sustainable growth of different countries is expected.

## Conclusion

The factors that have allowed the globalization and integration of markets, such as the sharp decrease of trade and ICT costs, generated a new production structure over the years: the Global Value Chain. Nowadays, thanks to the spread and evolution of Global Value Chains, firms can distribute design, production, assembly, marketing, logistics, distribution, and support.

The “unbundling” of production across international borders has strong implications for the way we think about trade. As a matter of fact, trade has transformed; it is no longer one country one final product but the main purpose of trade becomes linking international partners that work together for the production of one final good. Imports are as important as exports and intermediate goods cross borders several times before being assembled in the final product and reaching final markets. This implies higher costs of protection, which does not longer seem a reasonable option for countries willing to grow at a sustained rate without being overcome by the others. In fact, although international competition within the chains will cause the relocation of some activities across countries, protectionist measures should not be the response. As already discussed, shifts in labour demand should not alarm countries when policies are designed to facilitate this adjustment process.

Policy makers have to deal with a new trade-investment-service-knowledge nexus. They should not only consider tariffs but several further barriers caused by the new conception of trade, such as inefficient domestic infrastructure and services.

To ensure a sustainable growth, countries should invest in people, education and skills, and in high-quality infrastructure. Therefore, policies need to be revisited and updated in order to capture the fragmentation of production and to exploit the benefits it offers. Indeed, many trade and economic policies are still designed on the 20-th century trade pattern in which goods were produced in just one country. Policies implemented should be diversified depending on the development level of the country and whether it aims to enter GVCs, strengthen GVCs participation or turn the participation into sustainable development.

Despite the concerns about unemployment and the exploitation of developing countries, precisely these countries are the ones that are achieving the greatest benefits from the

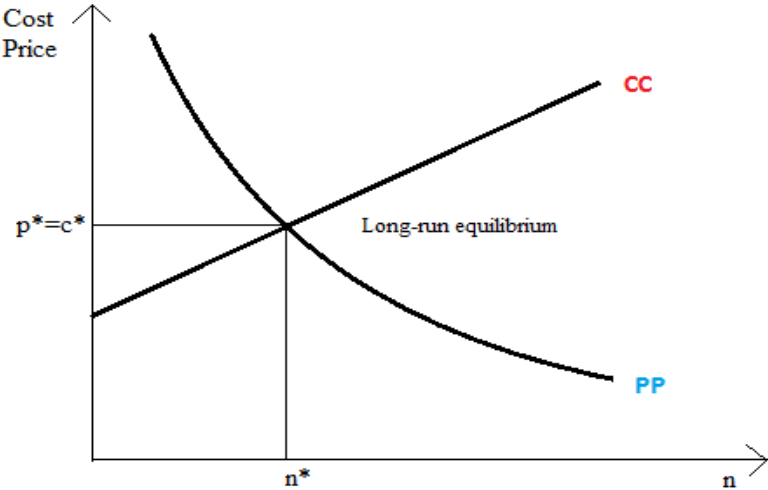
integration into GVCs. Countries that without GVCs would not have been able to cover the whole chain can now compete at an international level focusing on just one phase of production or skill. Developing countries can learn from Asia-Pacific successfully integrated countries, and enter GVCs by trying to improve their business environment, supporting domestic infrastructure and attracting inward FDI. The quality of institutions and government are also important in order to captivate investments and economic activities of firms in the long term.

In order not to harm emerging countries, the implementation of an effective framework of policies for sustainable, balanced and inclusive growth is needed. With trade facilitation and the promotion of a proactive business environment, every country can benefit from the participation into GVCs. OECD current initiatives aim to achieve precisely this goal through the formulation of new policies and the development of new measures and activities in their support.

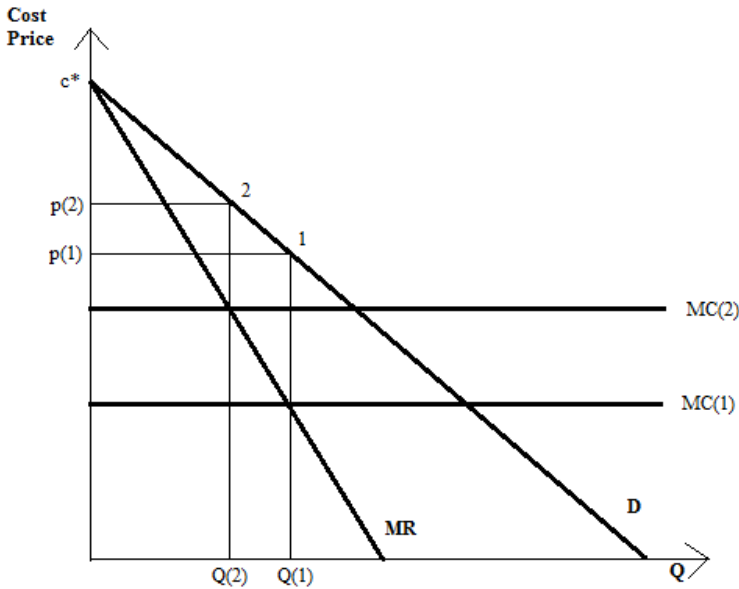
Both regional and global value chains are an economic reality that offers new prospects for global growth, allowing emerging countries to industrialize faster, creating jobs and improving living standards. For the huge beneficial effects that GVCs could have, the OECD, WTO, and UNCTAD need to continue to deepen their analysis of the functioning of GVCs and their relationship with trade and investment flows, development and jobs.

# Appendix

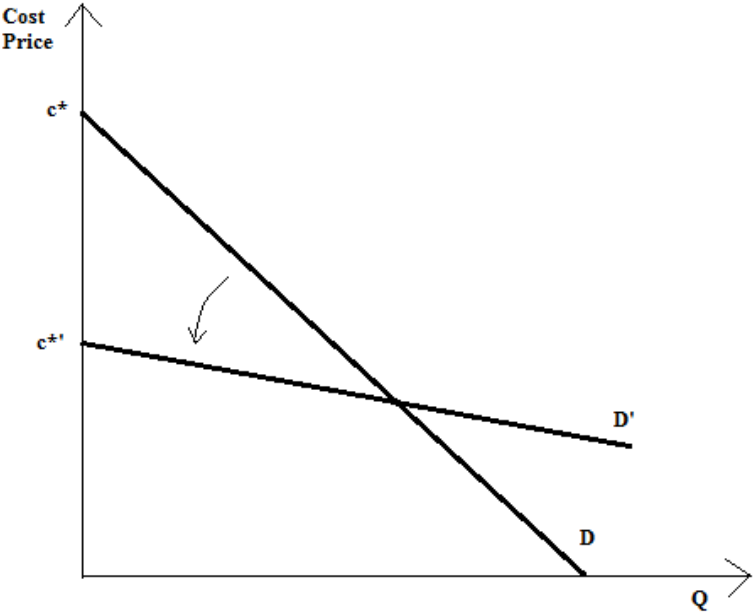
**Graph 1:** The CC schedule represents the relation between cost and number of firms operating in the market. This relation can be expressed as:  $AC=n*(F/S)+c$ , where  $n$  represents the number of firms,  $F$  the fixed cost,  $S$  the size of the market and  $c$  the marginal cost.



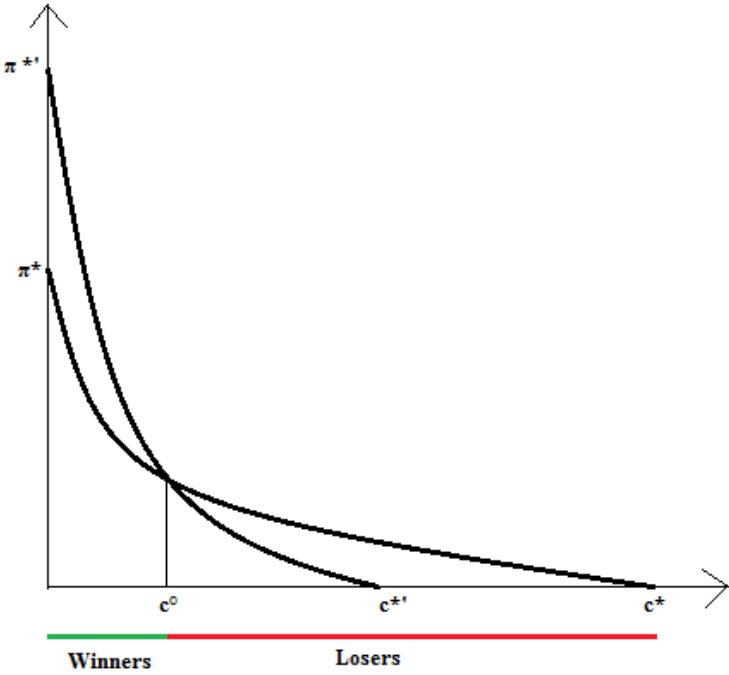
**Graph 2:** For the analysis of winners and losers we assume that two asymmetric firms face the same demand ( $D$ ) but have different cost structures ( $MC_1, MC_2$ ). The firm with lower marginal cost is able to produce more profits.



**Graph 3:** This graph shows that, when economies integrate and thus,  $S$  and  $n$  increase, the demand curve rotates. In fact, an increase in the number of firms, lowers the intercept and an increase of the size of the market flattens the demand curve.



**Graph 4:** The rotation of the demand curve cause a decrease in the cost cut-off ( $c^*$ ). This implies that firms that operated at a marginal cost between  $c^{*'}$  and  $c^*$  are no longer able to compete and have to exit the market. The real winners from internationalization are the firms operating at a marginal cost lower than  $c^0$ .



## Bibliography

C. Altomonte, M. Bugamelli, D. Horgos, D. Maggioni, G. B. Navaretti, F. Schivardi, *The global operations of European firms*, The second EFIGE policy report, 2011.

J. Amador, S. Cabral, *Global Value Chains surveying drivers and measures*, European central bank. Working paper series, no 1739, October 2014.

J. Amador and F. di Mauro, *The Age of Global Value Chains, Maps and Policy Issues*, A VoxEU.org Book, 2015.

R. Baldwin, *Misthinking globalisation: Twentieth-Century Paradigms and Twenty First-Century Challenges*, Institute of Developing Economies, 2013.

R. Baldwin, S. Evenett, *The collapse of global trade, murky protectionism, and the crisis: Recommendations for the G20*. Centre for Economic Policy Research, A VoxEU.org Publication, 5 March 2009.

E. Brancaccio, “Tra liberismo e protezionismo, meglio uno “standard sociale” sugli scambi internazionali”, *Il Sole 24 Ore*, 3 april 2017.

ECB, *Understanding the weakness in global trade, What is the new normal?*, European Central Bank, Occasional Paper Series, No 178/ Sep 2016.

H. Escaith, *IDE-JETRO Conference “Global Value Chains: Quo Vadis?”. International Supply Chains, Trade in Value-Added and Development: A small Economy’s Perspective*, 5 July 2013.

ESCAP, *Asia-Pacific Trade and Investment Report 2015: Supporting Participation in Value Chains*, 2 November 2015.

ESCAP, *Asia-Pacific Trade and Investment Report 2016: Recent Trends and Developments*, 29 November 2016.

M. J. Ferrantino, D. Taglioni, *Global Value Chains in the Current Trade Slowdown*, Poverty



Reduction and Economic Management Network. The World Bank, Economic Premise, March 2014.

G. Gereffi, O. Memedovic, *The Global Apparel Value Chain: What Prospects for Upgrading by Developing Countries?* Vienna, Austria. United Nations Industrial Development Organization, 2003.

J. Humphrey, H. Schmitz, *Governance and Upgrading: linking industrial cluster and global value chain research*. IDS working paper 120. Institute of Development Studies, 2000.

R. C. Johnson, *Five Facts about Value-Added Exports and Implications for Macroeconomics and Trade Research*. Journal of Economic Perspectives – Volume 28, Number 2 — Pages 119-142, 2014.

P. R. Krugman, M. J. Melitz, M. Obstfeld. *International Economics, Theory and Policy*. Pearson Global Edition, 2015.

J. Neilson, B. Pritchard, H.W. Yeung. *Global value chains and global production networks in the changing international political economy: An introduction*. Review of International Political Economy, 21:1, 1-8, 6 Feb 2014.

OECD, *About the OECD Initiatives on Global Value Chains, Production Transformation and Development*.

OECD, *Making Global Value Chains Work for ASEAN*, OECD-ERIA joint regional symposium, Hanoi, Viet Nam, 13 June 2016.

OECD, *Global Value Chains: challenges, opportunities, and implications for policy*, OECD WTO and World Bank Group, Report prepared for submission to the G20 Trade Ministers Meeting, Sydney, Australia, 19 July 2014.

OECD, *Global Value Chains (GVCs): Germany*, OECD publication complementing “Interconnected Economies: Benefiting from Global Value Chains”, May 2013.

G. Orefice, N. Rocha, *Deep integration and production networks: an empirical analysis*, World Trade Organization, Jul 2011.

E. Ortiz-Ospina, M. Roser, *International trade*, Published online at *OurWorldInData.org*. Retrieved from: <https://ourworldindata.org/international-trade>, 2016.

J. Ravenhill, *Global value chains and development*, Review of International Political Economy, 21:1, 264-274, 13 Jan 2014.

World Economic Forum, *The Shifting Geography of Global Value Chains: Implications for Developing Countries and Trade Policy*, Global Agenda Council on the Global Trade System, 2012.