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Global Value Chains and Vertical Specialization: The case of Portuguese *Textiles, Leather, and Shoes* exports

Tiago Domingues[1]

Abstract:

This paper evaluates the growing participation of the Portuguese economy, and especially of the *textiles, leather, and shoes* industry, in the so-called Global Value Chains (GVCs). We use the 2016 edition of the World Input-Output Database (WIOD) to empirical assess the changes in the geography of imports and exports of the Portuguese *textiles, leather, and shoes* industry as well as quantify the growing vertical specialization in this sector. We also measure value added, import and employment coefficients for the Portuguese economy and the Portuguese *textiles, leather, and shoes* sector. The results show that Portuguese *textiles, leather, and shoes* trade have been more concentrated in Spain, Italy, India and China and less concentrated in Germany, France, and the United Kingdom. This sector is more relevant in the Portuguese economy than in any other *Eurozone* economy in terms of output, employment and value-added, and it has been recovering its relevance in the Portuguese economy since 2009. *Textiles, leather, and shoes* is the manufacturing industry with the higher potential to generate new jobs in Portugal. Despite the negative contribution of the financial crisis, vertical specialization of Portuguese *textiles, leather, and shoes* exports have been increasing ever since.

JEL Classification Codes: C67; D57; E01; F14; L67
Keywords: Global value chains; Textile, leather, and shoes; Input-Output models

Note: This article is the sole responsibility of the authors and does not necessarily reflect the positions of GEE or the Portuguese Ministry of Economy.

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1. Introduction

There is evidence for the growing specialization in the nature of international trade. The emergence of the so-called Global Value Chains (GVCs), accompanied by an increase in imports, namely of intermediate inputs, highlights the multiple-border-crossing of trade. This disintegration of production involves value-added sharing during the production process among trade partners.

The significant change in the nature of international trade, with strong growth in the trade flows of parts and components to be used as inputs of other products, stems from the international fragmentation of the productive process. In that sense, GVCs have been contributing to a disruptive change in the way international trade and production are organized. This change comes primarily from the declining trade costs, increasing mobility of capital and rapid technological innovations (Baldwin et al., 2012). Consequently, the increasing interconnectedness of production, made mainly by multinational firms, magnifies these trade growth effects.

In a single monetary union, the elimination of both exchange rate risk and transaction costs and the reduction of uncertainty produced by inflation distortion contributed to the intensity and changing geography of trade. Since the foundation of the *Eurozone*, member state exports and imports trade volume of goods and services increased at an average annual growth rate of 4.3 and 3.7 percent, respectively over the period 2000-2014.

The GVC integration process depends heavily on the comparative advantages each country has in these international production networks. Each country integration in the GVCs is associated with the imported content of exports. Given this new configuration of international trade, conventional statistics on trade flows may no longer be informative enough. It is therefore relevant to assess with some precision the participation of each economy along the GVCs. The recent process of vertical specialization in the production chains fostered a substantial increase in international trade of intangibles and intermediate products, which in turn increases the difference between each country exports and imports in absolute value and the total amount of exports and imports in value-added (Amaral and Lopes, 2018).

In methodological terms, intangibles are on the rise, yet their measurement is elusive. The income share of labour in GDP has been declining and it is widely shared across industries and countries (Dao et al., 2017). Meanwhile, the residual that remains after subtracting measured payments to labour and imputed cost of capital from GDP (the factorless income) is on the rise (Karabarbounis and Neiman, 2018). This phenomenon reflects the increasing importance of intangible capital that is currently unmeasured in national accounts statistics. Contrary to tangible assets and labour that have a physical presence, the uses of intangibles cannot be uniquely attributed to a geographically location and therefore it is hard to infer the income that accrues to these intangibles in national accounts statistics as their use cannot be uniquely attributed to a geographically location (Haskel and Westlake, 2017).

The main measurement challenge is the fact that GVCs are not directly observable in the data and need to be inferred from information on the linkages between the various stages of production. In that sense, the last two decades can be seen as an exceptional period in the global economy, as multinational firms benefitted from reduced labour costs through offshoring, while capitalising on existing firm-specific intangibles, such as brand names (Chen et al., 2018).

Recently, empirical research has begun to use global Input-Output matrices to assess the role of intermediates in different industries more accurately. These matrices decompose the quantity of each intermediate good that is used by the different sectors of each country according to their geographical origin. Recognizing this need, several international databases were created, from which it is possible to obtain global Input-Output tables. These databases differ in their statistical sources, in the calculation methods, and in the hypotheses placed. The most used databases in the analysis of international trade and GVCs are OECD-WTO TiVA database, UNCTAD-Eora GVC database and World Input-Output Database (WIOD).

Based on this information, this paper intends to analyze the experience of the Portuguese economy as well as the Portuguese *textiles, leather, and shoes* industry in the GVCs, quantifying its *backward integration* during the period 2000-2014, according to the total (direct plus indirect) import content of exports applied in the work of

Hummels et al. (2001) [2]. We use the latest edition of the World Input-Output Database (WIOD), which contains annual time-series of world Input-Output tables and factor requirements that cover *Eurozone* countries and 15 other major economies during the period 2000-2014 [3]. Our dataset makes it possible to analyze the geographical and factorial distribution of value added, both within and across countries. [4]

Portugal is traditionally considered a labor-intensive country which would tend to have a comparative advantage in the labor-intensive sectors, such as textiles (a sector also considered to be of low technology). In the context of GVCs analysis, it is also important to note that *textiles, leather, and shoes* industry is a good case study, given the high intensity of intermediate inputs in global output and foreign trade.

The rest of the paper is organized as follows. Section 2 includes an overview of the main literature on this subject. Section 3 describes the fundamental Input-Output relationships with a particular focus on the Hummels measure of vertical specialization. Section 4 presents: i) the last edition of the WIOD dataset; ii) value-added, import and employment coefficients for both the Portuguese economy and for the *textiles, leather, and shoes* industry; iii) the *textiles, leather, and shoes* geography of trade; iv) relative weight of the sector in the Portuguese economy, its labor productivity and degree of openness; and v) a comparative analysis of the *backward integration* in the main *Eurozone* economies, with a closer look to the *textiles, leather, and shoes* industry. Finally, section 5 concludes.

[2]Corresponds to NACE-rev2 divisions 13 (Manufacture of Textiles), 14 (Manufacture of Wearing Apparel) and 15 (Manufacture of Leather and related products)

[3]For more details about this database and the sources and characteristics of the new 2016 release see (Timmer et al. (2016)) and (Timmer et al. (2015)), respectively. More information on the construction of the WIOTs can be found in (Dietzenbacher et al. (2013))

[4]Production processes are fragmenting across borders with countries trading tasks rather than products. Export statistics based on value added reveal a process of vertical specialisation. The traditional approach to measure specialisation in trade is based on the product composition of countries' gross export flows. The shortcomings of this approach became increasingly apparent as international production fragmentation progressed. In response, new trade statistics were developed based on the concept of value added in trade. Countries were seen as to export a bundle of activities, some of which are carried out locally and others imported as in the trade-in-tasks concept. The key novelty was to include information from input–output tables such that one could measure the value that is added by domestic industries. GVCs trade statistics only capture part of the new reality of global production as they are silent on the nature of the activities that are performed in trade. These 'second generation' trade statistics have become part of the standard tool kit for trade analysts. (Timmer et al., 2018)

2. Literature Review

The increasing interconnection of trade comes from the division of the production chain, with different stages of production being allocated worldwide and so, intermediates trade shifts from raw materials to manufactured parts (Bridgman, 2013). This phenomenon has been the subject of research in the literature as *vertical specialization*, *external orientation*, *fragmentation of production*, *international vertical integration*, *vertical production network*, *offshoring*, *outsourcing*, *fragmentation of production*, *internationalization of manufacturing*, *trade in tasks*, *trade in value added*, among others.

Helpman and Krugman (1985) first referred to *international vertical integration* as the trade and investment relationship made by multinational firms with their subsidiaries, while multinational companies spread their production process across different geographies. Feenstra and Hanson (1996) and Feenstra (1998) referred to *outsourcing* as the practice in which multinational companies divides production stages, allocating each stage according to minimize internal production costs. Arndt and Kierzkowski (2001) and Baldone et al. (2001) defined *fragmentation of production* as the segmentation of the product chain made essential by multinational companies that incorporate third-party services, mostly due to technological innovations and market liberalization. Additionally, Campa and Goldberg (1997) make use of Input-Output tables as an alternative to trade statistics and classified *external orientation* as the difference between industrial exports and the share of imported inputs in production. Arndt and Kierzkowski (2001) defined *internationalization of manufacturing* in which countries participate in different stages of the manufacturing process. As an alternative to the comparative advantage theory, countries specialized in processes or stages of production rather than products. Grossman et al. (2006) suggest that producers took advantage of the productivity gains deriving from worker specialization by dividing the production process into different tasks. More recently, Daudin et al. (2011) and Koopman et al. (2014) contributed to a redefinition of what is registered as a final good since a product in different stages of production crosses several borders until it becomes a final good, making use of the term *trade in value added*.

This study focuses on the *vertical specialization* in the Portuguese trade, using the definition first introduce by Hummels et al. (1998) and later formalized by Hummels et al. (2001) as a complete measure of vertical specialization. As defined by Hummels, vertical specialization refers to the division of production in sequential steps performed in different countries, each one specialized in different stages of the production process rather than being vertically integrated at a firm level. Consequently, the disintegration of production involves value-added sharing during the production process among trade partners and so, it is important to dissociate the value-added embodied based on sources of origin and final destinations.

Accordingly, one should consider both foreign value added (FVA), and domestic value added (DVA). The first is associated with *backward integration* and represents the imported input content of exports - i.e., foreign value-added embodied in national exports. By another hand, DVA represents both the sum of domestic value added directly consumed nationally and the domestic value added of products that enter into the production of other countries' exports, known as *forward integration*.

Around 55 percent of the growth in total manufacturing exports to gross output ratio between 1980 and 2002 is attributable to the increase in Portuguese vertical specialization (Amador et al., 2008). During the period 1995-2007, foreign value added in Portuguese exports suffered a significant increase that was only reversed by the international financial crisis. According to Amador et al. (2015), foreign value added in Portuguese exports accounted in 2011 for 26.8% and 22.9% in Leather and Footwear, and Textiles products respectively. Cardoso et al. (2013) studied the Portuguese participation in the GVCs during the last three decades and concluded that there was a significant increase after Portugal joined the European Community. They also conclude that the component that presented the higher import content was the global fixed capital formation accompanied by exports. The import content of private demand was lower than the import content of global demand while the public consumption registered the lowest import content.

In the case of *textiles, leather, and shoes* products, it is essential to stress the increasing participation of China in the international production chains, especially in what concerns intermediate inputs trade flows. Ping (2005) computed the Hummels measure of vertical specialization for China and concluded that the foreign content of Chinese exports accounted for 15% and 21% in 1997 and 2002 respectively. Similarly, Dean et al. (2011) found evidence of an Asian network of suppliers to China, with Japan, Hong Kong, Singapore, South Korea and Taiwan accounting for more than half of China's imported inputs, both in 1997 and in 2002, evidencing that the apparent sophistication in Chinese exports may indeed be a reflection of vertical specialization. According to Özçelik (2016), vertical specialization share of Chinese exports was 22.3% in 2011, which means that 22.3% of total Chinese exports corresponds to foreign content, while textile products constitute a significant part of total Chinese exports. In 2011, the leading contributor countries to China's vertical specialization were Taiwan, Japan, Korea, Germany and the United States. In the case of Korea, Suh (2008) found that vertical trade to China has proliferated. Also, Koopman et al. (2010) have shown that Asia's newly industrialized countries have very high vertical specialization shares and that the multinational supply chain for intermediate goods is widespread across Asia which constitutes an essential driver for the Asian regional value chain.[5]

Amador et al. (2015) concluded that, in 2011, for the euro area taken as a whole, GVCs was as important as in China and more important than in the U.S. and Japan, measured by the share of foreign value added in exports - i.e., *backward integration*. The service sector has increased its importance in GVCs in most countries, and the results corroborate the idea that GVC has a strong regional dimension. Results also confirm the increasing trend in the share of foreign value added in exports for the *Eurozone* as a whole during the period 2000-2011.[6]

[5]Research on trade economics have been reasonably successful in explaining the structure of trade at any point in time. However, to some extent it have been much less successful in understanding how the determinants of trade patterns change over time. This is particularly true since the entry of China and India in the global trade economy and the emergence of GVCs (Baldwin, 1989).

[6]Timmer et al. (2013) suggests a related concept, namely GVC jobs, measuring the number and types of workers that are involved in a GVC production. Results show that around half of the jobs directly or indirectly involved in manufactures GVC production are actually manufacturing jobs, and that international fragmentation does not necessarily lead to overall job destruction.

As regards the competitiveness, it is crucial for all the *Eurozone* economies, but especially for small and open economies like Portugal, to guarantee a good position in regional and global value chains. The increase in imports must be accompanied by an adequate increase in exports, generating a substantial amount of domestic value added, which is only achievable with a virtuous specialization in high and medium-high technology industries (Lopes et al., 2016).

3. Methodology Framework

3.1. Basic Assumptions and Input-Output Relationships

The empirical assessment is based according to the structural relationships in the multi-sectoral economy, formalized through the Leontief Input-Output model. For a detailed analysis of the IO model see (Miller and Blair, 2009) and (Amaral and Lopes, 2018). In order to model an economy according to the Leontief Input-Output relations, the basic equation is:

$$x = Ax + y \tag{1}$$

Where x is the column vector of gross output values of the j sectors of the economy, y is the final demand vector, and A is the technical coefficients matrix. The final solution of this system is:

$$x = (I - A)^{-1}y \tag{2}$$

Where $(I - A)^{-1}$ is the so-called Leontief inverse matrix of output multipliers (afterward represented by B), whose generic element, b_{ij} gives the increase of sector j's production caused by an additional unitary final demand directed to sector j. The vector of (total) final demand can be divided into two vectors: the domestic final demand d (public and private consumption plus investment), and the external final demand e.

Considering $y = d + e$, the solution of the Leontief system is given by:

$$x = B(d + e) \tag{3}$$

After that, one should calculate the primary factor income (salaries and profits, including also, for simplicity, the net indirect taxes) necessary for production, x, and for domestic demand, D:

$$VA = a^v Ba^d D + a^v Ba^e E + a^t{}_D \tag{4}$$

Where VA is the total gross value added of salaries and profits (plus net indirect taxes), a^v is the vector of value-added coefficients of j sectors (a^v= VA/X), a^d and a^e are the vertical coefficients of final demand (domestic and external) directed to the productive sectors. Equivalently, one can calculate the value of imports necessary for the production as:

$$M = a^m Ba^d D + a^m Ba^e E + a^m D \tag{5}$$

Where M represents the imports, a^m corresponds to the vector of imported input coefficients, a^m_d and a^t_d are the vertical coefficients of imports and net indirect taxes in the final domestic demand, respectively. Finally, D is the total value of final domestic demand, and E is the value of exports.

From equations (4) and (5), value-added and import content of domestic and external final demand can be expressed as:

$$va_D = a^v Ba^d D + a^t_d \quad \text{and} \quad va_E = a^v Ba^e D + a^t_e \tag{6}$$

$$m_D = a^m Ba^d + a^m_d \quad \text{and} \quad m_E = a^m Ba^e + a^m_e \tag{7}$$

Considering the equilibrium condition for the IO tables ($VA + M = D + E$), m_D and m_E can be expressed as:

$$m_D = 1 - va_d \quad \text{and} \quad m_E = 1 - va_e \tag{8}$$

Then, the total value of imports made by the economy can be expressed as:

$$M = (1 - va_D)D + (1 - va_E)E \tag{9}$$

Input-output (IO) analysis examines inter-industry relationships within an economy by capturing all financial market transactions between industries in a given time. The mathematical solution of the model allows for a better understanding of the effects of a change in one (or several) economic activities on the entire economy. Like any other model, the IO is based on a set of assumptions, such as: i) constant returns to scale and fixed input structure (changes in the economy will affect the industry's output level but not the mix of commodities and services it requires to produce that output.); ii) no supply constraints (there are no restrictions on raw materials and employment); iii) constant industry technology (an industry uses the same technology to produce each of its products); iv) static linear relationships (relationships for a given year do not change unless more data is considered).

In order to determine the employment content of domestic final demand and exports, we should consider the employment coefficients of the productive sectors, given by the (row) vector a^l. As it was done above, to get the generic element of this vector we divide the employment (number of employees) of sector j by its gross output value $a^l_j = L_j/X_j$.

Assuming the vertical structure of both domestic final demand and exports do not change, given by the (column) vectors a^d and a^e, the employment contents of one unit of domestic final demand and exports are given by:

$$l_D = a^l B a^d \quad \text{and} \quad l_E = a^l B a^e \tag{10}$$

In fact, l_D can be computed by difference, since both net direct taxes and imports do not generate employment. After computing the employment associated with exports $L_E = l_E E$, one can determine $L_D = L - L_E$, and then dividing by D one should get $l_D = L_D/D$.

3.2. Measuring Vertical Specialization

According to Hummels et al. (2001), vertical specialization involves the increasing inter-country link in international global chains. In other words, the emergence of the so-called GVCs, accompanied by an increase in imports, namely of intermediate inputs, highlights the multiple-border-crossing of trade. This process involves value-added sharing during the production process among trade partners. In that sense, this general tendency for disintegration and fragmentation of production has been contributing to the use of imported inputs in the production of goods that are exported afterward. The production of goods (and also services) are made in many countries, each one specializing in "tasks" or different stages of production.

Several reasons support the use of the vertical specialization measure introduced by Hummels. First, the increasing importance of vertically integrated multinationals is not captured by trends in intermediate goods trade, because the share of intermediate goods in trade has declined (Hummels et al., 1998). Second, contrary to the vertical specialization concept defined by Hummels, the classification of goods into intermediates and final categories is by necessity somewhat arbitrary. For example, given that Portugal uses imported wool and polyester, namely from India and China, to produce cloth and shoes, some of which are exported, how should they be classified? Avoiding this problem, vertical specialization builds on the Input-Output structure that fully captures the differences in the nature of goods.

According to Hummels et al. (2001), for each sector j, vertical specialization can be expressed as:

$$Vertical\ Specialization = VS_j = \frac{intermediate\ inputs}{gross\ output} \times exports \tag{11}$$

Alternatively, sectoral vertical specialization can be defined as the weight of imported inputs in sector's exports, that is equation (11) can be rewritten, in nominal terms, as: [7]

$$VS_j = \sum_{i=1}^{n} a_{ij}^{M} X_j \tag{12}$$

Where a_{ij}^{M} is the $n \times n$ matrix of imported intermediate input coefficients, representing the proportion of imported input i used to produce output Y_j, and X_j is the value of exports of sector j. Thus, VS_j measures the import content of exports, namely the external value that is included in the industry's j exports. Vertical specialization of country k corresponds to the sum of each j sector vertical specialization in the overall economy.

$$VS_k = \sum_{j=1}^{n} VS_j = \sum_{j=1}^{n} \sum_{i=1}^{n} a_{ij}^{M} X_j \tag{13}$$

Equivalently, one may think of a country's vertical specialization share of exports as an exported-weighted average of the sector VS export shares (Hummels et al., 2001). Recall that in a sectoral level, each j sector's vertical specialization export shares must equal the value of imported intermediate input shares in industry j gross output Y_j.

For simplicity purposes, it is useful to compute the vertical specialization as a share of total exports of country k. Thus, assuming that $X_k = \sum_{j=1}^{n} X_j$ corresponds to the total exports of country k, the vertical specialization share of total exports in country k can be expressed as:

$$\frac{VS_k}{X_k} = \frac{\sum_{j=1}^{n} VS_j}{\sum_{j=1}^{n} X_j} = \sum_{j=1}^{n} \left[\left(\sum_{j=1}^{n} a_{ij}^{M} \right) \frac{X_j}{X_k} \right] \tag{14}$$

[7] For examples of empirical applications of the Input-Output tables, especially in measuring the vertical specialization share of exports in the Portuguese economy see (Amador et al., 2007), (Amador et al., 2008) and (Lopes et al., 2016).

Another comparative advantage of the Input-Output tables is that it simplifies the calculation of equations (11)(12)(13)(14). In practice, IO tables allow for an explicit computation of the direct sectoral vertical specialization. In matrix notation, equation (14) can be rewritten as:

$$\frac{VS_k}{X_k} = uA^M \frac{X}{X_k} \tag{15}$$

Where u is a $n \times 1$ summation vector, A^M is the $n \times n$ matrix of imported direct intermediate input coefficients, X is a $n \times 1$ vector of exports of each sector j and X_k is the sum of exports across the n sectors. Each a_{ij} element of A^M represents the imported inputs from industry i allocated to produce one unit of sector j's output, Y_j. This result can also be named as the direct vertical specialization of exports since it measures the value of imported intermediate inputs used directly in total exports, or in other words, the direct import content of aggregate exports X.

An essential advantage of the IO model comes from the fact that it prevents errors in classifying the nature of the imported intermediate inputs. For example, how should we classify the use of a piece of wool? For some industries, it can be used as an intermediate input (when firms buy it to produce cloth, shoes, etc.) or instead they can be used as final goods. At that light, Input-Output tables are relatively strong, as it classifies goods based on its use rather than its characteristics.

Input-Output tables allow us to compute a more accurate measure of vertical specialization by considering also the imported inputs used indirectly in exports, since one intermediate input can be first used in sector j, whose outputs are employed in sector j+1, j+2, etc, until it is fully embodied in a final exported good. That way, intermediate inputs are set to circulate freely through different stages (tasks) of the economy, before there is an export. Keeping the previous example, suppose that a footwear company imports raw materials like wool in order to produce shoes. In that case, the direct import contribution is given by the relative weight of the value of the imported wool in the total value of the shoe. However, it is reasonable to consider that a footwear producer will also incorporate other raw materials, that in turn may also embody intermediate inputs imported from foreign markets. Using the same example,

think of a footwear company that uses not only wool to produce shoes but also ink, that is traded domestically. However, in order to produce ink, the domestic company incorporate as an intermediate input a set of additives such as plasticizers and others, that are imported worldwide. Thus, the imported inputs required for the production of a shoe must include not only the direct imports but also the indirect inputs that are imported indirectly to the production of ink. Those indirect intermediate input imports must be accounted in the final measure of vertical specialization, also avoiding the error of double counting.

Since we are modeling through the use of I-O matrices, one can compute the final measure of vertical specialization, that is the total vertical specialization of exports in country k as:

$$\frac{VS_k}{X_k} = uA^M \left[I - A^D\right]^{-1} \frac{X}{X_k} \tag{16}$$

Where $[I - A^D]^{-1}$ is the so-called Leontief inverse matrix, that is composed by the identity matrix I and by the $n \times n$ matrix of domestic technical coefficients, A^D. Accordingly, multiplying the matrix of imported direct intermediate input coefficients by the Leontief inverse matrix, we get the matrix of total requirements of imported inputs. Each element (i, j) of the matrix $A^M \left[I - A^D\right]^{-1}$ represents the total imports of product i required to satisfy one unit of exports for sector j. As it was shown previously in this work, equation (16) represents the sum of vertical specialization from all sectors and can be easily reformulated to each j sector of the economy.

4. Empirical Assessment

4.1. Data Description

The data used in this empirical work was gathered from the World Input-Output Database (WIOD), corresponding to the 2016 release. The last release provides (i) National Input-Output tables (NIOT), (ii) World Input-Output tables (WIOT), and (iii) Socio-Economic Accounts (SEA), denoted in current millions of U.S. dollars.

The WIOD dataset covers all 28 EU countries and 15 other major economies in the world, representing 85% of world GDP, for the period 2000-2014. For more details about this database and the sources and characteristics of the new 2016 release see (Timmer et al., 2016) and (Timmer et al., 2015), respectively. More information on the construction of the WIOTs can be found in (Dietzenbacher et al., 2013).

National Input-Output Tables (NIOT) describe the relationships between producers and consumers within an economy. They can either show flows of final and intermediate goods and services defined according to industry outputs. Another relevant feature of the new 2016 release is that it considers 56 sectors, in contrast with the 35 sectors considered in previous editions. Of the 56 sectors considered in the WIOD dataset, 19 are manufacturing sectors, according to the United Nations International Standard Industry Classification (ISIC) revision 4, section C - manufacturing divisions 10-33. The main focus of this work is on the manufacture of *textiles, leather, and shoes*, corresponding to divisions 13 (Manufacture of Textiles), 14 (Manufacture of Wearing Apparel) and 15 (Manufacture of Leather and related products).[8]

World Input-Output Tables (WIOT) are a very useful empirical tool for structural analysis at the international level, particularly in analyzing the sectoral geography of international trade, in which the diagonal blocks represent domestic transaction flows of intermediate goods and services across industries, while the off-diagonal blocks represent the inter-country flows of intermediates via exports and imports.

This dataset also contains the Socio-Economic Accounts (SEA), which covers industry-level data on employment, hours worked, capital stocks, gross output, and value added at current and constant prices.

Although our main assessment is focused on the Portuguese *textiles, leather, and shoes* industry, to put the results in perspective, a comparison with the main *Eurozone* economies was made, namely with Spain, France, Germany, Italy, Greece, Netherlands, Belgium, Austria, and Finland. Additionally, to assess the relative performance of *textiles, leather and shoes* in the Portuguese economy, a comparison is made with the remaining 18 manufacture Portuguese sectors.

[8]For a detailed analysis of the textile industry classification and its sub-classes see figure 11 in Appendix.

4.2. Value Added, Import and Employment Coefficients

4.2.1. Portuguese Economy vs *textiles, leather, and shoes*

After presenting the methodology used as well as its basic assumptions, we can now apply it empirically, exploring the results for both the Portuguese economy and the Portuguese *textiles, leather, and shoes* industry. First, it is necessary to compute A, the domestic technical coefficients matrix and also the correspondent Leontief inverse matrix $B = (I - A)^{-1}$. From that, we got the vectors of the sectoral value-added coefficient (a^v) and imported intermediate input coefficient (a^m). We also get the coefficients of indirect taxes on domestic final demand and of direct imports for domestic final demand (a_d^t and a_d^m).[9]

Upon that, value-added and import contents of domestic final demand and exports for the Portuguese economy were calculated as:

$$va_{D(Econ)} = a^v B a^d + a_d^t = 0.73375 \quad \text{and} \quad va_{E(Econ)} = a^v B a^e D + a_e^t = 0.66711 \quad (17)$$

$$m_{D(Econ)} = a^m B a^d + a_d^m = 0.26625 \quad \text{and} \quad m_{E(Econ)} = a^m B a^e + a_e^m = 0.33289 \quad (18)$$

Assuming the vertical structure of sectoral domestic final demand, given by the (column) vector a^d, remains constant and using the values of sectoral outputs given by the WIOT and the number of employees per sector, from the SEA, it is possible to calculate the vector of employment coefficients, a^l. Accordingly, l_D and l_E can be expressed as:

$$l_{D(Econ)} = a^l B a^d = 0.01221 \quad \text{and} \quad l_{E(Econ)} = a^l B a^e = 0.01176 \quad (19)$$

[9]The time-series for the value-added, import and employment coefficients for the Portuguese economy during the period 2000-2014, are present in figure 1 and tables 1 and 2. The values presented above for the value-added, import and employment coefficients correspond to the last year in which data is available, in this case, 2014.

From our results, one can make our first conclusions. Equation (17) describes the value-added increase resulting from a one unit increase in domestic demand and exports. So, va_D corresponds to the increase in value-added resulting from a unitary increase in final domestic demand and va_E measures the increase in value-added caused by a one unit increase in the level of exports. In 2014, a one unit increase in the level of domestic demand (exports) led to a 0.73 (0.68) increase in value-added. During the period 2000-2014, value-added contents of domestic final demand and exports remained relatively constant. However, the international financial crisis of 2008 produced a positive shock to va_D and va_E followed by a steady reduction, especially in va_E.

Equivalently, equation (18) refers to the import contents of domestic final demand and exports. In that sense, by looking at m_D one can conclude that in 2014, for each one-unit increase in the final domestic demand of the economy, the value of Portuguese imports increased by 0.27. During the period 2000-2014, this coefficient remained relatively unchanged (0.274 in 2000 and 0.266 in 2014). However, the international financial crisis of 2008 is quite observable (see figure 1), with a significant reduction in the magnitude of m_D for the Portuguese economy, followed by a sharp increase afterward. Additionally, when we look at the import content of exports, one can conclude that in 2014, each one unit increase in Portuguese exports tends to generate a 0.33 increase in the level of imports, which is a very high level (see Amaral et al. (2010)). During the period 2000-2014, the import content of exports suffered a slight increase (0.298 in 2000 to 0.333 in 2014), only offset by the financial crisis. After that, the coefficient m_E followed an increasing path. During the period 2000-2014, Portuguese exports were relatively more dependent on imports than the domestic demand.

As employment is measured in thousands of persons and demand (domestic and external) in millions of U.S. dollars, from equation (19) one can conclude that in 2014, each 1 million U.S. dollars increase in the level of Portuguese domestic demand (exports) had the potential to generate approximately 12.2 (11.8) new jobs. During the period 2000-2014, these coefficients suffered a significant decrease, from 24.6 (26.4) jobs in 2000 to 12.2 (11.8) jobs in 2014. It is also important to note that after 2008, m_E and m_D remained relatively constant with small year on year variations. Since 2011 the unitary employment content of domestic demand became slightly higher than the employment content of exports.

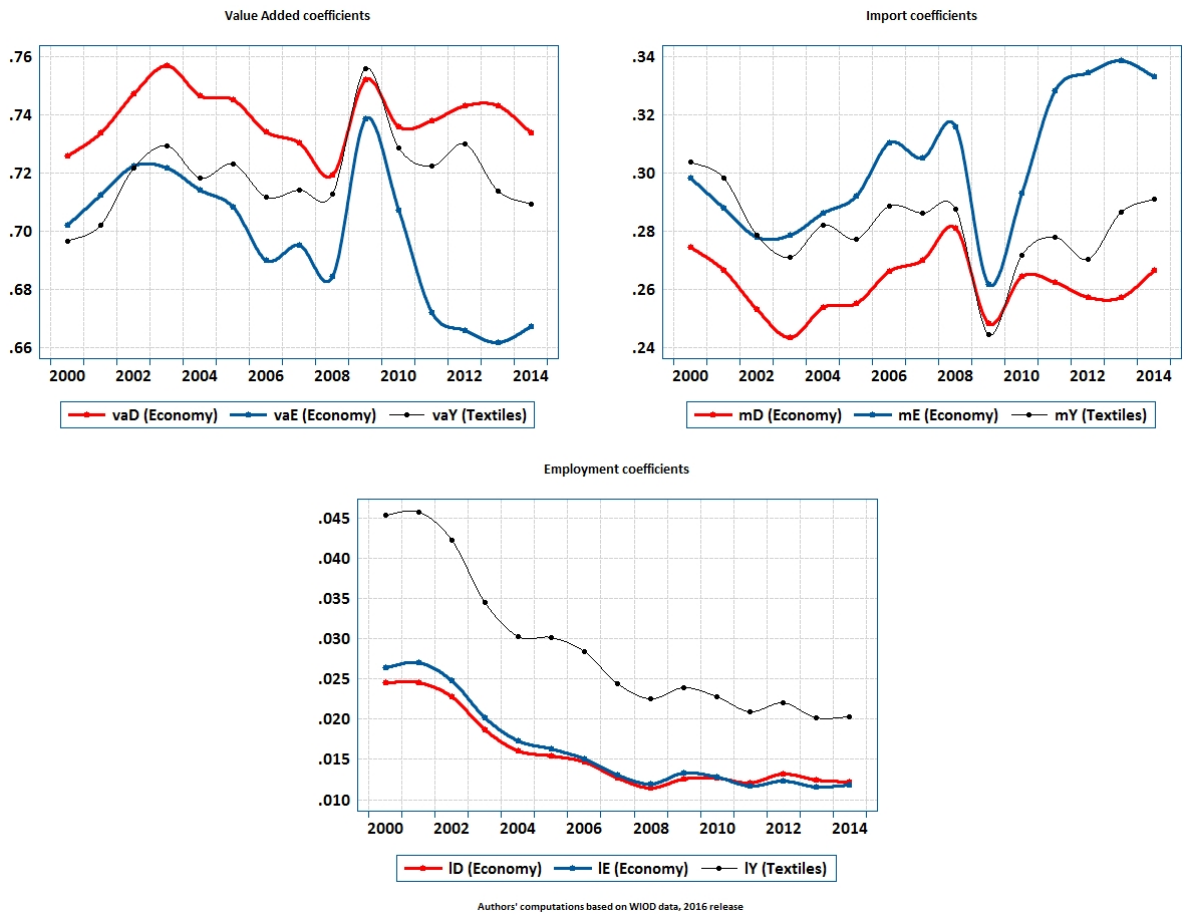

Figure 1: **Value-added, import and employment coefficients (Portuguese economy)**

4.2.2. An Inter-sectoral Analysis of the Portuguese manufacture

Our main assessment focuses on the manufacture of *textiles, leather, and shoes* products. As known, WIOD considers 19 different manufacture industries (see figure 11). To put the previous results into perspective, this section measures value-added, import and employment coefficients for all 19 manufacture industries considered in the WIOD dataset, highlighting the performance of the *textiles, leather, and shoes* industry.

For the sake of a clean interpretation of the results, in contrast with what was done in the previous section, we decide not to consider the vertical structure of the Portuguese economy, that is, to calculate the coefficients for the final demand instead of differentiating from domestic and external demand, according to the vertical sectoral structure of the Portuguese economy.

Having said that, value-added, imports and employment coefficients of final demand for the *textiles, leather and shoes* industry can be written as: [10]

$$va_{Y(Tex)} = a^v B = 0.7092 \tag{20}$$

$$m_{Y(Tex)} = a^m B = 0.2908 \tag{21}$$

$$l_{Y(Tex)} = a^l B = 0.0203 \tag{22}$$

In terms of value-added, from $va_{Y(Tex)}$ one can conclude that each one unit increase in *textiles, leather and shoes* industry final demand generates a 0.71 increase in value-added. Comparing with the remaining 18 manufacture industries, only Pharmaceutical products (0.79), Printing and Recorded media (0.74), Repair and Installation of Machinery (0.74), Rubber and Plastics (0.74) and Furniture and others (0.72) had higher marginal contributions to global value-added. In 2014 the Portuguese industry with lower value-added coefficient was Coke and Refined Petroleum products (0.18).

From $m_{Y(Tex)}$, we conclude that in 2014 for each unitary increase in textiles final demand corresponds a 0.29 increase in the level of imports directly to the textile industry. The higher values were recorded in Coke and Refined Petroleum (0.82), Motor Vehicles, Trailers and Semi-trailers (0.58) and Basic Metals (0.57). In contrast, the lower values were registered in the Pharmaceutical industry (0.21).

Finally, $l_{Y(Tex)}$ indicates that in 2014, each one million U.S. dollar increase in the level of *textiles, leather and shoes* final demand had the potential to generate 20.3 new jobs, which represents the highest value in the Portuguese manufacture. In contrast, Coke and Refined Petroleum registered the lowest values for the employment multiplier, while for each one million U.S. dollars increase in Coke and Refined Petroleum industry final demand had the potential to generate approximately 2.2 new jobs.

[10] All value-added, import and employment coefficients for the 19 considered manufacture industries during the period 2000-2014 are available in figure 2 and tables 2, 3 and 4.

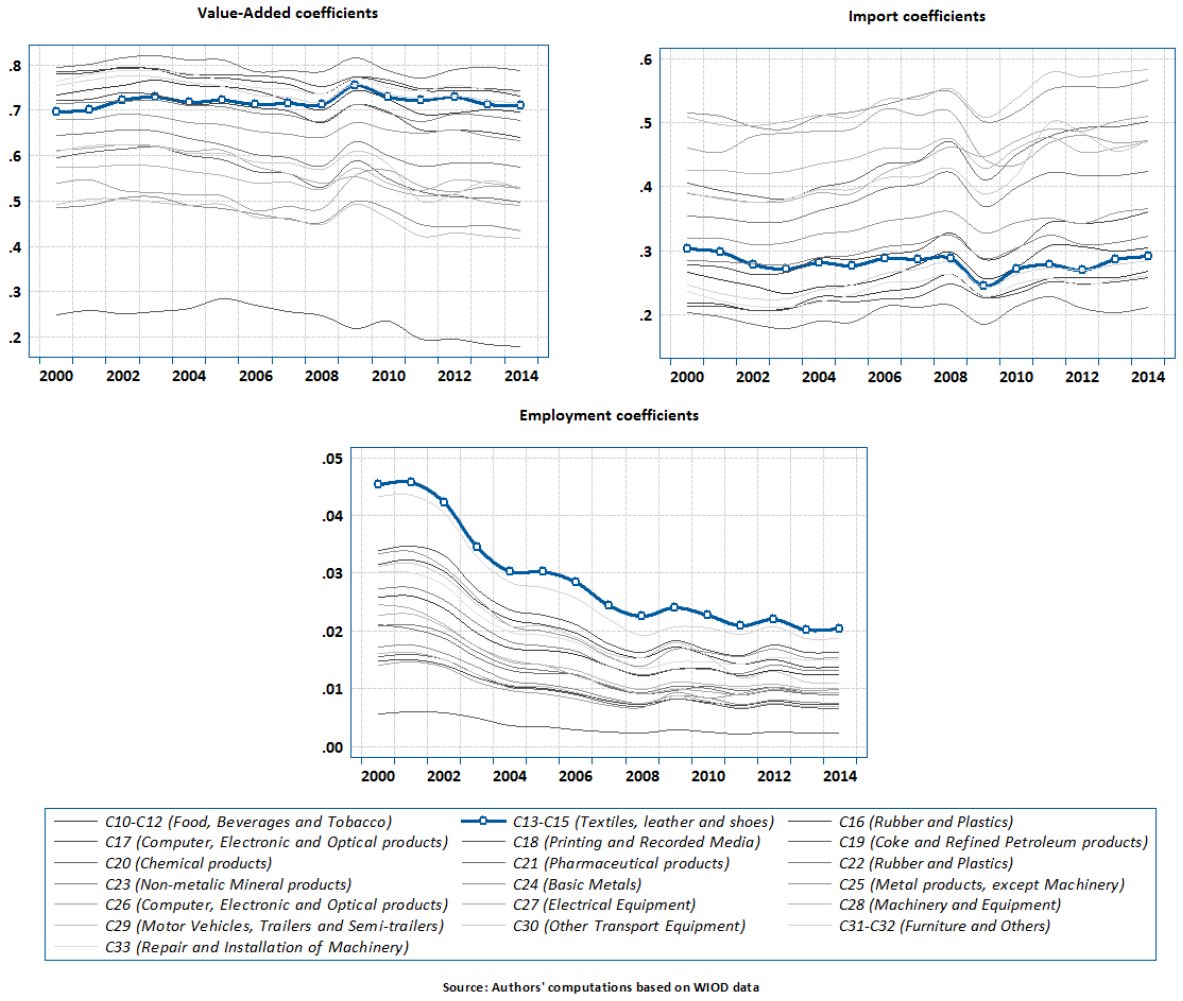

Figure 2: **Value-added, import and employment coefficients (*textiles, leather and shoes*)**

In 2014, *textiles, leather and shoes* was the sixth industry with the higher marginal contribution to the national value added (see figure 1). Additionally, it was the larger contributor to job creation, despite the huge reduction in the labor multiplier. Indeed, coefficient l_Y suffered a significant reduction in all 19 industries, in favor of the tertiary sectors. Parallel to this, we observe that Coke and Refined Petroleum industry is by far the manufacturing sector that contributes the less to value-added and employment creation, while it is the sector with higher intermediate imports dependency.

4.3. Geography of *textiles, leather, and shoes* Trade

Textiles, leather, and shoes is an industry with high exposure to foreign trade, and its openness has been growing, accompanying the general movement of globalization and international fragmentation of production (Doscher, 2009). On a global scale, buyers and intermediaries worldwide have turned increasingly towards larger suppliers that can source materials, coordinate logistics, induce creative development and operate in locations that allow for shorter delivery cycles (Staritz, 2012).

According to the WIOD, in 2014 *textiles, leather, and shoes* industries represented 8.1% of Portuguese exports and directly employed 186.1 hundred workers (1.2 Million in the *Eurozone* and 23.1 Million in the World). This sector is responsible for 2.4% of Portuguese value-added (0.6% in the *Eurozone* and 1.6% in the World) and accounts for 3.1% of GDP (0.9% in the *Eurozone* and 2.0% in the World).[11] It accounts for 3.83% of total Portuguese intermediate inputs (1.2% in the *Eurozone* and 2.5% in the World. The share of exports in *textiles, leather, and shoes* gross output increased in Portugal between 2000 (36.19%) and 2014 (48.30%). This evolution is in line with what has been happening in all other *Eurozone* countries, except Greece, which is a much more closed economy, especially after 2008.[12]

These industries have great potential for further development thanks to international participation in different regional trade agreements and its integration in the GVCs have been given increasing advantages concerning manufacturing and labor. When we look at the openness of the *textiles, leather, and shoes*, one can conclude that within our sample, except Greece, all countries have been increasing the weight of exports in the final output (see figure 8). In 2014, the relative less open industries were located in Greece, Portugal, Italy, and Finland, respectively. In contrast, France, Belgium, Austria, and Germany represent the most exporting industries.

This section considers the geography of *textiles, leather, and shoes* trade by describing the recent dynamics of Portuguese exports, imports, and intermediate inputs imports. We intend to shed further light on the main destinations and origins of the Portuguese *textiles, leather, and shoes* exports and imports.

[11] WIOD data does not consider the employment figures for China.
[12] All values were computed from the WIOD Socio Economic Accounts data.

4.3.1. Exports

In 2014, the main destinations of Portuguese *textiles, leather and shoes* exports were (see figure 3 and table 5): Spain (22.78%), France (15.38%), RW[13] (12.75%), Germany (9.25%), United Kingdom (7.41%), United States (5.09%) and Italy (4.15%). The top destination countries of Portuguese *textiles, leather, and shoes* exports were the same as in 2000. However, it is noteworthy the changing share in Portuguese exports: Spain (+11.23 p.p.), France (-1.62 p.p.), RW (+7.55 p.p.), Germany (-8.70 p.p.), United Kingdom (-7.69 p.p.), United States (-2.82 p.p.) and Italy (+0.55 p.p.).

Portuguese *textiles, leather, and shoes* exports were in 2014, in comparison with 2000, more concentrated in Spain and Italy, and less concentrated in Germany, France, the United Kingdom, and the United States. It is also worth to note the relative increase in the weight of China (0.04% in 2000 to 0.70% in 2014) and Russia (0.15% in 2000 to 3.00% in 2014) in the total Portuguese *textiles, leather, and shoes* exports.

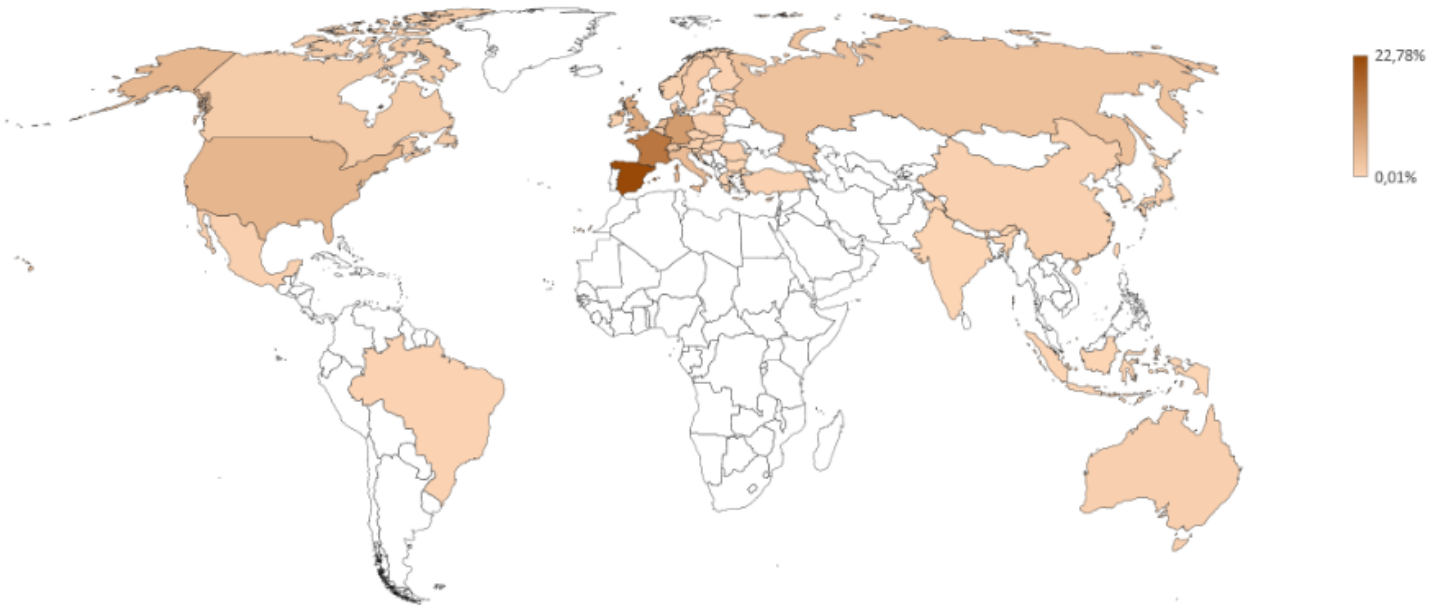

Figure 3: **Share in total Portuguese *textiles, leather and shoes* exports (%)**

[13]Rest of the World. WIOD only accounts for 43 economies. The remaining values are clustered in RW. It is important to stress that African countries are not considered for data issues. In the Portuguese case, it is reasonable to think in this cluster as highly composed by Angola.

4.3.2. Imports

In 2014, the main origins of Portuguese *textiles, leather and shoes* imports were (see figure 4 and table 6): Spain (35.17%), Italy (17.05%), RW (8.5%), China (7.55%), France (7.35%), Germany (5.51%) and India (4.77%). In comparison with 2000, it is worthful to stressed the increasing importance of Spain (+8.29 p.p.) and Italy (+0.19 p.p.), while Germany (-7.32 p.p.), France (-5.35 p.p.) and the United Kingdom (-6.67 p.p.) have decreased their relative weight in Portuguese *textiles, leather and shoes* imports.

It should be noted that this changes in the geography of Portuguese *textiles, leather and shoes* imports are in line with the ones registered for the exports, namely the relative increasing weight of Spain and Italy, accompanied by a decrease of France and Germany. It is also important to highlight the increasing importance of China in the *textiles, leather, and shoes* imports, from 1.02% in 2000 to 7.55% in 2014. In a less significant manner, India more than doubled its importance on the Portuguese *textiles, leather and shoes* imports from 2.31% in 2000 to 4.77% in 2014.

Figure 4: **Share in total Portuguese *textiles, leather and shoes* imports (%)**

4.3.3. Imports of intermediate inputs

In Portugal, the share of intermediate inputs in gross output of the economy has increased between 2000 (18.70%) and 2014 (20.10%), despite a small effect of the crisis in 2008. Equivalently, the share of intermediate inputs in the Portuguese *textiles, leather, and shoes* gross output increased in Portugal between 2000 (19.11%) and 2014 (19.38%). This evolution is in line with what has been happening in all other *Eurozone* economies.

In 2014, the main origins of Portuguese *textiles, leather and shoes* imports of intermediate inputs were (see figure 5 and table 7): Spain (22.93%), Italy (19.54%), RW (11.67%), Germany (8.35%), Turkey (5.66%), India (5.34%) and France (4.53%). During the period 2000-2014, Spain and Italy have strengthened its share, from 19.37% to 22.93% and 15.29% to 19.54%, respectively, while France (10.44% in 2000 to 4.53% in 2014) and Germany (17.23% in 2000 to 8.35% in 2014) decreased their shares in the Portuguese *textiles, leather and shoes* imports of intermediate inputs. From 2000-2014, China increased its share in Portuguese intermediate inputs imports by 2.67 p.p. (0.42% in 2000 to 3.09% in 2014) while India increased its share by 3.15 p.p. (2.19 in 2000 to 5.34 in 2014).

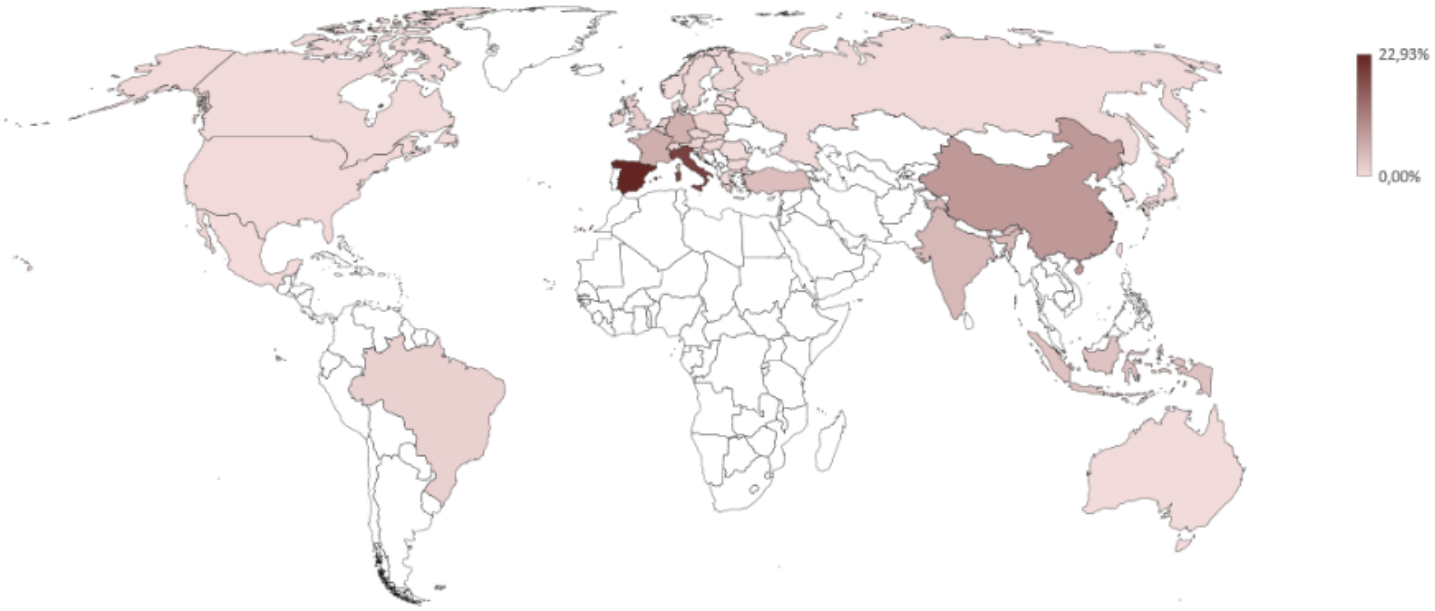

Figure 5: **Share in total Portuguese *textiles, leather, and shoes* imports of inputs (%)**

4.4. Measuring *textiles, leather, and shoes*

4.4.1. Relative Weight of *textiles, leather, and shoes*

The *textiles, leather, and shoes* sector is characterized by geographically dispersed production and rapid market-driven changes, providing employment opportunities to millions of workers worldwide. Due to recent technological innovations, this sector has become less intensive in labor as automation and robotics became increasingly present in the production processes. During the period 2000-2014, *textiles, leather, and shoes* industry has decreased its relative weight in the overall economy for all selected countries, namely concerning output, value added, exports and employment (see figure 6 and tables 8-11).

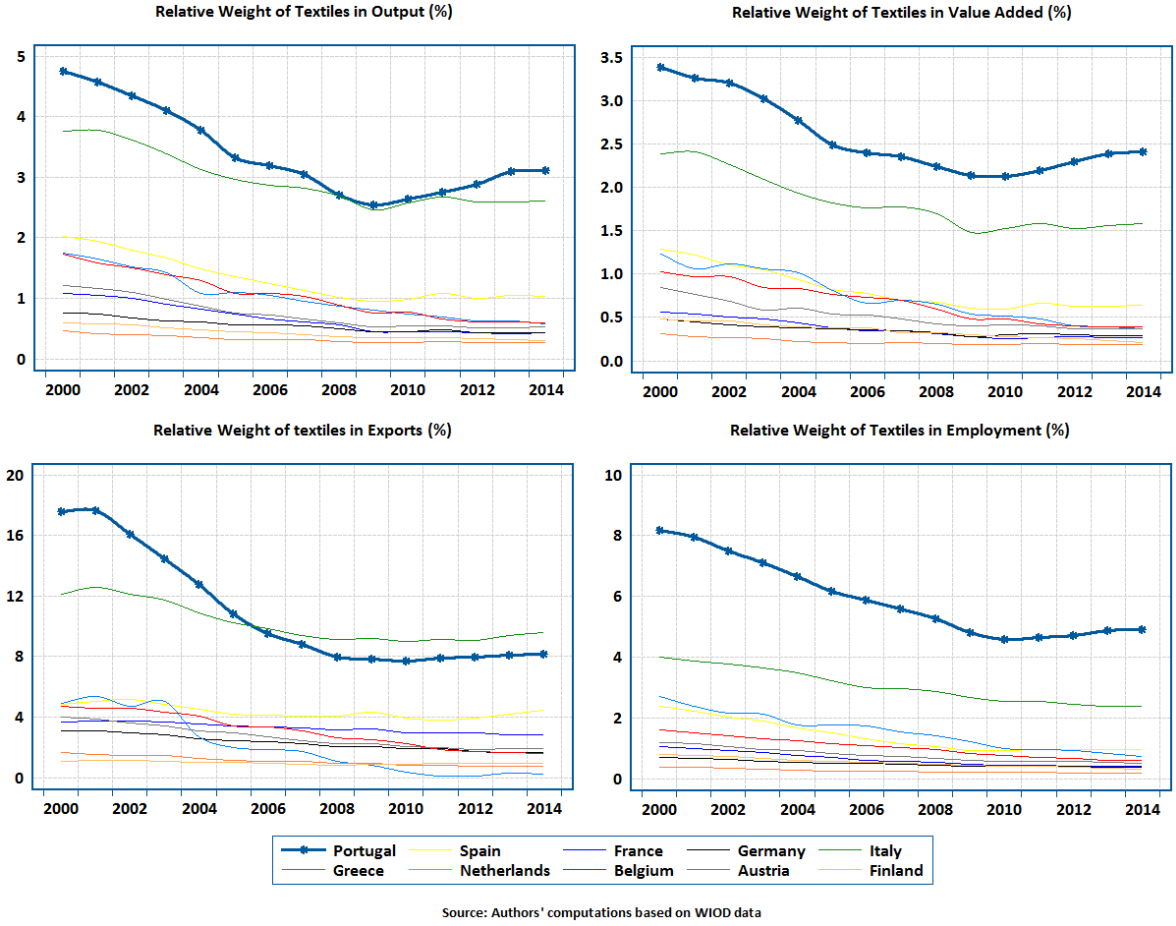

Figure 6: **Relative weight of *textiles, leather, and shoes***

Regarding the *textiles, leather, and shoes* sector, while European countries evidence greater participation in the GVCs, its domestically relative importance has been decreasing. Indeed, looking at our previous country group, with the exception of Portugal and Italy, in 2014 the share of *textiles, leather, and shoes* in national gross outputs, value added and employment was close but below 1% and the share of *textiles, leather and shoes* in national exports were below 4.5%. By other hand, from our 10 country sample, in 2014 the *textiles, leather, and shoes* industry was more important in the Portuguese economy in terms of gross output (3.12%), value-added (2.40%) and employment (4.91%) than in any other *Eurozone* economy, and the second in terms of exports (8.14%), only surpassed by Italy (9.58%).

Considering the period 2000-2014, the relative weight of textiles in all selected economies, namely in terms of gross output, value added, employment and exports, has been decreasing. However, this downward trend was to some extent reversed by the international financial crisis of 2008, especially for Portugal and Italy. This behavior was driven by the drastic fall in output, employment and value-added occurred mainly in the southern *Eurozone* countries like Portugal and Italy.

In Portugal, the share of textiles in gross output decreased from 4.75% in 2000 to 2.55% in 2009, and afterward, it increased up to 3.12% in 2014, similar to what happened in Italy. Regarding value added, exports and employment, the Portuguese *textiles, leather, and shoes* evidence the same pattern behavior. During the period 2000-2010, *textiles, leather and shoes* shares in Portuguese value-added, exports and employment decreased from 3.39%, 8.16% and 17.58% to 2.12%, 4.59% and 7.72%, respectively. Afterward, the relative weight of *textiles, leather, and shoes* in the economy increased up to 2.40%, 4.91% and 8.14% concerning value added, employment and exports, respectively.

In general terms, it should be pointed out that Portugal and Italy evidence a similar behavior with regard to the *textiles, leather, and shoes* sector, while the real weight of the sector in the economy has been much higher than the other *Eurozone* countries, pointing to a considerable specialization in this sector, where both countries evidence clear comparative advantages.

4.4.2. Labor Productivity

Besides the fact *textiles, leather and shoes* industry is relatively more important in the Portuguese economy than in any other *Eurozone* economy, its labor productivity is actually the lowest (see figure 7 and tables 12 and 13).

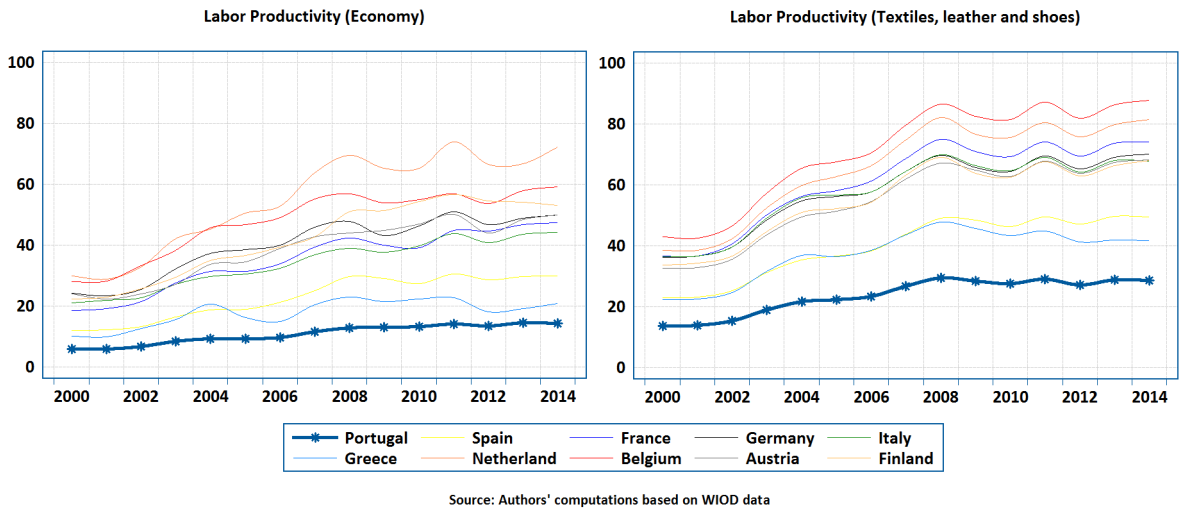

Figure 7: **Labor productivity**

In fact, during the period 2000-2014, overall Portuguese labor productivity, measured through the value added by working hour in real terms (value added over total hours worked), more than doubled (from 13.67 U.S. dollars per hour worked in 2000 to 28.50 in 2014). During the same period, Portuguese *textiles, leather, and shoes* labor productivity experienced an even higher jump (from 5.86 U.S. dollars in 2000 to 14.22 in 2014). The lowest values for labor productivity were recorded in Portugal, Greece, and Spain, respectively, both regarding the overall economy and the textile sector. In 2014 the higher labor productivity (economy and *textiles, leather and shoes* sector) were recorded in Belgium and the Netherlands. Portuguese labor productivity corresponds to 68.53%, 40.67% and 32.52% of overall labor productivity in Greece, Germany, and Belgium, respectively. Regarding the *textiles, leather, and shoes* sector, the Portuguese labor productivity accounts for 68.36%, 28.54% and 24.06% of the labor productivity in Greece, Germany, and Belgium, respectively. In this respect, the comparative advantage of the Portuguese economy vis-à-vis the other *Eurozone* economies is concentrated in the fabrication stage of production and results from low labor costs (productivity).

4.4.3. Degree of Openness

An interesting way to analyze a country (or sector) participation in the so-called GVCs can be done by measuring its degree of openness, or openness index, that is an economic metric calculated as the ratio of a country's total trade to the country's gross domestic product. Although closed economies are an exception, as a result of the growing tendency to diversify and intensify international trade, there are different degrees of openness, depending on the restrictions each country imposes on trade.

The reason why countries decide to open up to trade is that they obtain clear benefits from it, and especially in the case of a monetary union, such the European Monetary Union (EMU), those benefits are even more evident. The benefits of a common currency include the elimination of both exchange rate risk and transaction costs and the reduction of uncertainty produced by inflation distortion. At that light, a unified monetary union can be classified as an optimum currency area if it satisfies the benefits described above.[14]

The level of exports over total gross output has been increasing during the period 2000-2014 for all ten member states, except Greece. In the case of Portugal, the exports contribution to gross output almost doubled, from 9.77% in 2000 to 18.50% in 2014. In fact, according to WIOD data, in 2014 the Portuguese economy was relatively more export-oriented than Spain, France, Italy and Greece (see figure 8 and table 14). However, there is still a significant gap in the degree of openness between the south European member states and the North ones.[15]

[14] As McKinnon (1963) argues, the "optimum" term is intended to describe the capacity of a single currency union to produce and maintain full employment, balanced international payments and also to pursuit a relative price stability regime. Therefore, the EMU is characterized by a single currency area where the monetary policy is centralized and managed by an independent institution. In its foundation is implicit a certain level of active monetary policy, and even though all individual economies have maintained control over their fiscal policies, it turned out not to be completely independent of the centralized monetary policy. The EMU intergovernmental fiscal framework is based on the consensus of the Stability and Growth Pact (SGP), where each member state agrees to pursuit its fiscal policy within the guidelines presented in that agreement. Since the implementation of the SGP, there were introduced new features and reforms that are intended to provide actual guidelines for fiscal governance. (see for example Morris et al. (2006) and Schuknecht et al. (2011). Accordingly, one of the main objectives was to foster international trade flows within member states.

[15] South: Portugal, Spain, France, Italy, and Greece; North: Germany, Netherlands, Belgium, Austria, and Finland.

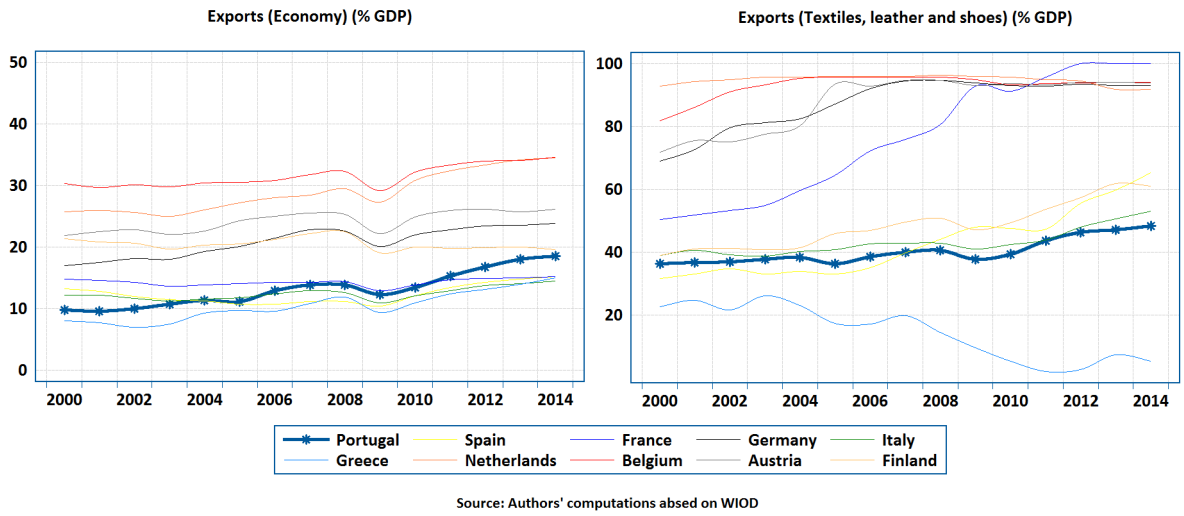

Figure 8: **Openness index - export intensity**

Another interesting fact is that, except Greece, for all selected European countries, *textiles, leather, and shoes* sector is relatively more open than the overall economy. Additionally, it has tended to increase during the period 2000-2014, except Greece and the Netherlands (see table 15). In other words, even though Portuguese *textiles, leather, and shoes* sector is relatively more open than the Portuguese economy (48.30% vs 18.5%), when compared with the other *Eurozone* sectors, it is the second lowest, only surpassed by Greece (5.3%).

A different way to quantify the degree of openness is to consider the intermediate input flows. Rather than consider the ratio between exports over gross output, one should compute the intermediate inputs flow over the gross output. Alongside with the generalized increasing share of exports in gross output, intermediate inputs also evidence an increasing tendency for inter-country interconnections within the *Eurozone* economies (see figure 9 and tables 15 and 16).

This openness index measure is even more relevant in the study of the GVCs and international trade. Once intermediate inputs are set to circulate freely through different stages (tasks) of the economy, before turning into exports, a county (or sector) intensity of intermediate inputs is considered a good measure for its participation in the GVCs.

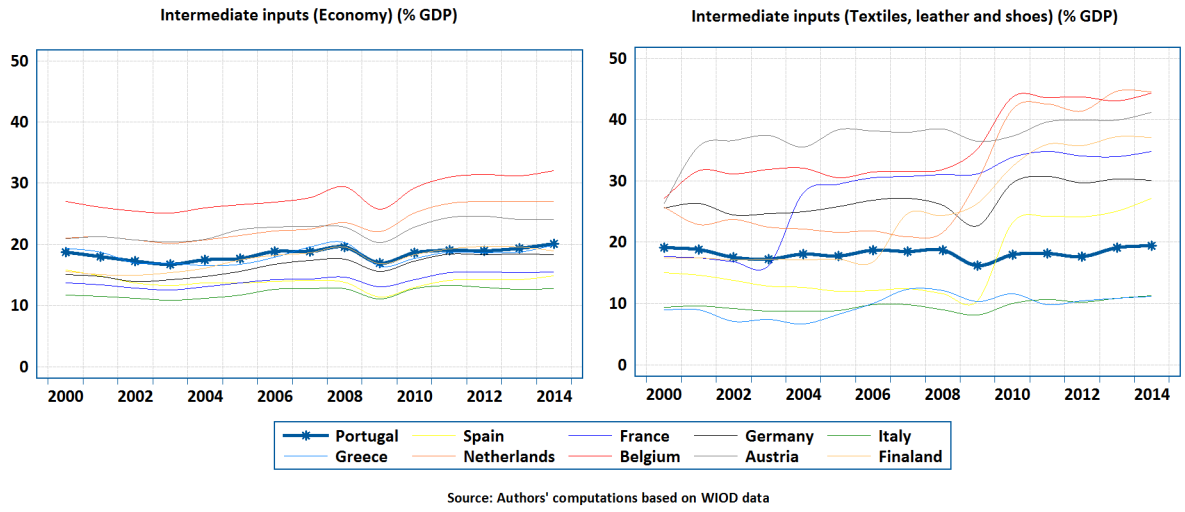

Figure 9: **Openness index - intermediate inputs intensity**

Hence, during the period 2000-2008, the share of intermediate inputs in Portuguese gross output rose from 18.70% in 2000 to 19.51% in 2008. Once again, the financial crisis of 2008 contributed to a downward shift in the intensity of intermediate inputs for all ten selected economies. In Portugal, this ratio decreased to 16.94% in 2009, and after that, it returned the upward trend up to 20.10% in 2014. An interesting conclusion is that in 2014, the Portuguese economy was relatively more intense in intermediate inputs than Spain (14.89%), France (15.47%), Germany (18.28%), Italy (12.76%), Greece (19,83%) and Finland (18.97%). However, the Portuguese *textiles, leather, and shoes* sector was in 2014, when compared to the other nine member states, the third lowest regarding intermediate inputs intensity (19.38%). In 2014, the higher weights of intermediate inputs in final gross *textiles, leather, and shoes* sector output were recorded in the North economies, namely Finland, Netherlands, Belgium and Austria (60.91%, 44.52%, 44.26%, and 41.21%, respectively).

To sum up, according to the WIOD data, during the period 2000-2014, all countries increased their intermediate inputs intensity, except Spain. In a sectoral level, manufacture of *textiles, leather, and shoes* also increased its share of intermediate inputs in the final gross output of the sector for all ten economies. In 2014 there was a shift, while the Portuguese *textiles, leather, and shoes* sector became less intense in intermediate inputs when compared with the overall Portuguese economy.

4.5. Vertical Specialization: A Comparative Analysis

As it was previously mentioned, one of the main advantages of modeling an economy through the Input-Output model is because it allows us to compute both the direct and total measure of vertical specialization. As we saw previously in this work, the significant difference is that the direct vertical specialization measure only accounts for the imported intermediate inputs directly used in the production. Differently, the total vertical specialization measure accounts for both direct and indirect uses of imported intermediate inputs in the sector's (or country's) production.

In this section we intend to measure both the direct and total vertical specialization of the economy as well as of the *textiles, leather and shoes* sector, for our sample of countries (see tables 18, 19 and 20; and figure 10).

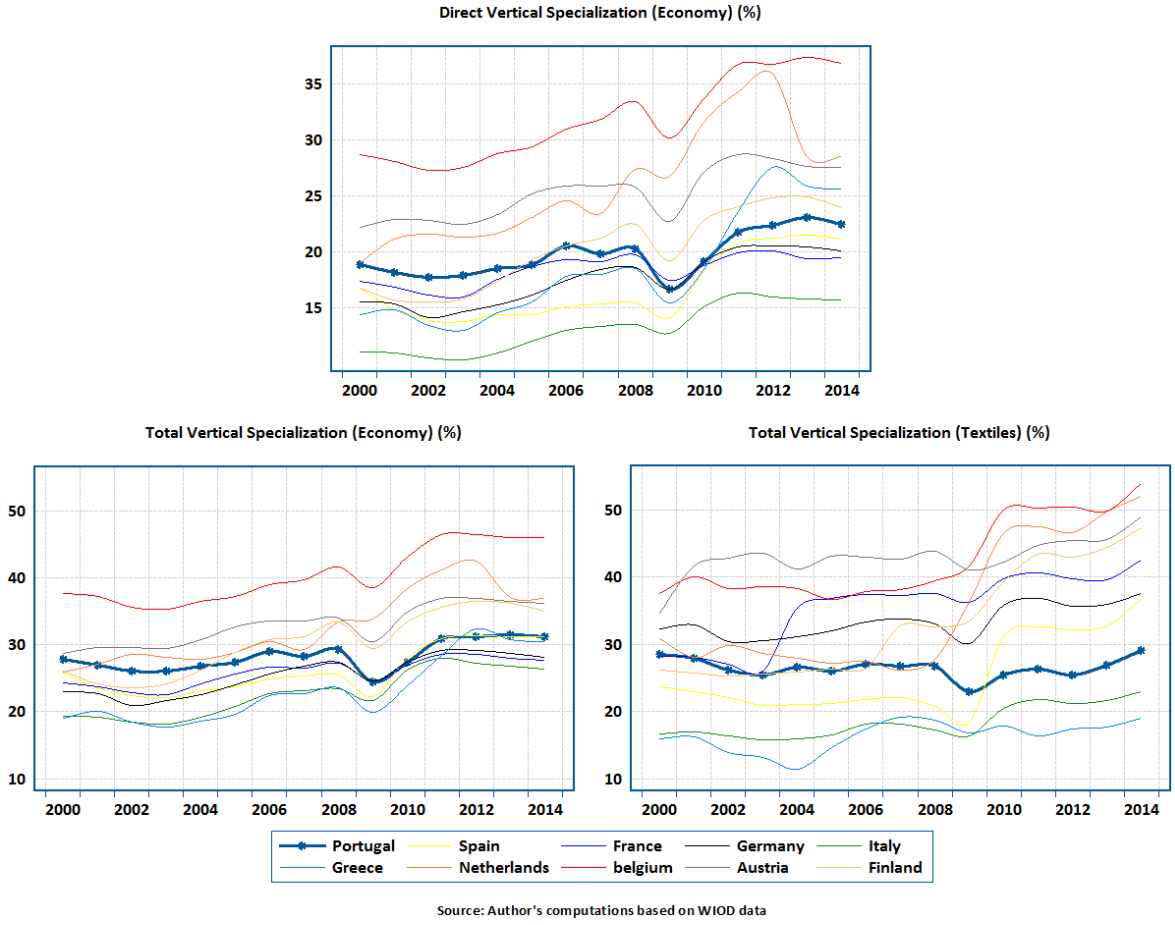

Figure 10: **Vertical specialization**

Regarding the direct share of vertical specialization in exports, one can notice that during the period 2000-2014, all *Eurozone* economies evidence an increasing trend. However, once again the international crisis has affected all countries, and in 2009 all economies experienced a drop in the direct vertical specialization accompanied by a recovery during the following years. In the Portuguese economy, the direct vertical specialization share of exports accounted for 18.90% in 2000 and 22.50% in 2014. During the period 2000-2014, the lowest value was recorded in 2009 (16.70%). In 2014, the higher values were recorded in Belgium (36.82%) and Netherlands (28.54%), while the lowest was recorded in Italy (15.79%) and France (19.47%).

When we analyze the total (direct plus indirect) vertical specialization share of exports (see table 19), it is clear that, as it was concluded previously, all *Eurozone* economies evidence an increasing trend during the period 2000-2014, except 2009. In 2014 the higher values were registered in Belgium (46.05%) and Netherlands (36.85%), while the lowest was recorded in Italy (26.37%) and France (27.72%). In the case of Portugal, vertical specialization share of exports accounted for 27.86% in 2000 and 31.16% in 2014.

The total vertical specialization for the *textiles, leather and shoes* sector evidence quite similar results (see table 20). During the period 2000-2014, total vertical specialization increased in all *textiles, leather and shoes* industries. Once again, 2009 was marked by a significant and abrupt fall in the value of total vertical specialization for all selected countries. In 2014, the industries that recorded higher shares were located in Belgium (53.90%), Netherlands (52.03%) and Austria (48.98%) while the lowest values were recorded in Greece (18.97%), Italy (22.90%) and Portugal (29.08%). The Euro Area north-south structural economic divide is once again clear when we analyze the *textiles, leather and shoes* vertical specialization, whereas northern countries tend to evidence higher values when compared to the southern ones.

After comparing the vertical specialization share of exports in the economy with the *textiles, leather, and shoes* sector, one can conclude that only Italy and Greece evidence lower values for the textile sector when compared to the overall economy. Evidence from the remaining eight countries suggests the *textiles, leather, and shoes* sector is relatively more exposed to intermediate inputs trade than the overall economy.

5. Conclusions

In the future, consumer needs and behaviors will likely become more sophisticated, more technology-driven and harder to predict, with fashion companies striving to keep up. As consumers engage with technology to enhance their shopping behavior, brands can leverage this to their advantage and further gain insights from their consumers (McKinsey, 2017).

Supply chains have experienced profound reconfiguration to meet new market demands for "fast fashion", marked by rapid shipments, higher quality requirements, and low retail inventories. The reconfiguration towards new styles and models has put a premium on shorter delivery cycles, improvements in factory skills and supply chain management, including fabric production, material sourcing, and finishing process. (Fukunishi et al., 2013). Multinationals have shifted away from sourcing a multitude of small firms to forging relationships with a smaller number of strategic suppliers, managing production across multiple factories and international locations, sharing financial liability, providing greater value-added services and in the end, making a larger share of profits in the *textiles, leather, and shoes* trade (Forstater, 2009).

Thus, the *textiles, leather, and shoes* value chain is “fertile” for low productive countries, in the sense that it bears fruits at many pieces of the chain. Above all, *textiles, leather, and shoes* is a commodity for which low-income countries have become indispensable parts of suppliers to the world market. This fragmentation requires offshore contractors to develop the capability to interpret designs, make samples, source the needed inputs, monitor product quality, meet the buyer’s price, and guarantee on-time delivery (Gereffi et al., 2005).

This work intended to characterize the Portuguese *textiles, leather and shoes* industry, by measuring its participation in the so-called GVCs through the measure of backward integration, defined by Hummels et al. (2001) as vertical specialization. We also computed value-added, import and employment coefficients for the Portuguese economy as well as for the Portuguese *textiles, leather, and shoes* sector. To put our results into perspective, we made an inter-industry analysis of the 19 manufacture sectors and compared our results in a set of 10 different *Eurozone* economies.

In an attempt to better understand the dynamics of the Portuguese *textiles, leather and shoes* industry, and especially its backward integration in the GVCs, we present a set of considerations, providing useful information for the policymakers and firms managers concerning measures and policies to improve efficiency and productivity in the Portuguese *textiles, leather and shoes* sector as well as support investment and capital allocation decisions. Based on our empirical analysis, we trace a set of conclusions contributing to an increase in the existing knowledge on the *textiles, leather, and shoes* sector regarding:

- ***Value-added, import and employment coefficients:*** We conclude that during the period 2000-2014, value-added and import contents of domestic final domestic demand and exports remained relatively constant, while the international financial crisis of 2008 produced a temporary positive shock on the value-added content of domestic demand and exports (va_D and va_E), and negative on the import content of domestic final demand and exports (m_D and m_E). In 2014, a one unit increase in the level of domestic demand (exports) led to a 0.73 (0.68) increase in value-added and 0.27 (0.33) increase in imports. During the same period, labor coefficients suffered a significant decrease, as general production became less labor intensive and so, in 2014, each 1 million U.S. dollars increase in the level of Portuguese domestic demand (exports) had the potential to generate approximately 12.2 (11.8) new jobs. Through our inter-sectoral analysis of the 19 manufacturing industries, *textiles, leather, and shoes* was the sixth Portuguese manufacturing industry with a higher marginal contribution to the national value added. Each one unit increase in *textiles, leather and shoes* final demand, contributed to a 0.71 increase in the sector's value-added. Additionally, we found that in 2014, each unitary increase in *textiles, leather, and shoes* final demand produced a 0.29 increase in the level of imports. Concerning employment, it was the largest marginal contributor to job creation. In 2014, each one million U.S. dollars increase in *textiles, leather, and shoes* final demand had the potential to generate approximately 20 new jobs. Indeed, coefficients l_Y suffered a significant reduction in all 19 industries, in favor of the tertiary sectors.

- ***Geography of trade:*** In respect of the geography of trade, the results show that the Portuguese *textiles, leather, and shoes* trade have been more centered in Spain, Italy, India and China and less concentrated in Germany, France, and the United Kingdom. In 2014, Spain represented 22.8% of Portuguese exports, 35,2% of imports and 22.9% of intermediate inputs imports. In turn, Italy represented 4.2% of Portuguese exports, 17,0% of imports and 19.5% of intermediate inputs imports. The rising importance of the Asian markets in the Portuguese geography of trade is quite observable especially when looking at Portuguese intermediate input imports — both China and India evidence a significant upward trend in the share of Portuguese imported intermediate inputs. In 2014, India and China represented 0.1% and 0.7% of Portuguese exports, 4.8% and 7.5% of imports and 5.3% and 3.1% of intermediate inputs imports.

- ***Relative weight in the economy:*** During the period 2000-2014, despite the increasing participation in GVCs, *textiles, leather, and shoes* industry has decreased its relative weight in the overall economy for all selected countries, namely concerning output, value added, exports and employment. Except for Portugal, Spain, and Italy, in 2014 the shares of *textiles, leather, and shoes* sector in gross national output, value added, and employment were close but below 1%. Equivalently, the share of textiles in national exports was below 4.5% in all selected economies, except Portugal and Italy. However, this downward trend was to some extent reversed by the international financial crisis of 2008, especially for Portugal and Italy. In 2014 the *textiles, leather, and shoes* industry was more relevant in the Portuguese economy in terms of gross output (3.12%), value-added (2.40%) and employment (4.91%) than in any other *Eurozone* country, and the second in terms of exports (8.14%), only surpassed by Italy (9.58%).

- ***Labor productivity:*** Besides the fact that *textiles, leather, and shoes* are more important in the Portuguese economy than in any other *Eurozone* economy, its labor productivity is the lowest. Portuguese labor productivity corresponds to 68.53%, 40.67% and 32.52% of overall labor productivity in Greece, Germany, and Belgium, respectively. In the case of *textiles, leather, and shoes*, it accounts for 68.36%, 28.54% and 24.06% of the labor productivity in Greece, Germany, and Belgium, respectively.

- ***Vertical specialization:*** During the period 2000-2008, the share of intermediate inputs in Portuguese gross output rose from 18.70% to 20.10%. Once again, the financial crisis of 2008 contributed to a downward shift in the intensity of intermediate inputs for all ten selected economies. In 2014, the Portuguese economy was relatively more intense in intermediate inputs than Spain (14.89%), France (15.47%), Germany (18.28%), Italy (12.76%), Greece (19,83%) and Finland (18.97%). However, the Portuguese *textiles, leather, and shoes* sector was in 2014, when compared to the other nine member states sectors, the third lowest regarding intermediate inputs intensity (19.38%). When we analyze the total (direct plus indirect) vertical specialization share of exports, all *Eurozone* economies evidence an increasing trend during the period 2000-2014, except 2009. In 2014 the higher values were registered in Belgium (46.05%) while the lowest was recorded in France (27.72%). In the case of Portugal, the vertical specialization share of exports accounted for 27.86% in 2000 and 31.16% in 2014. In 2014, the *textiles, leather, and shoes* sectors that recorded a higher vertical specialization share were located in Belgium (53.90%), Netherlands (52.03%) and Austria (48.98%) while the lowest values were recorded in Greece (18.97%), Italy (22.90%) and Portugal (29.08%).

The *Eurozone* north-south structural economic divide is evident when we analyze both productivity, the degree of openness and vertical specialization of the *textiles, leather, and shoes* sector, whereas northern countries tend to show higher values when compared to the south *Eurozone* economies. This structural division is the primary source of cross-country differences in income, especially regarding the *textiles, leather, and shoes* sector and makes it possible to assess how value-added varies across the different stages of bringing a product on to the market in a manufacturing industry.

According to our results, south countries like Portugal, Greece, Spain, and Italy tend to be concentrated in the middle part of the *textiles, leather, and shoes* value chain - (Fabrication), while northern economies tend to be responsible for the two ends of the value chain – (Patent & Technology and Brand & Service)[16].

[16]The smiling curve illustrates how value-added varies across the different stages of production. The two ends of the value chain – conception and marketing – command higher values added to the product than the middle part of the value chain – manufacturing. In a graphical view, it looks like a "smile".

6. References

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A. Appendix

Division	Group	Class	Description
Division 13			**Manufacture of textiles**
	131		Spinning, weaving and finishing of textiles
		1311	Preparation and spinning of textile fibres
		1312	Weaving of textiles
		1313	Finishing of textiles
	139		Manufacture of other textiles
		1391	Manufacture of knitted and crocheted fabrics
		1392	Manufacture of made-up textile articles, except apparel
		1393	Manufacture of carpets and rugs
		1394	Manufacture of cordage, rope, twine and netting
		1399	Manufacture of other textiles n.e.c.
Division 14			**Manufacture of wearing apparel**
	141	1410	Manufacture of wearing apparel, except fur apparel
	142	1420	Manufacture of articles of fur
	143	1430	Manufacture of knitted and crocheted apparel
Division 15			**Manufacture of leather and related products**
	151		Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur
		1511	Tanning and dressing of leather; dressing and dyeing of fur
		1512	Manufacture of luggage, handbags and the like, saddlery and harness
	152	1520	Manufacture of footwear

Figure 11: **ISIC rev.4 - detailed structure "*textiles, leather, and shoes*" sector**

	vaD Economy	vaE Economy	mD Economy	mE Economy	lD Economy	lE Economy
2000	0,7256	0,7018	0,2744	0,2982	0,0246	0,0264
2001	0,7335	0,7123	0,2665	0,2877	0,0245	0,0270
2002	0,7470	0,7221	0,2530	0,2779	0,0228	0,0247
2003	0,7568	0,7216	0,2432	0,2784	0,0186	0,0202
2004	0,7464	0,7139	0,2536	0,2861	0,0161	0,0173
2005	0,7449	0,7079	0,2551	0,2921	0,0155	0,0163
2006	0,7339	0,6897	0,2661	0,3103	0,0146	0,0150
2007	0,7302	0,6951	0,2698	0,3049	0,0127	0,0131
2008	0,7190	0,6844	0,2810	0,3156	0,0115	0,0119
2009	0,7519	0,7384	0,2481	0,2616	0,0126	0,0134
2010	0,7356	0,7072	0,2644	0,2928	0,0126	0,0128
2011	0,7377	0,6720	0,2623	0,3280	0,0121	0,0116
2012	0,7428	0,6658	0,2572	0,3342	0,0132	0,0123
2013	0,7429	0,6615	0,2571	0,3385	0,0124	0,0115
2014	0,7337	0,6671	0,2663	0,3329	0,0122	0,0118

Source: Authors' computations based on WIOD data

Table 1. **Value-added, import, and employment coefficients (economy)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
C10-C12	0,7333	0,7451	0,7546	0,7662	0,7557	0,7533	0,7424	0,7225	0,7012	0,7433	0,7255	0,6923	0,6944	0,7008	0,6960
C13-C15	0,6964	0,7021	0,7216	0,7291	0,7182	0,7230	0,7115	0,7139	0,7126	0,7556	0,7286	0,7223	0,7297	0,7137	0,7092
C16	0,7805	0,7836	0,7937	0,7902	0,7708	0,7718	0,7637	0,7569	0,7358	0,7720	0,7602	0,7426	0,7420	0,7419	0,7322
C17	0,7225	0,7250	0,7373	0,7340	0,7127	0,7142	0,7057	0,6983	0,6723	0,7137	0,6974	0,6557	0,6571	0,6523	0,6394
C18	0,7863	0,7867	0,7930	0,7919	0,7774	0,7790	0,7748	0,7716	0,7518	0,7736	0,7666	0,7486	0,7511	0,7488	0,7420
C19	0,2498	0,2582	0,2507	0,2566	0,2638	0,2847	0,2705	0,2558	0,2467	0,2190	0,2356	0,1953	0,1948	0,1839	0,1800
C20	0,5950	0,6062	0,6146	0,6187	0,6005	0,5911	0,5642	0,5595	0,5305	0,5892	0,5498	0,5210	0,5084	0,5065	0,4977
C21	0,7957	0,8024	0,8151	0,8215	0,8101	0,8105	0,7858	0,7876	0,7844	0,8148	0,7868	0,7717	0,7894	0,7956	0,7879
C22	0,6455	0,6493	0,6559	0,6546	0,6374	0,6244	0,6029	0,5962	0,5779	0,6310	0,6003	0,5776	0,5828	0,5829	0,5756
C23	0,7151	0,7163	0,7204	0,7218	0,7103	0,7077	0,6944	0,6887	0,6762	0,7122	0,6947	0,6747	0,6911	0,6863	0,6773
C24	0,4858	0,4904	0,5064	0,5099	0,4899	0,4829	0,4713	0,4595	0,4519	0,4990	0,4834	0,4481	0,4443	0,4450	0,4335
C25	0,6798	0,6810	0,6909	0,6874	0,6739	0,6680	0,6544	0,6471	0,6390	0,6723	0,6560	0,6485	0,6573	0,6415	0,6337
C26	0,5396	0,5464	0,5224	0,5172	0,5141	0,5102	0,4783	0,4883	0,4836	0,5564	0,5665	0,5314	0,5196	0,5314	0,5276
C27	0,6112	0,6170	0,6234	0,6223	0,6090	0,6114	0,5778	0,5613	0,5390	0,5531	0,5282	0,5107	0,5131	0,4979	0,4898
C28	0,5749	0,5746	0,5794	0,5762	0,5640	0,5562	0,5397	0,5411	0,5253	0,5714	0,5403	0,5240	0,5469	0,5404	0,5306
C29	0,4920	0,5041	0,5051	0,4981	0,4891	0,4924	0,4633	0,4633	0,4472	0,4923	0,4619	0,4217	0,4285	0,4222	0,4174
C30	0,6099	0,6203	0,6240	0,6189	0,6047	0,6044	0,5868	0,5849	0,5707	0,6102	0,5819	0,5007	0,5162	0,5443	0,5287
C31-C32	0,7537	0,7658	0,7753	0,7739	0,7618	0,7535	0,7348	0,7289	0,7181	0,7567	0,7371	0,7266	0,7307	0,7223	0,7151
C33	0,7634	0,7776	0,7868	0,7884	0,7794	0,7676	0,7504	0,7475	0,7371	0,7720	0,7512	0,7437	0,7539	0,7445	0,7377

Source: Authors' computations based on WIOD data

Table 2. **Value-added coefficients (Portuguese manufacture)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
C10-C12	0,2667	0,2549	0,2454	0,2338	0,2443	0,2467	0,2575	0,2775	0,2988	0,2567	0,2745	0,3077	0,3056	0,2992	0,3040
C13-C15	0,3036	0,2979	0,2784	0,2709	0,2818	0,2770	0,2885	0,2861	0,2873	0,2444	0,2714	0,2777	0,2703	0,2863	0,2908
C16	0,2195	0,2164	0,2063	0,2098	0,2293	0,2282	0,2363	0,2431	0,2641	0,2280	0,2398	0,2574	0,2579	0,2581	0,2678
C17	0,2775	0,2750	0,2627	0,2660	0,2873	0,2858	0,2943	0,3017	0,3277	0,2863	0,3026	0,3444	0,3429	0,3476	0,3606
C18	0,2137	0,2133	0,2069	0,2081	0,2225	0,2209	0,2252	0,2284	0,2482	0,2263	0,2334	0,2514	0,2489	0,2514	0,2581
C19	0,7501	0,7418	0,7493	0,7434	0,7362	0,7153	0,7295	0,7442	0,7533	0,7810	0,7644	0,8047	0,8052	0,8161	0,8200
C20	0,4050	0,3938	0,3854	0,3813	0,3995	0,4089	0,4358	0,4405	0,4695	0,4108	0,4502	0,4790	0,4916	0,4934	0,5023
C21	0,2044	0,1976	0,1849	0,1786	0,1898	0,1895	0,2143	0,2124	0,2156	0,1852	0,2132	0,2283	0,2106	0,2044	0,2121
C22	0,3545	0,3507	0,3441	0,3453	0,3626	0,3756	0,3971	0,4038	0,4221	0,3690	0,3997	0,4224	0,4172	0,4171	0,4244
C23	0,2850	0,2837	0,2797	0,2782	0,2897	0,2923	0,3056	0,3113	0,3238	0,2878	0,3053	0,3253	0,3089	0,3137	0,3227
C24	0,5142	0,5096	0,4936	0,4901	0,5101	0,5171	0,5287	0,5405	0,5481	0,5010	0,5166	0,5519	0,5556	0,5550	0,5665
C25	0,3201	0,3190	0,3091	0,3126	0,3261	0,3320	0,3456	0,3530	0,3610	0,3277	0,3440	0,3515	0,3427	0,3585	0,3664
C26	0,4604	0,4536	0,4776	0,4828	0,4859	0,4898	0,5217	0,5117	0,5164	0,4436	0,4335	0,4686	0,4805	0,4686	0,4724
C27	0,3888	0,3830	0,3766	0,3777	0,3909	0,3886	0,4221	0,4387	0,4610	0,4468	0,4718	0,4893	0,4869	0,5022	0,5103
C28	0,4250	0,4254	0,4206	0,4238	0,4360	0,4438	0,4603	0,4589	0,4747	0,4286	0,4597	0,4760	0,4530	0,4596	0,4694
C29	0,5080	0,4959	0,4949	0,5019	0,5109	0,5076	0,5367	0,5367	0,5528	0,5077	0,5381	0,5783	0,5715	0,5778	0,5826
C30	0,3901	0,3800	0,3760	0,3811	0,3953	0,3959	0,4132	0,4154	0,4293	0,3898	0,4181	0,4993	0,4838	0,4557	0,4713
C31-C32	0,2463	0,2342	0,2248	0,2261	0,2382	0,2465	0,2651	0,2711	0,2818	0,2433	0,2628	0,2734	0,2693	0,2777	0,2849
C33	0,2366	0,2224	0,2132	0,2116	0,2206	0,2324	0,2496	0,2525	0,2629	0,2280	0,2488	0,2563	0,2461	0,2556	0,2624

Source: Authors' computations based on WIOD data

Table 3. **Import coefficients (Portuguese manufacture)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
C10-C12	0,0259	0,0259	0,0238	0,0196	0,0170	0,0166	0,0159	0,0139	0,0123	0,0133	0,0136	0,0123	0,0132	0,0123	0,0123
C13-C15	0,0453	0,0457	0,0421	0,0344	0,0302	0,0302	0,0284	0,0244	0,0226	0,0239	0,0227	0,0209	0,0220	0,0201	0,0203
C16	0,0316	0,0322	0,0303	0,0250	0,0220	0,0211	0,0196	0,0166	0,0153	0,0172	0,0157	0,0142	0,0150	0,0137	0,0138
C17	0,0147	0,0150	0,0141	0,0118	0,0104	0,0100	0,0091	0,0078	0,0073	0,0082	0,0076	0,0070	0,0078	0,0073	0,0072
C18	0,0339	0,0347	0,0330	0,0271	0,0237	0,0226	0,0211	0,0178	0,0163	0,0182	0,0166	0,0158	0,0175	0,0163	0,0163
C19	0,0057	0,0059	0,0058	0,0049	0,0037	0,0034	0,0029	0,0025	0,0022	0,0028	0,0025	0,0022	0,0025	0,0023	0,0022
C20	0,0155	0,0159	0,0150	0,0124	0,0102	0,0098	0,0089	0,0075	0,0069	0,0082	0,0074	0,0066	0,0072	0,0067	0,0066
C21	0,0210	0,0203	0,0186	0,0154	0,0131	0,0127	0,0124	0,0102	0,0092	0,0097	0,0103	0,0096	0,0102	0,0093	0,0093
C22	0,0208	0,0211	0,0195	0,0163	0,0139	0,0132	0,0124	0,0105	0,0094	0,0103	0,0100	0,0089	0,0096	0,0090	0,0090
C23	0,0273	0,0275	0,0253	0,0212	0,0181	0,0173	0,0164	0,0139	0,0125	0,0134	0,0132	0,0126	0,0141	0,0132	0,0131
C24	0,0172	0,0176	0,0161	0,0136	0,0113	0,0107	0,0098	0,0084	0,0075	0,0087	0,0084	0,0073	0,0079	0,0076	0,0074
C25	0,0334	0,0338	0,0311	0,0256	0,0209	0,0199	0,0185	0,0156	0,0139	0,0168	0,0163	0,0156	0,0168	0,0154	0,0154
C26	0,0141	0,0145	0,0137	0,0112	0,0096	0,0091	0,0083	0,0071	0,0067	0,0092	0,0085	0,0091	0,0102	0,0097	0,0098
C27	0,0245	0,0238	0,0210	0,0173	0,0146	0,0140	0,0123	0,0105	0,0091	0,0098	0,0094	0,0089	0,0098	0,0093	0,0093
C28	0,0228	0,0229	0,0207	0,0172	0,0149	0,0141	0,0131	0,0111	0,0098	0,0111	0,0107	0,0104	0,0108	0,0101	0,0100
C29	0,0160	0,0163	0,0149	0,0124	0,0106	0,0104	0,0093	0,0079	0,0074	0,0087	0,0077	0,0066	0,0075	0,0070	0,0069
C30	0,0311	0,0318	0,0293	0,0245	0,0209	0,0208	0,0189	0,0162	0,0153	0,0179	0,0155	0,0118	0,0129	0,0111	0,0109
C31-C32	0,0433	0,0435	0,0404	0,0329	0,0284	0,0275	0,0257	0,0219	0,0193	0,0206	0,0205	0,0194	0,0206	0,0186	0,0187
C33	0,0302	0,0301	0,0279	0,0229	0,0197	0,0192	0,0179	0,0154	0,0135	0,0146	0,0146	0,0142	0,0154	0,0149	0,0149

Source: Authors' computations based on WIOD data

Table 4. **Employment coefficients (Portuguese manufacture)**

	2000	
	Value*	**%**
Total	3888,6867	100
Germany	698,0189	17,9500
France	661,0310	16,9988
United Kingdom	587,3682	15,1045
Spain	449,0709	11,5481
United States	307,5286	7,9083
RW**	202,4010	5,2049
Italy	139,9642	3,5993
Netherlands	138,5562	3,5631
Sweden	124,9409	3,2129
Denmark	88,1473	2,2668
Switzerland	79,1131	2,0344
Belgium	70,2764	1,8072
Norway	63,2485	1,6265
Austria	46,0612	1,1845
Finland	45,7383	1,1762
Canada	44,6418	1,1480
Ireland	28,4481	0,7316
Greece	20,4483	0,5258
Japan	16,2835	0,4187
Poland	12,3195	0,3168
Brazil	10,6927	0,2750
Mexico	6,7567	0,1738
Australia	6,1168	0,1573
Russian Federation	5,6290	0,1448
India	5,1187	0,1316
Czech Republic	5,0681	0,1303
Hungary	4,2665	0,1097
Cyprus	2,8983	0,0745
Turkey	2,7497	0,0707
Republic of Korea	2,7417	0,0705
Luxembourg	2,1601	0,0555
Slovakia	1,6605	0,0427
Taiwan	1,6472	0,0424
China	1,5412	0,0396
Slovenia	1,4309	0,0368
Bulgaria	0,9613	0,0247
Romania	0,9348	0,0240
Lithuania	0,6290	0,0162

	2014	
	Value*	**%**
Total	6234,2983	100
Spain	1420,4116	22,7838
France	958,7859	15,3792
RW**	794,8304	12,7493
Germany	576,6309	9,2493
United Kingdom	462,1259	7,4126
United States	317,5567	5,0937
Italy	258,9370	4,1534
Netherlands	237,4136	3,8082
Russian Federation	186,8658	2,9974
Canada	93,8532	1,5054
Sweden	90,4084	1,4502
Switzerland	86,5067	1,3876
Denmark	70,4954	1,1308
Austria	63,9684	1,0261
Belgium	62,1022	0,9961
Norway	54,0995	0,8678
Australia	50,2669	0,8063
Japan	45,5515	0,7307
China	43,7999	0,7026
Poland	38,7339	0,6213
Romania	38,5877	0,6190
Mexico	38,3171	0,6146
Turkey	35,4088	0,5680
Ireland	33,8527	0,5430
Finland	27,8598	0,4469
Czech Republic	26,5687	0,4262
Republic of Korea	22,0628	0,3539
Brazil	17,2551	0,2768
Slovakia	15,7193	0,2521
Greece	15,1874	0,2436
Hungary	8,0084	0,1285
Luxembourg	6,4141	0,1029
Lithuania	6,1585	0,0988
Slovenia	5,0357	0,0808
India	4,6789	0,0751
Bulgaria	4,1905	0,0672
Estonia	3,6716	0,0589
Cyprus	3,6700	0,0589

*Values Expressed in Millions of U.S. Dollars

**Rest of the World

Table 5. **Geography of Portuguese *textiles, leather, and shoes* exports**

	2000	
	Value*	**%**
Total	2963,4003	100
Spain	796,6882	26,8843
Italy	499,6135	16,8595
Germany	380,2082	12,8301
France	376,3213	12,6990
United Kingdom	232,4166	7,8429
RW**	143,3179	4,8363
Belgium	86,8603	2,9311
India	68,3270	2,3057
Turkey	66,5820	2,2468
Brazil	48,9226	1,6509
Netherlands	47,1283	1,5903
China	30,2680	1,0214
Austria	28,6633	0,9672
Indonesia	24,4324	0,8245
Sweden	20,9738	0,7078
Taiwan	15,7956	0,5330
Switzerland	12,5264	0,4227
Republic of Korea	12,3235	0,4159
Poland	12,0698	0,4073
Denmark	11,3456	0,3829
United States	9,4368	0,3184
Japan	8,7292	0,2946
Greece	6,9988	0,2362
Ireland	4,4272	0,1494
Czech Republic	3,7952	0,1281
Lithuania	2,2352	0,0754
Finland	2,0418	0,0689
Australia	1,7205	0,0581
Norway	1,5274	0,0515
Russian Federation	1,5138	0,0511
Luxembourg	1,4383	0,0485
Hungary	1,1223	0,0379
Latvia	0,7372	0,0249
Estonia	0,7058	0,0238
Canada	0,6757	0,0228
Slovenia	0,4525	0,0153
Slovakia	0,3283	0,0111
Mexico	0,3143	0,0106

	2014	
	Value*	**%**
Total	4607,4014	100
Spain	1620,3489	35,1684
Italy	785,3510	17,0454
RW**	407,7171	8,8492
China	347,6856	7,5462
France	338,4144	7,3450
Germany	253,6967	5,5063
India	219,9972	4,7749
Turkey	165,3378	3,5885
Indonesia	77,0649	1,6726
Belgium	67,6842	1,4690
United Kingdom	53,7764	1,1672
Netherlands	51,5500	1,1189
Brazil	47,2925	1,0264
Austria	25,1156	0,5451
Ireland	23,0488	0,5003
Poland	17,7866	0,3860
Croatia	15,7234	0,3413
Czech Republic	15,6510	0,3397
Republic of Korea	14,6919	0,3189
Hungary	6,6366	0,1440
Sweden	6,3242	0,1373
Switzerland	5,6376	0,1224
Finland	4,9505	0,1074
Slovakia	4,0105	0,0870
United States	3,8974	0,0846
Japan	3,8330	0,0832
Denmark	3,5199	0,0764
Taiwan	3,3275	0,0722
Bulgaria	3,0869	0,0670
Slovenia	2,6213	0,0569
Luxembourg	2,5830	0,0561
Russian Federation	2,4584	0,0534
Mexico	1,6097	0,0349
Lithuania	1,3762	0,0299
Romania	1,1871	0,0258
Estonia	0,6939	0,0151
Canada	0,4927	0,0107
Greece	0,4901	0,0106

Source: Authors' computations based on WIOD data, 2016 release
*Values Expressed in Millions of U.S. Dollars
**Rest of the World

Table 6. **Geography of Portuguese *textiles, leather, and shoes* imports**

	2000	
	Value*	**%**
Total	2053,5306	100
Spain	397,7241	19,3678
Germany	353,8298	17,2303
Italy	313,9907	15,2903
France	214,4011	10,4406
United Kingdom	182,6627	8,8951
RW**	121,2348	5,9037
Turkey	71,7215	3,4926
Belgium	62,5914	3,0480
Netherlands	45,9220	2,2362
India	45,0660	2,1946
Brazil	43,9812	2,1417
Switzerland	34,8520	1,6972
Sweden	24,0969	1,1734
Austria	21,8273	1,0629
United States	19,0691	0,9286
Taiwan	13,2541	0,6454
Japan	11,7050	0,5700
Republic of Korea	11,0069	0,5360
Denmark	9,7672	0,4756
China	8,6359	0,4205
Greece	6,3186	0,3077
Ireland	6,2097	0,3024
Finland	5,4875	0,2672
Czech Republic	4,1820	0,2036
Indonesia	3,6572	0,1781
Norway	3,3042	0,1609
Australia	2,8601	0,1393
Luxembourg	2,3077	0,1124
Lithuania	2,0533	0,1000
Russian Federation	1,6491	0,0803
Poland	1,6007	0,0780
Canada	1,3370	0,0651
Hungary	1,3220	0,0644
Romania	0,8640	0,0421
Mexico	0,8210	0,0400
Estonia	0,6448	0,0314
Slovenia	0,4556	0,0222
Croatia	0,4308	0,0210

	2014	
	Value*	**%**
Total	2501,8076	100
Spain	573,6719	22,9303
Italy	488,8449	19,5397
RW**	291,9425	11,6693
Germany	209,0200	8,3548
Turkey	141,5674	5,6586
India	133,7014	5,3442
France	113,2654	4,5273
United Kingdom	92,5982	3,7013
China	77,2955	3,0896
Netherlands	60,8747	2,4332
Belgium	48,6760	1,9456
Brazil	35,8922	1,4347
Indonesia	34,4290	1,3762
Austria	26,1547	1,0454
Sweden	22,0120	0,8798
Republic of Korea	21,2086	0,8477
United States	20,1829	0,8067
Switzerland	14,4111	0,5760
Luxembourg	12,1847	0,4870
Czech Republic	11,3248	0,4527
Poland	10,6681	0,4264
Ireland	8,9875	0,3592
Finland	6,9070	0,2761
Japan	6,1995	0,2478
Taiwan	5,3055	0,2121
Russian Federation	5,2406	0,2095
Denmark	4,9215	0,1967
Lithuania	3,8673	0,1546
Bulgaria	2,6595	0,1063
Romania	2,4494	0,0979
Hungary	2,3630	0,0945
Slovakia	2,3232	0,0929
Canada	1,9199	0,0767
Mexico	1,8907	0,0756
Slovenia	1,6352	0,0654
Norway	1,4789	0,0591
Greece	1,1937	0,0477
Croatia	0,8357	0,0334

*Values Expressed in Millions of U.S. Dollars

**Rest of the World

Table 7. **Geography of Portuguese *textiles, leather and shoes* imports (intermediate inputs)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	4,745	4,565	4,346	4,096	3,771	3,319	3,194	3,044	2,710	2,545	2,643	2,758	2,883	3,085	3,116
ESP	2,027	1,936	1,790	1,669	1,480	1,355	1,247	1,134	1,016	0,944	0,986	1,077	1,002	1,040	1,034
FRA	1,085	1,050	0,998	0,909	0,813	0,734	0,658	0,617	0,561	0,444	0,447	0,449	0,438	0,422	0,431
DEU	0,763	0,735	0,675	0,625	0,603	0,565	0,554	0,542	0,491	0,439	0,453	0,472	0,433	0,425	0,423
ITA	3,756	3,774	3,615	3,384	3,124	2,957	2,863	2,824	2,686	2,456	2,565	2,677	2,597	2,597	2,609
GRC	1,741	1,650	1,519	1,421	1,077	1,103	1,041	0,948	0,870	0,802	0,742	0,689	0,624	0,618	0,569
NLD	0,459	0,418	0,399	0,380	0,343	0,325	0,314	0,312	0,284	0,265	0,268	0,283	0,266	0,267	0,269
BEL	1,736	1,589	1,509	1,391	1,293	1,080	1,073	1,028	0,881	0,759	0,766	0,664	0,610	0,606	0,594
AUT	1,212	1,156	1,090	0,976	0,875	0,760	0,717	0,651	0,600	0,534	0,548	0,549	0,509	0,519	0,526
FIN	0,590	0,574	0,567	0,518	0,481	0,444	0,426	0,395	0,362	0,344	0,348	0,350	0,328	0,313	0,306

Source: Authors' computations based on WIOD data

Table 8. **Relative weight of *textiles, leather, and shoes* in output (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	3,387	3,251	3,195	3,023	2,765	2,482	2,399	2,356	2,236	2,134	2,124	2,194	2,290	2,379	2,403
ESP	1,281	1,213	1,103	1,053	0,931	0,825	0,775	0,699	0,676	0,605	0,598	0,658	0,627	0,629	0,636
FRA	0,559	0,536	0,508	0,483	0,432	0,382	0,348	0,342	0,314	0,274	0,257	0,268	0,275	0,264	0,271
DEU	0,478	0,443	0,413	0,393	0,383	0,363	0,356	0,344	0,323	0,280	0,300	0,310	0,295	0,288	0,289
ITA	2,382	2,402	2,255	2,087	1,929	1,815	1,757	1,768	1,695	1,483	1,528	1,584	1,529	1,552	1,582
GRC	1,224	1,058	1,119	1,059	1,009	0,804	0,660	0,694	0,653	0,538	0,518	0,483	0,405	0,392	0,367
NLD	0,313	0,282	0,269	0,258	0,218	0,212	0,204	0,209	0,195	0,181	0,182	0,194	0,184	0,183	0,186
BEL	1,020	0,974	0,965	0,845	0,831	0,762	0,731	0,692	0,593	0,485	0,482	0,430	0,402	0,396	0,387
AUT	0,845	0,760	0,680	0,588	0,606	0,543	0,525	0,476	0,427	0,400	0,418	0,401	0,365	0,372	0,367
FIN	0,484	0,457	0,455	0,417	0,394	0,383	0,379	0,324	0,323	0,297	0,282	0,269	0,260	0,231	0,212

Source: Authors' computations based on WIOD data

Table 9. **Relative weight of *textiles, leather, and shoes* in value-added (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	8,159	7,931	7,503	7,094	6,656	6,173	5,884	5,586	5,245	4,797	4,590	4,647	4,715	4,855	4,905
ESP	2,371	2,220	2,023	1,885	1,669	1,502	1,309	1,140	1,042	0,926	0,916	0,949	0,944	0,965	0,958
FRA	1,058	0,998	0,926	0,854	0,758	0,682	0,613	0,572	0,537	0,479	0,443	0,428	0,416	0,405	0,411
DEU	0,696	0,673	0,621	0,570	0,536	0,501	0,492	0,464	0,448	0,420	0,402	0,405	0,397	0,386	0,384
ITA	3,990	3,876	3,760	3,652	3,486	3,232	3,008	2,950	2,878	2,676	2,538	2,526	2,442	2,379	2,391
GRC	2,688	2,377	2,164	2,114	1,766	1,771	1,726	1,533	1,397	1,210	0,994	0,945	0,907	0,819	0,733
NLD	0,374	0,365	0,335	0,295	0,271	0,241	0,237	0,230	0,213	0,202	0,203	0,202	0,190	0,193	0,194
BEL	1,594	1,510	1,407	1,322	1,239	1,149	1,074	1,028	0,955	0,819	0,758	0,705	0,648	0,613	0,590
AUT	1,186	1,140	1,049	0,970	0,913	0,830	0,761	0,715	0,672	0,612	0,581	0,564	0,555	0,535	0,517
FIN	0,808	0,768	0,719	0,664	0,613	0,579	0,547	0,500	0,480	0,441	0,397	0,393	0,367	0,338	0,323

Source: Authors' computations based on WIOD data

Table 10. **Relative weight of *textiles, leather, and shoes* in employment (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	17,582	17,612	16,098	14,458	12,771	10,808	9,530	8,820	7,961	7,853	7,723	7,862	7,953	8,081	8,135
ESP	4,851	5,027	5,179	4,822	4,481	4,164	4,109	4,069	4,044	4,347	3,907	3,799	3,908	4,194	4,448
FRA	3,694	3,752	3,745	3,663	3,509	3,383	3,331	3,293	3,148	3,205	2,945	2,934	2,939	2,821	2,848
DEU	3,106	3,057	2,971	2,813	2,584	2,448	2,379	2,247	2,057	2,054	1,923	1,923	1,723	1,681	1,650
ITA	12,085	12,553	12,105	11,714	10,872	10,236	9,820	9,382	9,115	9,174	9,024	9,141	9,063	9,405	9,581
GRC	4,915	5,339	4,736	5,005	2,679	1,991	1,859	1,744	1,068	0,825	0,362	0,115	0,126	0,324	0,199
NLD	1,660	1,523	1,483	1,454	1,263	1,149	1,077	1,051	0,928	0,930	0,831	0,827	0,756	0,718	0,718
BEL	4,689	4,601	4,559	4,350	4,055	3,389	3,324	3,105	2,615	2,470	2,219	1,870	1,692	1,680	1,620
AUT	3,984	3,881	3,586	3,432	3,108	2,928	2,666	2,418	2,248	2,245	2,062	1,974	1,836	1,898	1,896
FIN	1,075	1,129	1,133	1,073	0,982	0,996	0,941	0,884	0,818	0,855	0,864	0,948	0,943	0,969	0,954

Source: Authors' computations based on WIOD data

Table 11. **Relative weight of *textiles, leather, and shoes* in exports (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	13,657	13,876	15,237	18,906	21,531	22,206	23,218	26,638	29,276	28,246	27,375	28,951	26,994	28,789	28,504
ESP	22,925	23,089	25,239	31,076	35,291	36,483	38,116	43,655	49,008	48,354	46,179	49,398	47,026	49,683	49,338
FRA	36,569	36,504	40,569	49,963	56,154	57,908	61,193	68,478	74,751	70,911	69,108	74,011	69,430	73,643	73,970
DEU	36,110	36,437	39,504	48,282	54,673	56,054	57,554	64,301	69,608	65,591	64,333	69,451	65,185	68,945	70,087
ITA	36,287	36,557	39,465	48,884	55,616	56,560	57,477	64,400	69,875	66,200	64,612	68,848	64,082	67,822	67,754
GRC	22,179	22,348	24,466	31,535	36,743	36,412	38,456	43,411	47,706	45,638	43,174	44,669	41,065	41,855	41,594
NLD	38,341	38,453	42,288	52,359	59,600	62,582	66,144	74,689	81,925	76,612	75,494	80,328	75,699	79,669	81,297
BEL	42,816	42,343	46,452	57,237	65,455	67,386	70,357	79,466	86,439	82,413	81,357	86,990	81,731	86,280	87,781
AUT	32,619	32,637	35,559	43,434	49,373	51,328	54,367	61,721	67,049	64,640	62,659	67,700	63,670	67,161	68,006
FIN	33,525	34,215	36,570	44,469	50,940	52,126	54,244	62,977	68,913	63,611	62,447	67,434	62,888	66,269	67,802

Source: Authors' computations based on WIOD data

Table 12. **Labor productivity (economy)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	5,856	5,824	6,630	8,244	9,107	9,053	9,601	11,476	12,801	12,936	13,090	14,097	13,324	14,366	14,223
ESP	11,957	12,112	13,210	16,408	18,562	18,931	21,088	25,022	29,650	29,010	27,186	30,330	28,494	29,474	29,775
FRA	18,495	19,015	21,458	27,429	31,177	31,308	33,695	39,232	42,212	39,827	38,980	44,745	44,513	46,650	47,318
DEU	24,090	23,198	25,368	32,068	37,138	38,511	39,807	45,732	47,635	43,155	46,121	50,936	46,668	48,779	49,830
ITA	20,870	21,771	22,721	27,013	29,550	30,461	32,236	36,798	38,775	37,565	39,618	43,580	40,658	43,415	44,101
GRC	9,997	9,830	12,467	15,551	20,564	16,065	14,793	20,335	22,900	21,430	22,174	22,594	17,947	18,975	20,805
NLD	29,758	28,637	32,803	41,899	45,136	50,427	52,834	63,611	69,290	65,082	65,156	73,781	66,487	66,684	72,042
BEL	27,856	28,063	33,257	38,312	45,525	46,585	48,890	54,999	56,802	53,803	54,780	56,738	53,682	57,838	59,106
AUT	23,824	22,145	23,884	27,122	33,566	34,488	38,748	42,669	43,995	44,795	46,875	49,914	43,856	48,255	49,685
FIN	22,205	22,822	25,518	29,454	34,829	36,591	39,324	42,558	50,877	51,324	54,201	56,542	54,422	54,063	52,999

Source: Authors' computations based on WIOD data

Table 13. **Labor productivity (*textiles, leather, and shoes*)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	9,766	9,494	9,927	10,690	11,301	11,124	12,869	13,795	13,823	12,197	13,427	15,271	16,729	17,996	18,498
ESP	13,185	12,711	11,933	11,395	11,175	10,716	10,641	11,047	11,077	10,411	11,983	13,399	14,179	14,785	15,149
FRA	14,759	14,480	14,198	13,608	13,767	13,981	14,248	14,211	14,357	12,858	13,825	14,617	14,895	14,959	15,132
DEU	16,917	17,433	18,059	18,011	19,234	20,088	21,440	22,744	22,577	20,065	21,879	22,767	23,414	23,475	23,805
ITA	12,089	12,176	11,665	11,187	11,533	11,749	12,379	12,861	12,596	10,937	12,054	12,816	13,706	13,971	14,442
GRC	7,993	7,613	6,915	7,400	9,190	9,614	9,569	10,732	11,795	9,309	10,893	12,327	13,030	13,899	14,993
NLD	25,672	25,891	25,536	24,984	25,997	27,093	27,927	28,414	29,404	27,268	30,778	32,384	33,239	34,098	34,411
BEL	30,246	29,685	30,096	29,770	30,381	30,476	30,833	31,684	32,248	29,114	32,173	33,232	33,859	33,964	34,482
AUT	21,818	22,435	22,794	22,030	22,555	24,228	24,944	25,482	25,260	22,115	24,884	25,932	26,067	25,724	26,061
FIN	21,300	20,746	20,560	19,658	20,292	20,428	21,178	22,130	22,414	18,970	19,897	19,782	19,881	19,945	19,556

Source: Authors' computations based on WIOD data

Table 14. **Relative weight of exports in output (economy) (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	36,186	36,628	36,774	37,730	38,273	36,223	38,403	39,977	40,610	37,638	39,235	43,531	46,139	47,140	48,300
ESP	31,561	33,011	34,516	32,922	33,831	32,932	35,056	39,642	44,080	47,949	47,501	47,263	55,323	59,652	65,144
FRA	50,236	51,722	53,255	54,841	59,449	64,409	72,148	75,852	80,555	92,808	91,046	95,631	100,000	100,000	100,000
DEU	68,897	72,473	79,498	81,045	82,442	87,035	92,011	94,306	94,616	93,822	92,944	92,843	93,278	92,954	92,972
ITA	38,895	40,500	39,062	38,721	40,138	40,680	42,464	42,724	42,747	40,848	42,411	43,756	47,824	50,600	53,035
GRC	22,565	24,638	21,563	26,058	22,867	17,355	17,092	19,730	14,474	9,579	5,309	2,053	2,635	7,298	5,256
NLD	92,835	94,259	94,874	95,540	95,665	95,848	95,815	95,737	96,132	95,768	95,528	94,788	94,390	91,811	91,676
BEL	81,679	85,977	90,893	93,076	95,253	95,612	95,542	95,668	95,694	94,725	93,127	93,603	93,852	94,080	94,017
AUT	71,719	75,313	75,006	77,483	80,083	93,318	92,771	94,632	94,620	93,048	93,561	93,257	93,972	94,037	93,873
FIN	38,818	40,827	41,113	40,698	41,433	45,823	46,777	49,522	50,726	47,100	49,380	53,486	57,232	61,662	60,909

Source: Authors' computations based on WIOD data

Table 15. **Relative weight of exports in output (*textiles, leather, and shoes*) (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	18,703	17,997	17,284	16,670	17,474	17,640	18,853	18,852	19,508	16,944	18,591	19,026	18,878	19,329	20,101
ESP	15,770	14,842	13,708	13,269	13,710	13,659	13,887	14,121	13,749	11,357	12,937	14,072	14,166	14,182	14,883
FRA	13,659	13,321	12,845	12,534	13,004	13,682	14,160	14,300	14,586	13,057	14,197	15,364	15,439	15,378	15,464
DEU	15,052	14,755	13,872	14,181	14,724	15,536	16,757	17,340	17,514	15,553	17,289	18,396	18,289	18,432	18,281
ITA	11,648	11,519	11,215	10,868	11,184	11,689	12,659	12,745	12,715	11,014	12,710	13,283	12,988	12,680	12,757
GRC	19,340	18,736	16,975	16,900	16,534	16,741	17,860	19,568	20,283	16,434	17,634	18,743	18,600	18,727	19,833
NLD	20,998	21,235	20,752	20,189	20,656	21,394	22,137	22,500	23,569	22,111	25,156	26,665	26,969	26,971	27,002
BEL	26,940	26,085	25,393	25,140	25,963	26,492	26,907	27,585	29,448	25,749	29,185	30,935	31,398	31,188	31,998
AUT	20,890	21,272	20,659	20,405	20,858	22,381	22,842	22,867	22,805	20,290	22,834	24,417	24,541	24,101	24,060
FIN	15,618	15,041	14,929	15,306	16,072	17,454	18,141	18,647	19,561	16,869	18,326	19,276	19,650	19,499	18,971

Source: Authors' computations based on WIOD data

Table 16. **Relative weight of intermediate inputs in output (economy) (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	19,109	18,729	17,552	17,249	18,084	17,739	18,653	18,442	18,671	16,206	17,984	18,188	17,672	19,087	19,383
ESP	15,059	14,552	13,787	12,798	12,646	11,988	12,085	12,407	11,526	10,386	23,137	24,197	24,142	25,037	27,133
FRA	17,594	17,414	16,751	16,212	27,946	29,419	30,460	30,704	31,033	31,136	33,877	34,734	34,084	33,957	34,829
DEU	25,609	26,324	24,471	24,664	24,990	25,734	26,785	27,183	25,983	22,619	29,651	30,696	29,701	30,333	30,047
ITA	9,310	9,609	9,117	8,722	8,761	8,850	9,762	9,735	8,942	8,113	10,028	10,669	10,224	10,806	11,227
GRC	8,952	8,933	7,103	7,324	6,626	8,191	9,939	12,261	12,077	10,292	11,516	9,824	10,427	10,791	11,151
NLD	25,716	22,856	23,682	22,486	22,090	21,596	21,759	20,835	21,610	29,978	41,703	42,544	41,346	44,633	44,519
BEL	27,136	31,679	31,091	31,806	32,068	30,523	31,388	31,551	31,876	35,220	43,701	43,543	43,683	42,994	44,255
AUT	26,282	35,590	36,606	37,434	35,509	38,384	38,145	37,946	38,408	36,489	37,294	39,558	39,940	39,949	41,212
FIN	38,818	40,827	41,113	40,698	41,433	45,823	46,777	49,522	50,726	47,100	49,380	53,486	57,232	61,662	60,909

Source: Authors' computations based on WIOD data

Table 17. **Relative weight of intermediates in output (*textiles, leather and shoes*) (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	18,896	18,204	17,720	17,944	18,576	18,935	20,593	19,833	20,322	16,698	19,179	21,822	22,373	23,095	22,501
ESP	16,823	14,857	13,944	13,853	14,410	14,436	15,124	15,378	15,477	14,139	18,186	20,833	21,245	21,519	21,192
FRA	17,446	16,846	16,216	16,043	17,584	18,695	19,371	19,181	19,799	17,517	18,835	19,961	20,107	19,415	19,465
DEU	15,583	15,411	14,211	14,726	15,281	16,187	17,491	18,476	18,672	16,728	19,183	20,449	20,519	20,460	20,158
ITA	11,108	11,004	10,554	10,449	11,057	12,100	13,055	13,370	13,533	12,732	15,164	16,318	16,031	15,869	15,785
GRC	14,399	14,896	13,465	13,042	14,635	15,542	17,864	18,004	18,534	15,483	18,498	23,661	27,566	25,922	25,672
NLD	19,102	21,153	21,643	21,368	21,676	23,084	24,561	23,443	27,419	26,799	31,578	34,260	35,857	28,532	28,538
BEL	28,664	28,069	27,322	27,545	28,743	29,436	30,966	31,813	33,383	30,200	33,706	36,761	36,746	37,405	36,816
AUT	22,210	22,958	22,849	22,462	23,318	25,223	25,887	25,935	25,845	22,737	27,080	28,722	28,387	27,636	27,548
FIN	16,812	15,740	15,536	15,808	17,372	19,325	20,558	21,245	22,516	19,288	22,803	24,102	24,863	24,908	23,988

Source: Authors' computations based on WIOD data

Table 18. **Direct vertical specialization (economy) (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	27,856	26,937	26,035	26,023	26,844	27,412	29,055	28,261	29,288	24,365	27,306	30,905	31,190	31,540	31,160
ESP	25,830	23,516	22,378	22,042	23,063	23,669	24,870	25,299	25,394	22,204	27,889	30,888	31,289	31,158	31,130
FRA	24,256	23,755	22,776	22,487	24,108	25,566	26,674	26,469	27,287	24,595	26,872	28,514	28,541	27,894	27,716
DEU	23,019	22,674	20,972	21,694	22,584	23,985	25,652	26,719	27,345	24,561	27,362	29,146	29,068	28,618	28,145
ITA	19,335	19,093	18,431	18,191	19,136	20,769	22,621	23,153	23,466	21,655	26,127	27,928	27,242	26,856	26,373
GRC	18,997	20,020	18,465	17,636	18,538	19,656	22,315	22,688	23,591	19,884	23,788	28,353	32,368	30,760	30,417
NLD	25,970	27,098	28,522	28,040	27,782	28,823	30,383	29,244	33,313	33,846	38,311	41,190	42,422	36,971	36,849
BEL	37,589	37,143	35,601	35,274	36,390	37,149	39,013	39,676	41,614	38,457	43,104	46,390	46,373	45,949	46,045
AUT	28,708	29,634	29,497	29,378	30,712	32,639	33,535	33,484	34,015	30,490	34,847	36,903	36,929	36,421	36,143
FIN	26,050	24,202	23,622	24,135	26,210	28,894	30,795	31,242	33,413	29,418	33,323	35,581	36,499	36,222	35,027

Source: Authors' computations based on WIOD data

Table 19. **Total vertical specialization (economy) (%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
PRT	28,451	27,953	26,103	25,439	26,567	26,069	27,039	26,661	26,734	22,898	25,434	26,286	25,381	26,832	29,076
ESP	23,700	22,905	22,090	20,910	21,068	21,170	21,691	22,054	20,762	18,361	31,176	32,645	32,134	32,727	36,645
FRA	28,152	27,982	26,984	25,935	35,297	36,788	37,459	37,307	37,551	36,257	39,792	40,636	39,733	39,517	42,501
DEU	32,235	32,795	30,399	30,598	31,135	31,998	33,247	33,781	32,958	30,111	35,727	36,813	35,649	35,996	37,581
ITA	16,714	16,948	16,336	15,772	15,907	16,530	18,059	18,041	17,303	16,307	20,465	21,816	21,219	21,546	22,899
GRC	15,859	16,219	13,818	13,128	11,436	14,664	17,352	19,102	18,749	16,782	17,825	16,384	17,320	17,728	18,970
NLD	30,842	28,034	29,869	28,577	27,828	27,172	27,485	26,178	27,811	36,288	46,512	47,451	46,631	49,698	52,028
BEL	37,540	39,969	38,295	38,511	38,217	36,728	37,853	38,184	39,425	41,686	49,948	50,248	50,419	49,743	53,903
AUT	34,681	41,686	42,767	43,591	41,199	43,038	43,004	42,699	43,812	40,994	42,194	44,724	45,372	45,570	48,984
FIN	26,210	25,762	25,274	25,596	25,905	26,221	26,375	32,784	32,541	33,410	39,352	43,333	42,946	44,464	47,259

Source: Authors' computations based on WIOD data

Table 20. **Total vertical specialization (*textiles, leather, and shoes*) (%)**