

# Spain in the global value chains

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In the past 15 years there has been an expansion in world trade accompanied by a growing international fragmentation of production, which has given rise to the so-called “global value chains” (GVCs). This new way of organising production at the international level means that countries specialise increasingly in small contributions to the final product and that companies are increasingly global.

The Spanish economy has also played a part in these developments, although its participation in GVCs is still below the international average. However, from the onset of the crisis up to 2014, the import content of Spanish exports increased, partly as a result of a reallocation of resources towards firms with a greater import content that have gained weight in total exports.

Moreover, Spain is characterised by the fact that it is one of the countries where exports are closer to the final consumer in the country of destination, a phenomenon that has increased in recent years.

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### Introduction

In recent decades the expansion in world trade has been accompanied by a growing international fragmentation of production processes. Hence, companies distribute their activities across an extensive number of countries, from product design to the manufacture of parts, their assembly and their marketing. This process has given rise to the so-called “global value chains” (GVCs), which may be defined as the set of activities or production phases that are carried out in different countries and that are required for the preparation and sale of final goods and services, from the initial stages of production of basic inputs to the provision of post-sales services.

The information contained in the world input-output database (WIOD) enables the functioning of the GVCs and, consequently, cross-country trade interrelations to be analysed. This database combines a set of harmonised national input-output tables and international trade data on goods and services. The integration of these two sources provides information on the inputs required for the preparation of each product according to the sector and country of origin of the inputs and the final destination of the product, whether for final consumption, investment or export.<sup>1</sup> It is in this way possible to calculate indicators of each country’s participation and position in the GVCs that provide for analysis of international trade patterns. For instance, this type of analysis has enabled some of the factors potentially behind the recent slowdown in global trade to be identified, such as the change in the composition of the growth of some economies, as has been the case in China, towards demand-side components characterised by a lesser import content (such as consumption), at the expense of other components with a greater import content (such as investment).<sup>2</sup>

In Spain’s case, the recent changes in participation in GVCs enable a deeper understanding of the interrelations between exports and imports, which have played a significant role in the recent improvement in the current account balance.<sup>3</sup> Also, our economy’s positioning within GVCs may be relevant for analysing the effects arising from international processes that will potentially alter international trade flows, such as the UK’s exit from the European Union and the possible changes in US trade policy.

This article offers an initial characterisation of the Spanish economy’s participation in GVCs and analyses the recent pattern in comparison with other economies. According to the evidence analysed, Spain’s participation in GVCs is relatively low, mainly because Spanish exported products are close to the good or service for final consumption. As to developments over time, Spanish exports have increased their import content from the start of the crisis up to 2014, unlike what has happened in other countries. This is due, at least in part, to the fact that certain products with higher import content have gained weight in overall exports, with the manufacture of chemicals and metallurgy being a case in point.

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<sup>1</sup> For further details on the WIOD database, see Timmer, Los, Stehrer and De Vries (2016).

<sup>2</sup> See, for example, “Global Value Trade: What’s behind the slowdown?”, Chapter 2 of the October 2016 *WEO*.

<sup>3</sup> See Banco de España (2017).

## Measures of participation in GVCs

In November 2016, the updated world input-output tables covering the period 2000-2014 were released.<sup>4</sup> This database is very rich in terms of the number of countries included (43) and the degree of disaggregation by sector of activity (56). In turn, these data are consistent with national accounts data and with the trade data of each of the countries making up the sample.

One of the advantages of the world input-output tables is that they provide for a more accurate measurement of international trade in terms of its value added. The official trade statistics in gross terms do not discount the value of imported intermediate goods when quantifying the value of exports. This may give rise to an artificial increase in trade figures, since the value of the imported intermediate good appears both in the country's imports and exports, whereby the global trade volume is ultimately overestimated in the context of greater international fragmentation of production.

On the basis of the world input-output tables it is possible to break down the value of gross exports into the contribution of domestic value added (DVA) and the contribution of foreign value added (FVA). DVA represents the contribution of domestic factors of production to exports, while FVA refers to the contribution of foreign productive factors. Under the methodology proposed by Koopman, Wang and Wei (2014),<sup>5</sup> these two components can be broken down in turn into various sub-components based on the final use of the exported product (see Diagram 1). Bearing in mind this breakdown, two indicators can be calculated to measure each country's participation in the GVCs. The first of these indicators, known as "backward participation", refers to the FVA in the gross value of a country's exports and approximates the import content of such exports. The second indicator, called "forward participation", corresponds to the DVA of goods or services which, after export, will subsequently be re-exported to a third country.

The sum of backward and forward participation relative to total gross exports approximates an economy's global participation in GVCs. A high value for this indicator reflects a country's greater integration into international trade flows, whether because its exports require the participation of intermediate goods imported from another country, or because its exports are an intermediate good that will be used as a factor of production in other countries' exports.

The difference between forward and backward participation is used to characterise an economy's position in GVCs. Specifically, a low value for this difference indicates that the economy's exports are close to the final consumer. Conversely, a high value denotes that the economy is specialised in the supply of factors of production that will be re-exported, with the economy therefore being further away from the final consumer.

To illustrate the information reflected in these indicators in the case of the Spanish economy, the automobile industry may be considered. This industry is firmly export-oriented and accounts for around 14% of total goods exports. In addition, it is characterised by a high import content; its backward participation is around 30%, i.e. of the total volume exported by Spain, 70% incorporates DVA. Domestic production in this

<sup>4</sup> In addition to greater time coverage, extended from 2011 to 2014, the new tables include some additional countries and sectors, covering up to 85% of global GDP. The data are expressed in millions of dollars and in current prices.

<sup>5</sup> For further details on alternative methodologies, see Nagengast and Stehrer (2014) and Borin and Mancini (2015).



SOURCE: Banco de España.

a For further details of the methodology for this breakdown of gross exports, see Koopman, Wang and Wei (2014). Exported DVA is broken down into final goods [1], and into intermediate goods that will be absorbed into the final production of the country of destination [2], for the production of goods that will be re-exported to a third country [3] or that return to the country of origin [4-5] and double-counted exports [6]. Exported foreign content is broken down into FVA either as a final good [7] or as an intermediate good [8] and the double-counted component [9].

industry is very closely related to assembly and, therefore, is close to the final good. This means that forward participation is low (close to 5%). In this respect, there is a high correlation between the automobile industry’s export markets and the countries of final demand for these products. As a result, this industry’s total participation in GVCs stands at around 35% (the outcome of adding the 30% of backward content and the 5% of forward content).

**Spain’s participation in GVCs and recent related developments**

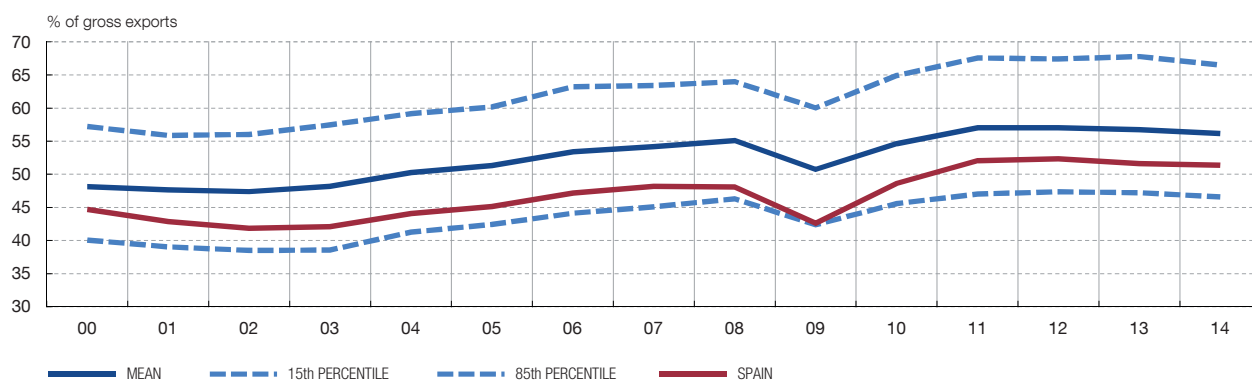
As can be seen in Chart 1, the participation in GVCs of the 43 countries in the sample increased in a sustained manner from 2000 to 2011, with the exception of the decline observed in 2009, further to the collapse in world trade.<sup>6</sup> Over the course of those years, average participation in GVCs increased by 9 pp to 57% of gross exports. This growing trend flattened out as from 2011, posting a level of 56.2% in 2014. Spain was part of the foregoing developments, and also increased its participation in GVCs, which rose from 44.7% in 2000 to 52% in 2011. Since 2011, this trend has buckled, as in other countries, with participation standing at 51.4% in 2014. The foregoing data reveal, in turn, that the Spanish economy has a lower-than-average participation in GVCs compared with the other countries in the sample.

However, the level of participation in GVCs is fairly high, and a negative association can be observed between the level of participation and the size of the economy<sup>7</sup> (see Chart

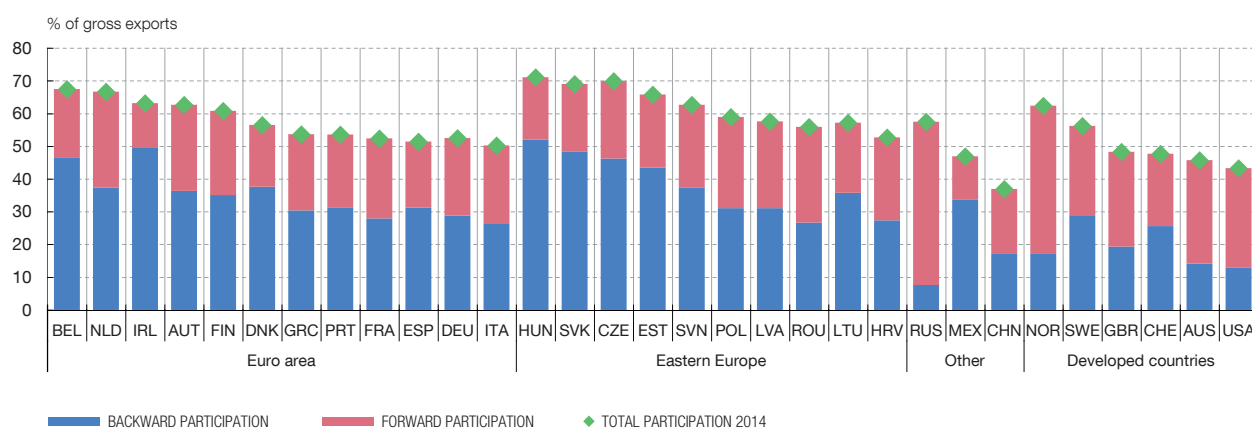
6 For a more detailed analysis of the determinants of global trade in value added in 2008-2009, see Nagengast and Stehrer (2014 and 2016).

7 The degree of utilisation of imported inputs or import content is partly related to the size of the economy, given that larger economies have less need of imports to produce their exports, as they have better access to a greater number of national suppliers.

## 1 CHANGES IN PARTICIPATION: 2000-2014 (a)



## 2 BACKWARD AND FORWARD PARTICIPATION IN GVCs BY COUNTRY IN 2014 (b)



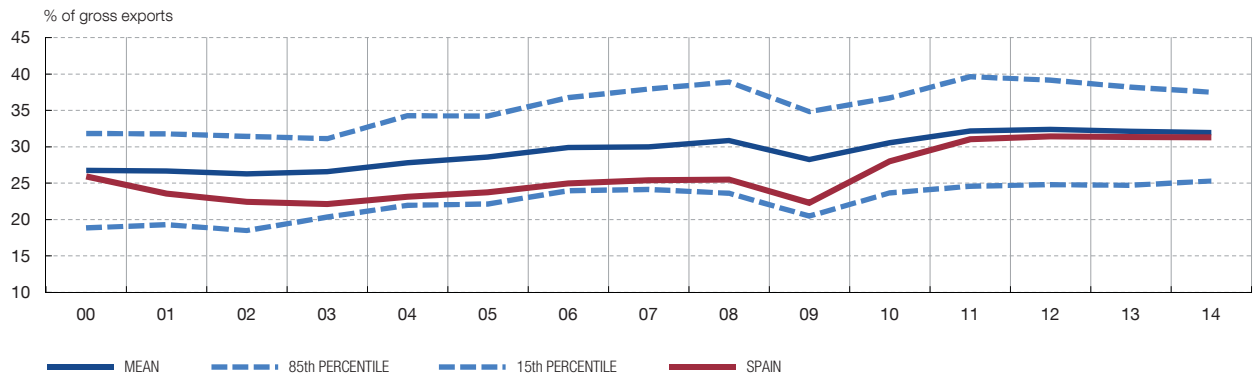
SOURCE: Own calculations based on WIOD-2016.

- a Participation is defined as the sum of backward and forward participation.  
 b China's and Mexico's low participation is due to the fact that the WIOD tables work under the assumption of the proportionality of the technical coefficients in each sector, irrespective of whether they are domestic or international companies. For further details, see Koopman, Powers, Wang and Wei (2010).

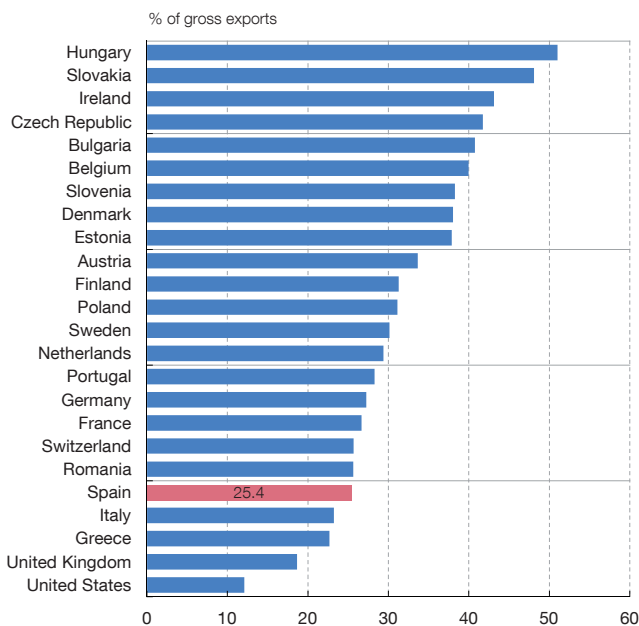
1.2). Indeed, Spain's participation is similar to that of its peers in Europe, namely Germany, France and Italy. In Spain's case, the level of participation is characterised by low forward participation and backward participation around the average for all the countries in the sample. Accordingly, as previously illustrated in the specific case of the automobile industry, the difference between forward and backward participation, as an indication of Spain's positioning within GVCs, would mean that Spanish exported products are generally close to the final good or service. Significantly, there is some heterogeneity by sector of activity in the backward participation and forward participation of Spanish exports (see Chart 4). Generally, and as also occurs in other countries, it is exports from the industrial sector that have a greater import content (backward participation), while the services sectors usually have a lower import content and a greater weight in forward participation.

The similar course in aggregate terms of Spain's participation and that of other economies masks a differing path of its two components in recent years. As Charts 2 and 3 show, although the Spanish economy's backward participation has increased, forward participation has lessened. Following the decline in backward participation in 2009, there

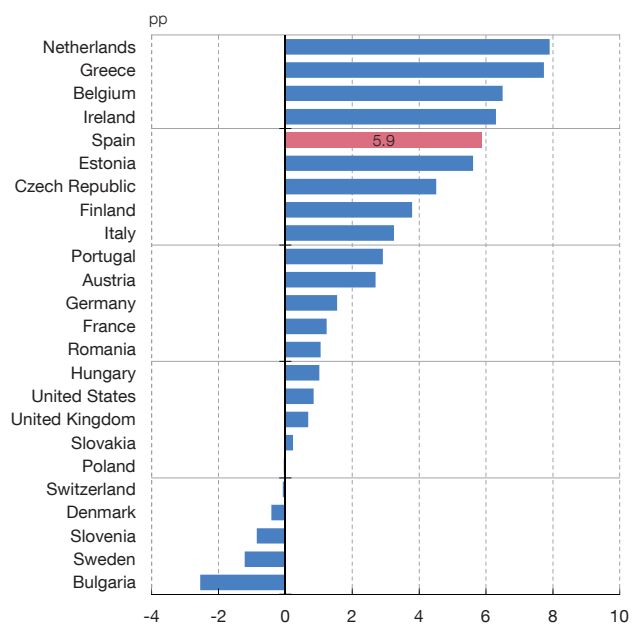
1 CHANGES IN BACKWARD PARTICIPATION: 2000-2014



2 BACKWARD PARTICIPATION BY COUNTRY IN 2007



3 CHANGE IN BACKWARD PARTICIPATION: 2014 COMPARED WITH 2007

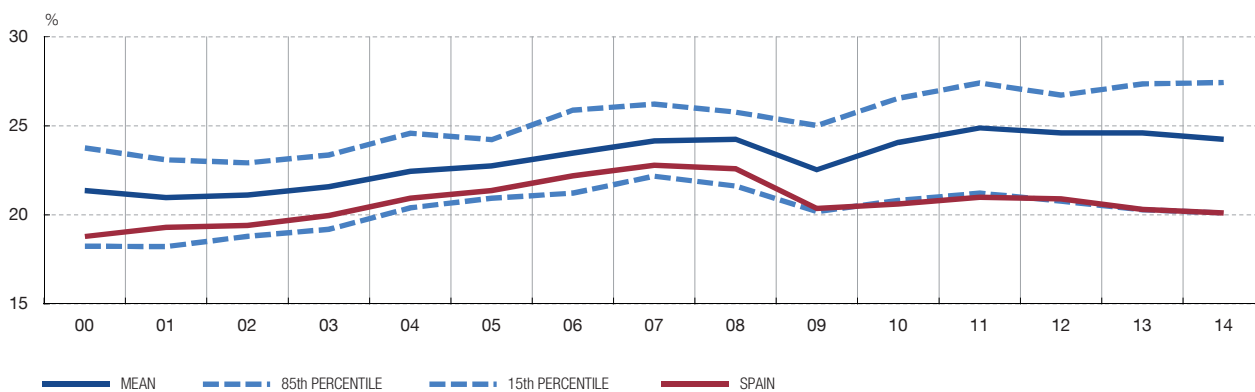


SOURCE: Own calculations based on WIOD-2016.

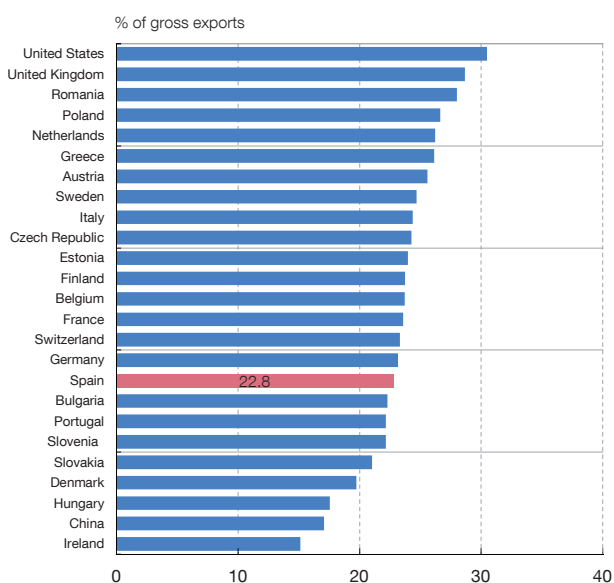
was a pick-up in import content, rising in 2011 to pre-crisis levels, which have held practically constant subsequently. Against this background, the Spanish economy stood in the lower part of the distribution of countries in terms of backward participation, with 24.1% on average in the pre-crisis years. However, in 2014 it was in the mid-section of the 43 countries, as the import intensity of its exports increased significantly from 2007 to 2014. Moreover, Chart 3 shows that forward participation also experienced trend growth between 2000 and 2011 which was subsequently checked.<sup>8</sup> In this case, Spain also stood in the mid-lower bracket of forward participation, with 22.8% in the pre-crisis years. This relatively low position has become more emphatic in recent years, with Spanish firms among those that have reduced their forward participation to a greater extent.

<sup>8</sup> Note that, globally, the two measures (backward and forward participation) are two sides of the same coin. If the capacity of certain countries to produce goods that are used for re-export to third countries (forward participation) increases, the intensity of imports in other countries (backward participation) must also necessarily increase.

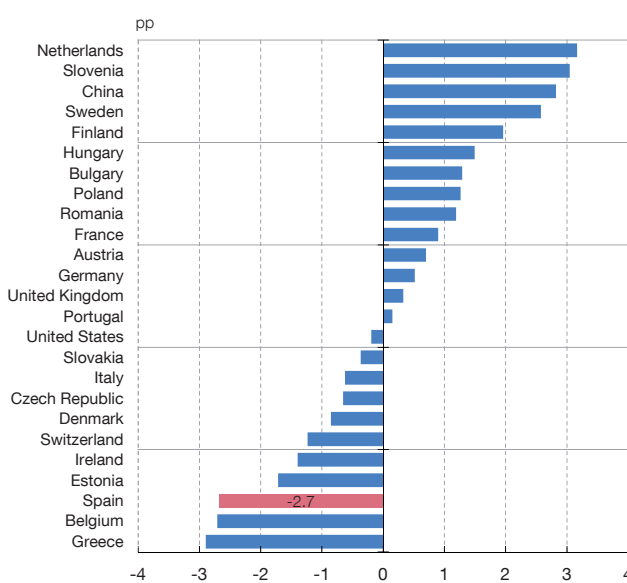
1 CHANGES IN FORWARD PARTICIPATION: 2000-2014



2 FORWARD PARTICIPATION BY COUNTRY IN 2007



3 CHANGE IN FORWARD PARTICIPATION: 2014 COMPARED WITH 2007

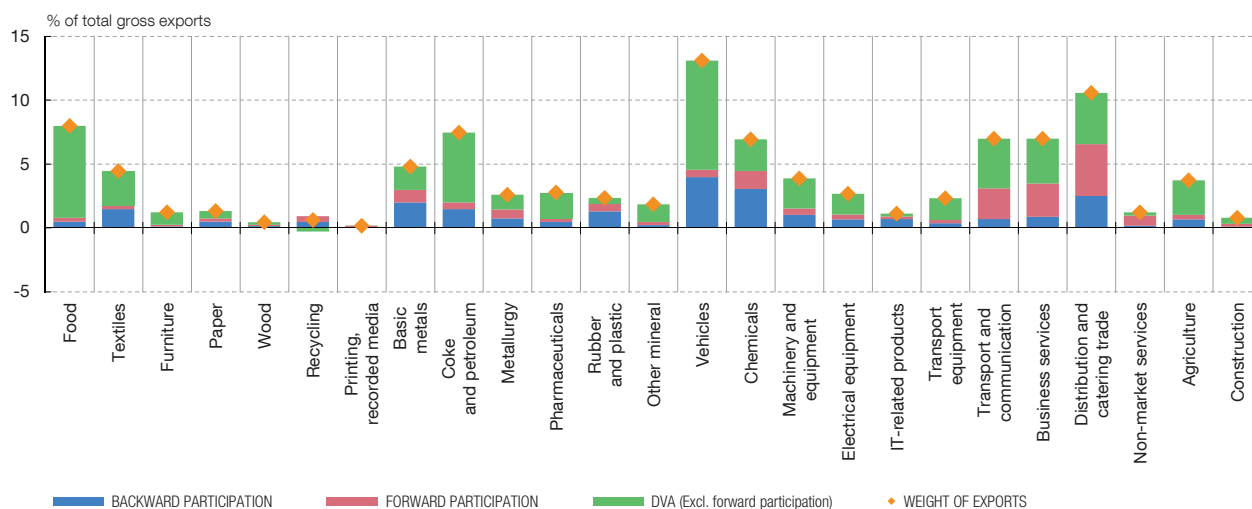


SOURCE: Own calculations based on WIOD-2016.

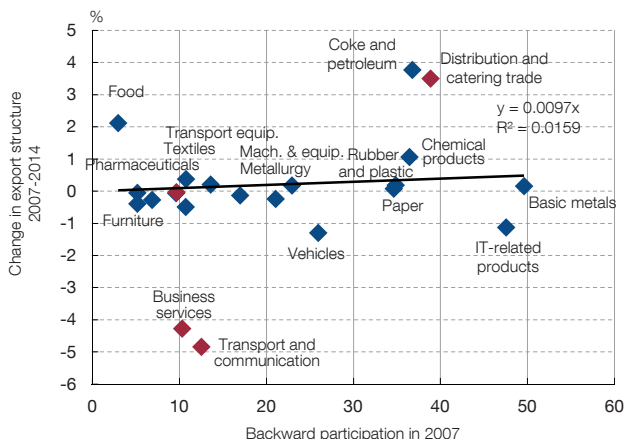
To assess to what extent the changes in backward and forward participation in GVCs are related to the changes observed in the sectoral composition of exports, Charts 4.2 and 4.3 show at the sectoral level the relationship between the change in each sector’s share as a proportion of total exports and the backward and forward participation indicators corresponding to the year 2007. As can be seen, the composition of Spanish exports changed from 2007 to 2014 in such a way that the weight of those products with a greater import content (backward participation) increased, which would explain, at least in part, the increase in aggregate terms in the Spanish economy’s import intensity during those years.<sup>9</sup> In parallel, according to Chart 4.3, it would not appear that the composition effects are related to the reduction in forward participation, given

<sup>9</sup> Along these same lines, but with firm-level information, it has been observed that the changes in purchases abroad suggest the presence of a degree of substitution of national output for imports in the recent period. However, the process of reallocation of resources towards bigger and more productive companies has led to companies with a greater import content gaining market share, thereby masking the import substitution process in aggregate terms. For further details, see Banco de España (2016 and 2017).

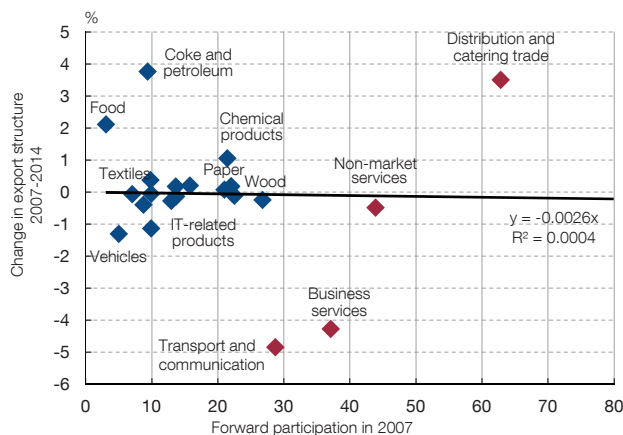
1 WEIGHT IN EXPORTS OF GOODS AND SERVICES BY SECTOR/INDUSTRY IN 2014



2 EXPORT PERFORMANCE AND BACKWARD PARTICIPATION BY SECTOR



3 EXPORT PERFORMANCE AND FORWARD PARTICIPATION BY SECTOR



SOURCE: Own calculations based on WIOD-2016.

that no clear association between forward participation and the changes in the export share for the different sectors is observed; this evidence would indicate that the value added of Spanish exports is generally positioning itself increasingly closer to the final consumer.

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