

Exports and employment in the Spanish economy: A repetitive pattern

Author(s): Milagros Dones Tacero, María Isabel Heredero de Pablos and Santos M. Ruesga Benito

Source: *Investigación Económica*, Vol. 76, No. 301 (julio-septiembre de 2017), pp. 137-169

Published by: Facultad de Economía, Universidad Nacional Autónoma de México (UNAM)

Stable URL: <https://www.jstor.org/stable/10.2307/26205121>

REFERENCES

Linked references are available on JSTOR for this article:

https://www.jstor.org/stable/10.2307/26205121?seq=1&cid=pdf-reference#references_tab_contents

You may need to log in to JSTOR to access the linked references.

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



Facultad de Economía, Universidad Nacional Autónoma de México (UNAM) is collaborating with JSTOR to digitize, preserve and extend access to *Investigación Económica*

JSTOR

Exports and employment in the Spanish economy: A repetitive pattern

Milagros Dones Tacero^{a,c} ▪ María Isabel Heredero de Pablos^b
▪ Santos M. Ruesga Benito^b

Abstract

This paper focuses on future job creation in Spain through exports. Our analysis covers direct, induced, or indirect job creation, based on exports output and inputs demanded by exports. We carried out estimations of symmetrical Input-Output Tables (IOT) from 2010 to 2020, as an instrument to analyze the impacts of exports on Spanish economy and employment.

The main conclusions deal with Spanish exports within sectorial production chains, the spillover effect of those exports on the domestic economy, and, by extension, their effect on job creation and the balance of payments. Thus, one of the main contributions of this paper, not much explored in current economic literature, is the continuity of the entrepreneurial structure of Spain's export sector. This entails a dual structure: A very few high-volume exporting companies that create few jobs, and a large amount of small exporting companies that create more jobs. We surmise that this structure will continue to exist over the following years. A conclusion of our investigation is that as Spain's export sector increases its participation in global production chains, there will be few net jobs created by exported output.

Key words: Employment, exports, global production chains, economic growth.

JEL Classification: F16.

Resumen

Este artículo se centra en el futuro de la creación de empleo en España a través de las exportaciones. El análisis versa sobre la creación de empleo, directa, inducida o indirecta, generada por las exportaciones y por la producción de los insumos demandados por

Manuscript received on October 13th, 2016; accepted on May 16th, 2017.

- a Department of Applied Economics of the Faculty of Economics and Business Sciences, Universidad Autónoma de Madrid (Spain).
- b Department of Economic Structure and Development Economics of the Faculty of Economics and Business Sciences, Universidad Autónoma de Madrid (Spain).
- c Corresponding author: milagros.dones@uam.es

© 2017 Universidad Nacional Autónoma de México, Facultad de Economía. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

aquéllas. Desarrollamos estimaciones a partir de tablas insumo-producto simétricas, desde 2010 hasta 2020, utilizadas como un instrumento para analizar los impactos de las exportaciones sobre la economía y el empleo españoles.

Las principales conclusiones relacionan las exportaciones españolas con las cadenas sectoriales de valor, con los efectos indirectos de tales exportaciones en la economía nacional y, por extensión, con sus efectos sobre el empleo y la balanza de pagos. En este sentido, una de las principales contribuciones de este trabajo, no muy conocida en la literatura económica actual, es la continuidad de la estructura empresarial del sector exportador español. Esto significa que su comportamiento es totalmente dual: unas pocas grandes empresas exportadoras con baja intensidad de trabajo y un amplio número de pequeñas empresas exportadoras que son más intensivas en trabajo. Y tal comportamiento continuará en los próximos años. Finalmente, como el sector exportador español más dinámico está muy ligado a cadenas globales de producción, las consecuencias, en términos de generación de empleo derivado de las exportaciones, son muy reducidas.

Palabras clave: empleo, exportaciones, cadenas globales de producción, crecimiento económico.

Clasificación JEL: F16.

INTRODUCTION

In light of the turmoil caused by Spain's unemployment since the current global crisis began in 2008, diverse economic policy options are vying for contention. One common current of thought in European countries insists, following the German example, on encouraging greater foreign sales as a way to compensate lower domestic demand¹. This lower demand arises both as an immediate effect of the implicit crisis of confidence (reflected by a drop in private consumption and investment), and because of economic austerity policies, most of which are being implemented (through cutbacks in public consumption and investment).

As Fujii and Cervantes (2013) have shown, there is nothing new in attempts to explain economic growth through export-led growth models. In this paper, we explore the relationship between export and growth variables and reference the fact that competition in export markets stimulates greater efficiency in the output structure (Bhagwati and Srinivasan, 1979; Feder, 1983; Kohli and

1 We can interpret wage stagnation in Germany as one of the basic components of austerity policies implemented in the past two decades. This stagnation has accentuated wage devaluation on the periphery of Europe. Given this context, Germany's surplus in its current account is the counterpart of deficits in Greece, Portugal, Spain, and France. Herein lies the difficulty that these latter countries face in successfully following a path of export-led economic growth (Manera 2013; Schui, 2014; Blyth, 2013).

Singh, 1989; Krueger, 1980). Furthermore, exports favor specialization, allowing benefits to accrue from economies of scale (Helpman and Krugman, 1989); export-driven firms also tend to be more technologically advanced and their technical progress spreads throughout the entire economy (Grossman and Helpman, 1993). Further, by bringing hard currency into an economy, exports help to overcome the possible external constraint on growth (Thirlwall, 2011).

Still, the chances that exports will be the main driving force behind economic growth, as seen in some Asian countries or, closer to home, in Germany, bear close relation to the net spillover effects that exports might have on the entire domestic economy (Irawan and Welfens, 2014). This will depend on how Spain's exports function within global production chains (Fuentes, Mainar and Cardenete, 2015). It is of little use to export goods described mostly as having "middle to high technology" (in reference to the technological factor intensity incorporated in the final good), if Spain's contribution to the global production chains emphasizes, for example, producing components with higher labor intensity, and if exporting depends on importing inputs to produce a large proportion of export-bound goods. In addition, hypothetically, the export-growth rate, and, mainly, exports' sectorial structure and the spillover effect of imports required by output (with their corresponding sectorial structure) condition the "export-led growth" model (Sinn, 2006).

Given this context, we should consider the export sector's potential demand for labor in order to gauge if it is indeed possible to counter high unemployment in a country like Spain by expanding exports. If possibilities exist in this regard, then the following logical question is how to expand Spain's exports, which require ongoing improvements in the competitiveness of domestic output². By extension, a greater volume of exports will bring not only greater sales abroad but also displacement of goods imported to the domestic market (Bayerl, Fritz and Hierländer, 2008). This paper endeavors to analyze the potential job-creation capacity of Spanish exports in the short term, by means of a detailed study of information provided by Input-Output Tables (IOT) and an inverse-matrix methodology. This will also entail analyzing the structure and the sectorial characteristics of Spanish exports, as well as macro and microeconomic (industrial) policies that directly affect this function. We will return to this latter aspect in our closing comments.

2 A detailed analysis of this central issue and reflections on how to overcome the limitations noted are found in García and Ruesga (2014, pp. 338-350) and García (2014, pp. 117-150).

OBJECTIVES

The objectives of this paper involve estimating employment created by exports of the Spanish economy and their sectorial distribution, in order to reach conclusions regarding future job creation in Spain. We are interested in direct, induced, or indirect job creation because of inputs demanded by exports (Miller and Blair, 2009). In this latter case, we also consider the difference between employment induced within the export sector itself (intra-industrial effect), and within all remaining economic sectors (inter-industrial effect). This distribution affects the job-creation capacity within the domestic market. In addition, we consider both the spillover effects of imports generated by exports, which here we deem to have substitution effects on domestic employment that should be considered when evaluating their net employment effect (Sousa *et al.*, 2012).

The subject is particularly relevant since results from this analysis can inform conclusions regarding how Spanish exports function in sectorial production chains. It is of interest to know what spillover effects Spain's exports have on the domestic economy and, by extension, on job creation and on the balance of payments. There are quite a few economies that, being strong exporters, have few multiplier effects domestically (López, 1999), and show ongoing balance of payments instability, owing to the significant spillover effect of imports inherent in a specific type of export specialization (Cervantes and Fujii, 2012; Fujii, Cervantes and Fabián, 2014).

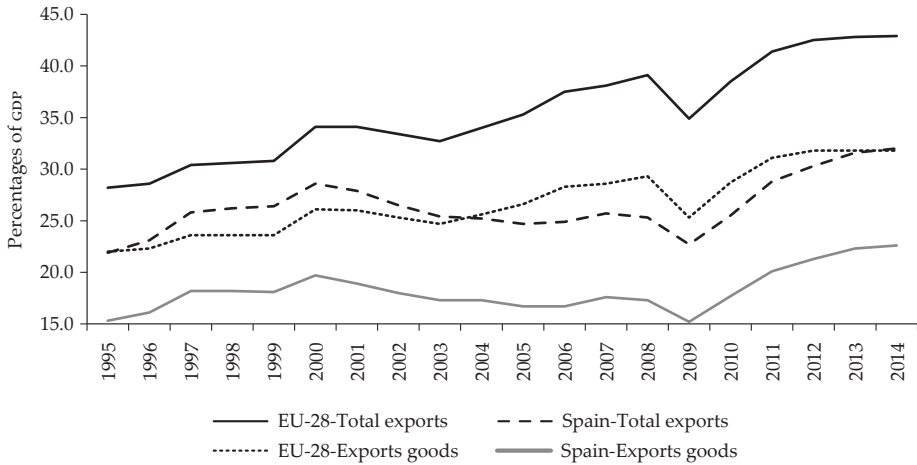
ECONOMIC CONTEXT AND ECONOMIC POLICY

We will briefly review the current situation of Spain's economy, especially its external sector, recently implemented economic policies, and the export strategy defined therein.

During the first decade of the 21st century and until the onset of the financial crisis, the export sector was characterized by a growing deficit (see Figure 1), which revealed some important limitations therein³. We begin by noting

3 “The two traits detected by García and Tello (2011) —Spain's non-specialization in high-technology manufacturing and concentration of output in activities of low competitive advantage— reveal that the obstacle is not only a problem of price competitiveness and low productivity growth. The domestic allocation of resources in Spain is problematic in that it ignores aspects that should be given priority for a successful competitive role in globalization” (García and Ruesga, 2014, p. 120). For new companies entering the export sector, see Hanley and Monreal (2012).

Figure 1
Exports rate (exports/Gross Domestic Product)
for Spain and European Union (total exports and goods exports)



Source: Own calculations based on Eurostat data, available at: <<http://ec.europa.eu/eurostat/data/database>>.

that exports are highly concentrated in a few large companies (Durán, 2014). This fact would seem to limit the role of this economic sector in becoming the driving force of recovery, given that Spain has many very small firms⁴. Thus, Durán (2014, pp. 191-192) notes, “the number of small-scale exporting firms is high, and these firms made few efforts [to modernize their technology]”. This situation leads to low productivity growth (Nuñez, 2004). Some analysts call it the “Spanish paradox”: Ongoing improvement of productivity is due to large, more export-oriented companies⁵ (Crespo, Pérez-Quirós and Segura-Cayuela, 2011). Cardoso, Correa-López and Domenech (2012) explain this paradox as “a modest market share loss since the launch of the euro alongside a real exchange rate appreciation” And they continue, “The non-price determinants of competitiveness are more important than export prices in explaining the change

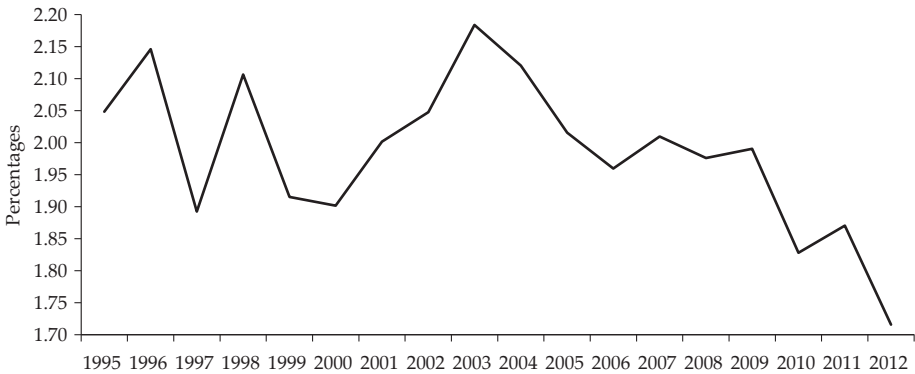
4 In a more general context, see Melitz and Ottaviano, (2008), and Sotomayor (2009).

5 This means: “Large Spanish companies are a key to improved productivity and appear to be more productive than large European companies” (García and Ruesga, 2014, p. 191) and may even be more efficient than large European companies. In contrast, small Spanish firms participate much more frequently as exporters than their counterparts in European countries and are also much less inefficient (Mora Sanguinetti and Fuentes, 2012; Durán, 2014).

of world export shares. Notably, Spanish firms’ strategic decision-making has helped shape Spain’s internationalization and may, ultimately, be the crucial factor that explains the paradox”. Durán and Úbeda (2013) reach similar conclusions about the strategy of larger Spanish (multinational) companies.

In other words, large Spanish firms are determinants of productivity improvement (López-García, Puente and Gómez, 2007) and in fact seem to be more productive than large European firms (Antrás, 2011). Further, smaller Spanish companies are less productive than European ones, and, obviously, the latter are less productive than large European companies (Mora Sanguinetti and Fuentes, 2012), reinforcing the idea that Spain’s export sector continues to be weak. For these authors, this reasoning would explain why Spain’s exports have had more relative success (compared to all other European Union countries) in containing the loss of their export share in world markets (see Figure 2), since the launch of the euro.

Figure 2
World share of Spanish manufactures
 (Spanish manufactures exports/total world, percentages)



Source: Own calculations based on International Monetary Fund (IMF) data, *World Economic Outlook*, available at: <<http://data.imf.org>>.

Later recovery, beginning in 2010, has been more a result of an ongoing drop in Gross Domestic Product (GDP) than of a significant recovery of exports. It turns out that the performance of a group of large exporting companies that dominate most export sales is the reason behind the rise in recent years of the export coefficient. In fact, the competitive advantage gains that occurred from

the drop in real wage costs (from 2012 on) do not seem to have translated into a significant rise in exports, but rather in greater net returns for exporting companies⁶.

Although we can see in Figure 1 that, since the current crisis began in 2007, there has been significant growth in Spain's export coefficient (percentage exports/GDP), it varies little from the phenomenon observed in the rest of our European Union partners in terms of total exports and manufactures. Therefore, Spain has gained very little market share in the European Union.

Spain's exports have fallen continuously since the beginning of this century, from a ratio of Spain's exports to total world exports of 2.2% in 2003, to 1.7% in 2012 (Figure 2). This confirms that on a global scale, Spain's economic competitiveness continues a decline that began several years ago.

Spain experienced a relative upswing of exports during the recession that seems to have encouraged authorities to search for a way out of the crisis through exports (Hanley and Monreal, 2012). As we shall see from the analysis below, this line of reasoning seems shortsighted, insofar as Spain's sizable unemployment problem is concerned.

It would seem that a strategy of internal (wage) deflation drives economic policy⁷, which is implicit in many of the structural reforms⁸ and austerity policies implemented. Apparently, these policies seek to improve Spanish firms' competitive position in European markets through prices (by decreasing absolute wage costs). The mainstream economic viewpoint that has guided economic policy in recent years would approve of these measures, given that they seem to coincide with the implementation of a type of export-led growth model.

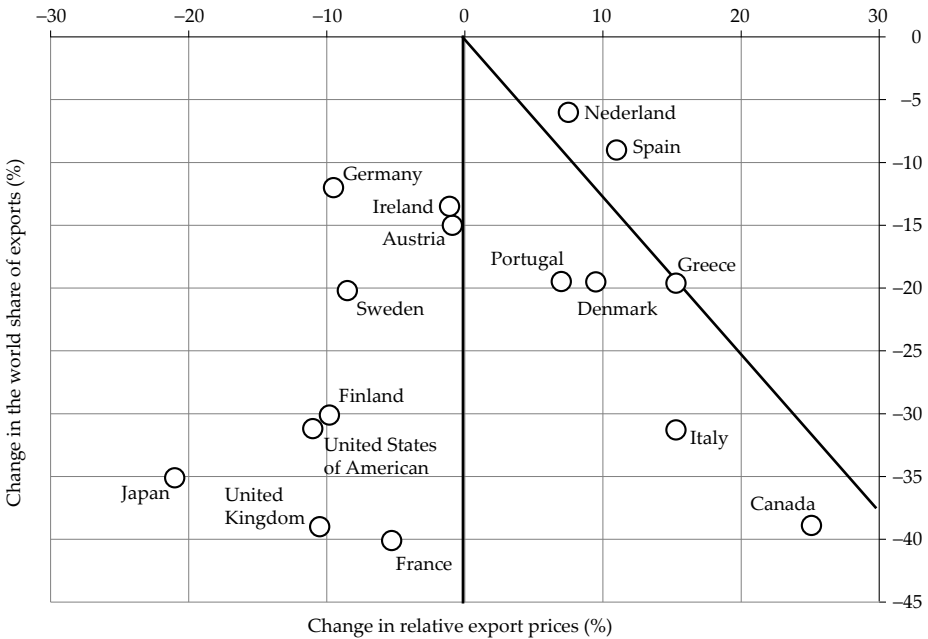
6 See García and Ruesga (2014, p. 274, footnote 24).

7 Seen from the theory of optimum currency areas (Mundell, 1961), once a country joins a monetary union external competitiveness should be kept at the expense only of low costs and prices rather than through recurring devaluations of the currency if labor and capital mobility, income transfers, or financial solidarity among members are nonexistent (Ruesga and Heredero, 2005). This was largely bypassed during the construction of the European Monetary Union (Ruesga, 2014). In this context, as a member of the Economic and Monetary Union and without the possibility of currency devaluation, since 2010 Spanish governments opted for an economic strategy of reducing wage costs (wage devaluation), which has meant a reduction in the wage cost per effective hour worked, around 1 percent in real terms (from 2008 to 2014).

8 Particularly, in the reform undertaken in February 2012 and later developments. This interpretation can also be made of other reforms that have affected, for example, the public, entrepreneurial, and administrative sectors, with successive wage cuts therein.

And yet, the empirical literature points to a different conclusion, *i.e.*, the relative improvement of Spanish competitiveness during the recession (from 2010) has not been due to the improvement in terms of relative prices of exports, but to the other variables to which we have alluded in previous paragraphs. These variables are linked to the characteristics of the process of internationalization of big companies and firms’ strategic decision-making over the last two decades (Cardoso, Correa-López and Domenench, 2012), in line with the “Kaldor paradox” (Maroto Sánchez and Rubalcaba Bermejo, 2006).

Figure 3
Change in the world share of exports and
in relative exports prices for goods and services, 1999-2011



Source: Cardoso, Correa-López and Domenench (2012).

The estimations undertaken herein (the basis for the constructed and forecast IOT for the Spanish economy from 2000 to 2020) are described in the following section. The macroeconomic scenarios in which these estimations are made foresee lower nominal wages in 2010-2015, and a moderate growth thereof in the following five-year period, but lower than GDP growth.

RESEARCH METHODOLOGY

Preparing the input-output tables

Here we develop models that incorporate a supply and demand perspective and are proliferating as powerful instruments to increase understanding of economic reality. They also allow for an integrated analysis known as the Keynes-Leontief model, based on their main authors (Klein, 1952; Leontief, 1946 and 1977).

This analytic tool is clearly informed by the development of a model that determines the performance of the different demand components, which generally become the inputs that make up the sectorial structure, *i.e.*, from supply components, through an input-output methodology (hereinafter IOM).

Given its wide acceptance, it seems unnecessary to comment on the versatility and suitability that this methodology lends to an analysis of any economy's sectorial performance. Yet, its usefulness as an instrument for simulating future scenarios undoubtedly expands its possibilities in the area of economic analysis, and is therefore well suited for interpreting the complexity of economic relationships.

The analysis undertaken is based on a scenario regarding Spain's possible economic growth until 2020, given the integration of demand estimations generated by a causal econometric model, whose forecasts are perfectly consistent with a set of dynamic input-output tables, estimated for 2000-2020. The last governmental IOT for Spain's economy was for 2008 (Pulido and Pérez, 2006; Pérez, 2005).

To define the macro scenario of Spain's economy until 2020, we have used the predictions from the Wharton-Universidad Autónoma de Madrid (UAM) model made in 2014 and thus include the official estimates of the Spanish economy until 2014 and predictions from 2015 to 2020.

This model was developed by the Lawrence R. Klein Institute for Investigation of the Autonomous University of Madrid, Spain's representative entity in Project Link (sponsored by United Nations), to which the authors of this paper are affiliated. Project Link brings together more than 80 teams throughout the world that continuously carry out analyses and predictions regarding the entire world economy through integrated econometric models.

The Wharton-UAM model is defined as a causal macroeconomic model, based on more than 600 equations that characterize the behavior of Spain's economy on a quarterly and annual basis. It is designed with a Keynesian approach

and in its construction includes world economic growth predictions, differentiated by economic areas and countries, as well as the foreseeable evolution of exchange rates, interest rates, and international prices, especially those related to raw materials.

In terms of predictions during the period considered, we believe that the Spanish economy has rebounded from the nadir of the recession. The need to reconsider the economy's main disequilibria led authorities to apply restrictive economic policies and fundamental labor-related reforms in keeping with European Union recommendations. These measures have brought economic and social transformations in Spain and it is forecast that by 2020 the Spanish economy will show positive growth.

Global estimates of the different demand components and labor market variables, obtained by the Wharton-UAM model, are included in a supply model built following the classic Leontief model, although modified by technical distribution and employment coefficients included in its formulation.

This process gives us the growth of the foreseen sectorial gross value added for Spain's economy and the estimation of a set of dynamic input-output tables that cover 2009-2020, from which the analysis is based regarding the foreseeable impact of the foreign market on the growth of employment in Spain, the main objective of this study.

This estimation is part of an IOT updating exercise, known as RAS method, undertaken by Professor Stone (1961, 1980; Stone and Brown, 1962), who views the modification of the technical relationships of output in accordance with both the dynamics of added values, either observed or quantified, and final demand, *i.e.*, assuming that the substitution and manufacturing effects are combined⁹.

The model thus defined allow us to establish inter-sectorial connections with a focus on supply, but also to apply the model of employment that is implicit in more traditional approaches to input-output modeling (Pulido and Fontela, 1999).

Nonetheless, given that our main interest is identifying what spill-over effect is exerted by foreign trade in terms of job creation, while pondering the

9 The first assumption examines the possibility that the structure of material consumed per unit produced is altered, as a response to the substitution of some materials for others in the composition of goods; the second assumption involves a foreseeable technological change, reflected in a change in the share of value added and intermediate consumption to output. In summary, this is a bi-proportional adjustment that guarantees a fundamental identity implicit in the IOT, *i.e.*, total equilibrium between resources and jobs in the economy.

implications of current economic policy on the Spanish job market, the classic formulation of the IOM has been subjected to an additional econometric analysis, which will allow us to identify at least three differential effects:

- How much output growth would result from an expansion of external demand?
- The effect that the observed change might exert on the structural composition of the Spanish economy (domestic demand *versus* foreign demand), with regard to the foreseeable evolution of the job market.
- Total or partial compensatory employment gains, depending on each sector's factor endowment, created by export-led economic growth, taking into account the rise in imports needed to respond to said growth.

Thus, a series of IOTs have been prepared that describe and anticipate the demand for employment generated by the external demand of the Spanish economy in 50 branches of production. The applied methodology lends consistency to these results with a macroeconomic scenario, which incorporates forecasts for both Spain's economy and the world economy, as recently estimated by several international institutions and organizations (IMF, United Nations, European Commission, etc.)

Methodology for estimating employment content

In this study, we shall focus exclusively on export sales. In other words, accounting for the direct employment coefficients, hereinafter e^d , and assuming that job creation for every million euros of output is independent of its geographic destination, we obtain:

$$e_{s,t}^d = \frac{FTJE_{s,t}}{Output_{s,t}} \quad [1]$$

$$Q_{exp,s,t}^i = [I - A_{s,t}^i]^{-1} EXP_{s,t} \quad [2]$$

$$e_{s,t}^T = [I - A_{s,t}^i]^{-1} e_{s,t}^d \quad [3]$$

$$e_{s,t}^I = e_{s,t}^T - e_{s,t}^d \quad [4]$$

where $FTJE_{s,t}$: Full-time jobs equivalent; $Q_{exp,s,t}^i$: Domestic output derived from exports; $EXP_{s,t}$: Value of exports for each period, with $t = 2000-2010$;

$[I - A_{s,t}^i]^{-1}$: Inverse matrix of internal technical coefficients; $e_{s,t}^d$, $e_{s,t}^T$ and $e_{s,t}^I$: Employment coefficients, direct, total, and induced, respectively.

These equations make it possible to transform output growth to employment growth due to exports, in accordance with the following equations:

$$FTJE_{exp,s,t}^d = e_{s,t}^d EXP_{s,t} \tag{5}$$

$$FTJE_{exp,s,t}^T = e_{s,t}^d Q_{exp,s,t}^i \tag{6}$$

$$FTJE_{exp,s,t}^I = FTJE_{exp,s,t}^T - FTJE_{exp,s,t}^d m \tag{7}$$

Further, by matrix diagonalization ($\widehat{(\cdot)}$), we obtain a differentiation of both intra- and inter-sectoral induced employment, so that:

$$\widehat{FTJE}_{exp,s,t}^T = \widehat{e}_{s,t}^d [I - A_{s,t}^i]^{-1} EXP_{s,t} \tag{8}$$

$$\widehat{FTJE}_{exp,s,t}^d = \widehat{e}_{s,t}^d \widehat{EXP}_{s,t} \tag{9}$$

$$\widehat{FTJE}_{exp,s,t}^I = \widehat{FTJE}_{exp,s,t}^T - \widehat{FTJE}_{exp,s,t}^d \tag{10}$$

However, according to our approach, these results for employment do not take into account that the increase in output derived from exports generates, in turn, an increase in imports and, thus, a loss of domestic employment¹⁰.

Therefore, the employment transferred overseas should be deducted due to the increase in imports. To this end, we have estimated the outsourced product, that is, the value of the imports generated by both total activity and that associated with exports, and these have been translated into terms of employment, according to the following equations:

$$A_{s,t}^m = \frac{M_{s_i,j,t}}{Q_{s_j,t}} \tag{11}$$

¹⁰ Obviously, this is a hypothetical assumption that has no real expression. It does allow us to perform a comparative counterfactual analysis of a scenario in which the entire production chain of an exported good or service is internalized.

$$M_{s,t}^{exp} = A_{s,t}^m EXP_{s,t} \quad [12]$$

$$FTJE_{exp,s,t}^{d,M} = A_{s,t}^m M_{s,t}^{exp} \quad [13]$$

$$Q_{exp,s,t}^i = [I - A_{s,t}^i]^{-1} EXP_{s,t} \quad [14]$$

$$Q_{exp,s,t}^t = [I - A_{s,t}^t]^{-1} EXP_{s,t} \quad [15]$$

$$Q_{exp,s,t}^m = Q_{exp,s,t}^t - Q_{exp,s,t}^i \quad [16]$$

$$FTJE_{exp,s,t}^{T,M} = Q_{exp,s,t}^m e_{s,t}^d \quad [17]$$

$$FTJE_{exp,s,t}^{i,M} = FTJE_{exp,s,t}^{T,M} - FTJE_{exp,s,t}^{d,M} \quad [18]$$

where $A_{s,t}^m$: Imported technical coefficients; $M_{s,t}^{exp}$: Imports generated because of imported exports; $Q_{exp,s,t}^t$, $Q_{exp,s,t}^i$ and $Q_{exp,s,t}^m$: Output attributed to total, domestic, and imported exports, and $FTJE_{exp,s,t}^{d,M}$, $FTJE_{exp,s,t}^{T,M}$ and $FTJE_{exp,s,t}^{i,M}$: Direct, total, and indirect employment that flows abroad as a result of the rise in imports that are need to supply exports.

Thus, we obtain an approximation of the foreseeable effects on employment attributed to the degree of economic openness, which also takes into account output specialization. Furthermore, the sectorial breakdown allows us to characterize the more internationalized sectors by differentiating their labor endowment (labor intensity), and their demand of imported products to generate their output with the resulting loss of effectiveness, in terms of employment.

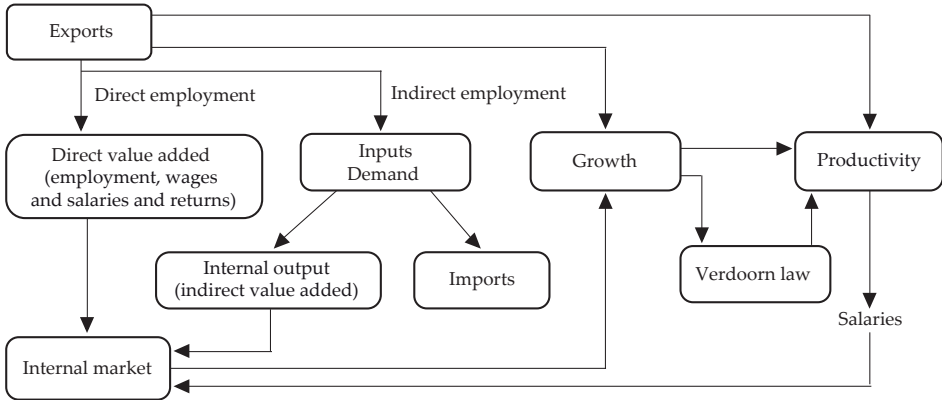
EXPORTS AND JOB CREATION IN SPAIN

Job creation through exports. Characteristics and tendencies

Employment contained in exports or the labor used to produce these exports is attributable to various output functions. Firms that produce goods and services for export directly demand labor to do so. In addition, they purchase supplies from other companies or use those that they themselves make, which, in turn, require labor for their output or, alternatively, they must import those goods and services, as supplies, in order to keep up with exports. This latter aspect would mean a hypothetical deduction (as if they had been made domestically), of domestic job creation. Thus, net employment created by exports accounts

for direct, induced, or indirect employment created by means of the inputs consumed, and for employment “lost” due to imports. The following Figure 4, synthesizes the analytical framework of exports’ effects on the domestic market, from which the corresponding impacts are deducted in terms of creating a demand for labor, *i.e.*, job creation.

Figure 4
Exports effects on internal demand



Source: Prepared by the authors based on Fujii and Cervantes (2013, p. 145).

For the purposes of this analysis, we consider that the relative impact of exports on the general volume of employment depends on:

- a) In the case of direct employment and indirect intra-industry employment generated by exports, the volume of employment depends on the ratio of employment generated by exports to total (or sectoral) employment. Thus, the lower this ratio, the lower the job creation capacity (in relative terms) due to the increase in export activity. The higher the proportion (exports become increasingly labor intensive), the greater the overall effect on job creation (equations [5], [6], and [7]).
- b) Inter-industry employment generated by exports will depend on the volume of exports as well as the employment demands generated in the economy as a whole through the cross-sectoral relationships that arise from supplier-supplier relationships (equations [8], [9], and [10]).
- c) In the case of increased imports due to the production of goods and services for export, the volume of employment depends on the ratio between the employment rate of exports and the coefficient of employment of imports on the

coefficient of the total national or sectorial product. So the net employment balance generated by exports, minus the “loss” due to imports, will increase as the previous ratio increases (exports become increasingly labor intensive) (equations [13], [17], and [18]).

In essence, the result in terms of job creation due to exports will be related to exports’ sectorial structure, as established by labor performance in output with respect to the output for domestic consumption (output realized and output hypothetically displaced due to imports). The above, in the final analysis, will also have to do with relative wage levels of jobs created by exports and that of jobs created by output for domestic consumption.

The volume of Spanish exports has grown steadily since the mid-2000s, following a relative decline reflecting the country’s lack of economic competitiveness during the period of economic expansion that lasted until 2007. If the forecasts in the macroeconomic scenario are correct, Spanish exports will continue to grow over the next few years (see Table 3 in the Appendix), thus, under the conditions set out above, export growth will mean an increase in the relationship between job creation linked to exports and employment.

Now, as we can see in Table 3 (Appendix), over the next decade the exports that will experience the greatest growth will be mainly services. Thus, manufacturing sectors (except processed foods) will lose relative importance. In summary, the more labor-intensive sectors will experience greater growth if the Spanish economy behaves according to macroeconomic expectations, as reflected in Table 2 (Appendix). The same table also shows a process of wage deflation in 10 years, becoming more moderate in the last five years. It would seem then that the external sector responds to the stimuli derived from lower wage costs, reinforcing and even intensifying the pattern of export performance that has characterized the Spanish economy in the past. We will return to this topic below.

During 2010, Spanish firms’ exports created 16% of all employment (in full-time job equivalents, *FTJE*). Because of the relative loss of weight of exports in total output during the first decade of the 21st century, this proportion decreases and reaches 2010 levels equivalent to those found at the beginning of the century. With regard to the decline, we can estimate an upward trend in the overall volume of exports, which could reach close to 35% of total output for 2020. Regarding the impact on employment, it is worth noting that the increase in the relative importance of export sectors is more intense in services than in

manufacturing (again, except food processing), or in agriculture; in other words, export activity seems to be increasingly concentrated in the most labor-intensive sectors in their respective output processes¹¹.

In fact, it is the low or medium-low labor-intensive sectors that represent just over 70% of the value of exports, generating a similar volume of employment in 2010. In the following decade, these sectors will increase their exports only slightly, indicating that a strategy of wage deflation will not change their overall presence in the Spanish economy and, therefore, will not significantly benefit the low to medium-low labor sectors. This means that in the future, the production model that has been in force for decades, with its low level of competitiveness, will continue to maintain the current pattern of exports of labor-intensive goods.

The job creation capacity of exports per million euros of production is lower than the average found in the entire productive structure. For example, in 2010 for every million euros of export production, 3.1 jobs were created, while for all domestic production the figure was 8.5, indicating that export-linked production is less labor-intensive. Although the relationship between the above figures remained relatively stable during the first ten years of this century, it is expected to increase, given that forecasts point to a significant increase in the next decade of exports of services, with respect to total exports.

In addition, the greatest capacity for job creation is concentrated in public expenditure, given that, in 2010, 12.6 jobs were created for every million euros. This function shows a relative tendency to decrease with time.

Twelve sectors (out of a total of 50, see Table 4, Appendix), with more than 2% of total jobs created through exports, account for more than two-thirds of the jobs created in 2010, showing a tendency to increase since 2000. The designated sectors account for almost one-third of the total output of goods and services and somewhat more than this proportion of jobs created than the entire domestic output structure (indicating a slightly higher labor intensity than that of the total economy), and represent more than 50% of the total value of Spain's exports.

Worth noting is the relative increase in job creation by the services sectors that are the most export oriented, and which since the start of the century have

11 We should consider the implicit contradiction of this tendency with Kaldor's laws, for the purpose of Spain's future economic growth using a type of export-led growth strategy (Cardona Acevedo *et al.*, 2004).

maintained an upward trend in job creation due to exports. Interestingly, the relative weight of employment linked to the export of business services continues to grow and is expected to continue growing in the coming decade. Given the relative increase of services in exports, we see a relative increase in the capacity of job creation in the economy as a whole.

Direct and induced (indirect) export-led job creation

The analysis undertaken indicates the way in which (direct and indirect) employment needed to produce exports is distributed among the various output sectors. This is, therefore, an important component of all labor demanded by Spain's output structure. Awareness of this distribution lends insight regarding the export sector's contribution to a country's economic development (Fujii, Cervantes and Fabián, 2014).

The exporting companies/sectors concentrate half of the jobs created directly by Spanish exports; output from sectors that supply the former generates the remaining employment (see Table 4, Appendix). However, sectorial differences exist that are worth mentioning. Three sectors (transport, ground transportation, and metal products) stand out because they generate more jobs through exports. These exports have a high percentage of indirect employment or employment induced thorough the rest of the Spanish output structure.

Further, direct or induced employment attributable to exports is concentrated in a limited number of sectors. Just ten sectors, each absorbing a minimum of 3% of total employment, account for around 70% of the overall figure, both in the past and current decades. On balance, no significant changes over time have occurred, besides the relative rise in job creation due to the services sectors.

Nonetheless, when accounting for the net effect of linking exports to domestic output, we must also consider the spillover effect of exports. Considering the spillover effects of imports necessary to produce in the domestic market, we find that around a million and a half jobs¹² have been lost, which gives a comparative idea of exports' net capacity for job creation.

Imports linked to production of exports could have created an equivalent of around 50% of total (direct and indirect) employment derived from exports. We can consider it as "employment loss" from the domestic labor market generation process. Accounting for the "substitution effect", (Cervantes and Fujii,

¹² Note that the labor intensity of imports is similar to that found in domestic output.

2012), the net result of job creation by Spanish exports comes out to be less than half of what the data show to be the direct and indirect labor needed to produce those exports.

Yet, in this regard, the sectorial differences are more pronounced. Thus, sectors such as metal products, textiles, leather and shoes, machinery and electronic equipment, and transport-related activities import products that could have employed a quantity of labor above 60% (in *FTJE*) of the jobs created, respectively, by their exports. These sectors are located in the low to medium-low labor-intensity strata. This fact is indicative of a deep insertion in international industrial chains, but with little repercussion in domestic output. Therefore, in designing export-oriented strategies to encourage job creation, export sectors should have inter-sectoral relationships within the internal market. This is an important objective that becomes very relevant in the orientation of industrial policies.

The combination of low indirect job creation and employment relatively displaced by imports points to the sectors most deeply integrated in international production chains, but weakly linked to the domestic market. This cross-reference shows sectors with such traits, such as chemicals and pharmaceuticals, machinery and electronic equipment, and motor vehicles, with low or very low labor intensity, but with a high led-export behavior. Further integration of these industrial chains into the domestic market would mean more jobs from Spain's exports.

It is thus worthwhile to confirm the performance of Spain's export sector according to the labor intensity of various output sectors. To this end, we prepared a simple typology of five sectorial strata (defined for 2010), according to the number of jobs created for every million euros of output. Total Spanish output shows a clear preponderance of output with medium or low-medium labor intensity. In addition, these low labor-intensive sectors show a clear export orientation. Their export ratio (value of exports/value of output) is quite above average in all years reviewed. In 2010, our year of reference, the export/output values ratio is above 40% for more labor-intensive sectors (A and B in Table 9 Appendix) *versus* 12% on average; these sectors produce more than a third of total exports and almost 10% of total output. Moreover, in the coming years we can expect a slight increase in the relative importance of low labor-intensive sectors in exports. This is due to increasing weight of services, which are becoming relatively important both in the overall output of Spain's economy and in its exports.

According to some analysts and policy-makers, this high specialization in exports of low-labor intensive output could justify a strategic decision to deflate wages as a way of increasing the competitive advantage of labor-intensive sectors. The crux of the matter is that, once again, this seems to be consolidating a model that, in terms of its exports, does not seem to have been very successful in the past, rather just the opposite.

Furthermore, an analysis of the IOM-Spain leads us to conclude that a combination of high export propensity and low labor intensity is linked, from a sectorial perspective, to relatively high wages (see Tables 11 and 12, Appendix). This can be observed in sectors such as chemicals and pharmaceuticals, motor vehicles (automobiles), and activities related to transport, with wage levels (*FTJE* wages by job) that are on average 25% to 55% higher than the national average. Looking to the future and to a program of sustained growth led by an export growth strategy, this finding would seem to underscore the inadequacy of a strategy that encourages export competitiveness based exclusively or preeminently on ongoing wage deflation.

Another very important outcome of our analysis is related to global production chains of, and their impact on, export-led employment creation. Medium-low (B) and low (A) sectors concentrate 8.5% of total employment created by exports but, at the same time, both accumulate 15% of total employment “lost” by necessary imports to produce their exports. Between these two groups of sectors, they themselves generate with their exports 1% of the net jobs created by total exports (minus total necessary imports) of the country (in 2010). That means that the sectors with the greatest export intensive level are strongly linked to global production chains of a transnational nature (in most cases, foreign enterprises) in which national exports are incorporated and so their import intensity is also very high.

CONCLUSIONS

1. The performance of the Spanish export sector has historically been very weak and relatively anti-cyclical. During the current recession, and in light of the contraction of domestic demand, the number of exporting companies has increased and so too the volume of sales abroad and their respective weight in GDP. Yet, exports continue to be mostly dominated by large companies (Durán, 2014; Myro, 2012), that are more productive and most of which have foreign investment.

2. An analysis of the Spanish business structure shows a great predominance of small firms that have relatively little weight in global export sales and show great volatility in the face of economic fluctuations.
3. Conclusions from our analysis of the IOM-Spain prepared for 2000-2010 and projected until 2020 are relevant for understanding the performance of the Spanish export sector and current tendencies therein. We can conclude that the export model forecast for the future does not seem to change substantially the patterns found currently, which point to a strengthening of services in overall export sales and a slight increase in labor intensity (job-creation capacity) of these activities.
4. Sectors that create greater value added per job are within manufacturing, but these will lose relative weight over time; these are also the sectors that are more export oriented and have wage levels above the national average. Concurrently, exports in these sectors show little inter-sectorial integration, with substantial spillover effects from imports needed to produce exports. All this points to a limited effect on net job creation in the greater Spanish labor market.
5. Other conclusions are useful for designing macro and micro economic policies: Current policies that, apparently, are strengthening a strategy of wage deflation, would tend to consolidate an output and export model that is largely inefficient to strengthen the sector, favoring activities with high labor intensity, low levels of labor qualification, and relatively low wages. These factors are at the heart of the enormous volatility of the output structure and its exports, and, by extension, the volatility of job creation.
6. Furthermore, from the above we can also conclude that to improve the domestic spillover of Spain's exports, policymakers would do well to develop a far-reaching industrial policy that is oriented to creating domestic productive chains linked to the output of exportable goods and services, a step that would widen the indirect inter-sectorial effect.

REFERENCES

- Antrás, P. (2011). El comportamiento de las exportaciones españolas. *Apuntes Fedea*, 2. Available through: Fedea <http://www.fedea.net/apuntes-fedea/apuntes/competitividad/apunte_comp02_exportaciones.pdf>.
- Bayerl, N., Fritz, O., and Hierländer, R. (2008). *Die gesamtwirtschaftlichen Effekte der Exporte seit 1995. Merkmale einer "Basar-Ökonomie" in Österreichs Außen-*

- wirtschaft* [Exportmultiplikatoren no. 11/2008]. Available through: Austrian Institute of Economic Research (WIFO) <http://www.wifo.ac.at/jart/prj3/wifo/resources/person_dokument/person_dokument.jart?publikation-sid=34403&mime_type=application/pdf>.
- Bhagwati, J., and Srinivasan, T. (1979). Trade policy and development. In: R. Dornbusch and J. Frenkel (eds.), *International Economic Policy: Theory and Evidence*. Baltimore: University Press.
- Blyth, M. (2013). *Austerity: The History of a Dangerous Idea*. London: Oxford University Press.
- Cardona Acevedo, M. et al. (2004). Diferencias y similitudes en las teorías del crecimiento económico. *Cuadernos de Investigación*, 22. Available through: Universidad EAFIT <<http://publicaciones.eafit.edu.co/index.php/cuadernos-investigacion/article/view/1321>>.
- Cardoso, M., Correa-López, M., and Domenech, R. (2012). Export shares, price competitiveness and the “Spanish paradox”. *VOX, CEPR’s Policy Portal*, 24 November. Available at: <<http://voxeu.org/article/export-shares-price-competitiveness-and-spanish-paradox>>.
- Crespo, A., Pérez-Quirós, G., and Segura-Cayuela, R. (2011). Indicadores de competitividad: la importancia de la asignación eficiente de los recursos. *Boletín Económico-Banco de España*, 12, pp. 30-39.
- Cervantes, R., and Fujii, G. (2012). The Mexican trade liberalization process and its net effects on employment: 1988-2004. *EconoQuantum*, 9(2), pp. 81-97.
- Durán, J.J. (2014). La empresa internacional de origen español en la crisis. In: N.E. García and S.M. Ruesga, *¿Qué ha pasado con la economía española? La Gran Recesión 2.0 (2008 a 2013)* (pp. 187-206). Madrid: Pirámide.
- Durán J.J., and Úbeda, F. (2013). Factores determinantes de la multinacionalización de la economía española y su efecto en el comercio exterior. *Información Comercial Española*, 870, pp. 11-30
- Feder, G. (1983). On exports and economic growth. *Journal of Development Economics*, 12(1-2), pp. 59-73.
- Fuentes, P.D., Mainar, A.J., and Cardenete, M.A. (2015). Análisis multisectorial del papel del sector exterior en la economía española. *Investigación Económica*, 74(294), pp. 135-153.
- Fujii, G., and Cervantes, R. (2013). México: valor agregado en las exportaciones manufactureras. *Revista CEPAL*, 109, pp. 143-158.
- Fujii, G., Cervantes, R., and Fabián, A.S. (2014). Empleo total, directo e indirecto contenido en las exportaciones de manufacturas mexicanas (2008).

- Mimeo. Mexico: Universidad Nacional Autónoma de México-Universidad de Guadalajara.
- García, N.E. (2014). La débil competitividad de la economía española. In: N.E. García and S.M. Ruesga, *¿Qué ha pasado con la economía española? La Gran Recesión 2.0 (2008 a 2013)*. (pp. 117-150). Madrid: Pirámide.
- García, N.E., and Ruesga, S.M. (2014). *¿Qué ha pasado con la economía española? La Gran Recesión 2.0 (2008 a 2013)*. Madrid: Pirámide.
- García, C., and Tello, P. (2011). La evolución de la cuota de exportación de los productos españoles en la última década: el papel de la especialización comercial y de la competitividad. *Boletín Económico-Banco de España*, 5, pp. 49-60.
- Grossman, G., and Helpman, E. (1993). *Innovation and Growth in the Global Economy*. Cambridge, MA: The MIT Press.
- Helpman, E., and Krugman, P.R. (1989). *Trade Policy and Market Structure*. Cambridge, MA-London: The MIT Press.
- Hanley, A, and Monreal, J. (2012). Are newly exporting firms more innovative? Findings from matched Spanish innovators. *Economics Letters*, 116(2), pp. 217-220.
- Irawan, T., and Welfens, P.J.J. (2014). *Transatlantic trade and investment partnership: Sectorial and macroeconomic perspectives for Germany, the EU and the US* [IZA Policy Papers no. 78]. Available through: IZA Institute of Labor Economics <<http://ftp.iza.org/pp78.pdf>>.
- Klein, L.R. (1952). On the interpretation of Professor Leontief's system. *Review of Economics Studies*, 20(2), pp. 131-136.
- Kohli, I., and Singh, N. (1989). Exports and growth: Critical minimum effort and diminishing returns. *Journal of Development Economics*, 30(2), pp. 391-400.
- Krueger, A.O. (1980). Trade policy as an input to development. *American Economic Review*, 70(2), pp. 288-292.
- Leontief, W. (1946). Exports, imports, domestic output, and employment. *The Quarterly Journal of Economics*, 60(2), pp. 171-193.
- Leontief, W. *et al.* (1977). *The Future of the World Economy*. New York: Oxford University Press.
- López, J. (1999). *Evolución reciente del empleo en México* [Serie Reformas Económicas no. 29]. Available through: Comisión Económica para América Latina y el Caribe (CEPAL) <<http://www.cepal.org/es/publicaciones/7477-evolucion-recente-empleo-mexico>>.
- López-García, P., Puente, S., and Gómez, A.L., (2007). *Firm productivity dynamics in Spain* [Documento de trabajo no. 0739]. Available through: Banco de

- España <<https://www.bde.es/f/webbde/SES/Secciones/Publicaciones/PublicacionesSeriadas/DocumentosTrabajo/07/Fic/dt0739e.pdf>>.
- Maroto Sánchez, A., and Rubalcaba Bermejo, L. (2006). *Competitiveness and the Kaldor paradox: The case of Spanish service sector* [Documentos de trabajo IAES-Instituto Universitario de Análisis Económico y Social no. 6]. Available through: e_Buah, Biblioteca Digital Universidad de Alcalá <<http://hdl.handle.net/10017/6515>>.
- Manera, C. (2013). *The Great Recession. A heterodox view*. London: Sussex-London School of Economics.
- Melitz, M.J., and Ottaviano, G.I.P. (2008). Market size, trade, and productivity. *Review of Economic Studies*, 75(1), pp. 295-316.
- Miller, R.E., and Blair, P.D. (2009). *Input-Output Analysis – Foundations and Extensions*. Cambridge: Cambridge University Press.
- Mora Sanguinetti, J., and Fuentes, A. (2012). *An analysis of productivity performance in Spain before and during the crisis: Exploring the role of institutions* [OECD economics department working papers no. 973]. Available through: OECD iLibrary <<http://dx.doi.org/10.1787/5k97771qshs5-en>>.
- Myro, R. (2012). La competitividad exterior de la economía española y sus determinantes. *Economistas*, 130, pp. 39-47.
- Mundell, R.A. (1961). A theory of optimum currency areas. *American Economic Review*, 51(4), pp. 657-665.
- Núñez, S. (2004). Salida, entrada y tamaño de las empresas españolas. *Boletín Económico-Banco de España*, 3, pp. 53-60.
- Pérez, J. (2005). El Proyecto Link de modelización económica internacional. *Revista de Economía Mundial*, 13, pp. 187-207.
- Pulido, A., and Fontela, E. (1999). *Análisis Input-Output. Modelos, datos y aplicaciones. España*, Madrid: Pirámide.
- Pulido, A., and Pérez, J. (2006). Lawrence R. Klein y la economía aplicada. *Estudios de Economía Aplicada*, 24(1), pp. 43-94.
- Ruesga, S.M., and Heredero, M.I. (2005). De discriminaciones laborales y ajustes salariales en el entorno globalizador. *Revista de Economía Mundial*, 12, pp. 15-25.
- Ruesga, S.M. (2014). El shock de empleo en la Gran Recesión 2.0. In: N.E. García and S.M. Ruesga, *¿Qué ha pasado con la economía española? La Gran Recesión 2.0 (2008 a 2013)* (pp. 249-300). Madrid: Pirámide.
- Schui, F. (2014). *Austerity. The Great Failure*. New Haven-Londres: Yale University Press.

Sinn, H.W. (2006). The pathological export boom and the bazaar effect: how to solve the German puzzle. *The World Economy*, 29(9), pp. 1157-1175.

Sotomayor, M. (2009). Medición del comercio intraindustrial no maquilador de México. *Investigación Económica*, 68(268), pp. 39-68.

Sousa, N., Rueda-Cantucho, J.M., Arto, I., and Andreoni, V. (2012). *Extra-EU exports and employment*. [Trade Chief Economist Note no. 2]. Available through: TRADE European Commission <http://trade.ec.europa.eu/doclib/docs/2012/may/tradoc_149511.%2024.05.2012.pdf>.

Stone, R.A. (1961). *Input-Output and National Accounts*. Paris: Organization for European Economic Cooperation.

Stone, R.A. (1980). Political economy, economics and beyond. *The Economic Journal*, 90(360), pp. 719-736.

Stone, R.A., and Brown, A. (1962). *A Computable Model of Economic Growth*. Vol. 1. London: Chapman and Hall.

Thirlwall, A.P. (2011). The balance of payments constraint as an explanation of international growth rate differences. *PSL Quarterly Review*, 64(259), pp. 429-438.

APPENDIX

Table 1
Exports, imports and trade balance rates, 2000-2012
 (percentages)

	2000	2001	2002	2003	2004	2005	2006
X/GDP	29.1	29.2	29.0	29.1	29.4	29.1	29.8
M/GDP	32.2	32.4	32.8	33.8	35.8	37.3	39.5
(X-M)/GDP	-3.1	-3.2	-3.8	-4.6	-6.4	-8.2	-9.6
	2007	2008	2009	2010	2011	2012	
X/GDP	30.8	30.2	28.3	31.6	34.0	35.3	
M/GDP	41.2	38.7	33.3	36.5	36.5	35.0	
(X-M)/GDP	-10.4	-8.5	-5.1	-4.9	-2.5	0.3	

Source: Eurostat from García and Ruesga (2014, p. 122).

Table 2
Macroeconomic scenarios

<i>Nominal growth rate:</i> <i>Annual average</i>	2005/2000	2007/2005	2010/2007	2015/2010	2020/2015
Gross Added Value	7.36	7.90	0.31	0.92	5.44
Gross Domestic Product	7.62	7.62	-0.24	0.79	5.43
Private consumption	6.91	7.29	0.02	0.85	4.62
Public consumption	8.64	8.71	5.16	-1.78	4.24
Investment	10.15	10.21	-9.90	-4.40	8.21
Exports	4.99	10.18	0.32	7.62	9.28
Imports	6.77	12.20	-4.47	2.70	9.45
Salary incomes	6.71	8.02	0.70	-1.77	4.81
Non salary incomes	8.13	7.77	-0.14	3.74	5.99
Net taxes	9.93	5.21	-5.37	-0.66	5.28
Employment (<i>FTJE</i>)	2.92	3.23	-2.94	-1.82	2.26
Average salary	3.68	4.65	3.75	0.05	2.49
Unemployment (active population survey)	-5.19	-2.08	36.19	4.03	-3.01

Source: Econometric Model Wharton-UAM and own elaboration.

Table 3
Evolution of Spanish output promoted
by exports/total Spanish internal output (sectorial*), 2000-2020
 (percentages)

<i>Sectors</i>	2000	2005	2007	2010	2015	2020	2020/2010
Agriculture and livestock	33.97	32.64	32.12	33.98	41.62	50.27	48.0
Food, beverages and tobacco	19.64	20.41	22.41	23.68	32.19	39.72	67.8
Textile, leather and footwear	44.21	50.58	56.14	55.34	67.53	80.19	44.9
Chemistry and pharmacy	49.90	55.42	59.05	58.50	69.59	76.92	31.5
Metal products	35.52	32.06	33.30	37.26	49.38	55.25	48.3
Machinery and equipment	49.43	42.64	44.86	47.30	56.98	60.99	28.9
Motor vehicles	68.52	66.72	69.76	72.11	80.59	85.30	18.3
Wholesale trade	27.19	25.84	25.02	27.29	38.39	44.52	63.2
Ground transportation	32.54	32.79	32.91	35.30	45.90	50.85	44.1
Transportation annex	32.56	31.76	32.25	34.44	46.48	54.47	58.2
Computer services	28.63	25.50	26.62	32.01	45.05	46.41	45.0
Other business services	26.42	26.54	26.84	30.37	42.16	46.78	54.1
Total output	22.45	20.05	20.66	22.16	30.68	34.78	57.0

Note: * All this sectors have more than 2% national total of employment creation through exports.

Source: Econometric Model Wharton-UAM, Sectorial Model and own elaboration.

Table 4
Sectorial employment created by exports, 2000-2010
 (percentage on total created employment by exports in each category)

Created employment by sectoral exports	2000			2005		
	<i>Total</i>	<i>Direct</i>	<i>Indirect</i>	<i>Total</i>	<i>Direct</i>	<i>Indirect</i>
Agriculture and livestock	11.1	13.9	8.2	9.4	11.1	7.7
Food, beverages and tobacco	3.1	4.1	2.1	3.3	4.3	2.2
Textile, leather and footwear	5.8	7.9	3.7	4.9	6.9	2.8
Chemistry and pharmacy	2.9	3.8	2.0	3.0	4.6	1.5
Metal products	4.3	2.4	6.3	4.3	2.5	6.1
Machinery and equipment	4.0	6.2	1.7	3.5	5.3	1.8
Motor vehicles	7.0	11.1	2.7	5.0	8.0	1.9
Wholesale trade	7.5	8.9	6.1	8.2	10.0	6.4
Ground transportation	6.1	4.5	7.7	6.8	5.5	8.2
Transportation annex	1.7	0.7	2.7	2.7	1.4	4.0
Computer services	1.7	1.9	1.5	1.8	2.1	1.6
Other business services	9.5	7.6	11.5	14.5	13.8	15.2
Total 12 more export sectors	64.8	73.0	56.3	67.5	75.3	59.5
	2007			2010		
	<i>Total</i>	<i>Direct</i>	<i>Indirect</i>	<i>Total</i>	<i>Direct</i>	<i>Indirect</i>
Agriculture and livestock	8.1	9.3	6.8	8.3	9.8	6.8
Food, beverages and tobacco	3.3	4.3	2.2	3.4	4.3	2.4
Textile, leather and footwear	4.2	6.0	2.3	3.0	4.2	1.8
Chemistry and pharmacy	3.0	4.6	1.3	2.7	4.1	1.3
Metal products	4.2	2.7	5.8	3.6	2.5	4.7
Machinery and equipment	3.6	5.4	1.7	3.4	4.9	1.8
Motor vehicles	4.3	7.0	1.4	3.6	5.9	1.3
Wholesale trade	8.5	9.6	7.4	8.8	10.2	7.4
Ground transportation	6.6	5.1	8.2	6.9	5.6	8.3
Transportation annex	2.9	1.6	4.3	3.1	1.9	4.4
Computer services	2.0	2.3	1.6	2.6	3.3	1.9
Other business services	16.6	15.7	17.5	19.4	18.2	20.7
Total 12 more export sectors	67.3	73.6	60.7	68.9	74.8	62.8

Source: Own elaboration based on Input-Output Tables 2000, 2005, 2007, 2010 of National Statistics Institute of Spain (Instituto Nacional de Estadística, INE).

Table 5
Sectorial employment (symmetrical input-output tables, sior-2010),
Spanish total output and exports

	Spanish total output employment						Spanish exports employment								
	Total employment (FTE)	Percentage total	Direct total employment (FTE)	Percentage total	Indirect total employment (FTE)	Percentage total	Exports total employment	Percentage total	Exports total direct employment (FTE)	Percentage total	Percentage direct employment/created	Percentage indirect employment/created	Indirect exports created employment (FTE)	Percentage total	Percentage indirect employment/total sector
Agriculture and livestock	691,236	3.9	285,503	2.6	405,733	6.0	234,854	8.3	139,721	9.8	59.5	95,133	6.8	40.5	
Food, beverages and tobacco	401,976	2.3	209,594	1.9	192,381	2.9	95,177	3.4	62,071	4.3	65.2	33,106	2.4	34.8	
Textile, leather and footwear	153,610	0.9	90,070	0.8	63,541	0.9	85,013	3.0	60,323	4.2	71.0	24,690	1.8	29.0	
Chemistry and pharmacy	133,082	0.8	79,688	0.7	53,393	0.8	77,846	2.7	59,082	4.1	75.9	18,764	1.3	24.1	
Metal products	274,118	1.6	63,840	0.6	210,278	3.1	102,133	3.6	35,435	2.5	34.7	66,698	4.7	65.3	
Machinery and equipment	202,515	1.1	112,483	1.0	90,032	1.3	95,791	3.4	70,284	4.9	73.4	25,508	1.8	26.6	
Motor vehicles	142,400	0.8	103,355	0.9	39,045	0.6	102,682	3.6	83,753	5.9	81.6	18,929	1.3	18.4	
Wholesale trade	910,497	5.2	463,759	4.3	446,738	6.6	248,434	8.8	145,090	10.2	58.4	103,345	7.4	41.6	
Ground transportation	555,971	3.2	194,769	1.8	361,201	5.4	196,241	6.9	80,018	5.6	40.8	116,223	8.3	59.2	
Transportation annex	256,491	1.5	77,782	0.7	178,709	2.6	88,325	3.1	26,661	1.9	30.2	61,664	4.4	69.8	
Computer services	233,626	1.3	100,304	0.9	133,322	2.0	74,794	2.6	47,599	3.3	63.6	27,194	1.9	36.4	
Other business services	1,812,625	10.3	462,514	4.2	1,350,111	20.0	550,423	19.4	259,820	18.2	47.2	290,603	20.7	52.8	
Total 12 more export sectors	5,768,145	32.7	2,243,660	20.6	3,524,485	52.2	1,951,714	68.9	1,069,856	74.8	54.8	881,858	62.8	45.2	
Total	17,630,875	100.0	10,882,864	61.7	6,748,011	38.3	2,833,757	100.0	1,429,412	50.4	50.4	1,404,345	49.6	49.6	

Source: Own elaboration.

Table 6
Spanish economy information from stior-2010

	Average wage per job occupied (Thousands euros)	Index: total = 100	Value of output (Thousands euros)	Percentage total value of output	Gross value added (Thousands euros)	Percentage value added over total	Labor intensity (employment/value of output)	Value of output of exports (Thousands euros)	Percentage over total value of exports	Value of inputs imported for exports output (Thousands euros)	Percentage value of imports over total	Employment of inputs imported by exports (total)	Percentage employment imports/exports	Percentage employment total imports over total employment
Agriculture and livestock	5,375	18.4	47,115	2.3	22,506	2.4	14.7	16,008	3.5	2,638	0.9	39	16.5	2.5
Food, beverages and tobacco	28,794	98.6	99,925	4.8	23,636	2.5	4.0	23,660	5.2	3,498	1.2	14	14.8	0.9
Textile, leather and footwear	23,334	79.9	24,308	1.2	5,240	0.5	6.3	13,453	2.9	5,346	1.8	34	39.7	2.2
Chemistry and pharmacy	50,598	173.3	52,713	2.5	13,694	1.4	2.5	30,834	6.7	24,492	8.4	62	79.4	4.0
Metal products	30,997	106.2	44,296	2.1	12,924	1.4	6.2	16,504	3.6	13,206	4.5	82	80.0	5.3
Machinery and equipment	21,590	73.9	31,042	1.5	7,269	0.8	6.5	14,683	3.2	9,868	3.4	64	67.2	4.2
Motor vehicles	42,187	144.5	66,139	3.2	9,091	1.0	2.2	47,692	10.4	26,726	9.2	58	56.0	3.7
Wholesale trade	31,671	108.5	71,347	3.4	50,031	5.2	12.8	19,468	4.2	5,749	2.0	73	29.5	4.8
Ground transportation	23,033	78.9	52,460	2.5	23,950	2.5	10.6	18,517	4.0	9,856	3.4	104	53.2	6.8
Transportation Annex	39,620	135.7	47,334	2.3	18,017	1.9	5.4	16,300	3.6	10,402	3.6	56	63.8	3.7
Computer services	39,796	136.3	20,934	1.0	12,603	1.3	11.2	6,702	1.5	1,162	0.4	13	17.3	0.8
Other business services	24,417	83.6	102,186	4.9	60,675	6.4	17.7	31,030	6.8	18,123	6.2	321	58.4	20.9
Total 12 more export sectors	25,978	89.0	659,798	31.9	259,636	27.2	8.1	254,849	55.6	131,068	45.1	921	47.2	59.9
Total	29,200	100.0	2,069,947	100.0	954,810	100.0	8.5	458,679	100.0	290,594	100.0	1,536	54.2	100.0

Source: Own elaboration.

Table 7
Employment created by exports and inputs imported
by economic activity (sectors) (FTJE), SIOT-2010

<i>Sectors</i>	<i>Employment of exports</i>	<i>Employment created from inputs imported by exports</i>	<i>Percentage employment of exports over total</i>	<i>Percentage employment imports over total</i>	<i>Percentage employment imports/employment exports</i>
Agriculture	251.3	46.7	8.9	3.0	18.6
Manufactures	903.5	529.8	31.9	34.5	58.6
Water, gas and electricity	51.5	41.1	1.8	2.7	79.8
Other industries	20.7	106.5	0.7	6.9	514.0
Construction	48.3	31.8	1.7	2.1	65.7
Services	1,558.5	780.6	55.0	50.8	50.1
Total	2,833.8	1,536.34	100.0	100.0	54.2

Source: Own elaboration.

Table 8
Employment created by exports
by economic activity (FTJE), SIOT-2010

<i>Sectors</i>	<i>Total</i>	<i>Direct</i>	<i>Indirect</i>	<i>Intra-sectorial</i>	<i>Cross-sectorial</i>	<i>Percentage intra-sectorial employment/total indirect employment</i>	<i>Percentage sectorial direct/total direct</i>	<i>Percentage sectorial indirect/total indirect</i>	<i>Percentage sectorial direct/sectorial total</i>
Agriculture	251.3	147.4	103.9	16.6	87.3	16.0	10.3	7.4	58.7
Manufactures	903.5	574.2	329.3	80.3	249	24.4	40.2	23.4	63.6
Water, gas and electricity	51.5	2.3	49.2	0.4	48.9	0.7	0.2	3.5	4.5
Other industries	20.7	6.4	14.3	0.5	13.8	3.2	0.4	1.0	30.9
Construction	48.3	2.2	46.2	1.1	45.1	2.3	0.2	3.3	4.6
Services	1558.50	697	861.5	57	804.5	6.6	48.8	61.3	44.7
Total	2,833.80	1,429.40	1,404.30	155.7	1,248.60	11.1	100.0	100.0	50.4

Source: Own elaboration.

Table 9
Share of output and exports by output labor intensive levels

		Export values/output value (percentage)						
		2000	2005	2007	2010	2015	2020	Promedio
Levels*	E. High	6.1	5.7	5.9	6.6	10.0	12.3	8.2
	D. Medium-high	9.7	8.5	10.3	10.1	14.1	17.3	12.2
	C. Medium	21.2	22.7	25.2	26.5	35.0	42.1	30.4
	B. Medium-low	34.9	36.0	40.0	40.7	49.2	56.0	44.5
	A. Low	56.1	51.8	52.3	44.8	50.4	62.4	53.6
	Total	11.5	10.6	11.5	12.1	17.0	20.5	14.5
		Percentage value of total output						
Levels*	E. High	59.8	62.4	63.3	63.0	60.8	60.5	61.7
	D. Medium-high	21.5	20.6	20.0	20.1	20.8	20.8	20.6
	C. Medium	7.5	7.4	7.4	7.4	7.9	7.9	7.6
	B. Medium-low	10.1	8.8	8.5	8.6	9.5	9.8	9.2
	A. Low	1.1	0.9	0.7	0.9	1.0	1.0	0.9
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		Percentage value of total exports						
Levels*	E. High	31.7	33.6	32.7	34.5	35.8	36.3	34.8
	D. Medium-high	18.2	16.6	17.9	16.9	17.2	17.6	17.4
	C. Medium	13.9	15.8	16.2	16.2	16.3	16.2	16.0
	B. Medium-low	30.9	29.8	29.9	29.1	27.6	26.8	28.4
	A. Low	5.2	4.2	3.3	3.3	3.1	3.0	3.4
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: * Levels; employments per € millions of total output: A = < 4; B = 4-7; C = 7-10; D = 10-13; E = > 14.

Source: Own elaboration.

Table 10
Labor intensive levels of employment created by exports, 2010
 (Thousands employments)

<i>Levels of labor intensity</i>	<i>Total employment (A)</i>	<i>Employment created by exports (D = B + C)</i>	<i>Employment lost by Imports generated by exports (E)</i>	<i>Direct Employment created by exports (B)</i>	<i>Indirect Employment created by exports (C = c1 + c2)</i>	<i>Intra-sectorial employment induced (c1)</i>	<i>Inter-sectorial employment induced (c2)</i>
E. High	14,218.5	1,978.6	917.8	905.1	1,073.5	93.0	980.5
D. Medium-high	2,383.4	377.8	221.1	215.5	162.2	27.2	135.1
C. Medium	574.3	238.9	171.1	129.5	109.4	13.0	96.4
B. Medium-low	404.7	212.0	205.1	156.8	55.2	21.7	33.5
A. Low	50.0	26.5	21.4	22.5	4.0	0.9	3.1
Total	17,630.9	2,833.8	1,536.3	1,429.4	1,404.3	155.7	1,248.6

	<i>Percentage exports/total output</i>	<i>Percentage employment exports/total employment (D/A)</i>	<i>Percentage employment imports/employment exports (E/D)</i>	<i>Percentage direct employment/employment exports (B/D)</i>	<i>Percentage indirect employment/employment exports (C/D)</i>	<i>Percentage intra-sectorial Direct employment/employment created by exports (c1/D)</i>	<i>Percentage inter-sectorial indirect employment/total employment created by exports (c2/D)</i>
E. High	6.6	13.9	46.4	45.7	54.3	4.7	49.6
D. Medium-high	10.1	15.9	58.5	57.1	42.9	7.2	35.7
C. Medium	26.5	41.6	71.6	54.2	45.8	5.4	40.3
B. Medium-low	40.7	52.4	96.7	73.9	26.1	10.2	15.8
A. Low	44.8	52.9	80.7	84.8	15.2	3.3	11.8
Total	12.1	16.1	54.2	50.4	49.6	5.5	44.1

Note: * Levels; employments per € millions of total output: A = < 4; B = 4-7; C = 7-10; D = 10-13; E = > 14.

Source: Own elaboration.

Table 11
Labour intensive levels and wages, 2010

<i>Levels of labor intensity</i>	<i>Compensation of employees (millions euros)</i>	<i>Gross operating surplus and mixed income (millions euros)</i>	<i>Jobs (Thousands FTJE)</i>	<i>Average wage (year euros per employment)</i>	<i>Percentage wage income/ total incomes</i>
E. High	416,119	258,303	14,219	29,266	61.7
D. Medium-high	56,676	146,980	2,383	23,779	27.8
C. Medium	21,843	20,895	574	38,037	51.1
B. Medium-low	18,372	12,520	405	45,401	59.5
A. Low	1,814	1,288	50	36,277	58.5
Total	514,824	439,986	17,631	29,200	53.9

Note: Levels; employments per € millions of total output: A: < 4; B: 4-7; C: 7-10; D: 10-13; E: > 14.
 Source: Own elaboration.

Table 12
Job creation in the Spanish economy

Total employment (Thousands of jobs FTJE)						
<i>Employment created by</i>	2000	2005	2007	2010	2015	2020
Exports	2,598	2,702	2,856	2,834	3,508	4,409
Investments	2,805	3,735	4,154	2,716	1,679	1,935
Public consumption	2,844	3,437	3,683	3,975	3,438	3,709
Private consumption	7,422	8,222	8,589	8,106	7,463	7,940
Total	15,670	18,097	19,283	17,631	16,088	17,993
Employment created by	Percentage over total employment					
Exports	16.6	14.9	14.8	16.1	21.8	24.5
Investments	17.9	20.6	21.5	15.4	10.4	10.8
Public consumption	18.2	19.0	19.1	22.5	21.4	20.6
Private consumption	47.4	45.4	44.5	46.0	46.4	44.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Employment created by	Direct employment (thousands of jobs FTJE)					
Exports	1,316	1,366	1,469	1,429	1,767	2,322
Investments	1,403	1,099	1,023	853	647	529
Public consumption	2,314	2,733	2,926	3,191	2,877	3,271
Private consumption	4,683	5,231	5,639	5,410	5,255	5,872
Total	9,716	10,430	11,056	10,883	10,546	11,993

Table 12, continuation...

Employment created by	Induced employment (Thousands of jobs FTJE)					
Exports	1,282	1,336	1,388	1,404	1,741	2,087
Investments	1,402	2,636	3,131	1,863	1,031	1,405
Public consumption	531	704	758	784	560	438
Private consumption	2,739	2,990	2,950	2,696	2,209	2,068
Total	5,954	7,667	8,227	6,748	5,542	5,999
Employment created by	Weight of the induced employment over total employment (percentage)					
Exports	49.3	49.4	48.6	49.6	49.6	47.3
Investments	50.0	70.6	75.4	68.6	61.4	72.6
Public consumption	18.7	20.5	20.6	19.7	16.3	11.8
Private consumption	36.9	36.4	34.3	33.3	29.6	26.0
Total	38.0	42.4	42.7	38.3	34.4	33.3
Total output created by (millions euros)						
Exports	298,445	372,860	441,030	458,679	664,606	983,033
Investments	269,774	447,331	529,127	407,654	325,629	448,022
Public consumption	159,317	239,006	277,949	316,638	277,865	336,735
Private consumption	602,115	800,466	886,793	886,978	897,985	1,058,245
Total	1,329,651	1,859,663	2,134,899	2,069,947	2,166,086	2,826,035
Output created by	Job created (millions euros)					
Exports	8.7	7.2	6.5	6.2	5.3	4.5
Investments	10.4	8.4	7.9	6.7	5.2	4.3
Public consumption	17.9	14.4	13.3	12.6	12.4	11.0
Private consumption	12.3	10.3	9.7	9.1	8.3	7.5
Total	11.8	9.7	9.0	8.5	7.4	6.4

Source: Own elaboration

Table 13
Spanish exports and imports evolution from SIOT

	2000	2005	2007	2010	2015
Percentage exports/internal output	11.5	10.6	11.5	12.1	17.0
Percentage imports/total output	13.0	12.8	13.9	12.7	13.8

Source: Own elaboration.