CATALONIA'S EXPORT INTENSITY AND POTENTIAL FUTURE MARKETS

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Abstract

Catalonia presents a competitive industrial fabric and an internationalized economy, as evidenced by the fact that the Catalan economy is achieving record-breaking figures in terms of both exports and the number of regular exporting companies. However, it remains to be seen whether, despite this export drive, Catalonia is taking sufficient advantage of the new dynamics presented by international markets to ensure that the growing export rate it has experienced in recent years does not slow down in the future. To this end, this paper calculates and analyses Catalonia's trade intensity index with nine world regions and 120 countries. It includes a comparison with benchmark European countries and concludes with a series of recommendations for markets where greater export presence is required.

Keywords

Strategy and Competitive Intelligence

Introduction

Catalonia is a globally oriented economy, as illustrated by its degree of openness, which is higher than the EU average and that of countries such as Finland and Denmark, which are similar in size to Catalonia.

The 2008 economic crisis encouraged more Catalan companies to pursue overseas markets as a result of the fall in domestic demand. This crisis helped change the mindset of Catalan companies, which started viewing international business as the norm, rather than as an activity to compensate for the decline in the domestic market.

This drive to internationalize the Catalan economy has led to record-breaking figures in terms of both exports and the number of regular exporting companies (companies that have exported goods for the previous four consecutive years), thereby strengthening Catalonia's dominant position within Spain and highlighting the competitiveness and international reach of its economy.

Nevertheless, it is necessary to analyse whether, despite this export drive, Catalonia is taking sufficient advantage of the new dynamics presented by present and future international markets, or whether, on the contrary, it needs to improve its export position in the regions and countries that are driving global demand. Addressing this question is key to ensuring that the growing export rate it has experienced in recent years does not slow down in the future and that Catalan companies continue their drive towards international expansion.

In this regard, one of the most commonly used indicators for assessing a country or region's export position and trade intensity with other markets is the trade or export intensity index. This index, defined as the ratio of the exports from one country or region to a specific destination to world exports to that destination, makes it possible to determine the share of a country or region's exports to a given destination with respect to the world exports to that same destination. In other words, it indicates whether a country or region's trade relations with a given market are in line with the world average, or are more or less intense.

Furthermore, the trade intensity index makes it possible to verify the hypothesis concerning the relevance of the gravity model of international trade, which assumes that trade relations between markets that are geographically and culturally close to each other are more intense.

The purpose of this study is to calculate and analyse Catalonia's trade intensity index to shed light on its degree of export intensity with regions and countries with the highest global demand and greatest future growth prospects, and to ascertain whether Catalan companies are taking advantage of the opportunities offered by international markets or whether, on the contrary, there is scope for improvement and a need for a greater export presence in certain countries. To check this potential scope for improvement, a comparative analysis was carried out with a number of benchmark European countries with similar economic structures in order to remove any potential geographic bias.

Thus, an analysis of the evolution of Catalonia's export intensity index makes it possible to:

- Verify the hypothesis found in the economic literature concerning the relevance of the gravity model of international trade: that geographical and cultural distance is a key factor in countries' trade relations.

- Compare Catalonia with benchmark European countries with respect to their degree of trade intensity to determine whether it is taking sufficient advantage of the dynamics of the regions and countries that drive global demand.

- Recommend markets where Catalonia shows room for improvement or needs a greater export presence to drive its international expansion.

The study has been divided into five sections. It starts with a brief review of the literature. It then outlines the methodology used for the study, before continuing with an analysis of the evolution of Catalan exports and exporting companies during the 2008-2016 period. The fourth section, which forms the body of the work, calculates and analyses the evolution of Catalonia's export intensity index by region, with a particular focus on the countries that present the greatest opportunities in terms of their import volume (global demand) and future growth prospects, and includes a comparative analysis of benchmark European countries. Based on the findings, the study concludes with a series of recommendations for markets with scope for improvement in terms of Catalonia's international expansion.

1. Background

The trade intensity index was created by Anderson and Norheim (1993). The two authors devised the following formula to measure the bilateral trade intensity between countries:

$$T_{ij} = \frac{X_{ij}/X_i}{M_j / \sum_{k \neq i} M_k} = \frac{x_{ij}}{m_j}$$

where

T_{ij} is the trade intensity index of country (or region) i with country (or region) j;

X_{ij} are the exports from i to j;

X_i are the total exports of i;

M_j are the total imports of j;

$\sum M_k$ are the total world (or region) imports;

therefore:

x_{ij} is the proportion of exports from i to j with respect to the total exports of country i;

m_j is the proportion of imports of j with respect to total world imports;

When calculating m_j, bear in mind that the total imports of i should be subtracted.

The index uses values between 0 and ∞ and is used to determine whether the exports of country/region i to country/region j are of high intensity (greater than one) or low intensity (less than one). When the index is equal to one, the proportion of exports from i to j with respect to the total exports of i is the same as the proportion of imports of j with respect to world imports. In this case, exports from i to j are in line with the global average. On the other hand, if $I_{ij} > 1$ ($I_{ij} < 1$), exports from i to j are of high (or low) intensity, since the proportion of exports from i to j is higher (or lower) than the share of imports of j in relation to global demand.

The trade intensity index devised by Anderson and Norheim makes it possible to verify the hypothesis found in economic literature concerning the relevance of the gravity model of international trade. The authors used the term "geographic bias" to refer to the fact that bilateral trade between countries is more intense when those countries and regions are geographically and culturally close to each other.

Over the years, Anderson and Norheim's trade intensity index has been used by leading institutions such as the World Bank and the OECD, which include the trade intensity index in their list of key international trade indicators.

Many academic and institutional studies have used the trade intensity index as a tool to measure and analyse the impacts of phenomena resulting from globalization, regional integration and disintegration, and business reorientation on the intensity of bilateral trade between countries and their area of influence or between different regional areas. For example, Grigoli (2008) and Parra (2010) observed how the move towards economic integration and free trade in the South American trade bloc Mercosur led to an increase in trade intensity indices and a clear reorientation towards regional markets in the countries involved. Cheong (2010) and Hamanaka (2012) regarded this indicator as one of the main tools for evaluating the potential economic effects of free trade agreements. Both authors analysed three of the biggest free trade areas (ASEAN, EU and NAFTA) and detected high intra-regional trade intensity in all three regions, especially in the countries of Southeast Asian. More recently, a study carried out by Park (2017) measured the trade intensity between South Korea, China and Japan, and compared their results to the intra-regional intensity of ASEAN, EU and NAFTA. They observed that the trade intensity between the three countries was much lower than that of the three areas and had declined in recent years. The authors attributed this decline to the deterioration in political relations between the three countries and the challenges involved in reaching agreements between them. Thirlwell (2016) analysed Australia's export intensity and, in line with the gravity model hypothesis, observed a high export intensity with the islands surrounding the country, the main countries of South and East Asia, and China. However, the author warned that, although Australia's trade intensity with China was growing, the opposite was occurring with India and Indonesia. By contrast, he found that Australia had a low export intensity with the rest of the world, especially with EU countries. Kastakova and Baumgartner (2017) focused on the trade relations between the European Union and Russia, and concluded that the trade intensity index between the two areas had decreased in recent years. They warned of the potential loss of the Russian market for the European Union, and Russia's reorientation towards other partners, especially China and India. Badircea et al. (2017) found that the trade intensity between Romania and the European Union remained low, despite recent growth, and represented a risk factor in the country's adoption of the euro. In the case of Spain, CaixaBank Research (2016) calculated the country's trade intensity with different world regions and compared it to the indices of major countries such as Germany, France and Italy. The analysis concluded that Spain's trade intensity with regions outside the European Union was much lower than that of benchmark countries such as France and Germany, and highlighted Asia as the main target for improvement.

In the absence of any recent studies concerning Catalonia, this paper aims to analyse Catalonia's export intensity by comparing it to the indices of benchmark European countries, thereby determining whether it is taking sufficient advantage of the dynamics of the regions and countries that drive global demand. It concludes by recommending markets in which Catalonia shows room for improvement or requires a greater export presence to drive its international expansion.

2. Methodology

Based on Anderson and Norheim (1993), Catalonia's export intensity index (*I*) was calculated for 2008 and 2016 to analyse its evolution and determine whether Catalonia exported more or less to a specific destination compared to the world imports of that same destination. The formula used is:

$$I_{cj} = \frac{X_{cj}/X_c}{M_j/M_w} = \frac{x_{cj}}{m_j}$$

where

X_{cj} are Catalonia's exports to region or country *j*

X_c are Catalonia's total exports

M_j are the total imports of region or country *j*

M_w are the total world imports

therefore:

x_{cj} is the proportion of Catalonia's exports to *j* with respect to Catalonia's total exports

m_j is the proportion of imports of *j* with respect to total world imports.

When calculating M_w, bear in mind that Catalonia's total imports should be subtracted. However, since Catalonia's imports in the global context are not significant, this adjustment was not considered necessary, given that the difference in the results would be insignificant.

The index is defined as the proportion of Catalonia's exports to a destination, divided by the share of that same destination with respect to world imports. The fact that it is calculated based on the proportion of total exports and imports minimizes the effect of size and thus makes it possible to compare the different countries and regions to each other.

The index uses values between 0 and ∞. An index equal to one indicates proportional exports; in other words, Catalonia's share of exports to that destination is equal to the share of world exports to that same destination. In this case, Catalan exports to a given market are in line with the global average. On the other hand, an index greater (or less) than one indicates that Catalonia's exports to a region/country are of high intensity (greater than one) or low intensity (less than one).

Catalonia's export intensity index was calculated for nine world regions: the European Union, the Rest of Europe, North Africa, Sub-Saharan Africa, the Middle East, Latin America, North America, Asia and Oceania, and for 120 countries, selected for their import volume (global demand); all 120 countries exceeded an import volume of $5 billion and together accounted for virtually all global imports in 2016 (96.9%).

Catalonia's trade intensity index was compared to those of five major European countries (Germany, the United Kingdom, France, Italy and Spain), and to those of three European countries of a similar size to Catalonia in terms of population and/or GDP (Austria, Denmark and Finland). Thus, the export intensity indices of these eight countries were calculated for the same regional markets as Catalonia.

To determine markets where Catalonia has scope for improvement or requires a greater export presence, countries with the greatest growth prospects over the next five years were identified.
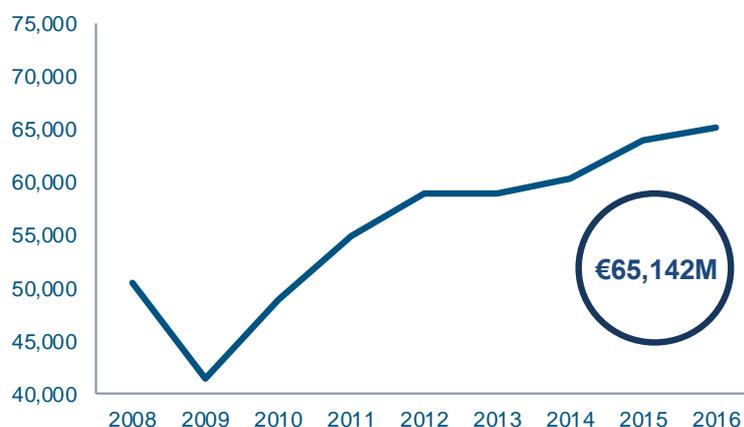
To this end, the average of the estimated GDP growth rates for the 2018-2022 period was calculated.

The sources used to conduct the study were DataComex-Secretary of State for Trade for Catalonia's export data, TradeMap-ITC for data on global trade at regional and country level, and the IMF's World Economic Outlook Database (October 2017) for countries' economic growth prospects.

3. Evolution of Catalan exports and exporting companies during the 2008-2016 period

Catalan exports rose steadily and sharply after 2010 to reach 65,142.1 million euros in 2016 (see Figure 1). The latest data available (January to November 2017) show that Catalan exports are still rising substantially (8.9% growth compared to the same period in 2016) and have already exceeded the total 2016 export volume. This represents a new record for the seventh year running.

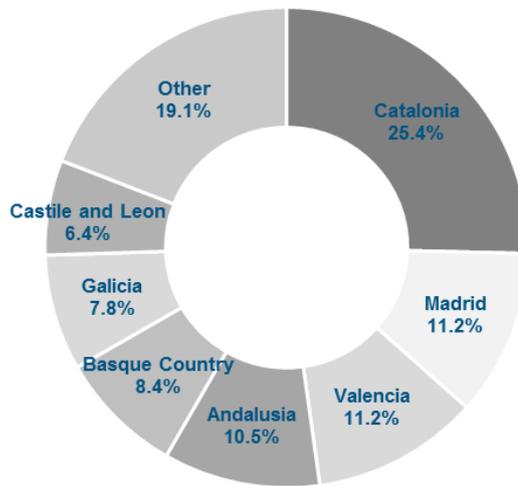**Figure 1. Evolution of Catalan exports, 2008-2016 (millions of euros)**

Source: ICEX-Estacom.

Catalonia led the way in terms of Spanish exports, with 25.4% of the total in 2016, more than twice the share of the second-place region, the Community of Madrid (see Figure 2), a clear sign of the export potential and international outlook of Catalonia's industrial fabric.
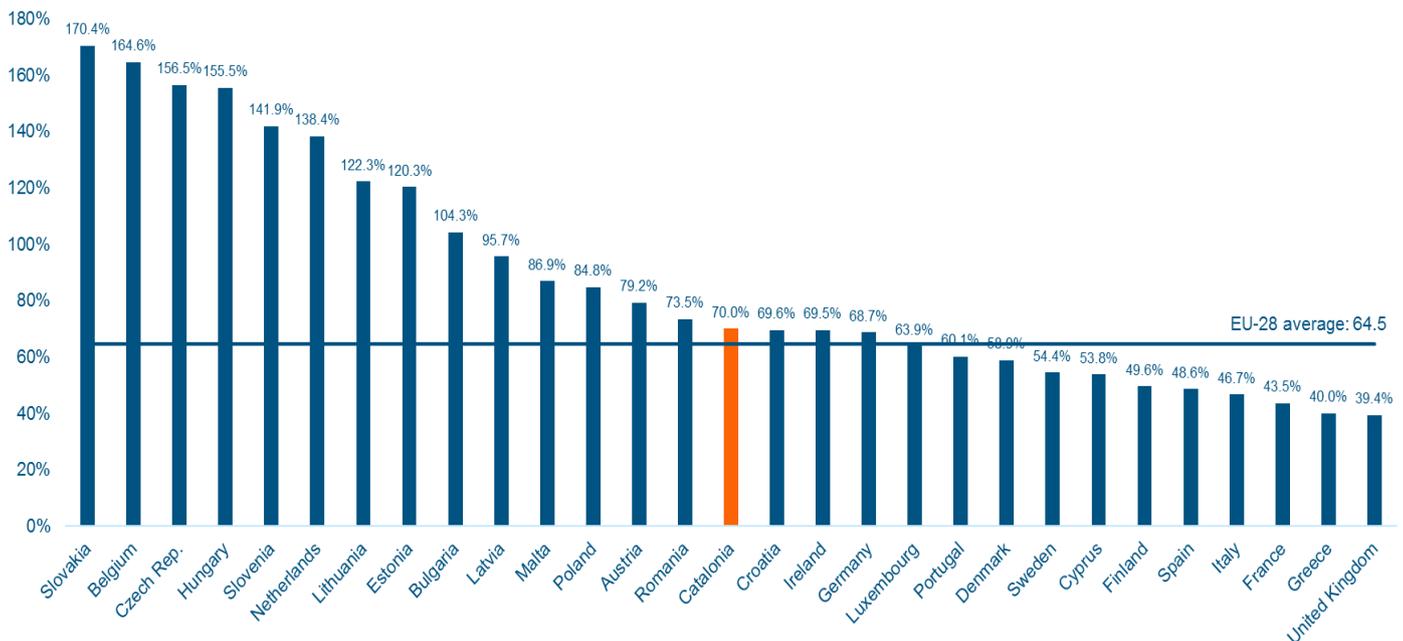
In this regard, Catalonia presented a degree of openness (i.e. exports plus imports as a share of GDP) of 70%, a figure that was higher than the average for the European Union and countries of a similar size such as Finland and Denmark (see Figure 3).

Figure 2. Distribution of exports by autonomous community, 2016 (% of total Spanish exports)
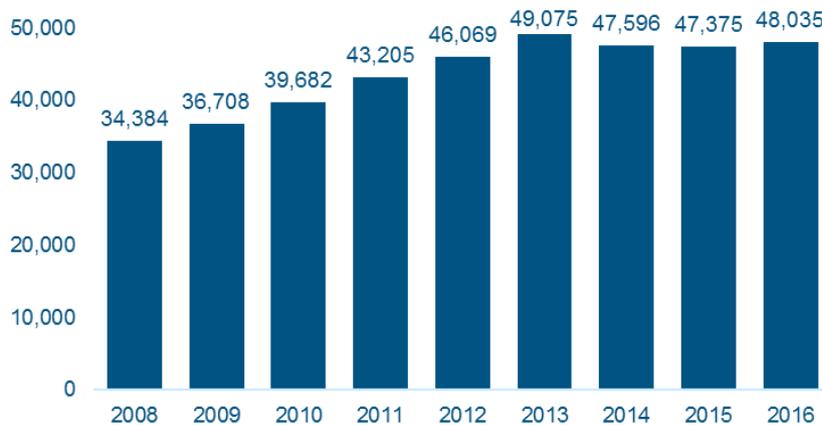

Source: ICEX-Estacom.

Figure 3. Degree of trade openness by EU country, 2016 (exports plus imports as a share of GDP, %)

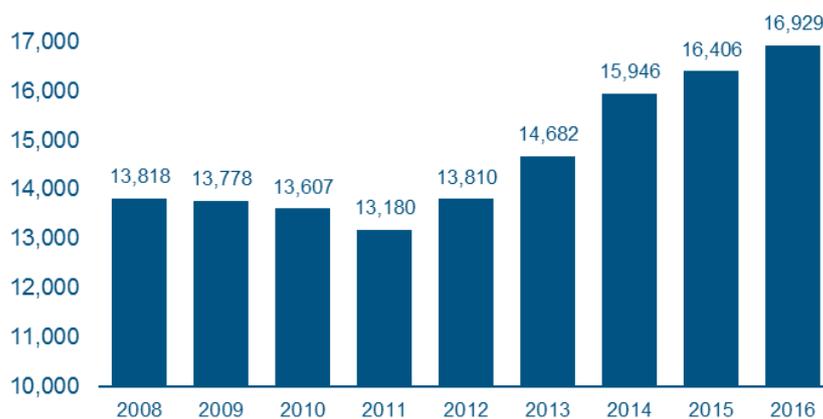Source: Compiled by the authors based on data from Idescat and Eurostat.

The period of economic crisis was also characterized by a growing number of Catalan exporting companies, which peaked in 2013 at 49,075 exporting companies, before reaching a consolidation phase that coincided with the start of the economic recovery.

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Figure 4. Evolution of the number of regular exporting companies, Catalonia. 2008-2016

Source: ICEX - Profile of the Exporting Company.

Nevertheless, the most remarkable fact is that this crisis helped change the attitude of Catalan companies, which started viewing international business as the norm, rather than as an activity to offset the decline in the domestic market. The increase in the number of exporting companies during the 2008-2013 period translated into a significant rise in the number of regular exporting companies (i.e. companies that have exported goods the last four years in a row). More than 3,000 companies have become regular exporting companies in the last four years (see Figure 5). According to estimates by ACCIÓ's Strategic Intelligence and Competitiveness Unit, the number of Catalan regular exporting companies will exceed 17,000 in 2017 and will set a new historic record for the fifth year running.

Catalan exporting companies led the way of all exporting companies in Spain by accounting for 32.3%. In terms of regular exporting companies, this figure was even higher, at 34%.

Figure 5. Evolution of the number of regular exporting companies*, Catalonia. 2008-2016

*Companies that have exported goods the last four years in a row.

Source: ICEX - Profile of the Exporting Company.

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Thus, the 2008-2013 economic crisis encouraged a greater number of Catalan companies to change their mindset by seeking and consolidating overseas markets as a result of the fall in domestic demand. This fact, together with the consecutive historical records achieved in foreign sales over the last few years, reveals that Catalonia has a competitive industrial fabric and an increasingly internationalized economy.

However, it remains to be seen whether Catalonia is taking sufficient advantage of the new dynamics of international markets or whether, on the contrary, greater efforts are required to improve its export position in certain countries and regions. To address this question, the key findings of the analysis of Catalonia's export intensity are presented below.

4. Analysis of Catalonia's trade intensity

This section features the main findings of the analysis of Catalonia's export intensity with different world regions and the countries selected. Catalonia's export intensity index was compared to those of five major European countries (Germany, the United Kingdom, France, Italy and Spain), and to those of three European countries of a similar size to Catalonia in terms of population and/or GDP (Austria, Denmark and Finland). Comparing Catalonia's export intensity index to those of benchmark European countries makes it possible to determine whether Catalan exports to a region or country are higher or lower than those of European countries and to recommend markets where Catalonia presents room for improvement or requires a greater export presence to drive its international expansion. The analysis is divided into two parts: by world region and then by country.
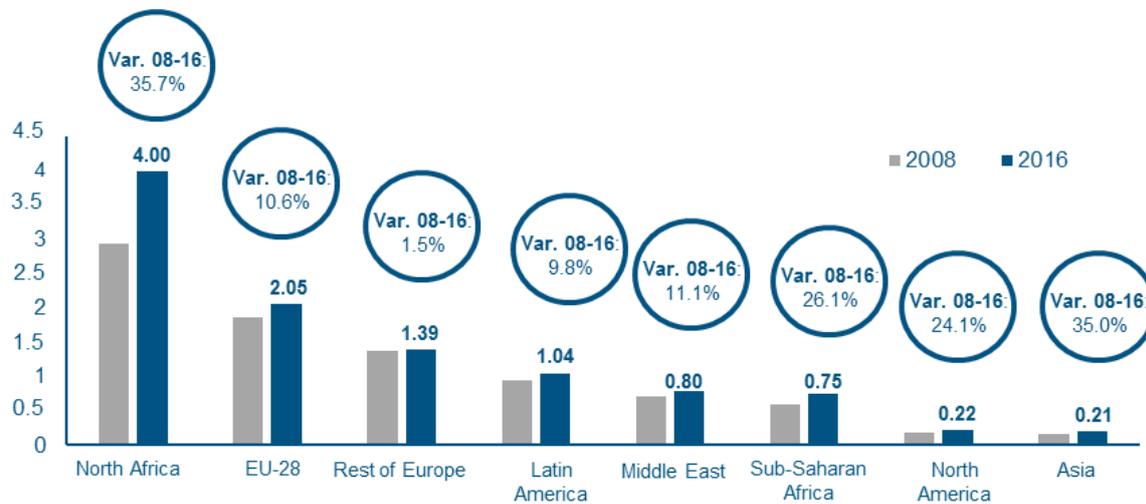
4.1 Analysis by world region

Catalonia's export intensity with all world regions has grown since the start of the crisis (see Figure 6). The highest growth between 2008 and 2016 occurred with North Africa (+35.7%); Catalonia's export intensity index was greatest in this region (4.0). Catalonia's export intensity with the European Union, the region that represents Catalonia's main market, was very high (2.05). Its export intensity index was also greater than one in the Rest of Europe (1.39), although this is the region where its export intensity has grown least since 2008 (1.5%). Also worth noting is its export intensity with Latin America, which, despite the geographical distance, was slightly above one (1.04). This was the result of Catalonia's cultural affinity with the region.

By contrast, Catalonia's indices with the Middle East and Sub-Saharan Africa were less than one (0.80 and 0.75, respectively). However, despite strong growth between 2008 and 2016, a low export intensity was observed with the more distant regions of North America (0.22) and Asia (0.21). Note that these latter two regions accounted for almost half (48%) of world imports (2016 data).

Therefore, Catalonia's export intensity indices confirm that geographical and cultural distance is a key factor in the trade relations between countries. The analysis shows a high export intensity in North Africa and the European Union and a low export intensity in Asia and North America.

Figure 6. Catalonia's export intensity index, 2008-2016

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

4.2 Analysis by country

There follows an analysis of Catalonia's export intensity by country, selected according to global demand. The countries selected all exceeded an import volume of $5 billion. Based on this criterion, the analysis included 120 countries, which together accounted for 96.9% of global imports in 2016. The results have been broken down by region.
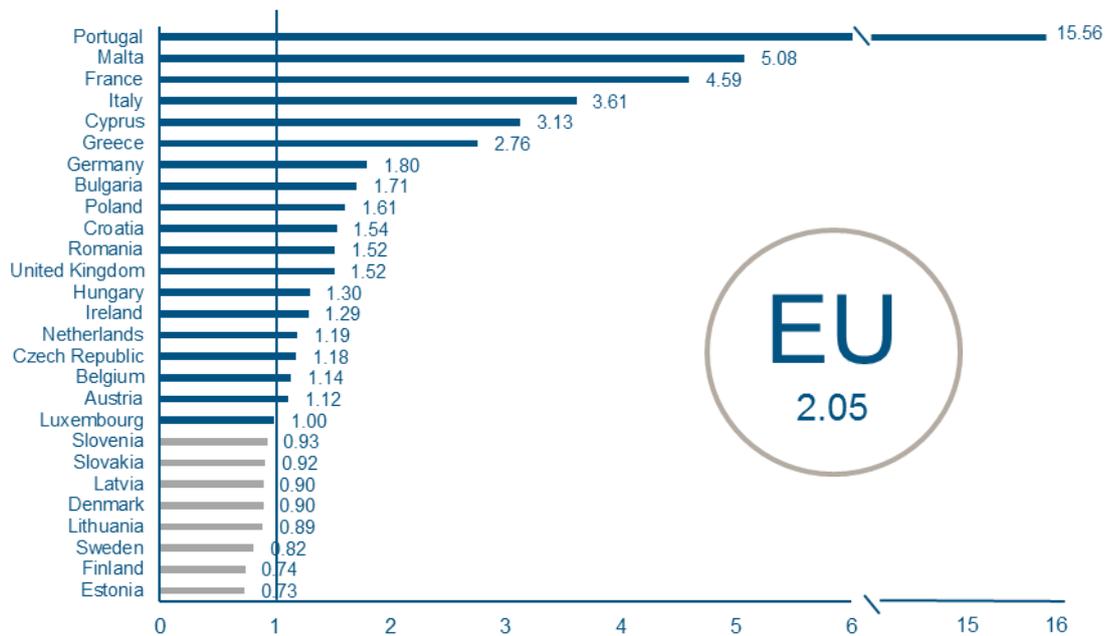
4.2.1 European Union

The European Union was Catalonia's biggest market and the world's largest importer. As a whole, the region accounted for 31.9% of global imports (2016 data).

Catalonia's export intensity was especially high with Portugal (15.56). Its index was also greater than one in major EU countries such as France (4.59), Italy (3.61), Germany (1.80) and the United Kingdom (1.52). This was also the case with Eastern European countries, including Bulgaria (1.71), Poland (1.61), Romania (1.52), Hungary (1.30) and the Czech Republic (1.18). The exceptions were Slovenia (0.93) and Slovakia (0.92), countries with which Catalonia, apart from having an export intensity index of less than one, has seen its export intensity fall away slightly in recent years (see Appendix, Table 1).

Catalonia's export intensity was low (i.e. less than one) in the Nordic and Baltic countries: Denmark (0.90), Sweden (0.82), Finland (0.74), Lithuania (0.90), Latvia (0.90) and Estonia (0.73).

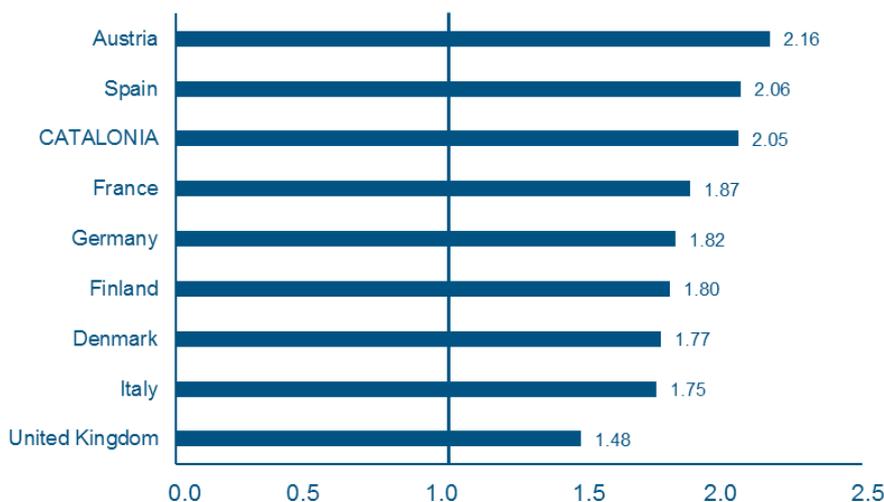**Figure 7. Catalonia's export intensity index, 2016. EU countries**

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

Comparing Catalonia's export intensity with benchmark European countries makes it possible to determine whether Catalan exports to the European Union are in line with, or higher or lower than those countries.

As expected, trade intensity between the EU countries was high, with Austria standing out (2.16). Catalonia had an intensity index very similar to that of Spain as a whole (2.06), and surpassed Finland, Denmark and the major EU countries. In general, therefore, Catalonia presented a higher export intensity index with the European Union than the main benchmark European countries, except for Spain and Austria. Nevertheless, compared to European countries, Catalonia had a low export intensity with the Nordic and Baltic countries.

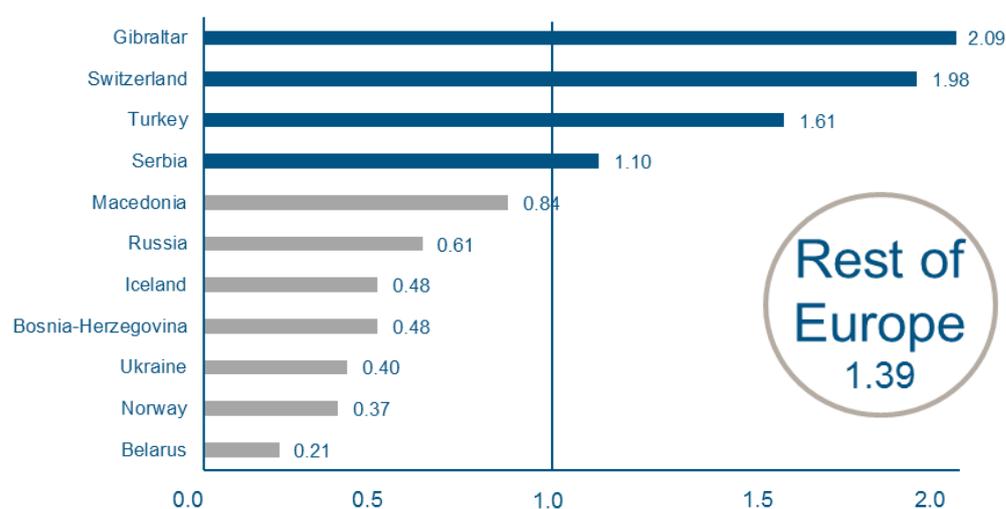**Figure 8. Export intensity index with the European Union, 2016. Comparison with benchmark countries**

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

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4.2.2 Rest of Europe

The countries that make up the Rest of Europe accounted for 5.3% of world imports. The main markets were Switzerland, Turkey and Russia, which together accounted for 76.3% of the region's imports.

In the Rest of Europe, Catalonia presented a particularly high export intensity with Switzerland (1.98) and Turkey (1.61). By contrast, its index was less than one with Russia (0.61) and neighbouring countries such as Ukraine (0.40) and Belarus (0.21). In addition, Catalonia's export intensity with these countries has fallen in recent years (see Table 2 of the Appendix), especially with Russia (however, it is important to bear in mind the Russian veto on certain tariff lines from the European Union, including meat, as a result of the conflict with Ukraine). Catalonia's export intensity with Norway was also very low (0.37).

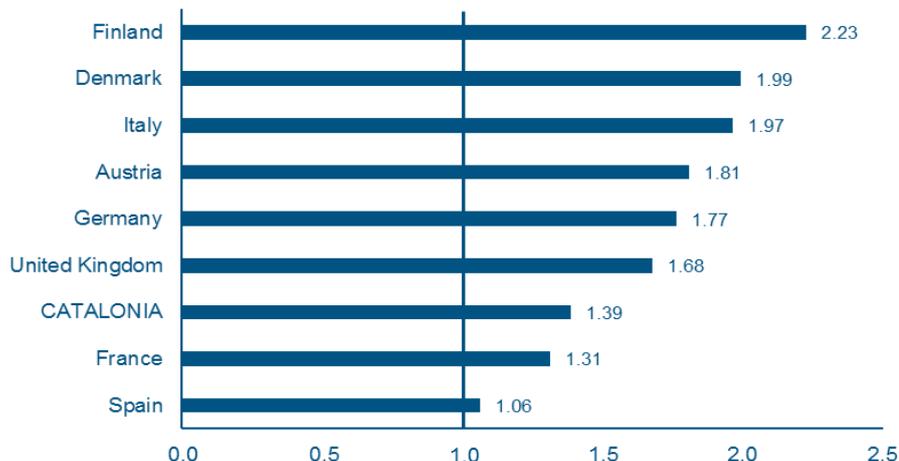**Figure 9. Catalonia's export intensity index, 2016. Countries in the Rest of Europe**

Note: Only countries whose imports exceeded $5 billion in 2016 were included.
Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

A comparison with the benchmark European countries (Figure 10) reveals that Catalonia's export intensity with the Rest of Europe was among the lowest. In fact, only Spain (1.06) and France (1.31) presented lower export intensity indices than that of Catalonia. Its index was lower than those of the other benchmark countries, especially when compared to those of Finland (2.23), Denmark (1.99) and Italy (1.97). This low export intensity was due primarily to its low presence in Russia, Ukraine, Belarus and Norway compared to most EU countries.

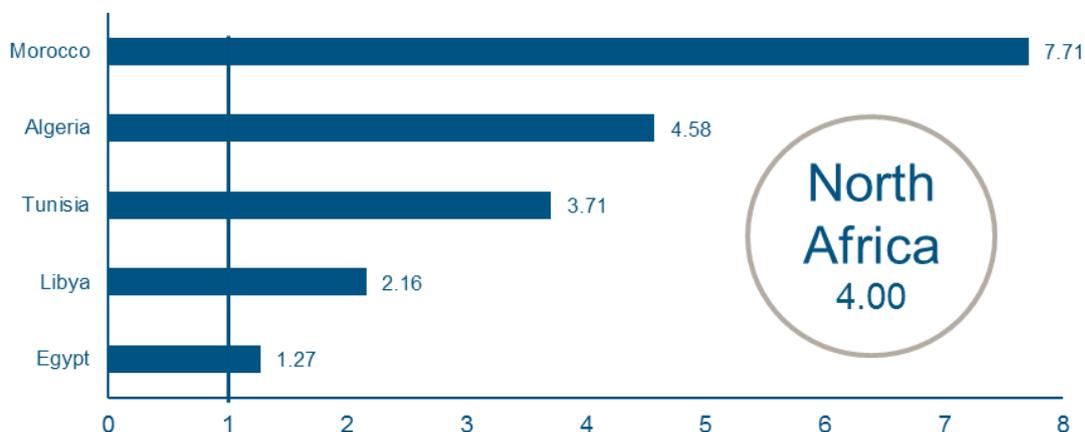**Figure 10. Export intensity index with the Rest of Europe, 2016. Comparison with benchmark countries**

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

4.2.3 North Africa

The countries of North Africa are markets close to Catalonia and, overall, accounted for 1.1% of world imports (2016 data).

Catalonia's export intensity was especially high with Morocco (7.71), Algeria (4.58) and Tunisia (3.71). Its export intensity indices were lower with Libya (2.16) and Egypt (1.27), although they were greater than one, which indicates a higher-than-average global export performance.

Figure 11. Catalonia's export intensity index, 2016. North Africa countries

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

A comparison with the benchmark countries (Figure 12) reveals that the European countries of the Mediterranean Basin presented a high export intensity index with North Africa. In fact, it was much higher than with the countries of Northern Europe. This illustrates that geographical proximity and historical links play a key role in trade relations. Catalonia's export intensity index (4.0) was higher than those of France (2.95) and Italy (2.71), but lower than that of Spain as a whole (4.52).

Figure 12. Export intensity index with North Africa, 2016. Comparison with benchmark countries
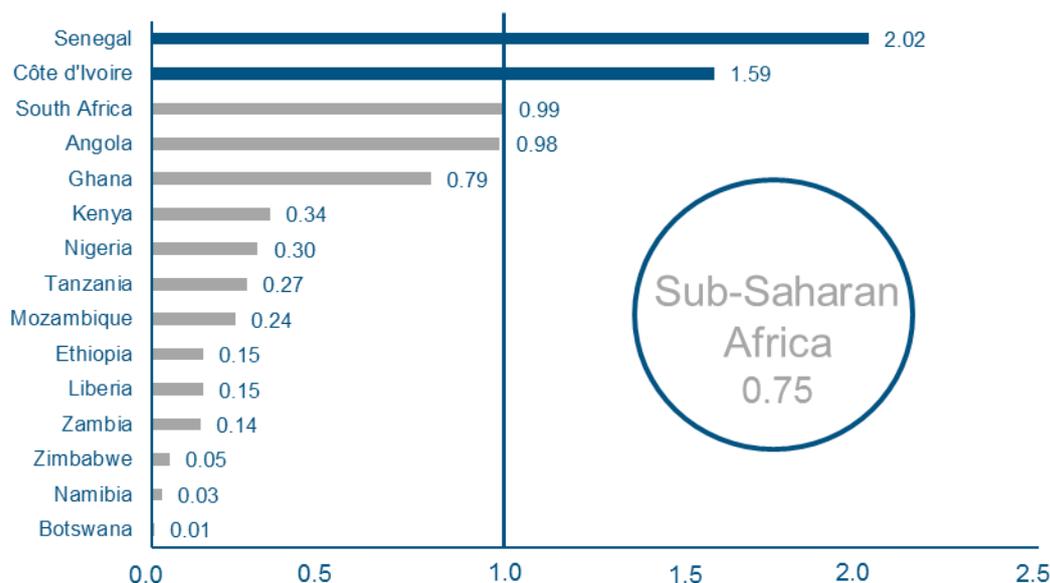

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

4.2.4 Sub-Saharan Africa

Sub-Saharan Africa accounted for 1.8% of world imports. Although, globally speaking, the imports of some countries are relatively low, key markets such as South Africa, Nigeria, Ethiopia, Kenya and Ghana accounted for more than half (52.9%) of the region's imports.

Catalonia's export intensity with the main countries of Sub-Saharan Africa was low, with the exception of Senegal (2.02) and Côte d'Ivoire (1.59), especially with East African countries such as Ethiopia, Kenya, Tanzania and Mozambique. It was also low with the main importing countries of West Africa, including Ghana (0.79) and, above all, Nigeria (0.30), a country with which Catalonia's export intensity has dropped significantly compared to 2008 (see Appendix, Table 2). With respect to the southern part of the continent, Catalonia's indices were low, although they were close to one in South Africa (0.99) and Angola (0.98).

Figure 13. Catalonia's export intensity index, 2016. Countries of Sub-Saharan Africa

Note: Only countries whose imports exceeded $5 billion in 2016 were included.
Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

When Catalonia's index was compared to the benchmark countries (Figure 14), it became evident that most European countries also presented a low export intensity. Only France (1.39) and the United Kingdom (1.0) presented indices greater than or equal to one. Catalonia's export intensity was 0.75, which was lower than that of Spain (0.82) but higher than those of Italy (0.63), Germany (0.61) and other similar-sized countries.

Figure 14. Export intensity index in Sub-Saharan Africa, 2016. Comparison with benchmark countries

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

4.2.5 Middle East

As a whole, the countries of the Middle East accounted 4.4% of world imports in 2016. The markets with the greatest import volume were the United Arab Emirates, Saudi Arabia, Israel and Iran, which together accounted for 73.8% of imports to the region.

Although Catalonia's export intensity was low in the region as a whole, it was relatively high with Lebanon (1.80) and Israel (1.56) and, to a lesser extent, with Saudi Arabia (1.17) and Jordan (1.11). By contrast, its export intensity indices were less than one with the countries of the Gulf Cooperation Council, including Qatar (0.70), Oman (0.68), Kuwait (0.63), the United Arab Emirates (0.56) and Bahrain (0.45), and even lower with Iran (0.38) and Iraq (0.22). Note that Catalonia's export intensity with some of these countries has declined significantly with respect to 2008. This is the case with the United Arab Emirates and Iran, two of the biggest countries in the region (see Appendix, Table 2).

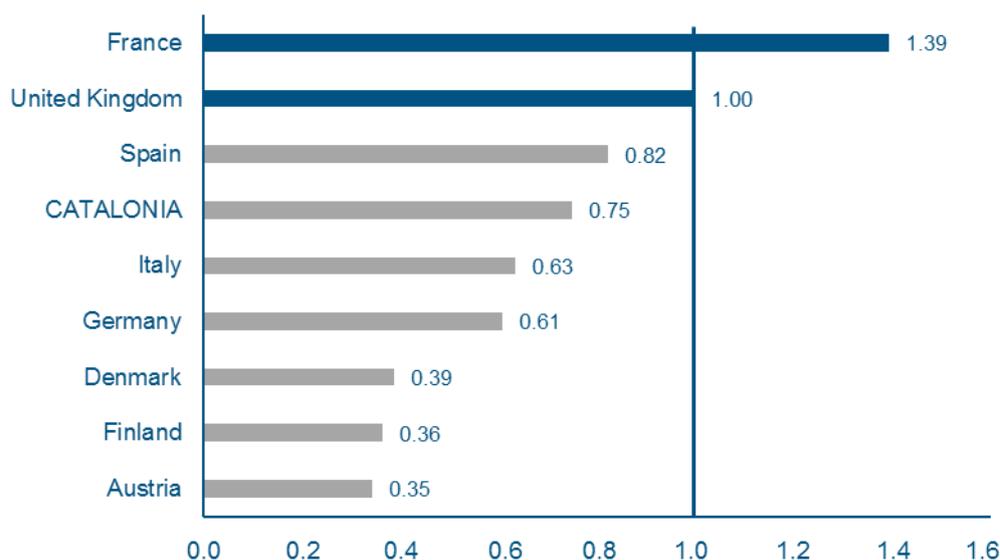**Figure 15. Catalonia's export intensity index, 2016. Middle Eastern countries**
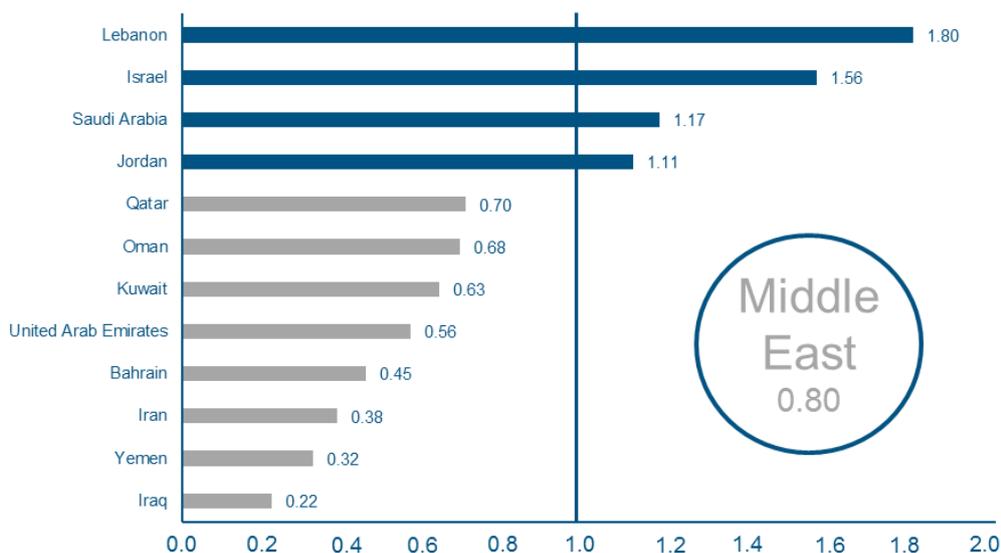

Note: Only countries whose imports exceeded $5 billion in 2016 were included.
Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

Compared to the benchmark European countries, only the United Kingdom (1.27) and Italy (1.06) presented export intensity indices with the Middle East that were greater than one. However, despite the fact that Catalonia's export intensity was much less than one (0.80), it was ahead of Spain as a whole (0.74) and the other EU countries included in the study. The Middle Eastern countries that Catalonia needs to address are Iran and the United Arab Emirates, where its export intensity is lower than that of most countries analysed.

Figure 16. Export intensity index with the Middle East, 2016. Comparison with benchmark countries

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

4.2.6 The Americas

The United States and Canada accounted for 16.5% of world imports, while the countries of Latin America as a whole accounted for 5.7%, half of which were concentrated in Brazil and Mexico.

With respect to Latin America, Catalonia's export intensity was especially high with Cuba (9.93) and, to a lesser but still significant extent, with countries such as Uruguay (1.89), Chile (1.55), Colombia (1.45), Argentina (1.29), Ecuador (1.29) and Peru (1.06). By contrast, Catalonia's export intensity was less than one with Brazil (0.97) and Mexico (0.82), the two biggest Latin American countries, which together account for more than half of Latin America's population (52.7%) and imports (57.4%).

However, the lowest indices were with North America, a region that accounts for 16.5% of world imports: United States (0.24) and Canada (0.15).

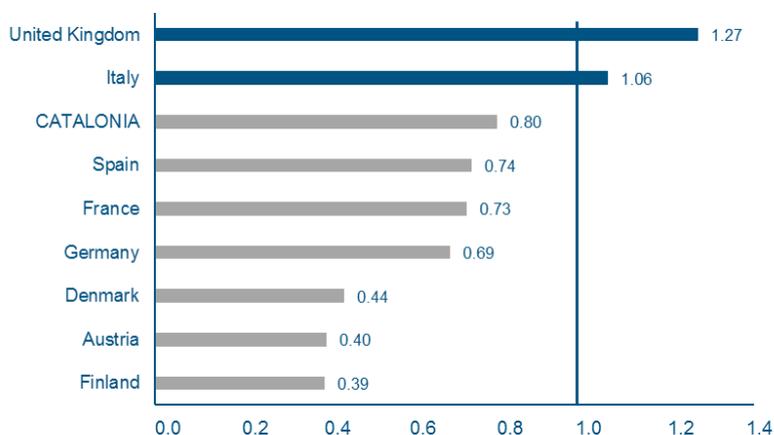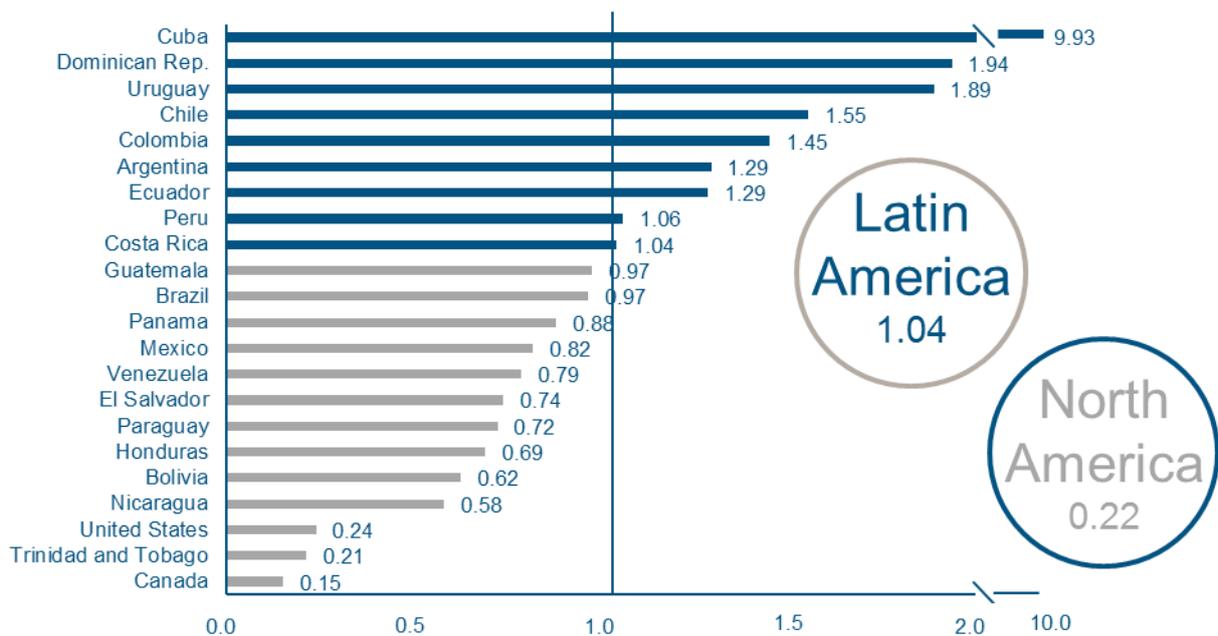**Figure 17. Catalonia's export intensity index, 2016. The Americas.**

Note: Only countries whose imports exceeded $5 billion in 2016 were included.
Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

A comparison with the benchmark European countries (Figures 18 and 19) shows that Catalonia had the highest export intensity with Latin America but the lowest with North America.

Catalonia presented the highest export intensity with Latin America (1.04), ahead of Spain (0.93) and the other European countries, which all had export intensity indices of less than one. However, Catalonia's export intensity with Brazil showed room for improvement, since it was lower than those of France and Spain.

By contrast, Catalonia had a very low export intensity with North America and trailed in last place when compared to the EU countries included in the study. However, only the United Kingdom had an index equal to one, as a result of its cultural and linguistic affinity with the region.

Figure 18. Export intensity index with Latin America, 2016. Comparison with benchmark countries

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

Figure 19. Export intensity index with North America, 2016. Comparison with benchmark countries

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

4.2.7 Asia

Catalonia's export intensity was very low with all Asian countries, a situation that poses a real export challenge, given that the region accounts for almost a third (31.4%) of world imports (2016 data). Only its indices with Georgia (0.70) and Pakistan (0.56) were higher than 0.5. Its export intensity was very low with the major Asian countries, including Japan (0.32), India (0.22), South Korea (0.21) and China (0.20), and with the main ASEAN countries, including the Philippines (0.36), Bangladesh (0.28), Thailand (0.25), Indonesia (0.18), Singapore (0.15), Vietnam (0.15) and Malaysia (0.12).

With respect to Oceania, Catalonia's export intensity was also low (0.40) and had fallen significantly since 2008, especially with Australia (see Appendix, Table 2).

Figure 20. Catalonia's export intensity index, 2016. Asian countries

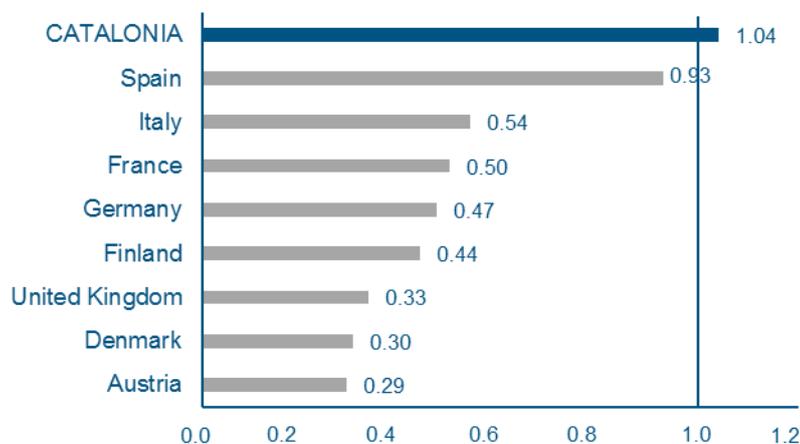Note: Only countries whose imports exceeded $5 billion in 2016 were included.
Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

Although none of the benchmark European countries analysed had an export intensity index greater than one with Asia (Figure 21), Catalonia had a particularly low index with the region (0.21), only slightly above that of Spain as a whole (0.19). This confirms Asia as one of Catalonia's main targets for improvement.

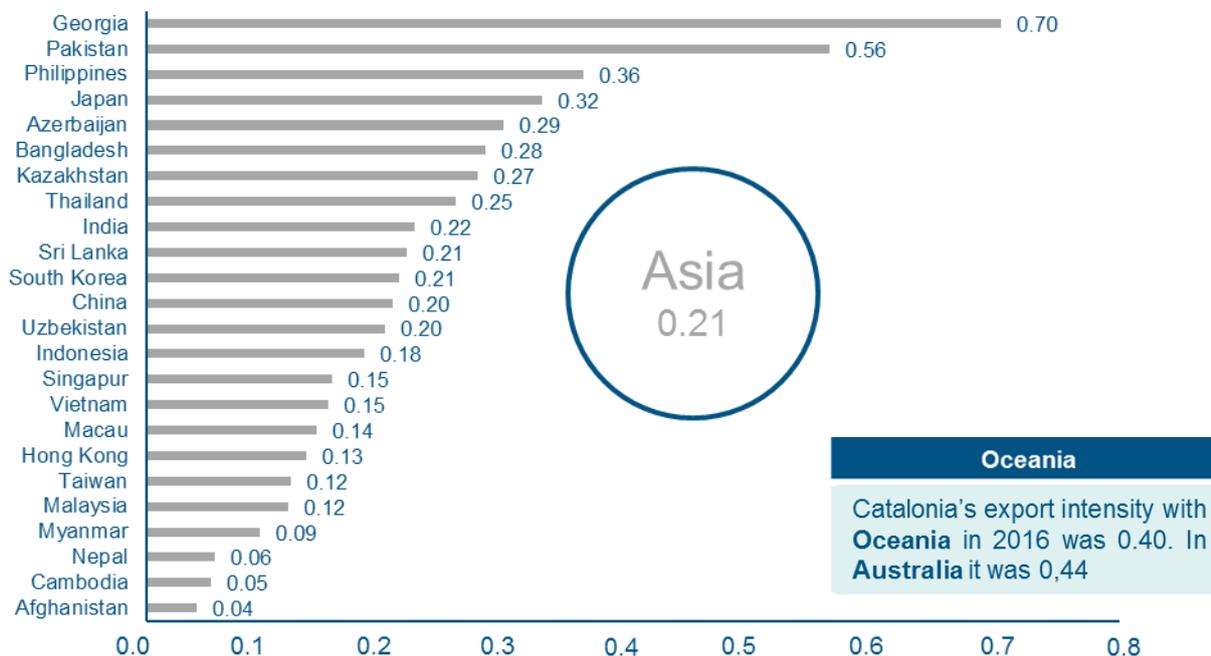**Figure 21. Export intensity index with Asia, 2016. Comparison with benchmark countries**

Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

5. Conclusions

The 2008 economic crisis encouraged more Catalan companies to change their mindset by seeking and consolidating overseas markets as a result of the fall in domestic demand.

Catalonia currently presents a competitive industrial fabric and an internationalized economy, as evidenced by the fact that the Catalan economy is achieving record-breaking figures in terms of both exports and the number of regular exporting companies.

However, it remains to be seen whether, despite this export drive, Catalonia is taking sufficient advantage of the new dynamics presented by international markets to ensure that the growing export rate it has experienced in recent years does not slow down in the future. The aim of this study was to address this question.

To this end, Catalonia's export intensity indices with nine world regions and 120 countries, selected for their import volume, were calculated for the years 2008 and 2016 and compared to those of a number of benchmark European countries. Below are the main conclusions drawn:

First, in line with the hypothesis found in the economic literature concerning the relevance of the gravity model of international trade, the world map showing Catalonia's export intensity indices reveals that geographical and cultural distance is a key factor in countries' trade relations. The main countries with which Catalonia presented the highest export intensity indices were those of the European Union, the Southern Mediterranean Basin (North Africa, Turkey and part of the Middle East) and some Latin American countries (especially the countries of the Pacific and the Caribbean islands). By contrast, the main countries with which it had the lowest export intensity indices were those of Sub-Saharan Africa, especially East Africa, North America, Asia and Oceania.

Second, a comparison of Catalonia's export intensity with major European countries and with those of a similar size to Catalonia made it possible to determine whether it is taking sufficient advantage of the dynamics of the regions and countries that drive global demand, and to recommend markets in which Catalonia shows room for improvement or requires a greater export presence to drive its international expansion.

In this regard, despite its high export intensity in Europe, Catalonia presents scope for improvement in the Nordic and Baltic countries, Russia and neighbouring countries. Similarly, although Catalonia presented the highest export intensity in Latin America among comparative European countries, there is room for improvement in the two largest Latin American countries: Brazil and Mexico. With respect to the Middle East, it has a considerable challenge in Iran and the United Arab Emirates.

Catalonia needs to intensify its exports to Sub-Saharan Africa, especially in East African countries with the greatest growth prospects such as Ethiopia, Kenya, Tanzania and Mozambique, and in the main importing countries of West Africa, including Nigeria and Ghana.

Finally, the data reveal Catalonia's underdeveloped export potential with North America and Asia, two regions that account for almost half of world demand. Thus, Catalonia's biggest export challenges lie in the United States and Canada and most Asian countries, especially those with the greatest growth prospects (India, China, South Korea, Philippines, Thailand, Indonesia, Vietnam, Malaysia and Bangladesh).

Appendix

Table 1. Export intensity index. Ranking by country (1-60) (continues in Table 2)

	Country	2008	2016	Variation		Country	2008	2016	Variation
1	Portugal	13.73	15.56	1.83	31	Ireland	0.75	1.29	0.54
2	Cuba	6.88	9.93	3.05	32	Ecuador	0.74	1.29	0.55
3	Morocco	5.09	7.71	2.62	33	Egypt	0.86	1.27	0.42
4	Malta	2.12	5.08	2.95	34	Netherlands	1.15	1.19	0.05
5	France	4.62	4.59	-0.03	35	Czech Rep.	1.21	1.18	-0.03
6	Algeria	3.68	4.58	0.89	36	Saudi Arabia	0.65	1.17	0.52
7	Tunisia	3.14	3.71	0.57	37	Belgium	0.91	1.14	0.23
8	Italy	2.86	3.61	0.75	38	Austria	1.05	1.12	0.07
9	Cyprus	2.49	3.13	0.64	39	Jordan	0.68	1.11	0.43
10	Greece	2.63	2.76	0.12	40	Serbia	0.64	1.10	0.46
11	Libya	1.37	2.16	0.79	41	Peru	0.79	1.06	0.27
12	Gibraltar	1.24	2.09	0.85	42	Costa Rica	0.76	1.04	0.28
13	Senegal	1.07	2.02	0.95	43	Luxembourg	0.72	1.00	0.28
14	Switzerland	2.26	1.98	-0.28	44	South Africa	0.87	0.99	0.12
15	Dominican Rep.	3.80	1.94	-1.87	45	Angola	0.72	0.98	0.26
16	Uruguay	1.43	1.89	0.45	46	Guatemala	0.72	0.97	0.25
17	Germany	1.36	1.80	0.44	47	Brazil	0.81	0.97	0.16
18	Lebanon	1.72	1.80	0.08	48	Slovenia	0.96	0.93	-0.02
19	Bulgaria	0.93	1.71	0.78	49	Slovakia	0.99	0.92	-0.07
20	Turkey	1.45	1.61	0.16	50	Latvia	0.65	0.90	0.25
21	Poland	1.19	1.61	0.42	51	Denmark	1.94	0.90	-1.04
22	Côte d'Ivoire	0.64	1.59	0.95	52	Lithuania	0.65	0.89	0.24
23	Israel	0.81	1.56	0.75	53	Panama	1.21	0.88	-0.33
24	Chile	0.81	1.55	0.74	54	Macedonia	0.68	0.84	0.16
25	Croatia	0.65	1.54	0.89	55	Mexico	0.84	0.82	-0.02
26	Romania	1.04	1.52	0.47	56	Sweden	0.75	0.82	0.07
27	United Kingdom	1.41	1.52	0.11	57	Ghana	0.49	0.79	0.30
28	Colombia	0.99	1.45	0.46	58	Venezuela	1.13	0.79	-0.34
29	Hungary	1.18	1.30	0.12	59	Finland	0.47	0.74	0.27
30	Argentina	1.40	1.29	-0.11	60	El Salvador	0.52	0.74	0.22

Note: Only countries whose imports exceeded $5 billion in 2016 were included.
Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

Table 2. Export intensity index. Ranking by country (61-120)

	Country	2008	2016	Variation		Country	2008	2016	Variation
61	Estonia	0.53	0.73	0.21	91	Thailand	0.19	0.25	0.06
62	Paraguay	0.58	0.72	0.14	92	United States	0.20	0.24	0.04
63	Georgia	0.55	0.70	0.16	93	Mozambique	0.20	0.24	0.04
64	Qatar	0.61	0.70	0.09	94	Iraq	0.10	0.22	0.13
65	Honduras	0.57	0.69	0.12	95	India	0.18	0.22	0.04
66	Oman	0.26	0.68	0.43	96	Sri Lanka	0.15	0.21	0.06
67	Kuwait	1.08	0.63	-0.44	97	Trinidad and Tobago	0.63	0.21	-0.42
68	Bolivia	0.67	0.62	-0.05	98	Belarus	0.21	0.21	0.00
69	Russia	1.14	0.61	-0.54	99	South Korea	0.13	0.21	0.08
70	Nicaragua	0.38	0.58	0.20	100	China	0.14	0.20	0.06
71	United Arab Emirates	0.79	0.56	-0.22	101	Uzbekistan	0.10	0.20	0.10
72	Pakistan	0.25	0.56	0.31	102	Indonesia	0.14	0.18	0.04
73	Iceland	0.53	0.48	-0.05	103	Singapore	0.13	0.15	0.03
74	Bosnia and Herzegovina	0.24	0.48	0.24	104	Canada	0.10	0.15	0.05
75	Bahrain	0.41	0.45	0.04	105	Vietnam	0.12	0.15	0.03
76	Australia	0.65	0.44	-0.21	106	Ethiopia	0.14	0.15	0.01
77	Sudan	-	0.40	-	107	Liberia	0.03	0.15	0.12
78	Ukraine	0.45	0.40	-0.05	108	Macau	0.18	0.14	-0.04
79	New Zealand	0.50	0.38	-0.12	109	Zambia	0.04	0.14	0.10
80	Iran	0.61	0.38	-0.23	110	Hong Kong	0.19	0.13	-0.06
81	Norway	0.35	0.37	0.03	111	Taiwan	0.10	0.12	0.02
82	Philippines	0.20	0.36	0.16	112	Malaysia	0.16	0.12	-0.04
83	Kenya	0.35	0.34	-0.01	113	Myanmar	0.01	0.09	0.08
84	Japan	0.17	0.32	0.16	114	Nepal	0.25	0.06	-0.19
85	Yemen	0.20	0.32	0.13	115	Cambodia	0.07	0.05	-0.02
86	Nigeria	0.71	0.30	-0.41	116	Zimbabwe	0.02	0.05	0.03
87	Azerbaijan	0.19	0.29	0.10	117	Afghanistan	0.15	0.04	-0.11
88	Bangladesh	0.51	0.28	-0.23	118	Namibia	0.14	0.03	-0.11
89	Kazakhstan	0.21	0.27	0.06	119	Botswana	0.05	0.01	-0.04
90	Tanzania	0.20	0.27	0.07	120	Marshall Islands	0.00	0.00	0.00

Note: Only countries whose imports exceeded $5 billion in 2016 were included.
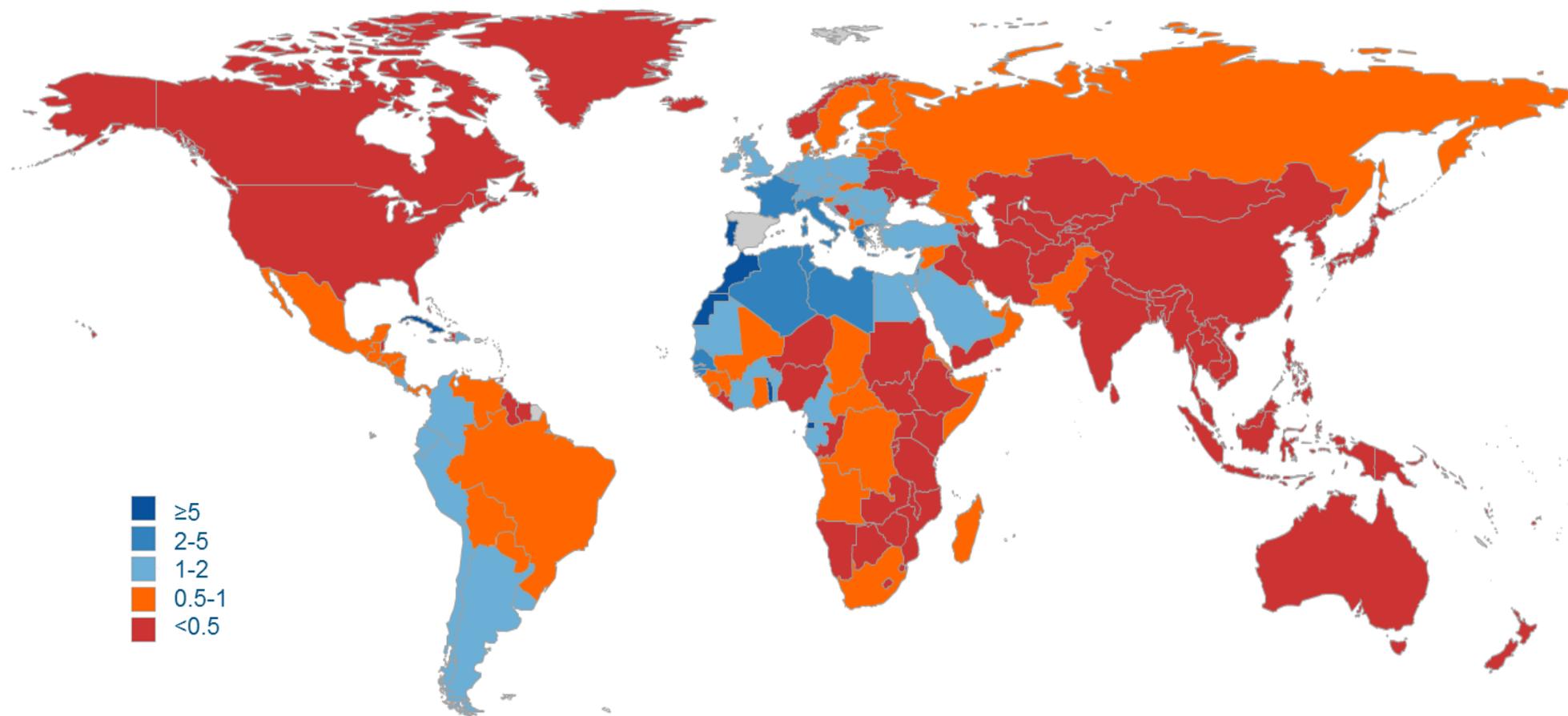Source: Compiled by the authors based on data from DataComex-Secretary of State for Trade and TradeMap-ITC.

Table 3. GDP growth forecast (2018-2022 average). Ranking by country

	Country	Average growth 2018-2022			Country	Average growth 2018-2022
1	Yemen	8.1%		31	Morocco	4.1%
2	India	7.9%		32	Nepal	4.0%
3	Ethiopia	7.9%		33	Afghanistan	4.0%
4	Mozambique	7.7%		34	Iran	4.0%
5	Libya	7.6%		35	Costa Rica	3.9%
6	Myanmar	7.5%		36	Paraguay	3.9%
7	Bangladesh	7.0%		37	Tunisia	3.9%
8	Senegal	6.9%		38	Peru	3.8%
9	Côte d'Ivoire	6.9%		39	Guatemala	3.8%
10	Philippines	6.8%		40	Serbia	3.8%
11	Tanzania	6.7%		41	Bolivia	3.8%
12	Cambodia	6.5%		42	Honduras	3.8%
13	Vietnam	6.2%		43	Ukraine	3.7%
14	China	6.2%		44	Malta	3.6%
15	Kenya	6.1%		45	Romania	3.6%
16	Ghana	6.1%		46	Sudan	3.6%
17	Uzbekistan	6.0%		47	Slovakia	3.6%
18	Pakistan	5.8%		48	Kuwait	3.5%
19	Liberia	5.6%		49	Turkey	3.5%
20	Panama	5.6%		50	Macedonia	3.5%
21	Egypt	5.5%		51	Colombia	3.5%
22	Indonesia	5.5%		52	Kazakhstan	3.5%
23	Macau	5.4%		53	Latvia	3.3%
24	Dominican Rep.	5.1%		54	Namibia	3.3%
25	Sri Lanka	5.0%		55	Lithuania	3.3%
26	Georgia	4.9%		56	Luxembourg	3.2%
27	Malaysia	4.9%		57	Thailand	3.2%
28	Zambia	4.5%		58	United Arab Emirates	3.2%
29	Nicaragua	4.5%		59	Estonia	3.1%
30	Botswana	4.4%		60	Israel	3.1%

Note: Only countries whose imports exceeded $5 billion in 2016, with an average GDP growth forecast of more than 3% for the next five years (2018-2022), were included.

Source: Calculations by the authors based on the FMI-WEO database, October 2017.

WORLD MAP: CATALONIA'S EXPORT INTENSITY INDEX, 2016

≥5	
2-5	
1-2	
0.5-1	
<0.5	

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