**el comercio Europa - China:**

**una aproximación empírica**

Abstract

The international economic order has undergone profound changes since the end of the twentieth century. The acceleration of the globalization process and the integration of emerging economies into the dynamics of international trade have led to the emergence of new centers of economic power, whose greatest exponent has been China. This paper analyzes the evolution of bilateral trade between China, the emerging economy that has most developed in recent decades, and Spain, a developed economy whose opening-up process has been taking place almost at the same time as that of China.

*Clasificación JEL/JEL Classification: F14, F19*

1. Introduction

In recent decades, China has become an indispensable trading partner for most countries in the world. Since the Reform and Opening-up process that began in 1978, China has been integrated into the dynamics of international trade, has become an export power and a large number of companies have relocated their activities to the Asian giant. This is why China's international relations as a whole cannot be understood without understanding its economic-trade relations in particular.

This paper aims to address the study of trade relations between Europe and China, trying to establish well-defined periods throughout the history of the bilateral relationship. Although there is abundant literature on China's economic take-off and the importance of this country in today's global trade, less attention has been paid to the study of this process from a historical-temporal perspective. What has this process been like? Has it been a gradual change or, on the contrary, have there been clear turning points establishing well-marked stages?

However, a problem arises when studying trade relations between China and the European Union from a historical-temporal perspective, and that is that China is a country while the European Union is not. The European Union is currently made up of 27 countries, but when the Reform and Opening-up began in China, the European Union did not even exist as such, and it would not be until 1993 that the former European Economic Community would take its current form, but even then it was composed of only 12 members. Is it appropriate to study trade relations between China and the EU without taking into account the subsequent accessions? Is it appropriate to take the whole of the current EU-27 even when those countries were not part of the Union and were not subject to its rules? To overcome this problem, the only solution is to take a specific reference country within the EU to get an idea of the joint evolution process, and to compare this reference country with other countries of similar characteristics within the EU to contrast whether its evolution can be taken as a reference or not.

Within the European Union, Spain is the largest economy that most closely resembles China in terms of its historical process. When China began its economic reform process in 1978, Spain approved its new constitution and established a new political system in the style of its neighboring countries. However, the process of industrialization and economic development in Spain had been going on for a long time, since 1959 with the approval of the Stabilization Plan. That is why Spain is the most appropriate country to take as a reference when studying the relations of Europe as a whole with China, since, at the time of the Reform and Opening-up of the Asian giant, Spain was an industrialized economy like other European countries, but had not yet begun its process of political reform.

To find out whether the periodization of Spain-China bilateral trade relations can be valid and taken as a reference or whether, on the contrary, they constitute an exception not applicable to other European countries, this evolution has been compared with two other similar countries in terms of geographic and demographic dimension, economic potential and cultural characteristics. These countries are France and Italy, the two countries that make up, together with Spain, the so-called Latin Arc of Europe.

Then, the purpose of the research is to periodize Spain's foreign trade with China (both imports and exports of goods) and to characterize the different stages through econometric analysis, comparing its evolution with that of other European countries, such as France and Italy, the other two nations that, together with Spain, form the so-called Latin Arc of Europe, countries with similar geographical dimensions, populations and cultural characteristics. The period under analysis runs from 1973, the year in which diplomatic relations were officially established, until 2020, when the COVID-19 pandemic began and led to the relocation of GVCs outside China.

When it comes to periodization, a problem immediately arises, which is finding the elements that allow us to distinguish the supposed stages of which the period would hypothetically consist before going on to characterize them. Generally, historical events or important changes in trade policy are taken to delimit the period and, from there, the main statistics of each stage are extracted. This is a reasonable option, but the problem it poses is that each of these stages would be delimited *a priori*, assuming, on the basis of preconceived ideas, that the chosen method of periodization is correct and accurate. For this reason, it has been decided to "let the series speak for themselves". In other words, the periodification is established based on the analysis of structural change, so that it is the mathematical characteristics of the series themselves that delimit each stage. The same method was adopted by Serrano, Sabaté and Gadea (2008) in their analysis of the Spanish foreign sector series from 1870 to 2000 with the series of Prados de la Escosura (2003), thus verifying whether the stages obtained have a historical and economic logic and coincide or not with the periodification made from the perspective of economic policy or economic history.

The following section will provide a preliminary analysis of the evolution of the foreign trade series between Spain and the Asian giant based on its graphical analysis. Subsequently, the methodology used for the analysis of structural change will be explained and its periodification will be established by means of this analysis. Once the different periods have been established, descriptive statistics will be extracted for each stage and the Spanish case will be compared with the French and Italian cases. The paper will end with comments on the main conclusions.

1. China-Spain relations

In 1973, Spain and China formally established diplomatic relations. At that time, China was by no means a major supplier to Spain. In that year, the value of Spanish imports of goods from China totaled $20,416,400[[1]](#footnote-1), which represented 0.2% of total Spanish imports. In 2020, imports reached a total value of 33,510,177,963 dollars, representing 10.1% of total Spanish imports of goods for that year.

To gain an idea about the evolution of the trade relationship between the two countries, it is enough to verify the position that China occupied as a trading partner of Spain then and now. In 1973[[2]](#footnote-2), the Asian giant was not a relevant trading partner of this European country or of any of its territories in imports of goods. Today[[3]](#footnote-3), China is Spain's third largest supplier, one of its main trading partners outside the EU and the country whose relative weight in Spanish imports has increased the most. Moreover, Spain is China's sixth largest import partner within the EU. Trade relations have progressed so much during this period of time that the Chinese government has come to define Spain as its "European friend".

Flows in the opposite direction have not progressed in such a remarkable way, but they have also been intense. In 1973, China was not a relevant client for Spain, with Spanish exports of goods to the Asian giant amounting to 6,353,231 dollars, which at that time represented about 0.1% of total Spanish exports. In 2020, the total volume of Spanish exports to China amounted to 9,339,784,364 dollars. This figure represented approximately 3% of Spain's total exports for that year. And although in relative terms the growth is much more modest, in absolute terms it represents a very voluminous growth. So much so that China is one of the countries classified as a *PASE* (*País con Actuación Sectorial Estratégica*) in the *Estrategia para la Internacionalización de la Economía Española* (*EIEE*).

China is also Spain's tenth largest customer and the largest in Asia[[4]](#footnote-4), which helps to illustrate the progress that has been made in trade relations, although Spain is below the EU average in terms of exports to China. Spanish exports to China cover a wide range of categories, from primary sector products to capital-intensive industrial sector manufactures, which make up two-thirds of total Spanish exports to China. Since the economic crisis that began in 2008, there has been a strong increase in the number of Spanish companies exporting to China, where Spanish products are generally associated with quality, although they are not associated with specific brands. Meanwhile, the EU as a whole has become China's second largest trading partner[[5]](#footnote-5), behind only the United States.

During this period, the People's Republic of China has become deeply integrated into global value chains (GVCs) by specializing as an assembly country, exporting labor-intensive manufactured goods. However, the composition of Chinese trade has changed substantially over the last few decades, from exporting clothing and textiles to exporting machinery and transport equipment, i.e., China's trade profile has changed considerably and has gained higher positions within GVCs. The Asian giant no longer exports exclusively agricultural products and low-quality labor-intensive manufactures, but also exports capital-intensive manufactures and electronic products.[[6]](#footnote-6)

This radical change in trade relations in barely four decades and the incorporation of China into the dynamics of international trade has naturally attracted the attention of the academic community. Rosa Puertas and Martí Selva (2004) have written about the impact of China's inclusion in the global trade order and how it has affected Spanish trade, accompanying their analysis with a series of recommendations to improve the competitiveness of different sectors. Likewise, Pablo Bustelo (2008) analyzes the implications for Spain of China's economic boom, pointing out both the positive and negative implications of this boom for Spain. Pérez Saiz (2018) examines the trade composition over the last few years, while providing an overview of the changes that have occurred in this period. According to Káiser Moreiras (2018), Spain will not be able to increase its share in the international market without having a sustained growth in the Chinese market.

Other authors such as Marta Noguer (2006) have focused more on the possibilities of exploiting the Chinese market for Spanish exporters, studying whether or not they take advantage of their export potential to China. Similarly, somo researchers have studied specific markets, such as Jiménez-Asenjo and Filipescu (2019) for Spanish wine and its export strategy to the Asian giant. The same has been done by Velilla Sanz, Peña Serrano and Pérez Ruiz (2018) with the food sector, López Arce (2018) for the case of Gestamp and the automotive industry, Bilbao Morán and García Jalón (2018) for the case of Siemens Gamesa and the energy market or Sebastián de Erice and Dubinksy (2018) with Técnicas Reunidas.

As commented before, the investigation of the commercial evolution between these two countries is particularly interesting given that both definitively opened up to international trade in a definitive manner and became fully integrated into the international economic dynamics after 1978, when the new constitution was approved in Spain and the Reform and Opening-up process began in China. This makes it possible, on the one hand, to compare the trajectories of the two countries and, on the other hand, to observe China's evolution in the GVCs in comparison with another country that began its process of opening up to international markets almost at the same time.

1. Evolution of the Spain-China bilateral trade series

Figure 1 shows the evolution of foreign trade between Spain and China for Spanish imports of goods from China (M\_ES) and Spanish exports of goods to China (X\_ES).

Figure 1 – Spanish imports from China and Spanish exports to China, 1973-2020 (millions of dollars) over here

It may be observed that both imports and exports have grown exponentially if we compare their volume in 1973 and in 2020. We can see the beginning of a timid growth from the 1980s onwards for both flows. From the middle of this decade, imports experienced an explosive and sustained growth that accelerated even more at the beginning of the 2000s and were curtailed at the end of the same decade, when they become less steep and more volatile. These periods correspond to the signing of the trade agreement between Spain and China in 1979, which, together with China's large-scale integration into the GVCs in the 1990s, explain this rapid rise, China's entry into the WTO in 2001 and the onset of the Great Recession in 2008.

Exports also began to take off in the 1980s, specifically at the end of the decade, but they did not experience the explosive growth that imports did, and it was not until the beginning of the 2000s and then at the end of the decade that exports experienced a major boom, coinciding with the events described above (China's integration into the WTO in 2001 and the onset of the crisis in 2008). However, unlike imports, Spanish exports to China do not seem to have been affected by the crisis, quite the contrary.

Going into more detail, it can be seen that at the beginning of the period there was relatively accelerated growth, especially from the late 1970s and early 1980s, as a result of the establishment of diplomatic relations and the signing of the 1979 trade agreement between Spain and China, coinciding with the process of reform and opening up carried out by the two countries the previous year. However, this accelerated growth quickly stabilized, and a new change in the trade regime was not experienced until the mid and late 1980s, when there was continuous and sustained growth until the end of the 2000s. Throughout this period, the trade relationship is consolidated through the signing of economic and industrial cooperation treaties (1984), the opening of consular offices (1985), treaties to prevent tax evasion (1992) and investment promotion treaties (1993). In 2008, at the beginning of the Great Recession, there was a sharp drop in the rate of growth, which stabilized or grew moderately.

During this period, China became fully integrated into global value chains and managed to move up the value chain from exporting purely labor-intensive products to exporting increasingly capital-intensive products.

We can therefore distinguish three distinct stages in this preliminary analysis. The first stage comprises the period prior to the mid-1980s in which trade between the two nations was unstable or underwent abrupt changes in trend. Another stage, between the mid-1980s and 2010, shows continuous and sustained growth. And, finally, there was the period after the 2010s in which the trend stabilized after having experienced a significant decline.

1. Methodology

What does the econometric analysis indicate about the periodization of the series? Does it coincide with what is observed in the graphical analysis of the evolution of the series? Is it related to the historical and political perspective? In order to answer these questions without conditioning *a priori* the behavior shown by these series, it is necessary to carry out an analysis of structural change. To this end, the statistical tests calculated for each possible structural break in the sample have been combined and, from there, a statistical test has been constructed to detect a possible structural change without previously imposing a specific date. This is the Wald test methodology.

Following Quandt (1960), Kim and Siegmund (1989) and Andrews (1993), the idea is to compare the maximum possible sample test with what might be expected under the null hypothesis of no break. Tests that employ the maximum sample test are known as supremum tests. Thus, the Wald supremum test would employ the maximum Wald test in the sample.

Where is the Wald test evaluated at a hypothetical date of structural change *b*. However, *supremum tests* gain power if they are used as an average or in their exponential form. Average tests use the mean of the sample tests, while exponential tests are defined as the logarithm of the mean of the sample exponential tests.

The average form would be expressed as follows.

And the exponential would have the following form.

Andrews and Ploberger (1994) argue that average tests are optimal when the alternative hypothesis consists of a smaller change of the parameters in the structural break. Exponentials, on the other hand, are useful when the change is larger.

Following Davis (1987), each test statistic depends on possible unknown structural changes in addition to being a function of the statistics of the sample itself. The limit of the distributions of each of the above cases would have the following form.

Where and are an independent k-dimensional vector with Brownian movement, , y . The p-value has been calculated according to the methodology proposed by Hansen (1987). To avoid identification problems, observations near the beginning or end of the sample have been excluded as possible structural changes, applying the 15% symmetrical cut-off recommended by Andrews (1993).

Thus, the test is a function of the sample statistics calculated over a possible range of structural change. A test is performed to see whether the regression coefficients vary between periods defined by an unknown structural change.

1. Results of the structural change analysis

The results obtained through the analysis of structural change corroborate what was observed in the preliminary graphic analysis. The structural change analysis was applied up to three times, the first change being the most decisive as it is the one that covers the whole sample, and the others are those that allow us to delimit more specific sub-periods from the previous divisions.

The first change is observed in 2009, shortly after the Great Recession broke out. In that year, the Spanish economy went into recession and contracted by almost 4% after years of economic bonanza. In this context, it is logical to detect a change in the trade regime, since, as economic capacity is reduced, so is purchasing capacity. This fact, therefore, must be understood in the context of the Great Recession and coincides with what was observed in the preliminary graphic analysis.

Table 1 – Analysis of structural change in imports over here

The series of Spanish imports from China would therefore be subdivided into two major subperiods (those established for the first change), namely, the one from the beginning of the period considered until the onset of the economic crisis. The analysis of structural change was also applied to the subperiod prior to the outbreak of the crisis due to its long duration.

The structural change for this subsample is detected in 1989 (second change), at the beginning of the 1990s, when China accelerated profound economic and social transformations under Jiang Zemin, which would expand those already begun in 1978 with Deng Xiaoping and would enable it to become fully integrated into the dynamics of international trade. The structural change analysis was applied again for the period prior to 1989 (given that it is when China underwent the most changes, so that the econometric and historical-political periodizations can be compared) and a year similar to that observed in the preliminary graphical analysis was obtained, that of 1982 (third change). The Wald test is significant in all cases.

The periods established, therefore, coincide with the starting dates of different periods and relevant historical events, which mark the different characteristics of each sub-period before and after.

Table 2 below presents the results for the case of exports from Spain to China.

Table 2 – Analysis of structural change in exports over here

In the case of Spain's exports to China, the year of the main structural change (first change) was 1987, just before the 1990s, when the trade relationship between the two countries and China's integration into the GVCs began to consolidate, as previously mentioned for imports. In the same way as before, we have analyzed the sub-period after 1987 (the longest and the one with the most significant political-historical events for comparison), resulting in the years 2003 and 2007. The year 2003 is not a particularly significant year, although China's opening up to international trade was consolidated after Hu Jintao took office as President of China in 2002 and China's inclusion in the World Trade Organization (WTO) two years earlier. The year 2007 would partially coincide with the findings for imports, since it practically coincides with the beginning of the crisis. In any case, the dates are more random from a historical and political perspective of international relations.

It should be taken into account that Spain's exports to China are now being analyzed, and that the Great Recession mainly affected the countries of the developed world and not the emerging economies. European countries, including Spain, saw their purchasing power diminished (fall in imports), but China hardly saw its purchasing power altered, which would explain why the start of the crisis is not detected as the first and main structural change, as was the case with imports. In 2007, China was growing at 14.2%, in 2008 at 9.7%, in 2009 at 9.4% and at 10.6% in 2010. The crisis had a greater impact on China's exports, i.e. on the imports from its partners, on its sales capacity, given that many of its customers were in crisis. However, its purchasing capacity would not have been significantly affected. Therefore, despite finding a break in years close to the crisis, it is not the main one.

As Dean, Fung and Wang (2008) argue, China has become a major player in world trade, being the "factory of the world", so there is greater dependence of other countries on China than of China on other countries in terms of production of goods and manufacturing, as was seen during the COVID-19 pandemic. This was also pointed out by Rosa Puertas and Martí Selva (2004), who at the time urged support for the internationalization of Spanish companies, given that at the beginning of the twenty-first century China was already the main world producer since it implemented market reform in 1978, and in this way it could avoid a very strong dependence and take advantage of the situation. Pablo Bustelo (2008) also pointed out that Spain was not prepared to exploit the advantages of international trade in the new emerging markets.

In short, Spain has consolidated its trade relationship with China, which is an important partner. This can be seen, above all, in the analysis of imports. This relationship has intensified since the signing of the trade agreement in 1979, which added to the process of reform and opening up of both countries, and their respective economic integration processes, allowed the consolidation of bilateral Spanish-Chinese trade. The stages found using the "naive approach" methodology exhibit an economic logic from a historical and political perspective in the case of imports. Exports, on the other hand, show a more erratic and random behavior if we compare the econometric periodization with this perspective. This is due to the lesser importance that Spain has as a trading partner of China as far as Chinese imports are concerned.

5. Descriptive statistics

After conducting the analysis of structural change of Spain with China, the most important descriptive statistics of each stage of bilateral trade between the two countries are studied. To this end, the two main stages arising from the first change detected for each case are analysed. In addition, the set of stages found considering the whole analysis of structural change and the different sub-periods are also examined. The analysis is carried out for both the imports made by Spain from China and for the exports made by Spain to China.

In the case of imports, the first change was detected in 2009. Table 3 shows the main statistics for each of these two stages.

Table 3 – Descriptive statistics of Spanish imports from China (2 stages) over here

It can be observed that the trade relationship has tended to consolidate. Thus, the mean, maximum and minimum values show a higher value in the second, more recent period. This can be seen especially when looking at the minimum value. However, note that the maximum value of both periods is practically the same, i.e. during the second period, as observed in the preliminary analysis with graphs, import trade growth displays a certain tendency to stagnate. The post-crisis trade regime seems to have truncated the previous continuous and sustained growth.

On the other hand, it may also be observed that the skewness is positive in the first period, but negative in the second. A negative skewness indicates that the smaller values within the study sample have a higher frequency than the higher values within the study sample. Conversely, a positive skewness would indicate just the opposite, that higher values predominate over lower values. In the case studied, as there is negative skewness, it is concluded that there are more small values than large ones in the second period, in contrast to the first stage, corroborating the period of stagnation and slow growth experienced by trade relations compared to the first stage.

 Given that the series in both periods display an increasing trend, what the negative asymmetry coefficient indicates that the series grew very little or not at all for a long time and then suddenly experienced a strong boom, i.e., the previous trade regime would have partially recovered as the crisis subsided.

With respect to kurtosis, negative values are observed in both cases. A high kurtosis indicates that higher than expected values appear with high frequency. A low kurtosis indicates that values below what is expected appear with high frequency. Negative kurtosis is obtained in both periods, indicating that values below what is expected appear more frequently. This coincides with the findings of Noguer (2006), who pointed out that during the 1990s bilateral trade between Spain and China had surpassed its possibilities, although it seemed that it had not reached its full potential once China joined the World Trade Organization.

The four-stage results generated the values shown in Table 4, and show in greater detail the evolution of the bilateral relationship of Spanish-Chinese foreign trade.

Table 4 – Descriptive statistics of Spanish imports from China (4 stages) over here

As with the two-stage results, the four-stage results show that as the period progressed, the relationship became more consolidated, although in the last period, as previously mentioned, it is not very clear whether or not the relationship continued to consolidate due to the outbreak of the economic crisis. It should be borne in mind that structural change was detected in 2009, once the Great Recession had begun and at a time when the crisis was hitting Spain the hardest. Pablo Bustelo (2008) agrees that the trade relationship had been consolidated and that it was predicted to continue consolidating, but points out that Spain was not prepared to take advantage of emerging markets, and that this could become a reality more than ever after the crisis.

The asymmetry again shows a positive sign in some cases and a negative sign in others. It is in the intermediate stages where it shows a positive sign, indicating that higher values predominate in those periods. This is logical, considering that it covers the period from the establishment of trade relations to the outbreak of the crisis, i.e., the periods most prone to experiencing greater growth and consolidation of the bilateral relationship. Nevertheless, the kurtosis continues to show a negative sign in all the periods considered.

As for exports, the results are shown for both two-stage and four-stage, after applying the breakout analysis to the pre-crisis period. The descriptive statistics for Spain's two-stage exports to China are shown in Table 5.

Table 5 – Descriptive statistics of Spanish exports to China (2 stages) over here

The behavior is similar to that of imports. Thus, the values of the statistics referring to the mean, minimum and maximum are higher in the second stage. It should be borne in mind that, as in the case of imports, in this second stage there had already been a political change in both countries, diplomatic relations had been established and various trade and economic cooperation agreements had been ratified. And although trade relations had been growing closer since the establishment of diplomatic relations and the signing of the first trade agreements, it was not until the second stage that they became continuous and sustained. The asymmetry coefficients again show positive values in the second stage and negative values in the first, and as with imports, the kurtosis is negative for both periods.

Finally, the results of the five-stage exports are shown and the values obtained are analyzed, showing the main statistics of the result. The values obtained for the statistics are shown in Table 6.

Table 6 – Descriptive statistics of Spanish exports to China (4 stages) over here

The values obtained by considering more stages once again lead to conclusions similar to those of the general two-stage analysis. The previous case is again reflected with two periods. It is striking that the main change was not detected at the beginning of the economic crisis and the Great Recession. However, it is logical that no structural change was detected in the case of Spanish exports to China given that, as previously mentioned, China was experiencing double-digit economic growth in this decade. Thus, any drop in exports that might have occurred would have been due to the fall in production in Spain rather than to the decline in purchasing power in China, which during this period showed sustained growth and consolidated its middle class. However, the latter period does include practically the period since the Great Recession.

6. Comparison with France and Italy

Has the case of Spain been unique or is it, on the contrary, similar to that of other neighboring countries? To answer this question, a comparison of the Spanish case with the French and Italian cases was carried out. France and Italy are two countries similar to Spain in terms of geographical size and level of development. In addition, they have common cultural characteristics, forming what is known as the Latin Arc of Europe.

To compare the series of the three countries, we have proceeded in the same manner. First, a preliminary analysis of the foreign trade series of Spain, France and Italy with China, both in exports and imports, was carried out, based on the graphic analysis. Subsequently, a structural change analysis was conducted.

Figure 2 allows a comparison of the evolution of the foreign trade of Spain, France and Italy with China in imports of goods. The series have been taken in logarithms to avoid dispersion problems. Imports by Spain (M\_ES), France (M\_FR) and Italy (M\_IT) from China are shown, taking 1973 as the base year, so that the growth can be studied in detail.

Figure 2 – Imports from China to Spain, France and Italy (Base year 1973) over here

If we compare the evolution of Spain with that of France and Italy, we can observe that they have a very similar behavior in terms of stages, but with lower levels of growth. The fact that diplomatic relations with China were established earlier by these countries would partly explain this fact, since they would have been trading with China decades before Spain, as Pérez Saiz (2018) points out, so the trade relationship would be more established and its growth would be more moderate. Likewise, the growth of these countries is practically identical. However, the lower export propensity to China by Spanish companies compared to those of other European countries should not be justified exclusively by this fact, but also by the vocation of Spanish companies towards Europe and Latin America for socio-cultural reasons and by the characteristics of Spain's business fabric which is less prone to export.

Figure 3, on the other hand, shows the evolution of goods exports in logarithms from Spain (X\_ES), France (X\_FR) and Italy (X\_IT) to China.

Figure 3 – Exports from Spain, France and Italy to China (Base year 1973) over here

Contrary to what has occurred with imports, exports exhibit a more erratic and random behavior, with ups and downs and abrupt changes in trend, although they seem to smooth out at the end of the period and there is a growing trend considering the period as a whole. Once again, Spain shows higher values than France and Italy but a very similar evolution.

This more random and erratic behavior could be explained by the reversal of buyer and seller roles with respect to imports. China has become one of the most important trade partners for these countries. However, China has more important trade patterns outside the European Union as the United States. In fact, China imports mostly from the United States and surrounding countries.

The results obtained in the structural change analysis for France and Italy and their comparison with Spain are shown in the following table.

Table 7 – Structural change analysis in imports of Spain, France and Italy from China over here

The first structural change for all the economies considered coincides or is close to the onset of the Great Recession. The Spanish economy contracted by 3.8% in 2009, the year in which the main change was detected for the sample as a whole, and despite very low growth of 0.2% the following year, it contracted again in the following years. Meanwhile, the French economy began to suffer as a result of the outbreak of the crisis, although in 2008 it still grew by 0.3%. In 2009 it entered recession and experienced a fall of 2.9%, so that French imports also fell, even though France began its recovery before Spain. This result is repeated for the Italian case, although Italy fell into recession before France, with the Italian economy growing by 1.5% in 2007, but going into recession the following year. The most remarkable thing is that similar values or even the same are obtained for all countries and in the same order.

Table 8 shows the results for exports from Spain, France and Italy to China.

Table 8 – Structural change analysis in exports of Spain, France and Italy from China over here

For France, the same main change (first change) is obtained as in the case of imports, the year 2011. This year again coincides with the period of the Great Recession, which, according to the results found, would have significantly modified China's bilateral trade relationship with European countries. The second change is in the year 2000, close to that obtained for the Spanish case in 2003. The results obtained again coincide with China's entry into the World Trade Organization a year later, which would imply the elimination of trade barriers by the Asian giant and greater export possibilities. Finally, the third change for France was detected in 1985, coinciding with the first change in Italy and close to the first in Spain, and also coinciding with the change observed in imports.

On the other hand, Italian exports to China experienced the first change in the mid-1980s, parallel with the slow development of China's Reform and Opening-up process, and then there was a break also in 2006, close to the Great Recession, and 1998, at the beginning of the 2000s, in the same way as for the other cases.

It is noteworthy that, in the case of exports, unlike in the case of imports, the first change, the main one comprising the whole sample, is not found relatively close to the Great Recession, except in the case of France, and a different date is obtained for each country. Likewise, it is noteworthy that for exports the break is found at the beginning of the 2000s or at the end of the previous decade. This could indicate that the behavior of exports has responded more to an internal purchasing policy of the Asian giant, than to the European historical-political context.

1. Conclusions

Bilateral trade between China and Spain experienced its most significant change around 2009 for Spanish imports from China and around 1987 for exports to China. In 1973, China and Spain formalized diplomatic relations, and in 1979, shortly after the beginning of the processes of reform, opening up and economic integration in both countries, the first trade agreement was signed. Since then, the bilateral trade relationship has been developing as the economies have opened up and new agreements have been signed.

The result obtained with the structural change analysis for Spain's imports is very close to that obtained for France and Italy. All of them show that two major stages can be distinguished: one from the beginning of the period up to approximately the Great Recession, and the other from the beginning of the crisis to the present day. Other structural changes detected refer to the consolidation of the trade relationship since the 1980s, the intensification of the same in the 1990s and, in the case of exports, the inclusion of China in the WTO. Exports, on the other hand, show a more differentiated and erratic behavior.

In this way, we have been able to periodize trade relations between several European and China from the last decades of the twentieth century to the present day by means of mathematical and econometric analysis, without establishing the stages a priori as is usually done in time series analysis. The results are consistent and coincide with different milestones of trade policy and the economic situation in the case of imports, while exports have a more irregular behavior.

Regarding the two major periods established, it may be observed that in the second period trade is much more consolidated, both for imports and exports, although it shows a tendency to stagnation. This conclusion is reached both for the first analysis, which considers only the two main periods established from the analysis of structural change, and for the analysis with more sub-periods.

The result obtained for all the countries is very similar, so it can be concluded that the research carried out is useful when making a historical-economic approach to the evolution of trade relations between China and the European Union as a whole.

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Appendix - Imports of Spain (M\_ES), France (M\_FR) and Italy (M\_IT) from China and Exports from Spain (X\_ES), France (X\_FR) and Italy (X\_IT) to China

(Millon dollars)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Año | M\_ES | M\_FR | M\_IT | X\_ES | X\_FR | X\_IT |
|  |  |  |  |  |  |  |
| 2020 | 3,35E+10 | 4,12E+10 | 3,67E+10 | 9,34E+09 | 2,00E+10 | 1,47E+10 |
| 2019 | 3,26E+10 | 5,96E+10 | 3,54E+10 | 7,61E+09 | 2,34E+10 | 1,45E+10 |
| 2018 | 3,18E+10 | 5,90E+10 | 3,65E+10 | 7,42E+09 | 2,46E+10 | 1,55E+10 |
| 2017 | 2,90E+10 | 5,54E+10 | 3,20E+10 | 7,06E+09 | 2,13E+10 | 1,52E+10 |
| 2016 | 2,64E+10 | 5,10E+10 | 3,01E+10 | 5,57E+09 | 1,77E+10 | 1,22E+10 |
| 2015 | 2,65E+10 | 5,19E+10 | 3,13E+10 | 4,94E+09 | 1,99E+10 | 1,15E+10 |
| 2014 | 2,62E+10 | 5,64E+10 | 3,33E+10 | 5,42E+09 | 2,15E+10 | 1,39E+10 |
| 2013 | 2,31E+10 | 5,42E+10 | 3,06E+10 | 5,24E+09 | 1,96E+10 | 1,30E+10 |
| 2012 | 2,27E+10 | 5,35E+10 | 3,21E+10 | 4,84E+09 | 1,94E+10 | 1,15E+10 |
| 2011 | 2,59E+10 | 5,74E+10 | 4,11E+10 | 4,72E+09 | 1,87E+10 | 1,39E+10 |
| 2010 | 2,50E+10 | 4,89E+10 | 3,81E+10 | 3,51E+09 | 1,45E+10 | 1,14E+10 |
| 2009 | 2,01E+10 | 4,12E+10 | 2,69E+10 | 2,77E+09 | 1,09E+10 | 9,20E+09 |
| 2008 | 3,03E+10 | 4,55E+10 | 3,46E+10 | 3,18E+09 | 1,33E+10 | 9,40E+09 |
| 2007 | 2,54E+10 | 3,87E+10 | 2,97E+10 | 2,92E+09 | 1,24E+10 | 8,58E+09 |
| 2006 | 1,81E+10 | 3,01E+10 | 2,25E+10 | 2,16E+09 | 1,01E+10 | 7,07E+09 |
| 2005 | 1,46E+10 | 2,59E+10 | 1,76E+10 | 1,90E+09 | 7,20E+09 | 5,66E+09 |
| 2004 | 1,06E+10 | 2,05E+10 | 1,47E+10 | 1,45E+09 | 6,57E+09 | 5,45E+09 |
| 2003 | 7,57E+09 | 1,50E+10 | 1,08E+10 | 1,24E+09 | 5,19E+09 | 4,30E+09 |
| 2002 | 5,46E+09 | 1,07E+10 | 7,83E+09 | 7,52E+08 | 3,27E+09 | 3,75E+09 |
| 2001 | 4,55E+09 | 9,70E+09 | 6,67E+09 | 5,68E+08 | 2,94E+09 | 2,90E+09 |
| 2000 | 4,30E+09 | 9,64E+09 | 6,45E+09 | 5,07E+08 | 2,97E+09 | 2,15E+09 |
| 1999 | 3,92E+09 | 8,05E+09 | 5,32E+09 | 4,71E+08 | 3,26E+09 | 1,93E+09 |
| 1998 | 3,22E+09 | 7,22E+09 | 4,84E+09 | 5,14E+08 | 3,31E+09 | 2,06E+09 |
| 1997 | 2,87E+09 | 6,64E+09 | 4,42E+09 | 4,88E+08 | 3,42E+09 | 2,53E+09 |
| 1996 | 2,42E+09 | 6,03E+09 | 4,03E+09 | 5,97E+08 | 2,42E+09 | 2,87E+09 |
| 1995 | 2,24E+09 | 5,14E+09 | 3,92E+09 | 8,50E+08 | 2,64E+09 | 2,69E+09 |
| 1994 | 1,80E+09 | 4,11E+09 | 3,13E+09 | 8,00E+08 | 2,17E+09 | 2,29E+09 |
| 1993 | 1,41E+09 | 3,75E+09 | 2,59E+09 | 6,50E+08 | 1,60E+09 | 2,47E+09 |
| 1992 | 1,62E+09 | 3,50E+09 | 2,78E+09 | 2,70E+08 | 1,39E+09 | 1,50E+09 |
| 1991 | 1,15E+09 | 3,03E+09 | 2,28E+09 | 3,23E+08 | 1,37E+09 | 1,26E+09 |
| 1990 | 7,42E+08 | 2,21E+09 | 1,81E+09 | 3,03E+08 | 1,41E+09 | 9,65E+08 |
| 1989 | 5,29E+08 | 1,73E+09 | 1,69E+09 | 2,27E+08 | 1,40E+09 | 1,24E+09 |
| 1988 | 3,86E+08 | 1,44E+09 | 1,43E+09 | 2,20E+08 | 9,28E+08 | 1,30E+09 |
| 1987 | 2,50E+08 | 1,10E+09 | 1,02E+09 | 2,69E+08 | 8,50E+08 | 1,09E+09 |
| 1986 | 2,40E+08 | 7,07E+08 | 6,81E+08 | 3,17E+08 | 6,65E+08 | 1,01E+09 |
| 1985 | 1,34E+08 | 4,99E+08 | 5,89E+08 | 4,73E+08 | 7,83E+08 | 7,95E+08 |
| 1984 | 1,14E+08 | 4,40E+08 | 4,35E+08 | 1,87E+08 | 3,12E+08 | 4,49E+08 |
| 1983 | 8,43E+07 | 4,32E+08 | 4,15E+08 | 1,08E+08 | 4,42E+08 | 2,65E+08 |
| 1982 | 9,93E+07 | 4,37E+08 | 4,28E+08 | 1,11E+08 | 3,45E+08 | 2,10E+08 |
| 1981 | 1,12E+08 | 5,08E+08 | 3,99E+08 | 7,43E+07 | 2,74E+08 | 3,21E+08 |
| 1980 | 1,18E+08 | 4,68E+08 | 4,37E+08 | 6,59E+07 | 3,04E+08 | 2,56E+08 |
| 1979 | 1,33E+08 | 3,27E+08 | 3,95E+08 | 1,28E+08 | 3,39E+08 | 2,79E+08 |
| 1978 | 6,79E+07 | 2,26E+08 | 2,00E+08 | 6,58E+07 | 1,98E+08 | 1,89E+08 |
| 1977 | 4,21E+07 | 1,94E+08 | 1,61E+08 | 2,21E+07 | 9,53E+07 | 7,86E+07 |
| 1976 | 4,70E+07 | 1,94E+08 | 1,55E+08 | 1,72E+07 | 3,50E+08 | 1,25E+08 |
| 1975 | 3,43E+07 | 1,73E+08 | 1,29E+08 | 2,33E+07 | 3,77E+08 | 1,46E+08 |
| 1974 | 2,12E+07 | 1,82E+08 | 1,17E+08 | 1,09E+07 | 1,60E+08 | 1,05E+08 |
| 1973 | 2,04E+07 | 1,47E+08 | 1,28E+08 | 6,35E+06 | 8,99E+07 | 7,63E+07 |

Source: Own elaboration based on COMTRADE data.

Figure 1 – Spanish imports from China and Spanish exports to China, 1973-2020 (millions of dollars)

Source: Own elaboration based on COMTRADE data

Table 1 – Analysis of structural change in imports

|  |  |  |
| --- | --- | --- |
| Structural change | Year | Wald Test |
|  |  |  |
| First change | 2009 | 140,808\*\*\* |
|  |  | (0,000) |
| Second change | 1989 | 11,608\*\*(0,049) |
| Third change | 1982 | 18,369\*\*\* |
|  |  | (0,003) |

Source: Own elaboration

Table 2 – Analysis of structural change in exports

|  |  |  |
| --- | --- | --- |
| Structural change | Year | Wald Test |
|  |  |  |
| First change | 1987 | 55,136\*\*\* |
|  |  | (0,000) |
| Second change | 2003 | 16,352\*\*\* |
|  |  | (0,006) |
| Third change | 2007 | 12,536\*\* |
|  |  | (0,033) |

Source: Own elaboration

Table 3 – Descriptive statistics of Spanish imports from China (2 stages)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Period | Mean | Median | Variance | Minimum | Maximum | Asymmetry | Kurtosis |
| 2009-2020 | 24,004 | 23,993 | 0,024 | 23,725 | 24,235 | -0,061 | -0,497 |
| 1973-2008 | 20,391 | 20,643 | 4,690 | 16,832 | 24,134 | 0,018 | -1,220 |

Source: Own elaboration

Table 4 – Descriptive statistics of Spanish imports from China (4 stages)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Period | Mean | Median | Variance | Minimum | Maximum | Asymmetry | Kurtosis |
| 2009-2020 | 24,004 | 23,993 | 0,024 | 23,725 | 24,235 | -0,061 | -0,497 |
| 1989-2008 | 22,082 | 21,990 | 1,300 | 20,086 | 24,134 | 0,225 | -0,650 |
| 1982-1988 | 18,905 | 18,712 | 0,320 | 18,250 | 19,771 | 0,436 | -1,396 |
| 1973-1981 | 17,791 | 17,667 | 0,513 | 16,832 | 18,704 | -0,042 | -1,515 |

Source: own elaboration

Table 5 – Descriptive statistics of Spanish exports to China (2 stages)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Period | Mean | Median | Variance | Minimum | Maximum | Asymmetry | Kurtosis |
| 1987-2020 | 21,064 | 21,016 | 1,480 | 19,209 | 22,958 | 0,006 | -1,490 |
| 1973-1986 | 17,916 | 18,063 | 1,624 | 15,664 | 19,975 | -0,204 | -0,758 |

Source: own elaboration

Table 6 – Descriptive statistics of Spanish exports to China (4 stages)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Period | Mean | Median | Variance | Minimum | Maximum | Asymmetry | Kurtosis |
| 2007-2020 | 22,331 | 22,350 | 0,141 | 21,743 | 22,958 | -0,118 | -0,863 |
| 2003-2006 | 21,223 | 21,228 | 0,064 | 20,941 | 21,495 | -0,076 | -3,208 |
| 1987-2002 | 19,914 | 20,025 | 0,205 | 19,209 | 20,561 | -0,233 | -1,313 |
| 1973-1986 | 17,916 | 18,063 | 1,624 | 15,664 | 19,975 | -0,204 | -0,758 |

Source: own elaboration

Figure 2 – Imports from China to Spain, France and Italy (Base year 1973)

Source: Own elaboration based on COMTRADE data

Figure 3 – Exports from Spain, France and Italy to China (Base year 1973)

Source: Own elaboration based on COMTRADE data.

Table 7 – Structural change analysis in imports of Spain, France and Italy from China

|  |  |  |  |
| --- | --- | --- | --- |
| Structural change | Spain | France | Italy |
|  |  |  |  |
| First change | 2009 | 2011 | 2007 |
| Wald Test | 140,808\*\*\*(0,000) | 143,804\*\*\*(0,000) | 179,210\*\*\*(0,000) |
|  |  |  |  |
| Second change | 1989 | 1987 | 1987 |
| Wald Test | 11,608\*\*(0,049) | 32,254\*\*\*(0,000) | 9,473(0,117) |
|  |  |  |  |
| Third change | 1982 | 1979 | 1979 |
| Wald Test | 18,369\*\*\*(0,003) | 11,586\*\*(0,050) | 28,536\*\*\*(0,000) |
|  |  |  |  |

Source: own elaboration

Table 8 – Structural change analysis in exports of Spain, France and Italy from China

|  |  |  |  |
| --- | --- | --- | --- |
| Structural change | Spain | France | Italy |
|  |  |  |  |
| First change | 1987 | 2011 | 1985 |
| Wald Test | 55,136\*\*\*(0,000) | 15,975\*\*\*(0,007) | 59,451\*\*\*(0,000) |
|  |  |  |  |
| Second change | 2003 | 2000 | 2006 |
| Wald Test | 16,352\*\*\*(0,006) | 4,794(0,593) | 20,054\*\*\*(0,001) |
|  |  |  |  |
| Third change | 2007 | 1985 | 1998 |
| Wald Test | 12,536(0,033)\*\* | 4,049(0,718) | 19,796\*\*\*(0,001) |
|  |  |  |  |

Source: own elaboration

1. According to COMTRADE (United Nations) [↑](#footnote-ref-1)
2. *Spanish Foreign Trade Statistics* (1973) Ministry of Finance [↑](#footnote-ref-2)
3. See *China-Spain Relations* (2018) Real Instituto Elcano [↑](#footnote-ref-3)
4. *Ibidem.* [↑](#footnote-ref-4)
5. *China Statistical Yearbook* (2018) National Bureau of Statistics of China. [↑](#footnote-ref-5)
6. See VIDAL, E. (2018) Trade Patterns of China and India, Bank of Spain. [↑](#footnote-ref-6)