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Foreign Trade Traps in the European Periphery: Spain, 1870-1913*

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Resumen

En este artículo se estudian las dificultades que la balanza comercial creó al proceso de integración de España en la economía internacional en las décadas previas a la Primera Guerra Mundial. Se comienza analizando algunos de los rasgos estructurales del comercio exterior español. A través de un análisis econométrico de las series de importaciones y exportaciones puede observarse la presencia de una tendencia estructural hacia el déficit comercial, que actuaba cuando España crecía a tasas similares a las de sus socios comerciales. Se comprueba también que, en ausencia de otros mecanismos compensatorios, el ajuste en los pagos exteriores podía llegar a través de medidas protectoras o de movimientos del tipo de cambio.

Abstract

In this article we research into the difficulties that foreign trade imposed on Spanish process of integration into the international economy in the years prior to the First World War. We start out by examining some features of the foreign trade structure of the country. By means of an econometric analysis of import and export series, it is possible to observe the presence of a trend towards trade deficit, which was in force when Spain grew at a rate similar to that of its trading partners. We also check that, in the absence of these compensatory mechanisms, adjustment in foreign payments could be reached by means of protective measures and the exchange rate.

Key Words: Foreign Trade, Balance-of-Payments Constraints

Code (Journal of Economic Literature): N13

1.   Introduction

The peripheral[1] condition of a country seems to be a positive factor in its economic development during phases of international economic growth. With regard to this, backwardness can help an economy to attain, under certain conditions, rates of growth higher than those of more advanced countries. Open economy forces play a main role in this process. Through them, core economies may offer peripheral countries a number of advantages: robust markets, the possibility of benefitting (through prices) from increases in productivity achieved overseas, and access to advanced technologies without incurring the costs involved in creating them. So, integration into the international economy seems to be one of the key factors which allows countries to profit from their backwardness[2].

The decades before the First World War were both a period of growth in most developed economies in Europe, and of a deepening of international economic relations. This situation could have opened up prospects of economic growth in peripheral countries. Particularly from the 1870s on, a number of European economies took advantage of this opportunity and partially closed the gap existing between them and the core. However, this was not the general response. Another larger group of countries was incapable of taking up the challenge. So, these countries achieved growth rates that were mediocre in comparative terms[3]. One of the elements that can explain these cases is their lack of integration into the international economy.

Spain is one of the clearest examples of a country that was incapable of responding to the challenge issued by the advanced countries. Throughout the period 1870-1913, the Spanish economy maintained rates of annual accumulative growth that were lower than those of its more developed

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[1] In this paper the concept "peripheral" refers to backwardness relative to core economies.

[2] Growth potential emerging from peripheral condition is a main issue in the seminal works by Gerschenkron (1962), Sandberg (1982) and Abramovitz (1986). Open economy forces contribution to this process is implicitly present in some of these authors' works, and has been carefully measured, for instance, in Taylor and Williamson (1994), or O'Rourke and Williamson (1995).

[3] The different paths of development of countries of the European periphery and their response to the challenges of the "core" in the period prior to 1914 are described in detail in Berend and Ranki (1982).

neighbours[4]. One of the explanations for Spain's relative "failure" may be the absence of advances in the process of integration in the international economy throughout this period. This interpretation has been upheld by several authors recently. On the one hand, it has been pointed out that (since 1891) excessive tariff protection prevented the Spanish economy from benefitting from the foreign economic juncture through the channel of foreign trade, and at the same time discouraged the private sector from seeking higher levels of competitiveness[5]. On the other hand, it has been indicated that the non-inclusion of the Spanish currency in the gold standard acted as a brake on foreign investment in our country. In this way, limited integration into the international commodity and capital markets seems to have been a factor constraining Spanish economic growth[6].

Development Economics has always been very concerned with the study of this type of problems. In some classical contributions, such as Prebisch (1959), Houthakker and Magee (1969) or Findlay (1971), the analysis of these problems has focused on foreign trade issues. These authors have pointed out that developing countries used to have a higher income elasticity of demand for their imports than the foreign income elasticity of demand for their exports. Therefore, they tend to experience more rapid import growth than export growth and a progressive deterioration in their trade balance. In absence of compensatory items within the balance of payments this situation generates foreign exchange scarcity and pressure on the exchange rate. In these authors' works, structural foreign trade troubles can be a constraint on the economic integration process of developing countries.

This article attempts to test if this was the case in the Spanish economy during the period 1870-1913. To do so we analyse the structural features of the Spanish foreign trade in order to test the existence of this trend toward commercial balance deterioration. Next we try to study the importance of other items of Spanish balance of payments in order to know the possibilities of

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[4] This may be observed in the most recent estimations of the Spanish Gross Domestic Product. See Prados (1995), which confirm the view of the same author, expressed in comparative terms elsewhere, such as in Prados (1988), and Prados, Dabán and Sanz (1992). Carreras (1989b) and Tortella (1994) have made similar observations about this period.

[5] This hypothesis is defended by Prados (1992) and Prados and Tena (1994), among others.

[6] This idea is defended by Martín Aceña (1994). Spain never adopted the discipline of the gold standard, either before or after the First World War.

making up for that trend and advancing in the process of integration into the international economy[7].

The structure of the article is as follows: Section 2 describes the model applied to the analysis of Spanish foreign trade and the existing precedents of similar analyses. In Section 3 the results obtained from the estimation of the model are described. Section 4 discusses the implications of these results, and Section 5 relates them to external sector behaviour and to the economic policy of that period. Section 6 consists of the conclusions we have drawn and some suggestions for further research.

2.   Analytical framework

In this section we describe the analytical framework employed to study the features of Spain's foreign trade between 1870 and 1913. We are interested in long-term factors; in this way, we hope to reach some conclusions about the structural problems of the Spanish commercial balance.

The model put forward is composed of two typical demand functions, in which the volume of commercial flow depends on the income of importing countries and the relative prices of the goods traded. Besides these typical variables, it has been considered necessary to include an additional variable that might reflect the degree of openness of the importing countries, given that it has a direct influence on the quantities imported and exported. By incorporating this new variable our aim has been to obtain an unbiased estimation of the relationship between imports and domestic income and exports and world income[8]. Thus, the "openness rate" variable seeks to take into account the changes in the volume of Spanish imports and exports caused by changes in the trade regime of Spain and its trading partners.

The import demand function is the following:

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[7] In fact, this analysis would require the global consideration of Spanish balance of payments and the use of complete models of the external sector. However, the scarcity of relevant statistical information does not allow us to do such a study. This made us choose an indirect approach: a systematic analysis of foreign trade is completed with the use of the scarce available information about the rest of the items of the balance of payments.

[8] Giovanni Federico criticises some estimations of export functions made for Italy and Spain for making use of foreign trade indicators as proxies of the income, without considering the level of openness of the economies. The same criticism may be made of the direct use of the income series, since demand is affected by changes in the trade regime. See Federico (1992), 279.

$$M_d = M_d(Y, P^* e/P, O) \qquad (1)$$

where Y is the national income, P^* the international prices of imported products, P the prices of domestic import substitutes, e the nominal exchange rate and O the openness variable.

The export demand function has the following form:

$$X_d = X_d(Y^*, P/P^* e, O^*) \qquad (2)$$

where Y^* is the income of the rest of the world, P the Spanish export prices, P^* the international prices of Spanish export substitutes produced abroad, e the nominal exchange rate and O^* the openness variable for the rest of the world.

The functions are expressed in a log-linear form, as is usual in this type of exercise. So, the coefficients of the regressors represent the income and price elasticities of import and export demand. The expected signs of the elasticities are those common to a demand function. It is assumed that import demand rises in response to increases in the national income or in the openness degree and to decreases in the relative import prices. Similarly, export demand rises in response to increases in world income and openness degree and to decreases in relative export prices.

A similar exercise to ours can be found in Prados (1988)[9]. This author offers the OLS estimation of a log-linear import demand function for the periods 1849-1883 and 1849-1913, and another of an export demand function for the periods 1815-1880 and 1815-1913. In this article we study a shorter period of time, and apply a different method than Prados did. The main difference is the incorporation of cointegration techniques. The fundamental rationale behind this methodological change is our wish to make conclusions about the long-term behaviour of the variables analysed and about the structural or non-structural character of the problems detected. Our objective is to test the existence of a cointegration relationship among the variables that appear in each function and, if positive results are achieved, estimate this long-term relationships. The existence of cointegration relationships may be interpreted as

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[9] See pp. 184-187. A similar work, only for export demand, can be found in Prados (1982), 29-32.

a sign of stability of the long-term relationships estimated, although it is necessary to confirm this inference with further tests.

In the event that a cointegration relationship is found among the variables, its best representation will be an error-correction model. This consists of a short-term part (with the variables expressed in differences), and a long-term part (with the variables expressed in levels). The resultant specification is the following (D is the difference operator):

$$D(M) = \alpha_0 + \alpha_1 D(Y) + \alpha_2 D(P^* e/P) + \alpha_3 D(O) + \alpha_4 \{M(-1) - \beta_0 - \beta_1 Y(-1) -$$

$$-\beta_2 (P^* e/P)(-1) - \beta_3 O(-1)\} \tag{3}$$

$$D(X) = \gamma_0 + \gamma_1 D(Y^*) + \gamma_2 D(P/P^* e) + \gamma_3 D(O^*) + \gamma_4 \{X(-1) - \delta_0 - \delta_1 Y^*(-1) -$$

$$-\delta_2 (P/P^* e)(-1) - \delta_3 O^*(-1)\} \tag{4}$$

In this way, we will be able to distinguish the short-term import and export demand elasticities (parameters α_1, α_2, α_3, γ_1, γ_2, γ_3) from the long-term ones (parameters β_1, β_2, β_3, δ_1, δ_2, δ_3) and focus our attention on the latter. Furthermore, through parameters α_4 and γ_4 we will be able to test the model's tendency towards equilibrium: the negative value of these parameters would indicate that exogenous impacts have a short-term effect, but are overcome as time passes, for the variables permanently tend to return to their structural path (represented by the long-term parameters).

The theory recognises different mechanisms due to which the import and export demand elasticities may change[10]. A transitory change in the short-term elasticities (parameters α_1, α_2, γ_1, γ_2 in equations (3) and (4)) may be caused by exogenous impacts of certain magnitude, and specifically by changes in tariffs or monetary policy that agents perceive as temporary, which lead them to postpone their decisions until these disturbances have disappeared. In the long term, however, the elasticities (parameters β_1, β_2, δ_1, δ_2 in equations (3) and (4)) change in accordance with the process of economic development, which gradually transforms the imports and exports pattern of the country. This

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[10] The instability factors of the income and price elasticities in estimations of import and export functions can be seen in Magee (1975), and with an applied approach in Stern, Baum and Green (1979).

process is autonomous, but may be stimulated by economic policies with structural effects.

Our interest lies in the changes in long-term elasticities. In the event that their stability is confirmed, this would indicate the persistence of the structural features of the Spanish trade balance throughout the period. This persistence could be interpreted as an indication of the meagre advances made by the Spanish economy in the process of economic development and also of the absence of structural efficiency in the economic policy applied during this period.

3.   Empirical results.

This section presents the results of the estimation of the import and export demand functions. All the series employed in the econometric work are natural logarithms of indices (with 1913=100). The statistical sources are described in the Appendix.

First, the order of integration of the variables was studied. The Dickey-Fuller test was used for this purpose. In each case, a constant and a time trend was or was not included in the regression of the test, depending on the individual significativeness of each one. In all cases, it is accepted that the variables considered are integrated of order 1 and not integrated of order 2. The values of the Durbin-Watson statistic in the regression corresponding to the test reinforce the validity of this conclusion. The results of the test are compiled in table 7.1 (Appendix). Perron (1989) warns of the bias of the Dickey-Fuller test towards acceptance of the unit root hypothesis when a structural breakdown in the series analysed exists. When this could be the case, the unit root test was repeated making use of the specification and critical values proposed by this author, and the results obtained by means of the Dickey-Fuller test were confirmed[11].

As the order of integration is the same for all the variables that feature in each function, the Engle-Granger[12] representation theorem allows the existence of a cointegration relationship between them to be tested. For this purpose, the

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[11] Starting from the study of each variable behaviour, a change in mean has been tested in Spanish relative import prices, exports and openness series; a change in deterministic trend has been tested in imports and in domestic income series; and finally, a change both in mean and in trend has been tested in relative export prices and in Spanish openness series.
[12] Engle and Granger (1987).

Engle-Granger cointegration test was applied. The test allows the non-cointegration hypothesis to be rejected with a significance level of 5% in the export function and of 10% in the import one[13]. This is an indication in favour of the existence of a long-term relationship between the series, which remains stable throughout the period considered. The stability hypothesis was confirmed by the recursive estimation of the long-term equation. The results of the Engle-Granger test are shown in table 7.2 (Appendix).

Next, we estimated the error correction model in two stages[14]. In the first one, the long-term relationship between the variables (cointegration vector) was estimated. In the second one, the complete model was estimated, including as regressors the first differences of each of the explanatory variables and the series of errors, lagged a period, from the cointegration vector. This method of proceeding allows the coefficients of the variables in differences to be considered as short-term elasticities of imports and exports with respect to each of the regressors. The results obtained are shown in table 7.3 (Appendix).

The lagged errors of the cointegration vector are significant in the explanation of the variations in both imports and exports. In turn, the negative value of their coefficients indicates that the estimated long-term parameters represent equilibrium relationships and that the endogenous variables tend to return to their structural path with the regressors when they are removed by exogenous impacts.

The remainder of the coefficients have the expected signs. The tests to which we subjected the residues of the short-term models endorse their good behaviour. However, the adjustment in the complete model is far from satisfactory, specially in the case of import function, which, furthermore, does not pass the WHITE Heteroskedasticity test. These problems reflect that, although the model is useful in order to understand the structural behaviour of the endogenous variables, it proves to be inadequate when seeking to explain their short-term dynamics.

4. Interpretation of the evidence: the structural problems of Spanish foreign trade.

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[13] The application of the Johansen test gives also positive results.
[14] Estimation of the error correction model in one stage essentially offers the same results.

Among the estimates obtained, we have focused our attention on the long-term relationships. These provide information about the structural characteristics of Spanish foreign trade during the period. The summary of estimated long-term elasticities is shown in table 4.1. Given the uncertainty associated with retrospective statistics, the values shown should not be seen as exact figures, but as ranges around which the true elasticities would be situated.

TABLE 4.1
Estimated Long-Term Elasticities

	Import Demand	Export Demand
Income	1,715	0,647
Prices	-0,682	-1,11

SOURCES: See Appendix.

The values of the estimated elasticities are related to an import and export pattern that is typical of a country in the first stages of its development. They fall in line with existing data about the commodity structure of Spanish foreign trade. Throughout the period under study, Spanish exports consisted mainly of agricultural products and mineral raw materials with low income elasticity and high price elasticity of demand. On the contrary, among imports there was a high proportion of capital goods and raw materials that were essential for industry, with demand showing high income elasticity and scant sensitivity to price changes[15].

Focusing our attention on the price elasticities shown in table 4.1, it may be observed that the real depreciation of the currency would have had real effects both on imports and on exports. The majority of historians who have given their attention to this matter agree with this general statement. Sometimes, such as in Tena (1992), on the basis of Prados' estimations[16], the protective

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[15] The distribution of Spanish foreign trade by products can be seen in Tena (1995). This import and export structure is that suggested for developing countries by Prebisch (1959).
[16] Prados (1988), 186, offers the following table of demand elasticities (Imports: 1849-1913; Exports: 1815-1913).

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influence of the real depreciation has been magnified, compared with its effect on exports. The results of our estimation lead to somewhat different conclusions. In the long term, Spanish exports would respond to changes in relative prices more strongly than imports. The real depreciation of the peseta would have stimulated very much foreign sales and would have been much less effective in restraining imports.

On the other hand, table 4.1 offers information about the global impact of the real depreciation on the trade balance. It is generally accepted that the real depreciation of the currency only has positive effects on the trade balance in the event that the sum of the import and export price elasticities exceeds one (that is to say, if the Marshall-Lerner condition is met)[17]. The values estimated here reflect the fulfillment of this condition in the long term. So, it may be considered that the real depreciation of the peseta could act as an automatic adjustment mechanism[18].

Finally, the income elasticities of demand in table 4.1 show that the Spanish economy was characterized during the period under study by the structural problem described in the stories told by Development Economics. The distance between their values in import and in export functions imposed a basic structural constraint on the process of development of the Spanish economy. The fact that the income elasticity of Spanish import demand reached a higher value than the export one indicates that, in the absence of compensatory mechanisms, the Spanish economy would face bottlenecks in its foreign payments, if it were to grow at a rhythm comparable to that of its trading partners.

On the other hand, as we mentioned in the previous section, the estimates presented in table 4.1 have shown themselves to be stable throughout the period. This stability may be interpreted as a sign of the limited extent of the process of structural change in Spain in the decades prior to the First World

	Import Demand	Export Demand
Income	1.478	0.922
Prices	-1.176	-0.708

[17] It must be noticed, however, taht the existence of a trade deficit prior to depreciation raises the value required to the sum of the elasticities.

[18] Prados, in his work of 1982 (p. 32), expressed his scepticism about the effectiveness of depreciation in improving the trade balance. However, in that work, he did not show estimations of the Spanish import demand function. When he did this (Prados, (1988), 186), his results were in line with our perspective (see his table of elasticities in note 16).

War, but also as a sign of the ineffectiveness of economic policy, during that period, to resolve the structural limitations of the Spanish economy. According to our results, the measures adopted were merely effective in the short term, but they did not act as a stimulus to the process of economic development and industrialisation of the country. In 1913, the Spanish foreign sector was in as precarious a position as it had been in 1870[19]: the external constraint had not been overcome.

In this respect, it may be stated that the various shocks which affected the trade balance during those years only had transitory effects on import and export levels, and they did not change the long-term income and price elasticities. The changes in the exchange rate or the levels and structure of tariff protection were merely transitory shocks, which only succeeded in moving Spanish imports and exports away from their equilibrium relationship in the short term. In the long term, however, the evolution of these aggregates continued to be determined by the movements of the fundamental variables (income and relative prices) and subject to the constraint described.

5. The external constraints on Spanish economic policy (1870-1913)

On the basis of our estimations, some hypotheses may be formed about the economic policy of the period under study. At the beginning of this article we wondered about the reasons that might have led the Spanish economy to a path of closure. The Spanish import and export demand functions, that reflect the economic structure of the country, may shed new light on this point. The existence and persistence of the aforementioned elasticities pattern demanded of the Spanish economy that, in order to attain equilibrium, it should adjust the rhythm of growth of its imports to the evolution of the remaining balance of payments items. If this were not achieved, the adjustment would arrive through the depreciation of the currency.

Consequently, a research into the causes of the low level of openness of the Spanish economy prior to the First World War requires an analysis of the evolution of each of the balance of payments items throughout that period. With respect to this, two distinct stages may be noted, separated for conventional purposes by the year 1891.

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[19] This does not mean that no changes in foreign trade structure occurred, but that the changes that took place did not alter the long-term demand elasticities.

During the years 1870-1891, the Spanish economy was able to maintain a high import growth rate, against a background of relative openness, thanks to two fundamental factors. On the one hand, relative export prices evolved very favourably during these two decades. On the other hand, Spain took advantage of two exogenous shocks which caused its exports to increase dramatically: the phylloxera epidemic in France, that led to an explosion in sales of wine to the neighbouring country[20], and the spread of acid steel production methods, that had an extraordinarily positive effect on exports of non-phosphoric iron, particularly to Great Britain[21]. Finally, there were important foreign investments during this period, especially in metal mining. That inflow of capital also helped to relieve the problem of foreign payments. A clear sign of this good position is the absence of exchange problems before 1890.

In the decade beginning 1890, however, those exogenous factors desappeared: the French vineyards recovered and the production of basic steel spread progressively. In addition, the last captive colonial markets were lost. On the other hand, it was not possible to rely on other balance of payments items to sustain the growth of imports: the emigrants´ remittances were still of minor importance[22] and the inflow of capital fell sharply since 1883[23] and did not recover until the first decade of the 20th century (when there was a repatriation of capital from the last colonies and a new wave of industrial investment).

Initially, the Spanish economy was not capable of adjusting the rhythm of growth of its imports to the new economic situation. Consequently, the exchange rate tended to deteriorate and the peseta suffered a process of heavy depreciation, reaching its lowest point in 1898, when the budget impacts of Cuban War joined the trade balance problems. 1891 Tariff Act only had a delaying effect on the process[24], but the stability of the estimated elasticities indicates that it did not provide a solution to the basic problem.

The decade beginning 1900 witnessed the recovery of exchange stability. However, this was not a response to an improvement in the foreign sector, but

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[20] The growth of wine sales to France benefitted in particular from the signing of the trade agreement in 1882, while the interruption of the sales is associated with the non-renewal of this agreement in 1892. See Serrano Sanz (1987).

[21] Nadal (1975)

[22] Spanish emigration figures can be seen in Nicolau (1989) and Sánchez (1990).

[23] Sardà (1987), 222.

[24] Several years later, the Gold Standard Commission recognised this fact as follows: "When the exceptional exports to France ended, the impact on our exchange rate would have been fiercer, had it not been softened by the protective tariff of 1891." Dictamen... (1929), 56.

to the implementation of a more restrictive monetary policy[25] and the maintenance of high protection levels[26]. Thus, since 1891 it can be confirmed that the foreign trade constraint on economic openness was in full force, this being reflected firstly in a deterioration in the exchange rate, and finally in the adaptation of imports growth to the new situation. This resulted in a period of limited growth and absence of convergence with more developed economies.

The perspective put forward up to this point allows the Spanish economic policy of the period to be reinterpreted. At this point, we may add some new elements to the former reflections of historians on this subject. As we stated in the introduction, in recent years great emphasis has been laid on the costs associated to Spain's low degree of integration into international commodity and capital markets. This isolationism has been suggested as one of the causes of the backwardness of the economy around 1913.

Although we could agree with this general view, our research has led us to make some distinctions with respect to the feasibility of the contrafactuals put forward by other authors. According to these, Spain's economic development during the period 1870-1913 demanded the country's incorporation into the gold standard system or a tariff policy that was more free-trade oriented than the one actually devised. We will proceed to analyse the realism of each of these two contrafactuals.

Adoption of the gold standard

One group of authors has qualified non-incorporation into the gold standard system as one of the main flaws in the Spanish economy during that period[27]. However, if we emphasise the existence of a structural problem in Spain's foreign payments, one of the costs of adopting a fixed exchange standard becomes apparent. By renouncing the flotation of the currency, the Spanish foreign sector would have lost an adjustment mechanism that was effective in the long term and practically automatic in its operation. With a trade balance as fragile as Spain's, monetary stability could only have been

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[25] The restraint of public spending took place since 1899 through the Fernández-Villaverde reform. The Spanish Public Sector experienced a prolonged series of surpluses between 1900 and 1908. Comín (1988).
[26] Liepmann (1938) estimates average *ad valorem* protection levels of between 32% and 42% for the case of Spain.
[27] In particular, see Martín Aceña (1994).

maintained in the event that compensatory items had been continuously present on the balance of payments. In the absence of these, adjustment, since it could not be reached through the exchange rate, should have relied on the available instruments: a growing protection of the domestic market or an extraordinarily restrictive monetary policy. This would have been especially serious during the worst years of the period: the decade beginning 1890. Consequently, the existence of a structural constraint on the trade balance would question the advisability and even the feasibility of this exchange practice[28].

The free trade option

Secondly, we may ask ourselves about the effects that the adoption of a free trade policy would have had. The existence of structural problems in the balance of payments tells us that, by adopting a free trade policy, the Spanish economy would have renounced another of the instruments available to control the evolution of the trade balance.

Furthermore, if the structural problem originated from the degree of development and the structural characteristics of the Spanish economy, greater openness would not have resolved it. On the contrary, if a free trade policy had been adopted, the result would have been a greater depreciation of the currency or the necessity of restrictive monetary policies, which would only have provided an *ad hoc* solution.

With regard to protection, however, it should be pointed out that it could also have been used as an instrument of structural change. Nevertheless, the stability of our estimations is a sign of the tariff policy followed not contributing appreciably in that period to a perceptible change in the pattern of pre-existing comparative advantages. We do not deny the possibility of a slow structural functioning of the trade policy, specially since the tariff changes in the first third of the 20th century. However, when the First World War broke out, the structural tendency towards deficit persisted in the commercial balance,

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[28] We are not denying that, as is suggested in Martín Aceña (1994), in the event that the Spanish economy had joined the gold standard, probably it would have had a larger and more stable inflow of capital. This fact would have been a consequence of the reduction of the exchange risk that some authors consider to be the main effect associated with formal adoption of the gold standard. However, Fratianni and Spinelli (1985) have shown, in the case of Italy, that formal adhesion to the standard did not produce any guarantee with respect to the rules that the governments would follow. In those conditions, the exchange risk was more a question of governmental reputation than of formal obligation.

and periodic recourse to *ad hoc* compensatory measures continued to be necessary[29].

5. Conclusions

In this article we have researched into the difficulties that foreign trade imposed on Spanish process of integration into the international economy in the years prior to the First World War. We have started out by examining some features of the foreign trade structure of the country. By means of an econometric analysis of import and export series, it has been possible to observe the presence of a trend towards trade deficit, which was in force when Spain grew at a rate similar to that of its trading partners. This trend, typical of developing economies, was linked with the commodity composition of Spanish imports and exports.

This underlying trend could be offset in the foreign sector as a whole by various means: favourable movements of the relative import and export prices, short-term export booms, or surpluses in other items of the balance of payments. We have also checked that, in the absence of these compensatory mechanisms, adjustment in foreign payments could be reached by means of protective measures and the exchange rate.

During the years 1870-1913, we have drawn a distinction between two different periods. In the first of these, up until 1891, an exceptional export cycle, accompanied by an important inflow of capital, enabled the Spanish economy to attain high import and GDP growth rates without risk of exchange rate deterioration. However, from 1891 these exceptional conditions disappeared. The external equilibrium was only reached thanks to high interest rates and an increase in tariff protection. Both measures slowed economic growth and reduced imports, but they were not sufficient to prevent the depreciation of the peseta, which reached its lowest level in 1898. The exchange rate only became stabilised during the first decade of the 20th century, thanks to a new inflow of foreign capital and the practice of a restrictive monetary policy.

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[29] Kuznets (1967), 71, however, warns of the delay with which changes in the productive structure are perceived in the indicators of comparative advantage. The structural effectiveness of the tariff policy has been defended, in the case of agricultural products, by Gallego and Pinilla (1995).

Thus, neither the general structural conditions nor the particular economic circumstances of the last decade of the century favoured greater integration into the European economy. However, this evidence must not be identified with the absence of viable alternatives in the field of economic policy which would support exchange stability and at the same time act as a stimulus to the process of structural change and the elimination of the prevailing constraints. With regard to this, a different sectorial orientation of the tariff regime, or a more active policy of commercial agreements with the most expansive foreign markets could have stimulated Spain's process of development.

The results of our research pose new questions about the Spanish economy at the beginning of the 20th century. Although the tariff of 1891 proved to be clearly ineffective in resolving the structural problems of the foreign sector, from 1906 there seems to be a change in tariff sectorial orientation[30]. The magnitude of the impact associated with the First World War prevents us from prolonging the econometric analysis beyond 1913. However, it would be interesting to consider whether the new tariffs of the first decade of the century were an attempt to orchestrate a dynamic trade policy. Likewise, it would be interesting to analyse the measures after 1918 not in terms of their being a protectionist reaction to the post-war crisis, but as an effort to continue along the path first taken in 1906.

On the other hand, in the introduction we referred to the diversity of behaviour of the countries of the European periphery in response to the challenge set by the central economies. A good way to continue this research would be to try to apply the arguments developed here to other peripheral countries. The divergent performances could be linked with each country's economic structure. Thus, it would be interesting to ask whether cases of success were due to a different foreign trade structure from that of Spain, or rather, if they were linked with the presence of balancing items that were absent in Spain. Possibly, each success and each failure would provide different answers. At all events, such analysis would lead to a better understanding of the pattern followed by the European economy as a whole towards convergence.

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[30] This interpretation is directly derived from the work of Sabaté (1995) and Tirado (1994). However, there is not unanimous agreement about this. A totally discordant view can be found in Prados and Tena (1994) and a partly opposing perspective in Gallego and Pinilla (1995).

7. Appendix

A) Statistical sources

a) Import Function:

- LIM is the Spanish import index in real terms, directly obtained from the series Import Volume Index, compiled in Tena (1989), 351-354, col. 1110.

- LGDP is used as scale variable and is constructed from the real Gross Domestic Product series shown in Prados (1995), 127-129.

- LPRIM seeks to incorporate the evolution of the relative import prices. It is constructed as a ratio between the Import Price Index shown in Tena (1989), 351-354, col. 1112, and the implicit GDP deflator in Prados (1995), 132-134. We have opted to use a general deflator this index due to the difficulty involved in constructing a Domestic Price Index of import substitutes.

- LOD is the additive inverse of the unweighted mean of the Spanish nominal protection rate coming from Tirado (1994), 192.

b) Export Function:

- LEX is the Spanish export index in real terms, directly obtained from the Export Volume Index series appearing in Tena (1989), 351-354, col. 1109.

- LGDPW is the arithmetic mean of the real gross domestic product indices of France and Great Britain, taken from Maddison (1991), 147-148[31].

- LPREX is a relative export price index constructed as the ratio between the Export Price Index presented by Tena (1989), 351-354, col. 1111, and the arithmetic mean of the consumer price indices of France and Great Britain, taken from Maddison (1991), 199-200, and multiplied by the peseta/pound exchange rate series, provided by Martin Aceña (1989), 390-392, col. 1179. The reason for choosing general price indices instead of the specific indices of export substitutes is the same as in the case of the variable LPRIM.

- LODW is the arithmetic mean of the openness rates of France and Great Britain. To construct them, export and GDP data have been taken from Maddison (1991), 147-148 and 208-209, and nominal import data from Mitchell (1992), 555-562, that have been deflated with the series of wholesale price indices of the same author (pp. 839-845).

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[31] In this and further variables, the use of arithmetic means of british and french figures is justified by Spanish exports distribution according to their destination.

B) Econometric results

TABLE 7.1

Dickey-Fuller Order of Integration Test

Variable	Test stat.	MacKinnon 5% crit. val.	D-W Reg.[a]
1. Variables in levels:			
LIM	-1.12	-1.95	1.99
LGDP[b]	-2.49	-3.52	2.01
LPRIM[b]	-0.85	-1.95	1.99
LOD	-3.66	-4.18[c]	1.86
LEX[b]	-1.33	-1.95	1.95
LGDPW[b]	-3.19	-3.52	2.03

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LPREX	-2.57	-2.93	2.07
LODW[b]	-1.63	-2.93	2.03

2. Variables in first differences:

DLIM	-7.07	-3.52	1.99
DLGDP	-7.00	-3.52	2.06
DLPRIM	-8.74	-3.52	1.99
DLOD	-7.13	-3.52	2.00
DLEX	-5.61	-3.52	1.94
DLGDPW	-6.97	-3.52	2.06
DLPREX	-7.48	-3.52	2.09
DLODW	-5.85	-3.52	1.96

[a] Durbin-Watson statistic coming from the regression associated with Dickey-Fuller test.

[b] In this case, Augmented Dickey-Fuller test was applied.

[c] McKinnon crit. value at 1%

SOURCES: See Appendix A.

TABLE 7.2

Engle-Granger Cointegration Test

1. Import function

Dickey Fuller stat. (OLS residues):		-4.27
MacKinnon crit. val.	1%	-5.08
	5%	-4.36
	10%	-4.01

2. Export function

Dickey-Fuller stat. (OLS residues):		-4.69
MacKinnon crit. val.	1%	-5.09
	5%	-4.36

SOURCES: See Appendix A.

TABLE 7.3
Spanish Import and Export Demand Functions (1870-1913)

1. Import Demand function:

Cointegration Vector (1st stage) (dependent variable: LIM):

Constant	LGDP	LPRIM	LOD
0.532	1.715	-0.682	0.174
(0.99)[a]	(9.61)	(-5.21)	(1.44)

R^2 Adj.: 0.693

D-W stat.: 1.22

F-stat.: 33.38

ECM (2nd stage) (dependent variable: DLIM):

Constant	DLGDP	DLPRIM	DLOD	ECMIMP(-1)[b]
0.017	0.336	-0.244	0.099	-0.442
(0.98)	(0.84)	(1.36)	(0.84)	(-2.92)

R^2 Adj.: 0.114   F-stat: 2.345   D-W: 2.077

S.E. Reg: 0.105   Jarque-Bera: 0.136   White, F-stat: 5.001

ARCH(2)test,F-stat:2.125   RESET test, F-stat: 0.262

2. Export Demand function:

Cointegration vector (1st stage) (dependent variable: LEX):

Constant	LGDPW	LPREX	LODW
-3.710	0.647	-1.110	2.288
(-2.88)	(4.35)	(-8.85)	(6.84)

R^2 Adj.: 0.94

D-W stat.: 1.17

F-stat: 243.30

ECM (2nd stage) (dependent variable: DLEX):

Constant	DLGDPW	DLPREX	DLODW	ECMEXP(-1)[b]
0.022	0.157	-0.577	1.235	-0.578
(1.46)	(0.31)	(-4.94)	(2.78)	(-4.97)

R^2 Adj.: 0.559	F-stat.: 14.28	D-W stat.: 1.68
S.E. reg.: 0.069	Jarque-Bera: 0.63	White F-stat.: 1.16
ARCH(2) F-stat.: 2.04		RESET F-stat.: 2.43

[a] Figures in brackets are t-ratios.

[b] Lagged errors of the cointegration vector.

SOURCES: See Appendix A.

8.   References

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