THE PERIPHERAL PROTECTIONIST BACKLASH IN THE *FIRST GLOBALIZATION*: SPAIN (1870-1913)*

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Forthcoming in Revista de Historia Económica-Journal of Iberian and Lation America Economic History
This version, January 2011

ABSTRACT

This paper studies the role played by different trade barriers (transport costs, customs and currency) in the evolution of Spanish imports during the *First Globalization* (1870-1913). Through the estimation of several gravity equations with panel data analysis, we obtain the elasticities of imports to each barrier, which allows us to combine them into a single *ad valorem* measure of barriers to trade (which we call the *trade costs tariff equivalent*). More interestingly, the contribution of the barriers to the profile of the *tariff equivalent*, as well as the assignment of an active role to the peseta exchange rate as a barrier, illustrates the existence of a protectionist backlash against the sustained decline in transport costs in the period 1870-1913.

Keywords: gravity equation, protectionism, transport costs, late 19th century

JEL Code: C33, F15, N73, N43

RESUMEN

En este artículo se analiza la influencia de diferentes barreras al comercio (costes de transporte, aranceles y tipo de cambio) sobre la evolución de las importaciones españolas durante la *Primera Globalización* (1870-1913). En primer lugar, partiendo de la ecuación de gravedad, se obtiene la elasticidad importación a cada barrera. En segundo lugar, haciendo uso de esas elasticidades, las distintas barreras se combinan en una medida *ad valorem* sintética (una *tarifa equivalente*) de obstáculos al comercio. La contribución de cada barrera a esta *tarifa equivalente* permite ilustrar el papel jugado por la cotización de la peseta, además de localizar en 1890-1891 la reacción proteccionista española a la sostenida caída internacional de los costes de transporte en el último tercio del siglo XIX.

Palabras clave: ecuación de gravedad, protección, costes de transporte, siglo XIX

1. INTRODUCTION

The literature generally presents the period 1870-1913 as the *high watermark* of 19th century globalization (Daudin *et al*. 2008), which is known as the *First Globalization* to contrast it with the post-World War II (WWII) process of international integration. However, there is also agreement that, during the period 1870-1913, the advance of international integration itself triggered a *retreat from pro-global postures* (Williamson 1998, 2002). This *retreat* has been explained as a protectionist backlash: partly in response to the *grain invasion* of continental Europe caused by technological improvements in transport (O'Rourke 1997) and partly as a reply of the European periphery to the customs increases of its core-country partners (Blattman *et al*. 2003; Williamson 2006). In any case, the popular wisdom is that there was an anti-globalization reaction during the globalization process during 1870-1913 that, for Spain, has been traditionally associated with the protectionist changes of the 90s.

First, in December 1890, as a declared response to the drop in transport costs, duties on grain and meat were substantially increased in Spain. A year later, in December 1891, as part of a strategy to force France to negotiate a new treaty, duties on manufactured goods were also increased. The resulting rise in customs, because of its intensity, has led the literature to talk about a 90s protectionist swerve (the *viraje proteccionista*, Serrano-Sanz 1987). Moreover, part of the academic community has claimed that the deterrent effect of raised customs on imports was then reinforced by the simultaneous depreciation of the Spanish peseta (Prados de la Escosura 1988, 1997; Prados de la Escosura and Tena 1994).

Therefore, three main barriers have supposedly influenced Spanish trade during 1870-1913 (international transport costs, customs and currency) and the aim of this paper is to disentangle the role that each one played over time by using a gravitational approach. The approach, of course, is not new. In the last decade, a number of works have analyzed the forces that drove trade during the *First Globalization* by introducing different measures of, or proxies for, trade barriers into a gravity equation (Estevadeordal *et al*. 2003; López-Córdova and Meissner 2003; Flandreau and Maurel 2005; Mitchener and Weidenmier 2008; Jacks and Pendakur 2010).

However, none of these papers have compared the specific evolution of the different trade barriers for the period 1870-1913, which is the comparison we carry out for Spain. In this task, we can exploit a range of measures of customs barriers, instead of using proxies or the traditional ratio of customs revenues over total imports used in multi-country analyses to date. Moreover, given that for most of the period under examination, the peseta exchange rate was in a floating regime, instead of the traditional dummies used in multi-country panels to capture the effects of adherence or non-adherence to the gold standard, we consider the size and sign of the peseta exchange rate departures from parity between 1870 and 1913 and their effects on trade.

The results from estimating the gravity equation for different panel data samples confirm that, whatever the customs variable considered, transport costs and currency variables are always significantly linked to imports. However, the customs variable only appears significant when considering the measures that control for the sample of goods over time. This might explain the difficulties experienced by some studies in finding a significant relationship between customs and imports when using the simple ratio between customs revenues and total imports[1].

More interestingly, as we have directly estimated the elasticity of substitution for Spanish imports, we can combine the three kinds of variables into a costs function to obtain a single measure of barriers to trade. According to our estimations, this synthetic measure, *the trade costs tariff equivalent*, averaged an *ad valorem* tariff of 112 per cent during 1870-1913, 65 points coming from transport costs, 22 from customs and only 7 from the exchange rate. Thus, on average, the exchange rate seems to have played a minor deterrent role compared with that of the other barriers. This finding fits in with the idea of those who hold that, in the long run, the peseta played a minor role as a trade barrier.

However, when instead of static averages, we consider the evolution of the *trade costs tariff equivalent* and its three components over time, the resulting picture tells a much richer story. To start with, we find that the peseta acted both as a barrier to and a boost for trade at different moments during the period. In the 80s, the exchange rate moved under parity contributing, together

[1] This occurs when Estevadeordal *et al*. (2003) introduce this ratio into a gravity equation that uses world trade pooled data for 1913, 1928 and 1938.

with customs and transport, to a reduction of the *trade costs tariff equivalent*. This is in clear contrast to what happened in the 90s, when a chain of exceptional depreciations that culminated in the year of the defeat against the United States (1898) raised a currency barrier which, added to the increased customs, broke the downward trend of the *tariff equivalent*. Once the war was over, the peseta adjusted to a new movement of appreciation that significantly reduced its height as a barrier. Therefore, we find that the exchange rate played an active role during the period 1870-1913, in some periods reinforcing the movement of customs, in others playing an offsetting role. In this way, this paper reconciles the two positions, one assigning a minor long-run role and the other an active short-run role to the peseta as a barrier, that coexist in the literature.

Finally, the aforementioned reversal in the downward trend of the *trade costs tariff equivalent* confirms the 90s as the moment of the Spanish protectionist backlash. The breaking down of the *tariff equivalent* into its components illustrates how, before the 90s, the sharp reduction of transport costs ran in parallel to a slight decrease in customs, both contributing, along with the exchange rate, to the decline of the Spanish *trade costs tariff equivalent*. In the 90s, however, the increase in customs stopped the falling trend of the *tariff equivalent*, thus reflecting the Spanish backlash against the drop in transport costs and the abandonment of the premises of free trade in continental Europe, especially in France.

The result is the story of anti-globalization within globalization to which we have referred. As a sign of globalization, the Spanish *tariff equivalent* average decreased between 1870-1890 and 1891-1913, although to a much lesser extent than if currency and, especially, customs had not raised barriers in the 90s. Without the anti-globalizing role played by the Spanish idiosyncratic barriers to trade (customs plus currency), we have estimated that the decline in transport costs would have trebled the growth of imports at the end of the period 1870-1913.

The rest of the paper is organized as follows: in the second section, we present the procedure and data used in the estimation of the gravity equation. In the third section, we discuss the evolution of the *trade costs tariff equivalent* and relate the dynamics shown by its three components to the historical narrative. In the fourth section, we conclude.

2. THE PROCEDURE AND DATA

As we have said, our goal is to establish the channels whereby different sources of costs affected Spanish trade in the *First Era of Globalization*. To this end, we consider three kinds of directly measured barriers (customs, maritime transport costs and exchange rates) that are introduced into a gravity equation *à la* Anderson and van Wincoop (2003). These authors, starting from a constant elasticity of substitution (CES) utility function

where the prices of imported goods reflect «iceberg» trade costs, propose the following gravity equation:

$$Xij = \frac{Yi \cdot Yj}{Y^w}\left(\frac{tij}{\Pi_i \cdot Pj}\right)^{1-\sigma} \quad [1]$$

where X_{ij} denotes exports from country i to country j; Y_i and Y_j represent the respective national GDPs; Y^w is the total world income and σ the elasticity of substitution between products; t_{ij} is the bilateral trade cost factor (one plus the tariff equivalent of trade barriers) and Π_i and P_j denote country i's and country j's price indexes. The specific expression of these price indexes is:

$$\prod_i^{1-\sigma} = \sum_j P_j^{\sigma-1}\theta_j t_{ij}^{1-\sigma} \quad \forall i$$

$$P_j^{1-\sigma} = \sum_i \prod_i^{\sigma-1}\theta_i t_{ij}^{1-\sigma} \quad \forall j$$

where θi denotes the share of world income of country i.

Anderson and van Wincoop (2003, 2004) refer to Π_i and P_j as *multilateral resistance* indexes since, by construction, they consider the average trade resistance between a country and its partners. Index Π_i weighs the trade costs of country i when exporting to all its partners. Index P_j weighs the trade costs imposed by importer country j to all its partners. To explain bilateral trade flows, the bilateral trade cost factor has to be compared to the product of the multilateral indexes. The authors summarize the rationale for this comparison as follows: Given a bilateral barrier between i and j (t_{ij}), a higher *multilateral resistance* of country j (higher barriers in j for other partners; P_j) will reduce the relative prices of goods from i and increase its exports to j. Analogously, a higher *multilateral resistance* of country i (higher barriers faced by i from other partners; Π_i) will reduce the supply price of goods from i and increase its exports to j.

Given our specific interest in analyzing Spanish imports, we express equation [1] as:

$$X_{is} = M_{si} = \frac{Y_i \cdot Y_s}{Y^w}\left(\frac{t_{is}}{\Pi_i \cdot P_s}\right)^{1-\sigma} \quad [2]$$

where M_{si} denotes Spain's imports from country i, Y_s is the Spanish GDP and P_s represents Spain's *multilateral resistance*.

Thus, the theoretical stochastic expression in which we are interested becomes:

$$\log M_{si} = K_{si} + \log Y_i + \log Y_s + (1-\sigma)\log t_{is} - (1-\sigma)\log \Pi_i - (1-\sigma)\log P_s + \varepsilon_{is} \quad [3]$$

We assume that the bilateral trade cost factor t_{is} can be defined as a multiplicative function of different trade barriers, $t_{is} = \Pi\,(Z_{is\ n})^{\lambda n}$, where $Z_{is\ n}$

($n = 1 \ldots N$) denote the barriers and λ_n are the observable individual elasticities of each component Z_{isn}. Finally, if we introduce the trade costs function t_{sj} into equation [3], we obtain the expression:

$$\log M_{ij} = K_{si} + \log Y_i + \log Y_s + (1-\sigma)\sum \lambda_n \log Z_{isn} - (1-\sigma)\log \Pi_i - (1-\sigma)\log P_s + \varepsilon_{is} \quad [4]$$

or more specifically, since we consider three kinds of barriers (customs, ct; currency, CU; and maritime transport costs, tcr), the expression to estimate is (where all the variables are in logs):

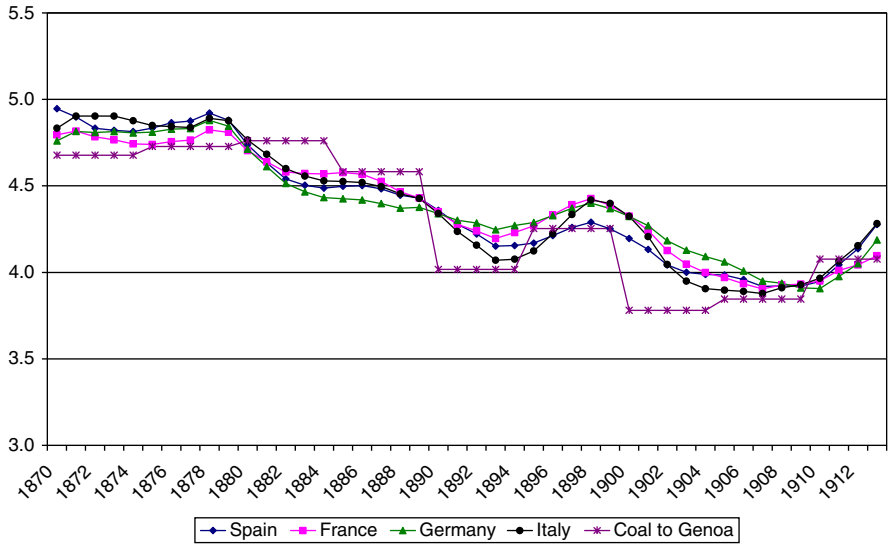
$$m_{ij} = k_{si} + y_i + y_s + (1-\sigma)\lambda_1 ct + (1-\sigma)\lambda_2 cr + (1-\sigma)\lambda_3 tcr - (1-\sigma)\pi_i - (1-\sigma)p_s + \varepsilon_{is} \quad [5]$$

Starting from this equation, the estimation of coefficients for the three barriers $\gamma_n = (1-\sigma)\lambda_n$ $n = 1,2,3$, enables us to compute the individual elasticities in the trade costs function as $\lambda_n = \gamma_n/(1-\sigma)$ and the *tariff equivalent* for each barrier Z_n as $(Z_{is\ n})^{\lambda n}$. This is possible since, according to Feenstra (2002, 2004), when working with the simple customs average, the coefficient estimated in a gravity equation is equal to $(1-\sigma)$. This means that the elasticity $\lambda_1 = 1$ or, in other words, the *tariff equivalent* for the simple customs average is the average itself. Therefore, we can derive the elasticity value from the γ_1 coefficient, then calculate the elasticities for the other two barriers and, finally, combine the customs, currency and transport costs *tariff equivalents* into a multiplicative trade costs function to obtain a synthetic *trade costs tariff equivalent*.

The data used to calculate this synthetic *tariff equivalent* come from the following sources. The availability of data for the period 1870-1913 allows us to work with a sample of twenty countries (Australia, the Austro-Hungarian empire, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, the Netherlands, Italy, Japan, Norway, New Zealand, Portugal, Sweden, Switzerland, Uruguay, the United Kingdom and the United States). National GDPs (expressed in 1990 Geary-Khamis dollars) come from Maddison (2009). As regards the bilateral flows, import figures have been obtained from the Spanish annual Foreign Trade Statistics, first converted to dollars and then to 1990 dollars with the U.S. deflator of Taylor (2002). The value of Spanish imports from these countries averaged 80 per cent of total imports during 1870-1913. The figures for total exports in domestic currency come from Mitchell (2003a, 2003b, 2003c) and have been converted to dollars by applying the exchange rates in the Global Financial Data site (http://www.globalfindata.com) and then corrected by the U.S. deflator.

As previously mentioned, three different kinds of barriers are included in our trade costs function: maritime costs, customs tariffs and those associated with exchange rates. Starting with maritime shipping costs, there is a pervasive agreement that these costs registered an overall declining trend during the

FIGURE 1
SHIPPING FREIGHT RATES BETWEEN THE UNITED KINGDOM AND SPAIN AND SPAIN'S MAIN PARTNERS



Source: Jacks and Pendakur (2010) and Mohammed and Williamson (2004).

period 1870-1913, as shown by Mohammed and Williamson (2004) in their *real global freight rate* index. The same occurs with the indexes of country-pair specific freight rates offered in Jacks and Pendakur (2010). These authors construct indexes between the United Kingdom and 21 other countries for the period 1870-1913, and conclude that freight rates fell on average by 50 per cent in this period. In Figure 1, we show the paths of shipping costs between the United Kingdom and Spain and between the United Kingdom and Spain's main trade partners, all of which are quite reminiscent of the pattern shown by the commodity- and city-specific *Coal to Genoa* freight rate index of Mohammed and Williamson (2004). The indexes of transport costs of Jacks and Pendakur (2010) are used in our estimation while, as explained later in the paper, the indexes of Mohammed and Williamson (2004) are used to test the robustness of the results.

More specifically, we use the United Kingdom–Spain freight rate series of Jacks and Pendakur (2010) to proxy the evolution of bilateral Spanish shipping costs with its main partners and also with Austria, Belgium, the Netherlands and Portugal. The indexes between the United Kingdom and Australasia, Brazil, Canada, Denmark, Japan, Sweden–Norway (for Sweden, Norway and Finland), the United States and Uruguay are taken as representative of the respective maritime transport costs between Spain and each

of these countries that, once again, follow a clear downward trend. By doing so, we are assuming that, for the nearest countries, the United Kingdom–Spain index is representative of the evolution of Spain's short-haul freight rates. For the most distant countries, we are assuming that the deeper downward trends registered by the United Kingdom routes are representative of the evolution of Spain's long-haul freight rates[2]. Of course, we are conscious that the transport revolution of the 19th century was not limited to shipping. There was also a decline in land transport costs associated with the spread of railroads. However, we assume that, for a peninsular country like Spain, maritime transport played the most important role in explaining its integration into the world market[3].

Concerning tariff barriers, in Figure 2, we show different measures of trade-weighted nominal protection. The trajectory of Weighted 1 corresponds to the ratio of tariff revenues over the value of total imports as registered in the official Spanish Foreign Trade Statistics. It is worth remarking that, in the Spanish case, the unreliability of official import unit values introduces significant bias into the calculation of the *ad valorem* rates of protection[4]. For this reason, we also work with measures such as Weighted 2 and Weighted 3 that take into account the falsity of the import unit values in the official statistics. Weighted 2 is calculated by dividing the tariff revenue by the corrected import values in Prados (1986). Weighted 3 comes from Tena (2006), who adds the surcharges on sugar imports to the import revenues. We have modified these three series to take into account the payment of Spanish tariffs in gold from 1906 on, which meant an appreciable surcharge on duties[5]. Payment in gold is also taken into account in the trade-weighted measure Weighted 4 constructed

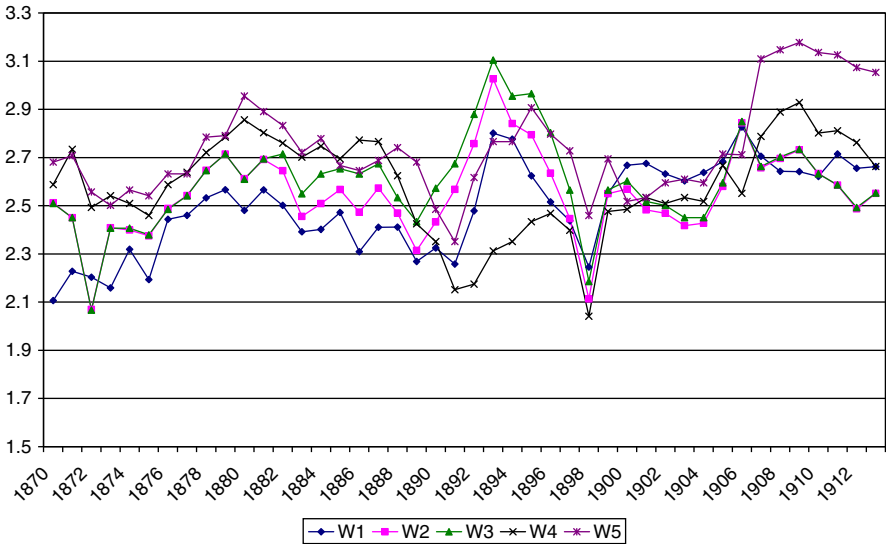
[2] According to Valdaliso (1991), there were no Spanish reports on freight rates in the late 19th century and, when data started appearing in Spanish magazines at the beginning of the 20th century, they were a reproduction of the freight rates reported in British sources. These data were taken as representative of the evolution of transport costs affecting the Spanish foreign trade, because of the dominium of British merchants. The market share of Spanish merchants fell below 20 per cent in the last third of the 20th century following the «colonization» of the Spanish routes, which was possible partly because of Spain's geographical position on oceanic and Mediterranean routes and partly because the United Kingdom was the main consumer of Spanish raw materials and agricultural products. References to the intense fall in maritime transport costs and the increasing competition from British merchants are abundant in the sessions of the Spanish parliament. See, for example, *Diario de Sesiones del Congreso de los Diputados* (DSCD) of July 8, 1876, March 16 and 19, 1882, February 21 and March 21, 1883, March 2, 1885, July 5, 1889 or July 13, 1891 (www. Congreso.es).

[3] The proportion between overland and maritime Spanish imports (of 1 to 3) remained quite stable from 1870 to 1913 (Spanish Foreign Trade Statistics, http://biblioteca.meh.es/basicicdocs). In fact, entries from the main origin of Spanish land imports, France, amounted to less than 20 per cent of our sample import value during the 80s, at the peak of Spanish–French pre-WWI trade.

[4] By using the market values with which Prados (1986) estimated the series of Spanish imports for the period 1850-1913, Sabaté and Pardos (2001) showed the importance of deviations between market and official values for specific goods over the period 1870-1913.

[5] From 1906 to 1913, the depreciation of the peseta note with respect to the official gold peseta parity was around 9 per cent.

FIGURE 2
TRADE-WEIGHTED CUSTOMS TARIFFS

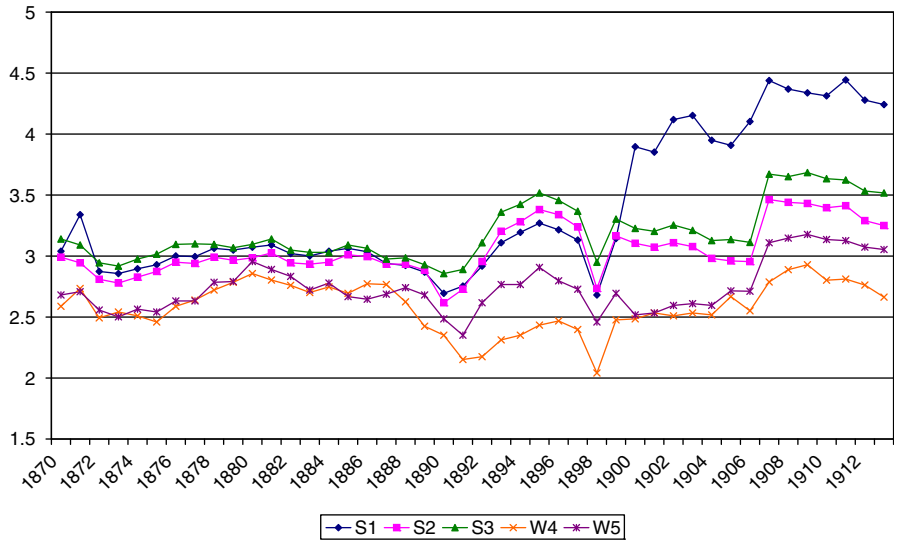


Source: Prados (1986), Tirado (1994) and Tena (2006).

by Tirado (1994). In this case, the official values are also corrected but, instead of considering all products registered in the Spanish Foreign Trade Statistics during 1870-1913, the author uses an unchangeable selection of highly representative goods over the period. In Weighted 5, the sample only considers the industrial goods in Weighted 4. Therefore, both these indexes have the advantage of avoiding the risk that variations in the aggregate measure might simply be reflecting variations in the goods composition of trade, thus blurring the relationship between commercial policy and trade.

However, as is well known, trade-weighted averages endogenize the constraint effect of customs increases on trade and, consequently, there is always a bias of undervaluation in these measures. The higher the tariff applied to a certain good, the lower its imports and, consequently, the lower the weight of the highest taxed goods in the calculation of the aggregate level of protection. For this reason, it is important to have, as well as trade-weighted averages, simple arithmetic averages which, in turn, are the type of measures to consider in a theoretically well-founded version of the gravity equation. The simple arithmetic average, Simple 1, shown in Figure 3 along with Weighted 4, is offered in Tirado (1994), both of them for the same sample of representative goods mentioned above. Simple 2 is the simple arithmetic average once overseas products have been excluded. It is clear

FIGURE 3
SIMPLE AND TRADE-WEIGHTED CUSTOMS TARIFFS

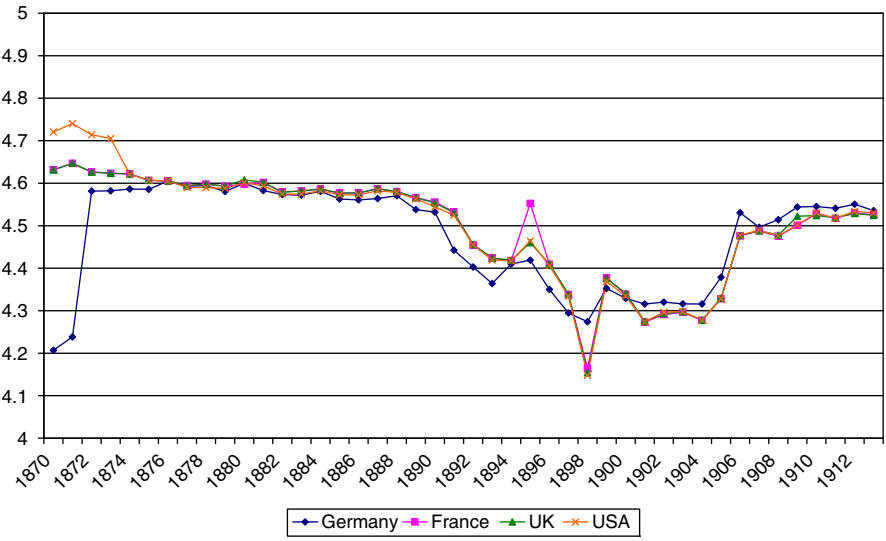


Source: Tirado (1994).

how both simple averages, as expected, reach higher values than the weighted rate. The same occurs if we compare Weighted 5 to Simple 3, where the latter is the simple average for the industrial goods included in Simple 1. This point is also illustrated for Spain by Tena (1999), when comparing different customs measures for a number of years during the period 1870-1913. The levels are always higher for simple than weighted measures, whether the latter are weighted by actual trade or the trade structure prior to the enforcement of a new bill. In any case, the interruption of the declining trend of tariff barriers in the 90s is a common feature for all the yearly series mentioned above, including the profile shown by the estimations of Tena (1999). Therefore, as previously mentioned, we can exploit a range of measures of customs barriers, although none of them are available in bilateral terms, a shortcoming which we consider minimized because the *Most Favoured Nation Clause* was the rule for Spain's commercial policy during 1870-1913.

Finally, we have considered the role played by the peseta exchange rate in Spanish external trade. Unlike most western currencies, the peseta never formally belonged to the gold standard, there being only a partial gold convertibility from 1876 to 1882. In Figure 4, we show the performance of the nominal rates of the peseta against its main partners' currencies which, after Germany adhered to gold in 1871 and the United States won the battle

FIGURE 4
NOMINAL EXCHANGE RATE INDEXES FOR GOLD CORE COUNTRIES



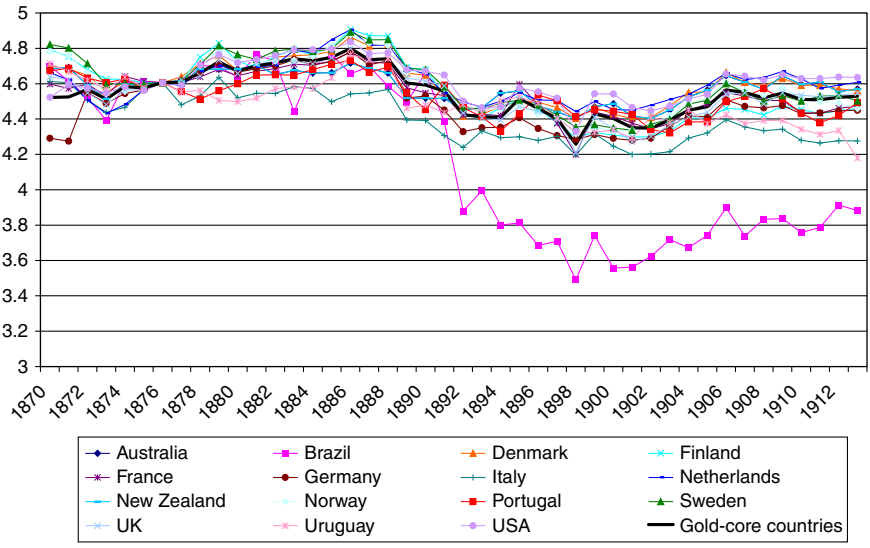
Source: Global Financial Data.

against silver in 1874, exhibit a noticeable parallelism in their evolution[6]. The Spanish lack of commitment to gold emerges clearly in the early 90s. It was then that the peseta began to depreciate and this depreciation gathered pace in the years of the war against Cuba and the United States (1895-1898). After this plunge in its external value, the Spanish currency adjusted to a path of recovery until the end of the period.

Our interest in the exchange rate, however, goes beyond its nominal evolution. Its role, either as a barrier to or as a boost for imports, depends on whether the interaction between nominal rates and relative prices determines episodes of real depreciation or appreciation for the peseta, respectively. Therefore, we focus on the peseta real exchange rates, which we calculate for the countries with available data by correcting the nominal rate through the corresponding relative price index (Spanish over foreign prices). The prices are GDP deflators: the Spanish deflator comes from Prados (2003) and the foreign ones from Mitchell (2003a), except for the Dutch, Portuguese and Uruguayan figures that come from Smits *et al*. (2000), Lains (2006) and Bértola (mimeo), respectively. The indexes of real exchange rates are shown in Figure 5. Here again, we find a very similar evolution of the peseta exchange

[6] For a complete chronology of each country's adherence to the gold standard, see Bordo and Schwartz (1996) and Officer (EH.net).

FIGURE 5
REAL EXCHANGE RATE INDEXES



Source: Mitchell (2003a), Prados (2003), Bértola (mimeo), Smits *et al*. (2000) and Lains (2006).

rates against most of the currencies considered, consistent with their general commitment to gold. In fact, the two countries with the shortest commitment, Italy and Brazil, especially the latter, are those that exhibit the weakest adjustment to the gold core-countries' real exchange average[7].

For the gold currencies, the evolution of the peseta real exchange rate goes through three stages. First, there is a movement of real appreciation in the 80s, which turns into a movement of depreciation in the 90s. Once the war is over, the peseta adjusts to a new trend of real appreciation. We select the profile depicted by the core-countries' average as representative of the evolution of the peseta real exchange rate for all the countries in our sample (including those for which we have no information) except for Italy and Brazil, for which we will consider their respective real exchange rate indexes[8]. In the next section, we examine how these real exchange rate indexes along with maritime transport costs and customs influenced the performance of Spanish imports in the *First Era of Globalization*.

[7] Italy adhered to the gold standard from 1884 to 1894 and Brazil did so in 1888-1889 and from 1906 to 1913.

[8] Thus, we are assuming that, based on their commitment to gold, Austria, Belgium, Canada and Japan adjusted their real exchange rate patterns to that averaged by the gold-core countries.

3. ANTI-GLOBALIZATION WITHIN GLOBALIZATION

As observed in the previous section, the expression to estimate is:

$$m_{ij} = k_{si} + y_i + y_s + (1-\sigma)\lambda_1 ct + (1-\sigma)\lambda_2 cr + (1-\sigma)\lambda_3 tcr - (1-\sigma)\pi_i - (1-\sigma)p_s + \varepsilon_{is} \quad [6]$$

However, some practical problems arise. In theory, the difference between the prices of countries *i* and *s* included in the gravity equation should reflect the effect of relative trade barriers on bilateral flows, for which the available price indexes can only be considered as a proxy. Consumer price indexes and GDP deflators include non-tradable goods prices and, furthermore, certain trade barriers are not reflected in prices. For this reason, Feenstra (2002) and Anderson and van Wincoop (2003) proxied the *multilateral_resistance* effect by using source and destination region fixed effects. However, with our data panel, which covers only one country (Spain) during a relatively short period (1870-1913), the use of country-year effects would leave us without enough degrees of freedom[9]. Neither can we solve the problem by using country-period effects (country dummies interacting with 2-, 3-, 4- or 5-year-period dummies) because of problems of multicollinearity[10]. Therefore, we propose an alternative way to proxy the *multilateral resistance* effect on the basis of the model of Anderson and van Wincoop (2003), summarized in Section 2.

According to these authors, the bilateral trade cost factor between *i* and *j* (in our case, the barrier between country *i* and Spain, t_{is}) has to be compared to the product of the multilateral indexes (country *i*'s and Spain's price indexes, Π_i and P_s). The rationale for this comparison is that, given a bilateral barrier between *i* and Spain, a reduction in barriers faced by *i* from other partners will raise its total exports, increasing the supply price of *i*'s goods and reducing its exports to Spain. Thus, if we read an increase in *i*'s total exports as the result of a reduction in its multilateral barriers, one way to proxy the *multilateral resistance* depressing effect of this on *i*'s exports to Spain is to discount the value of *i's* total exports from *Yi*. By doing so, we are reducing *i's* exporter potential to Spain. Analogously, given a bilateral barrier between *i* and Spain, a reduction in the barriers between Spain and the rest of its trade partners will increase the relative prices of goods from *i* and reduce Spanish imports from country *i*. Thus, if we read an increase in its total imports from third partners as the result of a decrease in its multilateral

[9] The country-fixed effects have been used to avoid any bias due to omitted variables related to causes other than *multilateral resistance* effects.

[10] We thank an anonymous referee for suggesting this procedure. We tried to capture *multilateral resistance* by introducing country-period dummies into the estimation of expression [6]. However, this procedure introduced a serious problem of multicollinearity into the estimation, reflected in the loss of significance of the variables of interest (customs and transport costs barriers).

barriers, one way to proxy this other *multilateral resistance* depressing effect on Spanish imports from i is to discount the value of Spanish total imports (except i's) from Y_s. By doing so, we are reducing the Spanish importer potential from country i.

Consequently, our instrumental version of the gravity equation is as follows:

$$m_{ij} = k_{si} + y*_i + y*_s + (1-\sigma)\lambda_1 ct + (1-\sigma)\lambda_2 cr + (1-\sigma)\lambda_3 tcr_s + \varepsilon_{is} \qquad [7]$$

where Y_i* and Y_s* denote i's and Spain's GDPs, after discounting the levels of country i's total exports and Spain's imports from third countries, respectively.

We use several measures of customs protection and the indexes of maritime freight rates of Jacks and Pendakur (2010)[11]. We have also considered the real exchange rate of the peseta over time as a potential influence on Spanish imports. The results of combining these different measures, after imposing the standard assumption of unit elasticity on the adjusted economic size variables, are shown in Table 1. The first finding to highlight is that transport costs are always highly significant. The same occurs if, when testing for robustness, we proxy the trends of shipping costs by the city- and commodity-specific indexes of Mohammed and Williamson (2004)[12]. The exchange rate is also always significant. However, the only significant tariff measures (Simple 1, Simple 2, Simple 3, Weighted 4 and Weighted 5) are those that keep the sample of goods unchanged over the period under study. The difference between the coefficients of the simple and weighted measures is also important. The coefficients for the weighted measures are significantly higher than those corresponding to the simple measures (Weighted 4 vs. Simple 1, both calculated for the whole unchanged sample; Weighted 5 vs. Simple 3, both calculated for the industrial unchanged sample), in line with the criticism of undervaluation against the former mentioned above. From here on, we will focus on the results obtained when considering simple customs averages and, particularly, the

[11] Consequently, we follow Jacks and Pendakur (2010) when they incorporate some of their country-pair specific freight rates into a gravity equation. We have also considered the possibility of those rates being endogenous to trade. However, the Hausman test of endogeneity yields a rejection of the hypothesis. This rejection may be related to the size of Spain, the country being too small for its demand for imports to influence international freight rates.

[12] We applied the *Coal to Genoa* rate index to the imports from the Austro-Hungarian empire, Belgium, Denmark, France, Germany, the Netherlands, Italy and the United Kingdom, and the *Baltic-grain* index to the imports from Finland, Norway and Sweden In the case of the United States of America and Canada, we used the *East North America-grain* index. Finally, we applied the *East Latin America-grain* index to the Brazilian and Uruguayan imports and the *West North America-grain* index to the imports coming from Australia, New Zealand and Japan. The coefficients maintain their range between −2.5 and −3.6 and are all highly significant.

TABLE 1
GRAVITY ESTIMATIONS OF TRADE COSTS

	Weighted averages					Simple averages		
	W1	**W2**	**W3**	**W4**	**W5**	**S1**	**S2**	**S3**
Transport costs	−2.84 (−5.06)	−2.61 (−4.43)	−2.46 (−4.14)	−2.98 (−4.97)	−3.29 (−5.13)	−3.60 (−5.22)	−3.07 (−4.67)	−3.18 (−4.82)
Currency	1.55 (5.78)	1.57 (5.80)	1.53 (5.53)	2.03 (6.71)	1.78 (6.38)	1.51 (5.59)	1.55 (5.96)	1.52 (5.86)
Customs	−1.73 (−0.93)	−0.16 (−0.11)	1.50 (0.98)	−5.48 (−3.76)	−3.84 (−3.70)	−0.85 (−3.38)	−1.94 (−2.21)	−1.81 (−2.73)
N	690	690	690	690	690	690	690	690
Adjusted R^2	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77

W, weighted; S, simple.

Notes: W1 calculated with official values; W2, W3, calculated with corrected values, the latter including sugar surcharges; W4 calculated with corrected values maintaining the sample fixed; W5, as W4, for only industrial goods.

S1 calculated for the same sample as W4; S2 is S1 without overseas products; S3, for the same sample as W5.

Estimations are country-fixed effects.

Source: See text.

Simple 2 average, calculated for the unchanged sample of goods with the exclusion of overseas food[13].

This average is a simple one and therefore, as explained before, we assume that its individual elasticity $\lambda_1 = 1$ and calculate the elasticity of substitution starting from the estimated coefficient $\gamma_1 = (1-\sigma)$. Since the coefficient obtained for the protection measure is 1.94, we find that the elasticity of substitution among Spanish imports is 2.94 when transport costs and fluctuations in the real exchange rate are controlled for. This is an interesting result because it is directly estimated from the panel data and is near the usual elasticity values found in the literature[14].

By using our estimated elasticity of substitution among the Spanish imports, we calculate that the elasticities of the maritime freight rates and the peseta real exchange rate in the trade costs function are 1.58 and −0.80, respectively. This yields a *trade costs tariff equivalent*, τ, that averages 112 per cent during 1870-1913, 65 points coming from transport costs, 22 from customs and 7 from the exchange rate[15]. Our estimated *trade costs tariff equivalent* is above those computed by Jacks *et al*. (2010). These authors, by assuming a price elasticity of imports of 11 ($\sigma = 11$), derive a comprehensive measure of trade costs for the United Kingdom, France and the United States, which ranges from a minimum of around 30 per cent (in the United Kingdom in 1913) to a maximum of 48 per cent (in the United States in 1870). However, our *tariff equivalent* level is not directly comparable to theirs. First, our assumption about the level of maritime transport costs to which to apply the indexes of Jacks and Pendakur (2010) is overestimating our *tariff equivalent* level[16]. Second, they hypothesize a high elasticity value, which might be underestimating their *tariff equivalents*.

Fortunately, the comparison of levels is not the goal of this paper. Rather than in the absolute level of the *trade costs tariff equivalent* and its average during 1870-1913, which are clearly sensitive to the elasticity considered, we are interested in the changes in the dynamics of its components (transport

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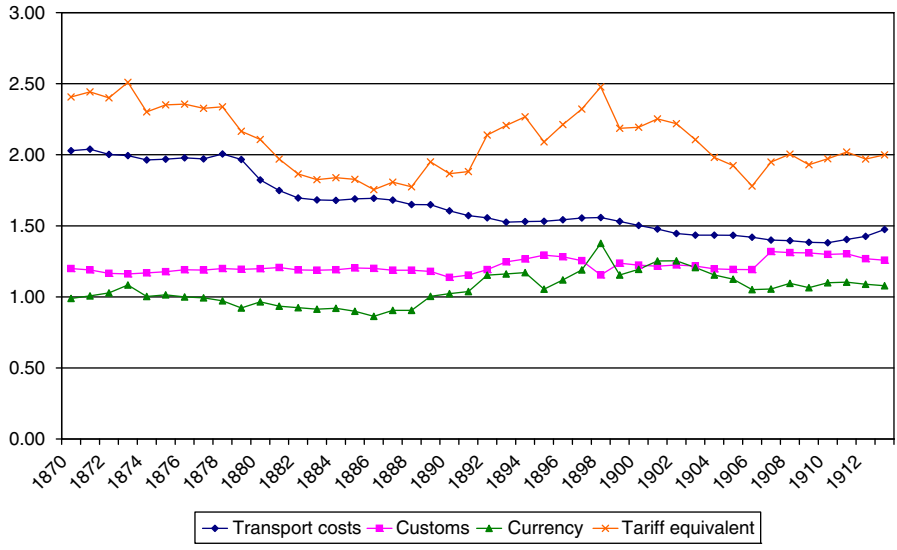
[13] We select Simple 2 against Simple 1 because our country sample does not include Cuba, by far the main supplier of exotic food (sugar and coffee) until 1898. As the exclusion of Cuba means the exclusion of exotic food, we selected the Simple 2 measure as being more representative of the average customs barrier raised against the goods imported from the countries in our sample.

[14] In the literature on gravity equations, we find estimations of σ that range from 2 to 5.3 in the second half of the 20th century (Hummels 2001), the estimations lowering with increases in the level of trade aggregation (Hummels 2001; Chaney 2006). Since we work at the highest level of aggregation, some of the goods in our sample (wheat, coal, cotton) are difficult to substitute. This might explain the similarity of our elasticity to that obtained for the second half of the 20th century, although the degree of differentiation for qualities of the same good is accepted to be lower in recent decades.

[15] The residuals from the estimations of the gravity equation amount to 18 per cent points.

[16] Following Estevadeordal *et al.* (2003), we took the 22.1 freight rate given by Williamson (2002) for the ton of wheat on Atlantic routes in 1910, adjusted backward by applying the indexes of Jacks and Pendakur (2010). Since this rate corresponds to a bulk commodity and is probably higher than the rates for manufactured goods imported by Spain, we are conscious that the level of the transport cost *tariff equivalent* might be upwardly biased.

FIGURE 6
TRADE COSTS TARIFF EQUIVALENT AND COMPONENTS



costs, commercial policy and currency). We are looking for a confirmation of the Spanish protectionist backlash against the decline in international transport costs and the supposedly protectionist role played by a currency that did not join the gold standard. To this end, the trajectories of the *trade costs tariff equivalent* and its components, not seriously affected by the elasticity value chosen, are far more informative. Looking at Figure 6, we find that the *tariff equivalent* was reduced from 156 per cent to 104 per cent between 1870 and 1913 and, above all, we find that the trends shown by its components match the economic history narrative perfectly[17]. Behind the downward trend in the transport costs component, it is easy to recognize the technological improvements in maritime shipping (among them, the introduction of the screw propeller, the compound engine, steel hulls and the increase in ship sizes)[18]. We also find that the slight decrease in

[17] The *tariff equivalent* levels are sensitive to the elasticity of substitution. However, as proof that the *tariff equivalent* is robust to changes in elasticities, we tried the extreme value $\sigma = 11$. By doing so, we found that the *tariff equivalent* falls from 20 per cent to 15 per cent between 1870 and 1913. Thus, the *tariff equivalent* drops by 25 per cent instead of the 33 per cent fall when working with a value $\sigma = 2.94$. Most importantly, the differences in the relative contributions of the individual barriers (customs, currency and transport costs) to the *trade costs tariff equivalent* average and their movements over time are negligible.

[18] For a description of the so-called transport revolution, see O'Rourke and Williamson (1999). According to Mohammed and Williamson (2004), between 1871-1873 and 1909-1911, freight rates

the customs and exchange rate components during the 80s matches the historical record.

On May 11, 1882, Spain signed a treaty with France in which the two countries exchanged significant concessions. Spain agreed to cut customs for many manufactured items and France, in exchange, substantially reduced duties on the Spanish import of wine, from 3.5 to 2 francs/hectolitre. More importantly, soon after this, the Spanish reductions agreed in the treaty were included as a second column of duties in the bill of July 1882. This second column was applied to the countries that enjoyed the *Most Favoured Nation Clause* in their relationship with Spain, which, in the mid-80s (after the *Modus Vivendi* signed with the United Kingdom in 1885), applied to more than 90 per cent of the value of Spanish imports[19].

In the same direction as customs, the exchange rate also facilitated the entry of foreign goods into Spain. In 1870, at the beginning of the period under examination, the Spanish monetary standard was bimetallic (gold and silver) and, for that reason, was fully affected by the sustained decline in the international price of silver initiated in 1867. This fall in prices meant silver overvaluation at the mint. Minting silver became a profitable business and silver coins quickly started to oust increasingly valuable gold from circulation. To put an end to this process, the Spanish authorities declared their intention of abandoning bimetallism in favor of gold and prohibited the private mintage of silver through a decree in August 1876[20]. Nevertheless, despite this measure, budgetary problems led the Spanish government to continue the profitable minting of silver while continuing to monetize deficits through bond sales to the Bank of Spain[21]. In this way, the growth in fiat money (overvalued silver and paper), by offsetting the continuous hoarding of gold, was enough to increase the Spanish money supply and isolate domestic prices from the international deflation of the 70s.

During this decade, however, the pressure on the reserves of the Bank of Spain was kept under control. As mentioned before, the peseta never formally belonged to the gold standard. Convertibility was always a discretional issue for the Bank which, in fact, repeatedly limited this possibility[22].

(F'note continued)
declined due to the introduction of iron hulls and the drop in ship prices, which was the result of productivity gains in the shipbuilding industry. Until 1887-1889, productivity gains in the coal industry reinforced the decline in maritime transport costs.

[19] The Spanish–French treaty and the bill of 1882 are thoroughly studied in Serrano-Sanz (1987). This work also covers the tariff reform of 1891 and details the other Spanish treaties from 1882 to 1895.

[20] Martín-Aceña (2000) provides a detailed account of Spanish monetary history from the creation of the peseta in 1868 until 1913.

[21] The existence of a link between budget and money in Spain during the classical and the exchange-rate gold standards is illustrated in Sabaté *et al*. (2006).

[22] In 1876, the Bank of Spain refused gold conversion even to the Spanish government. Moreover, during the years 1876-1877, gold conversion was limited to 2,500 pesetas per month.

The problems, however, did not become unsustainable until the 80s when the drop in capital inflows caused by the French stock crisis depreciated the peseta enough to make the export of gold profitable, thus stimulating paper conversion. As a consequence, despite the Bank having rationed convertibility, its gold reserves were reduced from 126 million pesetas in 1881 to 61 million in 1882. When, in 1883, the reserves decreased to 36 million pesetas, the Bank decided to suspend convertibility and it would never be resumed. However, despite price divergence, the peseta nominal exchange rate remained quite stable after the suspension, thanks to the exceptional exports of wine to France along with the offsetting role played by private exports of gold[23]. The result was a real appreciation of the peseta in the 80s, which, combined with the simultaneous decrease in maritime freights and customs barriers, explains the fall in the total *tariff equivalent* in that decade[24].

However, in the early 90s, as shown in Figure 6, this harmony of declining barriers was broken and, while transport costs continued to go down, the Spanish customs component started to rise. In fact, the first step in the Spanish tariff protectionist reform of 1890-1891 was defended as a means to offset the declining prices of grain imports resulting from technological advances in transport. As a result of this competition, the price of wheat in Barcelona had decreased from 26.7 to 22.3 pesetas/hectolitre between 1880 and 1885, pushing down the domestic average from 23.9 to 19.9 pesetas, respectively[25]. As a first response to this internationally induced drop in domestic prices, several measures aimed at improving productivity were taken[26]. However, as time went by and gains in efficiency failed to stop the advance of imports, the decision was taken to reinforce protection[27]. In December 1890, tariffs on grains and rice were raised. Tariffs were also

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(F'note continued)
Even when, in 1878, the gold reserves approached the amount of issued notes, the Bank still refused to declare full convertibility, preferring to relax the limit and establish an automatic convertibility up to 1,000 pesetas per day. See Serrano-Sanz (2004) for a detailed account of the resistance of the Bank to full convertibility.

[23] Following the treaty of 1882, in the late 80s, exports of wine accounted for over one-third of total Spanish exports, 85 per cent of them going to France. The export of gold (*emigration of gold*, according to contemporaries) is well documented in Barthe (1905) and Jiménez-Rodriguez (1905). A specific term, *chalequeros*, was even coined for the people who, in the 80s, crossed the Pyrenees wearing special vests, *chalecos*, with compartments full of gold (Jiménez-Rodriguez 1905, p. 166).

[24] A structural change in the mean, located in the interval 1878-1883, econometrically confirms the real appreciation of the peseta. See Sabaté *et al*. (2003, 2005).

[25] GEHR (1980), p. 96. Between those years, the price of the hectolitre in London decreased from 0.76 to 0.53 pounds. See GEHR (1980) and Garrabou and Sanz-Fernández (1985).

[26] Different bodies were created to spread technical formation (school farms, *granjas escuela*) and help peasants with the selection of seeds and the fight against plagues. Moreover, investment in land irrigation was increased. For an exhaustive list of decrees and laws approving these and other related measures, see Serrano-Sanz (1987, pp. 101-102).

[27] As proof of the difficulties experienced by domestic producers, no Castilian grain was sold in Barcelona during 1885-1889. Garrabou and Sanz-Fernández (1985, p. 177).

increased on meat, whose imports, coming from Australia and Argentina, had registered a great increase in the 80s due to the combined effect of declining transport costs plus refrigeration[28]. In this way, Spain started the retreat from liberalization that characterized the reaction of continental Europe to the land rent losses brought about by the grain invasion from Russia and overseas[29]. The retreat mirrors the social significance of landowners in the Spain of the late 19th century[30].

The second step in the retreat was the approval of the bill of December 31, 1891, which, as well as including the raised tariffs on agrarian products, increased most of the customs for manufactured items. The reason argued for this remarkable increase in the duties on manufacture was one of strategic policy. In January 1891, France had denounced the treaty signed with Spain in 1882, meaning that, from February 1892, if a new treaty were not agreed upon, Spanish wine would have to pay the duties resulting from the tariff reform then in progress in the French Assembly. As is well known, the Méline bill, finally passed in December 1891, included a generalized increase in customs that was especially punishing for Spanish wine because its duties were raised from the previous range of between 2 and 3.5 francs/hectolitre to another of between 14.8 and 19.8 francs. The Spanish response consisted of inflating the duties on manufactures in its bill of 1891, also approved in December[31], and then offering France a treaty that included a cut in duties on Spanish manufactures in exchange for a reduction in French duties on Spanish wine[32]. To reinforce the appeal of the proposal, Spain offered these cuts in exclusivity. However, France's interest in the Spanish market was much less than Spain's in the French. In 1890, Spain received only 5 per cent of total French exports, while France received 45 per cent of total Spanish exports. This meant that Spain had to negotiate by attacking «with a needle against one defending with a sword»[33] and, not surprisingly, the treaty was never signed. Having lost the main market for its principal export (wine), Spain only exchanged minor concessions with other countries (through treaties with the Netherlands, Norway, Sweden and Switzerland), which

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[28] The duties on wheat and flour were increased by 40 and 60 per cent, respectively. The duties on meat were more than trebled.

[29] See Findlay and O'Rourke (2003) for a summarized presentation of tariff changes in the western world from the late 70s on. A more quantitative approach to the protectionist trends during 1865-1913 is offered in Williamson (2006).

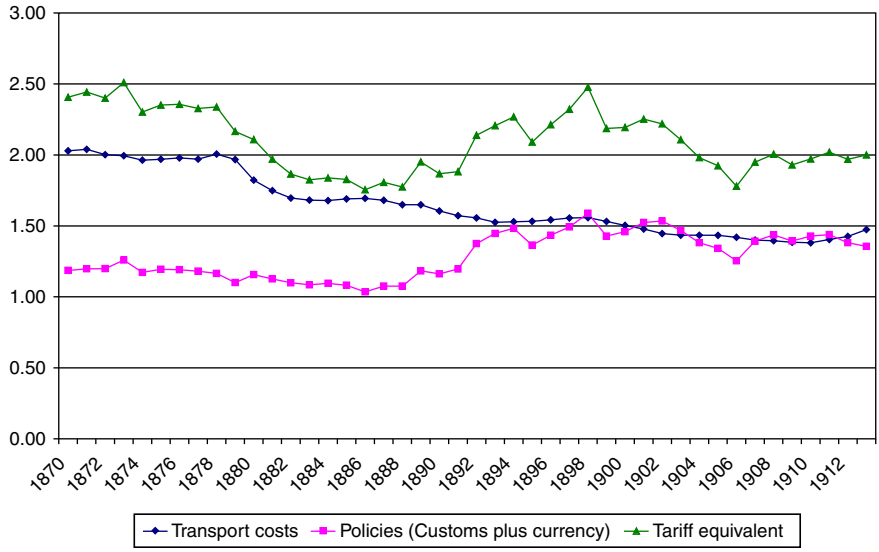
[30] The lobbying power of the agrarian oligarchy matches the slight fall in the Spanish wage-rental ratio at the end of the 19th century perfectly, as documented in Rosés *et al*. (2007).

[31] According to Navarro-Reverter, the sub-secretary of the Treasury at that time, duties were modified according to the answers of agrarian and industrial associations to the government questionnaire and, on occasions, even surpassed their demands (DSCD, December 13, 1894).

[32] The intention of using the bill of 1891 to interest France in an interchange of concessions is profusely alluded to in the Spanish parliament. See, for example, the sessions of January 27 and February 3 and 21, 1892.

[33] Azcárate (1892, p. 19).

FIGURE 7
TRADE COSTS TARIFF EQUIVALENT, TRANSPORT COSTS AND POLICIES



were far less important markets[34]. In the end, the result of the whole process (the 1891 bill and the four treaties mentioned) was a significant increase in customs at the beginning of the 90s. Accordingly, Figure 6 shows a rise of the customs component that is in clear contrast to the decline registered by the transport costs component.

As regards the movements of the exchange rate in the 90s, they contributed to the *trade costs tariff equivalent* in the same direction as commercial policy, that is to say, by increasing it. This common pattern can be clearly seen in Figure 6 and even more so in Figure 7, where the Spanish policy barriers (customs and exchange rate) have been added. The agrarian crisis of the mid-80s seriously affected tax revenues, a significant deficit reappeared and the sale of bonds to the Bank resumed to such an extent that, in 1890, fiat money accounted for more than 80 per cent of legal tender. In these circumstances, the Baring crisis in Argentina, by spreading doubts about the solvency of countries with a weak treasury, led to a sharp drop in the capital flows to Spain. The result was a significant depreciation of the peseta, which did not recoup part of its losses until 1895, just before plummeting again as a consequence of the risk that the markets assigned to the Spanish debt because of the strongly renewed monetization of deficit to finance the war against Cuba and

[34] Around 1890, exports to the Netherlands, Norway, Sweden and Switzerland did not reach 5 per cent of Spanish exports compared with the figure of 45 per cent exported to France.

the United States. In sum, the risk assigned to the Spanish Treasury led to a decade of real depreciation for the peseta, which worked as a barrier for imports. More importantly, the effect of this depreciation, added to the increase in customs barriers, was enough for the Spanish *trade costs tariff equivalent* to regain a substantial part of the level to which it had fallen in the 80s[35].

The financial disorders of the war years, however, were quickly addressed. A number of measures taken in 1899-1900 allowed the budget to close with a surplus, debt held by the Bank of Spain was redeemed and prices were stabilized[36]. The restoration of confidence in the Spanish Treasury plus the renewal of foreign investment inflows (now focused on electricity and water services) are the reasons put forward to explain the recovery, in 1906, of the nominal exchange rate levels prior to the Baring crisis. From then on, the relative control of public finances and domestic prices determined the stability of the exchange rate at around 26 pesetas to the pound and, as shown in Figure 6, the exchange rate significantly reduced its role as a trade barrier.

At this point, it is worth highlighting the changing trends of the exchange rate component, since these changes allow us to reconcile some apparently divergent stances taken in the literature regarding the consequences of Spain not having belonged to the gold standard. Returning to Figure 6, it is clear that the performance of the exchange rate component is consistent with the ideas of Prados de la Escosura (1988, 1997), Prados de la Escosura and Tena (1994), Tortella (1994) and Sánchez-Alonso (1995), among others, when arguing that the movements of the peseta reinforced the protection approved in the tariff bill of 1891 and reduced that approved in the bill of 1906. However, the trajectory of the exchange rate component also supports the ideas of Serrano-Sanz *et al*. (1998) and Gadea and Sabaté (2004), who, finding evidence in favor of the purchasing power parity (PPP) hypothesis, argue in favor of a moderate role of the peseta in terms of protection. In their opinion, the holding of the hypothesis means discarding the idea that remaining out of the gold standard led to a continuous increase or decrease of competitiveness for Spain. In this regard, the figure of 7 per cent that the exchange rate component averages in the period 1870-1913 is consistent with a long-run moderation in protectionist terms. In the same way, the variations in the trend of the exchange component shown in Figure 6 match the significant short-run deviations from parity found by Serrano-Sanz *et al*. (1998)

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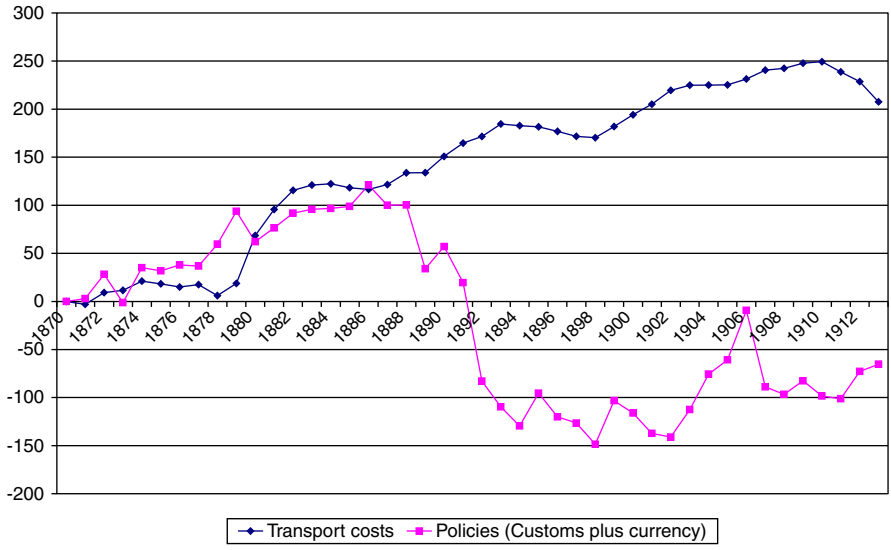
[35] The striking asymmetry of customs and exchange rate tariff equivalents in 1898 can be explained by the fact that the duties were specific (pesetas per unit of weight or volume). Therefore, the effect of depreciation, by swelling the value of imports in pesetas, is reflected in a drop in the *ad valorem* tariffs. This corresponds to the specific-duty effect which Williamson (2006) considers when trying to capture the factors driving tariffs during 1865-1938. In our case, this cut in *ad valorem* protection is counterbalanced by simultaneously considering the protection granted by the inflated exchange rate. Figure 6 illustrates this complementarity, which is especially clear in the critical year of 1898.

[36] Summarized in Sabaté *et al*. (2006).

FIGURE 8
CONTRIBUTIONS TO THE GROWTH OF SPANISH IMPORTS.



Source: see text.

and Gadea and Sabaté (2004) for the 80s (deviations of appreciation) and for most of the 90s (deviations of depreciation)[37]. These variations serve to reconcile positions: in the short run, the exchange rate played an active role (reinforcing or loosening commercial barriers); in the long run, the average effect was smoothed.

As regards transport costs and customs components, while the former continued to follow a downward trend in the first decade of the 20th century, the latter moved upward. Thus, the counterbalancing role of transport costs and customs tariffs continued and this became especially clear when the bill of 1906, by raising duties, restored the *ad valorem* customs levels of the 90s[38]. In sum, two dynamics clearly emerge, one before and one after 1890, when comparing the evolution of transport costs and customs components in Figure 6. Before the 90s, the sharp reduction in transport costs took place in

[37] In fact, Gadea and Sabaté (2004) find that the year 1898 registered the highest residual depreciating deviation from the PPP equilibrium in the period 1883-1931. The role played by bellum-risk in this residual is confirmed when we introduce the variable level of public debt into the error correction model. The short-run deviation between the actual and the fitted PPP exchange rate then disappears.

[38] For a detailed description of the political economy of protection between 1895 and 1913, see Sabaté (1996), where there is also a detailed account of the changes introduced into the Spanish tariff structure by the bill of 1906.

parallel with a slight decrease in customs and, thus, the decline in the Spanish *trade costs tariff equivalent* was essentially driven by the path of maritime freight rates. However, in the 90s, the increase in customs barriers started an offsetting relationship between them that the tariff reform of 1906 sustained. Thus, from 1890 onward, especially when the exchange rate barrier was lowered, trade policy becomes the most active force in defining the profile of the Spanish *trade costs tariff equivalent*.

Finally, in Figure 8, we present this counterbalancing relationship in terms of the accumulated contributions of the different barriers to the variations in the ratio between Spanish trade and economic growth. According to this figure, the decline in transport costs, had the customs and the exchange rate barriers remained unchanged, would have trebled the growth of imports in 1913. Also in the figure, it is easy to observe the offsetting role of customs plus currency barriers after 1890. During the subperiod 1870-1890, customs and currency as well as transport costs had contributed positively to the growth of imports. In contrast, during the subperiod 1891-1913, the gains in the contribution of transport costs were severely offset by the negative contribution of Spanish policy barriers, especially in the decade of the 90s, when customs and exchange rate barriers rose in similar fashion.

4. CONCLUSIONS

This paper estimates the relationship between three potential kinds of trade barriers (transport costs, customs and currency) and Spanish imports during 1870-1913. First, we find that customs tariffs have a significant negative impact on trade as long as the selected protection measure controls for the goods composition. We also show how the use of trade-weighted measures, normally employed in these estimations, downwardly biases the estimated effect of customs on imports. Second, whatever the customs measure, transport costs and exchange rate always show a significant effect on imports, both with the expected sign. Third, on the basis of their significance, we have combined the three kinds of variables into a trade costs function to obtain a single measure of trade barriers. This yields a *trade costs tariff equivalent* average of 112 per cent *ad valorem* during 1870-1913, with only 7 points coming from the exchange rate. As remarked before, the moderate height averaged by the currency barrier during 1870-1913 fits in with the idea of the peseta having played a long-run minor deterrent role on trade. Even so, in the short run, as revealed by the evolution of the exchange rate component, currency made significant (positive and negative) contributions to the *trade costs tariff equivalent*. Thus, this paper reconciles the short- and long-run approaches to the analysis of the protectionist consequences of the fact that the peseta never formally belonged to the gold standard. Finally, our estimations locate the start of an offsetting relationship

between decreasing transport costs and increasing customs barriers in the 90s, in tune with the historical record, which dates the Spanish protectionist backlash to the tariff reform of 1890-1891.

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