The protectionist backlash in the First Globalization. The trade-off between tariffs, exchange rates and transport costs in Spain (1870-1913)

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1. Introduction

In the last decade, a number of works have analyzed the forces that drove the pre-WWI globalization. The methodology, as in Estevadeordal et al. (2003), López-Córdova and Meissner (2003), Flandreau and Maurel (2005), Mitchener and Weindermier (2008) and Jacks and Pendakur (2008), has consisted of introducing different measures of or proxies for barriers to trade into a gravity equation. In all these works, the results assign a significant role in the international trade boom in 1870-1913 to the decline of transport costs and the adherence to the Gold Standard.

However, some discrepancies arise when trying to capture the effect of customs tariffs. On one hand, López-Córdova and Meissner (2003), introducing a Most Favoured Country Clause dummy as a proxy for commercial policy, fail to find a significant link between non-discriminatory treatment and world trade in 1870-1910. On the other, differentiating among customs unions, preferential agreements and open door policies, Mitchener and Weidenmier (2008) find that commercial policy within empires played a significant role in boosting world trade in 1870-1913. We also find discrepancies in studies that include direct measures of protection in their panel samples. Flandreau and Maurel (2005), using the ratio of customs income to imports, find that commercial policy had a significant effect on the evolution of the European trade in 1880-1913. Jacks and Pendakur (2008) work with the same measure of commercial policy and also find a significant link between customs and UK trade in 1870-1913. But, when Estevadeordal et al. (2003) introduce the ratio of customs revenues to imports into a gravity equation that uses pooled data for 1913, 1928 and 1938, they do not find any significant effect of commercial policy on world trade. They
suggest the lack of country-pair specific measures as a possible reason for this failure and their inability to find evidence for a tariff backlash prior to WWI.

The literature generally presents the period 1870-1913 as the high water mark of the XIXth century globalization (Daudin, Morys and O’Rourke, 2008) and, as such, it has been called the First Globalization, to contrast it with the post-WWII process of international integration. But, it is also agreed that, within the period 1870-1913, the sustained decline in international transport costs and the simultaneous decline in tariffs of the seventies, was followed by a rising movement of tariffs in most countries, the German bill of 1879 being the turning point. In fact, part of the pre-WWI protectionist backlash of the European periphery has been presented as a reaction to the boosting effect of decreasing transport costs on trade (Williamson, 2006).

The goal of this paper is to illustrate this trade-off between transport costs and customs by using the case of a peripheral country, Spain in 1870-1913. We can exploit a range of alternative protection measures available for the country and, by using these measures, illustrate (through the estimation of several gravity equations with panel data analysis) the sensitivity of results to the measure selected. In practice, we can only find a significant relation between commercial policy and trade when using a measure that controls for the goods sample and, thus, partly overcome the undervaluation bias consubstantial to the traditional ratio between customs revenues and imports used to date. Moreover, in line with the results of previous works, we find that the maritime transport cost and currency variables always appear significantly linked to Spanish trade.

As a novelty, the fact that Spain did not adhere to the Gold Standard allows us to estimate the effects of currency frictions on trade in a different way, taking time-variant, not a cross-country approach. Spain never formally belonged to the Gold Standard.
There was limited gold convertibility until 1883 and, from then on, the peseta started to work as a floating regime. This particularity has fuelled a controversy on the consequences of exchange rate fluctuations for Spanish trade, some scholars arguing that the currency was a barrier as effective as commercial policy in protecting the Spanish market from external competition, others arguing that its long-run effect on imports was neutral. According to our estimations, on average, customs, transport costs and exchange rate operated as a global trade cost tariff equivalent of 73\% \textit{ad valorem} in 1870-1913, 38 points coming from transport costs, 22 from customs and 3 from the exchange rate. Thus, on average, exchange rate seems to have played a residual deterrent role compared to that of the other barriers. This finding fits in with the long-run neutrality approach.

However, when we consider the evolution of the trade cost tariff equivalent and its three components over time, the resulting picture tells a much richer story. To start with, we see how the peseta exchange rate acted both as a barrier to and a boost for trade at different moments during the period. In the eighties, the exchange rate moved under parity contributing to reduce the trade cost tariff equivalent. This is in clear contrast to what happened in the nineties, when a chain of exceptional depreciations, culminating in the year of the defeat against the USA (1898), raised the trade cost tariff equivalent. Once the war was over, the peseta adjusted to a new trend of appreciation, pushing down the tariff equivalent. It is clear that in the short run, the exchange rate influenced imports, in some periods reinforcing the movement of transport costs and customs, in others playing an offsetting role.

Finally, also as a novelty in the literature, the estimated contributions of transport costs and customs to the trade costs tariff equivalent allow us to identify a Spanish protectionist backlash within the period 1870-1913 and the resulting trade-off between
the two kinds of barriers. Before the nineties, the sharp reduction of transport costs ran in parallel to a slight decrease in customs and, thus, the decline in the Spanish trade cost tariff equivalent was essentially driven by the path of maritime freight rates. But, in the nineties, the increase in customs barriers started a trade-off relation between them. Thus, from 1890 on, especially when the exchange rate barrier was lowered, the commercial policy becomes the most active force in defining the profile of the Spanish trade cost tariff equivalent. More importantly, the change in dynamics fits in perfectly with the historical record, since the Spanish tariff reform of 1890-1891 has been always presented partly as an offsetting reaction to the drop in the prices of grain imports resulting from the technological advances in transport and partly as a reaction to the abandonment of the premises of free trade in Continental Europe (Serrano-Sanz, 1987).

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 cost tariff equivalent and relate the complementarities and trade-offs between 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 that 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 Wincoop (2003). These authors, starting from a constant-elasticity-of-substitution (CES)
utility function where the prices of imported goods reflect “iceberg” transport costs and tariffs, propose the following gravity equation:

\[
X_{ij} = \frac{Y_i \cdot Y_j}{Y^w} \left( \frac{t_{ij}}{P_i \cdot P_j} \right)^{1-\sigma}
\]  

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 \(\sigma\) the elasticity of substitution between products. As regards trade barriers, \(t_{ij}\) is the bilateral trade cost factor (one plus the so-called tariff equivalent) so that, if \(P_i\) is exporter \(i\)'s supply price for a good, then \(P_j\)

\[
(P_j = \sum_i \left( \beta_i \cdot P_i \cdot t_{ij} \right)^{1-\sigma} )^{1/(1-\sigma)}
\]

is importer \(j\)'s consumer price index. In this expression, \(P_i\) and \(P_j\) denote \(i\) and \(j\)'s multilateral resistance variables, to which the bilateral trade cost factor has to be compared in order to explain bilateral trade flows\(^1\).

Given our specific interest in analyzing Spanish imports, we express equation (1) as:

\[
X_{ui} = M_{ui} = \frac{Y_i \cdot Y_s}{Y^w} \left( \frac{t_{ui}}{P_i \cdot Ps} \right)^{1-\sigma}
\]

where \(M_{ui}\) denotes Spain’s imports from country \(i\), \(Y_s\) is the Spanish GDP and \(Ps\) represents Spain’s multilateral resistance. Finally, in the spirit of Novy (2007) and Jacks, Meissner and Novy (2009), we proxy \(i\)'s multilateral resistance by its total export value (for whom the more a country exports, the lower the barriers found in other countries will be). Spain’s multilateral resistance is proxied by its total import value

\(^1\) As Anderson and Wincoop (2003) put it, for a given bilateral barrier between \(i\) and \(j\), a higher multilateral resistance of country \(j\) (which means higher barriers raised by \(j\) to other partners) reduces the relative prices of goods from \(i\) and increases its exports to \(j\). Analogously, a higher multilateral resistance of country \(i\) (higher barriers faced by \(i\) from other partners) reduces its supply price and increases its exports to \(j\).
(assuming that the more Spain imports, the lower the barriers for other countries must be). Consequently, our instrumental version of the gravity equation is as follows:

\[ M_{si} = \frac{Y_{i}^{*} \cdot Y_{s}^{*}}{Y_{w}} (t_{si})^{1-\sigma} \]  

(3)

where \( Y_{i}^{*} \) and \( Y_{s}^{*} \) denote Spain’s GDPs, after discounting the levels of country \( i \)'s total exports and Spain’s total imports, respectively.

In practice, assuming unit elasticity on the economic size variables, the stochastic expression in which we are interested becomes:

\[ \log \left( \frac{M_{si}}{Y_{i}^{*} \cdot Y_{s}^{*}} \right) = k_{si} + (1 - \sigma) \log t_{si} + \epsilon_{si} \]  

(4)

Since our aim is to assess the trade-off between different kinds of barriers, we assume that the barriers enter into a trade costs function, \( t_{ij} = \Pi \lambda_{n} \) in a multiplicative form, \( Z_{isn} \) being the series of the N observable variables considered.

Thus, the expression to estimate is:

\[ \log \left( \frac{M_{si}}{Y_{i}^{*} \cdot Y_{s}^{*}} \right) = k_{si} + \sum \lambda_{n} \log Z_{isn} + \epsilon_{si} \]  

(5)

with \( \lambda_{n} = (1-\sigma) \gamma_{n} \), where \( \sigma \) is the elasticity of substitution among imports and \( \gamma_{n} = \lambda_{n}/(1-\sigma) \) is the observable individual elasticity of each component in the trade costs function.

In order to estimate the gravity equation (5), we have considered the following sources. The data on national GDPs for the period 1870-1913 allows us to work with a sample of twenty-one countries (Australia, the Austro-Hungarian empire, Belgium,

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2 Theoretically, the difference between the prices of countries \( i \) and \( y \) 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, given that this procedure would leave us without enough degrees of freedom, we have followed the proposal of Novy (2007) and adjusted the size of each economy by its total level of trade, obtaining the variable they call multilateral resistance.
Brazil, Canada, Chile, Denmark, Finland, France, Germany, the Netherlands, Italy, Japan, Norway, New Zealand, Portugal, Sweden, Switzerland, Uruguay, the United Kingdom and the United States of America). 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 US deflator of Taylor (2002). The value of Spanish imports from these countries averaged 80% of total imports in 1870-1913. The figures for total exports in domestic currency come from Mitchell (2003 a, b, c) 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 US deflator.

As regards the barriers in our trade costs function, we consider three different kinds: maritime costs, custom 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 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 (2008). These authors construct indexes between the UK and 21 other countries for 1870-1913, and conclude that freight rates fell on average by 50 per cent in that period. In Figure 1, we show the paths of shipping costs between the UK and Spain and between the UK and Spain’s main trade partners, all of which are quite reminiscent of the pattern shown by the specific-route Coal to Genoa real freight rate of Mohammed and Williamson (2004). We use the UK-Spain freight rate series 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 UK and Australasia, Brazil, Canada,
Denmark, Japan, Sweden-Norway (for Sweden, Norway and Finland), the USA and Uruguay are taken as representative of the respective maritime transport costs between Spain and each of these countries. In Figure 2, we show a selection of these indexes that, once again, follow a clear downward trend, even clearer when considering that the cut in long-haul freight rates was higher than in short-haul rates. Of course, we are conscious that the transport revolution of the XIX\textsuperscript{th} 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 Spain, being a peninsular country, maritime transport played the most important role in explaining its integration into the world market\textsuperscript{3}.

As regards tariff barriers, in Figure 3, we show different measures of trade-weighted nominal protection. The trajectory of W1 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 \textit{ad valorem} rates of protection\textsuperscript{4}. For this reason, we also work with measures such as W2 and W3 that take into account the falsity of the import unit values in the official statistics. W2 is calculated by dividing the tariff revenue by the corrected import values in Prados (1986). W3 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

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\textsuperscript{3} The proportion between overland and maritime Spanish imports (of 1 to 3) remained quite stable from 1870 to 1913 (Spanish Foreign Trade Statistics, web reference). 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 eighties, in the peak of the Spanish-French pre-WW1 trade.

\textsuperscript{4} By using the market values with which Prados (1986) estimated the series of Spanish imports for 1850-1913, Sabaté and Pardos (2001) showed the importance of deviations between market and official values for specific goods over the period 1870-1913.
surcharge on duties\textsuperscript{5}. Payment in gold is also taken into account in the trade-weighted measure \( W_4 \) constructed 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 in 1870-1913, the author uses an unchangeable selection of highly representative goods over the period. In \( W_5 \), the sample only considers the industrial goods in \( W_4 \). Therefore, both 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 tariff policy and trade.

However, as is well known, trade-weighted averages endogenize the constraint effect of a tariff increase on trade and, consequently, a bias of undervaluation is always in these measures. The higher the tariff applied to a certain good, the lower its imports and 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, apart from 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, \( S_1 \), shown in Figure 4 along with \( W_4 \), is offered in Tirado (1994), both of them for the same sample of representative goods. \( S_2 \) is the simple arithmetic average once overseas products have been excluded. It is clear how both simple averages, as expected, reach higher values than the weighted rate. The same occurs if we compare \( W_5 \) to \( S_3 \), where \( S_3 \) is the simple average for the industrial goods included in \( S_1 \). In any case, the interruption of the declining trend of tariff barriers in the nineties is a common feature for all the series mentioned above.

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\textsuperscript{5} From 1906 to 1913, the depreciation of the peseta note with respect to the official gold peseta parity was of around 9\%. 

Finally, we have considered the role played by the peseta exchange rate in Spanish external trade. Unlike most western currencies, the peseta never belonged formally to the Gold Standard, there being only a partial gold convertibility from 1876 to 1882. In Figure 5, we show the performance of the nominal effective rate of the peseta against the pound and the French franc, each currency weighted by its relative share of the Spanish imports. The floating nature of the peseta exchange rate regime emerges clearly in the early nineties. It was then that the peseta began to depreciate, strongly stressed in the years of the war against Cuba and the USA (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 fluctuations. Its role, either as a barrier to or as a boost for imports, depends on whether the interaction between nominal rates and relative prices determine episodes of real depreciation or appreciation for the peseta, respectively. Therefore, we focuss on the index of the peseta real effective exchange rate, which we calculate by correcting the nominal rate by the relative price index obtained from the Spanish deflator (Prados, 2003) and the trade-weighted average of the UK and French deflators (Mitchell, 2003a). The index of real exchange rate is also shown in Figure 5 where we can see three stages. There is a first movement of real appreciation in the eighties, which turns into a movement of depreciation in the nineties. Once the war is over, the peseta adjusted to a new trend of real appreciation. In the next section, we examine the interactions of these real exchange rate movements with those in maritime transport costs and customs and their influence on the performance of Spanish imports in the First Era of Globalization.
3. Complementarities and trade-offs between barriers

We start by estimating expression (5) using several measures of customs protection and the indexes of maritime freight rates of Jacks and Pendakur (2008). We have also considered the real exchange rate of the peseta over time as a potential influence on Spanish imports. The results of the estimations are shown in Table 1 and the first thing to highlight is how, while transport costs and the exchange rate are always significant, the only significant tariff measures (S1, S2, S3, W4 and W5) 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 it is also important. The coefficients for the weighted measures are significantly higher than those corresponding to simple measures (W4 versus S1 and W5 versus S3), 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 tariff averages and, particularly, the S2 average, which does not include imports of overseas food in the sample.

To calculate the estimated function (5) in terms of tariff equivalents, we start from the multiplicative specification of trade costs à la Anderson and van Wincoop (2003),

\[ \tau_{ijn} = \Pi Z_{is} \lambda_n, \]  

where \( \lambda_n = \lambda_{ij}/(1-\sigma) \) is the individual elasticity for trade barrier \( n \) and \( \lambda_n \) are the coefficients in the theoretical gravity equation. Since the coefficient obtained for the protection measure is equal to 2.29, we find that the elasticity of substitution among Spanish imports is 3.29 when transport costs and fluctuations in the real

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6 Consequently, we follow Jacks and Pendakur (2008) 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 small size of Spain, too small for its demand for imports to influence international freight rates.

7 We select S2 against S1 because our country sample does not include Cuba, by far the main supplier of exotic food (sugar and coffee) until 1898. Nevertheless, results presented in the following pages do not essentially vary when considering the S1 or S3 averages.
exchange rate are controlled for. This is an interesting result because it is directly estimated from the panel data and, although it is not an *a priori* assumed value, it is near the usual elasticity values. Indeed, Anderson and Wincoop (2004) choose values 5, 8 even 10 for more recent periods, when the elasticity is expected to be higher.

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 cost function are 1.35 and -0.48, respectively. This yields a trade cost tariff equivalent, \( \tau \), that averages 0.73% in 1870-1913, 38 points coming from transport costs, 22 from customs and 3 points from the exchange rate. Our estimated trade cost tariff equivalent is above those computed by Jacks, Meissner and Novy (2009). These authors, by assuming a price elasticity of imports of 11 (\( \sigma = 11 \)), derive a comprehensive measure of trade costs for the UK, France and the USA which ranges from a minimum of around 30% (the UK in 1913) to a maximum of 48% (the USA in 1870). In our case, given an estimated elasticity of 3.29, the assumption of \( \sigma = 11 \) would mean an important underestimation of the Spanish level of the trade cost tariff equivalent.

More than in the absolute level of the trade cost tariff equivalent and its average in 1870-1913, clearly sensitive to the elasticity considered, we are interested in the

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8 According to Feenstra (2002, 2004), the coefficient obtained for the mean tariff is equal to \( (1 - \sigma) \), so the elasticity of substitution among Spanish imports is \( (1 - \lambda_n) \), \( \lambda_n \) being the estimated coefficient for the mean tariff in the gravity equation.

9 To estimate \( \sigma \), it is necessary that at least one of the trade costs function components be directly observable. In the literature on gravity equations, we find estimations of \( \sigma \) that range from 2 to 5.3 in the second half of the XXth century (Hummels, 2001). Moreover, the estimations of \( \sigma \) turn out to be lower when the level of trade aggregation increases (Hummels, 2001; Chaney, 2006). Thus, as our elasticity is estimated for a period previous to the WWII and for aggregate flows of trade and, our value is within the range of values found in the literature, we have decided to use it in the calculus of the tariff equivalent. If we were working with higher values, we would be undervaluing the real height of the trade costs barriers.

10 The only misgiving about the level of the tariff equivalent comes from the assumption made about the level of maritime transport costs. Following Estevadeordal et al. (2004), we have taken the 22.1 freight rate given by Williamson (2002) for the ton of wheat on Atlantic routes in 1910, adjusted backwards by applying the indexes of Jacks and Pendakur (2008). Because 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.
changes in the dynamics of its components (transport costs, commercial policy and exchange rate).\textsuperscript{11} 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 that end, the trajectories of the trade cost tariff equivalent and its components, shown in Figure 6, are far more informative. To start with, it appears clear that the trade cost tariff equivalent was reduced from 117\% to 83\% between 1870 and 1913. More importantly, we find that the trends shown by its components fit in perfectly with the economic history narrative. Behind the downward trend in the transport cost tariff 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 of ship sizes).\textsuperscript{12} We also find that the slight decrease in customs and exchange rate tariff equivalents during the eighties fit with the historical record.

On 11 May 1882, Spain signed a treaty with France in which they exchanged significant concessions. Spain agreed to cut customs for many manufactured items and France, in exchange, substantially cut duties on the Spanish import of wine, from 3.5 to 2 Francs/hectolitre. More importantly, soon after, the Spanish reductions agreed in the treaty were included as a second column of duties in the bill of July of 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-eighties (after the Modus

\textsuperscript{11} The tariff equivalent levels are sensitive to the elasticity of substitution. However, their evolution proves to be robust to $\sigma$–values that range from 3.29 to 11.

\textsuperscript{12} For a description of the so-called transport revolution see O’Rourke and Williamson (1999). According to Mohammed and Williamson (2004), between 1871/73 and 1909/11, freight rates declined due to the introduction of iron hulls and the drop in ship prices because the productivity gains in the shipbuilding industry. Until 1887/89, productivity gains in the coal industry reinforced the decline in maritime transport costs.
Vivendi signed with the UK in 1885), applied to more than 90 per cent of the value of Spanish imports.\(^{13}\)

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 favour of gold and prohibited the private mintage of silver through a decree of August 1876.\(^{14}\) Nevertheless, despite this measure, budgetary problems led the Spanish government to continue the profitable minting of silver at the time that monetized deficits through bond sales to the Bank of Spain\(^{15}\). 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 seventies.

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 discretionary issue for the Bank who, in fact, repeatedly limited this possibility.\(^{16}\) But the problems did not become unsustainable.

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\(^{13}\) 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.

\(^{14}\) Martín-Aceña (2000) provides a detailed account of the Spanish monetary history from the creation of the peseta in 1868 until 1913.

\(^{15}\) 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).

\(^{16}\) In 1876, the Bank of Spain refused gold conversion to the Spanish government itself. Moreover, during the years 1876-1877, gold conversion was limited to 2,500 pesetas per month. Even when, in 1878, the gold reserves approached the amount of issued notes, the Bank still refused to declare full convertibility.
until the eighties 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 reassumed. 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. The result was a real appreciation of the peseta in the eighties, which, combined with the simultaneous decrease in maritime freights and custom barriers, explains the fall in the total tariff equivalent in that decade.

But in the early nineties, as shown in Figure 6, this harmony of declining barriers was broken and, while transport costs continued to go down, the Spanish customs tariff equivalent started to rise. As such, Spain reflects perfectly the trade-off between tariff policy and transport costs at the turn of the XIXth century mentioned by Williamson (2006), who specifically refers to the pre-WWI anti-globalization as a compensation effect for the sustained decline in transport costs. In fact, the first step in the Spanish tariff reform of 1890-91 was itself defended as a means to offset the declining prices of grain imports resulting from technological advances in transport.

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 the full convertibility.

17 Following the Treaty of 1882, in the late eighties, exports of wine accounted for over one third of total Spanish exports, 85% of them going to France. The export of gold (emigration of gold, according to contemporaries) is well documented in Barthe (1905) and Jiménez-Rodríguez (1905). A specific term, chalequeros, was even coined for the people that, in the eighties, crossed the Pyrenees wearing special vests, chalecos, with compartments full of gold (Jiménez-Rodríguez, 1905, p. 166).

18 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).

19 Williamson (2006) again refers to the trade-off between customs and transport costs when working with a panel of 35 countries for the enlarged period 1865-1938. He finds a significant negative relation between what he calls effective distance (distance to the USA or the UK, adjusted by seaborne freight rates) and customs tariffs.
As a result of this competition, the prices 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.\textsuperscript{20} As a first response to this internationally induced drop in domestic prices, several measures aimed at improving productivity were taken.\textsuperscript{21} However, as time went by and gains in efficiency failed to stop the advance of imports, the decision was taken to reinforce protection.\textsuperscript{22} In December 1890, tariffs on grains and rice were raised. Tariffs were also increased on meat, whose imports, coming from Australia and Argentina, had registered a great increase in the eighties due to the combined effect of declining transport costs plus refrigeration.\textsuperscript{23} 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.\textsuperscript{24} The retreat mirrors the social significance of landowners in the Spain of the late XIXth century.\textsuperscript{25}

The second step in the retreat was the approval of the bill of 31 December 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 noticeable increase in the duties on manufacture was one of strategic policy. In January 1891, France had renounced the treaty signed with Spain in 1882, meaning that, from February 1892, if a

\begin{itemize}
\item \textsuperscript{20} 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).
\item \textsuperscript{21} Different bodies were created to spread technical formation (school-farms, granjas escuela) and help the peasants with the selection of seeds and to fight against plagues. Moreover, investment in land irrigation was financially boosted. For an exhaustive list of decrees and laws approving these and other related measures, see Serrano-Sanz (1987), pp. 101-102.
\item \textsuperscript{22} As proof of the difficulties experienced by domestic producers, no Castilian grain was sold in Barcelona in 1885-1889. Garrabou and Sanz-Fernández (1985), p. 177.
\item \textsuperscript{23} The duties on wheat and flour were increased by 40 and 60 per cent, respectively. The duties on meat were more than trebled.
\item \textsuperscript{24} See Findlay and O’Rourke (2003) for a summarized presentation of tariff changes in the Western world from the late seventies on. A more quantitative approach to the protectionist trends in 1865-1913 is offered in Williamson (2006).
\item \textsuperscript{25} The lobbying power of the agrarian oligarchy matches perfectly with the slight fall in the Spanish wage-rental ratio at the end of the XIXth century documented in Rosés et al. (2007).
\end{itemize}
new treaty were not agreed, 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 of customs that
was especially punishing for the Spanish wine, because its duties were raised from a
range from 2 and 3.5 Francs/hectolitre to another between 14.8 and 19.8 Francs. Against
this background, the Spanish strategy consisted of inflating the duties on manufactures
in its bill of 1891, also approved in December, and then offering France a treaty that
included a cut in duties on Spanish manufactures in exchange for a cut in French duties
on Spanish wine.26 However, France’s interest in the Spanish market was much less
than Spain’s in the French and, consequently, the treaty was never signed. Having lost
the main market for its main export (wine), Spain only exchanged minor concessions
with other countries (through treaties with the Netherlands, Norway, Sweden and
Switzerland), which were far less important markets.27 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 nineties. Accordingly, Figure 6 shows a rise of the
customs tariff equivalent that is in clear contrast to the decline registered by the
transport costs trade equivalent.

As regards the movements of the exchange rate in the nineties, they contributed to
the trade cost 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 idiosyncratic barriers (customs and exchange rate) have
been added. The agrarian crisis of the mid-eighties seriously affected tax revenues, a

26 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 27 January and 3 and 21 February
27 By 1890, exports to the Netherlands, Norway, Sweden and Switzerland did not reach 5 per cent of the
Spanish exports compared with 45 per cent exported to France.
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 towards 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 the USA. 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 to offset the simultaneous drop in maritime freight rates. Consequently, the trade cost tariff equivalent in the nineties regained a substantial part of the level to which it had fallen in the eighties. 28

The financial disorders of the war years, however, were quickly addressed. A number of measures taken in 1899-190029 allowed the budget to close with a surplus, debt held by the Bank of Spain was redeemed and prices were stabilized. The restoration of confidence in the Spanish Treasury plus the renewal of foreign investment inflows (now focussed 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.

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28 The striking asymmetry of customs and exchange rate tariff equivalents in 1898 can be explained by considering 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 in 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 appears especially clear in the critical year of 1898.

29 Summarized in Sabaté et al. (2006).
and, as shown in Figure 6, the exchange rate reduced its role as a trade barrier to a minimum.

At this point, it is worth highlighting the fluctuations of the exchange rate tariff equivalent, since these fluctuations allow us to reconcile some apparently divergent stances taken in the literature about the consequences of Spain not having belonged to the Gold Standard. Coming back to Figure 6, it is clear that the performance of the exchange rate tariff equivalent is consistent with the idea 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. But, the trajectory of the exchange rate tariff equivalent also supports the idea of Serrano et al. (1998) and Gadea and Sabaté (2004), who, finding evidence in favour of the PPP hypothesis, conclude the long-run neutrality 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 moderate 2.8% that the exchange rate tariff equivalent averages in the whole period 1870-1913, is consistent with the long-run neutrality in protectionist terms. In the same way, the fluctuations of the exchange tariff equivalent shown in Figure 6 match with the significant short-run deviations from parity found by Serrano et al. (1998) and Gadea and Sabaté (2004) for the eighties (deviations of appreciation) and for most of the nineties (deviations of depreciation). The fluctuations of the exchange rate tariff equivalent serve to reconcile positions: in the

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30 In fact, Gadea and Sabaté (2004) find that the year 1898 registered the highest residual depreciating deviation from the Purchasing Power Parity (PPP) equilibrium within the period 1883-1931. The role played by bellum-risk in this residual is confirmed when introducing the variable level of public debt into the Error Correction Model (ECM): the short-run deviation between the actual and the fitted PPP exchange rate disappears.
short run, the exchange rate played an active role (reinforcing or loosening commercial barriers); in the long run, the average effect is diluted.

The situation was quite different for transport costs and customs tariff equivalents. The former continued to follow a downward trend in the first decade of the XXth century, while the second moved upwardly. Thus, the trade-off between transport costs and custom tariffs continued and this became especially clear when the bill of 1906, by raising duties, provoked a jump in the level of the Spanish trade cost tariff equivalent.31

In summary, two dynamics clearly emerge, one before and one after 1890, when comparing the evolution of transport cost and custom tariff equivalents in Figures 6 and 7. Before the nineties, the sharp reduction of transport costs was in parallel with a slight decrease in customs and, thus, the decline in the Spanish trade cost tariff equivalent was essentially driven by the path of maritime freight rates. But, in the nineties, the increase in custom barriers started a trade-off relation between them that the tariff reform of 1906 sustained. Thus, from 1890 on, especially when the exchange rate barrier was lowered, the economic policy becomes the most active force in defining the profile of the Spanish trade cost tariff equivalent.

In Table 2, we present this trade-off in terms of the contributions to the variations in the ratio between Spanish trade and economic growth. According to our estimations, the decline in transport costs, had the customs and exchange rate been kept invariable,

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31 The jump in level shown in Figure 6, given the goods composition of the customs measure (S2), reflects the reinforcement of customs on manufactures more than on primary products. In the S2 average, agricultural products are represented by wheat and its flour, whose duties were untouched by the bill of 1906. When the reform took place, the duties on wheat and flour were kept, respectively, at the 8 and 13.2 pesetas per 100 kilos fixed in 1890, both accepted as sufficient even by the representatives of the main production areas in the Parliament. In fact, more than in increasing duties, the grain landowners were interested in the maintenance of the sliding scale that had been functioning from 1895 on, with surcharges of 2.5 and 4 pesetas applied on wheat and flour whenever the price of the 100 kilos of grain fell below 25 pesetas in Castilia.

For a detailed description of this scale and 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.
would have doubled the growth of imports. Obviously, the trade-off between transport costs and custom barriers is even more clearly shown if, in order to capture the protectionist backlash in 1890, we divide the whole sample into two sub-periods. Then, we find that the sub-period 1870-1891 concentrates 70% (151 out of 208 points) of the contribution of transport cost to the growth of Spanish imports in the whole period. Customs and exchange rate also contributed positively to this increase, although to a lesser extent (with 26 points). In contrast, during the sub-period 1891-1913, the much lower positive contribution of transport costs (56 out of 207 points), was clearly offset by the negative contribution of customs and exchange rates (-103 points). As can be seen in Figure 6, customs in the first decade of the XXth century became the main force driving the trade cost tariff equivalent.

4. Conclusions

This paper has estimated the relationship between three potential kinds of trade barriers (transport costs, customs and currency) and Spanish imports in 1870-1913. Firstly, 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. Secondly, whatever the customs measure, transport costs and exchange rate always show a significant effect on imports, both with the expected sign. Thirdly, on the basis of this significance, we have calculated the elasticity of each barrier in the trade costs function. This yields a trade cost tariff equivalent that averages 0.73% in 1870-1913, 38 points coming from transport costs, 22 from customs and 3 from the exchange rate. As remarked before, the
moderate height that the currency barrier averages in 1870-1913 fits with the idea that its long-run effect on trade was neutral. But this is without neglecting, as revealed by the evolution of the exchange rate component that, in the short run, it made significant (positive and negative) contributions to the trade costs tariff equivalent. Finally, the estimated contributions of transport costs and customs to the trade costs tariff equivalent identify a Spanish protectionist backlash and the resulting trade-off between the two kinds of barriers in 1890. The finding is in tune with the historical record, to the extent that the Spanish tariff reform of 1890-1891 has been always presented as an offsetting reaction to the drop in the prices of grain imports resulting from the technological advances in transport.
References


Figure 1. Shipping freight rates between the UK and Spain and Spain's main partners

Figure 2. Other specific country-pair freight rates
Figure 3. Trade-weighted custom tariffs

Figure 4. Simple and trade-weighted custom tariffs
Figure 7. Tariff equivalent, transport costs and policies
Table 1. Gravity estimations of trade costs

<table>
<thead>
<tr>
<th></th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
<th>W5</th>
<th>S1</th>
<th>S2</th>
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<td>-2.57</td>
<td>-2.49</td>
<td>-2.76</td>
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<td>(4.41)</td>
<td>(4.18)</td>
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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.

Table 2. Contributions of transport costs and policies (customs and currency) to imports growth

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<th>Imports (%)</th>
<th>Transport costs</th>
<th>Customs+ Currency</th>
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<tr>
<td>1870-1890</td>
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<td>26</td>
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<tr>
<td>1891-1913</td>
<td>Transport costs</td>
<td>Customs+ Currency</td>
<td>57</td>
<td>-103</td>
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</tbody>
</table>

Notes: Contributions are all calculated in relation to the change of the whole period 1870-1913.