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The Political Economy of Exchange Rate Stability During the Gold Standard. Spain 1874—1914

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THE POLITICAL ECONOMY OF EXCHANGE RATE STABILITY DURING THE GOLD STANDARD. SPAIN 1874-1914[·]

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Abstract

This article contributes to the literature on central bank independence and monetary stability during the classical gold standard era. On the eve of the First World War, European periphery had not achieved stable adherence to gold despite the protection of central banks against political pressures to monetize debt. In the 19th century, most issuing institutions were private banks whose main objective was profit maximization. As a result, monetary stability depended on negotiations between monetary and fiscal authorities and not directly on central bank independence as is the case nowadays. Strong governments were needed to impose the objective of monetary stability on central banks in negotiation practices. To test our argument, we have constructed indicators of government strength and central bank independence to measure bargaining power for the case of Spain. Results confirm that a highly independent private central bank avoided the responsibility of defending gold adherence when negotiating with weak government, even in a stable macroeconomic environment. Our research suggests that the success of central bank independence in generating monetary stability during the gold standard period depended on sound political institutions.

Keywords: gold standard, monetary stability, political economy, central bank independence, institutional design, Spain

JEL codes: E02, E42, E58, F33, N13

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Introduction

Economic theory states that central bank independence generates monetary stability. Lévy (1911) already asserted that central bank independence was a prerequisite for monetary stability because the separation of the central bank from the state prevented debt monetization (Flandreau *et al.* 1998). This theory on fiscal dominance was formalized by Sargent and Wallace (1981): the central bank's objective is monetary stability, but the fiscal authority puts pressure on the central bank to monetize fiscal deficits. Therefore, fiscal deficits are the source of inflation. In this context, central bank independence ensures fiscal responsibility and avoids all excessive use of the inflation tax.

A second theoretical approach that supported the relationship between central bank independence and monetary stability was developed by Kydland and Prescott (1977) and extended by Barro and Gordon (1983). According to this model, there is an inflationary bias inherent to monetary policy due to the time inconsistency problem. If policymakers are able to convince the public of a certain inflation target, the government has an incentive to "surprise" the economy with an inflation shock to reduce unemployment. But inflation surprises cannot arise systematically in equilibrium when people understand the policymaker's incentives and adjust their inflationary expectations in order to eliminate a consistent pattern of surprises. In this case, the potential for creating ex-post inflation shocks means that, in equilibrium, the average rates of inflation will be higher than otherwise. Therefore, the equilibrium rates of inflation can be lowered by shifts from monetary institutions that allow discretion to ones that enforce rules. Rogoff (1985) proposed to delegate monetary policy to a "conservative" central banker whose dislike for inflation relative to unemployment is known to be stronger than average, which established a theoretical rationale for creating an independent central bank.

A third theoretical argument supporting central bank independence is to avoid the political influences of political business cycles on monetary policy. According to this argument, the source of inflation is excessively loose monetary policy because of political influences of governments trying to improve their re-election chances. Governments thus routinely attempt to time their use of monetary policies to exploit delays from expansionary policies to their inflationary consequences to secure high growth before elections, with the inflationary effect arising post-election. Central bank independence can limit the inefficient fluctuations of inflation created by political cycles. In this context, the meaning of "independent" central banker implies terms of office going beyond that of the government, that is, a central banker cannot be easily removed by a newly appointed government and replaced by a different central banker, more sympathetic to the new executive (Alesina, Cohen, Roubini 1997).

A large number of empirical studies construct measures on central bank independence to connect these different strands of theoretical work and test the impact of central bank independence on monetary stability (see Eijffinger and de Haan 1996, Berger et al. 2001, Hayo and Hefekre 2002, and Cukierman 2008 for surveys). Authors confirm a negative correlation between central bank independence and inflation for industrial economies (Alesina and Summers 1993, Grilli et. al. 1991, Cukierman 1992, Cukierman et al. 1992). By contrast, inflation is not related to legal central bank independence in the group of developing countries (Cukierman et al. 1992). However, when central bank independence is defined by more

behaviourally oriented proxies of central bank independence, such as the actual turnover of central bank governors and the political vulnerability of the central bank governor, a negative correlation between central bank independence and inflation is confirmed also for developing countries (Cukierman 1992, Cukierman et al. 1992, Cukierman and Webb 1995).

We aim at testing the relationship between central bank independence and monetary stability in historical perspective. Concretely, we focus on the period of the classical gold standard. On the eve of the First World War, Europe had achieved a high degree of central bank independence. Capie *et al.* (1994) contend that monetary laissez-faire dominated the gold standard period. The state tended to keep its distance in monetary matters and the central banks assisted the gold standard. Flandreau et al. (1998) analyse the evolution of central bank independence in Europe during the gold standard period. Central bank independence was repeatedly violated, especially when recurrent fiscal difficulties were experienced. But, after 1896, central bank independence was gradually reconstructed and the protection of central banks against political pressures to monetize debt was high in the years immediately preceding the First World War.

According to Flandreau *et al.* (1998), central bank independence was the endogenous outcome of negotiations that codified state-banks' relations when charters were drafted, and their adjustment over time following actual changes in underlying power relations. Power relations differed between the core and peripheral Europe. For countries that enjoyed stable gold adherence (Britain, France, Germany, Belgium, the Netherlands, and Scandinavia), substantial balances in the relationship between the government and the central bank characterized the gold standard period. On the contrary, in central-eastern and southern Europe (Russia, Austria-Hungary, Portugal, Greece, Italy and Spain), state-bank relations changed over time and differed from those prevailing in core countries. While central-eastern and southern Europe gradually adopted the protection of central banks against political pressures to monetize debt – with the exception of Portugal– they were unable to commit to gold adherence.

Higher central bank independence did not ensure durable monetary stability for peripheral Europe as it did for north-western Europe. Case studies on the power relations that codified state-central banks outcome of negotiations on monetary stability might explain why central bank independence generated monetary stability in core but not in peripheral Europe. Very few studies document state-central bank power relations during the classical gold standard period. Holtfreich (1988) and Bouvier (1988) very briefly discuss the cases of Germany and France respectively. To our knowledge, no systematic empirical research exists addressing this question for peripheral Europe.

We focus on the case of Spain. We combine the literature on central bank independence together with measurements on the degree of strength of political institutions to explain why central bank independence did not ensure monetary stability in peripheral countries during the gold standard period. The detailed analysis of the political and central bank institutional design permits the relations between the fiscal and monetary authorities and their changes over time to be examined. This approach opens the scope from the conceptual framework of central bank independence to a broader view that considers also the quality of political institutions.

This approach would be in line with Acemoglu *et al.* (2008) who suggest that the success of central bank independence depends on political institutions.

The Bank of Spain was granted the national monopoly to issue banknotes in 1874. Spain had a bimetallic standard *de iure*, that is to say, the local currency was convertible into gold or silver at the discretion of the Bank of Spain. Gold adherence was never an explicit target. The Bank applied an orthodox monetary policy, and the gold standard was maintained *de facto* until 1891, when the charter was renewed, and the Bank of Spain stopped defending the exchange rate (Martínez-Ruiz and Nogues-Marco 2014). After 1895, the exchange rate depreciated sharply, and the depreciation of the peseta reached its maximum level in 1898-1899 when money creation largely financed the Spanish-American War. After 1900, the government introduced a deflationary policy aimed at stabilizing the exchange rate. The political authorities' objective was to join the gold standard and an orthodox fiscal policy was designed to introduce it. Yet the gold standard was never resumed, because the Bank of Spain refused to deflate the economy.

Decisions affecting the exchange rate are explained in this paper, based on the fluctuating balance of power between the government and the central bank and determined by the current institutional framework in each year. Thus, section 1 describes monetary stability as the outcome of negotiations between the government and the central bank, which depended on the relative power of the two institutions. We then construct two indexes to interpret the dynamics of state-banks relations. Section 2 elaborates the index of political strength based on variables related to both political stability and the financial situation. Section 3 calculates a central bank independence index based on variables related to the terms of chief executive officers, policy formulation, and limitations on government lending. Section 4 measures the probability of gold standard adherence as a function of the balance of power between the government and the central bank. The final section provides a conclusion.

Econometric results show that higher central bank independence did not generate monetary stability. Both central bank independence and political strength are significant variables in explaining exchange rate stability. Central bank independence is negatively correlated with gold adherence, while political strength shows a positive correlation. Results confirm that a highly independent private central bank avoided the responsibility of defending gold adherence when negotiating with weak government, even in a stable macroeconomic environment. Our research suggests that the success of central bank independence in generating monetary stability during the gold standard period depended on sound political institutions.

1. The Political Economy of Monetary Stability

The monetary stability of the gold standard depended on the national issuing regulations. Spain used two limits to regulate issuing, one defined a minimum reserves and the other a maximum banknotes ceiling.[1] The legislation set limits on the issue of notes in the 1874 decree

[1]Countries used three types of systems to limit issuing: (1) fiduciary systems, in which the central bank was permitted to issue a limited amount of currency not backed by gold reserves (Britain, Norway, Finland, Russia and Japan); (2) proportional systems, when gold could not fall below a proportion of banknotes, typically 35 or 40 percent (Belgium, the Netherlands, Switzerland); (3) hybrids of these two forms, which combined both an issuing

that granted the Bank of Spain the monopoly of issuing. These limits were changed several times during the classical gold standard period, concretely in 1882, 1891, 1898, 1899 and 1902.

The numerous changes in issuing limits are remarkable. It is also striking that the institutional framework of issuing regulations was not enacted by the government to preserve monetary stability, but instead negotiated between the government and the Bank of Spain in order to achieve private interests. On the one hand, the government aimed at monetizing debt without increasing the issuing ceiling, that is, by trying to persuade the Bank to reduce the private earning assets in exchange for increasing the public earning assets. On the other hand, the Bank aimed at increasing the issuing ceiling. This would improve profitability by increasing the public earning assets without reducing the private earning assets. Here we need to interpret central bank objectives in a historical perspective. Nowadays, the central bank's objective is to guarantee monetary stability. Historically, however, central banks were private banks looking for profit (Goodhart 1988, Flandreau 2008, Blancheton 2016). *A priori* the bank of Spain was not interested in monetizing public debt without increasing the issuing ceiling, because the profitability of the private earning assets was higher than the profitability of its public counterpart. However, the bank of Spain would be willing to monetize debt if the issuing ceiling was increased, because this would report an additional source of revenues. Conversely, the government would want to avoid increasing issuing ceiling because, despite the short-term cost being lower than financing debt in the market, it would cause the suspension of the gold standard, currency depreciation and the increase of the risk premium on sovereign debt.

Changes in issuing law were the result of bargaining between the government and the Bank. Bargaining is a process through which the actors try to reach an agreement. Each actor would prefer to reach an agreement, but also to reach an agreement as favourable as possible (Muthoo 2000). The bargaining outcome is determined by the sources of each actor's bargaining power. The threat of non-renewal of the issuing monopoly was the main source of bargaining power of the government and it put pressure on the central bank to reach an agreement.[2] The government had the legal right to grant the monopoly of issuance to the central bank. As a consequence, if the central bank perceived a risk of losing the issuing monopoly, it would be willing to create money for the government in exchange for maintaining the issuing privilege. This was indeed the case for the Bank of Spain.

The charter granted to the Bank of Spain in 1874 was intended to be temporary, with a term of 30 years. No one argued against the temporary nature of the charter, that became the main instrument for exerting control over the Bank of Spain, since it seemed likely that the negotiation for renewal would be problematic. For example, possible subsequent non-renewal

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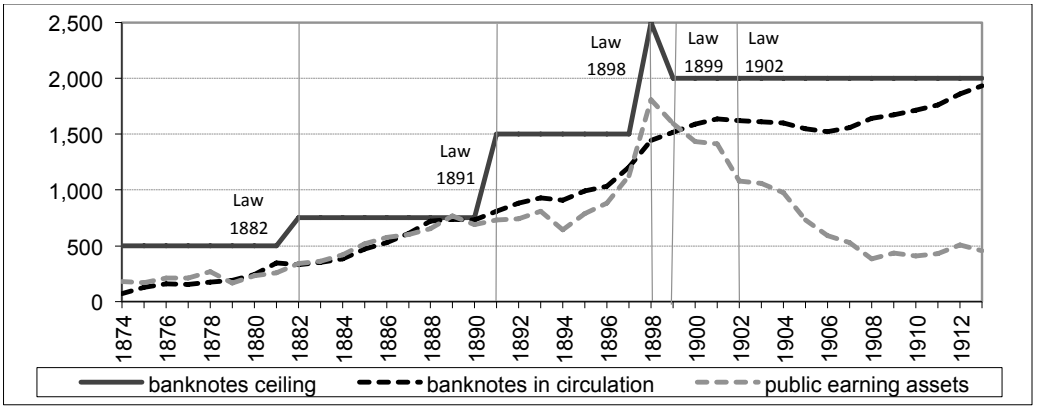
ceiling and a proportion between gold and banknotes, such as the systems of Germany, Austria-Hungary and Sweden (Eichengreen 1996, p. 23). Spain was in the third group of issuing regulation. A detailed description of the legal limits for banknotes issued by the Bank of Spain, both banknote ceiling and minimum reserves, is available in Martín-Aceña *et al.* (2012), Table 8.1.m p.153.

[2] Although from a modern perspective the eventual withdrawal of the charter might seem inconceivable because of the very likely subsequent collapse of the monetary system, this situation was by no means exceptional in contemporary Europe, where issuing banks were in general considered as just another privileged company. Furthermore, in Spain the concession of privileges in exchange for revenues or credits had a long-lasting tradition and it is also worth mentioning that the normal length of such concessions was between 20 and 30 years. See Flandreau *et al.* (1998) for dates of charter revisions of the European central banks in the 19th century, and Broz and Grossman (2004) for the Bank of England case before 1844.

was one of the main arguments of shareholders opposed to the acceptance of the charter in 1874.[3] The Commercial Code of 1885 provides further proof, which made clear the temporary character of the charter and the plausible return to the banking structure of multiple provincial issuing banks 10 years after the Bank of Spain obtained the issuing monopoly: "issuing banks may issue notes, but admission to the transactions will not be enforced. This freedom to issue banknotes will be on hold, however, while the privilege currently enjoyed by Bank of Spain subsists".[4]

From 1874 to 1898, the Bank forced negotiations to increase the issuing ceiling at the exact moment when the government asked for debt monetization because the government was weakened when it was in a hurry to monetize. The actors' degrees of impatience play an important role in the outcome of bargaining (Muthoo, 2000); the greater the degree of impatience of the government, the lower its bargaining power. Figure 1 shows the relationship between public earning assets and banknote ceiling. The negotiations were held when the amount of public earning assets had reached the maximum legal issuing, that is, in 1882, 1891 and 1898.

FIGURE 1. NOTES AND PUBLIC DEBT HELD IN THE BANK OF SPAIN PORTFOLIO (million ptas)



Source: Authors' calculations. Banknotes in circulation and public earning assets in Minutes of the Shareholders' General Meetings, 1874-1914. Banknote ceiling in Martín-Aceña *et al.* (2012), Table 8.1.m p.153.

The issuing ceiling increased as a result of negotiations in 1882 and 1891, suggesting a gradual gain in the Bank's bargaining power (Figure 1 – Laws 1882 and 1891). In 1882, the maximum amount of banknotes increased from 500 to 750 million ptas. In 1891, the issue limit was set at 1,500 million ptas. The Bank used the financial needs of the government to renegotiate the charter renewal before the expiry date, which further reduced the government´s bargaining power as the threat to not renew the charter was the main source of bargaining power of the government. In 1891, thirteen years before the first charter had elapsed, the monopoly of issuance was renewed for another 30 years, until the end of 1921. As a result of the bargaining agreement attached to the law that regulated the renewal, the government obtained a new long-term loan of 125 million ptas from the Bank to be repaid in 1921. The Bank of Spain in turn achieved the renewal of the charter. The "exchange of jointly held interests" between the

[3]Bank of Spain, Archives, Proceedings of the Annual General Meeting of the Shareholders, 19, 23, 24 and 25 February 1874 (Secretary Box 708)
[4]Commercial Code 1885. Paragraph 179. See also Salvador Armédariz (2000), p. 63

Bank and the Government was the expression used by the Bank during negotiations to justify rescuing the Treasury in exchange for increasing issuance limits.[5]

The issuing limit reached its maximum level in 1898, when the financial consequences of the colonial wars in Cuba generated an important rupture in the evolution of Spanish public finances. The 1898 decree authorised the Bank of Spain to increase the issue of notes to a value of 2,500 million ptas (Figure 1- Law 1898). The wars produced a sharp increase in spending impossible to finance by ordinary revenue. The main source to meet such extraordinary expenditure was debt, especially short-term debt placed in the Bank of Spain and hence monetized. Negotiations were commenced to define the conditions for the monetization of debt. The Bank's board of governors proposed absolute freedom to issue notes without a ceiling, while establishing reserves only in silver. Removing the issuing ceiling was, according to the board of governors, the "golden dream" for the Bank of Spain.[6] The final bargaining agreement was the increase of the issuing limit from 1,500 to 2,500 million ptas.[7] The Finance Minister announced in Parliament that allowing the increase in issuing was a temporary measure designed to obtain revenue during the emergency of wartime.[8] The consequent growth of the money supply, coupled with uncertainty about the wars, brought about the sharply depreciation of the peseta.

Bordo and Kydland (1995) interpreted gold standard rule as a contingent rule. Only in case of well-understood emergencies, such as a war, temporary departures from the rule would be permitted on the assumption that convertibility of the national currency into gold would restore once the emergency passed. Britain, France and the United States all suspended specie convertibility during wartime. They also restored parity once the emergency passed. The rule was contingent in the sense that agents understood that the suspension would last only for the duration of the emergency plus some period of adjustment and that afterwards the government would adopt the deflationary policies necessary to resume payments at the original parity between the currency and gold.

In the case of Spain, the government adopted an extensive debt conversion reform to stabilize the exchange rate after the Cuban War of Independence. This reform reduced short-term debt hold on the bank of Spain portfolio near fivefold, from a maximum of 1,811 million ptas in 1898 to a minimum of 383 million in 1908, so that in this year it reached a level comparable to the mid-1880s (see Figure 1). However, the debt conversion reform did not lead to an orthodox monetary policy. Fiscal discipline substantially reduced the public debt held in the Bank of Spain's portfolio, but banknotes in circulation were not reduced (see Figure 1), as monetary deflation was partially sterilized. Public earning assets were not redeemed by reducing banknotes in circulation, but by increasing silver reserves and private earning assets. Between 1898 and 1908 silver reserves multiplied fourfold (from 197 to 810 million ptas) and private earning assets multiplied fivefold (from a minimum of 128 to 697 million ptas).[9] The exchange

[5]Bank of Spain, Archives, Minutes of the Board of Governors Meetings, 30 April 1889
[6]Bank of Spain, Archives, Minutes of the Board of Governors Meetings, 22 April 1898
[7]Bank of Spain Proceedings of the Annual General Meeting of the Shareholders, 1898, pp. 28-29. Decree of 9 August 1898, authorized on 17 May
[8]Sarda (1948), pp. 213-214
[9]Bank of Spain Proceedings of the Annual General Meeting of the Shareholders, 1898-1908

rate did not converge with gold parity because sterilization prevented deflation, despite fiscal discipline.

Deflation was not achieved because the legal issuing limits were not reduced sufficiently to force the Bank to withdraw banknotes from circulation (Figure 1- Laws 1899 and 1902). As we have seen, legal issuing limits were not defined by the government but negotiated between the government and the Bank. The final output depended on the relative bargaining power. The Law of 1899 only reduced the ceiling on issuing from 2,500 to 2,000 million ptas. The Finance Ministry agreed with the Bank of Spain to reduce the interest rate paid by the government loan in exchange for maintaining a high issuing ceiling. This interest rate was at an annual rate of 2.5%, far below the discount rate which was 4% at that moment. The logic of this agreement was that a high issuing ceiling would report a profit to the Bank to compensate for the interest reduction on government lending.[10] Again, in the negotiation of 1902 the Bank was able to maintain the limit on issuing without any decrease, in exchange for reducing once more the interest rate on government lending to 2%.[11] Monetary stability was not achieved as the legal issuing ceiling did not decrease enough to reduce the exchange rate to a level compatible with the adherence to gold. As we will see in section 4, the Bank of Spain blocked gold adherence from that moment on, despite government attempts in this respect.

To sum up, the stability of the exchange rate depended on the issuing regulations. The numerous changes of issuing limits are remarkable for the case of Spain. As we have seen in this section, issuing regulations were the result of the bargaining power between the central authority and the monetary authority. The following sections measure the evolution of government power and central bank independence in order to quantify the relative bargaining power of the two institutions throughout the gold standard period.

2. The Index of Government Influence

Our general claim is that monetary stability, understood as exchange rate stability, was determined by the interaction of two institutions, the government and the Bank of Spain, whose bargaining positions changed over time. To capture these changes, we construct two indices to measure the relative strength of each actor over time: an independence index for the Bank of Spain and a power index for the government. The government power index is composed of criteria regarding two different dimensions. On the one hand, a political dimension that attempts to capture the degree of stability of the political system. On the other hand, a financial or economic dimension intended to capture how much room for manoeuvre the government enjoyed in financial matters. The variables incorporated are summarised in the Appendix (table A1).

Political stability is key to determining the capacity of a given government to carry out a sound macroeconomic policy, as possible weakness of the executive would undermine the credibility

[10]Bank of Spain, Archives, Minutes of the Board of Governors Meetings, extraordinary session 1 Aug 1899. The bargaining agreement contained a clause which stated that an eventual increase of the issuing limit to 2,500 million ptas would not require further compensation from the Bank to the Treasury (Martínez Mendez 2005, chapter 10)
[11]See also Martínez-Ruiz and Nogues-Marco (2014), p. 26

of any agreement, thereby limiting the possibility of executing political projects.[12] In our case, that would mean that a weak and unstable government would find it more difficult to enforce on the Bank of Spain any decision on monetary policy that the central bank found harmful to its interests.[13] A broad range of indices of political stability is to be found in literature on economics and political science. This includes a wide variety of indicators, ranging from the permanence of the executive (term of office), to the degree of political violence (number of coup d'état, strikes or political revolts), or to institutional characteristics (ways of selecting the executive and constraints on executive decision-making or the extent of political participation). We have considered two proxies that are intended to capture the turnover rate of the government (President of the Council of Ministers, *too 1,* and the Minister of Finance, *too 2*), firstly because as Grilli *et al.* (1991) have demonstrated, the durability of governments is the most significant variable when explaining political responses to macroeconomic turbulence. Furthermore, as we explain below, various features of the true functioning of the Spanish political system justify this choice.

The political regime in Spain from 1874-1923 is known as the Restoration, since it was the restoration of the Bourbon dynasty, after 6 years of political instability known as the "sexenio revolucionario" (six-year revolution), which initiated this long period of constitutional monarchy.[14] The 1876 constitution established that sovereignty was shared by the Parliament and the King. The power of the Crown was reinforced as the King bore the authority to appoint the President of the Council of Ministers and even the Ministers, and shared legislative power with Parliament, maintaining the right of absolute veto over laws passed by Parliament. Furthermore, the monarch had the power to summon, suspend or dissolve Parliament. The aim of such laws was to enhance stability, since in the foregoing 50 years Spain had experienced more than 25 major political disruptions (civil wars, coup d'états or drastic changes to the regime). At the outset this objective was fulfilled, although over time the characteristics intended to ensure stability would in fact become part of the problem, since the operation of the system depended crucially on the personality of a limited number of actors, as will be shown below.

The constitution did not specify the franchise for electing Congress, although the electoral law of 1878 established restricted suffrage, restricted to major taxpayers, which lasted until 1890, when universal male suffrage was reintroduced. This could have constituted a major change in participation. But the Restoration was far from a democratic system as understood today, and even far from a bourgeois democracy in which participation was reserved for privileged groups. The political system of the Restoration was based on the existence of two major parties, the Conservatives and the Liberals, who agreed on a regular alternation of power. This "turn and turn about" between the two large parties was also intended to ensure stability. The shift in power was guaranteed because the electoral system overturned the rules of the parliamentary system in which the majority force following an election. Thus, when the ruling party suffered a process of political attrition and/or lost the confidence of Parliament, the monarch

[12] There exists extensive literature on the relationship between politics and economic policy; among others, see Persson and Tabellini (1990), Grilli *et al.* (1991), Persson (2002), Aemoglu *et al.* (2003) and Besley and Case (2003).

[13] As Acemoglu *et al.* (2003) demonstrate, inadequate macroeconomic policy is often only a symptom of institutional problems that allow powerful interest groups to "extract" rents from the rest of society.

[14] An excellent characterization of the Restoration political system is to be found in Jacobson, S. and Moreno-Luzón, J. (2000)

summoned the head of the opposition party to form a government. The new government then called elections in order to build a sufficient parliamentary majority to exercise power in a stable manner. Alternation in government was also made possible by the manipulation of elections (Jacobson and Moreno-Luzón, 2000, p.98). The party organising the elections did not hesitate to buy votes, falsify records and pressurize the electorate, using the influence and economic power of certain individuals in society (*caciques*). The adulteration of the vote was achieved by the more favourable treatment of rural compared to urban districts and, especially, by widespread electoral fraud.

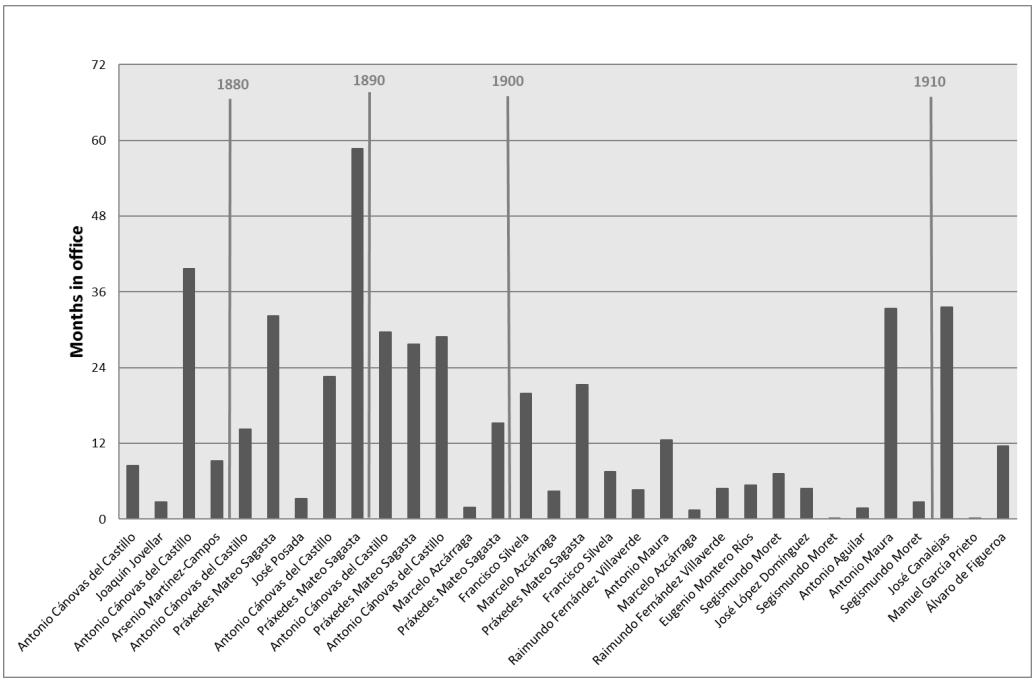
Furthermore, the two main parties were not modern mass parties, in today's terms, with headquarters, groups, and affiliates. They were parties of "notables", that is to say they were the result of the meeting of several political leaders with their respective clienteles, their press and local support. Thus, each of these politicians led a faction. The leader's task was to hold together the different factions of the party, and spread the benefits of balanced power between them. The centrifugal tendency of factions was constant: their leaders supported the government in exchange for compensations, for example the distribution of government offices.[15] If satisfactory agreements were not reached, the factions could display their discontent in Parliament. When a party lost internal cohesion while in government, the King would withdraw his confidence and call for the opposition to form a new government and organise new elections, through what is known as "a decree of dissolution". That means that governments could fall after losing the confidence of the King, the Houses of Parliament, or both.

Therefore, the consideration of proxies (*too1* and *too2*) which reflect the turnover rate (President of the Council of Ministers) and the Minister of Finance respectively, allow us to account for governmental stability in a period without major institutional changes where, however, the "human factor" was of paramount importance. From 1874 to 1913 the President changed 33 times, providing an average tenure of barely 15 months in office. Some considerations are necessary to understand the true meaning of these numbers. On the one hand, cabinet changes under the same presidency were very common, since government composition was always the result of fragile compromises among the different factions of a party. This made the government even more unstable than the computed numbers show. For example, in the same period there were 49 Ministers of Finance, meaning that the head of economic policy lasted on average 10 months in office. On the other hand, of course, the Presidency of the Council of Ministers almost always went to the leader of one of the two main parties, and thus the number of persons occupying the Presidency was much lower. There were only 17 presidents, and some of them occupied the position for many years even if in different periods. For example, from 1874 to 1902, the presidency was occupied by Canovas or Sagasta for almost 25 years, and thus in that period only five other persons were designated president and only for very brief mandates that sometimes lasted only a matter of months. This depicts a more stable government than the numbers show.

[15] Or allocation of government spending for certain provinces or territories. See for example Curto-Grau *et al.* (2012)

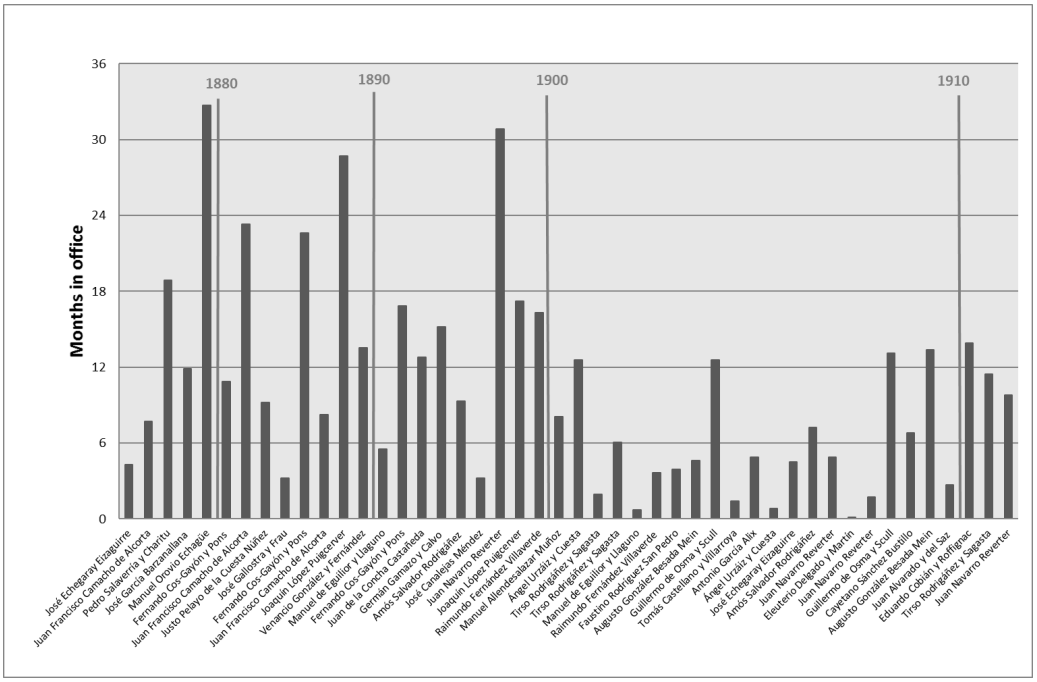
The last consideration refers to the difference in time. The system seemed to work as expected during the nineteenth century, but by the end of the century some weaknesses of the system were apparent. As Figure 2 shows, instability rose as years went by.

FIGURE 2a. TERM OF OFFICE FOR THE PRESIDENT OF THE COUNCIL (MONTHS)



Source: Urquijo Goitia (2001)

FIGURE 2b. TERM OF OFFICE FOR THE MINISTER OF FINANCE (MONTHS)



Source: Urquijo Goitia (2001)

This was due to a variety of causes. Firstly, from the above description of the system it is evident that the party leader had to be a figure with sufficient charisma to control the party's factions. During the last quarter of the nineteenth century, Canovas and Sagasta were the undisputed leaders, but after their deaths the internal divisions in their respective parties raged.[16] Other factors also contributed to the rising instability of the Restoration system. Given the reigning electoral malpractices, a moderator was needed to interpret the feelings of public opinion and to avoid the tendency of all parties to remain in power once having gained it. This was precisely the role attributed to the King who decided when to appoint or dismiss the President of the Council or to dissolve Parliament. The character of the monarch was therefore an important feature of the system. Alfonso XIII assumed the crown in 1902. He was, unlike his predecessors, a king with political ambitions, ready to reign and rule (Moreno Luzón, 2003). He therefore intervened more directly in politics, assuming his constitutional role as the chief of the executive at the expense of the constitutional principle of ministerial responsibility. Moreover, the emergence of new parties and the weakening of the historical parties gave greater prominence to Parliament, making governments weaker.

When the indicator of the turnover rate of presidents is calculated for the two different periods, before and after 1902, striking differences arise. The number of presidencies from 1874 to 1902 was 17, with an average of over 20 months in office. Very long tenures were sometimes registered. Canovas was President for almost 40 months between 1875 and 1879 and Sagasta lasted 59 months, nearly 5 years between 1885 and 1890, in what is known as the "long Parliament". By contrast, between 1900 and 1913 there were 19 changes in the Presidency, with an average tenure of barely 10 months. Table 1 shows these differences by decades.

TABLE 1. AVERAGE TERM OF OFFICE FOR THE PRESIDENT OF THE COUNCIL AND THE FINANCE MINISTER BY DECADES (IN MONTHS)

	President	Minister
1874-1880	15.0	15.1
1881-1890	26.2	15.6
1891-1900	20.6	15.2
1901-1910	8.8	5.5
1911-1913	15.1	11.3

Source: Figure 2

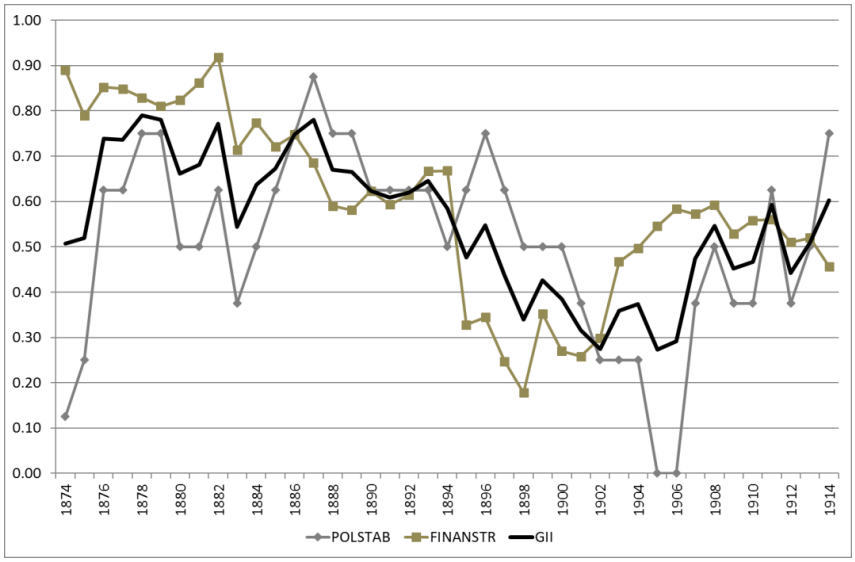
The case of the Ministers of Finance clearly reflects the growth of political instability: until 1902 the average tenure of ministers in office was about 15 months. There were even two who lasted more than 30 months. During the first years of the reign of Alfonso XIII continuity declined to the point of barely reaching six months (on average, from May 1902 to December 1913). In one single year (1902) there were five ministerial changes. This high turnover had far-reaching effects on governmental action, as many governments eluded important reforms in order to prevent rejection by Parliament that would mean the end of the minister who had defended the proposal and sometimes even of the whole government (Martorell Linares, 2012).

[16] Canovas died on 8 August 1897, while Sagasta passed away on 5 January 1903. King Alfonso XIII took power on 17 May 1902.

Concerning the economic dimension, three proxies are included in the index, all of them related to the state's fiscal strength. A deficit criterion (*Def*), defined in the conventional way as fiscal balance/GDP, measures the net borrowing of the state each year. The bigger the deficit, the less able is the government to impose conditions on other economic agents. The last two criteria reflect government choices for the financing of such deficits. Firstly, we consider the significance of financing by the central bank (*CB financing*). This variable reflects the percentage of total state debt present each year in the Bank of Spain´s balances and therefore monetized. In this case the bigger the share of debt placed in the Bank of Spain, the more dependent was the government on its central banker. The last criterion (*Extdebt*) is intended to capture the access of international markets to Spanish sovereign debt and consequently to reflect government leeway when deciding how to finance their deficits. The proxy is based on the significance of external debt in the total volume of public debt (the variables are plotted in Table A1 in the Appendix). The greater the external debt, which means the easier the access to foreign markets, the more freedom the government had to choose the optimal portfolio for funding public debt, minimizing the cost of financing by going to the most liquid foreign markets that offered better conditions.[17] In effect, the observation of the yields that the bank obtained from its portfolio of public securities reflects that these were triggered when a suspension of the external debt or an unfavourable political situation closed the access to international markets, as was the case between 1874 and 1879.

The final step in the construction of our influence index is to aggregate the different elements in a single indicator that ranks from a complete absence power (0) to total power (1). We have proceeded in two steps: firstly, two different variables for political stability and financial strength were calculated, as an unweighted average of the relevant proxies in each case. Secondly, these two variables were aggregated once more, as an unweighted average. The result is shown in Figure 3.

FIGURE 3. GOVERNMENT INFLUENCE INDEX



[17] For possible explanations of the borrowing in foreign financial centres see Flandreau and Sussman (2004)

As can be seen in Figure 3, after 20 years of relatively unchanged government strength, the reactivation of separatist conflict in Cuba brought about a weakening of executive power, mainly driven by the worsening of the state's financial position, caused by the increase in military spending. From 1901 on, the government was able to reverse the state of its finances and the financial strength variable shows a progressive improvement. The index of government influence, however, does not record a recovery until five years later, due to the political instability that followed the war. Thus, the considerable effort made to consolidate public finances during the period 1900-1902 was undermined by the weakness of a political system unable to adapt to the new reality of the country.

3. Central Bank Independence Index

As for the independence index, we have taken advantage of a wide range of empirical studies which attempt to prove the positive relationship between central bank independence (CBI) and monetary stability.[18] Several measures of CBI have been developed and discussed since the 1980s, but the most widespread are the Grilli-Masciandro-Tabellini index (1991) and the Cukierman index (1992).[19] We build on this empirical literature, beginning specifically from the legal independence indices constructed by Cukierman (1992) and Cukierman, Webb and Neyapti (1992). Our measure therefore identifies a set of relevant features of independence related to three basic aspects of the bank´s functioning: those related to the chief executive officer (CEO) of the bank, those concerning the mandate, the objectives and the autonomy of the bank in monetary policy formulation (MONPOL), and, finally, those linked to the ability of the bank to shape financial relations with the government. As for the first category, the general logic is that the greater the independence of the central bank, the greater will be the independence of the CEO. Furthermore, the more room the bank has to decide on interest rates, reserve movements or the expansion of money and credit, the more independence will there be for monetary policy. Finally, in the case of limits or regulations on the ability of the government to borrow from the bank, in a broad sense, then the more closely regulated or restricted governmental lending, the more independent is the bank from pressures to divert resources to the state, and thus the greater is its capacity to pursue its own objectives.

We capture the legal regulation of each dimension on the condition that it is contained in the different laws, decrees and/or agreements.[20] Table A2 of the Appendix summarizes the features included in the Legal Independence Index (LIWA), the respective codification and a brief description of each variable included in the index. The first group (called *CEO*) corresponds to the variables that affect the chief executive officer/CEO of the bank, the governor in our case. Two legal dimensions have been taken into account: who bears the legal authority to appoint (A*pp1*) and who can dismiss the governor and why this can happen (*Diss1*).

[18] If nowadays monetary stability is identified almost uniquely with price stability, before the First World War monetary stability meant exchange rate stability.

[19] A very large number of empirical studies has constructed indexes on central bank independence to measure the relationship between central bank independence and monetary stability. Eijffinger and de Haan 1996, Berger *et al.* 2001, Hayo and Hefekre 2002, and Cukierman 2008 summarize main contributions. The advantage of using standardized indexes on central bank independence is that they facilitate comparisons across countries and periods.

[20] We have not included all the characteristics considered by Cukierman *et al* (1992), for example the legal term of office of the governor, if the governor held another office, the role of the bank in the budgetary process or other potential borrowers from the bank, because none of these appeared in the charter.

The more authority the government has in appointing or dismissing the governor, the less independent will be the central bank. In the policy formulation dimension (MONPOL), we try to capture the Bank of Spain's ability to formulate monetary policy. This is captured through two proxies, who formulates policy (*Formpol*) and who resolves conflicts (*Conf*). The *Formpol* criterion measures the degree of responsibility in the formulation of monetary policy attributed to the central bank. The *Conf* criterion tries to capture the ability of the Bank to resist pressure from the government to adopt a policy measure, by determining who has the power to solve an eventual conflict. The greater was its capacity to oppose government orders and/or suggestions, the more independent was the bank. With regard to the limitations of the capacity of the government, or more generally the public sector, to borrow from the Bank of Spain, 5 proxies have been included to capture aspects such as limitations on advances (*lla*) or securitized lending (*lls*), or regulation of the conditions of lending, in general (*ldec*), or more specifically maturity (*lmat*) and interest rates (*lint*). In this case, in a broad sense, the stronger the restriction, the more independent was the bank from pressures to divert resources to the state. Each variable has received a coding for each year from 1874 to 1914.

The final step in the construction of our Legal Independence Index is to aggregate the different elements in a single indicator that ranks from zero independence (0) to total independence (1). We have considered the weights proposed by Cukierman *et al.* (1992) and, like them, we have rescaled the weights according to the data availability for our index (see Table A4 of the Appendix for the weights used for LIWA). The aggregation was performed in two stages. Firstly, two variables were obtained, CEO and MONPOL, from the aggregation of corresponding features, mentioned above. Secondly, we averaged two variables concerning lending to the public sector, conditions regarding loan maturity and interest rates, in a single variable. The other 3 variables concerning limitations imposed on the bank to lend to the public sector are treated separately. The six variables were then aggregated once more to obtain the final legal index (LIWA).[21]

Secondly, we extended the legal independence index with another aspect considered in the literature. Thus, Grilli, Masciandro and Tabellini (1991) pointed to the importance of the rules for appointing and dismissing not only the Bank of Spain's CEO, but also the rest of the Bank's board.[22] In the period analysed the Bank of Spain's boards were elected by the shareholders and the government had no representation, except for the governors. But the high turnover rate of the governors had important consequences for the effective management of the Bank of Spain. The brevity of terms in the central bank prevented the governors from acquiring the necessary familiarity with the organization and customs of the Bank of Spain, or even from developing a sound network of internal bonds and loyalties that could ensure support in case of disagreements.[23] This means that the governors had great difficulty in playing a useful role in the effective management of the institution and in monetary policy, or that they could only

[21] Following Dincer and Eicheengren (2014), we calculate the correlation between weighted and unweighted indexes. The four measures of Independence, LIWA, LIUA, ELIWA and ELIUA are strongly correlated, showing that results are not influenced by the weights chosen (see Table A6 of the Appendix).

[22] Also in Eijfinger and Schaling (1993) and Jacome and Vazquez (2008)

[23] Many of the chosen governors had some proficiency in financial topics, although this was not always the case. To our knowledge, the range of expertise was very broad, from relatively skilled people in the relevant areas to those without any experience at all. But the capacity to really manage the Bank was limited, even when the governor was an expert.

do so at the cost of a high level of conflict. These circumstances awarded a very important role to the figure of the Deputy Governors (DGs), who in fact assumed the function of managing the normal activity of the Bank.[24] From the study of the Bank's internal decision-making process, it is evident that not only the internal administration, but also the main operational decisions were essentially influenced by the personality and ideas of the DGs. For these reasons, two new proxies have been included (*App2*, *Diss2*) to account for the same dimensions as in the case of governor. The new criteria have been aggregated as part of *CEO.* So a new index, the Extended Legal Independence Index has been obtained (see Table A5 of the Appendix for the weights used for ELIWA).

We then constructed a broader measure of independence (INDEPWA) that incorporates not only this detailed consideration of the legal aspects, but also the actual results of the more or less informal arrangements, the customs of the bank or the personalities of the individuals responsible. The legal status of the central bank is the obvious starting point, not only because it is the most straightforward way to proceed, but also because it allows us to approximate the intentions of the government with respect to the issues analysed. However, it requires some important qualifications based on the detailed analyses of the actual functioning of the bank since, on the one hand, not every element is included in the legal texts and, on the other, the actual application of norms is in many cases more important than the initial intention of the legislator.

To the legal criteria, therefore, some proxies for actual independence have been added. Actual independence may often deviate, quite substantially, from legal independence. Such deviations depends on the degree of enforcement of the law (Cukierman 2008, p. 723). A broadly used indicator of *de facto* independence is the real term of office of the governors (too3), on the understanding that a governor who remains in office longer than the government is more able to resist the pressures of the executive branch and/or to implement longer-term policies not necessarily shared by the incumbent governments.[25] This indicator has also been included for the deputy governors (too4). These variables have been added to CEO. On the other hand, in order to account for the actual compliance with the limitations on advances and securitized lending, we have calculated the existing amounts of advances and public debt in the Bank's portfolio and have compared them with the legal limits. This is an important issue since the government's financial needs were sometimes solved by forcing the bank of Spain to exceed the limits provided by law, which would indicate a greater dependence of the central bank than the legal texts seem to indicate. Two criteria have been included clla and clls, a code of 1 being attributed to those years when the limits were observed, a code of 0 when they were not (see Table A7 of the Appendix).

We therefore attempt in all these cases to include not only the legal status of the central bank, but also to account for practice in reality. This decision is crucial for our purposes since we try to capture the real room for manoeuvre of the Bank of Spain. In the literature these aspects are treated separately, so that it is usual to find two different measures: a legal independence index and a *de facto* independence index. We have chosen to include both types of proxies,

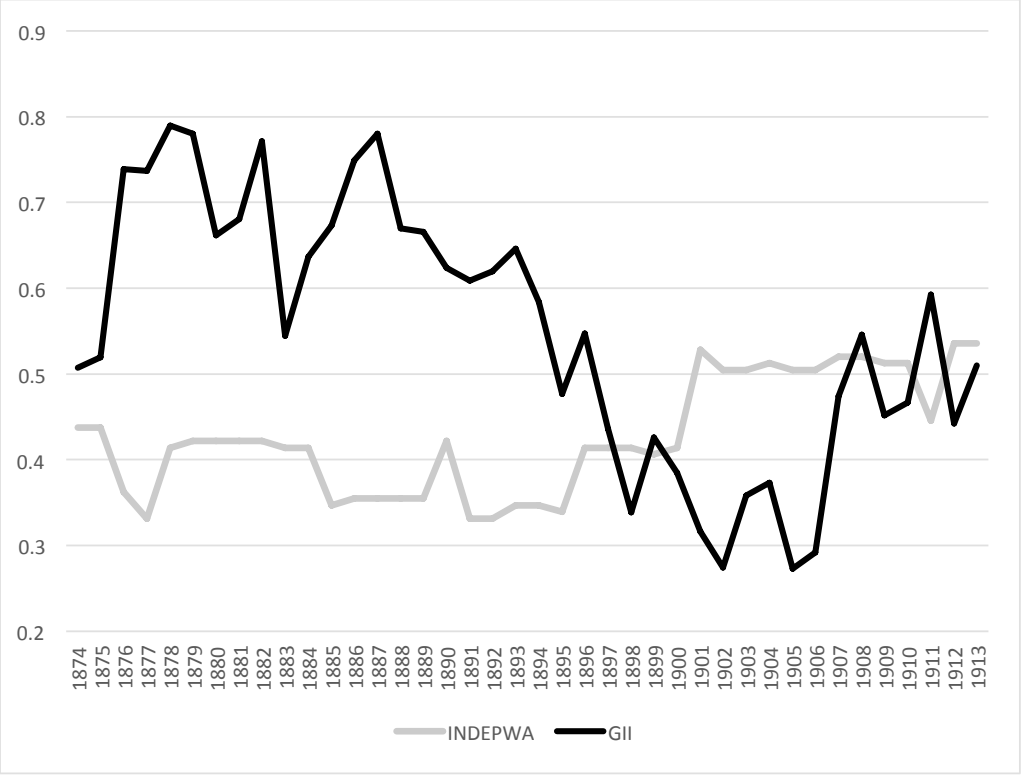
[24] Galvarriato (1932) and Banco de España (2009).

[25] On the contrary, it could be assumed that a governor lasting longer in charge must have been accommodating government demands. Given the political situation in Spain, as explained above, this possibility is highly unlikely.

the legal and the *de facto* or so-called behaviourally oriented ones in the same index, in order to obtain an operational measure. Table A8 in the Appendix shows the aggregation steps and the weights attributed in this case (INDEPWA index).[26]

Once all these aspects are taken into account the degree of independence of the Bank of Spain is far from low.[27] In fact, the Bank of Spain enjoyed medium and increasing degrees of independence during the period we analyse. It is also worth mentioning that, as evident from Figure 4 where the two obtained indexes are shown together, the independence index experimented an increase around 1900. This change is related to the reform implemented by the Ministry of Finance – Raimundo Fernández-Villaverde, which affected the regulation of the financial relationship between the government and the central bank. The clarification of the framework around 1900 indeed resulted in an increase in the central bank's independence since, consistently with the ultimate goal of the fiscal reform to pursue exchange rate stability, changes hindered government access to central bank financing.

FIGURE 4. *CENTRAL BANK INDEPENDENCE INDEX AND GOVERNMENT INFLUENCE INDEX* (1874-1914)



[26] Results are not influenced by the chosen weights (see Table A8 of the Appendix)

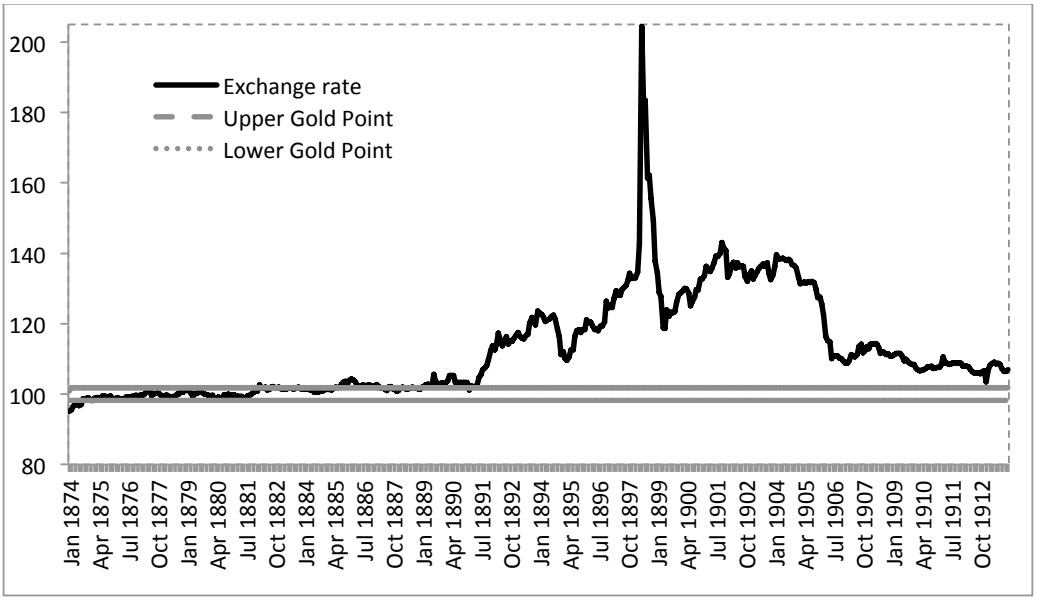
[27] Of course this is always a relative measure and cannot be compared with other central banks since, to our knowledge, no similar index has been constructed for other countries

4. Bargaining Power and Exchange Rate Stability

The gold standard was a monetary system of fixed exchange rates in which currencies were pegged to gold. The adherence to gold means that the exchange rate fluctuated within the band defined by the "gold-points", which is the ratio of official gold prices in two centres plus/minus the cost of shipping gold between them (Officer 1996).

Figure 5 measures gold-points between Madrid and London from 1874 to 1913. The exchange rate fluctuated within the gold-points from 1874 to 1891. During this period the exchange rate returned soon to parity with gold when it broke the lower or upper gold-point. However, the dynamic of the exchange rate changed severely in 1891. We observe a structural break in the exchange rate level in the summer of 1891. From that moment to 1913 exchange rates floated without adherence to gold being restored.[28]

FIGURE 5. MONTHLY EXCHANGE RATE 1874-1913, PTAS/£ (% OFFICIAL PARITY)



Source: Authors' calculations. Exchange rate: *Boletín de cotización oficial del Colegio de agentes de cambio de la Bolsa de Madrid 1874-1913, Biblioteca de la Bolsa de Madrid*. From 1874 to Dec 1887 the exchange rate in Madrid on London was quoted at 3 months. We have converted the 3-month exchange rate to the spot exchange rate (see Flandreau *et. al.* 2009; to calculate the spot exchange rate we have used London market interest rates collected from *The Economist*). Official gold parity Spain-England=25.20 ptas/£. Shipping costs extracted from *Actas de la Junta Consultiva de la Moneda*, 1876-1888. *Archivo del Ministerio de Hacienda*, Book 22859, pp. 273-278, 08/08/1877.[29]

We focus on the power relations between the state and the central bank that codified monetary stability. The outcome of negotiations has been described in section 1. Here we aim

[28] A multiple breakpoint test identifies three break dates: 1891M08, 1897M08 and 1906M02 (trimming 0.15, significance level 0.01, maximum breaks = 5). Test statistics employ HAC covariances (Prewhitening with lags=1, Quadratic-Spectral kernel, Andrews bandwidth). Robust results for breaks estimated with Bai-Perron tests of L+1 vs. L globally determined breaks, Bai-Perron test of 1 to M globally determined breaks, and compares information criteria for 0 to M globally determined breaks (Schwarz criterion and LWZ criterion). Bai and Perron (1998, 2003)

[29] Estimated gold cost is 1.78% (shipping cost from Madrid to London, via Santander), similar to the gold cost reported by Esteves, Reis and Ferramosca (2009) for the case of Lisbon-London (1.5%)

at measuring monetary stability as the result of these power relations. For that purpose, exchange rate stability is modeled as a function of the bargaining power between the government and the central bank:

$$\text{Prob}(\textit{exchange rate}_{\textit{year i}}=\text{GOLD}) = f(\textit{GII}_{\textit{year i}}, \textit{INDEPWA}_{\textit{year i}}, \textit{CHARTER}_{\textit{year i}}) \quad (1)$$

which states that the probability of gold adherence is a function of the government influence index (*GII*), the bank independence index (*INDEPWA*) and the renewal of the monopoly issuing (*CHARTER*).

This model is estimated as a probit in which the dependent variable indicates whether there is gold adherence (that is, taking the value of 1 for the years 1874-1891, and zero otherwise- see Figure 5). *GII* is the government influence index explained in section 2. It is an index delimited between 0 (minimum influence) and 1 (maximum influence). *INDEPWA* is the central bank independence index measured in section 3. It is also normalized between 0 (minimum independence) and 1 (maximum independence). CHARTER is a proxy that aims at measuring the capacity of the government to put pressure on the bank to reach an agreement on monetary stability. As we have seen in section 1, the government's main instrument of leverage was provided by its capacity of not renewing the national monopoly on paper currency. This variable has been included to measure the impact of this threat. It is defined as the number of years remaining for the charter to be renewed. [30]

Figure 6 shows correlations between gold adherence and the explanatory variables. Signs are as expected. The probability of gold adherence increased with respect to the government influence index, and decreased with respect to the bank independence index and the years remaining to renew the issuing monopoly. On the one hand, the objective function of the government was to minimize the total cost of debt, subject to the maintenance of an acceptable level of risk in the long run. The stronger the government, the higher was the probability of maintaining the gold standard regime that minimized the cost of external debt by reducing the risk premium. On the other hand, the objective function of the bank was to maximize profit. The more independent the central bank, the higher was its bargaining power to expand the issuing ceiling that would increase profitability and, therefore, the lower was the probability of adherence to gold. Profit maximization was, however, limited by the threat of losing the charter. The more credible the possibility of losing the charter, the less probable was the bank's suspending its adherence to gold. The credibility of the threat of losing the charter was related to the number of years left for its renewal. The longer period left to renew the charter, the less effective was the threat regarding its non-renewal (Flandreau *et al.* 1998, p. 132).

[30] We consider the *de facto* year of renewal. As explained in section 1, the Bank of Spain was granted the issuing monopoly in 1874 for a period of 30 years. However, the renewal was granted in 1891, 13 years earlier.

FIGURE 6. PROBABILITY OF ADHERENCE TO GOLD WITH RESPECT TO INDEPENDENT VARIABLES

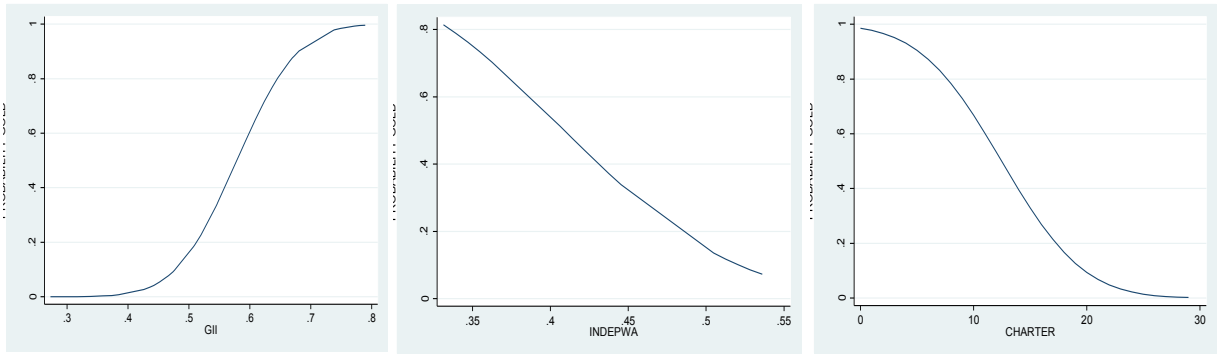


Table 2 presents the average marginal effects and the average marginal elasticities from the probit regression. The average marginal effects indicate the change in the probability of gold adherence for an infinitesimal change in the explanatory variable. The average marginal elasticities indicate the percentage of change in the probability of adherence to gold for a one per cent change in the explanatory variable. The Pearson chi2 test indicates that we accept the goodness of fit, and the percentage of correctly classified observations indicates that 92.5% of probabilities are correctly predicted (using the 0.5 predicted threshold). The Wald Test accepts the joint significance of coefficients; and the z-ratio accepts the individual significance of coefficients. All the coefficients are statistically significant and their signs are as expected.

TABLE 2. DETERMINANTS OF ADHERENCE TO GOLD IN SPAIN: MARGINAL EFFECTS AND MARGINAL ELASTICITIES FROM PROBIT REGRESION, 1874-1913

Independent Variable	Coefficient	Marginal effects	Marginal elasticity
GII	9.633 (3.29) ***	0.905 (0.21) ***	5.914 (2.96) **
INDEPWA	-8.051 (3.44) **	-0.753 (0.26) ***	-5.542 (3.43) *
CHARTER	-0.148 (0.05) ***	-0.014 (0.01) ***	-4.117 (2.26) *

Notes: Correctly classified: 92.05%. AIC: 20.23. BIC: 25.29. Goodness-of-fit test: Pearson chi2 (37) = 16.20 (Prob>chi2=0.9988). The number of observations is 40. Robust standard errors are in parenthesis. *** Significant at the 99 percent level. ** Significant at the 95 percent level. * Significant at the 90 percent level

The marginal effects and marginal elasticities for GII and INDEPWA are nearly equal in magnitude and of the opposite sign. Gold adherence was the result of the bargaining between the government and the central bank. Both government influence and central bank independence are relevant to explain the commitment to gold, government power being slightly more influential. An increase in bank independence of 1% decreased the probability of gold adherence by 5.5%. Symmetrically, an increment of government influence of 1% increased the probability of joining the gold standard by 5.9%.

However, the probit regression is a nonlinear model. The marginal elasticities depend on the values taken for the explanatory variables. Table 2 reports the average marginal elasticity, that is to say the average of the marginal elasticities for each observation. Still, averages can obscure differences in elasticities across cases. To capture the dynamics of the interaction between the government and the bank, we need to calculate the marginal elasticities for the different levels of government influence and bank independence (Williams 2012). Table 3

calculates the marginal elasticities from the probit regression for low, medium and high values of the independent variables (GII and INDEPWA). As the GII and INDEPWA indices are series normalized between 0 and 1, we consider 0.25 as low, 0.50 as medium and 0.75 as high.

TABLE 3. MARGINAL ELASTICITIES FROM PROBIT REGRESSION FOR LOW, MEDIUM AND HIGH VALUES OF THE INDEPENDENT VARIABLES

		DEGREE OF BANK INDEPENDENCE		
		low	medium	high
DEGREE OF GOVERNMENT INFLUENCE	low	INDEPWA- 4.298* GII 5.159**	INDEPWA -15.854 GII 9.515*	INDEPWA-35.424 GII 14.173*
	medium	INDEPWA -1.115*** GII 2.678***	INDEPWA -7.284* GII 8.743**	INDEPWA -21.511 GII 17.213*
	high	INDEPWA -0.074 GII 0.267	INDEPWA -1.604*** GII 2.888**	INDEPWA -9.074 GII 10.892*

*** Significant at the 99 percent level. ** Significant at the 95 percent level. * Significant at the 90 percent level

Table 3 reports differences in elasticities across cases. It can be observed that marginal elasticities of INDEPWA and GII are similar for a similar level of bargaining power between the government and the bank (Table 3-the diagonal of the marginal elasticities: low GII-low INDEPWA, medium GII-medium INDEPWA and high GII-high INDEPWA). In these cases, a change of relative power for the government and the bank will have a similar impact on the probability of gold adherence. However, the magnitude of marginal elasticities differs when we compare the different levels of bargaining power between actors. In the case of a medium-high level of government influence together with a low-medium level of bank independence, marginal elasticities are small in magnitude, government marginal elasticity being higher than bank marginal elasticity (Table 3- marginal elasticities below the diagonal: high GII-low INDEPWA, high GII-medium INDEPWA and medium GII-low INDEPWA). This means that an increase in bank independence would have a very small probability of abandoning gold convertibility. Strong political institutions would guarantee gold adherence.

On the contrary, in the case of a low-medium level of government influence together with a medium-high level of bank independence, marginal elasticities are high in magnitude, bank marginal elasticity being higher than government marginal elasticity (Table 3-marginal elasticities above the diagonal: low GII-medium INDEPWA, low GII-high INDEPWA, medium GII-high INDEPWA). In this case, an increase in bank independence would have a very high probability of abandoning the convertibility of gold as bank's aim is profit maximization and not monetary stability. Strongly independent private central banks negotiating with weak governments would avoid the responsibility of defending the currency even in a stable macroeconomic situation.

Qualitative evidence confirms econometric results. State-bank power relations moved gradually to a higher level of central bank independence together with a lower level of government strength (as we have measured in sections 2 and 3). As a consequence, monetary stability was sacrificed in favour of banking profitability. Two episodes were crucial. First, the bringing forward of the charter renewal from 1904 to 1891. Before the charter renewal, the Bank of Spain had applied orthodox monetary policy oriented to maintain the exchange rate within the gold points, that is, the Bank raised the interest rate to reduce the money supply

when the reserve ratio reduced in currency crises (Bloomfield 1959). Spain suffered a currency crisis in both 1882 and 1891. In the first currency crisis, the Bank increased interest rates and reduced reserves. Interest rates increased from 4 to 4.5% in 1882 and from 4.5% to 5% in 1883. Reserves were reduced drastically during 1882 (26% of silver reserves and 60% of gold reserves). The Bank of Spain controlled the speculative attack of 1882 and the peseta remained within the gold points. Once the peseta had been stabilized, the Bank reduced the interest rate once more to the original level of 4%, and the interest rate did not change until the following currency crises, during the period 1889-1891. In the second currency crisis, the Bank of Spain increased interest rates (from 4% to 5% in 1891 and from 5% to 5.5% in 1892). Silver reserves were reduced by 60% from 1888 to 1890 (gold reserves suffered only a minor reduction because the Bank had gradually stopped converting banknotes to gold between the mid-1880s and 1890) (Martinez-Ruiz and Nogues-Marco 2014, pp. 26-31). However, the increase in the interest rate did not reduce the money supply because the change of issuing ceiling doubled the maximum quantity of banknotes in circulation (from 750 to 1,500 million ptas; see Figure 1) (Law 14 July 1891). From that moment on, the Bank of Spain stopped defending the peseta, which started to float in August 1891, just a few days after the renewal of the charter (see Figure 5).

The second episode was the fiscal reform implemented in 1899-1901 by the Ministry of Finance – Villaverde, intended to restore order to Spanish finances after the 1898 Cuban War of Independence, which substantially increased the independence of the Bank (see Figure 4). Villaverde's reform included a tax reform and a debt conversion plan. It was intended not only to provide a definitive solution to the permanent fiscal deficit, but also to prevent the damages that, in his view, debt monetization had inflicted on the international value of the peseta. In this respect, the plan included firm measures to restrict the government's capacity to turn to central bank financing and the obligation of the State to repay the Bank all the loans received to finance the War, considered by Villaverde a necessary preliminary step to undertake the necessary reduction of the circulation of money to integrate in the gold standard. However, in this occasion, the Bank of Spain did not cooperate with the government in seeking to restore stability of exchange because the greater the depreciation of the exchange rate, the greater were the paper profits of the Bank. The policy of the Bank of Spain was to offer loans collateralized with sovereign debt at an interest rate lower than the yield earned by the sovereign debt itself, thereby encouraging speculators to borrow as much as possible by pledging sovereign bonds, use the loan to buy more public bonds and use them once again as a collateral for another loan to buy more public bonds, and so on (Conant 1915, p. 315-316).

Gold adherence was a political aspiration shared by the majority parties, but the way to achieve it was not entirely shared within the government, as part of the cabinet did not understand the emphasis Villaverde placed on monetary stability versus ensuring an easy access to banks' financial help.[31] Even then, the President, Francisco Silvela, expressed doubts, saying "I wonder whether Villaverde is a sort of deluded fool driven by the secret aim to sanitize the currency".[32] This was not uncommon during the period as party cohesion was especially weak in economic issues, since the interest of the represented group, region or even

[31] Martinez Mendez (2005) Chapter 9.

[32] Francisco Silvela (1904) cited in Martorell (2000)

company always prevailed over party voting discipline.[33] The lack of consensus over the deflationist option was revealed two years later when the new Finance Minister, Ángel Urzáiz y Cuesta, tried to complete the reform of Villaverde by imposing a reduction of the issuing limits. Urzáiz's purpose was to decrease the amount of banknotes in circulation to improve exchange rate and gold premium, ranging at the time between 37 and 40 premium. He laid much stress on the imperious necessity for Spain to take thus the first steps in the direction of a sounder policy in its currency and in its excessive banknote issue.[34] The negotiation process was intense. According to *The Economist* "the board of directors [of the bank of Spain] had a hard fight with the liberal finance ministers, who were backed by public opinion, by commercial and financial circles, by the Press, and even by the Opposition Statesmen and ex-ministers of finance in the Parliament".[35] Bank resistance to surrender and the lack of uniform criteria in government ranks caused the fall of several ministers in less than five months. At the same time, for several months in 1902, no new governor could be appointed at the Bank of Spain following the resignation of the former one, due to the strong opposition of the Bank Board to abide by the conditions of the government in negotiating the new agreement that aimed at reducing banknote issuing. [36] The final result was a new legal framework for the Bank of Spain (Law 13 May of 1902 and Agreement 17 July 1902) that made it more difficult for the government to access central bank financing, while at the same time ensuring it was cheaper, but did not manage to reduce issuing ceiling (see Figure 1). The Law was considered in the press and in business circles as a triumph of the interests of the bank against general interests.[37]

From that moment on, the Bank of Spain blocked currency stabilization despite government attempts to adopt gold standard. In June 1903, the Finance Minister presented to Parliament two bills which he deemed likely to improve the monetary situation, particularly in connection with foreign exchanges and the value of the Spanish currency. [38] In September 1903, the Finance Minister considered that "the time had come to attend, if possible, to foreign exchanges, to the currency, the fiduciary circulation, the relations of the Bank of Spain and the Treasury, and to the administration and guarantees of the Bank itself, that he deemed insufficiently reformed by the law voted by the Parliament in 1902". The goal was to reduce silver and notes in circulation as the best means to promote the return to a gold standard and gold currency. *The Economist* recognized that "Mr. Villaverde [being President of the Government in that moment] is gamely trying to grapple with some of the most difficult problems that Spanish Governments and Spanish Finance Ministers have been confronted with for years. His efforts are viewed with favour by the commercial and industrial classes. But as the success of his financial policy depends, as usual in Spain, upon the length of time that he

[33]Martorell Linares (2012). The article includes a very illustrative citation on this issue by the influential congressman Baldomero Argente, who said in 1914*, "economic affairs are not matters of dogma, are not fundamentally party issues".*

[34]The Economist, "Spanish Finance and Currency", July 13, 1901, issue 3020, pp. 1044-1045

[35]The Economist, "The Report of the Bank of Spain for 1902", April 4, 1903, issue 3110, pp. 605-606

[36]Bank of Spain. Archives, Minutes of the Board of Governors Meetings (1902). The new governor was finally named after the signing of the new agreement

[37]Luque Castillo (2014), p. 104-105

[38]The Economist, "The Spanish Budget", June 27, 1903, issue 3122, pp. 1128-1129

will command enough favour at Court to counteract the many political influences at work, even in the ranks of his own Conservative party"[39]

Between 1903 and 1913, at least four bills which aimed at stabilizing the exchange rate and preparing Spain for the integration of the gold standard were presented at the Bank of Spain. All these projects faced the Bank's opposition and led to crude confrontations between the government and the Bank. Shareholders expressed some concern and displeasure at the decline in the value of their shares, which took into account the inevitable consequence of the steady decrease, since 1900, of the relations of the Bank with the State and Treasury. [40] Due to the incapability of the State to persuade the Bank to assume the objective of stabilizing the exchange rate within the gold points, the government proposed the creation of a special fund styled "Fund of Exchange" co-financed by the State and the Bank to regulate and improve international exchange. This project was also unsuccessful, and the premium on gold rose to almost 6.75 on Paris in December 1912.[41] The last legislative attempt to speed the integration of the peseta into the gold standard was made in May 1914. The gold standard was never resumed because the Bank of Spain was sufficiently independent and therefore could reject taking the necessary steps even after the successful fiscal consolidation.

Conclusions

This article contributes to the literature on central bank independence and monetary stability during the classical gold standard era. On the eve of the First World War, European central banks had achieved a high degree of protection against political pressures to monetize debt. Central bank independence was the endogenous outcome of negotiations that codified state-banks relations when charters were drafted and adjusted over time following actual changes in underlying power relation.

North-western European countries enjoyed stable gold adherence, while central-eastern and southern European countries were unable to commit to long-lasting gold adherence despite gradually increased central bank independence. In this paper we have explored state-bank power relations to explain the relationship between central bank independence and monetary stability in peripheral Europe. Concretely, we have focused on the case of Spain. State-bank power relations and its changes over time have been measured by combining indexes on central bank independence together with estimations on the degree of strength of political institutions.

Results have shown that both central bank independence and political strength are significant variables in explaining long-lasting gold adherence. Higher central bank independence did not generate monetary stability. On the contrary, central bank independence is negatively correlated with gold adherence. Nowadays, central bank independence theory assumes that the objective function of central bank is monetary stability, so greater independence means

[39]The Economist, "Spanish Finance", September 5, 1903, issue 3132, pp. 1535-1537
[40]The Economist, "The Bank of Spain", March 18, 1905, issue 3212, pp. 442-443
[41]The Economist, Reforms in Spain and a Loan", December 28, 1912, issue 3618, pp. 1329-1330

higher monetary stability. But this statement is not valid historically because the bank of Spain was a private institution whose main goal was profitability and not monetary stability.

Monetary stability was a political goal. Effectively, results show a positive correlation between political strength and gold adherence. More important, our results confirm that a highly independent private central bank avoided the responsibility of defending gold adherence when negotiating with weak government, even in a context of fiscal consolidation.

Our research suggests that the success of central bank independence in generating monetary stability during the gold standard period depended on sound political institutions. Gold adherence required austerity policies to deflate the economy. Then, as now, policies oriented to fiscal consolidation and monetary adjustment needed strong political institutions capable to implement them successfully.

References

- Acemoglu, D., Johnson, S., Robinson, J. and Thaicharoen, Y. (2003): "Institutional causes, macroeconomic symptoms: volatility, crises and growth", Journal of Monetary Economics 50, pp. 49-123

- Acemoglu, D., Johnson, S. Querubín, P. and Robinson, J. A. (2008): "When Does Policy Reform Work? The Case of Central Bank Independence", *Brookings Papers on Economic Activity*, n. 1 Spring, pp. 351-429

- Actas de la Junta Consultiva de la Moneda, 1876-1880, Archivo del Ministerio de Hacienda, Libro 22859.

- Alesina, A. and Summers, L. H. (1993): "Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence", *Journal of Money, Credit and Banking* 25 (2), pp. 151-162

- Alesina, A. Cohen, G. and Roubini, N. (1997): *Political Cycles and the Macroeconomy*, MIT Press

- Archivo del Banco de España (1876): *Leyes Orgánicas, Estatutos y Reglamento del Banco de España*, Madrid: Imprenta de Miguel Ginesta.

- Archivo del Banco de España (1897): *Leyes Orgánicas, Estatutos y Reglamento del Banco de España*, Madrid: Imprenta del Asilo de Huérfanos del S. C. de Jesús.

- Archivo del Banco de España (1912): *Leyes Orgánicas, Estatutos y Reglamento del Banco de España*, Madrid: Imprenta de Bernardo Rodríguez.

- Bai, J. and Perron, P. (1998): "Estimating and testing linear models with multiple structural changes", *Econometrica* 66, pp. 47–78

- Bai, J. and Perron, P. (2003): "Critical values for multiple structural change tests", *Econometric Journal*, 6, pp. 72-78

- Banco de España (2009): *El Consejo del Banco de España. Su estructura y composición, 1782-2008*, Madrid: Banco de España, (Segunda edición corregida).

- Barro, R.J. and Gordon, D. (1983): "Rules, discretion, and reputation in a positive model of monetary policy". *Journal of Monetary Economics*, Vol.12, pp. 101– 121.

- Berger, H., de Haan, J. and Eijffinger, S.C.W. (2001): "Central bank independence: an update of theory and evidence". *Journal of Economic Surveys*, Vol 15, pp. 3– 40.

- Besley, T. and Case, A. (2003): "Political Institutions and Policy Choices: Evidence from the United States", *Journal of Economic Literature*, XLI, pp. 7-73

- Blancheton, B. (2016): "Central bank independence in a historical perspective. Myth, lessons and a new model", *Economic Modelling*, 52, pp. 101-107

- Blommestein, H J and A Hubig (2013): "Is the standard micro portfolio approach to sovereign debt management still appropriate? A critical analysis of the underlying analytical framework of public debt management", in A. Hubig, *Introduction of a New Conceptual Framework for Government Debt Management*, Belin, Heidelberg: Springer, pp. 21-30

- Bloomfield, A.I. (1959): *Monetary policy under the international gold standard, 1880-1914*, New York: Federal Reserve Bank of New York,

- Bordo, M.D. and F. E. Kydland (1995): "The Gold Standard as a Rule: An Essay in Exploration", *Explorations in Economic History*, 32 (4), pp. 423-464, (October 1995).

- Bordo, M. D., Meissner, C. M. and M. D. Weidenmier (2006): "Currency Mismatches, Default Risk, and Exchange Rate Depreciation: Evidence from the End of Bimetallism", NBER WP 12299

- Bouvier, J. (1988): "The Bank of France and the state from 1850 to the present day", in G. Toniolo (ed.) *Central Banks' Independence in Historical Perspective*, Berlin: Walter de Gruyter

- Capie, F., Goodhart, C., Fischer, S., and Schnadt, N. (eds.) (1994): *The Future of Central Banking*, Cambridge: Cambridge University Press.

- Carreras, A., Prados de la Escosura, L. and Roses, J. (2005): "Renta y riqueza" in *Estadísticas Históricas de España. Siglos XIX y XX*. Bilbao: Fundación BBVA vol. III, pp. 1297-1376.

- Comín, F. and Díaz Fuentes, D. (2005): "Sector público administrativo y estado del bienestar", in *Estadísticas Históricas de España. Siglos XIX y XX*. Bilbao: Fundación BBVA vol. II, pp. 873-964.

- Comín, F. and M. Martorell (coords.) (1999): "Villaverde en Hacienda, cien años después", *Hacienda Pública Española*, Special issue.

- Conant, C. (1915): *A History of the Banks of Issue*, New York and London: G.P. Putnam's Sons, 4th edition.

- Cukierman, A. (1992): *Central Bank Strategy, Credibility, and Independence: Theory and Evidence*, Cambridge, Mass.-London: The MIT Press.

- Cukierman, A. (2008): "Central bank independence and monetary policymaking institutions. Past, present and future". *European Journal of Political Economy*, Vol. 24(4), pp.722-736.

- Cukierman, A. Webb, S.B. and Neyapti, B. (1992): “Measuring the Independence of Central Banks and Its Effect on Policy Outcomes”, *The World Bank Economic Review*, Vol. 6, No. 3 (Sep., 1992), pp. 353-398

- Cukierman, A., Webb, S. B. (1995): "Political influence on the central bank: international evidence", *The World Bank Economic Review* 9, pp. 397-423

- Cukierman, A. Miller, G. and Neyapti, B. (2002): "Central Bank Reform, Liberalization and Inflation in Transition Economies: An International Perspective", *Journal of Monetary Economics*, 49 (2), pp. 237-264

- Curto-Grau, M., A. Herranz-Loncan and A. Solé-Ollé (2012): “Pork Barrel Politics in Semi-Democracies: The Spanish “Parliamentary Roads,” 1880–1914”, *Journal of Economic History*, 72, 3, pp. 771-796.

- Dincer, N. N. and Eichengreen, B. (2014): "Central Bank Transparency and Independence: Updates and New Measures", *The International Journal of Central Banking*, March issue, pp. 189-253

- Eichengreen, B. (1996): *Globalizing Capital. A History of the International Monetary System*, Princeton: Princeton University Press.

- Eijffinger, S. and Schaling, E. (1993): “Central bank independence in twelve industrial countries,” Banca Nazionale del Lavoro Quarterly Review, 184, pp. 64-68.

- Eijffinger, S. C. W. and de Haan, J. (1996): "The Political Economy of Central Bank Independence", Special Papers in International Economics, 19. Princeton University Department of Economics International Finance Section.

- Esteves, R. P., J. Reis, and Ferramosca, F. (2009): “Market Integration in the Golden Periphery: The Lisbon/London Exchange, 1854–1891”, *Explorations in Economic History* 46 (3), pp. 324–45.

- Fernández-Villaverde, R. (1903): *Proyecto de Ley para regularizar y mejorar el cambio exterior y para procurar el restablecimiento de la circulación y de la libre acuñación de la moneda de oro*, Madrid: Imprenta de la sucesora de M. Minuesa de los Ríos

- Flandreau, M. (2008): “Pillars of Globalization: A history of monetary policy targets, 1797 1997”, in A. Beyer and L. Reichlin, (eds.) *The role of money money and monetary policy in the 21st century*, Frankfurt: ECB, pp. 208 243

- Flandreau, M. Le Chacheux, J. and Zumer, F. (1998): Stability without pact? Lessons from the European Gold Standard, 1880-1914, *Economic Policy*, 13 (26), pp. 115-162

- Flandreau, M. and Zumer, F. (2004): *The Making of Global Finance, 1880-1913*, Paris: OECD

- Flandreau, M., Galimard, C. Jobst, C. and Nogues-Marco, P. (2009): “The Bell Jar: Commercial Interest Rates between Two Revolutions, 1688-1789” , in J.Atack and L.Neal (eds.), *The Origins and Development of Financial Markets and Institutions. From the Seventeenth Century to the Present*, Cambridge: CUP, pp. 161-208

- Galvarriato (1932): *El Banco de España, su historia en la centuria, 1829-1929*. Madrid: Banco de España.

- Goodhart, C.A.E. (1988): *The evolution of central banks*. Cambridge MA: The MIT press.

- Grilli, V., Masciandaro, D. and Tabellini, G. (1991): "Institutions and policies". Economic Policy, Vol. 6, pp. 341– 392.

- Guttentag, J. and Herring, R. (1983): "The insolvency of financial institutions: Assessment and regulatory disposition", in P. Wachtel (ed.): *Crises in the economic and financial structure*, Lexington: Lexington Books, pp. 99-126

- Hayo, B. and Hefekre, C. (2002): "Reconsidering central bank independence" *European Journal of Political Economy*, 18(4), pp. 653-674.

- Holtfrerich, C. L. (1988): "The relations between monetary authorities and government institutions: the case of Germany from the nineteenth century to the present", in G. Toniolo (ed.) *Central Banks' Independence in Historical Perspective*, Berlin: Walter de Gruyter

- Jacobson, S. and Moreno-Luzón, J. (2000): "The political system of the Restoration, 1875-1914: political and social elites", in José Álvarez Junco and Adrian Shubert (eds.), *Spanish History since 1808*. London: Arnold, pp. 93-109.

- Jacome, L.I. and Vazquez, F. (2008): "Any link between legal central bank independence and inflation? Evidence from Latin America and the Caribbean," *European Journal of Political Economy*, 24, pp. 788-801.

- Lévy, R. G. (1911): *Banques d'émission et Trésors publics*, Paris: Hachette.

- Linderberg E, Band S. A. and Ross, X. (1981): "Tobin's q ratio and industrial organization", *The Journal of Business*, 54 (1), pp. 1-32

- Luque Castillo, F. J. (2014): *Los ministros de Hacienda en España (1901-1986): perfil sociopolítico e influencia.* Unpublished PhD dissertation, Departamento de Ciencia Política y de la Administración, Universidad de Granada

- Martín-Aceña, P., Martínez-Ruiz, E. and Nogues-Marco, P. (2012): "Floating against the tide: Spanish monetary policy, 1870-1931", in A. Ögren and L. F. Øksendal (eds.): *The Gold Standard Peripheries: Monetary Policy, Adjustment and Flexibility in a Global Setting*. Basingstoke: Palgrave Macmillan, pp. 145-173.

- Martín-Aceña, P., Martínez-Ruiz, E. and Nogues-Marco, P. (2013): The Banco de España: A national financial institution?", *Journal of European Economic History*, XIII (1), pp. 11-45

- Martínez Méndez, P. (2005): *Trabajos de Historia Económica: Tesoro y Banco de España, 1900-1936*, Madrid: Banco de España.

- Martínez Pérez, E. (1922): *Banco de España. Su régimen, operaciones y situación*, Madrid: Gráficas Reunidas.

- Martínez-Ruiz, E. and Nogues-Marco, P. (2014): *Crisis cambiarias y políticas de intervención en España, 1880-1975*, Madrid: Banco de España-Estudios de Historia Económica, n. 66

- Martorell Linares, M. (2000): *El santo temor al déficit. Política y Hacienda en la Restauración*, Madrid: Alianza editorial.

- Martorell Linares, M. (2011): *José Sánchez Guerra. Un hombre de honor*, Madrid: Marcial Pons

- Martorell Linares, M. (2012): "A ação governativa afoga-se num dilúvio de palavras": leis, fiscalização e consenso no parlamento espanhol", in Pedro Tavares de Almeida e Javier Moreno Luzon (eds.) *Das urnas ao hemiciclo: eleiçôes e parlamento em Portugal (1878-1926) e Espanha (1875-1923)*, Lisboa: Assembleia da República, pp. 131-165.

- Moreno Luzón, J. (2003): *Alfonso XIII. Un político en el trono*, Madrid: Marcial Pons.

- Muthoo, A. (2000): "A Non-Technical Introduction to Bargaining Theory", *World Economics*, 1(2), pp. 145-166

- Officer, L. H (1996): *Between the Dollar-Sterling Gold Points: Exchange Rates, Parity, and Market Behavior*, Cambridge: Cambridge University Press.

- Pan Montojo, J. (2015): "La deuda pública entre 1899 y 1936: de Villaverde a Ramos" in C. Álvarez-Nogal and F.Comín: *Historia de la deuda pública en España (s-XVI-XXI)*, Madrid: Instituto de Estudios Fiscales, pp.287-303.

- Persson, T. (2002): "Do Political Institutions Shape Economic Policy?" *Econometrica*, 70 (3), pp. 883-905.

- Persson, T. and Tabellini, G. (1990): *Macroeconomic Policy credibility and Politics*, Chur Switzerland, Harwood Academia Publishers.

- Kydland, F. E. and Prescott, E. C. (1977): "Rules Rather than Discretion: The Inconsistency of Optimal Plans", *Journal of Political Economy*, 85 (3), pp. 473-492.

- Rogoff, K. S. (1985): The Optimal Degree of Commitment to an Intermediate Monetary Target, *Quarterly Journal of Economics*, 100 (4), pp. 1169-1189

- Sargent. T. and Wallace, N. (1981): "Some unpleasant monetarist arithmetic", *Federal Reserve Bank of Minneapolis Quarterly Review*, 5 (3), pp.1–17

- Salvador Armendáriz, M. A. (2000): *Banca pública y Mercado. Implicaciones jurídico-públicas de la paridad de trato*, Madrid: Instituto Nacional de la Administración Pública

- Sardá, J. (1998) [1948]: *La política monetaria y las fluctuaciones de la economía española en el siglo XIX*, Barcelona: Alta Fulla

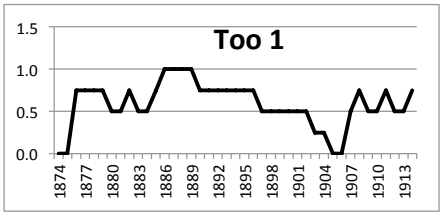
- Urquijo Goitia, J.R. (2001): *Gobiernos y ministros españoles (1808-2000)*, Madrid: CSIC

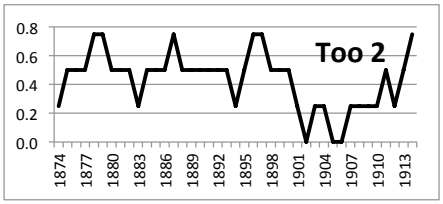
- Williams, R. (2012): "Using the margins command to estimate and interpret adjusted predictions and marginal effects", *The Stata Journal*, 12 (2), pp. 308-331

Appendix

Table A1: Government influence variables and their coding

POLITICAL STABILITY (POLSTAB)			
Presidential term of office *The bigger the turnover, the less stable the government*			
Too1= Presidential term of office	1	≥48	1
	2	48>too≥24	0.75
	3	24>too≥12	0.5
	4	12>too≥6	0.25
	5	<6	0
Ministry of Finance term of office *The bigger the turnover, the less stable is economic policy*			
Too2= Ministry of Finance term of office	1	≥48	1
	2	48>too≥24	0.75
	3	24>too≥12	0.5
	4	12>too≥6	0.25
	5	<6	0





FINANCIAL SITUATION (FINANSTR)		
Annual net borrowing of the state *The bigger the deficit, the less able will the government be to impose conditions on other economic agents*		
Def		Fiscal balance /GDP *
Significance of financing by the central bank *The bigger the share of debt placed in the Bank of Spain, the more dependent the government will be on its central banker*		
CB financing		Public debt on Bank of Spain balance sheets/total public debt *
External debt *The greater the external debt, the more freedom the government will have to choose the optimal portfolio for funding public debt.*		
Extdebt		Ext Debt/Total Debt **

Notes: 1 maximum influence, 0 minimum influence

*Normalized as $1-[(y_i\ year_t - y_i\ max) / (y_i\ min - y_i\ max)]$

**Normalized as $(y_i\ year_t - y_i\ min) / (y_i\ max - y_i\ min)$

Sources: DEF: Comín and Díaz Fuentes (2005) SERIE 2790 and Carreras, Prados de la Escosura and Roses (2005) SERIE 4411; CB financing: Annual Report Bank of Spain (1874-1914) and Comín and Díaz Fuentes (2005) SERIE 2894; EXTDEBT: Comín and Díaz Fuentes (2005) SERIES 2887 and 2894

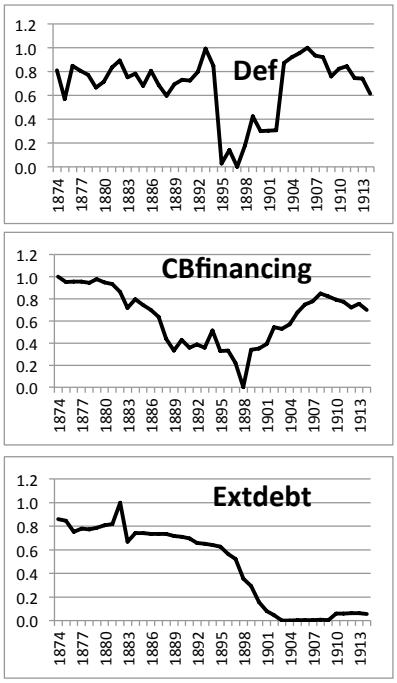


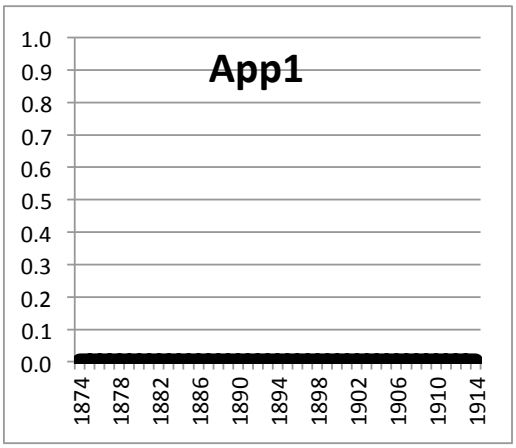
Table A2. List of criteria for legal independence, weighted average (LIWA)

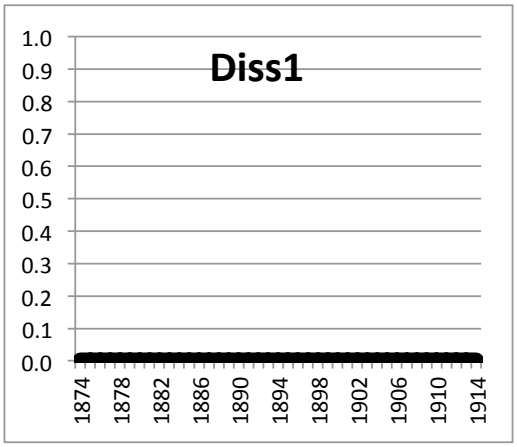
CHIEF EXECUTIVE OFFICERS (CEO)			
Who appoints? The greater the authority the government has to appoint, the less independent will be the central bank			
App1= Who appoints governor?	1	Central bank board	1
	2	Council composed of members from executive and legislative branches	0.75
	3	Parliament	0.5
	4	Council of Ministers	0.25
	5	Prime Minister or Minister of Finance	0
Who dismisses and why? The greater the authority of the government to dismiss and the more arbitrary its capacity, the less independent will be the central bank			
Diss1= Provision for dismissal of Governor	1	No provision	1
	2	Only possible for non-policy reasons	0.83
	3	At discretion of CB board	0.67
	4	For policy reasons at discretion of Parliament	0.5
	5	Unconditional at discretion of Parliament	0.33
	6	For policy reasons at discretion of Government	0.17
	7	Unconditional at discretion of Government	0
POLICY FORMULATION (MONPOL)			
Who formulates central banking policy? The greater the responsibility in the formulation of central banking policy, the more independent will be the central bank			
Formpol= Who formulates policy?	1	CB alone	1
	2	CB + Government together	0.66
	3	CB advises/proposes; government decides	0.33
	4	Government alone	0
How are conflicts resolved? The greater the capacity to oppose/resist government orders and/or suggestions, the more independent will be the central bank			
Conf= Resolution of conflict	1	CB given authority over issues clearly defined as CB objectives	1
	2	Government has final authority only over policy issues that have not been clearly defined as CB goals or in case of conflict	0.8
	3	In case of conflict the final decision is up to a common council	0.6
	4	Parliament has final authority on policy issues	0.4
	5	Government has final authority on policy issues but subject to due process and possible protest by CB	0.2
	6	Government has unconditional authority	0

LIMITATIONS ON GOVERNMENT LENDING			
Limitation on advances The more binding/strict the limitations, the more independent will be the central bank			
lla= Limitation on advances (*de iure*)	1	Prohibited	1
	2	Limits in terms of absolute cash or to other types of relatively strict limits	0.66
	3	Limited, specified as a percentage of CB capital or other liabilities	0.33
	4	No limitation	0
Limitation on securitized lending The more binding/strict the limitations, the more independent will be the central bank			
lls= Limitation on securitized lending (*de iure*)	1	Prohibited	1
	2	Limits in terms of absolute cash or to other types of relatively strict limits	0.66
	3	Limited, specified as a percentage of CB capital or other liabilities	0.33
	4	No limitation	0
Who sets the general terms of borrowing? The more regulated or the stricter the restriction, the more independent will be the bank from pressures to give more favorable conditions to the state			
ldec= Who sets the general terms of borrowing?	1	CB controls terms and conditions	1
	2	Terms specified by law or CB given legal authority to set the terms	0.66
	3	Law leaves it to negotiation between both	0.33
	4	Government controls terms and conditions	0
Limitations on maturity and/or interest rates The more regulated or the stricter the restriction, the more independent will be the bank from pressures to deviate resources to the state			
lmat= Limitations on maturity	1	Limited to a maximum of 6 months	1
	2	Limited to a maximum of 12 months	0.66
	3	Limited to a maximum of more than 12 months	0.33
	4	No legal upper bounds on maturity	0
lint= Limitations on interest rates	1	Interest rate on CB loans must be at market rate	1
	2	Interest rate on CB loans cannot be lower than a certain ceiling	0.75
	3	Interest rate on CB loans cannot exceed a certain ceiling	0.5
	4	No legal provision regarding interest rate on CB loans	0.25
	5	Law stipulates no interest rate charge	0

Note: 1 maximum independence, 0 minimum independence.

APP1 and **DISS1**: throughout the study period the Governor of the Bank of Spain was appointed directly by the Minister of Finance, who could also dismiss him at any time. The governor was therefore seen as a trusted political officer of the incumbent government. Consequently, no legal term of office was contemplated in law, since it was understood that each minister would appoint his own trusted person for such an important office.[42] For that reasons, the code assigned to both legal proxies is 0, signifying total dependence.





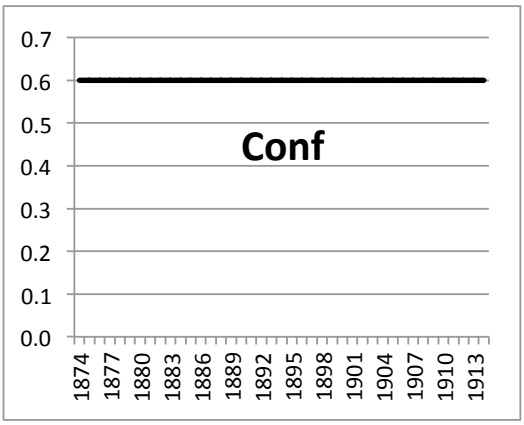
FORMPOL and **CONF**: The Bank of Spain was completely free to set the interest rate. With regard to discount rates, the normal operational mode in the period analysed was that interest rates changes were decided in the Bank of Spain's Executive Council, normally on its own initiative. As time went by the government, usually through the governor, began to make explicit indications on the issue.[43] From 1901 on the government was in fact much more prone to make suggestions to the Bank about the appropriate course of action. In 1902 the government even tried to usurp the power to set the interest rate, with no success.

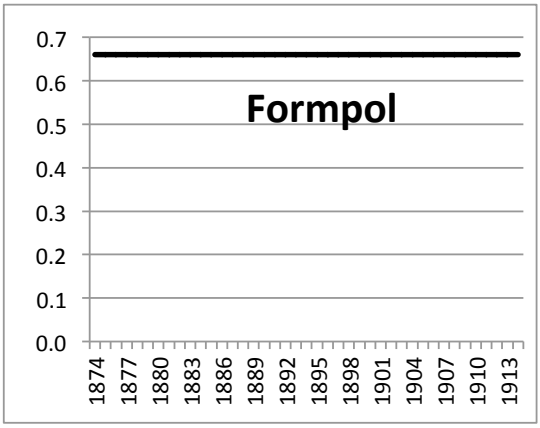
The fact that very often the Minister of Finance suggested ("invited" in the florid language of the correspondence between the Bank of Spain and the Ministry) that the Bank adopted a particular measure has sometimes been interpreted as a total submission of the central bank to government wishes.[44] In this respect some qualifications are necessary. Firstly, it is important to bear in mind that government suggestions were not always followed and frequently aroused heated arguments among the members of the council. The result of such discussions was in many cases determined by the character of the personalities involved, mainly the governor and the deputy governors, and thus it is essential to pay attention to actual practice.[45] Secondly, as Martínez Méndez (2005) has pointed out, the suggestions of the

[42] A measure of the legal term of office is not included in our index precisely because it does not exist as such.
[43] Actually it was the executive commission who proposed such changes, while the council usually just ratified the decisions of the commission.
[44] See, among others, Martínez Mendez (2005), who states: "The vision that seems to prevail in the political sphere is that the Bank of Spain was a mere executor of decisions defined once and for all"
[45] On occasion of the increase of the discount rate in 1903, Sanchez Guerra, then Bank of Spain governor, wrote to a political fellow "For days I've been fiddling about between the desires of the President and the resistance, passive

Treasury were in many cases obviously the result of prior negotiation, as the text, full of jargon and technical considerations, appeared to be drafted by the Bank's own officers.

In short, given the lack of clear legal dispositions, it was essential to turn to actual practice to determine the degree of prominence of each actor in monetary policy decisions. After analysing each decision in this respect, taken during the 40 years of our study period, we have assigned a code of 0.66 to *Formpol* as we consider that there is evidence of a more or less equal implication of the two actors in the decision process. In the same way, the resolution of eventual conflicts was always the result of negotiations between the Bank of Spain and the government. Far from being docile, the Bank of Spain usually employed every weapon at its disposal to defend its position. For that reason, we have assigned a code of 0.6 to *Conf*.





LLA, **LLS**, **IDEC**, **LMAT** and **LINT**: The terms and conditions of government borrowing from the Bank were not established in any legal text, but subject to negotiations, the results of which were published in the form of agreements signed by the two institutions. In fact, the legal configuration of the financial relations with the state can be defined as vague, rendering it more important to examine actual practice in greater detail. That means to determine to what extent those agreements were imposed on the Bank or instead were agreed to. Intuitively, this ambiguous framework enhanced government chances of imposing financial arrangements on the Bank. When looking at the evidence provided by the Bank's council minutes and other internal discussion forum though, we find that, although the State had a stronger bargaining chip in this matter, the Bank had also good opportunities to assert its position and rarely a decision was taken if the Bank considered it damaging to its economic interests. Consequently, as the general conditions of the borrowing were the result of prior negotiation, we assigned a code 0.33 to *Idec* proxy, with no changes during the period.

As for the remaining variables during the studied period two different periods are to be distinguished. From 1874 to 1901, the regulations about the advances and securitized lending limited the capacity of the State to resort to the Bank of Spain to a percentage of CB paid-up capital (100%) and never without "solid guaranties".[46] The agreement signed in 1891 on

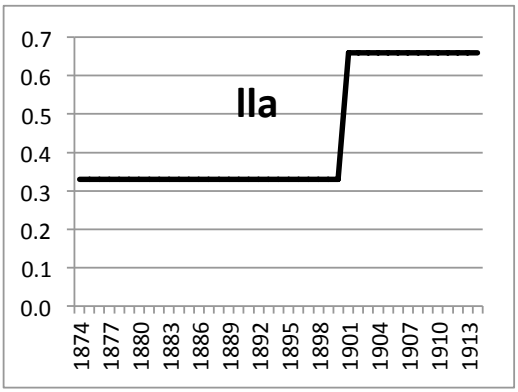
and active, of the ...Council to achieve... the elevation of the discount rate and the loans to 4.50%. We'll see if it gives the result that the government promises? ". Cited in Martorell Linares (2011)

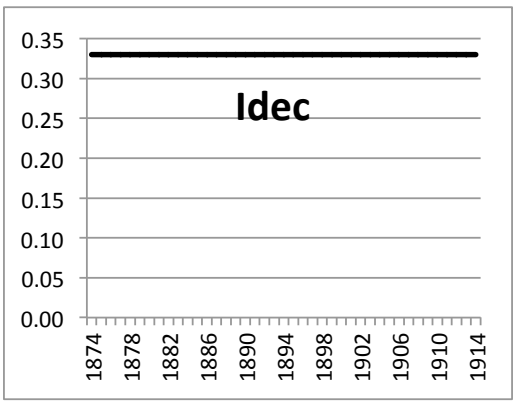
[46] Martínez Pérez (1922) , p. 7

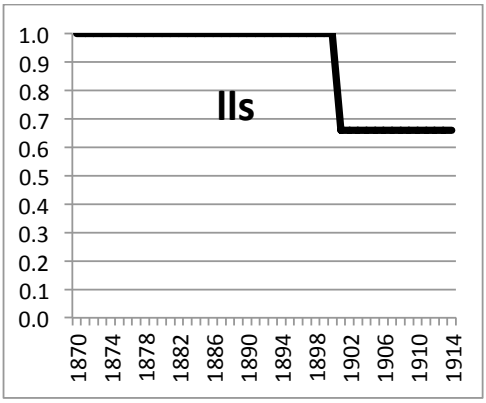
occasion of the charter renewal obliged the Bank to give an advance every year up to a maximum of 75 million ptas (50 percent of paid up-capital). In this sense, although a restriction existed, it was not a very binding one, and thus we have assigned a code of 0.33 to *lla*. Securitized lending was forbidden and thus a code of 1 has been assigned to *lls*. As it will be explained later, this prohibition was not respected from 1874 to 1901, and that fact was recognized in the fiscal reform of 1901.

In fact, there is a clear break in this respect in 1901, when the Minister of Finance, Fernández Villaverde, launched an ambitious fiscal reform in an attempt to rationalise spending and to modernise the fiscal structure that was accompanied by a drastic conversion of the debt. Villaverde's fiscal consolidation plan included resolute measures to restrict government capacity to turn to central bank financing. The result was a law (13 May 1902) that established a new legal framework for the Bank of Spain. Consequently, the Treasury committed itself to repaying the Bank the amount of the long term credits from external debt within 10 years. The limits to securitized lending were therefore established in terms of absolute cash, which gave them a relatively binding character, but and less strict one than the former prohibition, so that from 1902 on a code of 0.66 has been attributed to *lls*. As for the advances, the government committed itself to not receiving advances other than those provided for in the 1891 agreement. This decision made the limitations stricter, so that from 1902 on a code of 0.66 has been assigned to *lla*.

The opposite was true for the dispositions on interest rates. From 1874 to 1891 there was no specific disposition in legal texts concerning the interest rate to be charged to the government. Consequently, the interest charged was the result of negotiation. Accordingly, *lint* received a code of 0.5 in this period. On the contrary, in the 1891 agreement the government included a clause that established that new advances were to be charged at an interest rate "equal to (the) lowest of those charged to the operations carried out by the Treasury". Furthermore, in a new agreement signed on 17 July 1902, the interest rate to Treasury bonds was fixed at 2 percent and it was established that it could be reduced when required by "extraordinary circumstances". The capacity of the Bank to set the interest rates of its advances and other lending to the government declined and consequently the code assigned has been reduced to 0.25. As for the maturity of borrowing until 1901, the Bank had no capacity to influence that aspect of lending. Again the new agreement of 1902 attributed to the Bank the establishment of the maturity of loans.






lls
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1870
1874
1878
1882
1886
1890
1894
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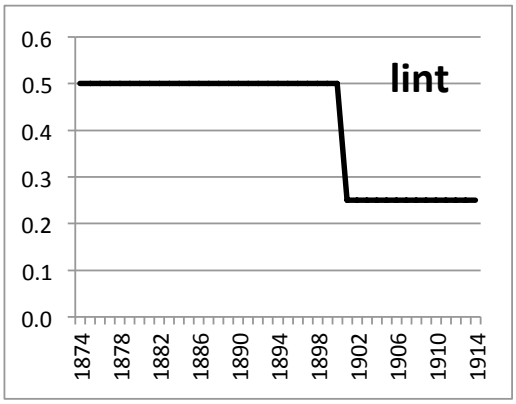
1902
1906
1910
1914


lint
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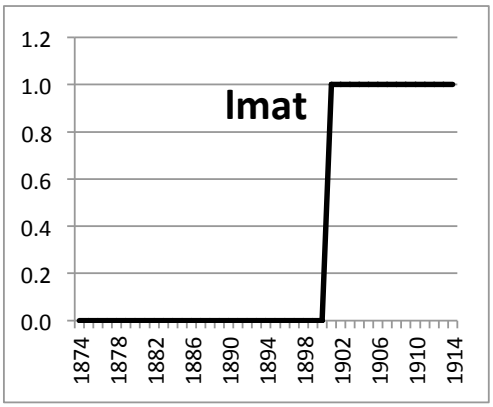
lmat
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1910
1914

Table A3. Criteria list for extended legal independence, weighted average (ELIWA)

CHIEF EXECUTIVE OFFICERS (CEO)			
Who appoints? The greater the authority the government to appoint, the less independent will be the central bank			
App2= Who appoints sub-governor?	1	Central bank board	1
	2	Parliament	0.75
	3	CB board proposes candidates, Council of Ministers chooses	0.5
	4	Council of Ministers	0.25
	5	Prime Minister or Minister of Finance	0
Who dismisses and why? The greater the authority of the government to dismiss and the more arbitrary its capacity, the less independent will be the central bank			
Diss2= Provision for dismissal of deputy governor	1	No provision	1
	2	Only possible for non-policy reasons	0.83
	3	At discretion of CB board	0.67
	4	For policy reasons at discretion of Parliament	0.5
	5	Unconditional at discretion of Parliament	0.33
	6	For policy reasons at discretion of Government	0.17
	7	Unconditional at discretion of Government	0

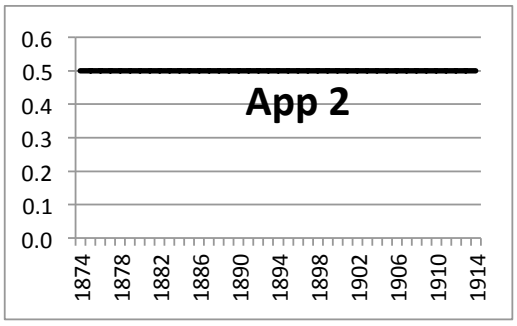
Table A4. Weights used in the aggregations for legal independence, weighted average (LIWA)

	Criterion	Variables considered in each criterion	Aggregation	Weights
1	CEO	*app1*	unweighted	0.25
		diss1		
2	MONPOL	*formpol*	0.66	0.20
		confl	0.33	
3	Limits to advances	*lla*	No	0.15
4	Limits to lending	*lls*	No	0.10
5	General terms of borrowing	*ldec*	No	0.15
6	Conditions of lending	*lmat*	unweighted	0.15
		lint		

Table A5. Weights used in the aggregations for extended legal independence, weighted average (ELIWA)

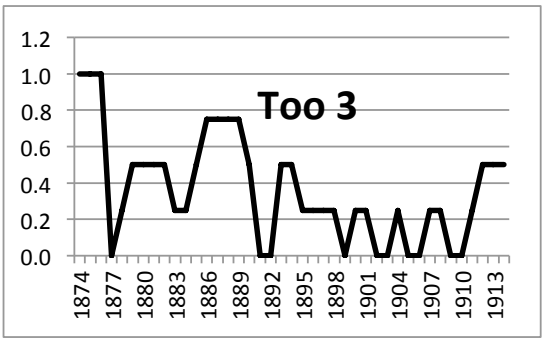
	Criterion	Variables considered in each criterion	Aggregation	Weights
1	CEO	*app1*	unweighted	0.25
		diss1		
		app2		
		diss2		
2	MONPOL	*formpol*	0.66	0.20
		confl	0.33	
3	Limits to advances	*lla*	No	0.15
4	Limits to lending	*lls*	No	0.10
5	General terms of borrowing	*ldec*	No	0.15
6	Conditions of lending	*lmat*	unweighted	0.15
		lint		

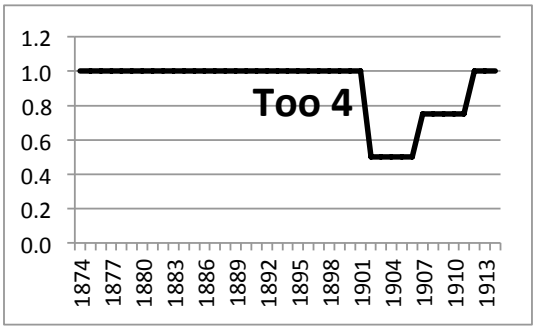
APP2 and **DISS2**: In the period analysed there were two Deputy Governors, first and second. The government bore the authority to appoint both of them, although they were required to be chosen from among the 3 persons proposed by the bank's council. In most cases, the appointment of the first DG went to the second DG at that time, making the renewal of the two positions simultaneous. The second DG was usually chosen from among the top officials of the Bank. This means that the DGs came from the bank's management and had spent a long career in Parliament, culminating in their appointments. Appointments were for life, so that in many cases the substitution of the DG was the result of death. In other cases, the person in charge resigned for health or age considerations. No one was dismissed by the government in this period, even though the executive had the legal power to do so. Therefore, A*pp2* and *Diss2* have a coding of 0, while App2 has received a 0.5 coding.



TOO3 and TOO4: In the years analysed, changes in the governor did not coincide exactly with the change of government or Minister of Finance, in many periods there was not even a general coincidence. Between 1 January 1874 and 31 December, 34 governors of the Bank of Spain were appointed, although 9 of them were appointed twice, which counterbalanced the high turnover rate to a certain extent. This gives an average duration of office of about 14 months. However, it must be noticed that in the first years, 3 governors (Martín Belda, Romero Ortiz and Salvador de Albacete) had relatively long terms, holding the position for 38, 31 and 65 months respectively. Furthermore, between 1892 and 1895, Pío Gullón was Governor for 28 months. No other governor had a term of longer than five years. One governor lasted only 37 days, and in 1905 the office was unoccupied for over five months. The code has been assigned according to the length of the term. Since the idea is that, in order to be able to pursue long-term objectives, the governor needed to remain in his post longer than the government an initial threshold has been established at 6 years.[47] Any year with a governor remaining in the post longer than 6 years has received a code of 1. The length has then been gradually reduced to less than 4, 2 and 1 years. In the case that the governor lasted less than 12 months a code of 0 has been allocated.

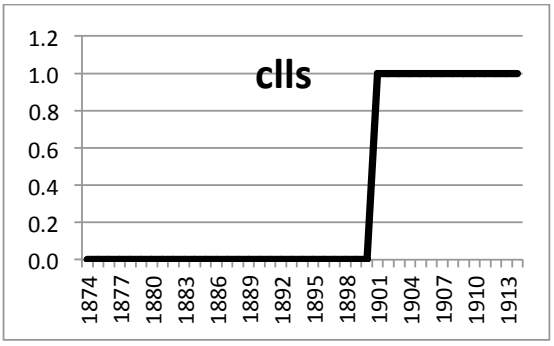
As for the deputy governor, from 1 January 1874 to 31 December 1914 only 6 persons occupied the position of first DG; of these 5 had been the second DG immediately before.[48] The first DG had a mean of almost 9 years in office, and 2 of them were in their posts for over 15 years. The lengthy permanence of the DG and their great influence effectively decoupled the decisions of the Bank from political events, giving stability to the institution. In the same way as for the governors, a code has been assigned according to the length of the term of the first DG ranging from 0 (less than a year), to 1 (over 6 years). The coding is 1 for every year, except for the 1902-1911 period where 6 years was awarded a code of 0.5 and the remaining years a code of 0.75.





Clla and Clls: These variables account for the actual compliance with the limitations on advances and securitized lending. After calculating the existent amounts of advances and public debt in the Bank's portfolio, we compared them with the legal limits. A code of 1 was attributed to those years when the limits were observed and a 0 code when they were not (see Table A7 of the Appendix).

[47] As will be shown below the maximum duration of a government was 5 years.
[48] Only the first DG of the period studied, José González Breto, had not been a second DG before.



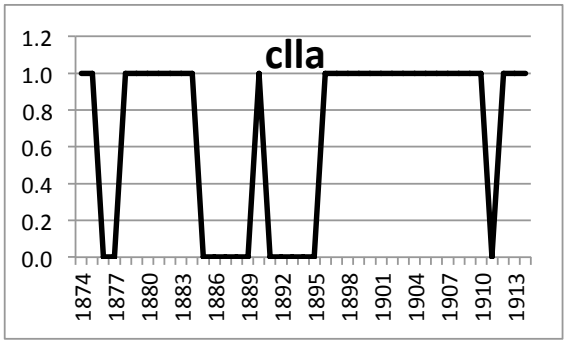


Table A6. Simple correlation and Spearman rank correlation weighted and unweighted index of legal independence

Simple correlation				
	LIUA	LIWA	ELIUA	ELIWA
LIUA	1			
LIWA	0.995	1		
ELIUA	1	0.995	1	
ELIWA	0.995	1	0.995	1

Spearman rank correlation				
	LIUA	LIWA	ELIUA	ELIWA
LIUA	1			
LIWA	1	1		
ELIUA	1	1	1	
ELIWA	1	1	1	1

Table A7. *De facto* criteria list for INDEPWA

CHIEF EXECUTIVE OFFICERS (CEO)			
Term of office The longer a governor stayed in office, the more able was he to resist the pressures of the executive branch and/or to implement longer term policies			
Too3= Term of office of governors	1	≥72 months	1
	2	72>too≥48	0.75
	3	48>too≥24	0.5
	4	24>too≥12	0.25
	5	<12 months	0
Too4= Term of office of deputy governors	1	≥72 months	1
	2	72>too≥48	0.75
	3	48>too≥24	0.5
	4	24>too≥12	0.25
	5	<12 months	0
LIMITATIONS ON GOVERNMENT LENDING (LEND)			
clla= Compliance with limitation on advances (*de facto*)	1	Yes	1
	2	No	0
clls= Compliance with limitation on securitized lending (*de facto*)	1	Yes	1
	2	No	0

Table A8. Weights used in the aggregations for INDEP

			Aggregation	Weights
1	CEO	*app1*	unweighted	0.25
		app2		
		diss1		
		diss2		
		Too3		
		Too4		
2	MONPOL	*formpol*	0.66	0.20
		confl	0.33	
3	Limits to advances	*lla*	unweighted	0.15
		clla		
4	Limits to lending	*lls*	unweighted	0.10
		clls		
5	General terms of borrowing	*ldec*		0.15
6	Conditions of lending	*lmat*	unweighted	0.15
		lint		

Table A9. Simple correlation and Spearman rank correlation weighted and unweighted index of independence

Simple correlation		
	INDEPWA	INDEPUA
INDEPWA	1	
INDEPUA	1	1

Spearman rank correlation		
	INDEPWA	INDEPUA
INDEPWA	1	
INDEPUA	0.968	1