The Political Economy of Road Construction: Evidence from Restoration Spain[1]

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Abstract

This paper aims at analysing the extent to which public allocation of road investment was influenced by political and electoral goals during the Spanish Restoration (1874-1923). More precisely, our main purpose is to identify which sort of provinces were favoured with road construction expenditures and whether tactical strategies used by parties varied over time due to the increase in political competition. Thus, this paper links concepts from three strands of literature: legislative pork-barrel, clientelism and machine politics, and electoral competition. Our key empirical finding on a panel of Spain's provinces suggests that those provinces that elected a large share of deputies belonging to minority or opposition parties were initially punished through lower levels of road investment but by the end of the period were favoured with more resources than the rest. On the other hand, we can also observe that "senior" deputies were more capable than other politicians to attract resources to their constituencies.

Keywords: road investment, distributive politics, electoral competition, vote-buying.
JEL classification: H54, P16, D72

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> *"We refer* (a journalist wrote) *to the immoral, disastrous and disturbing faculties conferred the Co-legislative Bodies to include in abundance roads in the State General Plans without any other guidance than the political and electoral desires of the Deputies and Senators (...)."*
>
> Revista de Obras Públicas (1899)

1. Introduction

The Spanish Restoration (1874-1923) provides political economists and historians with an interesting case to study the long term evolution of clientelist systems and vote-buying mechanisms.[2] The electoral system of the Restoration allowed two hegemonic parties (Liberals and Conservatives) to remain in power for fifty years thanks to the so-called *turno pacífico* (peaceful turn). This was a system that relied on an agreement between both "dynastic" parties by which they arranged their peaceful alternation in power.[3] At the same time, during this period of time, Spanish electoral tactics, which were essentially organised at the local level and by local and provincial elites, were mainly based on the systematic use of clientelism, coercion and mass electoral fraud, in order to guarantee that the actual electoral results did not contradict the two hegemonic parties' objectives.[4]

[2] In 1874 Spain suffered a military uprising led by general Martínez Campos which caused the end of the First Republic and the reestablishment of the Bourbon dynasty. The period of time between this moment and Primo de Rivera's new military coup d'état in 1923 is known as the Spanish Restoration, which is considered "*the most stable and long lived of the constitutional regimes of* [Spain during] *the 19th century*" (Shubert, 1990).

[3] As is usual in the literature, henceforth we will refer to the Liberal and Conservative parties as "dynastic" parties, given that they accepted to play a governmental role during Alfonso XII and Alfonso XIII's reigns.

[4] In the Spanish context the term *caciquismo* is commonly used to refer to clientelism (therefore, hereafter we will use both terms interchangeably). This concept is linked to the term *caciques*, which refers to members of the local elite who gained power by manipulating the administrative machinery for their own personal benefit and that of their clientele. For instance, quoting Carr (1982), "*the cacique always protected his village clientele from the laws, taxes and conscription levies of the outside world of the state*".

Among the different clientelist (vote-buying) practices, one of the most noticeable in the Restoration electoral campaigns was the exchange of votes for road investment, according to the practice that is commonly known in political literature as "pork-barrel politics". In this paper, on the basis of the assumption that political interests shaped the allocation of road construction expenditures in Restoration Spain, we try to disentangle the pork-barrel-type strategies used by political parties to maximise the amount of seats gained in parliamentary elections.

This paper brings two main contributions to the existing literature on the relationship between electoral strategies and the allocation of government spending. First of all, the novelty lays on the data used, since Spanish Restoration's electoral evidence has not been used so far to that aim.[5] Secondly, and more importantly, the importance of the historical changes that took place in Spain during the period under consideration, such as the establishment of universal male suffrage in 1890 or the Spanish monarchy's gradual loss of legitimacy after the so-called "disaster" of 1898 (the loss of the last remains of the Spanish empire) generated an increase in political competition and forced Spanish politicians to alter their strategies throughout the period. Therefore, the Restoration provides and interesting case that allows observing empirically the effects of increasing political competition on clientelist electoral strategies in the long term.

In order to perform our empirical analysis, we use a panel of 45 Spanish provinces over 1879-1914, which contains information on road investment and electoral outcomes. The paper is structured as follows. Section 2 presents a short review of the

[5] If we disregard political factors, the study that is closer to ours is that of Herranz-Loncán (2007), whose objective is to analyse how the spatial distribution of Spanish transport infrastructure was determined by economic variables and institutional factors between 1860 and 1930.

contributions of the political literature that may be relevant for the analysis of the Spanish case. Sections 3 and 4 provide, respectively, a description of the Spanish Restoration's political situation and a brief comment on the economic relevance of roads in the Spanish economy. Finally, Section 5 presents the empirical procedure, which includes data used, estimation strategy and results, and Section 6 sets out the conclusions.

2. Literature review

The influence of electoral strategies on the spatial allocation of public expenditure has been analysed for some historical and present cases by the literature on "universalism" or "pork-barrel politics". For instance, Wallis and Weingast (2005) have studied, from a purely theoretical point of view, the reasons behind the inefficiency of the US federal government spending by the end of the 18th century and the beginning of the 19th. More precisely, their paper is focused on infrastructure projects and develops a theory of legislative choice and infrastructure investment. In their model both Congress and state legislatures are geographically oriented, i.e. their attachment to a specific geographic location creates some incentives for them to care about their own districts (while nationwide interests were secondary for them). As is shown below, this might fit well with Spanish deputies' behaviour during the Restoration.

The outcomes of empirical work in this field are mixed. Levitt and Poterba (1999) analyse the effects of US congressional representation on state economic outcomes and the regional allocation of federal spending. They also test whether higher levels of resources flow towards districts were the majority party holds a thin electoral margin, in order to maintain this party's status. Their study, however, finds no evidence that political factors determine the allocation of federal spending. By contrast, other

empirical analyses do find evidence of the importance of political and electoral variables for expenditure allocation. This is the case of most of the pork-barrel literature, as far as we are aware. In this sense some relevant empirical works are those of Knight (2004), who analyses the association between congressional votes and transportation project funding, and Inman and Fitts (1990), who develop and test the notion of "constrained universalism".[6]

On the other hand, the literature on electoral competition has analysed the allocation strategies that are used by political parties in strongly competitive political systems. The classic studies focusing on the swing voter model are that of Lindbeck and Weibull (1987) and Dixit and Londregan (1996), while Cox and McCubbins (1986) analyse the relevance of core voters. The first type of studies consider that politicians target weakly opposed and indifferent voters, because these are the only ones able to exert a credible threat if they are not favoured. By contrast, the second type of studies argue that, provided that candidates are risk averse and attracting swing voters has an uncertain return, legislators should promise redistribution to core voters, whose preferences and needs they know better. So far, the evidence reached by empirical analyses about the core-voter debate is inconclusive. Some empirical studies that test the swing-voter model are Johansson (2003), Dahlberg and Johansson (2002) or Castells and Solé-Ollé (2005), whereas Levitt and Snyder (1995) follow the core-voter model approach.

[6] For pork-barrel literature related to the US' New Deal Spending see also Wallis (1998) and Wright (1974), who introduce a "political productivity index" as a proxy for the electoral productivity extracted out of a given amount of expenditures in a state (in other words, the electoral return from an increase in spending allocation). On the other hand, the pork-barrel literature emphasises the fact that there may exist certain deputies or parties whose power clearly exceeds that of the rest. For instance, Wallis (1998) also takes into account a leadership dummy variable to confirm that the State of Nevada was an outlier due to the excessive power of its senator Key Pittman.

Some studies stress the benefits that voters may get from higher electoral competition. This is especially relevant for our own analysis, since such competition may have been an important determinant of political moves during the Spanish Restoration. Regarding this issue, Besley (2007) finds that an increase in a party's political advantage leads it to address fewer resources towards swing voters and more towards core supporters. Besley, Persson and Sturm (2008) examine the effect of political competition on policy choices and suggest that the absence of such competition in a state is associated with anti-growth policies. Moreover, they find evidence that swing voters are only influential once political competition exceeds a critical threshold. This situation occurs because, once a dominant party faces a large electoral advantage, it has fewer incentives to attract swing voters who are not committed to their party. Although there is no clear conclusion on this issue, the aforementioned papers agree that changes in political competition levels translate into changes in policy choices.

Other literature has attempted to analyse the electoral strategies of political parties in clientelist systems. Clientelism, which, as has been mentioned, was widely used during the Spanish Restoration, uses public goods to lock in a party's political clientele in a long-term relationship of dependence, where parties can credibly threaten to withhold resources from those who defect. This strategy has been analysed for the case of Mexico during most of the 20th century, when the PRI (the hegemonic party) remained in power for more than seventy years thanks to coercion and tactical strategies. The logic of survival of the Institutional Revolutionary Party (PRI) is studied in detail in Magaloni (2006). Moreover, Diaz-Cayeros, Magaloni and Weingast (2006) conclude that the PRI rewarded its core supporters (the only ones able to exert a credible threat) while withdrawing budgetary funds to punish voters who betrayed them. On the other hand, Stokes (2005) provides a theoretical analysis (including also

evidence for Argentina) that describes how political machines (political parties) can ensure that the voters they favour finally commit to their promises and vote them.

3. Spanish elections during the Restoration period

The Spanish Restoration system had some particular political and electoral features which require a brief explanation, in order to get a complete understanding of the political economy of road construction during the period.[7] After the two first brief parliamentary experiences that took place in the years 1812-1813 and 1820-1823, Spanish Parliamentary elections were quite regularly called between 1834 and 1923 (when a military dictatorship started, which was ruled by general Primo de Rivera and lasted until 1931). For most of that time, Spanish elections were organised according to the system established by the 1846 electoral law, which divided the country into uninominal districts, of ca. 50,000 inhabitants, who elected their deputy following a simple majority voting rule.[8] This system was affected by three main changes between 1846 and 1923, which are worth noting due to their implications. First of all, in 1871 several "plurinominal" districts were established in some urban constituencies (six during 1871-1878 and twenty six from 1878 onwards). In those districts, citizens voted for one or two candidates less than the total amount to be elected, in order to ensure that minorities were represented. Secondly, the introduction of universal male suffrage in

[7] The nature of Restoration political mechanisms bears some resemblance to the Italian *trasformismo*. Moreover, Restoration Spain may also be compared to other European historical political systems such as 'old corruption' in England and Napoleon III's France (Moreno-Luzón, 2007). For further details on an international comparison of clientelism, see Piattoni (2001).

[8] Although the Spanish Parliament (*Cortes*) had a bicameral structure during the whole Restoration period, we restrict our analysis to the lower chamber (*Congreso de los Diputados*) since the members of the upper chamber (*Senado*) either had that position for their own right or were selected either by the King or by an electoral college made up by the provincial administrations (*Diputaciones*) and by some electors designed by the local councils and the richest taxpayers.

1890 (which was already temporarily used during the revolutionary period of 1868-1876) allowed low-income men to participate in elections. Lastly, a new electoral law was introduced in 1907. The key and more controversial clause of this law was article 29, which established that, in those districts for which the number of candidates running for election did not exceed the number of seats available, no election would take place.[9]

Under this system, the elections that took place during the period 1846-1868 were characterised by systematic fraud and absence of competition, since they were always won by the political party that had the control of the government. The only way to change the political composition of the parliament was through military uprisings, such as in 1854 or 1868. By contrast, during the Restoration period, the Liberal and Conservative parties agreed to alternate in power (the *turno pacífico* system), forming a strong duopoly which remained in place until 1923. The operation of the system was as follows. Before the election, the King appointed a new Prime Minister (*Presidente del Consejo*), coming from the dynastic party that was in minority in the Parliament. Then, with a new government in office, the King dissolved the Parliament and called for elections. These were rigged by the new Ministry of *Gobernación* (Home Office), whose objective was to guarantee that the new party in power would obtain the majority of seats in the new Parliament. However, in order to guarantee that the election outcome was the one planned by the government, it was much more convenient for the party in power to collude with the main opposition party, rather than engaging into competitive mobilisation. In other words, the arrangement between both "dynastic" parties was not a straight assignment of a fixed amount of seats, but the outcome of complex negotiations.

[9] A more detailed description of the electoral system during the Restoration period can be found in Linz et al. (2005) and Varela et al. (1996), among others.

In order for that negotiated outcome to be finally materialised in the electoral results, the government's intervention in the electoral process can be summarised in three different stages. The first one involved substantial state control before the election took place. To do so, one of the best-known ways was the so-called "*encasillado*"**.** This concept refers to a mechanism by which the government and the local *caciques* would enter into negotiations, which would end up with the agreement of the latter to support the party in government. Then, the second stage involved controlling the polling stations, for instance, by forging the election of its inspectors. At the last stage, mass fraud was observed during elections.[10]

The candidates were usually divided into two categories: "*propios*"[11] and "*cuneros*". The former were candidates who were repeatedly running for elections in their districts, and they used to be either noblemen or *caciques.* The latter, instead, were assigned by the executive power to a certain district in order to ensure that the seat remained under their power –this refers to the aforementioned "*encasillado*". Varela Ortega (1977) would define them as those ones "*whose election was due to the government's support rather than their local influence*". The districts where these deputies were running for were called "available districts". As one would expect, most of the *cuneros* were not local citizens (or had nothing to do with the district they were assigned to): *"entire provinces were represented by deputies with no properties in it, without any relationship"* (Varela Ortega, 1977).

[10] Situations of electoral fraud and coercion were generically known as *pucherazos.* Moreno-Luzón (2007) states that "*the meddling of the government in elections, linked to this clientelist structure, secured like-minded parliamentary majorities at the cost of producing high levels of fraud*". Several detailed description of the kind of irregularities observed in the 1886 elections can be found in Dardé (1986): e.g. *"(...) two inspectors complaint because nobody published with enough clearness the place where the election was called and because the ballot box had no lock*", "*because the ballots were kept in the drawer of a table, instead of a ballot box*", etc.

[11] Also known as "*natural candidates, with roots or for their own right*" (Varela Ortega, 1977).

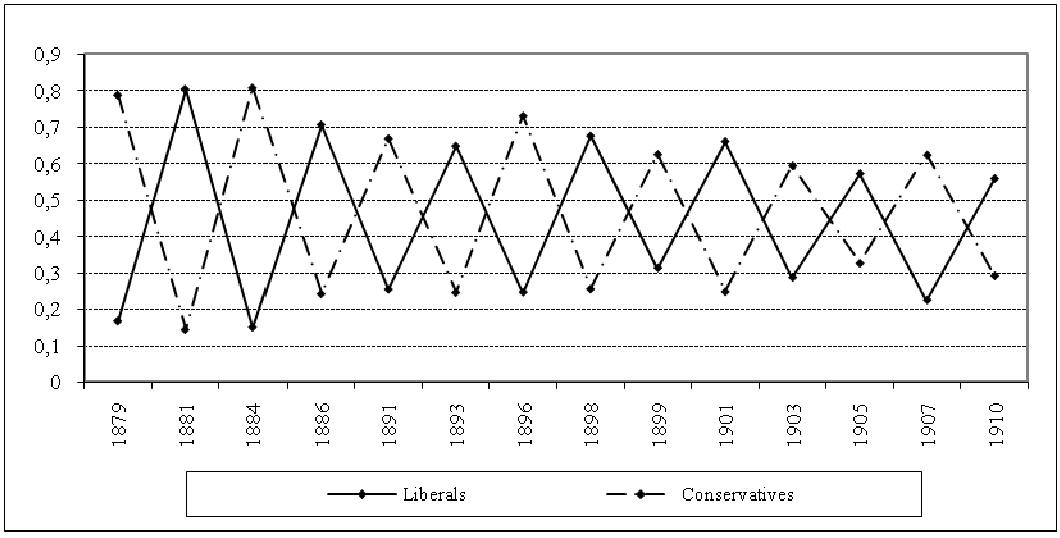
On the other hand, the government needed the *caciques* to operate at the local level, given its limited capacity to intervene in and regulate society. Regarding this aspect, in the Spanish electoral dynamics of the period it is necessary to make a distinction between two different government layers. Firstly, at the state level, it was necessary to forge links between state candidates and the local and provincial powers. Secondly, at the local or provincial level, where electoral outcomes were set, local *caciques* and provincial *notables* exerted their influence. So, caciques were the main link between the state and a demobilized society due to the political parties' lack of meaningful ideological identity and their inability to organize the society. As Varela Ortega (1977) states, "*a cacique was the only tie between the countryside and the city and between the people and the state*".

In other words, *caciques*, which might also be candidates (usually *propios*), established close links with both the government and the voters, that can be seen as a "patron-client" relationship. In this context, elections were rigged not only with fraud, but also with job offers (patronage) or individual monetary gifts, and also with indivisible profits like public works. For instance, one of the *caciques'* typical strategies was to surrender the electoral census of the district "*to the candidate who before certain date ma[de] a deposit for the construction of the bridge or administered the granting of the railway*" (Varela Ortega, 1977). This process typically included plans for road construction.

The operation of the Spanish electoral system, however, was not stable throughout the Restoration period. Figures 1 and 2 below depict the percentage of deputies running for the Liberal, Conservative and minority parties in each election. Both figures show a gradual increase in political competition as time went by, which might have altered the "dynastic" parties' electoral tactics. On the one hand side, as may

be seen in Figure 1, the "dynastic" party that was in the opposition seems to have been more and more reluctant to hand over power. On the other hand side, a glance at Figure 2 shows that not only the margin between the two "dynastic" parties was contracting but also the margin between these parties and the minority ones was decreasing. That decrease, however, was not a continuous process. It accelerated after the establishment of the universal male suffrage in 1891, but was abruptly interrupted in the 1896 election, to be resumed thereafter. The 1896 downward jump seems to have been associated to governments' attempts, mainly based on the extensive use of fraud, to make up for the difficulties that the "dynastic" parties were finding to keep the system under control after the establishment of the universal male suffrage. However, those attempts had only a transient effect, and the minority parties' electoral share started again to increase again from the 1898 election onwards.[12]

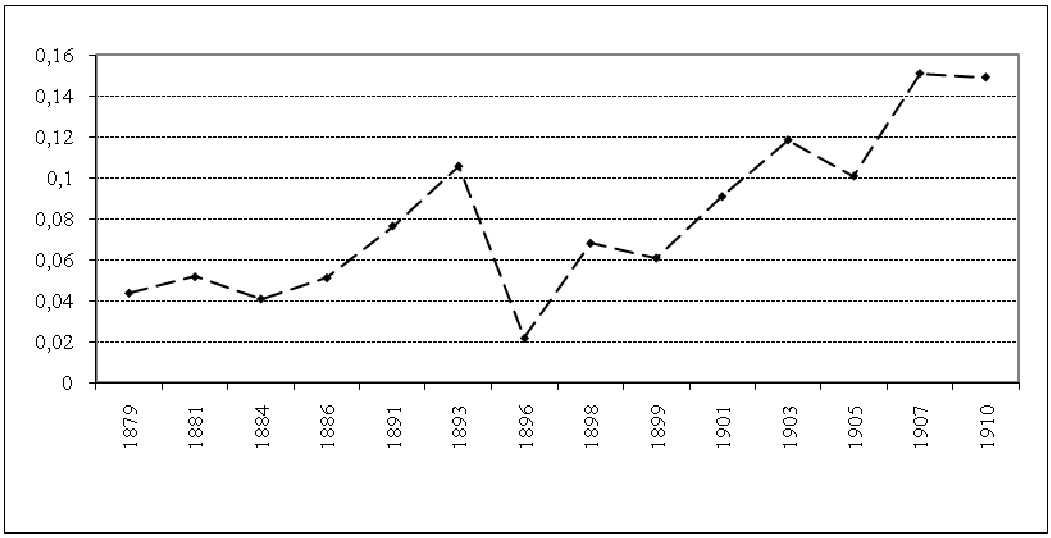
Figure 1. Share of Liberal and Conservative deputies within total



Source: Varela Ortega (2001), Sánchez de los Santos (1908 and 1910), *El año político* (1895-1910), *El Imparcial* (1876), *El Liberal* (1881-1910) and *La Correspondencia de España* (1879).

[12] Just to give a rough idea, some of the main minority deputies of the period were Republicans, Regionalists and also (at the end of the period) Socialists.

Figure 2. Share of Minority Deputies within total



Source: Varela Ortega (2001), Sánchez de los Santos (1908 and 1910), *El año político* (1895-1910), *El Imparcial* (1876), *El Liberal* (1881-1910) and *La Correspondencia de España* (1879).

4. Road construction in Restoration Spain

As in most European countries, railways were the essential element of the Spanish internal transport system during the second half of the 19th century and the early 20th century, until roads started gaining ground in the Interwar period thanks to the automobile. In that context, the relevance of roads before 1914 lays in the fact that they were the main way to connect a large share of the Spanish territory to the railway network and to the most important urban and international markets. Low population density prevented the expansion of the railway network beyond a certain threshold, and the geographic characteristics of the country complicated the use of navigation for internal transport. Therefore, roads were the only possibility of communication of large portions of the Spanish territory during the period under consideration.

Road construction (and infrastructure investment in general) took off in Spain since the end of the Carlist War in 1840 but, especially, since the establishment of a Progressive government in 1855. Between 1802 and 1855 116 km. of new roads were

constructed yearly in Spain, while that figure turned to be 422 between 1855 and 1877 and 791 between 1877 and 1911.

During the nineteenth and early twentieth century, Spanish roads were separated into three different categories. First category roads formed a radial network centred at Madrid, second category roads connected the main population centres among them and with the railways, and third category roads served the rest of the territory. During the first years after 1840, the construction of first category roads attracted the highest amount of resources. However, later on, an increasing share of resources was oriented to second and especially third category roads, which were meant to fulfil regional and local interests.

Third category roads caused great controversy, because they were largely allocated not on economic but on political grounds. We can find plenty of criticisms since the mid nineteenth century on how territorial interests were influencing the government's investment programs in that field. To a large extent, this situation was the consequence of the fact that, for most of the period under consideration, attempts to develop a consistent Road Plan repeatedly failed. Actually, the 1857 Road Law had stated that "*the quantities allocated between the three types of roads ought to be equitably distributed amongst the Kingdom's provinces*" instead of using resources for "*ending works of limited usefulness and futile usage of jobs and resources*" (García Ortega, 1982) and, as an outcome of this Law, two road plans were approved in 1860 and 1864. Nevertheless, those plans were useless, being mainly a catalogue of the works under performance in those years and, later on, in 1877, a new Road Plan was introduced which favoured, with its ambiguity, the further inclusion in the plan of a

large number of additional roads (the so-called "parliamentary roads")[13] during the following years. This situation was only amended by the 1911 Road Law, which repealed the 1877 Road Plan. Finally, in 1914 a new road plan (the Ugarte Plan) was approved that required the separation of road works into urgent and necessary, a classification that had to be updated every two years.

Therefore, at least until 1911, regional distribution of state investment on road construction seems to have been largely determined by the influence of territorial interests, represented by their parliamentary representatives. This was specially the case since 1870, when second- and third-category road investment became dominant in the aggregate road construction expenditures (by contrast, before 1870 the main priority was to build the basic radial network, which reduced the margin for regional and local interests to be effective). In that context, given the importance of the local interest in the electoral system, the analysis of the regional allocation of road construction expenditures may be a good way to approach the electoral strategies of the Spanish governments during the Restoration period. In addition, another reason to use road infrastructure construction (instead of other public works) as a means to analyse the electoral system of the period is the abundance of road investment data for the period under study in the *Memorias, Anuarios* and *Estadísticas de Obras Públicas* that were regularly published by the Government. Finally, roads were extended throughout the entire country, which allows an almost complete cross-regional study.

As has been indicated, our main focus of interest is the network of second- and third-category roads. However, given that for some years of our sample we do not have

[13] The concept of "parliamentary roads" is commonly used in literature related to the Spanish Restoration, and it was aimed at remarking the legislative excess of the Spanish Parliament regarding road planning. For further comments on this issue see, for instance, Cuéllar Villar (2003) or Alzola y Minondo (1899).

disaggregated data on this type of roads, the analysis below is performed for the whole road network (i.e. the sum of all three categories). This, however, provides a good proxy for second- and third-category road expenditure, as these two categories accounted on average for 96% of total road expenditure during the years for which we have enough information.

* * *

In the next Section, we analyse the relationship between electoral outcomes and the spatial allocation of road expenditure during the Spanish Restoration. As has been described, late nineteenth and early twentieth century Spain provides an interesting case of a two-party clientelist system that was threatened by the gradual increase in the level of electoral competition. This was expressed in the growing difficulties that the successive governments found to obtain the complete control of the Congress, due to the increasing presence of deputies of both the opposition "dynastic" party and the minority parties. Therefore, in the next section we analyse if those provinces that resisted the government's plan were punished through the withdrawal of budgetary funds, and also if the governments' strategy changed as time went by and the level of competition increased, with a gradual reallocation of road construction spending towards swing voters (i.e. those more prone to support candidates from the opposition "dynastic" party or the minority parties). In addition, since most of the empirical analyses on pork-barrel literature predict that more senior deputies should be more capable to extract larger amounts of roads for their regions, we try to analyse if the deputies' seniority translated into a higher level of funds in their constituencies.

5. Empirical Framework

5.1. Data and variables

Sample. Although elections took place at district level, in this paper data is aggregated into provinces, because information on road investment is only available at the provincial level. On the other hand, in the Basque Country and Navarre road investment was mostly planned and carried out at the provincial level and by the provincial administrations (*Diputaciones*) and, thus, their provinces (Álava, Biscay, Guipúzcoa and Navarre) must be excluded from our analysis. So, the sample consists of a set of 45 provinces (an average of 311 districts and 375 elected deputies per election).

We have restricted our analysis to the period 1879-1914, before the approval of the 1914 Ugarte Plan, which reduced the flexibility of governments' road construction decisions. Therefore, the elections included in the analysis are the following: 1879, 1881, 1884, 1886, 1891, 1893, 1896, 1898, 1899, 1901, 1903, 1905, 1907 and 1910.

Dependent variable. The endogenous variable is measured through pesetas of public investment on all categories of State roads per km^2. We only consider new road construction and disregard any other type of expenditure, such as maintenance works. Information on public road investment comes from the *Memorias, Anuarios and Estadísticas de Obras Públicas*, which were regularly published by the Spanish *Ministerio de Fomento* between 1856 and 1924.

Independent variables. These can be divided into two sets: political and economic. The first ones are constructed out of data on election results. The main source is the appendix of Varela Ortega (2001), which indicates the deputies elected in each district from 1876 until 1923 and their party affiliation. This database, however, has several lags which have been completed on the basis of Sánchez de los Santos (1908

and 1910), the yearly publication *El año politico* (1895-1910), and the press of the period (*El Imparcial* for 1876, *La Correspondencia de España* for 1879, and *El liberal* for 1881 onwards).

We have divided the elected deputies into government deputies (those who belonged to the party in government), opposition deputies (Liberal deputies under a Conservative government and Conservative deputies under a Liberal government), and minority deputies (those ones not running for Liberals or Conservatives). Additionally, following the suggestions of the pork-barrel literature, we introduce a variable that accounts for the deputies' seniority, on the basis of the hypothesis that more senior representatives tend to extract larger amounts of resources for their districts. In order to measure this effect, the *Seniority* variable is computed as the number of times in which the deputies within a province had already been elected before a concrete election. This variable is obtained by tracing the deputies' names of each election on the previous elections database.[14]

Economic variables are incorporated in order to control for other factors that may influence the allocation of road investment. According to Herranz-Loncán (2007), five economic aspects might have been relevant for the allocation of road expenditure: population density, road unit construction costs, urbanisation and industrialisation rates, and GDP per capita. Apart from construction costs, which are hold constant over the time, we have filled in the time gaps in those variables through interpolation. Table 1 presents a short description of the variables and their descriptive statistics and data sources.

[14] Furthermore, one could think that some sort of "political productivity index" such as that of Wallis (1998) and Wright (1974) would be an interesting variable to be added in our study. Unfortunately, data on the vote shares obtained by every candidate is extremely scarce and unreliable due to extensive electoral fraud.

Table 1

Descriptive statistics and data sources

Variable	*Description*	*Mean (S.D)*	*Source*
Road investment	Pesetas of road investment/Km^2	41.67 (38.94)	*Memorias, Anuarios and Estadísticas de Obras Públicas*. Ministerio de Fomento (several years)
Minority	% Minority deputies	0.07 (0.13)	Varela Ortega (2001), Sánchez de los Santos (1908 and 1910), *El año politico* (1895-1910), *El Imparcial* (1876), *El Liberal* (1881-1910) and *La Correspondencia de España* (1879).
Opposition	% Dynastic opposition deputies	0.25 (0.18)	
Seniority	% Deputies elected in previous elections	2.22 (1.35)	
Urban Population	Population in cities of over 10,000 pop./Km^2	12.36 (17.24)	Calculated from the Spanish population censuses
Density	Population / km^2	42.16 (26.27)	
Industrial Sector	% Industrial Production / Total GDP	0.18 (0.08)	Data provided by Julio Martínez-Galarraga
GDPpc	GDP / Population (pesetas)	467.37 (174.14)	
Costs	Estimated road construction costs per km^2 (Spain=100)	103.04 (34.58)	Own estimation from data in *Memorias, Anuarios and Estadísticas de Obras Públicas*. Ministerio de Fomento (several years)

5.2. Estimation strategy and results

The chosen estimating technique is a random-effects model (selected on the basis of the outcomes of the Hausman test). The estimation to be performed is:

$$i_{it} = \beta Z_{ip} + \lambda X_{it} + \delta C_i + D_t + \varepsilon_{it}$$
$$\varepsilon_{it} = \alpha_i + \alpha_t + u_{it}$$

where the X_{it} accounts for economic variables that change over time, C_i represents economic time-invariant variables (i.e. construction costs) and variables included in Z_{iP}

capture the political variables discussed above, which vary every election (p). We assume that a certain year's investment is influenced by the closest previous election. In other words, we consider that election outcomes have no impact on the election year's road allocation, given that politicians needed some time to exert their influence on investment. Finally, in order to capture changes in electoral strategies, we assume that the effects of the *Minority* and *Opposition* variables follow either a linear or a cubic time trend, i.e.:

- Linear time trend specification:

$$i_{it} = \alpha_t * \text{Minority}_{it} + \lambda X_{it} + D_t + u_{it}$$
$$where \quad \alpha_t = -\alpha_0 + \alpha_1 * t$$

- Cubic time trend specification:

$$i_{it} = \alpha_t * \text{Minority}_{it} + \lambda X_{it} + D_t + u_{it}$$
$$where \quad \alpha_t = -\alpha_0 + \alpha_1 * t + \alpha_2 * t^2 + \alpha_3 * t^3$$

Table 2 shows the results of the estimation.

Table 2

Political determinants of the regional allocation of road investment in Spain (1880-1910). Random effects model

	(1)	(2)	(3)	(4)	(5)	(6)
Time trend	Linear	Linear	Linear	Cubic	Cubic	Cubic
%Minority seats	-45.60**	-44.26**	-40.28**	-42.50**	-41.31**	-37.55**
	(-2.55)	(-2.49)	(-2.28)	(-2.45)	(-2.39)	(-2.19)
*%Minority seats * Trend*	3.37**	3.19**	2.89***	3.38***	3.19***	2.90***
	(5.10)	(4.83)	(4.37)	(5.09)	(4.82)	(4.36)
%Opposition seats	-21.34**	-20.79*	-19.64*	-20.28**	-19.75*	-18.63*
	(-2.00)	(-1.96)	(-1.86)	(-1.97)	(-1.93)	(-1.83)
*%Opposition seats *Trend*	1.06**	1.05**	1.00**	1.06**	1.05**	1.00**
	(2.20)	(2.19)	(2.09)	(2.18)	(2.17)	(2.07)
%Seniority	3.46***	2.78***	2.36**	3.46***	2.79***	2.36**
	(3.58)	(2.86)	(2.43)	(3.58)	(2.86)	(2.43)
Density		0.16	0.65***		0.16	0.65***
		(1.63)	(4.09)		(1.64)	(4.08)
Costs		0.33***	0.30***		0.33***	0.30***
		(4.29)	(3.95)		(4.28)	(3.95)
Industrial Sector			-75.65***			-75.59***
			(-2.79)			(-2.79)
Urban population			-0.94***			-0.94***
			(-3.75)			(-3.746)
GDPpc			57.81***			57.83***
			(3.86)			(3.86)
Constant	35.18***	-3.17	-21.22**	35.18***	-3.16	-21.22**
	(5.92)	(-0.34)	(-2.01)	(5.92)	(-0.34)	(-2.00)
Within R^2	0.140	0.140	0.160	0.140	0.140	0.160
Between R^2	0.318	0.513	0.449	0.318	0.513	0.449
Overall R^2	0.171	0.275	0.262	0.171	0.275	0.262
Observations	1,575	1,575	1,575	1,575	1,575	1,575

Notes: (1) z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1; (2)Time effects included in all regressions.

In Table 2, the control variables are generally significant and have the expected sign, according to the results obtained by Herranz-Loncán (2007). As for the political variables, Table 2 indicates that, broadly speaking, the proportion of minority and/or

opposition deputies in each province was a relevant factor to explain the cross-regional distribution of road expenditures. At first, it seems to have had a negative and significant effect on the allocation of road investment. In other words, as means of punishment, the government might have withdrawn resources from those provinces where minority and/or opposition parties were obtaining an excessive electoral margin. However, when these variables are interacted with a linear or a cubic trend, its positive sign reveals that the initial punishment towards minority deputies' provinces did not last for the whole period or, in other words, that Spanish governments may have gradually changed their electoral tactics throughout the Restoration. This would confirm Besley's (2007) idea that the increase in political competition translated to more transfers to swing voters (i.e. those more prone to challenge the government's plan). On the other hand, the sign of the *seniority* variable indicates that more senior representatives might have been capable to attract more road investment expenditures to their regions.

6. Conclusions

This paper has examined the effects of parliamentary representation on the distribution of state funding for road infrastructure during the Spanish Restoration, by analysing the possibility that politicians affected individuals' vote preferences (as well as their welfare) by directly allocating state spending that was favourable to district interests. The Spanish political system of the period under analysis was very appealing for political economy analyses, due to the broad use of vote-buying mechanisms by politicians and the process of increasing electoral competition.

Our findings on a panel of Spanish provinces over 1879-1910 confirm the relevance of political factors on the regional distribution of road construction. Using a random-effects model we show that, initially, the party in government initially punished

those provinces with larger shares of minority deputies in order to avoid their empowerment, which would risk the *turno pacífico* system. However, later on, they realised that this tactic was not effective enough (as the increase in political competition shows) and they rechanneled road expenditure towards minority deputies' provinces. At the same time, increasing political competition implied in some districts a growing resistance of the "dynastic" parties' voters to change the sign of their vote election after election. This trend was also initially punished by governments with a lower level of investment, but also in this case, this strategy was gradually altered when the governments realised that it was not effective. Finally, the outcomes of the estimation also show that those provinces with higher proportion of senior deputies did obtain more public road construction resources. In this sense, the ability of senior deputies to attract resources to their constituencies might have been rewarded with more votes, regardless of the sign of their party of affiliation. All these results indicate that political variables had a statistically significant effect of on the allocation of road infrastructure during the Spanish Restoration are signs of the importance of the electoral dynamics under a political system that is usually described as non-democratic. In addition, our analysis also provides an interesting example of the evolution over time of governments' tactics in clientelist contexts.

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