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Fiscal Federalism

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**THE POLITICAL ECONOMY OF INFRASTRUCTURE CONSTRUCTION:
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ABSTRACT: This paper examines the extent to which the public allocation of road investment was influenced by political and electoral goals during the Spanish Restoration (1874-1923). More precisely, we seek to identify those provinces that were favoured with higher road construction expenditure and whether tactical strategies adopted by the political parties varied over time to reflect increasing political competition. In so doing, this paper combines concepts from three strands of literature: legislative pork-barrel; clientelism and machine politics; and electoral competition. Our main empirical finding for a panel of Spain's provinces suggests that constituencies electing a higher proportion of deputies from minority or opposition parties were initially punished through lower levels of road investment but that, by the end of the period, they were instead favoured with more resources than the rest. In addition, we also observe that senior deputies who had been ministers in previous administrations were more capable than other politicians of attracting resources to their constituencies.

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“We refer to the immoral, disastrous and disturbing faculties conferred on the Co-legislative Bodies to include roads in abundance 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 in which to study the long-term evolution of clientelist systems and vote-buying mechanisms.¹ The electoral system of the Restoration allowed two hegemonic parties (Liberals and Conservatives) to remain in power for almost fifty years thanks to the so-called *turno pacífico* (peaceful turn). This was a system that relied on an agreement between both “dynastic” parties according to which they arranged their peaceful alternation in power.² At the same time, in these years, Spanish electoral tactics, which were essentially organised at the local level and involved the participation of local and provincial elites, were based on the systematic use of clientelism, coercion and mass electoral fraud so as to ensure that the electoral results did not contradict the objectives of the two hegemonic parties.³

Among the various clientelist practices, one of the most frequently adopted in the Restoration was the exchange of votes for investment in roads, in line with the practice more commonly referred to today in the political economy literature as “pork-barrel politics”. Indeed, among the many road projects approved by Parliament during the Restoration legislatures, a large proportion was agreed to not on economic criteria but rather on political grounds. These projects were known as “parliamentary roads”

¹ In 1874 a military uprising in Spain led by general Martínez Campos brought the First Republic to an end and saw the reestablishment of the Bourbon dynasty. The following period up to Primo de Rivera’s military coup d’état in 1923 is known as the Spanish Restoration and was the most long lived of the Spanish constitutional regimes of the 19th century.

² As is customary, henceforth, we shall refer to the Liberal and Conservative parties as the “dynastic” parties, both of which agreed to take on a governmental role from the early years of Alfonso XII’s reign. The Conservative Party was founded in 1876, coinciding with the king’s ascension to the throne, while the Liberal Party was established four years later, in 1880, initially as the “Fusionist Party”, and adopting its eventual name in 1885.

³ In Spain clientelism is usually referred to as *caciquismo* (and, as such, hereinafter we use both terms interchangeably). The concept is linked to the *caciques*, members of the local elite who gained power by manipulating the administrative machinery for their own personal benefit and that of their clientele. In Ramón y Cajal’s words, the *cacique* was an indispensable agent, “*the only tie that links the town and the village with the State*” (Moreno Luzón, 1995: 219, our translation).

and were fiercely criticised at the time, as representative of a highly inefficient and corrupt system of allocation of public resources. Thus, in this paper, assuming that political interests shaped the allocation of road construction expenditures in Restoration Spain, we seek to disentangle the pork-barrel-type strategies used by the political parties to maximise the number of seats won in parliamentary elections.

This paper makes two main contributions to the existing literature on the relationship between electoral strategies and the allocation of government spending. The first concerns the data used, since electoral evidence from the Spanish Restoration has not been used to date for this purpose.⁴ Secondly, and more importantly, the relevance of the historical changes that took place in Spain during the period under consideration, including the establishment of universal male suffrage in 1890 and the Spanish monarchy's gradual loss of legitimacy after the so-called "Disaster" of 1898 (the loss of the last vestiges of the Spanish empire), heightened political competition and forced Spain's politicians to modify their strategies throughout the period. As such, the Restoration provides an interesting case that enables us to observe empirically the effects of growing political competition on clientelist electoral strategies in the long term.

In order to conduct our empirical analysis, we use a panel of 45 Spanish provinces between the years 1880 and 1914, containing information on road investment and electoral outcomes. The rest of this paper is structured as follows. Section 2 presents a short review of some contributions in the political economy 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 system and some reflections on the role of road investment in the context of that system. Finally, Section 5 presents the empirical analysis, which includes the data used, the estimation strategy and our results. Section 6 sets out the main conclusions.

2. Literature review

The influence of electoral strategies on the spatial allocation of public expenditure has been analysed in several historical and present-day case studies on

⁴ Political factors aside, the study that is most similar to ours is Herranz-Loncán's (2007), which analyses the way in which the spatial distribution of Spanish transport infrastructure was determined by economic variables and institutional factors between 1860 and 1930.

distributive politics. Two types of model can be distinguished within this literature. Firstly, non-partisan (or legislator-based) models emphasise the role played by influential legislators that are able to obtain large amounts of resources to serve the interests of their own district (and, in turn, those of the legislator). Such models suggest that congressional seniority or committee membership can have a positive impact on the allocation of resources, which in turn increases the probability of the re-election of the more influential representatives. Secondly, partisan models take into consideration that such legislators form part of a broader organisation (i.e. a political party) to whose discipline they are (to varying degrees) subject. These models place the focus more fully on political parties as opposed to individual legislators. In this case, two alternative scenarios might arise: either governments channel public funds to the more closely disputed political jurisdictions (that is, they target “swing” voters) or they do so to their “safe” seats (i.e. to their “core” voters).⁵

In the case of non-partisan models, there is some (albeit not extensive) evidence of the role played by individual legislators in the allocation of public expenditure. Levitt and Poterba (1999), for instance, find a very weak association between seniority and the regional distribution of federal funds in the US between 1953 and 1990, although they observe that those states that were represented by more senior congressmen grew more quickly than the rest throughout the period. Milligan and Smart (2005) provide evidence that Canadian regional grants between 1988 and 2001 were biased towards the districts represented by cabinet ministers, but they also show – in contrast with many studies on US redistributive politics – a negative correlation between seniority and spending. The most plausible explanation for this relationship is, they believe, that once the seniority of a politician exceeds a certain threshold (for instance 10 years) her expectations of running for re-election will tend to fall and, therefore, they may well reduce their attempts to obtain spending for her particular constituency. In the case of the US during the 1980s, Levitt and Snyder (1995) suggest that a congressman’s efforts may have played an important role in accounting for the federal funds received by her district. A good example of the impact that an influential politician can exert on the distribution of public funds is provided by the case of Key Pittman, a US senator for Nevada during the New Deal. Pittman’s ability to obtain spending for his State is tested (and confirmed) in

⁵ Core (or partisan) voters are those that, due to their beliefs or preferences, remain loyal to a particular party. By contrast, swing voters are those who show no such attachment.

Wallis (1998) by incorporating a leadership dummy into his model. Finally, as regards specific spending programs, Knight (2004) focuses on transportation projects and shows that US federal government legislators have incentives to increase spending in their districts. Such incentives, Knight argues, arise because the funding of transportation projects is drawn from a common pool of funds, i.e. the tax burden does not fall fully on the district/state/region where the expenditure is made. This preference to satisfy local as opposed to national interests results in the overprovision of public goods.⁶

As for partisan models, some of the most frequently cited studies adopting the “swing voter” approach are Lindbeck and Weibull (1987) and Dixit and Londregan (1996), while Cox and McCubbins (1986) is an oft-cited example of a study taking a “core voter” perspective. The former assume that politicians will tend to target indifferent voters or those expressing weak opposition, since this group of voters are the only ones to represent a credible threat if not favoured. By contrast, the latter argue that, if candidates are risk averse and attracting swing voters has an uncertain return, legislators prefer to target core voters, whose preferences and needs they understand much better. However, to date, the empirical evidence on the “core” versus “swing” voter debate remains inconclusive. For instance, Wright (1974) concludes that, in order to maximise expected votes, federal spending during the US New Deal was used to target swing voters. Indeed, the US New Deal (characterised by a drastic increase in federal spending) has been used by many other authors to prove the existence of pork-barrel politics. A good example of this is provided by Wallis (1998) who, using political productivity variables, in line with Wright (1974), reports evidence of a disproportionate allocation of grants to swing voters. Several other studies that provide evidence for the swing voter model are Johansson (2003) and Dahlberg and Johansson (2002) for the Swedish case, and Castells and Solé-Ollé (2005) for Spain. By contrast, Milligan and Smart (2005) conclude that, in the allocation of Canadian regional development grants between 1988 and 2001, those districts represented by members of the government were favoured, thereby lending support to the core voter approach; see also, in the same line, Levitt and Snyder (1995).

⁶ For an analysis of the implications of “universalism” see Wallis and Weingast (2005) who also examine infrastructure projects. Their theory of legislative choice shows why investment in large-scale projects during the US antebellum era was unfeasible for the federal government. Likewise, Inman and Fitts (1990) also discuss the costs associated with “universalism”, but focus their study on US fiscal policy.

Our analysis here is directly inspired by these two strands of the literature on distributive politics as we seek to disentangle the influence of both partisan and non-partisan factors on the allocation of state investment in road construction during the Spanish Restoration. However, as we outline in the next section, the Spanish Restoration political system presented two specific features that must be properly accounted for in the analysis. Firstly, it was a clientelist system, which used public resources to seal a party's political clientele in a long-term relationship of dependence. And, secondly, the system evolved over time towards a significantly higher degree of political competition, which was one of the eventual reasons for its ultimate demise. In this regard, recent research has focused on the operation of clientelism and machine politics in several autocracies or weak democracies where corruption, mass electoral fraud and vote-buying strategies were the most effective tactics for keeping a hegemonic party in power for long periods of time. This is, for instance, the case of Mexico where, during more than seventy years, the Institutional Revolutionary Party (PRI) retained power thanks to coercion and other political strategies. The reasons underlying the political survival of the PRI are examined in detail in Magaloni (2006) and Diaz-Cayeros, Magaloni and Weingast (2006). They conclude that the party rewarded its core supporters and punished the voters that betrayed them by providing them with less budgetary funding. Likewise, within a clientelist framework, Stokes (2005) builds a model, which she applies to the study of the Argentinean case, in which she disentangles the way that clientelist parties (referred to also as political machines) ensure that the voters they favour eventually honour their promises and exchange their votes for benefits. Although both parties and voters are likely to renege on their initial promises, this does not occur when the political agents are integrated within the voters' social networks and are able to monitor their votes to some extent (even when the ballot is secret). In addition, Stokes' model includes a repeated game that extends indefinitely over time which, together with the monitoring of voters, ensures that no problems of commitment arise. Finally, among other case studies on clientelism, Hsieh et al. (2009) shows how during the Chávez regime in Venezuela, his opponents – identified thanks to a software program called Maisanta – have been punished with lower earnings and fewer opportunities of employment.

A political party's focus on its core supporters under a clientelist system may, however, be affected by greater political competition, as would seem to have been the

case throughout the Spanish Restoration. Regarding this issue, Besley and Preston (2007) present a model in which two parties compete for voters by presenting their policy platforms, designed either to reward partisan voters or to attract swing voters. The authors use a probabilistic voting model to argue that where there is bias towards a political party because of the distribution of voters (i.e. electoral districting), the party favoured by such bias will tend to reward its core voters rather than the swing voters. Moreover, in Besley's (2007) model – where, again, two parties compete for swing voters – the broader the electoral margin that a party faces, the higher is the spending addressed directly to its supporters at the expense of the swing voters and, at the same time, the higher the utility (in terms of political rents) that a party obtains from winning, the more likely it is to direct spending towards the swing voters. Similarly, Milligan and Smart (2005) establish that the impact of the voting margin in a particular district depends on whether it is a government or opposition seat. Districts held by the opposition are able to ensure higher government expenditure when the electoral margin is low, whereas this pattern does not hold if the district is government held. In other words, changes in the level of political competition have a clear impact on policy choices. In this context, after describing the characteristics of the Spanish political system at the time, in section 5 we present an empirical analysis that seeks to disentangle the extent to which these different strategies were present in the political system of the Spanish Restoration and the extent to which they altered over time as political competition increased.

3. The Spanish political system during the Restoration

The Spanish Restoration system presented a number of particular political and electoral features that require a brief explanation if we are to understand fully the political economy of road construction during the period.⁷ Apart from two earlier brief periods of parliamentary rule in the years 1812-1813 and 1820-1823, Spanish Parliamentary elections were called quite regularly between 1834 and 1923, until ended

⁷ The political mechanisms of the Restoration bear a certain resemblance to those of the Italian *trasformismo* and the Portuguese *rotativismo*. Moreover, Restoration Spain may also be compared to other earlier European political systems such as 'Old Corruption' in England and Napoleon III's France (Moreno-Luzón, 2007). For an international comparison of clientelism, see Piattoni (2001).

by Primo de Rivera's military dictatorship, which lasted until 1931. For most of this period, Spanish elections operated in accordance with the system established by the 1846 electoral law, which divided the country into uninominal districts, of (initially) ca. 50,000 inhabitants, in which the wealthier and more educated men elected their deputy, according to census suffrage and a simple majority voting rule.⁸

The suffrage underwent substantial changes over time, through a gradual extension of the electorate and, finally, the establishment of universal male suffrage in 1890.⁹ As for the district structure, it failed to adapt to the marked demographic changes that were recorded after 1846, giving rise therefore to significant size differences between districts. The main change to which it was exposed was the establishment of several "plurinominal" districts, which were mainly located in urban constituencies. In these districts, citizens voted for one or two candidates fewer than the total amount to be elected, in order to ensure that minorities were represented. The creation of those "plurinominal" districts was in general characterised by the presence of gerrymandering, in order to neutralise, as far as it was possible, the relatively more independent urban electorate.

Under this system, the elections that were held in the period 1846-1868 were characterised by systematic fraud and the absence of competition, since the political party that enjoyed control of the government always won them. Thus, the only way to change the political composition of the parliament was through military uprisings, as exemplified by the events of 1854 and 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 that survived until 1923. The system operated as follows. Before the election, the King appointed a new Prime Minister (*Presidente del Consejo*) 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.

⁸ Although the Spanish Parliament (*Cortes*) had a bicameral structure throughout the Restoration period, our analysis is restricted to the lower chamber (*Congreso de los Diputados*) since the members of the upper chamber (*Senado*) either held their position in their own right or were appointed by the king or an electoral college comprising the provincial administrations (*Diputaciones*) and a number of electors designated by the local councils and the wealthiest taxpayers.

⁹ Universal male suffrage was also temporarily introduced during the revolutionary period of 1868-1876. For a more detailed description of the electoral system during the Restoration period, see Linz et al. (2005), Varela Ortega et al. (1996) and Varela Ortega (2001), among others.

These were then rigged by the new Ministry of *Gobernación* (Home Office), whose aim was to ensure that the new party in power could obtain a majority of seats in the new Parliament. In this context, in order to ensure that the election outcome was the one planned by the government (the so-called “*encasillado*”), it was more convenient for the party in power to collude with the main opposition party, rather than engaging in competitive mobilisation. However, the arrangement between the two “dynastic” parties was not just the simple assignment of a fixed number of seats, but rather the outcome of complex negotiations.

Given the government’s limited capacity to intervene in and regulate society, however, the expected electoral result could only be achieved by relying on the support of the local elites (*caciques*). This meant forging links between candidates and the local and provincial powers, who could wield a direct influence over the electoral outcomes by controlling the polling stations and via the widespread use of vote buying, coercion and mass fraud,¹⁰ as well as by promising individual favours or indivisible benefits to the electorate, which were to be obtained thanks to the influence of the elected candidate.

An interesting distinction was made between the candidates, classified as either “*propios*”¹¹ or “*cuneros*”. The former were candidates that repeatedly ran for election in the same districts and who had some link or tie with them - in some instances they were the local *caciques*. The latter, by contrast, were designated directly by their party to a certain district, in accordance with the “*encasillado*”. Varela Ortega (1977: 414) defines them as those “*whose election was due to the government’s support rather than their local influence*”, and the districts in which these deputies stood were known as “available districts”. Most *cuneros*, therefore, were not local citizens (and had no ties with the district they had been assigned), and frequently public campaigns were

¹⁰ Situations of electoral fraud and coercion were generically known as *pucherazos*. There are numerous descriptions of such fraudulent practices in the literature of the period. By way of example, several detailed descriptions of the irregularities observed in the 1886 elections can be found in Dardé (1986): “(...) *two inspectors complained because nobody published with sufficient clarity the place where the election was to be held and because the ballot box had no lock*”, “*the ballots were kept in the drawer of a table, instead of in a ballot box*”, etc. That year in Barcelona, Valentí Almirall (a Republican politician) declared that he saw his late father going to vote several times, transformed into a municipal employee or a police informer (Rubí Casals and Armengol Segú, 2001: 269).

¹¹ Also known as “*natural candidates, with roots or standing in their own right*” (Varela Ortega, 1977: 414).

mounted against them. As Moreno Luzón (1995) points out, at that time it was believed that deputies without any links with a particular district would not perform adequately their main function, which was precisely seeking to obtain favours for their voters in Madrid.

In other words, the *caciques* (who, in practice, might also be candidates), established close links with both the government and the voters, in what might be described as “patron-client” relationships. In this context, what the local “clients” demanded from the elected deputies was essentially access to administrative resources. As such, the operation of the clientelist system was largely based on the discriminatory application of bureaucracy and on the deputies’ capacity to expedite certain administrative processes (Moreno Luzón, 1995; Comín, 1988).

The specific promises and favours that might win local electoral support were particularly diverse. The most frequent were perhaps individual benefits, including exemption from military service, personal interventions in the judicial system, job offers, etc. But, as discussed above, indivisible favours such as dams, roads, railways or civil buildings (schools, markets, etc.) were also very important. Moreover, these individual and collective benefits not only affected public expenditure; they also had a bearing on the distribution of the tax burden among individuals and districts. Therefore, one of the main consequences of clientelism was the arbitrary application of the tax system and the distribution of public funds (Comín, 1988: 505-7).¹² In Varela Ortega’s (2001: 12) words, the Parliament became the solution for the *caciques*’ “hungering for budget”.

In this context, the political system of the Spanish Restoration, as just described, was gradually undermined, and it became increasingly difficult for the government to control the electoral process. These problems became apparent in the 1890s and culminated in the complete breakdown of the system in the years immediately preceding the 1923 coup d’état. In fact, since 1918 it had proved extremely difficult for the government to obtain a Parliamentary majority. The reasons for this crisis were manifold. On the one hand, the system had proved incapable of adapting to the country’s process of economic and social modernisation. Since the early years of the

¹² For more details regarding the pressure exerted by the districts on Parliament as regards tax policy, see Martorell Linares (2000: 276-81).

twentieth century, this process gave rise to the growing presence of minority parties that sought to mobilise the electorate by appealing to ideological arguments in the context of increasingly competitive elections. As such, these parties gained considerable influence in a number of Spanish towns (Moreno Luzón, 2007; Comín, 1988).¹³ On the other hand, the influence of the local powers had gradually increased at the expense of that of the central government. This process was further encouraged by the establishment of universal male suffrage in 1890, by the Spanish monarchy's gradual loss of legitimacy after the 1898 defeat in the colonial war, and by the growing fragmentation of the "dynastic" parties since the early years of the twentieth century. Such fragmentation "obliged Spanish politicians to look for security in a guaranteed local power base in order not to be swept away by the instability of the government" (Moreno Luzón, 2007: 435; see also Martorell Linares, 2000: 277).¹⁴

Those processes were reflected, on the one hand, by an increase in the presence of minority parties in the Parliament and, on the other, by the growth in the number of districts "owned" by the same deputy election after election (*"propios"*), regardless of which party was in power and, therefore, by the increasing presence in Congress of members of the "dynastic" opposition party. Figures 1 and 2 illustrate these effects by reporting the percentage of deputies running for the Liberal, Conservative and minority parties at each election. As we can see, not only did the margin between the two "dynastic" parties contract, but also the margin between these parties and the minority ones became smaller. This process fluctuated, however, in pace. An acceleration was noted after the introduction of universal male suffrage in 1891, but this was abruptly interrupted by the 1896 election, only to be resumed thereafter. The 1896 downward trend might reflect successive government attempts, founded on widespread fraud practices, to counter the difficulties that the "dynastic" parties were experiencing in

¹³ The main minority groups in this period were the republican parties, followed by various groups of regionalists, traditionalists and also (by the end of the period) socialists. According to Moreno Luzón (2007: 430-1), those parties' "*modern methods did not prevent the frequent recurrence of cacique-inspired techniques, from fraud to administrative favours, whenever a political party dominated a particular branch of power. Mixed political apparatuses, such as the reformist republicans in Asturias or the regionalists in Catalonia, who combined modern political activities in the cities with the promotion of caciquismo in rural areas, were quite common.*"

¹⁴ However, Varela Ortega (2001) and Comín (1988) conclude that universal male suffrage did not introduce significant changes in the operation of the system, except for the greater incidence of vote-buying mechanisms (which made elections more expensive for candidates and the State).

keeping the system under their control following the introduction of universal male suffrage. However, their efforts had only a transient effect, and the vote of the minority parties rose again in the 1898 election and thereafter.

*** Figures 1 and 2 about here***

4. Road construction in Restoration Spain

During the Restoration, the construction of roads became one of the most frequent of the collective and indivisible benefits to be exchanged for votes. It is easy to understand why, given the importance of roads to Spain's transport system at that time. Although railways were indeed the core element of the transport system during the second half of the nineteenth and the early twentieth century (before the diffusion of the motorcar), for a large area of the Spanish territory roads provided the only link to the railway network and to the most important urban and international markets. Since low population density had prevented the expansion of the railway network beyond a certain threshold,¹⁵ and the geographic characteristics of the country hampered the use of navigation for internal transport, roads afforded the only possibility of communication for large swathes of the territory.

Road construction (and infrastructure investment in general) took off in Spain after the end of the Carlist War in 1840, and accelerated after 1855. Between 1802 and 1855, 116 km of new roads were constructed yearly in Spain, and this figure rose to 422 km between 1855 and 1877 and to 791 km between 1877 and 1911.

During the nineteenth and early twentieth century, Spanish roads were divided into three categories. Those in the first category formed a radial network centred on Madrid, second category roads connected the main population centres with each other and with the railways, and third category roads served the rest of the territory. In the first few decades after 1840, the construction of first category roads attracted the greatest amount of resources. However, as Figure 3 shows, later on an increasing share of resources was dedicated to roads in the second and, especially, third categories, which were supposed to meet regional and local interests.

¹⁵ By 1900, the density of the Spanish railway network was 26 km per 1000 km² of territory, compared with 130 in Great Britain, 81 in France and 55 in Italy, and some Spanish towns were more than 200 km away from the nearest railway station (Herranz-Loncan, 2008: 48).

Figure 3 about here

The construction of roads in this third category caused the greatest controversy at the time, because spending on them appeared to be largely allocated according to political criteria. There are many recorded instances of criticism from the mid-nineteenth century onwards directed against the way in which territorial interests influenced Parliamentary decisions regarding road investment. To a large extent, this situation was the consequence of the fact that, for most of the period under review, attempts to develop a systematic road plan met with repeated failure. In fact, the 1857 Road Law had specified that “*the quantities allocated to the three types of road ought to be equitably distributed amongst the Kingdom’s provinces*” instead of using resources for “*culminating work of limited use and the 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 proved totally ineffective, constituting merely a catalogue of the work in progress in those years. Later, in 1877, a new Road Plan was introduced which favoured, with its ambiguity, the further inclusion in it of a large number of additional roads. 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 road works to be classified as either urgent or necessary, a classification that had to be updated every two years.

Given the absence of a well-defined road plan, the few decades leading up to 1911 were characterised by a legislative delirium in the field. More than 1,000 new road projects were passed by Parliament between 1877 and 1911, representing more than 40,000 km (i.e. more than the total mileage constructed by the State in the whole of the nineteenth century). This process reached its zenith in the 1890s: in the Parliamentary year of 1895-1896 alone, 313 new road projects were passed. Clearly, many of these projects, known at the time as “parliamentary roads”, would not in fact be built during the period. However, this uncontrolled expansion of road projects gave considerable freedom to successive governments to undertake the allocation of road investment funds. According to various contemporary opinions, this enabled the executive to allocate expenditure on the basis of electoral considerations and private interests, rather than of the satisfaction of real territorial needs. As a consequence, as the government itself stated by 1886: “*There may be cases of two, three and sometimes four roads all abundantly servicing the same public interests, and others that run through desert*

areas, and at such a high cost that it should have been enough to defer its construction through more fertile and populated terrains” (Government Royal Decree 17 September 1886).¹⁶

In this regard, roads seem to have constituted an ever-present element in the electoral process, as one of the collective benefits (along with other forms of infrastructure and certain tax benefits) offered by candidates to districts in exchange for their electoral support. The candidates might typically promise the passing of a given road project before Parliament but, more importantly, they might promise to secure the necessary public funding for the construction of the road. Thus, both legislative and administrative promises were present in the electoral campaigns. For instance, in 1904, César de la Mora asked Prime Minister Maura to approve the construction of a number of roads in Puente del Arzobispo because *“if I do not get any positive results in my district I am done for”*, and Luis Gallo was elected in Talavera in 1899 and 1901 after promising improvements to the district’s roads (Moreno Luzón, 2001, 169-170). Frías Corredor’s (1992, 253) study on the province of Huesca provides detailed information on the road projects that were both approved and eventually built in the province during the last quarter of the nineteenth century thanks to the influence of the elected deputies, and indicates that *“Broadly speaking, there was not a single “fixed” deputy that could not be related by the electorate with the construction of certain important roads that reflected the district’s interests”*. In fact, according to Comín (1988: 675), the growth in the budget of the Ministry of Public Works during the Restoration can be explained in part by the electoral costs of the parliamentary roads.

Therefore, up until 1911 at least, the regional distribution of state investment in roads seems to have been largely determined by the influence of territorial interests, as represented by each district’s parliamentary deputy. This was particularly the case since 1870, when second- and third-category road investment became dominant in the aggregate expenditure on road construction (by contrast, before 1870 the main priority had been to build the basic radial network, which had reduced the room for manoeuvre of regional and local interests). As such, an analysis of the regional allocation of road construction expenditure might constitute an effective approach for understanding the electoral strategies of successive Spanish governments during the Restoration period. In

¹⁶ For a more detailed discussion on “parliamentary roads” see, for instance, Cuéllar Villar (2003) or Alzola y Minondo (1899).

addition, it has the advantage over other indivisible benefits (that were also extensively used at the time) of being supported by an abundance of systematic quantitative information, since road investment statistics were published regularly throughout the period in the *Memorias*, *Anuarios* and *Estadísticas de Obras Públicas*. In the next section we seek to analyse this question.

5. Empirical Analysis

In this 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 electoral competition. This was reflected in the growing difficulties that successive governments found in controlling the Congress, due to the increasing presence of deputies from both the opposition “dynastic” party and the minority parties. Here, therefore, we analyse whether the provinces that resisted the government’s plan were punished with the withdrawal of budgetary funds, and also whether government strategy changed over time, as the level of competition increased, with the gradual reallocation of road construction expenditure towards swing voters (i.e. those more likely to support candidates from the opposition “dynastic” party or the minority parties). In addition, since most empirical analyses in the pork-barrel literature predict that more senior deputies should be more able to extract larger amounts of roads for their regions, we seek to determine whether a deputy’s seniority and/or leadership translated into a higher level of funding in his constituency.

5.1. Data and variables

Sample. The analysis below is carried out at the provincial level. As indicated, during the period under analysis, the Spanish general elections were held at the district level. However, as information on road investment is only available at the provincial level, we have had to aggregate the data on electoral outcomes by province.¹⁷ Note, also, that as road investment in the Basque Country and Navarre was mostly financed

¹⁷ Varela Ortega (2001: 562) notes, however, that a significant number of provinces showed certain political unity during the period under study.

and executed by the provincial administrations (*Diputaciones*), we have excluded these provinces (Álava, Biscay, Guipúzcoa and Navarre) from the analysis. Hence, our final sample consists of a set of 45 provinces with an average of 309 districts and 372 elected deputies per election.

We have restricted our analysis to those road investment projects undertaken by the central government between 1880 and 1914. We have selected this period because 1880 is the first year following the 1879 election, which may be considered as the starting point of the *turno pacífico* system, while 1914 is the year of the approval of the Ugarte Plan, which reduced government flexibility in its decisions regarding road construction. We assume that a given year's investment was influenced by the nearest previous election but, at the same time, we consider that the expenditure made by the government in an electoral year was not influenced by that year's election outcomes. This is reasonable given that infrastructure projects needed to go through a somewhat involved process before being approved and implemented. In other words, politicians needed some time to exert their influence on investment. Based on this assumption, the elections that are included in the analysis are the following: 1879, 1881, 1884, 1886, 1891, 1893, 1896, 1898, 1899, 1901, 1903, 1905, 1907 and 1910.

Dependent variable. Although, ideally, we should have focused on public expenditure dedicated to second and third category roads, the data on road investment are not disaggregated by category for some years of the period under study. However, since second and third category roads accounted for 93% of the new road mileage constructed during the period, we consider that the aggregate investment on all categories of State roads can be used as a good approximation to our variable of interest. Road investment is measured in constant pesetas per capita, and we only consider new road construction while disregarding any other type of expenditure, such as maintenance work.¹⁸ Information on public road investment has been extracted from the *Memorias, Anuarios and Estadísticas de Obras Públicas*, which were published regularly by the Spanish Ministry of Public Works (*Ministerio de Fomento*) between 1856 and 1924.

¹⁸ Investment figures have been expressed in real terms by using the price index for “other construction” investment by Prados de la Escosura (2003).

Independent variables. We have used two sets of independent variables for our empirical analysis, which are related, respectively, with potential political and economic explanatory factors for the allocation of road investment. The political variables have been constructed on the basis of electoral data. The main source of information is the appendix to Varela Ortega (2001), which contains the name of the deputies elected in each district from 1876 until 1923 as well as their party of affiliation. This database, however, has several gaps which have been filled by drawing on Sánchez de los Santos (1908 and 1910), the yearly publication *El año político* (1895-1910), some of the newspapers published in the days after each election (*El Imparcial*, *El Liberal*, *La Correspondencia de España*, *La Época* and *ABC*) and the Historical Archive of Deputies (1810-1977) of the Spanish Congress.¹⁹

We have divided the deputies elected 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 not running as either Liberals or Conservatives). This distinction is made to test whether the government was investing more heavily in those regions with a higher share of government deputies or, on the contrary, whether the party in government made a strategic use of road investment to buy votes in those regions in which the minority parties were more influential. Moreover, we add a variable that accounts for the change in the number of minority deputies elected with respect to the previous election, in order to test if the government reacted in the short term to increases in the level of political competition. Besides these four variables (*% Government Seats*, *% Opposition Seats*, *% Minority Seats* and *% Change in Minority Seats*), it would have been useful to include a “political productivity index” as in Wallis (1998) or Wright (1974). However, data on the share of the vote obtained by each candidate are scarce and unreliable, because of extensive electoral fraud.

Additionally, in line with the pork-barrel literature, we have estimated a variable that accounts for the deputies’ seniority in the Parliament, on the basis of the hypothesis that more senior representatives may be able to extract larger amounts of resources for their districts. We have used two alternative measures. With the first of these, which we

¹⁹ This information can be found at the website of the Spanish Congress:
<http://www.congreso.es/portal/page/portal/Congreso/Congreso/SDocum/ArchCon/SDHistoDipu>

call *Relative Seniority*, we aim to measure the seniority of a deputy by comparing him with the most senior deputy standing at that election. In other words, the *Relative Seniority* of a province at an election is equal to the average of the seniority of each of its deputies with respect to the maximum seniority observed at this election (in whichever province). The higher this indicator is, the smaller is the gap between the province's deputies and the most senior representative and, therefore, the more capacity they have to attract resources. The second measure (*% Senior Deputies*) is an alternative and simpler seniority indicator, which corresponds to the share of elected deputies that had already been elected in previous elections in each province. These two seniority indicators are obtained by tracing the names of each elected deputy in the databases for the previous elections.²⁰

The pork-barrel literature also suggests that certain political leaders can wield greater influence and so obtain more public resources for their regions. Thus, we have created two *leadership* variables to capture this effect: *Public Works Minister* (dummy variable set to 1 if the minister of Public Works was a deputy elected for that province) and *% Deputies who were Ministers in the Past* (share of deputies in province i who are not ministers in term t but who have been so in previous terms). Note that this last variable not only captures the *leadership* effect but also the *seniority* effect. In line with suggestions in the pork-barrel literature, we expect the sign of these two variables to be positive.

As far as economic factors that might influence the allocation of road investment are concerned, we incorporate three variables following the analysis conducted in Herranz-Loncán (2007): urbanisation and industrialisation rates and GDP per capita. We have filled the time gaps in these variables through interpolation. Table 1 presents a summary description of the variables and their descriptive statistics and data sources.

Table 1 about here

4.2. Estimation strategy and results

Econometric specification. In order to analyse how political factors conditioned the distribution of road investment in Spain between 1880 and 1914, we use a panel

²⁰ The first election considered when measuring the deputies' seniority is the general election of 1876, the first to be held in the Restoration period.

dataset comprising 35 years and 45 provinces, in which we consider public road investment as being influenced both by economic factors and by electoral variables. Provided that we can observe the behaviour of individual units (provinces) at different points in time, we can capture variation between units as well as over time by using a linear panel data model. Thus, the initial specification of our model is as follows:

$$i_{it} = \beta Pol.Competition_{it} + \mu Leadership_{it} + \psi Seniority_{it} + \lambda X_{it} + \delta D_t + \varepsilon_{it} \quad (1)$$

$$\varepsilon_{it} = \alpha_i + u_{it}$$

where i_{it} is investment per capita on roads; X_{it} accounts for economic variables that change over time (*GDP p.c.*, *Urban Population* and *Industrial Sector*); “*Pol.Competition_{it}*” includes the political variables which aim at measuring the degree of political competition at each election (*% Opposition Seats*, *% Minority Seats* and *% Change in Minority Seats*); “*Leadership_{it}*” comprises the two variables which account for influential politicians (*Public Works Ministers* and *% Deputies who were Ministers in the past*); “*Seniority_{it}*” is alternatively measured through the two aforementioned variables (*Relative Seniority* and *% Senior Deputies*); D_t is a time dummy to identify each year (so we have t-1 binary variables) and captures the impact of certain factors (such as economic crises, national policies, etc.) that occurred in a given year and which affected all the provinces; α_i represents the time-invariant, province-specific effects; and u_{it} is an error term which is uncorrelated with the explanatory variables. Note that the political variables are held constant within each term, as they only vary with every election.

Equation (1) above provides the basic framework from which we can derive two different econometric specifications, namely the random and the fixed effects models. The latter will be preferred to the former (which provides biased estimates) if the province-specific effects α_i are correlated with the explanatory variables. By contrast, if they are uncorrelated, random-effect estimates are consistent and efficient. In order to choose among both specifications, a Hausman test must be carried out which contrasts the null hypothesis that the individual effects are uncorrelated with the regressors. However, in this case, the standard Hausman test is not appropriate since, according to different tests, the disturbances in our panel are both heteroscedastic and autocorrelated, and this makes clustering our panel convenient. Clustering arises when errors for different observations within a group/cluster are correlated. In our study, the panel is

clustered by election and province, i.e. each province at each election year forms a cluster. Thus, we created 630 clusters. This means that the road construction undertaken within a province during the term of office (disregarding investments in electoral years, as explained) correlates with each other but not with other clusters. In this context, in order to report robust SE estimates we need to conduct cluster-robust inference. Instead, therefore, of a standard Hausman test we perform a robust Hausman test based on a Wald test, as suggested in Wooldridge (2002). The results of this test confirm that the best option is to use a random-effects model. At the same time, when testing for random-effects we use the Breusch-Pagan Lagrange multiplier to test whether variances across entities are zero, and we reject this hypothesis, which again confirms the validity of the model chosen.

Results. The regressions whose outcomes we present in Table 2 are based on equation (1).

Table 2 about here

Columns (1) to (4) present the random-effects estimates obtained when only political variables are taken into account. These variables are divided into two groups: “Political Competition” and “Leadership and Seniority” variables. In the first group, only the *% Minority Seats* – i.e. the share of deputies in province i that represent a Minority (i.e. non dynastic) party – has a statistically significant and positive effect on the amount of road investment received by a province. By contrast, we do not find any significant impact of the *% Change in Minority Seats* (the percentage difference between the share of Minority deputies obtained in election t with respect to the previous election). The *% Opposition Seats* (proportion of deputies who belonged to the dynastic party which was not in power at that time) also has a non significant effect on the dependent variable, meaning that the dynastic parties did not favour one another when in government. As for the second group of political variables, having a Minister of Public Works as the representative of a province does not have a significant impact on the allocation of roads towards such regions and neither does the fact of having relatively more senior deputies (using whichever of the two seniority measures computed).

The result that the seniority of deputies *per se* has no impact on the allocation of road investment is a surprising outcome. For instance, Frías Corredor (1992: 249)

indicates that, in the case of the province of Huesca, it “*is no accident that the longest representations coincide with those deputies that achieved specific results for their electorate*”. A possible explanation for our results, in line with suggestions made in Milligan and Smart (2005), is that once the seniority of a politician exceeds a certain threshold their expectations of running for re-election might fall and, as such, they might relax their efforts in attempting to obtain spending for their district. On the other hand, the significant and positive sign of the % *Deputies who were Ministers in the past* reflects, in contrast, the fact that being represented by senior deputies who had previously been ministers (and, therefore, more influential than the others) did have a significant and positive impact on the amount of public expenditure on roads. Once the economic control variables (per capita income, urbanisation and industrialisation rates) are included in the regression – see column (5) of Table 2 – these same results hold, although the variables that are relevant are only statistically significant at the 10% level. In short, according to the results reported in Table 2, apparently the government made relatively larger investments in provinces with a large share of minority deputies – presumably with the objective of influencing its citizens and buying their votes. At the same time, regions represented by the most influential politicians (i.e. deputies who had been ministers in previous administrations) were also the recipients of larger road investments.

Structural change. As described in section 3, the political system of the Spanish Restoration underwent a gradual transformation throughout the period under consideration and, therefore, the results in Table 2 that account for the impact of the ‘political competition’ variables might, to some extent, be misleading if they were driven by the presence of structural change. In order to account for this possibility, we have run a new estimation that distinguishes between two different subperiods. We took 1890 as the break-off point, i.e. the year in which universal male suffrage was introduced and which, according to Moreno Luzón (2007) and Martorell Linares (2000), among others, saw a strengthening in the relationship between candidates and districts and resulted in a loss of the central government’s prominence in the electoral process.²¹ In addition, the 1890s are, in general, considered by historians as being the years that saw the onset of the crisis in the system, due not only to the extension of suffrage but

²¹ By contrast, Varela Ortega (2001) and Comín (1988) minimise the role of the establishment of universal male suffrage in the transformation of the political system (see above).

also to the modernisation of the country, the monarchy's gradual loss of legitimacy after the 1898 defeat, and the growing fragmentation of the "dynastic" parties (Comín, 1988).²² Therefore, the first subperiod that we consider includes the elections from 1879 until 1886, and the second one the elections from 1891 until 1910.

We have defined a time dummy variable for the second subperiod,²³ which has been interacted with each of the 'political competition' variables, generating three new variables: *% Minority Seats* × *2nd Subperiod*, *% Opposition Seats* × *2nd Subperiod* and *% Change in Minority Seats* × *2nd Subperiod*. The results of estimating regression (1) with these new variables are presented in Table 3 below. Column (5), which shows the estimation outcomes of the more complete version of the regression, confirms once more that the share of minority deputies had a significant impact on government expenditure on road construction. However, while the sign of this effect was negative during the first subperiod, this trend was reversed after 1890. The same process may be observed in the case of the opposition variable, although the coefficient is lower in this case. As for the impact of the change in minority seats with respect to the previous election, this again is non significant, as is the impact of the seniority variables. Finally, the deputies who had been ministers in previous administrations seem to have used their influence to attract greater resources to their provinces.

Based on earlier considerations, these results seem to suggest that the low level of electoral competition during the early years of the Spanish Restoration made the use of vote-buying tactics unnecessary and, therefore, the government could assign more resources to the "core" regions²⁴ at the expense of the rest of the country. This would indicate that the dynastic parties did not collude to favour one another when allocating public funds for roads, as might initially be expected. By contrast, after 1890, the results of the estimation suggest two possible interpretations, both associated with increasing political competition. On the one hand, it might be argued that the rise in the number of minority and opposition deputies forced the government to exchange road investments,

²² Comín (1988: 495) suggests 1898 as the main turning point in the Restoration period. Actually, the results of the analysis are not altered significantly if we take this year instead of 1890.

²³ Since the regression has a constant term, we only interact a dummy variable for the second period, while taking the first subperiod as a reference. The dummy for the second subperiod is equal to 1 if the political variables refer to an election held after 1890.

²⁴ By 'core regions' we refer to those provinces in which the party in government enjoyed the largest representation.

as well as other benefits, for electoral votes, in an attempt to attract swing voters. On the other hand, the results might reflect the fact that, with time, the deputies elected from minority and opposition parties managed to challenge the government's electoral plans thanks to their relatively high efficiency in obtaining benefits for their districts. This would be consistent with the idea that, since the 1890s, the local powers grew to the detriment of the central power (Moreno Luzón, 2007), and it might also explain to some extent the lack of significance of the seniority variables. Inasmuch as senior deputies remained in Parliament regardless of the party holding office, the effect of seniority would be partially captured by the share of minority and/or opposition parties in each province.

Table 3 about here

An alternative way to account for the presence of structural change in the model is the interaction of the political competition variables with a linear time trend, as in the following specification:

$$\begin{aligned}
 i_{it} &= \beta_t Pol.Competition_{it} + \mu Leadership_{it} + \psi Seniority_{it} + \lambda X_{it} + \delta D_t + \varepsilon_{it} \\
 \varepsilon_{it} &= \alpha_i + u_{it} \\
 \beta_t &= \beta_0 + \beta_1 \times trend
 \end{aligned}
 \tag{2}$$

Hence, the new variables in the regression are: *% Minority Seats × trend*, *% Opposition Seats × trend* and *% Change in Minority Seats × trend*. Actually, if we ignore (as in the regressions in Tables 2 and 3) the possibility that the effect of the “political competition” variables may present a shifting trend over time, we might be dealing with the results of a spurious regression in which the impact of the explanatory variables on road investment would be in fact the effect of an omitted factor. In this context, introducing the interaction of a time trend with the explanatory variables allows us to capture the impact of the upward trend in the level of political competition over time (as revealed by Figure 2). The outcomes of the estimation of this specification of the model are shown in Table 4.

Table 4 about here

All columns in Table 4 confirms the results obtained in the earlier analysis, where we introduced the possibility of a structural change, although now the

interpretation of the coefficients is not so straightforward. Using the results reported in column (5) we can see that in an initial year ($t=1$) a 10% increase in the share of minority deputies in one province leads to a 0.017 pesetas decrease in per capita road investment. However, this effect does not remain constant for the entire period. By the end of the period (for instance when $t=30$, which is equivalent to 1909) the effect is quite distinct and we would observe a 0.012 pesetas increase in per capita road investment as a result of a 10% increase in the share of minority deputies in one province. The β_t specification in equation (2) allows us to infer the cut-off year when the initially negative effect of the number of minority deputies was cancelled out and after which the effect became positive. Thus, it was at $t=18$ (that is, in 1897) when a province's share of minority deputies had no impact on the government allocation of road expenditure. Following the same reasoning, the share of deputies representing the "dynastic" opposition exerted no impact on the distribution of road investment in 1899.

Robustness. To conclude this section, we present in short the robustness checks that we have conducted to ensure the validity of our results. First of all, it might be argued that, despite solid reasons for taking 1890 as the cut-off point for dividing the sample into two subperiods, the results might be different if another year had been selected. As mentioned in footnote 24, 1898 could also represent a reasonable cut-off point. We have performed the same regressions as those reported in Table 3 on the basis of this hypothesis and find that, besides obtaining slightly lower coefficients, the sign and significance of the variables remained unaltered in all cases except for the two variables related to the share of Opposition deputies, which lose their significance. Secondly, we have also tried to capture the level of seniority that the deputies of a province had by using another specification, which attempts to reflect the level of seniority of a deputy compared to the maximum seniority that he would have had if he had been elected in all previous elections. Then, the seniority level of province i can be expressed as follows:

$$Seniority_i = \frac{\sum_{n=1} \tau_{n,i,t}}{N * \tau_t^{Max}}$$

where $\tau_{n,i,t}$ is the number of times that deputy n in province i at election year t has been previously elected, τ_t^{Max} is the maximum number of times that a deputy could have been elected (i.e. the number of previous elections) up to election year t and N is the number

of deputies in province i in electoral year t . The analysis with this indicator of seniority does not alter our previous results. Our third robustness check was to consider a cubic as opposed to a linear time trend. This allows the effect of the ‘political competition variables’ to be seen in three different stages, implying that the effect of this variable is not null at a precise point in time but rather that it remains null for a number of years before changing its sign, which would result in a smoother transition. However, the non-significant results of this regression tell us that this type of trend is unlikely to fit with the patterns observed during the period under analysis. Lastly, column (6) of each table provides the estimates of the fixed effect regressions of each specification,²⁵ as a further means for checking the robustness of the results.

6. Conclusions

This paper has examined the effects of parliamentary representation on the distribution of state funding for road infrastructure during the Spanish Restoration. Put more simply, it has investigated the possibility that politicians affected individuals’ voting preferences (as well as their welfare) by directly allocating state spending to promote a particular district’s interests. One of the main points of interest arising out of this case study is the fact that it involves a political system in which the widespread use by politicians of vote-buying mechanisms coexisted with a process of increasing electoral competition.

Our findings from a panel data set for Spanish provinces between 1880 and 1914 confirm the relevance of political factors in the regional distribution of road building. During this period, the Spanish electoral system underwent major changes that led the government to redefine its political tactics. More specifically, the mid-1890s seem to have constituted a turning point, after which electoral strategies experienced significant change. Once this structural change is taken into consideration in the estimation, our analysis shows that the party in government, initially, undertook relatively less road investment in those provinces with a largest representation of minority and/or opposition deputies. This was presumably aimed at avoiding their

²⁵ This requires a degree-of-freedom adjustment on the cluster-robust covariance estimator due to the fact that panels are not nested within clusters.

empowerment and, thus, their potential challenge to the *turno pacífico* system. However, later on, increasing political competition resulted in the government re-channelling road expenditure towards the provinces more represented by minority and opposition deputies. Moreover, our estimates show that the provinces with a higher proportion of senior deputies who had been ministers in previous administrations obtained more public resources for road construction. In this sense, the ability of influential deputies to attract resources to their constituencies might have been rewarded with more votes, regardless of the political persuasion of their party of affiliation.

To conclude, these results indicate that political variables had a statistically significant impact on the allocation of road infrastructure during the Spanish Restoration. Further, our findings point to the importance of electoral dynamics within a political system that is often considered to be non-democratic, while the overall analysis offers an interesting example of the long-term evolution in government tactics within settings characterised by clientelist practices.

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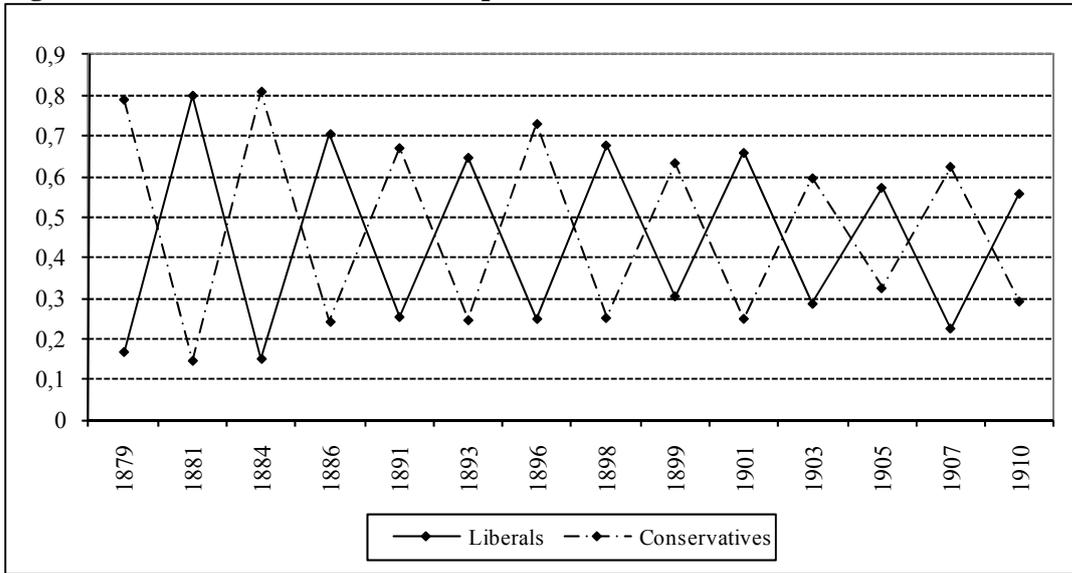
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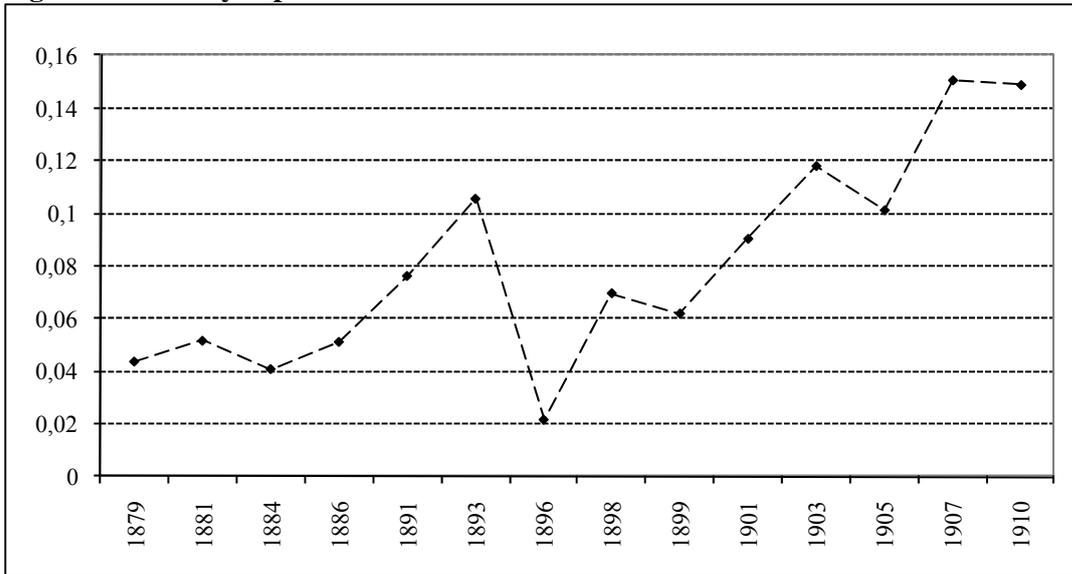
Figures and Tables

Figure 1. Liberal and Conservative deputies as share of total



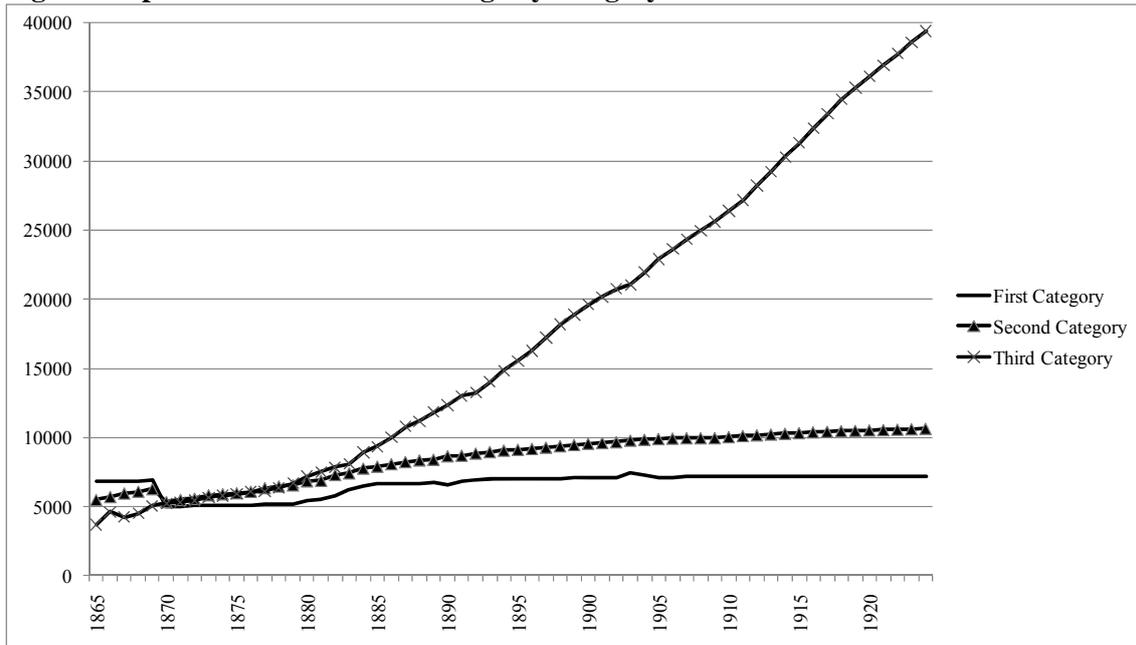
Sources: Varela Ortega (2001), Sánchez de los Santos (1908 and 1910), *El año político* (1895-1910), *El Imparcial* (1876), *El Liberal* (1881-1910), *La Correspondencia de España* (1879-1905), *La Época* (1879-1905), *ABC* (1905).

Figure 2. Minority deputies as share of total



Sources: Varela Ortega (2001), Sánchez de los Santos (1908 and 1910), *El año político* (1895-1910), *El Imparcial* (1876), *El Liberal* (1881-1910), *La Correspondencia de España* (1879-1905), *La Época* (1879-1905), *ABC* (1905).

Figure 3. Spanish road network mileage by category



Source: Ministerio de Fomento, *Memoria(s), Anuario(s) and Estadística(s) de Obras Públicas* (1865-1924).

Table 1:

Descriptive statistics and data sources

| <i>Variable</i> | <i>Description</i> | <i>Mean (S.D)</i> | <i>Source</i> |
|--|--|-----------------------|--|
| <i>Road investment p.c.</i> | Pesetas of road investment _{it} / Population _{it} | 1.16 (1.07) | <i>Memorias, Anuarios and Estadísticas de Obras Públicas, Ministerio de Fomento (1880-1914)</i> |
| <i>% Minority Seats</i> | Minority parties seats _{it} / Total seats _{it} | 0.07 (0.14) | |
| <i>% Opposition Seats</i> | Dynastic opposition parties seats _{it} / Total seats _{it} | 0.24 (0.18) | |
| <i>% Change in Minority Seats</i> | $\frac{\% \text{Minority Seats}_{it} - \% \text{Minority Seats}_{i,t-1}}{\% \text{Minority Seats}_{it}}$ | 0.07 (0.25) | |
| <i>Relative Seniority</i> | $\frac{1}{N} \sum_{n=1} \left(\frac{\tau_{n,i,t}}{\tau_t^{Max}} \right)$ τ_t^{Max} : max. number of times that a deputy has been elected up to election year t $\tau_{n,i,t}$: n° of times that deputy n in province i at election year t has been previously elected. N: total number of deputies in province i in electoral year t | 0.37 (0.15) | Varela Ortega (2001), Sánchez de los Santos (1908 and 1910), <i>El año político</i> (1895-1910), <i>El Imparcial</i> (1876), <i>El Liberal</i> (1881-1910), <i>La Correspondencia de España</i> (1879-1905), <i>La Época</i> (1879-1905), <i>ABC</i> (1905) and Historical Archive of Deputies (Spanish Congress). |
| <i>% Senior Deputies</i> | Deputies elected in previous elections _{it} /Total n° of deputies _{it} | 0.61 (0.20) | |
| <i>Public Works Minister</i> | Dummy variable = 1 if the Minister of Public Works represents province i in election term t | 0.02 (0.13) | |
| <i>% Deputies who were Ministers in the past</i> | Deputies in province i who were ministers in previous electoral terms/Total n° of deputies in t | 0.07 (0.25) | |
| <i>Urban Population</i> | Population in cities of over 10,000 inhab. _{it} /Population _{it} | 0.23 (0.20) | Calculated from the Spanish population censuses |
| <i>Industrial Sector</i> | % Industrial Production _{it} / Total GDP _{it} | 0.18 (0.08) | |
| <i>GDP p.c</i> | GDP _{it} (in thousands of pesetas) / Population _{it} | 0.47 (0.17) | Data provided by Julio Martínez-Galarraga |

Note: Subindex it always refers to province i and year t .

Table 2:

Determinants of the regional allocation of road investment during the Spanish Restoration.

| | (1) Random- effects | (2) Random- effects | (3) Random- effects | (4) Random- effects | (5) Random- effects | (6) Fixed- effects |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------|
| <i>'Political Competition' factors</i> | | | | | | |
| <i>% Opposition Seats</i> | 0.00 (0.02) | 0.00 (0.01) | --- | --- | -0.03 (-0.15) | -0.03 (-0.19) |
| <i>% Minority Seats</i> | 0.72** (2.11) | 0.86** (2.24) | --- | --- | 0.60* (1.67) | 0.44 (1.32) |
| <i>% Change in Minority Seats</i> | --- | -0.08 (-1.42) | --- | --- | -0.03 (-0.55) | -0.02 (-0.33) |
| <i>'Leadership and Seniority' factors</i> | | | | | | |
| <i>Public Works Minister</i> | --- | --- | 0.55 (0.95) | 0.55 (0.95) | 0.59 (1.05) | 0.59 (1.14) |
| <i>% Deputies who were Ministers in the past</i> | --- | --- | 1.05** (2.17) | 0.88** (2.04) | 1.01** (2.04) | 1.09** (2.18) |
| <i>Relative Seniority</i> | --- | --- | -0.27 (0.63) | --- | -0.07 (0.16) | -0.10 (0.24) |
| <i>% Senior Deputies</i> | --- | --- | --- | 0.05 (0.24) | --- | --- |
| <i>Control Variables</i> | | | | | | |
| <i>GDP p.c.</i> | --- | --- | --- | --- | 1.95*** (3.41) | 2.90*** (4.27) |
| <i>Urban Population</i> | --- | --- | --- | --- | -1.27** (-2.14) | 1.09 (0.97) |
| <i>Industrial Sector</i> | --- | --- | --- | --- | -2.57** (-2.42) | -2.63** (-1.97) |
| <i>Constant</i> | 0.99*** (5.25) | 0.98*** (5.13) | 0.92*** (4.39) | 0.98*** (4.67) | 0.81*** (2.56) | -0.07 (-0.15) |
| N° Observations | 1575 | 1575 | 1575 | 1575 | 1575 | 1575 |
| Time-effects (f_T) | YES | YES | YES | YES | YES | YES |
| R-squared | 0.0883 | 0.0896 | 0.0681 | 0.0716 | 0.112 | 0.139 |
| Robust Hausman Test (<i>fe vs.re</i>) | 0.17 [0.84] | 0.11 [0.95] | 0.69 [0.56] | 2.00 [0.11] | 1.07 [0.38] | --- |
| B-P LM Test($Var(u)=0$) | 3669.55 [0.00] | 3682.96 [0.00] | 3666.93 [0.00] | 3562.21 [0.00] | 2543.49 [0.00] | --- |
| F-Test ($H_0:f_T=0$) | 181.07 [0.00] | 181.22 [0.00] | 179.22 [0.00] | 171.17 [0.00] | 175.17 [0.00] | 5.91 [0.00] |
| F-Test ($H_0:Fixed-eff.=0$) | --- | --- | --- | --- | --- | 19.07 [0.00] |

Notes: (1) Robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1; (2) p-values in brackets; (3) SE clustered by province and election (45 provinces x 14 elections=630 clusters); (4) DoF adjustment is imposed in the fixed-effect regression; (5) Refer to Table 1 for a brief explanation of the variables.

Table 3:

Determinants of the regional allocation of road investment during the Spanish Restoration. Interaction of a dummy for the 2nd subperiod (1892-1914) with 'political competition' factors

| | (1) Random- effects | (2) Random- effects | (3) Random- effects | (4) Random- effects | (5) Random- effects | (6) Fixed- effects |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------|
| 'Political Competition' factors | | | | | | |
| <i>% Opposition Seats</i> | -0.76* (-1.79) | -0.76* (-1.80) | -- | -- | -0.84** (-1.94) | -0.91** (-2.20) |
| <i>% Opposition Seats × 2nd Subperiod</i> | 1.01** (2.20) | 1.01** (2.21) | -- | -- | 1.07** (2.34) | 1.16*** (2.62) |
| <i>% Minority Seats</i> | -1.25* (-1.82) | -1.16 (-1.54) | -- | -- | -1.23* (-1.65) | -1.24* (-1.81) |
| <i>% Minority Seats × 2nd Subperiod</i> | 2.35*** (3.05) | 2.43*** (2.86) | -- | -- | 2.24*** (2.79) | 2.09*** (2.79) |
| <i>% Change in Minority Seats</i> | -- | -0.03 (-0.23) | -- | -- | 0.01 (0.10) | -0.00 (-0.00) |
| <i>% Change in Minority Seats × 2nd Subperiod</i> | -- | -0.06 (-0.40) | -- | -- | -0.06 (-0.40) | -0.02 (-0.17) |
| 'Leadership and Seniority' factors | | | | | | |
| <i>Public Works Minister</i> | -- | -- | 0.55 (0.95) | 0.55 (0.95) | 0.57 (1.08) | 0.57 (1.19) |
| <i>% Deputies who were Ministers in the past</i> | -- | -- | 1.05** (2.17) | 0.88** (2.04) | 1.07** (2.19) | 1.16** (2.36) |
| <i>Relative Seniority</i> | -- | -- | -0.27 (0.63) | -- | -0.08 (0.18) | -0.11 (0.25) |
| <i>% Senior Deputies</i> | -- | -- | -- | 0.05 (0.24) | -- | -- |
| Control Variables | | | | | | |
| <i>GDP p.c.</i> | -- | -- | -- | -- | 1.70*** (3.02) | 2.52*** (3.83) |
| <i>Urban Population</i> | -- | -- | -- | -- | -1.16** (-1.98) | 1.29 (1.15) |
| <i>Industrial Sector</i> | -- | -- | -- | -- | -2.75*** (-2.62) | -3.00** (-2.30) |
| <i>Constant</i> | 1.19*** (5.80) | 1.18*** (5.73) | 0.92*** (4.39) | 0.98*** (4.67) | 1.14*** (3.47) | 0.33 (0.78) |
| N° Observations | 1575 | 1575 | 1575 | 1575 | 1575 | 1575 |
| Time-effects (f_T) | YES | YES | YES | YES | YES | YES |
| R-squared | 0.0913 | 0.0936 | 0.0681 | 0.0716 | 0.120 | 0.154 |
| Robust Hausman Test (f_e vs. re) | 0.29 [0.88] | 0.22 [0.97] | 0.69 [0.56] | 2.00 [0.11] | 1.07 [0.39] | -- |
| B-P LM Test ($Var(u)=0$) | 3795.82 [0.00] | 3745.56 [0.00] | 3666.93 [0.00] | 3562.21 [0.00] | 2607.51 [0.00] | -- |
| F-Test ($H_0: f_T=0$) | 179.98 [0.00] | 176.99 [0.00] | 179.22 [0.00] | 171.17 [0.00] | 177.45 [0.00] | 6.55 [0.00] |
| F-Test ($H_0: Fixed-eff.=0$) | -- | -- | -- | -- | -- | 19.54 [0.00] |

Notes: (1) Robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1; (2) p-values in brackets; (3) SE clustered by province and election (45 provinces x 14 elections=630 clusters); (4) DoF adjustment is imposed in the fixed-effect regression; (5) Refer to Table 1 for a brief explanation of the variables.

Table 4:

Determinants of the regional allocation of road investment during the Spanish Restoration. Interaction of linear trend with the 'political competition' factors.

| | (1) Random- effects | (2) Random- effects | (3) Random- effects | (4) Random- effects | (5) Random- effects | (6) Fixed- effects |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------|
| 'Political Competition' factors | | | | | | |
| <i>% Opposition Seats</i> | -0.73 (-1.55) | -0.74 (-1.55) | -- | -- | -0.79* (-1.67) | -0.85* (-1.85) |
| <i>% Opposition Seats × Trend</i> | 0.04* (1.65) | 0.04* (1.68) | -- | -- | 0.04* (1.78) | 0.04** (1.97) |
| <i>% Minority Seats</i> | -1.84*** (-2.58) | -1.84** (-2.30) | -- | -- | -1.80** (-2.29) | -1.84** (-2.38) |
| <i>% Minority Seats × Trend</i> | 0.10*** (3.40) | 0.11*** (3.25) | -- | -- | 0.10*** (3.15) | 0.09*** (3.16) |
| <i>% Change in Minority Seats</i> | -- | 0.07 (0.45) | -- | -- | 0.07 (0.46) | 0.06 (0.41) |
| <i>% Change in Minority Seats × Trend</i> | -- | -0.01 (-0.75) | -- | -- | -0.00 (-0.48) | -0.00 (-0.36) |
| 'Leadership and Seniority' factors | | | | | | |
| <i>Public Works Minister</i> | -- | -- | 0.55 (0.95) | 0.55 (0.95) | 0.55 (1.02) | 0.55 (1.10) |
| <i>% Deputies who were Ministers in the past</i> | -- | -- | 1.05** (2.17) | 0.88** (2.04) | 1.07** (2.18) | 1.15** (2.34) |
| <i>Relative Seniority</i> | -- | -- | -0.27 (0.63) | -- | -0.05 (0.12) | -0.08 (0.19) |
| <i>% Senior Deputies</i> | -- | -- | -- | 0.05 (0.24) | -- | -- |
| Control Variables | | | | | | |
| <i>GDP p.c.</i> | -- | -- | -- | -- | 1.61*** (2.93) | 2.31*** (3.53) |
| <i>Urban Population</i> | -- | -- | -- | -- | -1.11* (-1.88) | 1.25 (1.11) |
| <i>Industrial Sector</i> | -- | -- | -- | -- | -2.68** (-2.53) | -3.02** (-2.31) |
| <i>Constant</i> | 1.20*** (5.92) | 1.21*** (5.79) | 0.92*** (4.39) | 0.98*** (4.67) | 1.16*** (3.63) | 0.44 (1.06) |
| N° Observations | 1575 | 1575 | 1575 | 1575 | 1575 | 1575 |
| Time-effects (f_T) | YES | YES | YES | YES | YES | YES |
| R-squared | 0.0880 | 0.0901 | 0.0681 | 0.0716 | 0.118 | 0.154 |
| Robust Hausman Test (fe vs. re) | 0.34 [0.85] | 0.23 [0.97] | 0.69 [0.56] | 2.00 [0.11] | 0.83 [0.62] | -- |
| B-P LM Test ($Var(u)=0$) | 3830.76 [0.00] | 3808.31 [0.00] | 3666.93 [0.00] | 3562.21 [0.00] | 2666.01 [0.00] | -- |
| F-Test ($H_0: f_T=0$) | 183.41 [0.00] | 181.42 [0.00] | 179.22 [0.00] | 171.17 [0.00] | 174.39 [0.00] | 5.00 [0.00] |
| F-Test ($H_0: Fixed-eff.=0$) | -- | -- | -- | -- | -- | 19.45 [0.00] |

Notes: (1) Robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1; (2) p-values in brackets; (3) SE clustered by province and election (45 provinces x 14 elections=630 clusters); (4) DoF adjustment is imposed in the fixed-effect regression; (5) Refer to Table 1 for a brief explanation of the variables.

2009

- 2009/1. Rork, J.C.; Wagner, G.A.: "Reciprocity and competition: is there a connection?"
- 2009/2. Mork, E.; Sjögren, A.; Svaleryd, H.: "Cheaper child care, more children"
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- 2009/13. Barrio-Castro, T.; García-Quevedo, J.: "The determinants of university patenting: do incentives matter?"
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2010

- 2010/1. De Borger, B., Pauwels, W.: "A Nash bargaining solution to models of tax and investment competition: tolls and investment in serial transport corridors"
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- 2010/10, Di Paolo, A.; Raymond, J.L.; Calero, J.:** "Exploring educational mobility in Europe"
- 2010/11, Aidt, T.S.; Dutta, J.:** "Fiscal federalism and electoral accountability"
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- 2010/14, Calabrese, S.; Epple, D.:** "On the political economy of tax limits"
- 2010/15, Jofre-Monseny, J.:** "Is agglomeration taxable?"
- 2010/16, Dragu, T.; Rodden, J.:** "Representation and regional redistribution in federations"
- 2010/17, Borck, R.; Wimbersky, M.:** "Political economics of higher education finance"
- 2010/18, Dohse, D.; Walter, S.G.:** "The role of entrepreneurship education and regional context in forming entrepreneurial intentions"
- 2010/19, Åslund, O.; Edin, P-A.; Fredriksson, P.; Grönqvist, H.:** "Peers, neighborhoods and immigrant student achievement - Evidence from a placement policy"
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- 2010/21, Koh, H.; Riedel, N.:** "Do governments tax agglomeration rents?"



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