Was the allocation of public investment ideologically motivated? Evidence from the Francoist dictatorship in Spain (1939-1975)

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Abstract

While much attention has been put on the criteria underlying the allocation of public investment before and after the Francoist dictatorship in Spain, no research has been conducted for this specific period. We study whether the allocation of public investment was driven by economic or non-economic incentives during the Francoist dictatorship in Spain. Our analysis consists of a two-step methodology that combines theory with an empirical model. Using a sample of 50 Spanish provinces for the period 1940-1975, we find that economic incentives coexist with non-economic incentives, which are mainly intended to avoid social conflict. These results are consistent with the theoretical model and hold when assuming spatial patterns derived from the influence of neighboring regions.

Keywords: Francoist Dictatorship, Spain, public investment, socio political conflict

JEL Codes: N34, O47, R12

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1. Introduction

Despite the time passed, the Spanish economy during the Francoist dictatorship has been subject to limited quantitative analysis by the academic profession. Its macroeconomic features and evolutions have been carefully analyzed (see e.g., Prados de la Escosura, et al. (2012) or Cárdenas and Fernández (2020)). However, the quantitative, analytical literature has rarely descended into the reality of regions and economic agents. Paucity of data is a possible explanation, though previous historical episodes in Spain have received similar or even preferential attention (see e.g., the comments by Biescas (1989))[1]. In fact, in the words of Prados de la Escosura and Sánchez-Alonso (2019: 20), "economic historians […] left aside the 20th century, which has been more the field of economists

[1] Examples of that literature are, among others, Tirado, Paluzie and Pons (2002a, b).

[…]. The absence of debate about the long-run Spanish economic performance during the 20th century is striking".

Our focus here will be the ideological determinants of public investment allocation during the Francoist dictatorship in Spain. The literature on the non-economic criteria for the allocation of public investment is centered on within (Cadot et al., 2006; Voigtländer and Voth, 2019) and between country comparative studies (Kemmerling and Stephan, 2010; Haque and Kneller, 2015). However, for the case of Spain, the evidence is only within the country, exploring territorial patterns, though focused on the Restauración period (1876-1923) (Herranz-Loncán, 2007; Curto-Grau et al., 2012) or the current democratic government (De la Fuente and Vives, 1995; Castells and Solé-Ollé, 2005; Albalate et al., 2012). To the best of our knowledge, this strand of literature has neither considered individually the Francoist dictatorship in Spain (1939-1975) nor isolated the effects of the Francoist dictatorship during a whole sample of years.[2]

In this respect, our research also tries to shed light on the impact of this period´s economic policy on the territorial allocation of public goods. Bel (2012) asserts that the provision of network infrastructure was associated to a centralization motive, which favored the accessibility of Madrid, the capital of Spain, since the 18th century. Among other purposes, we aim to test empirically the validity of such hypothesis for the Francoist period, trying to assess the uniformity of the modern economic history of Spain about this issue. We use a territorial database for 50 Spanish provinces during the period 1940-1975, when the Francoist dictatorship governed Spain.

Furthermore, given a (hypothetically) differentiated political alignment of the Spanish provinces during the dictatorship, we will test the existence of a potential ideological motive behind the geographical allocation of public investment by the Francoist dictatorship. Since there were no democratic elections during this period, we have used some measures of social conformity with the dictatorship by provinces; mainly related to the electoral results in the February 1936 democratic elections, which took place immediately before the Spanish civil war (1936-1939). The interaction of these electoral results with other time-varying economic indicators allows us to obtain time-varying

[2] Solé-Ollé (2010)´s chapter is mainly concerned with the democratic period. However, he also incorporates to his analysis the time interval 1964-1975, to conclude that the dictatorship showed comparatively a lower willingness to redistribute income towards the poorer regions, via infrastructure provision.

measures of social conformity during this period. Our purpose is then disentangling the motives that may have guided the authorities to allocate territorially the public investment, with a possible ideological view in mind.

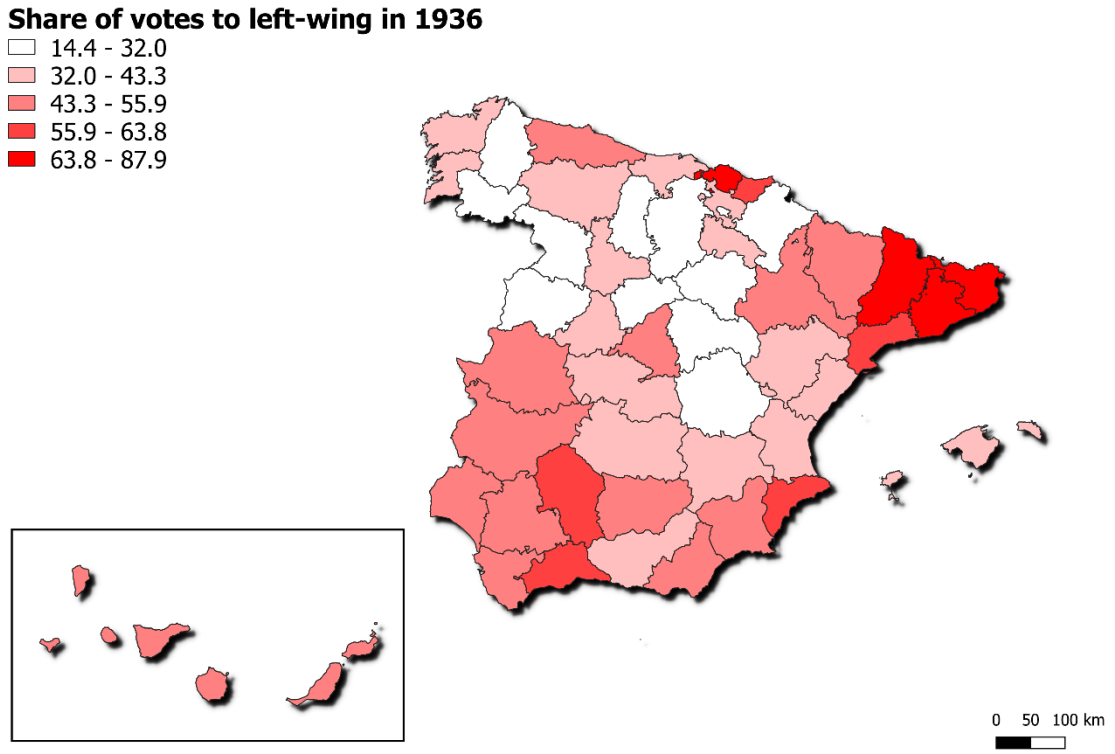


Figure 1. Presumable intensity of opposition to the dictatorship, by province (%)

Figure 1 above captures the presumable opposition to the Francoist government at the province level, judging by the share of voting received by the left-wing and the Catalan, Basque, and Galician nationalist parties in February 1936 (Linz and De Miguel, 1977). Clearly, the wealthiest and most industrialized regions in Spain were prone to show a more vigorous opposition to the dictatorship. We use this electoral variable as a proxy to measure opposition to the Francoist government. Moreover, using such a variable as a regressor allows us to possibly account for the regional pattern of public investment allocation, together with other different economic and geographical variables.

The issue of the potentially asymmetric attention paid by the Francoist economic policy to the different Spanish regions has been controversial, giving rise to all sorts of speculations. For instance, Clavera et al. (1973) or Molinero and Ysàs (1998) collect

anecdotal testimonies from this historical period, with diverse geographical origins.[3] Other researchers (see e.g., Segura (1992)) considered that the Spanish economic development was not unbalanced because of ideological reasons, but due to the disparate regional fundamentals in the absence of basic infrastructure. Our intention here is to offer a first methodological attempt to analyze this issue under an academic perspective and shed light on understanding the Spanish economic history during the 20th Century.

Our results are twofold. On the one hand, the theoretical setting demonstrates the existence of a relationship between local intensity of conflict and the allocation of public investment. On the other hand, our empirical results find that marginal effects of the oppositional identity are not significant at the province level. This suggests that ideological considerations did not play a determinant role in the regional allocation of public investment. However, we found a remarkable interaction effect between the local GDPs per capita and the presumable oppositional intensity. This suggests that the government allocated more public resources to rich provinces where political turmoil might be threatening the political stability of the dictatorship. Such an attitude of the Francoist government is confirmed by an additional robustness analysis, as increasing levels of conflict in labor relations are associated with rises in the share of public investment allocated to the conflictual areas.

This paper is organized as follows: the next section introduces a literature review on the economic and political factors that affect the geographical distribution of public investment. Section 3 briefly reviews the Francoist dictatorship in Spain, according to its implications in terms of public policy. Sections 4, 5, and 6 respectively describe our research objectives, theoretical model, and empirical analysis. Section 7 contains an evaluation of the results. Finally, section 8 concludes.

2. Literature Review

Economic theory and subsequent empirical studies have recognized the importance of public investment in infrastructure, healthcare, and education to increase economic growth and development. Moreover, public investment is a key variable to explain cross-

[3] Much more recently, Cárdenas and Fernández (2020:261) state that during the 1960s "government interventionism continued to be reflected in 'indicative planning', in order to promote investment in certain sectors and specific areas (*mainly in those cities that assisted in the 1936 coup d'état*)".

country variations in economic performance. For each country, governments decide where and when to reallocate public investment; how to make these decisions, however, depends on the criteria assumed.

On the one hand, these criteria may be normative and related directly to economics. De la Fuente and Vives (1995) and Yamano and Ohkawara (2000) identify three basic criteria: efficiency, redistribution, and neutrality. First, efficiency is related to the maximization of the aggregate returns to public investment at the national level, so the highest share of spending would be reallocated to maximize gains. Second, there may be poorer regions with special needs of investment, which requires redistribution. Finally, the normative criteria may be neutral, since the constitutional norms of the country may prescribe equal access to public capital in all regions; and therefore, the regional allocation of public investment should be decreasing in the initial stock of public capital.

In the case of Spain, De la Fuente (2004) evaluated the optimality of the recent public investment policy. Taking as given the ex-post degree of redistribution observed, he compared the actual distribution of the stock of infrastructures with the optimal allocation resulting from a constrained planning problem. His application of this setting to the Spanish case suggested that public investment had been too redistributive in the year 1995.

On the other hand, the literature also recognizes the existence of (positive) non-economic factors, related to political incentives, that affect the decision to reallocate public investment (e.g., Smart and Sturm, 2013; Carozzi and Repetto, 2016, among others). Solé-Ollé (2010) distinguishes two cases: the pork-barrel politics, when spending is allocated following political connections between representatives, and the programmatic redistribution, which is referred to the connection between citizens and potential candidates.

In this respect, Cadot et al. (2006) studied the allocation of transportation infrastructure across the French regions from 1985 to 1992 and concluded that electoral factors were considerably relevant. Using data for 66 countries during the period 1970-2000, Haque and Kneller (2015) find that corruption increases levels of public investment, though at the same time corruption decreases the return to public investment, causing inefficiencies. Kemmerling and Stephan (2010) carry out a comparative analysis for France, Germany, Italy, and Spain to demonstrate the existence of country-specific factors that can explain

the regional allocation of public investment. They conclude that electoral incentives are important for all countries, and their political institutions can explain the differences in the regional allocation of public investment. Finally, Voigtländer and Voth (2019) find that the construction of the Autobahn in the Nazi Germany had to do with non-economic factors and was key to gain electoral support, especially in states politically unstable.

Studies about the influence of politics on the allocation of public investment for the case of Spain are very scarce and have focused on infrastructures. Since these analyses follow a regional approach, data availability represents a major constraint. Studies analyze the end of the 19th century and the beginning of the 20th century, and the post-1975 period with the arrival of democracy. In some cases, they acknowledge the incorporation of Spain to the European Union.

For the first set of studies, Herranz-Loncán (2007) analyses the investment in infrastructure for Spain during the period 1850-1930 and finds the existence of strong non-efficiency criteria for the construction of networks. Curto-Grau et al. (2012) find that regional public spending on road infrastructures during the period 1880-1914 in Spain depends on the results of the elections.

On the other hand, Castells and Solé-Ollé (2005) focus on the period 1987-1996 to find that not only regional infrastructure needs, but political factors, govern the allocation of public infrastructure investment. De la Fuente and Vives (1995) study the impact of European funds on Spanish regional inequality in the years 1981, 1986, and 1990. They find that public investment in infrastructure plays a key role in determining regional performance. Parallel to their research, they find political influence as negligible criteria to allocate the funds, in contrast to previous studies.

Finally, Albalate et al. (2012) study the regional allocation of public investment in Spain during the period 1981-2005, disaggregating by network (road and rail) and airport infrastructure. These authors identified the existence of political factors, such as electoral results and party alignment, together with a centralization motive that assigns a key role to the transport accessibility of Madrid.

To the best of our knowledge, studies finding the impact of politics on public investment are limited and focus on the current democracy or the Restauración period (1876-1923) for the case of Spain. In order to identify a persistent (or a discontinuous) pattern of political influence over time in Spain, it is necessary to shed light on the importance of

politics when allocating public investment during the Francoist dictatorship (1939-1975). This is also important to evaluate whether the potential pattern of extractive institutions in Spain to allocate public investments is persistent or not.

3. The Francoist dictatorship in Spain and its implications in terms of public policy

It exceeds our breadth and purpose to offer a detailed synthesis about this especially lengthy and controversial historical period[4]. Instead, we will try to have a grasp on the main features of the decision-making process regarding public policy, which had a direct impact on the territorial allocation of infrastructure, healthcare, and education.

As emphasized, among many others by Clavera et al. (1973), the workings of the Francoist macroeconomic policy were far from homogeneous over time[5]. Gámir (2000) divided it into three stages: the interventionist autarkic era (1939-1959), the stabilization and liberalization period (culminated by 1959), and the subsequent process of economic growth. Gunther (1996) perceives a common thread along the whole life of the dictatorship, concerning the political determination of public policy outputs. These characteristics could be synthesized as follows:

a) The allocation of public expenditure and investment was based on interdepartmental decision-making very concentrated in a few hands; basically, the minister of finance and (from the late 1950s) the president of the planning commission, often the commissar López Rodó. This personalistic feature was almost invulnerable to pressures from the rest of the cabinet. In contrast, the intradepartmental allocation was subject to multiple pressures from privileged "cronies," with clear economic interests in the private sector.
b) Franco and his inner circle were generally uninterested in economic policy issues (see e.g., González (1979)). They would only intervene in these matters if the maintenance of the dictatorship and the public order were under threat. For

[4] For a detailed and comprehensive political analysis of the Francoist dictatorship in Spain, the reader is encouraged to consult Preston (1976), Fusi Aizpurúa (1985), Townson (2007) or Chapter 25 in Tamames and Rueda (2008).

[5] More recent economic research is questioning this sharp discontinuity around 1960 within Francoism. As emphasized by Prados de la Escosura and Sánchez-Alonso (2019:20): "a convincing explanation of why the historical determinants of Spain´s economic backwardness weakened or faded away from the 1960s onward is still lacking".

instance, the 1973 tax reform proposal would be finally blockaded because it may have undermined the support to the dictatorship by certain social strata[6]. However, Franco´s inner circle was careful enough to choose government officials from certain elite groups in order to preserve their conservative values.

c) This lack of a (bottom-up) structural mechanism to aggregate social preferences on public goods resulted in an overrepresentation of the interests of the banking system, certain industrial corporations, the church, the army, or the bureaucratic *cuadros*. And the consequent infra-representation of some of the weakest segments of society.

d) One of the few reasons for the intervention of the highest political authorities in this decision-making process were revolts and sociopolitical turmoil. In these cases, the government usually tried either to exert repression or sometimes appease the opposition through targeted investment in specific sectors.[7]

A persistent strategy of accelerated industrialization gave rise by the mid-1950s to an important increase in public investment, financed with public debt.[8] The consequent inflation precipitated some popular protests in the most important industrial nodes of the country: Asturias, Catalonia, the Basque Country, and Madrid (Maravall, 1970). Nevertheless, the quest for a strong industrial base (see e.g. Donges (1976) or González (1979)) was carried out at the expense of the primary sector; often endangering the subsistence of the new urban settlers during the years of reconstruction.

During the first stage within the life of the dictatorship, public investment was mainly devoted to building heavy infrastructure: water reservoirs, roads, etc. Over time, the attention shifted slowly towards the creation of a welfare state of small proportions, through education and healthcare expenditures (Martínez Serrano et al., 1982).

Under the auspices of the World Bank and taking France as the main example, the Spanish government introduced then a sequence of four Development Plans, in which indicative planning tried to coup with substantial regional and social imbalances. Although this

[6] According to Tamames (1973), certain middle-class sections thought that "the civil war had not been won" to bear the burden of those taxes.

[7] "Labor unrest in 1956, for example, led to an increase in spending through the Ministry of Labor from 380 million pesetas in 1955 to 2668 million the following year. But that ministry´s allocation fell to 712 million pesetas in 1957, and to 276 million in 1958" (Gunther, 1996: 24).

[8] An important instrument for this policy was the Instituto Nacional de Industria (INI), a massive holding of public enterprises.

strategy succeeded in consolidating specific industries like the automotive sector (De la Torre and García-Zúñiga, 2013), it was generally criticized for the distortion of producers' incentives or their tolerance with institutional corruption.

Certainly, "[by 1975] the 19.5% of Gross Domestic Product that flowed to all levels of government in Spain [via taxes] was substantially below the OECD average of 32.7%" (Gunther, 1996: 6). The reasons for this gap were an outdated tax system and the final policy of balanced state budgets. These factors resulted in an underdeveloped provision of basic services, despite the remarkable growth rates experienced from the early 1960s.

4. Research objectives

Based on the prior sections, we can formulate our research objective as follows:

Objective 1: We would like to know whether there existed ideological/political determinants of the allocation of public investment during the Francoist dictatorship.

The literature has explored the existence of non-economic determinants to explain the allocation of public investment (Haque and Kneller, 2012; Voigländer and Voth, 2018, among others), but the evidence is scarce for Spain. The research has focused on the Restauración period (1876-1923) (Herranz-Loncán, 2007; Curto-Grau et al., 2012) or the current democratic dictatorship (De la Fuente and Vives, 1995; Castells and Solé-Ollé, 2005; Albalate et al., 2012).

However, the Francoist dictatorship has been left aside and no empirical studies have contrasted whether these motivations were also present then. This omission undermines the understanding of the determinants of public policy during the first half of the 20th century; and may distort the analysis on regional growth patterns before the transition to democracy in Spain.

In order to extend and confirm the results mentioned above, we intend to contribute by investigating the role of non-economic factors to explain the allocation of public investment during the Francoist dictatorship in Spain. Accordingly, this paper is aimed to elaborate on a neglected feature of the recent Spanish economic history. Along the following sections, we develop a two-stage analysis: a theoretical and an empirical one, in sections 5 and 6, respectively.

5. Theoretical analysis

After the autarkic period, the Francoist dictatorship enacted some new legislation on labor relations that allowed for autonomous negotiations between workers and employers, out of the state´s sphere of influence (see e.g., Molinero and Ysàs (1998)). With these measures, the government was trying to rationalize a market economy, although the new labor relations gradually allowed some members of the political opposition to infiltrate into the official trade union. New protests gradually emerged in the most affluent industrial areas of the country, as if economic development were itself awakening the awareness of the working class (Maravall,1970).

Here we will provide the reader with a theoretical mechanism to understand some determinants of the allocation of public investment, at the territorial level, during this historical period. The following model, which is adapted from Lohmann (1997), aims to analyze the effects of labor productivity and local oppositional alignment (our exogenous variables) on conflict and the local provision of public investment (our endogenous variables). The exogenous variable that unleashes all the transformations in this society is productivity growth, which at the time was increasing considerably due to FDI and the imported foreign technology.

In the following model, there are three main agents: capitalists, who act in a coordinated way by choosing their investment levels; workers, who need to overcome a free-rider problem to demonstrate, in the presence of governmental repression; and the government, who allocates territorially the public investment. We will assume that the existing government shares the same objective function as the capitalists.

Let us also assume the government conditions the provision of infrastructure, healthcare, and education to the maintenance of stable labor relations, in which productive factors receive the value of their marginal productivity (in particular, workers receive a wage w_i). If that is the case, the government will provide workers in that province with G_i units of the public good. Otherwise, they will receive zero units, although they will appropriate then the whole output of the firm. We will consider that the government moves first. That is, the government officials internalize how the private agents will be later affected by their choice of G_i.

Let us denote by $\hat{C}_i$ the probability that an individual worker in province i decides to demonstrate, joining the ranks of the opposition in her workplace. Let us also denote by $P_i(\hat{C}_i)$ the probability that the demonstration succeeds and achieves the goal of improving

the local workers' conditions. The Cobb-Douglas production function in province i ($Y_i = K_i^{\beta}(A_i L_i)^{1-\beta}$) combines an aggregate stock of productive capital (K_i) and some efficiency units of labor ($A_i L_i$). Then the actual stock of private capital results from the following maximization problem, faced by the capitalists at the province level:

$$Max_{K_i}\left\{\left(1 - P_i(\hat{C}_i)\right)\beta K_i^{\beta}(A_i L_i)^{1-\beta} - K_i\right\} \quad (1)$$

As we can observe in (1), capitalists will obtain a profit only if protestors fail. They need to advance an optimal amount K_i before production starts. Therefore,

$$K_i = A_i L_i \left(\left(1 - P_i(\hat{C}_i)\right)\beta^2\right)^{\frac{1}{1-\beta}}$$

$$\frac{Y_i}{L_i} = A_i \left(\left(1 - P_i(\hat{C}_i)\right)\beta^2\right)^{\frac{\beta}{1-\beta}}$$

$$w_i = (1-\beta)\frac{Y_i}{L_i} \quad (2)$$

We will consider that demonstrating is costly for every participant, due to the potential repression; and there is a priori uncertainty as to the magnitude of such cost. The final cost will be idiosyncratic for every worker and will follow ex-ante a uniform probability distribution with support $[0, 1]$. Therefore, the cost level that makes workers indifferent between protesting or not is equal to their ex-ante probability of protesting. If the demonstration succeeds (fails), the local firm will (not) need to improve the workers' remuneration and everyone will get $\frac{Y_i}{L_i}(w_i + G_i)$, apart from the abovementioned cost in case of participation in the protests.

Moreover, the level of oppositional identity is different in every province. This identity is associated with the historical awareness of the working class, which is assumed stronger in those provinces where the opposition to the dictatorship was more consolidated in the past (e.g., during the Spanish 2nd Republic (1931-1936)). Let us denote by k_i' the number of local workers that need to join the demonstration for them to succeed in province i. We will consider then that k_i' is lower in the oppositional provinces, since the authorities will be especially careful there about the course of events and will improve the workers' remunerations more willingly in the presence of turmoil.

As in Lohmann (1997), the workers will play mixed strategies and the equilibrium level of $\hat{C}_i$ will be determined in the following indifference condition:

$$(w_i + G_i)\sum_{k=0}^{k'-1}\binom{L_i-1}{k}\hat{C}_i{}^{k}(1-\hat{C}_i)^{L_i-k-1} + \frac{Y_i}{L_i}\sum_{k=k'}^{L_i-1}\binom{L_i-1}{k}\hat{C}_i{}^{k}(1-\hat{C}_i)^{L_i-k-1} =$$

$$= (w_i + G_i)\sum_{k=0}^{k'-2}\binom{L_i-1}{k}\hat{C}_i{}^{k}(1-\hat{C}_i)^{L_i-k-1} + \frac{Y_i}{L_i}\sum_{k=k'-1}^{L_i-1}\binom{L_i-1}{k}\hat{C}_i{}^{k}(1-\hat{C}_i)^{L_i-k-1} - \hat{C}_i \quad (3)$$

The left-hand side of (3) corresponds to the payoff for an individual worker if he decides not to participate in the revolts, whereas the right-hand side captures the net payoff if he participates. After simplifying and rearranging in the last expression, we can restate the indifference condition as

$$1 = \binom{L_i-1}{k'-1}\hat{C}_i{}^{k'-2}(1-\hat{C}_i)^{L_i-k'}\left(\beta\frac{Y_i}{L_i} - (1-\beta)\,G_i\right) \quad (4)$$

From (2) and (4) we can already infer the following proposition.

Proposition 1: For a sufficiently low value of k_i', a higher level of local productivity (A_i) will result in a higher probability of participation in the protests ($\hat{C}_i$) and a higher probability of success for the workers ($P_i(\hat{C}_i)$).

Proof: See the Part 1 of the Appendix.

Therefore, if the government receives a very low social support in province i (i.e., if workers can succeed more easily because k_i' is low), then workers in i will take more risks and will protest more intensely the more resources they can appropriate, i.e., the higher is the local productivity A_i. The opposite could be happening in less oppositional provinces, in which productivity growth could be stifling the workers' chances to succeed.

The government spends on public investment with two different purposes: by conditioning such expenditure, the incentives to protest will be reduced; and, consequently, capitalists will be able to invest more private capital and raise their profits. Our second analytical finding is related to the connection between productivity growth

and public investment. Since we already predicted that higher productivity entails more intense protests, the public incentives to spend in the province will be enhanced by technological change and conflict.

Proposition 2: For a sufficiently low value of k_i', a higher local productivity A_i will also result in higher expenditure on public investment (G_i).

Proof: See the Appendix.

Therefore, there exists a positive correlation between the local intensity of conflict and the public investment in the province. Such correlation is associated with the simultaneous process of technological change and growth that was taking place in the most industrialized Spanish regions. All this process happens more effectively in those provinces with a higher degree of social opposition to the dictatorship.

6. Empirical analysis

a. Research model

Our baseline equation (5) is defined following previous specifications of the allocation of investment in infrastructure. More specifically, we follow Albalate et al. (2012) and Castells and Solé-Ollé (2005). In this equation, we intend to consider the factors that explain the territorial allocation of public investment:

$$\ln I_{it} = \beta_0 + \beta_1 \ln VOTESL_i + \beta_2 \ln GDPPC_{i,t-1} + \beta_3 \ln VOTES_i * \ln GDPPC_{i,t-1} + \beta_4 \ln POPULATION_{i,t-1} + \beta_5 \ln AREA_i + \beta_6 \ln TSTOCK_{i,t-1} + \beta_7 \ln DISTMAD_i + \rho_r + \varphi_t + \varepsilon_{it} \quad (5)$$

Where subscripts *ln*, *i*, *r,* and *t* refer to the natural logarithm, the specific territory, the region linked to the territory and time, respectively. I_{it} is the amount of public investment received by province *i* at time *t*. $VOTESL_i$ is the share of votes to left wing and Catalan, Basque or Galician nationalist parties from province *i* in 1936. $GDPPC_{i,t-1}$ is the 1-year lagged value of GDP per capita at time *t*. $POPULATION_{i,t-1}$ denotes the 1-year lagged value of the population in province *i* during *t*. $TSTOCK_{i,t-1}$ refers to the 1-year lagged value of the total stock of public capital in province *i* at time *t*. $AREA_i$ is the geographical extension of the land surfaces occupied by province *i*, measured in square kilometres. Finally, $DISTMAD_i$ is the geographical distance between the province *i* and Madrid, the capital of Spain.

The remaining variables are controls. ρ_r denotes the controls for the specific region *r* and φ_t denotes the time controls, whose role is incorporating the effect of the business cycle to the econometric model. Finally, ε_{it} is the error term.

The use of electoral variables tries to ascertain whether public investment was partially driven by political considerations. GDP per capita is included to know whether more public investment was allocated toward poorer regions with a redistributive purpose (De la Fuente and Vives, 1995; Albalate et al., 2012). It is important to highlight that (i) our electoral variable is only computed for the elections in 1936 and no democratic elections took place again until 1977, and (ii) there exists a strong correlation between the electoral variable and GDP per capita, since wealthier and peripheral regions presumably presented a tougher opposition to the Francoist dictatorship. When these two variables are interacted, the resulting measure is time-varying.

The stock of public capital is included to observe whether there existed neutrality criteria followed by the government (De la Fuente and Vives, 1995; Albalate et al., 2012). Population and land area are indicators of mobility needs, which tend to be positively associated with investment in infrastructure (Albalate et al. 2012). The reason for including the distance to the capital is related to the centralization motive, as pointed out by Albalate et al. (2012). Centralization implies that the allocation of infrastructure would follow non-economic criteria, since those peripheral provinces exhibiting more resistance to the Francoist dictatorship would be receiving fewer funds.

Finally, regional and time controls are included following Castells and Solé-Ollé (2005), as these variables capture the factors that are invariant across regions, as well as the effect of the business cycle. In addition to that, these controls allow to mitigate the existence of potential mismeasurement effects and omitted variable bias.

b. Data

For this study, our database contains a sample of 50 Spanish provinces, at the NUTS III[9] level of territorial disaggregation. We gathered the provincial data from different statistical sources: historical data on gross value added, population and available income per capita were collected by Alcaide Inchausti – Fundación BBVA (2003) every five

[9] Nomenclature of Territorial Units for Statistics.

years, from 1940 until 1975; the stock and flows of public investment in infrastructures, healthcare and education come from the IVIE-Database on historical series of public capital.

Moreover, the electoral results corresponding to the February 1936 general elections were compiled, at the level of each provincial district, by Linz and De Miguel (1977). The series on conflict in labor relations were provided by Gago-Vaquero (2014), over the time interval 1963-1975, using the historical statistics of the Spanish Ministry of Labor. Finally, our data on provincial land area and distances to Madrid were retrieved from the Anuario Estadístico de España, published by the Spanish National Office for Statistics (Instituto Nacional de Estadística)[10]. Tables A1 and A2 in the Part 2 of the Appendix contains the list of Spanish provinces as well as the main descriptive statistics, respectively.

c. Estimation strategy

For this study, we follow a random effects estimation, which is common for static panel models, which assume that past values of the dependent variable do not influence the current patterns. The decision between a pooled estimator or a fixed/random effects model that considers individual differences is fundamental to carry out the estimation of static panel models (Greene, 2012). To this extent, the previous equation (5) is modified and changed to a new equation (6), which is shown as follows:

$$\begin{aligned}\ln I_{it} = {} & \beta_0 + \beta_1 \ln VOTES_i + \beta_2 \ln GDPPC_{i,t-1} + \beta_3 \ln VOTES_i * \ln GDPPC_{i,t-1} \\ & + \beta_4 \ln POPULATION_{i,t-1} + \beta_5 \ln AREA_i + \beta_6 \ln TSTOCK_{i,t-1} \\ & + \beta_7 \ln DISTMAD_i + \rho_r + \varphi_t + (\alpha + u_i) + \varepsilon_{it} \qquad (6)\end{aligned}$$

Equation (6) introduces an additional element in relation to equation (5): u_i. This is a group-specific random variable "similar to the error term except that for each group, there is but a single draw that enters the regression identically in each period" (Greene, 2012: 376). α is a constant term associated with the unobserved heterogeneity. Although this model is more efficient than the estimation by fixed effects because of its lower variance, the fixed effects model computes the average for each variable and may be more consistent. However, the fixed effects estimation drops all the time-invariant variables, which implies to omit the distance and area variables. Hence, the implementation of the

[10] www.ine.es

fixed effects model would make more difficult the assessment of economic or non-economic criteria to reallocate public investment.

Endogeneity is one of the major concerns when estimating panel models (Greene, 2012). To this extent, we lag the explanatory time-varying variables by one period. By lagging the variables one year, we avoid the spurious correlations between the explanatory and the dependent variable caused by identical business cycles during the *t* period, as the explanatory variables are expressed in the *t-1* period. This approach has been followed in other studies to mitigate the effect of endogeneity (Albalate et al., 2012).

The literature on the regional allocation of public investment has not addressed the existence of spatial dependence. To account for the presence of spatial dependence in the levels of investment per capita and investment effort among provinces, we augment equation (6) by including a spatial lag of the dependent variable. Spatial regression models allow estimating the magnitude and statistical significance of spatial spillovers (LeSage, 2014). Equation (7) is shown as follows:

$$\begin{aligned}\ln I_{it} = {} & \beta_0 + \rho W ln\, I_{it} + \beta_1 \ln VOTES_i + \beta_2 \ln GDPPC_{i,t-1} + \beta_3 \ln VOTES_i \\ & * \ln GDPPC_{i,t-1} + \beta_4 \ln POPULATION_{i,t-1} + \beta_5 \ln AREA_i \\ & + \beta_6 \ln TSTOCK_{i,t-1} + \beta_7 \ln DISTMAD_i + \rho_r + \varphi_t + (\alpha + u_i) \\ & + \varepsilon_{it} \qquad (7)\end{aligned}$$

where W is the spatial contiguity matrix, and ρ is the spatial autoregressive parameter to be estimated. The spatial contiguity matrix, W, is an n by n matrix with element $w_{ij} = 1$ if provinces i and j are neighbors and zero otherwise. Once the W matrix is calculated, the matrix is row-standardized – all rows sum to one. With a row-standardized matrix, the product $W ln\, I_{it}$ is the average of the investment in neighbouring regions. The model in equation (6) is estimated by maximum-likelihood (Lee and Yu, 2010).

7. Results

a. Main results

As indicated above, we intend to know whether the oppositional alignment of a province was a significant determinant of its received level of public investment. In order to measure the variations in the local stocks of public capital, we have considered two dependent variables: the level of investment per capita in Table 1 (as in Albalate et al.,

2012) and the "investment effort" in Table 2, being defined as the ratio of gross public investment over the initial stock of public capital (see e.g. Solé-Ollé (2010)). Tables 1 and 2 include four main scenarios in columns 1-4: column 1 includes no controls, column 2 only considers regional controls, column 3 only considers time controls, and, finally, column 4 includes both regional and time controls.

Table 1. Results for equation (6), period 1940-1975, estimated by Panel Random Effects. Dependent variable: level of investment per capita

Specification	(1)	(2)	(3)	(4)
$\ln VOTESL_i$	0.087	0.024	0.265**	0.277*
	(0.119)	(0.180)	(0.100)	(0.162)
$\ln GDPPC_{i,t-1}$	1.529***	1.651***	0.799***	0.810***
	(0.127)	(0.132)	(0.138)	(0.162)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.271**	0.385***	0.306***	0.314***
	(0.114)	(0.124)	(0.086)	(0.093)
$\ln POPULATION_{i,t-1}$	-0.500***	-0.534***	-0.493***	-0.421***
	(0.061)	(0.080)	(0.056)	(0.075)
$\ln AREA_i$	0.566***	0.422***	0.259***	0.313***
	(0.058)	(0.103)	(0.066)	(0.101)
$\ln TSTOCK_{i,t-1}$	0.052	0.126	0.153*	0.044
	(0.084)	(0.094)	(0.080)	(0.090)
$\ln DISTMAD_i$	0.049	-0.182**	-0.005	-0.084
	(0.035)	(0.081)	(0.033)	(0.080)
Intercept	-0.434	1.036	0.417	1.023
	(0.803)	(1.103)	(0.751)	(1.059)
Regional Fixed Effects	No	Yes	No	Yes
Time Fixed Effects	No	No	Yes	Yes
Observations	350	350	350	350
BP-LM test	22.30***	1.21	21.12***	5.85***

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BP-LM test denotes the Breusch-Pagan Lagrange Multiplier test

Our regressors are exactly those chosen by Albalate et al. (2012), except for the ideological variable ($\ln VOTESL_i$), defined as the electoral share of oppositional parties in 1936, and the latter variable interacted with the provincial GDP per capita. The sign and significance of our regressors is like those in Albalate et al. (2012), although the variable $\ln DISTMAD_i$ has no significant impact on public investment in our regressions. Therefore, we cannot identify a centralization motive affecting the allocation of public investment during this historical period.

The effect of our ideological variable tends to be irrelevant as well, although its interaction with GDP per capita exhibits a considerable impact on both investment per capita and the investment effort. This fact reveals the concern of the dictatorship about

the potential conflict in the most industrialized, oppositional areas, which could be threatening the local labor relations. We also find that the BP-LM test (Breusch and Pagan, 1979) is consistent with the random effects specification, as the value of the statistics often highlights the importance of considering the differences across individuals, except for column (2) that includes regional but no time effects. These results point to the sensitivity of the specification to the inclusion of the business cycle through time controls.

Table 2. Results for equation (6), period 1940-1975, estimated by Panel Random Effects. Dependent variable: investment effort

Specification	(1)	(2)	(3)	(4)
$\ln VOTESL_i$	0.131	0.047	0.303***	0.290*
	(0.118)	(0.177)	(0.101)	(0.161)
$\ln GDPPC_{i,t-1}$	1.533***	1.653***	0.878***	0.859***
	(0.126)	(0.131)	(0.139)	(0.162)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.290**	0.401***	0.331***	0.336***
	(0.113)	(0.123)	(0.086)	(0.093)
$\ln POPULATION_{i,t-1}$	0.546***	0.523***	0.570***	0.652***
	(0.061)	(0.079)	(0.057)	(0.075)
$\ln AREA_i$	0.511***	0.390***	0.233***	0.290***
	(0.058)	(0.101)	(0.067)	(0.101)
$\ln TSTOCK_{i,t-1}$	-0.951***	-0.899***	-0.882***	-0.999***
	(0.084)	(0.093)	(0.081)	(0.089)
$\ln DISTMAD_i$	0.049	-0.155*	-0.002	-0.062
	(0.035)	(0.080)	(0.034)	(0.079)
Intercept	-0.444	0.926	0.424	0.917
	(0.801)	(1.084)	(0.765)	(1.050)
Regional Fixed Effects	No	Yes	No	Yes
Time Fixed Effects	No	No	Yes	Yes
Observations	350	350	350	350
BP-LM test	17.19***	0.38	23.48***	5.67***

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. BP-LM test denotes the Breusch-Pagan Lagrange Multiplier test

The results showed in Table 2 are very similar to the results of Table 1. $\ln GDPPC_{i,t-1}$ coefficients are positive and significant, but lower than in the previous table. The interaction between the electoral and the GDP per capita variables is not significant in column (1), when no additional controls are included. In contrast to the previous specification, the variable $\ln POPULATION_{i,t-1}$ is positive, which implies that the most populated provinces are the potential recipients of larger amounts of public investment. The stock of public investment, $\ln TSTOCK_{i,t-1}$, is significant, but its coefficient is negative, which suggests the application of neutrality criteria by the public administration during this historical period.

The results obtained at Tables 1 and 2 can be summarized as follows: although changes are not highly significant, the results are sensitive to the type of variable chosen to measure the allocation of public investment. In addition to that, coefficients do not change, but as showed by the Breusch-Pagan test, the overall specification of random effects is sensitive to the inclusion of time controls, which denote the high importance of the business cycle. Moreover, the government did not show as a fundamental priority the redistribution towards the most disfavored provinces. The positive sign and prominent magnitude of the coefficient on GDP per capita could reflect efficiency considerations, although the governmental capture by some local, affluent elites may have been important as well[11]. Hence, we conclude that economic criteria, related to efficiency, may coexist with non-economic ones when allocating the public investment in Spain. During the Francoist dictatorship, Preston (1990, 1993) highlights the incorporation of technocrats to the Spanish government from 1957.

We include additional specification tests on Table A3 in Part 2 of the Appendix, to demonstrate the consistency of our empirical specification. For this reason, we compute serial correlation, the Hausman test, and the Levin–Lin–Chu (LLC) unit root test. As a first stage, we have computed the existence of first-order serial correlation in our panel data model (Wooldridge, 2002; Drukker, 2003). The p-value, greater than 5%, shows the existence of no serial correlation.

In addition to that, we show the results of Hausman´s (1969) test for panel data. The results, with a null p-value, point to the prevalence of a fixed effects estimator. However, these results must be interpreted with caution, since the computation of this test requires to exclude all the time-invariant variables, as pointed by Albalate et al. (2012). Using the fixed effects model would imply excluding all the time-invariant differences and would not be representative of the real situation. Hence, our random effects specification is consistent since it does not exclude explanatory variables and does not present first-order correlation. We also test the existence of a potential structural break by testing the presence of unit roots in the panel data for each one of the dependent variables, following the Levin et al. (2002) test. The results of the test statistic, significantly lower than zero, denote that the null hypothesis of unit roots is rejected in favor of the assumption of stationarity for the two variables across the panel. Accordingly, these results are not

[11] As pointed by Acemoglu and Robinson (2012), the presence of extractive elites may hinder the economic development of a country.

aligned with a structural break during the Francoist dictatorship, since the mean and the variance of the public investment variables are both constant across the panel.

b. An extension of the results by considering spatial dependence

Concerning the existence of spatial dependence, Tables A4 and A5 in the Part 2 of the Appendix show the estimation results of the spatial model (6). The inclusion of the spatial lag of the investment variable complicates the calculation of the marginal effect, as it is no longer the estimated coefficient. The marginal effect of one variable in a given province also depends on that in its neighbors, and on the neighbors of its neighbors, and so on.

LeSage and Pace (2009) propose three scalar measures to compute the degree of spatial dependence: the average direct effect, the average indirect effect, and the average total effect. The average direct effect is a measure of the direct effect of one variable in its own province. The average indirect effect is a measure of the spillovers, as it measures the impact through the neighbors. Finally, the average total effect is the sum of the average direct effect and the average indirect effect. Tables (3) and (4) show the estimated impacts of the three effects.

Results show that the interaction of the ideological variable with the GDP per capita has a substantial positive and significant direct effect in the level of investment per capita and the investment effort in the province, and a lower but still positive and significant indirect effect. Accordingly, the consideration of spatial dependence in the allocation of public investment does not alter our previous results substantially and contributes to shed additional evidence on this topic.

Table 3. Direct, indirect, and total impacts for equation (7), period 1940-1975. Dependent variable: level of investment per capita

Specification	(1)	(2)	(3)	(4)
Direct				
$\ln VOTESL_i$	0.208	0.298*	0.28***	0.303**
	(0.136)	(0.158)	(0.101)	(0.142)
$\ln GDPPC_{i,t-1}$	0.970***	0.928***	0.718***	0.774***
	(0.123)	(0.121)	(0.14)	(0.149)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.213**	0.276**	0.278***	0.298***
	(0.103)	(0.106)	(0.084)	(0.09)
$\ln POPULATION_{i,t-1}$	-0.326***	-0.501***	-0.435***	-0.461***
	(0.077)	(0.076)	(0.066)	(0.078)
$\ln AREA_i$	0.451***	0.438***	0.264***	0.335***
	(0.075)	(0.091)	(0.067)	(0.087)
$\ln TSTOCK_{i,t-1}$	-0.053	0.079	0.096	0.085
	(0.089)	(0.088)	(0.092)	(0.094)
$\ln DISTMAD_i$	0.017	-0.056	-0.007	-0.066
	(0.050)	(0.072)	(0.035)	(0.067)
Indirect				
$\ln VOTESL_i$	0.187	0.300*	0.053*	0.076*
	(0.128)	(0.171)	(0.027)	(0.045)
$\ln GDPPC_{i,t-1}$	0.871***	0.936***	0.137***	0.194***
	(0.137)	(0.141)	(0.051)	(0.074)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.191**	0.278*	0.053**	0.075**
	(0.094)	(0.112)	(0.023)	(0.033)
$\ln POPULATION_{i,t-1}$	-0.293***	-0.505***	-0.083***	-0.116***
	(0.077)	(0.104)	(0.028)	(0.044)
$\ln AREA_i$	0.405***	0.442***	0.05**	0.084**
	(0.085)	(0.115)	(0.022)	(0.038)
$\ln TSTOCK_{i,t-1}$	-0.048	0.080	0.018	0.021
	(0.081)	(0.088)	(0.017)	(0.024)
$\ln DISTMAD_i$	0.016	-0.056	-0.001	-0.016
	(0.045)	(0.072)	(0.007)	(0.017)
Total				
$\ln VOTESL_i$	0.395	0.598*	0.333***	0.379**
	(0.262)	(0.327)	(0.122)	(0.181)
$\ln GDPPC_{i,t-1}$	1.841***	1.864***	0.855***	0.968***
	(0.215)	(0.228)	(0.165)	(0.193)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.404**	0.555**	0.331***	0.373***
	(0.195)	(0.214)	(0.099)	(0.114)
$\ln POPULATION_{i,t-1}$	-0.620***	-1.007***	-0.518***	-0.577***
	(0.147)	(0.168)	(0.077)	(0.105)
$\ln AREA_i$	0.857***	0.880***	0.315***	0.419***
	(0.149)	(0.175)	(0.083)	(0.116)
$\ln TSTOCK_{i,t-1}$	-0.101	0.159	0.114	0.106
	(0.171)	(0.175)	(0.109)	(0.118)
$\ln DISTMAD_i$	0.033	-0.112	-0.008	-0.082
	(0.095)	(0.144)	(0.041)	(0.084)

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 4. Direct, indirect, and total impacts for equation (6), period 1940-1975. Dependent variable: level of investment per capita

Specification	(1)	(2)	(3)	(4)
Direct				
$\ln VOTESL_i$	0.209	0.024	0.324***	0.23
	(0.144)	(0.154)	(0.105)	(0.148)
$\ln GDPPC_{i,t-1}$	1.227***	1.126***	0.836***	0.822***
	(0.122)	(0.118)	(0.142)	(0.154)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.27**	0.25**	0.318***	0.288***
	(0.106)	(0.107)	(0.084)	(0.091)
$\ln POPULATION_{i,t-1}$	0.575***	0.496***	0.583***	0.614***
	(0.083)	(0.073)	(0.071)	(0.084)
$\ln AREA_i$	0.421***	0.293***	0.23***	0.277***
	(0.08)	(0.088)	(0.07)	(0.091)
$\ln TSTOCK_{i,t-1}$	-0.887***	-0.828***	-0.9***	-0.953***
	(0.092)	(0.083)	(0.096)	(0.098)
$\ln DISTMAD_i$	-0.021	-0.126*	-0.019	-0.068
	(0.054)	(0.069)	(0.038)	(0.071)
Indirect				
$\ln VOTESL_i$	0.139	0.023	0.042*	0.054
	(0.1)	(0.145)	(0.023)	(0.038)
$\ln GDPPC_{i,t-1}$	0.82***	1.058***	0.109**	0.195***
	(0.136)	(0.165)	(0.048)	(0.075)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.18**	0.235**	0.041**	0.068**
	(0.074)	(0.103)	(0.02)	(0.029)
$\ln POPULATION_{i,t-1}$	0.384***	0.466***	0.076**	0.145***
	(0.089)	(0.101)	(0.034)	(0.055)
$\ln AREA_i$	0.281***	0.275***	0.03*	0.066**
	(0.067)	(0.09)	(0.016)	(0.031)
$\ln TSTOCK_{i,t-1}$	-0.593***	-0.778***	-0.117**	-0.226***
	(0.116)	(0.143)	(0.053)	(0.083)
$\ln DISTMAD_i$	-0.014	-0.118*	-0.003	-0.016
	(0.037)	(0.067)	(0.005)	(0.018)
Total				
$\ln VOTESL_i$	0.348	0.047	0.366***	0.284
	(0.242)	(0.299)	(0.121)	(0.182)
$\ln GDPPC_{i,t-1}$	2.047***	2.184***	0.945***	1.017***
	(0.204)	(0.239)	(0.161)	(0.197)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.45**	0.486**	0.359***	0.356***
	(0.177)	(0.207)	(0.096)	(0.111)
$\ln POPULATION_{i,t-1}$	0.96***	0.962***	0.659***	0.76***
	(0.159)	(0.162)	(0.088)	(0.116)
$\ln AREA_i$	0.702***	0.568***	0.26***	0.342***
	(0.136)	(0.173)	(0.08)	(0.114)
$\ln TSTOCK_{i,t-1}$	-1.48***	-1.605***	-1.017***	-1.178***
	(0.18)	(0.203)	(0.122)	(0.146)
$\ln DISTMAD_i$	-0.035	-0.245*	-0.022	-0.084
	(0.091)	(0.134)	(0.043)	(0.088)

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

c. Robustness of results and mechanism analysis

In order to check the robustness of our results and, if conflicts or political ideology are driving our findings, we build a panel for each province in Spain. First, we study whether there is a statistical association between conflicts, political ideology, and investment. Second, we explore whether there is evidence to assess that such an association is due to political ideology. It is worth noting that data on conflicts is available only since 1963. This is why we did not include such a variable in the empirical analysis of the previous section. As for this analysis, our sample period spans from 1963 to 1974. Namely, we consider the following regression models (8) and (9):

$$I_{it} = \alpha_i + \alpha_t + \beta_1 left_i \times conlf_{it} + \beta_2 right_i \times conlf_{it} + \beta_3 center_i \times conlf_{it} + \varepsilon_{it} \quad (8)$$

$$I_{it} = \alpha_i + \alpha_t + \beta_1 left_i \times years + \beta_2 right_i \times years + \beta_3 center_i \times years + \varepsilon_{it} \quad (9)$$

where $left_i, center_i$ and $right_i$ are different measures of political ideology in province i, $conlf_{it}$ is a measure of workers in conflict[12] in province i and year t, $years$ is the number of years since 1936, α_i and α_t are respectively province and year fixed effects and ε_{it} stands for the errors. Note that this analysis is based on data at province-year level. In total there are 50 provinces, we cluster variance at province level.

Table A6 in the Part 2 of the Appendix shows the results of the two regression models above. In columns (1) and (3) the political ideology variables (i.e., left, center and right) are binary variables taking value 1 if the share of votes for that certain political ideology in the elections of 1936 is larger than 0.5. On the other hand, in columns (2) and (4) the political ideology variables (i.e., left, center and right) take the value of the share of votes in the elections of 1936. Since there are no provinces with workers in conflicts and a majority of votes for center political parties that variable does not appear in column (1). Column (1) finds empirical evidence of a positive (negative) statistical correlation between public investment and conflicts in left-wing provinces (right-wing provinces). Column (2) uses the exact share of votes for each of the three categories of political ideology and finds similar results. This might suggest that actually left-wing provinces

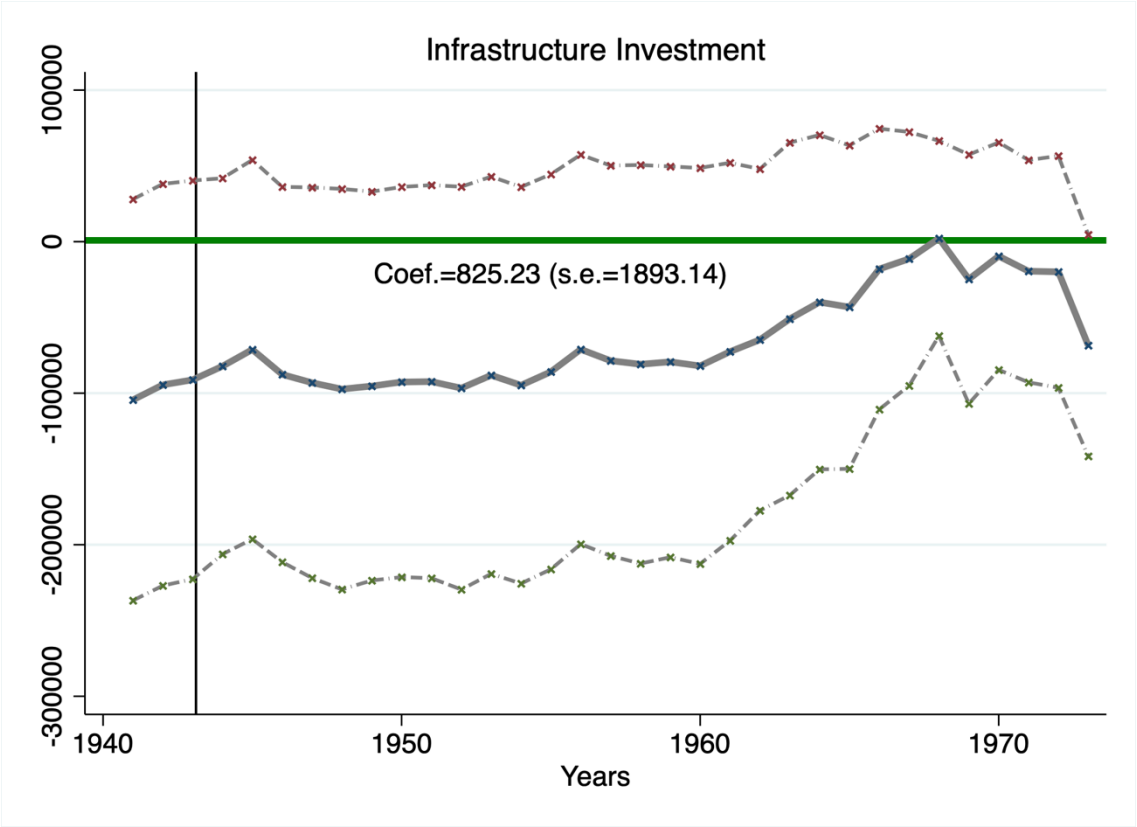
[12] Source: Gago-Vaquero (2014).

benefitted from higher levels of infrastructure investment due to their political ideology. To address this issue, columns (3) and (4) drop conflicts and focus on the number of years since 1936. If the effect on infrastructure investment is due to political ideology, there might be a concern that it becomes stronger as time elapses. Columns (3) and (4) find that the negative statistical associations for center and right-wing provinces are robust to this specification while the positive statistical association for left-wing provinces fades out. This finding suggests that this positive statistical association was due to the interaction between left-wing provinces and conflicts and not to the political ideology of such provinces per se. Possibly conflicts in such provinces were more violent, and in line with our theoretical model, the government had to invest larger amounts of money in such provinces to placate the concerns.

To this end, the last three rows of Table A6 show the p-values associated with the null hypothesis of the coefficients displayed in each row. Comparing such p-values for left-wing province suggest that these provinces exhibit statistically different associations from their center-wing and right-wing counterparts. While there is no conclusive evidence to state that the same is true for either center-wing or right-wing provinces. However, insofar as conflicts correlates positively with left-wing provinces (i.e., there are more conflicts in left-wing provinces on average), these findings could be explained either by political ideology or conflicts.

To show further evidence on this issue, we interact our binary left-wing variable with year fixed effect. This interaction should capture any change across years in infrastructure investment allocated to left-wing provinces. Figure 2 depicts the estimated coefficient associated with the interaction of our binary left-wing variable with years fixed effects. As this picture displays, the year level fixed effects for left-wing provinces are statistically zero for each year. These results are in line with the results of column (3) of Table A.6. They suggest that there is no year in Franco dictatorship in which left-wing provinces experienced higher or lower infrastructure investment due to their political ideology.

Figure 2. Results of the interaction between the left-wing variable and the year fixed effects

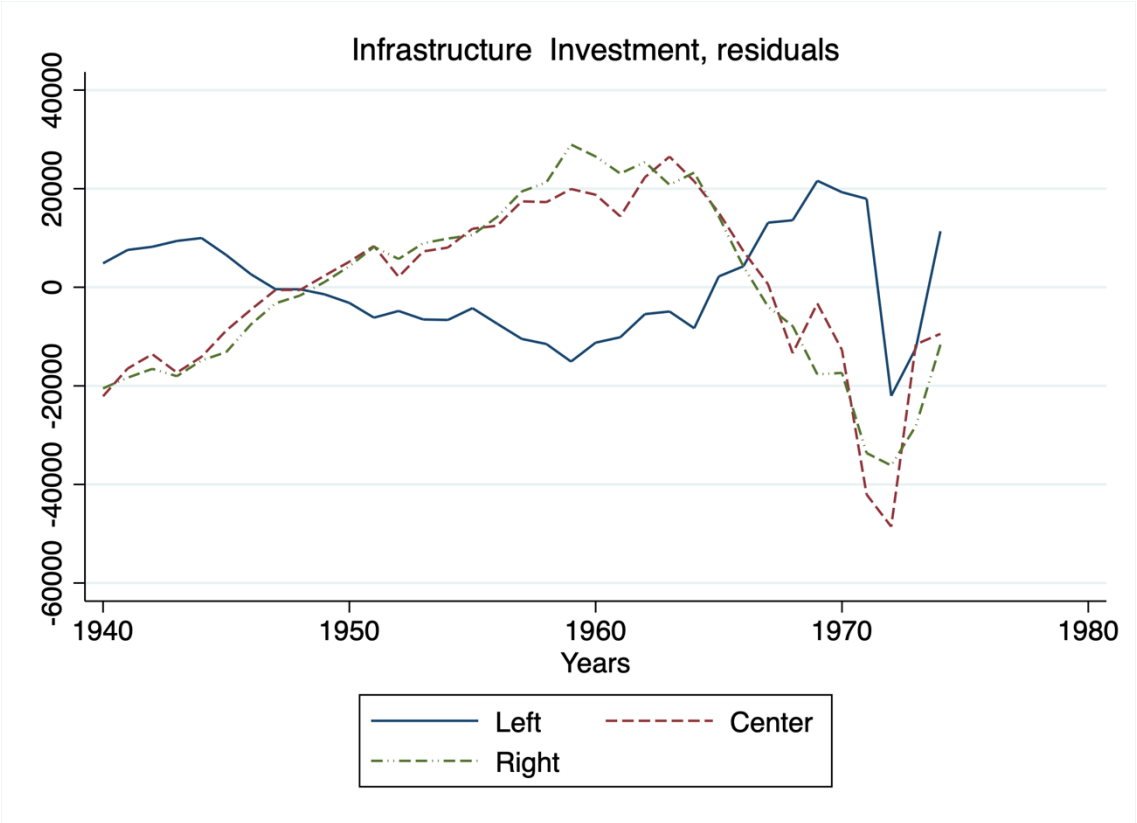


Lastly, there might be the concern that infrastructure investment in left-wing provinces is declining, but our estimates do not capture this correlation. Hence, Figure 3 below shows the results of running column (3) of Table A.6 regression model, storing the residuals, averaging them for each of the categories of political ideology, and plotting them for each one such categories. Once again, results are clear, as a whole it does not seem there are

effects on infrastructure investment for left-wing provinces. These findings suggest that the positive statistical association found above was due to conflicts in such provinces and not to the political ideology per se.

Simply put, these results suggest that Franco dictatorship ended up investing larger amounts of money in investments in the infrastructure of provinces who had left-wing political ideologies during the Spanish Civil war. Nevertheless, this was not due to the political ideology of such provinces, but because such provinces exhibited higher levels of conflicts during the Francoist dictatorship.[13] Combining these results with our theoretical model, it seems reasonable to think that Franco dictatorship spent larger amounts of money in such provinces in an effort to curb conflicts.

Figure 3. Residuals of the infrastructure investment



[13] To this extent since our sample period covers the last decade of the dictatorship, and our estimates are positive, our results might be interpreted as lower bounds.

8. Conclusions

In this paper, we have examined whether the allocation of public investment followed economic and/or non-economic criteria during the Francoist dictatorship in Spain. Previous studies found the existence of non-economic criteria coexisting with the economic criteria, which had been governing the allocation of the public investment before and after the Francoist dictatorship. In these studies, non-economic criteria were basically related to potential earnings from future voters.

To accomplish our research objective, we use a two-step procedure, combining theoretical and empirical analysis for a sample of 50 Spanish provinces for the period 1940-1975. We find that economic and non-economic criteria coexisted during the Francoist dictatorship in Spain. In addition to that, non-economic criteria are minimal and not related to potential political votes but to avoid the social conflict. The results are similar when assuming that the public investment in a specific region depends on the infrastructure allocated in neighboring regions, as well as to the performance of other robustness tests with variables of labor conflict.

Our results shed light to understand Spanish economic history and growth dynamics. The most adopted theoretical framework has assumed the existence of political incentives in dictatorships to benefit selected elites (Acemoglu and Robinson, 2005; 2012), but we find that non-economic criteria are almost negligible during the Francoist dictatorship concerning the regional allocation of public investment. Hence, the Spanish economic growth during the Francoist dictatorship might not be hindered by non-economic factors, which results in a balanced growth model when considering the public investment. This balanced growth pattern, together with the attempts to avoid social conflict and favor industrial development, may have been useful to facilitate a peaceful transition to democracy in Spain, and also contribute to increase territorial integration.

Although these results contribute to understand the growth patterns during the Spanish economic history, this topic presents avenues for further future research that have not been addressed in this paper. First, it would be convenient to extend the analysis to other types of public expenditure, like health services, as opposed to investment. Second, future research may consider disaggregating the infrastructure investment following Albalate et al. (2012): airports and network investment. To this extent, the disaggregation of the infrastructure investment may be very important, because Albalate et al. (2012) only find

the centralization motive for network infrastructure and not for airports, for instance. Finally, it may be useful to estimate another variable that reflects political outcomes with an overtime variation and may complement the electoral results in 1936. However, it is important to highlight that the territorial level of disaggregation is high (NUTS III), and data availability represents a major constraint to perform further analyses.

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Appendix

Part 1: Proofs of the theoretical model

Proof of Proposition 1

The definition of the probability of success for the demonstrators implies that

$$P_i(\hat{C}_i) = 1 - \sum_{k=0}^{k'-1} \binom{L_i}{k} \hat{C}_i^{\,k} (1 - \hat{C}_i)^{L_i - k}$$

When k' is sufficiently close to one

$$P_i(\hat{C}_i) = 1 - (1 - \hat{C}_i)^{L_i}$$

From our equations (2) and (4), it is possible to derive implicitly $\hat{C}_i$ as a function of G_i and the parameters of the model:

$$\hat{C}_i = (1 - \hat{C}_i)^{L_i - 1}\left[\beta^{\frac{1+\beta}{1-\beta}} A_i (1 - \hat{C}_i)^{\frac{\beta L_i}{1-\beta} - 1} - (1-\beta)G_i\right]$$

Moreover, we can define the following function

$$H = \hat{C}_i - (1 - \hat{C}_i)^{L_i - 1}\left[\beta^{\frac{1+\beta}{1-\beta}} A_i (1 - \hat{C}_i)^{\frac{\beta L_i}{1-\beta} - 1} - (1-\beta)G_i\right]$$

And apply the implicit function theorem, so that we conclude

$$\frac{dH}{d\hat{C}_i} = 1 + (L_i - 1)\frac{\hat{C}_i}{(1 - \hat{C}_i)} + (1 - \hat{C}_i)^{\frac{L_i}{1-\beta} - 2}\beta^{\frac{2}{1-\beta}} A_i \frac{L_i}{(1-\beta)} > 0$$

And $\frac{dH}{dA_i} < 0$. Therefore,

$$\frac{d\,\hat{C}_i}{dA_i} = -\frac{\frac{dH}{dA_i}}{\frac{dH}{d\hat{C}_i}} > 0$$

Proof of Proposition 2

Furthermore, the government chooses G_i to maximize the same objective function as the capitalists in (1), considering that public investment is not directly productive but attenuates conflict. Therefore, G_i is useful to reduce $P_i(\hat{C}_i)$. The first-order condition corresponding to the optimal investment behavior by the government is

$$1 + \beta^{\frac{1+\beta}{1-\beta}} A_i \frac{{L_i}^2}{1-\beta}(1 - \hat{C}_i)^{\frac{L_i}{1-\beta} - 1}\frac{d\,\hat{C}_i}{dG_i} = 0$$

Where $\frac{d\,\hat{C}_i}{dG_i} = -\frac{\frac{dH}{dG_i}}{\frac{dH}{d\hat{C}_i}} < 0$.

So, if we define the function $J = 1 + \beta^{\frac{1+\beta}{1-\beta}} A_i \frac{{L_i}^2}{1-\beta}(1 - \hat{C}_i)^{\frac{L_i}{1-\beta} - 1}\frac{d\,\hat{C}_i}{dG_i}$, after some simplifications it is possible to obtain that

$$\frac{dG_i}{dA_i} = -\frac{\frac{dJ}{dA_i}}{\frac{dJ}{dG_i}} = \frac{(1 - \hat{C}_i)}{A_i\left(\frac{L_i}{1-\beta} - 1\right)} > 0$$

Part 2: Additional tables

Table A1. List of Spanish provinces (NUTS III) included in the sample

Albacete	Ciudad Real	Huelva	Navarra	Tenerife
Alicante	Coruña	Huesca	Orense	Teruel
Almería	Cuenca	Jaén	Palencia	Toledo
Asturias	Cáceres	Las Palmas	Pontevedra	Valencia
Badajoz	Cádiz	León	Rioja	Valladolid
Baleares	Córdoba	Lleida	Salamanca	Vizcaya
Barcelona	Girona	Lugo	Segovia	Zamora
Burgos	Granada	Madrid	Sevilla	Zaragoza
Cantabria	Guadalajara	Murcia	Soria	Álava
Castellón	Guipúzcoa	Málaga	Tarragona	Ávila

Table A2. Main descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
$\ln I_{it}^{*}$	350	-2.58	0.51	-4.10	-1.21
$\ln I_{it}^{**}$	400	-2.02	0.84	-4.00	0.18
$\ln VOTESL_i$	400	-0.84	0.36	-1.94	-0.13
$\ln GDPPC_i$	400	-0.64	0.59	-1.73	0.99
$\ln VOTES_i * \ln GDPPC_i$	400	0.59	0.61	-0.80	2.87
$\ln POPULATION_i$	400	13.05	0.63	11.57	15.28
$\ln AREA_i$	400	9.09	0.55	7.55	9.99
$\ln TSTOCK_i$	400	13.91	0.68	12.37	16.94
$\ln DISTMAD_i$	400	5.86	0.74	3.50	7.71

Notes: * refers to the investment in infrastructure measured in the total stock, while ** denotes the investment in infrastructure using investment per capita.

Table A3. Computation of additional tests

Specification	**Table 1**	**Table 2**
Serial correlation	0.80*** (0.376)	1.30*** (0.260)
Hausman test	65.15*** (0.000)	78.34*** (0.000)
LLC test	-70.58*** (0.000)	-20.67***(0.000)

Notes: The values of the test are included together with their associated p-valued between parentheses, such as *** p<0.01, ** p<0.05, * p<0.1. To compute the serial correlation, we have computed the xtserial Stata command taking column (3) as baseline but excluding all the time-invariant variables, since the regression

takes the first-order differences. An identical procedure is followed to compute the Hausman test. LLC refers to the bias-adjusted Levin-Lin-Chu test for unit roots in panel data using the xtunitroot Stata command for the each one of the dependent variables at Tables 1 and 2, respectively. The LLC test incorporates a number of lags such as the Akaike information criterion (AIC) for the regression is minimized and also a linear time trend.

Table A4. Results for equation (6), period 1940-1975, estimated by Spatial Panel Random Effects. Dependent variable: level of investment per capita

Specification	(1)	(2)	(3)	(4)
$W \ln I_{ij}$	0.523***	0.556***	0.169***	0.213***
	(0.042)	(0.041)	(0.051)	(0.061)
$\ln VOTESL_i$	0.190	0.269*	0.278***	0.300**
	(0.124)	(0.142)	(0.100)	(0.141)
$\ln GDPPC_{i,t-1}$	0.888***	0.838***	0.713***	0.765***
	(0.120)	(0.117)	(0.139)	(0.148)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.195**	0.249***	0.276***	0.295***
	(0.094)	(0.097)	(0.083)	(0.089)
$\ln POPULATION_{i,t-1}$	-0.299***	-0.452***	-0.432***	-0.456***
	(0.071)	(0.069)	(0.066)	(0.077)
$\ln AREA_i$	0.413***	0.396***	0.262***	0.331***
	(0.070)	(0.082)	(0.067)	(0.086)
$\ln TSTOCK_{i,t-1}$	-0.049	0.071	0.095	0.084
	(0.082)	(0.079)	(0.091)	(0.094)
$\ln DISTMAD_i$	0.016	-0.050	-0.007	-0.065
	(0.046)	(0.065)	(0.034)	(0.067)
Intercept	0.520	1.525*	0.730	1.182
	(0.993)	(0.875)	(0.792)	(0.890)
Regional Fixed Effects	No	Yes	No	Yes
Time Fixed Effects	No	No	Yes	Yes
Observations	350	350	350	350

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table A5. Results for equation (6), period 1940-1975, estimated by Spatial Panel Random Effects. Dependent variable: investment effort

Specification	(1)	(2)	(3)	(4)
$W \ln I_{ij}$	0.439***	0.535***	0.121**	0.203***
	(0.047)	(0.043)	(0.047)	(0.060)
$\ln VOTESL_i$	0.197	0.022	0.323***	0.227
	(0.136)	(0.140)	(0.104)	(0.147)
$\ln GDPPC_{i,t-1}$	1.158***	1.025***	0.833***	0.813***
	(0.122)	(0.114)	(0.142)	(0.153)
$\ln VOTESL_i * \ln GDPPC_{i,t-1}$	0.254**	0.228**	0.317***	0.285***
	(0.100)	(0.098)	(0.084)	(0.091)
$\ln POPULATION_{i,t-1}$	0.543***	0.452***	0.581***	0.608***
	(0.078)	(0.066)	(0.071)	(0.083)
$\ln AREA_i$	0.397***	0.267***	0.230***	0.274***
	(0.077)	(0.080)	(0.070)	(0.090)
$\ln TSTOCK_{i,t-1}$	-0.837***	-0.754***	-0.896***	-0.943***

	(0.089)	(0.076)	(0.096)	(0.098)
$\ln DISTMAD_i$	-0.020	-0.115*	-0.019	-0.067
	(0.051)	(0.063)	(0.037)	(0.070)
Intercept	0.366	2.057**	0.928	1.419
	(1.100)	(0.859)	(0.856)	(0.949)
Regional Fixed Effects	No	Yes	No	Yes
Time Fixed Effects	No	No	Yes	Yes
Observations	350	350	350	350

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table A6. Additional robustness results

VARIABLES	(1)	(2)	(3)	(4)
Center Share#Confl		-20,074***		
		(7,490)		
Left Share#Confl		19,499***		
		(6,494)		
Right Share#Confl		-15,316**		
		(6,352)		
Left#Confl	2,609*			
	(1,414)			
Right#Confl	-12,753***			
	(4,256)			
Center#Years			-2,706**	
			(1,041)	
Left#Years			825.2	
			(1,893)	
Right#Years			-3,137***	
			(1,054)	
Center Share#Years				-16,147**
				(6,274)
Left Share#Years				-2,715
				(6,374)
Right Share#Years				-15,422**
				(5,998)
Observations	600	600	1,750	1,750
left=center	0.071	0.005	0.03	0.040
right=center	-	0.478	0.01	0.825
left=right	0.004	0.007	0.016	0.004

Note: Clustered variance at province level between parentheses. All the scenarios include province and year fixed effects.