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

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Abstract

In countries with multiple cultural and ethno-linguistic cleavages, it is often difficult to reach agreements about historical relations. In the Spanish case, a scientific examination of the geographical direction of public investment may shed light on government intentions, for certain historical periods. During the Franco dictatorship, our empirical results point to an early discrimination, during the autarkic period, against the productive interests in Catalonia and the Basque Country. This situation could have been corrected later, for reasons linked both to economic liberalization and to the search for political survival, in the face of a revolutionary threat. In this sense, the significance of the ideological determinants of public investment, at the provincial level, confirms the existence of non-economic incentives behind the territorial allocation of infrastructure.
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**Keywords:** Francoist dictatorship, Spain, infrastructure, economic growth.

**JEL Codes:** N34, O47, R12

1. Introduction

Despite the long time passed, the conditions of the Spanish economy during the Francoist dictatorship require further quantitative analysis by academics. Its macroeconomic features and evolutions have been carefully analyzed (see e.g., Calvo-González (2007 and 2021), Prados de la Escosura et al. (2012), Espuelas (2012) or Cárdenas and Fernández (2020)), but the quantitative literature needs to continue descending into the micro-reality
of regions and economic agents within the country. Our focus here will be the determinants of the territorial allocation of infrastructure during the Francoist dictatorship in Spain, which to the best of our knowledge remains largely unexplored by the academic literature.

The analysis of criteria for the allocation of public investment is centered on within (Cadot et al., 2006; Voigtländer and Voth, 2021) and between country comparative studies (Kemmerling and Stephan, 2010; Haque and Kneller, 2015). For the case of Spain, the evidence has indeed explored territorial patterns, though focused on the Restauración period (1876-1923) (Herranz-Loncán, 2007; Curto-Grau et al., 2012) or the current democratic regime (De la Fuente and Vives, 1995; Castells and Solé-Ollé, 2005; Albalate et al., 2012). By identifying a possibly differentiated political alignment of the Spanish provinces during the Franco dictatorship, we will test the presence of an ideological motive behind the geographical allocation of public investment.

Our theoretical and empirical work is closely related to the literature on the prevention of insurgency, by means of the provision of public investment that increases the opportunity costs of rebellion (see e.g., Berman, Shapiro and Felter (2011) or Gwatipedza and Janus (2019)). Nevertheless, we cover a historical period in Spain for which the importance of non-economic factors behind the public allocation of infrastructure had not been analyzed before. Moreover, in contrast to the existing literature\(^1\), we do it using a theoretical model in which the governmental objective function is not the probability of regime demise, or the kleptocratic revenue for the dictator’s inner circle, but the expected benefits for capitalists under the conditions of the Cold War. We also provide an explicit micro-

foundations for the individual incentives to participate in protests against the dictatorship, which determines its probability of survival.

Furthermore, the issue of the possibly asymmetric attention paid by the Francoist economic policy to different Spanish regions has been controversial. For instance, Clavera et al. (1973), González-Portilla and Garmendia (1988), Molinero and Ysàs (1998) or Harrison (2009) collect anecdotal testimonies from this historical period, with diverse geographical origins. For instance, Sudrià (1991) and Harrison (2009) claim that the weaker relative performance of Catalonia during early Francoism was not due to a policy of overt discrimination, but to the special sensitivity of the Catalan economy to the autarkic restrictions in the 1940s. Our intention is to offer a methodological attempt to analyze these issues quantitatively and shed light on a better understanding of the Spanish economic history.

In this respect, our empirical analysis suggests that, during the 1940s and the early 1950s, the government may have tried to shift the location of the industrial basis of the country. These intentions were probably abandoned with the liberalization reforms. It is important to recall the early declarations by Juan A. Suanzes in 1943, who was by then minister of industry and president of the INI:

“I have considered that as the process of industrialization develops in Spain, there must necessarily be a certain displacement of the nation’s industrial center of gravity. Overcoming reasons of a purely economic nature – which, in short, would lead us to continue increasing indefinitely the industrial capacity of Barcelona and Bilbao – it is mainly those of a strategic nature and those of a social and political-economic nature, which should motivate the opportune decisions” (quoted in García Crespo, Velasco Barroetabeña and Mendizábal Gorostiaga (1981)).
However, judging by the conditional marginal effects of regional dummies for the whole period 1940-1975, from the early 1950s the way in which Catalonia was treated improved considerably, to the extent that its predictive margin is statistically the same as Madrid’s from much of the 1950s, and from 1963 onward. Therefore, apparently, in the final decades economic reasons prevailed together with the prevention of political conflict, due to the regime’s instinct of survival.

Our empirical results also find that the marginal effects of left-wing ideology on the provision of infrastructure are positive and significant, at the provincial level. The local intensity of left-wing ideology was measured by means of the electoral results in 1936 and 1977. This suggests that conflict-related ideological considerations, controlling for other determinants, played a role in the territorial allocation of public investment.

The rest of the paper is organized as follows: the next section introduces the corresponding framework and state of the art. Section 3 presents a theoretical setting that tries to illuminate the following empirical analysis. Section 4 discusses the empirical methods and contains an evaluation of the results. Finally, section 5 concludes.

1. Conceptual framework and literature review

1.1. 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 politically controversial period in the Spanish history. Instead, we will discuss the main features of the decision-making process in terms of public policy, which had a direct impact on the territorial allocation of infrastructure. As emphasized, among many others, by Clavera et al. (1973), Prados de la Escosura and Sanz (1996) or Carreras and Tafunell (2018), the workings of the Francoist economic policy were far from homogeneous over time. Gámir (2000) divided them into three stages: the interventionist autarkic era, the stabilization
and liberalization period (culminated by 1959), and the subsequent process of economic growth (Martínez-Ruiz and Pons (2020)). Gunther (1996) perceives a common thread during the whole life of the dictatorship, concerning the determination of public policy outputs. These characteristics could be synthesized as follows:

a) The allocation of public expenditure and investment was based on a decision making, at the interdepartmental level, very concentrated in a few hands: basically, the minister of finance and, from the late 1950s, the president of the Planning Commission. 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 economic interests in the private sector (see e.g., Comín (2018)).

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 or the public order were under threat. For instance, the 1973 tax reform proposal was finally blockaded because it could have undermined the support to the dictatorship by certain social strata. However, Franco’s inner circle was careful enough to choose government officials from certain elite groups, in order to preserve their conservative values.

c) The 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 most vulnerable segments of society.

d) One of the few reasons for the intervention of the highest political authorities in the decision-making process were revolt and sociopolitical turmoil. In these cases,
the government usually tried to exert repression, or sometimes appease the opposition through targeted investment in specific sectors. For instance, “labor unrest in 1956 […] led to an increase in spending through the Ministry of Labor from 380 million pesetas in 1955 to 2668 million in the following year. But the ministry’s allocation fell to 712 million pesetas in 1957, and to 276 million in 1958” (Gunther, 1996: 24).

The governmental quest for a strong industrial base (see e.g., Donges (1976), González (1979) or Braña et al. (1984)) was carried out at the expense of more balanced industrialization strategies, in terms of regional cohesion. This strategy of accelerated industrialization gave rise by the mid-1950s to an important increase in public investment, financed with public debt. 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).

During the first stage in the life of the dictatorship, public investment was mainly devoted to building heavy infrastructure: water reservoirs, roads, etc. Over time, the attention shifted toward the creation of a welfare state of very small proportions, through expenditure on education and healthcare (Martínez Serrano et al., 1982). Under the auspices of the World Bank and taking France as the main example, the Spanish government introduced a sequence of three Development Plans, in which indicative planning tried to couple with substantial regional and social imbalances. Although this 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 the tolerance with institutional corruption (see e.g., Comín and Vallejo (2009)).
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 may be associated to an outdated tax system
and the final policy of balanced state budgets. These factors resulted in an underdeveloped
 provision of basic services (see e.g., Espuelas (2012)), despite the remarkable growth
 rates experienced from the early 1960s.

1.2. The socioeconomic relevance of conflict in labor relations (1940-1975)

Although the different social divisions were nuanced and numerous, one of the
fundamental determinants of the Spanish Civil War (1936-1939) was the bourgeois
defense of the status quo, facing a political threat from a collectivist opposition. The new
state, ensuing the nationalist victory in the Civil War, proclaimed that there would be no
longer room for the class struggle. The new order would be of “harmonious” coexistence
within a state conceived as a “gigantic union of producers”. Consequently, all the labor
market institutions linked to the bilateral relations between workers and employers were
abolished. The membership of horizontal, class-related trade unions was banned, and the
exercise of any associated right for workers was declared sedition, in the midst of a
terrifying repression (see e.g., Molinero and Ysàs (1998) or Ysàs (2008)).

The new official, centralized trade union (Organización Sindical Española (OSE)) was
vertically organized by productive sector; keeping the representatives of workers and
employers subjected to a strict discipline, emanated from the Ministry of Labor. In
practice, only the employers enjoyed from a substantial representation, since the workers’
representatives were delegated by the single, official political party of the regime.
However, although the working class was initially terrorized, the apathetic resistance
gradually turned into an ambitious mobilization, concentrated mainly in five key
provinces (Asturias, Barcelona, Madrid, Guipúzcoa and Vizcaya). Only these five
enclaves gathered, in 1973, 41.17% of the Spanish industrial labor force and 72.26% of the number of registered conflicts.

Among the liberalizing economic reforms of the late 1950s, the Francoist dictatorship enacted some new legislation on labor relations, allowing for autonomous negotiations between workers and employers, partially out of the state’s sphere of influence. Although these measures were oriented to a certain rationalization of the market economy, the evolving labor relations gradually permitted some members of the political opposition to infiltrate into the official trade union (see e.g., González Portilla and Garmendia (1988), Babiano (1995) or Lardín (2005)). Meanwhile, new protests emerged in the most affluent industrial areas of the country, as if economic development were awakening the awareness of the working class (Maravall, 1970).

At this point, the political position of the OSE became hardly sustainable: they risked losing completely their electoral predicament in the designation of worker representatives; but simultaneously, they could not deviate from the fundamental orientations of the regime. Finally, the growing socio-political tensions induced some sectors of the industrial bourgeoisie to lose confidence in the regime’s capacity to procure social order. Overall, all this mobilization could not precipitate the end of the dictatorship but is thought to have contributed importantly to the advent of a new democracy in Spain (Molinero and Ysás, 1998)).

1.3. Economic and non-economic determinants of the allocation of public investment

Both economic theory and subsequent empirical studies have recognized the importance of certain drivers, such as public investment in infrastructure, healthcare and education, to boost economic growth and development. Moreover, public investment is also thought to be a key variable to explain cross-country variations in economic performance. The
criteria to allocate public investment may be related mainly to economics, or they may depend on positive, non-economic factors connected to political incentives.

On the one hand, De la Fuente and Vives (1995) and Yamano and Ohkawara (2000) identified three basic normative criteria to guide the territorial allocation of infrastructure: efficiency, redistribution, and neutrality. First, efficiency is linked to the maximization of the aggregate returns to public investment at the national level. Second, there may be poorer regions with special needs, which requires redistribution, often by means of place-based policies. Third, the normative criteria may be neutral, since the constitutional norms of the country may prescribe an equal access to public capital in all regions; and therefore, in that case the regional allocation of public investment should be decreasing in the initial stock of public capital.

For the case of Spain, De la Fuente (2004) evaluated the socio-economic 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 optimization problem. He found that the cost of public investment had been excessive on welfare grounds given the redistributive goal, because the actual allocation of infrastructure had been too redistributive toward the poorest regions in 1995.

On the other hand, the literature also recognizes the existence of other positive, and often non-economic, factors that affect the allocation of public investment (see e.g., Smart and Sturm (2013) or Carozzi and Repetto (2016)). Solé-Ollé (2010) distinguishes two fundamental cases: the pork-barrel politics, when spending is allocated following political connections between representatives; and the programmatic redistribution, 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 interests were considerably relevant. Using data for 66 countries during the period 1970-2000, Haque and Kneller (2015) found that corruption increases the levels of public investment, though at the same time decreases the returns to it, causing inefficiencies. Kemmerling and Stephan (2010) carry out a comparative analysis for France, Germany, Italy, and Spain to conclude that electoral incentives are important for all countries, and their specific political institutions can explain the regional allocation of public investment. Finally, Voigtländer and Voth (2021) 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 those states politically unstable.

Studies about the influence of politics on the allocation of public investment for the case of Spain are relatively scarce and focus mainly on infrastructure. Since these studies follow a regional approach, data availability represents a major constraint to undertake the analysis of long-time spans. They analyze the end of the 19th century, the beginning of the 20th century, and the post-1975 period with the arrival of democracy. For the first set of studies, Herranz-Loncán (2007) examines the investment in infrastructure during the period 1850-1930 and finds the existence of strong non-efficiency criteria for the construction of networks. Curto-Grau et al. (2012) found that regional public spending on road infrastructure during the period 1880-1914 depends on government electoral tactics.

On the other hand, Castells and Solé-Ollé (2005) focus on the period 1987-1996 to find that not only regional infrastructure needs, but also political factors governed the allocation of public infrastructure investment. De la Fuente and Vives (1995) studied the impact of European funds on Spanish regional inequality in the years 1981, 1986 and
1990. They concluded that public investment in infrastructure plays a key role in determining regional performance. Parallel to that 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 crucial role to the transport accessibility of Madrid. However, in a recent study conducted for the period 1980-2008 in Spain, controlling for the spatial effect associated with neighboring regions, Fageda and Olivieri (2019) find that political congruence – defined as larger levels of investment in those provinces where the affinity or support to the central government is higher – is not significant.

Our work is also related to the literature on the prevention of insurgency and violence, by means of the provision of public investment and services that increase the opportunity costs of rebellion (see e.g., Berman, Shapiro and Felter (2011) or Gwatipedza and Janus (2019)). Nevertheless, we cover a historical period in Spain for which the importance of non-economic factors behind the public allocation of infrastructure had not been analyzed before. In contrast to the existing literature, we do it using a theoretical model in which the governmental objective function is not the probability of regime demise, or the kleptocratic benefits for the dictators’ inner circle, but the expected benefits for capitalists.

2. Theoretical findings

Working with scarce historical data complicates the task of discussing causality in an econometric exercise. Therefore, we will try to further support our results with a
theoretical model, which adds plausibility and rationality to the identified channels. The following analytical setting contains a stylized model, whose structure rests on the historical accuracy of two assumptions:

a) First, an overall identification of the Francoist economic policy with the interests of certain capitalist spheres of influence; and the capacity of the latter to use some forms of political control over the former. In this sense, it is illustrative to quote this statement by Moreno Fonseret (1999): “[It is fundamental] the question of the extent to which the economic policy was not subordinated to the interests of the state, but to the interests of the individuals who controlled the state”. It is widely documented that, once the dictatorial regime was settled, the lobbies’ influence was oriented to achieve favor from those individuals in the state with political power. And the latter also extended the capital of public corporations to sectors where they would not only complement the private initiative, but also establish a political patronage to consolidate themselves and the survival of the state.

Therefore, in contrast to the literature on the political economy of autocracies (e.g., Grossman (1991), Acemoglu, Robinson and Verdier (2004), Acemoglu (2005) or Gwatipedza and Janus (2019)) in our model the governmental objective function is the expected profit of capitalists, instead of the probability of survival or the kleptocratic revenue for the dictatorship.

b) Secondly, especially during the late Franco regime, there existed a perception of a latent need for a political liberalization. Although this idea was generally resisted by the public administration, the mentalities of the youngest generations of bureaucrats knew that the only pillars for their survival were two: “Franco and the ‘economic miracle’. [Their survival as an elite] was the result of circumstances that were necessarily going to change in the future […] and were, for reasons of
biology and economics, beyond human control” (Cazorla Sánchez, 2007). In this respect, it is interesting to collect the opinion of the civil governor of Cádiz in 1972: “the silent majority clearly tends toward a modern socialism that balances social progress with a fair distribution of wealth […] This ideological tendency is […] adaptable to any regime or political system that could implement it”. Furthermore, the most problematic provinces for the Franco dictatorship were those that “exhibited most, and sometimes all, of the following factors: heavy immigration; strong pre-dictatorial traditions of political and union mobilization; industrial decay; peripheral nationalist movements, and the presence of large universities” (Cazorla Sánchez, 2007).

We therefore model the imminence of political transformations toward a more egalitarian distribution of political rights (and income), by means of a probabilistic survival of the regime, which influences the equilibrium investment in both private and public capital.

Our intention with the analytical model is formalizing the governmental use of public expenditure to placate the opposition, reduce the likelihood of regime change and increase the expected profits of capitalists. In our framework, the government conditions the provision of public expenditure to the maintenance of the status quo. The different agents in the model (government, opposition, capitalists, and workers) make their choices according to the following timing:

- **Period 1:** The government moves first by acting as a “Stackelberg leader” in the dynamic game. They consider the opposition’s schedule of protests, which depend on the cost of repression and the potential gains from the regime demise. These gains are conditioned by the level of public investment, and the size of the output
appropriated by the labor force in case of success in the protests. The only variable that the government can handle directly is the level of public investment \( (G_i) \).

- **Period 2:** In this period, the collectivist opposition sets the probability of individual participation in the protests \( (C_i) \), by pondering the future costs of repression and the individual gains from the event of regime change. The individual participation probability then translates into another final probability of the demise of the dictatorship \( (P) \). Simultaneously, the capitalists choose the level of capital investment \( (K_i) \) that maximizes their expected profits \( (\pi_i) \), according to the existing probability of political transformation. Moreover, their demand for labor faces a perfectly elastic supply of workers from a rural hinterland, who are willing to work at a wage (only) marginally above their agricultural remuneration \( (a) \). Therefore, the number of workers employed in the modern sector becomes endogenous and affected by the investment decisions.

- **Period 3:** Finally, in the last period protests, repression and production take place. In case of failure of the protests, labor and capital are remunerated according to their marginal productivity. In case of success, all the output is appropriated by workers and distributed equally among them.

The Cobb-Douglas technology of production in the modern sector of province \( i \) combines private capital \( (K_i) \) and labor \( (L_i) \), to manufacture a single good \( (Y_i) \), as follows:

\[
Y_i = (A_iL_i)^{1-\beta} K_i^\beta \quad (1)
\]

where \( A_i \) stands for an aggregate TFP (i.e., Total Factor Productivity) parameter for this province. We assume that capitalists borrow to fund their investment at an international interest rate that depends positively on the amount borrowed. If we posit that the amount to be repaid after borrowing \( K_i \) is equal to \( R_i = \frac{1}{\gamma} K_i^{\gamma-1} \), where \( \gamma > 1 \), then the capitalists
choose (in period 2) the private investment level that maximizes their expected profit function, as follows:

$$\pi_t = (1 - P)\beta Y_t - \frac{1}{\gamma} K_t^\gamma, \quad \gamma > 1 \quad (2)$$

Given the historical prevalence of rural-urban migration in the period, we will consider that the labor force exhibits a perfectly elastic supply curve, and the wage rate in the modern sector \((w_t)\) will stick to the agricultural remuneration \((a)\). The final output \((Y_t)\) and the demand for labor will be then related to \(K_t\) as follows:

$$w_t = a = (1 - \beta) \frac{Y_t}{L_t}; \quad L_t = \frac{(1 - \beta)Y_t}{a}; \quad Y_t = A_i^{\frac{1-\beta}{\beta}} \left(\frac{1-\beta}{a}\right)^{\frac{1-\beta}{\beta}} K_i \quad (3)$$

As a result, the maximization problem for capitalists can be detailed as follows:

$$Max_{K_t} (1 - P)\beta A_i^{\frac{1-\beta}{\beta}} \left(\frac{1-\beta}{a}\right)^{\frac{1-\beta}{\beta}} K_i - \frac{1}{\gamma} K_t^\gamma \quad (4)$$

The final level of investment, which depends negatively on the probability of regime demise and positively on TFP, is determined as

$$K_i = (1 - P)^{\frac{1}{1-\gamma}} A_i^{\frac{1-\beta}{\beta(\gamma-1)}} \left(\beta \left(\frac{1-\beta}{a}\right)^{\frac{1-\beta}{\beta}}\right)^{\frac{1}{\gamma-1}} \quad (5)$$

The consequent demand for labor will stimulate migration from rural to modern areas, up to a certain level \(L_t\):

$$L_t = E_i (1 - P)^{\frac{1}{\gamma-1}}; \quad E_i \equiv A_i^{\frac{1-\beta}{\beta(\gamma-1)}} \left(\frac{1-\beta}{a}\right)^{\frac{1-\beta}{\beta(\gamma-1)}} \quad (6)$$
As we anticipated above, the objective function of the government will be equal to the expected profits of capitalists, net of the cost of funding the public investment. Such objective function \( V_i \) can be therefore expressed as follows:

\[
V_i = B_i \left( 1 - P(G_i) \right)^{\frac{\gamma}{\gamma - 1}} - \frac{1}{\gamma} G_i^\gamma; \quad B_i \equiv \left( \frac{\gamma - 1}{\gamma} \right)^{\frac{(1-\beta)\gamma}{\beta^{\gamma-1}}} \left( \frac{1-\beta}{\beta^\gamma} \right)^{\frac{1}{\gamma - 1}} \quad (7)
\]

where \( P(G_i) \) denotes the opposition’s reaction function schedule that the government internalizes, in order to choose its optimal level of public investment \( G_i \). Now we will proceed to derive and characterize implicitly that schedule, by specifying the mixed strategies that the workers play.

Let us assume that demonstrating is costly for every worker that participates, due to the potential repression exerted by the government. As in Lohmann (1997), every participant in the demonstrations has an idiosyncratic ex-post cost of repression, which ex-ante follows a uniform probability distribution within the support \([0,1]\). This implies that the cutoff value of ex-post repression that makes the worker indifferent between demonstrating or not is also equal to his (ex-ante) probability of protesting \( C_i \). The dictatorship will (will not) be finally toppled if at least (less than) \( k' \) workers participate in the protests. Then, in case of success (failure) every individual worker will get \( Y_i L_i (w_i + G_i) \), regardless of the repression costs.

Now we are considering the specific case of a “weak state”, in which a very limited number of demonstrators could precipitate the end of the regime. In the limit, we can handle the case of \( k' = 1 \), which turns out to imply that

\[
(1 - P) = (1 - C_i)^{L_i}; \quad C_i = 1 - (1 - P)^{\frac{1}{L_i}} \quad (8)
\]
Then, each individual worker will be indifferent between participating or not when his/her repression cost is equal to the expected remuneration gain. The latter can be written in terms of the average output, wages, the conditional provision of public expenditure and the probability that the individual worker is pivotal. Therefore, the equilibrium level of $C_i$ will be implicitly determined by this equation:

$$C_i = \left( \frac{a\beta}{1-\beta} - G_i \right) \left( 1 - C_i \right)^{1-1} \quad (9)$$

That is, from (8) and (9), if we define $x \equiv 1 - P$ (the probability of regime survival),

$$x^{\frac{1-L_i}{L_i}} - x^{\frac{2-L_i}{L_i}} = \frac{a\beta}{1-\beta} - G_i \quad (10)$$

Therefore, we can define an implicit function $J$ to characterize the responsiveness of the opposition’s reaction function to the public investment level:

$$J \equiv x^{\frac{1-L_i}{L_i}} - x^{\frac{2-L_i}{L_i}} - \frac{a\beta}{1-\beta} + G_i \quad (11)$$

Then, it is possible to obtain the slope of the opposition’s reaction function as follows:

$$\frac{\partial x}{\partial G_i} = -\frac{1}{\frac{\partial J}{\partial x} + \frac{\partial J}{\partial L_i} \frac{\partial L_i}{\partial x}} \quad (12)$$

where

$$\frac{\partial J}{\partial x} = \left( \frac{1}{L_i} - 1 \right) x^{\frac{1}{L_i^2}} - \left( \frac{2}{L_i} - 1 \right) x^{2\left(\frac{1}{L_i} - 1\right)}; \quad \frac{\partial J}{\partial L_i} = x^{\frac{1}{L_i^2} - 1} \ln x \left( 2x^{\frac{1}{L_i}} - 1 \right);$$

And

$$\frac{\partial L_i}{\partial x} = E_i \frac{1}{\gamma - 1} x^{\frac{2-\gamma}{\gamma - 1}} \quad (13)$$

Therefore, from (12) and (13),
\[
\frac{\partial x}{\partial G_i} = \frac{L_i}{x^{1/L_i} \left( (L_i - 1) - (L_i - 2)x^{1/L_i} \right)} + \frac{1}{x^{1/L_i - 1}} \ln x \left( 1 - 2x^{1/L_i} \right) \frac{E_i}{(y - 1)x^{2-y}} \]  

(14)

Finally, using the first-order condition in the governmental optimization problem (see (7) and (14)), we can solve for the equilibrium response of the state in terms of public investment:

\[
G_i = \left[ \frac{B_i \gamma - 1}{\ln x \left( 1 - 2x^{1/L_i} \right)} \frac{E_i}{(y - 1)x^{2-y}} + \frac{1}{x} \left( (L_i - 1) - (L_i - 2)x^{1/L_i} \right) \right]^{1/y} 
\]

(15)

As a result, the expressions (10) and (15) determine the equilibrium probability of regime survival and the public investment level. Both variables are consequently endogenous, and dependent on the values of the parameters: \( A_i, \beta, \gamma \) and \( a \). However, we want to evaluate the attitude of the government toward those provinces with an especially intense activity of political opposition.

To that purpose, it is possible to plot the function expressed by our equation (15) above, as we do in Figure 1. On the horizontal axis we have the probability of the regime demise \( (P = 1 - x) \), plotted against \( G_i \). As our empirical estimates will confirm below, the schedule in Figure 1 shows an upward sloping section, since the government will be using public investment to keep a rising \( P \) under control. This tends to happen for low enough levels of \( P \). For much higher values, there would be hardly any private investment in the economy, which would discourage the government from investing in public capital, in response to a higher \( P \). Figure 1 also contains a graph with the second derivative of the \( V_i \) function in (7), evaluated at the different optimal choices by the government. Since the
values are always negative, it is clear that the government is maximizing its objective function along the curve on the left.

Intuitively, the government is here lowering the expected gain from taking to the streets, by conditioning the provision of public capital to political stability. There is a tradeoff for the dictatorial regime between protecting a declining (private) investment by capitalists, as \( P \) goes up, and affecting the probability of its own survival. Moreover, our equation (9) above presents a government repressing the demonstrators and simultaneously rewarding with \( G_i \) to those who refused to demonstrate, as in Acemoglu, Robinson and Verdier (2004)’s setting.

**Figure 1:** beta=0.6; a=0.6; A=1; gamma=3

The logical conclusion from the analysis is that the government could rationally allocate more public investment to those provinces where the political opposition was stronger.
Furthermore, it is necessary to emphasize that the survival probability, the local population, and the local income are all endogenous variables: they are affected by identical shocks to TFP, the rural remuneration of labor, the factor shares of income, etc. that have an impact on $G_t$. This fact suggests that these regressors will require an appropriate instrumentation in our empirical model.

3. **Empirical methods**

3.1. **Empirical model**

Our baseline equation (1') is defined according to the previous analytical model, although we have also followed other specifications of the allocation of investment in the literature. More specifically, we have incorporated the stock of public capital to the set of regressors, along the lines of Albalate et al. (2012) and Castells and Solé-Ollé (2005). In this equation, we intend to consider the factors that affected the territorial allocation of public investment in infrastructure:

$$\ln INVINFRA_{it} = \beta_0 + \beta_1 LEFT1977_i + \beta_2 \ln STOCK_{it} + \beta_3 \ln POPULATION_{it} + \beta_4 \ln INCOMEPERCAPITA_{it} + \varphi_r + \varphi_t + \varphi_{rt} + \sum_t \gamma_t YEAR_t * LEFT_i + \epsilon_{it} \quad (1')$$

where the dependent variable, $INVINFRA_{it}$, refers to the total flow of public investment in province $i$ at time $t$. As in Albalate et al. (2012), we are considering 48 Spanish provinces ($i = 1, 2, \ldots, 48$) in 16 regions ($r = 1, \ldots, 16$), which coincide with the current autonomous communities, excluding the Canary Islands and the municipalities of Ceuta and Melilla. $LEFT1977_i$ is the share of votes to left-wing parties from province $i$ in the 1977 democratic elections, right after the end of the dictatorship.

$STOCK_{it}$ stands for the value of the stock of public capital (in infrastructures) in province $i$ at time $t$. Moreover, $POPULATION_{it}$ denotes the value of the residing population in province $i$ at time $t$, and $INCOMEPERCAPITA_{it}$ is the value of the real GDP per capita.
in province $i$ at time $t$. $\varphi_r$ and $\varphi_t$ refer to the region and time fixed effects, the latter used to control for the role of any business-cycle or secular-trend effects. The interaction of regional and time fixed effects is captured by the term $\varphi_{rt}$. Finally, $LEFT_i$ and $YEAR_t$ are both qualitative variables; the former takes the value of one if the left wing obtained in region $i$ at least 50% of the vote share, and the latter if the time period corresponds to year $t$. The white noise error term is referred to by $\varepsilon_{it}$.

The use of electoral variables tries to ascertain whether public investment was partially driven by the ideological support to the opposition in every province. We have considered the variable $LEFT1977$ as a regressor, although similar results were achieved with the electoral outcome of February 1936, right before the outbreak of the civil war. In fact, since strong pre-dictatorial traditions of political mobilization were significant predictors of oppositional behavior during the dictatorship, we have also instrumented $LEFT1977$ using the provincial distribution of the 1936 electoral results (compiled by Linz and De Miguel, 1977). It is important to highlight that no democratic elections took place between February 1936 and June 1977. With the qualitative variables $LEFT_i$ and $YEAR_t$ we intend to describe the historical evolution of the governmental strategy toward the oppositional areas.

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). A negative coefficient for this regressor would imply that the government might be willing to provide a homogeneous stock of infrastructure per capita (across provinces). Moreover, GDP per capita is included to know whether public investment was allocated with a redistributive purpose, or perhaps following efficiency considerations. Population is an indicator of mobility needs, which tend to be positively associated with investment in infrastructure. Finally, regional and time controls are included following Castells and
Solé-Ollé (2005), as these variables capture factors that are invariant across regions, as well as the effects of the business cycle. These controls also allow to mitigate the existence of potential mismeasurement effects and omitted variable bias.

3.2. Estimation strategy

As a benchmark, we will show the OLS estimation results of equation (1’).

We then continue with a second estimation, using a TSLS procedure, in which our variables \( LEFT1977, \, STOCK, \, POPULATION \) and \( INCOMEPERCAPITA \) are instrumented with their lagged counterparts in 1936 (\( LEFT36 \), for the electoral variable) and in 1940 (for the other three regressors), the provincial land area, its distance to Madrid and a time trend. That will be our second and baseline specification.

Additionally, we will also undertake an instrumental-variable, random effects estimation, which is common for static panel models. Random effects estimation splits the hidden individual effect into a constant part \((\alpha)\) and a province-variant part \((u_i)\). That is, equation (1’) is updated as follows:

\[
\ln INVINFRA_{it} = \beta_0 + \beta_1 LEFT1977_i + \beta_2 \ln STOCK_{it} + \beta_3 \ln POPULATION_{it} + \\
\beta_4 \ln INCOMEPERCAPITA_{it} + \varphi_r + \varphi_t + (\alpha + u_i) + \epsilon_{it} \quad (2')
\]

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, rendering the estimation of the effects of non-economic determinants on the investment reallocation impossible. Potential endogeneity is one of the major concerns when estimating panel models (Greene, 2012). To this extent, here we again instrument
LEFT1977 and the explanatory, time-varying variables with their counterparts in 1940, LEFT36, the provincial land area, its distance to Madrid and a time trend.

3.3. Data

We measure the presumable opposition to the Francoist regime at the provincial level, by the share of voting received by the left-wing parties in June 1977, as captured in Figure 2. It is possible to observe here a great persistence in the territorial distribution of the electoral variable, which is used as a proxy to measure opposition to the Francoist government. It is noticeable that the wealthiest and most industrialized regions in Spain, together with some poorer Southern and Western enclaves, were prone to show a more vigorous opposition to the dictatorship. From Northwest to Southeast there existed a more conservative fringe, which was flanked by more industrialized “left-wing” pockets to the North and mostly rural areas to the South, especially abundant in landless laborers in 1936. In fact, the relevance of this ideological cleavages has been apparent until very recently, during the current democratic regime, as several recent studies have analyzed (e.g., Tur-Prats and Valencia Caicedo (2020)).

As for the regional pattern of investment allocation, together with different economic and geographical variables, our database contains a sample of 48 Spanish provinces, at the NUTS III 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 years, from 1940 until 1975. Therefore, we applied a linear interpolation to those quinquennial data (on two of our regressors) to complete the database.
Figure 2: Vote share of left-wing parties in the 1936 and 1977 democratic elections (percentage)

The stock and flows of public investment in infrastructure come from the IVIE-Database on historical series of public capital. Finally, our data on provincial land area and distances to Madrid were retrieved from the Anuario Estadístico de España, published by
the Instituto Nacional de Estadística. Variables like income per capita, capital stock, population, land area, distance from Madrid or investment are expressed in logarithmic points.

Figure 3 shows the distribution of investment per capita in 1940 and 1975, by province. In general, it looks remarkable the tendency to prioritize the public investment in industrialized, “profitable” territories (mainly in the North, the Mediterranean basin and Madrid). This can be observed on the instructive Table 1 as well. Nevertheless, in order to disentangle the different motivations to invest in public capital, it is necessary to control for different regressors, which may be endogenous (with the subsequent problem of “bad controls”), as suggested by our theoretical model above. This fact confirms the pertinence of an econometric analysis to isolate the economic and non-economic determinants of the allocation of state investment.

It is well known the poor capacity to raise fiscal revenue by the Francoist governments, due to the outdated tax system in place. This fact affected crucially the willingness to spend on public investment, even in the a priori favorable context of the Development Plans (Comín and Vallejo, 2009). In fact, the proportion of public investment as a share of GDP rarely exceeded 1.5% and was very stable over time. However, public investment

**Figure 3:** Log investment per capita in 1940 and 1975, by province
Table 1: Annualized growth rates of different macroeconomic aggregates by region (1940-1975)

<table>
<thead>
<tr>
<th>Annualized Growth Rates (1940-1975)</th>
<th>Stock of public capital per capita in infrastructures</th>
<th>Population</th>
<th>GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canarias</td>
<td>5.17</td>
<td>1.81</td>
<td>4.04</td>
</tr>
<tr>
<td>C. Valenciana</td>
<td>4.29</td>
<td>1.25</td>
<td>3.93</td>
</tr>
<tr>
<td>Madrid</td>
<td>4.09</td>
<td>2.87</td>
<td>4.38</td>
</tr>
<tr>
<td>Cataluña</td>
<td>3.68</td>
<td>1.89</td>
<td>4.05</td>
</tr>
<tr>
<td>País Vasco</td>
<td>3.21</td>
<td>1.10</td>
<td>3.71</td>
</tr>
<tr>
<td>Murcia</td>
<td>3.20</td>
<td>0.56</td>
<td>4.04</td>
</tr>
<tr>
<td>Asturias</td>
<td>3.20</td>
<td>0.71</td>
<td>3.28</td>
</tr>
<tr>
<td>Galicia</td>
<td>3.15</td>
<td>0.17</td>
<td>3.77</td>
</tr>
<tr>
<td>Extremadura</td>
<td>3.07</td>
<td>-0.31</td>
<td>3.60</td>
</tr>
<tr>
<td>Cantabria</td>
<td>2.93</td>
<td>0.60</td>
<td>3.86</td>
</tr>
<tr>
<td>Castilla la Mancha</td>
<td>2.73</td>
<td>-0.39</td>
<td>3.92</td>
</tr>
<tr>
<td>Aragón</td>
<td>2.60</td>
<td>0.30</td>
<td>3.80</td>
</tr>
<tr>
<td>Castilla y León</td>
<td>2.52</td>
<td>-0.11</td>
<td>3.51</td>
</tr>
<tr>
<td>Baleares</td>
<td>2.46</td>
<td>1.07</td>
<td>3.67</td>
</tr>
<tr>
<td>Andalucia</td>
<td>2.21</td>
<td>0.48</td>
<td>3.68</td>
</tr>
<tr>
<td>Rioja</td>
<td>1.76</td>
<td>0.25</td>
<td>3.29</td>
</tr>
<tr>
<td>Navarra</td>
<td>1.41</td>
<td>0.85</td>
<td>3.60</td>
</tr>
</tbody>
</table>

became an interesting indicator of the allocative and redistributive intentions of the different Francoist administrations.

3.4. Results

We intend to know whether the oppositional alignment of a province was a significant determinant of its received level of public investment. To that purpose, we are using three different econometric approaches, whose results appear on Table 2 below. The first two of them are based on the equation (1’) above (OLS and IV-TSLS), and the third one (IV-Random Effects) follows the pattern of equation (2’). The effect of our ideological variable stands out as large, positive and statistically significant. This fact could reveal that, among others, ideological opposition was a driver of the allocation of public investment.

The concern of the dictatorship about the potential conflict in the most industrialized, oppositional areas shows that the opposition could have threatened the labor relations and
thus the stability of Franco’s regime. That would be in line with Espuelas (2012:221),
who finds that “non-democratic governments tried to buy political stability by increasing
social spending, but only when they felt pressure from below and felt politically
threatened”. More importantly, increasing investments in these areas points to a perceived
high likelihood of revolt that would result in a renewed reallocation of resources. It is
important to point out that we control for potential volatility in business cycles through
the inclusion of time fixed effects in all specifications.

Table 2: Political ideology and public investment in infrastructures. 3 specifications.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnSTOCK</td>
<td>0.816***</td>
<td>0.409***</td>
<td>0.469***</td>
</tr>
<tr>
<td></td>
<td>(0.0489)</td>
<td>(0.0554)</td>
<td>(0.124)</td>
</tr>
<tr>
<td>lnINCOMEPERCAPITA</td>
<td>0.0280</td>
<td>-0.137</td>
<td>-0.227</td>
</tr>
<tr>
<td></td>
<td>(0.0781)</td>
<td>(0.123)</td>
<td>(0.277)</td>
</tr>
<tr>
<td>lnPOPULATION</td>
<td>0.120***</td>
<td>0.268***</td>
<td>0.321***</td>
</tr>
<tr>
<td></td>
<td>(0.0375)</td>
<td>(0.0339)</td>
<td>(0.0904)</td>
</tr>
<tr>
<td>LEFT1977</td>
<td>0.407**</td>
<td>2.154***</td>
<td>1.040**</td>
</tr>
<tr>
<td></td>
<td>(0.180)</td>
<td>(0.387)</td>
<td>(0.501)</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.207***</td>
<td>-0.949*</td>
<td>-1.887*</td>
</tr>
<tr>
<td></td>
<td>(0.444)</td>
<td>(0.498)</td>
<td>(1.124)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,728</td>
<td>1,728</td>
<td>1,728</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.933</td>
<td>0.920</td>
<td></td>
</tr>
<tr>
<td>Number of Id</td>
<td></td>
<td></td>
<td>48</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
Moreover, the government did not show as a fundamental priority the redistribution toward the most disfavored provinces, as suggested by the changing sign and lack of statistical significance of the coefficient of income per capita. Nevertheless, the relevance of the rest of time-varying controls indicates that economic criteria may coexist with non-economic ones when allocating the public investment in Spain.

The specifications (1) and (2) allow us to keep track of the individual effects of each region over time. Therefore, it is possible to address cautiously the way in which the dictatorship handled the issue of nationalism in Catalonia and the Basque Country, concerning the allocation of public investment. Figure 4 suggests that, based on the results of the specification (2), Andalusia and Catalonia may have been discriminated against in this respect during the autarkic years, in relation to Madrid. However, from the early 1950s the way in which Catalonia is treated improves considerably, to the extent that the predictive margin is statistically the same as Madrid’s during much of the 1950s, and from 1963 onward. Meanwhile, Andalusia will continue lagging behind the other two regions until the arrival of democracy. The picture would be very similar if we had included the Basque Country, instead of Catalonia, in Figure 4.
Figure 4: Predictive margins of the year and regional dummies for Andalucía, Cataluña, and Madrid (1940-1975). Based on the IV-TSLS specification (2).

If we consider the conditional marginal effects of regional dummies for the whole period 1940-1975, Figure 5 reveals that the treatment to Asturias, Madrid, Catalonia, and the Balearic Islands seemed to be especially favorable, after controlling for the rest of explanatory variables. The case of Navarre exhibits the effect of the peculiar legal statute of the region during the Franco regime, as a territory with special financial autonomy.

Overall, the reality analyzed in Figure 4 suggests that, during the 1940s and the early 1950s, the government may have tried to shift the location of the industrial basis of the country, although those intentions were probably abandoned with the liberalization reforms. In this sense, it is important to recall the early declarations by Juan A. Suanzes in 1943, who was by then minister of industry and president of the I.N.I.:

“I have considered that as the process of industrialization develops in Spain, there must necessarily be a certain displacement of the nation's industrial center of gravity.
Overcoming reasons of a purely economic nature - which, in short, would lead us to continue increasing indefinitely the industrial capacity of Barcelona and Bilbao - it is mainly those of a strategic nature and those of a social and political-economic nature, which should motivate the opportune decisions” (quoted in García Crespo, Velasco Barroetabeña and Mendizábal Gorostiaga (1981)).

However, it seems that in the following decades economic reasons finally prevailed, together with the prevention of political conflict due to the regime’s instinct of survival.

**Figure 5:** Conditional marginal effects of the regional dummies, based on the IV-TSLS specification (2). Andalusia is the reference region.

4. **Conclusions**

In this manuscript, we have examined the extent to which the territorial allocation of public infrastructure followed economic and non-economic criteria during the Francoist dictatorship in Spain. To accomplish our research objective, we combine a theoretical and
an empirical analysis for a sample of 48 Spanish provinces, in the period 1940-75. We find that economic and non-economic criteria coexisted, and the latter were partially related to ideology and inclined to avoid political conflict.

Concerning the infrastructure allocation toward Catalonia and the Basque Country, their individual effects suggest that during the 1940s they could have been subject to discrimination relative to Madrid; although their position improved considerably over time. Finally, from the mid-1950s, the regional predictive margins in Madrid and Catalonia show no statistical difference. Moreover, controlling for other determinants, the Francoist authority did not seem to allocate infrastructure with a redistributive purpose toward disfavored territories.

These results try to shed light to understand better the Spanish economic history and growth dynamics, although this topic presents avenues for further 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 education and health services, as opposed to investment in infrastructure. Second, further research may consider disaggregating the infrastructure investment following Albalate et al. (2012) or Fageda and Olivieri (2019): network investment and airports. This disaggregation may be important, since Albalate et al. (2012) only found a centralization motive for network infrastructure. Finally, it may be useful to find another variable that reflects opposition to the Francoist regime, with an overtime variation that may complement the electoral results in 1936 and 1977.

5. References


