

Master in Institutions and Political Economy
Master Thesis

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Ripple Effects of Economic Crisis
The Influence of Economic Cycles on Political Selection
in Spanish Municipalities

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Master en Institucions i Economia Política

MASTER THESIS

Ripple Effects of Economic Crisis The Influence of Economic Cycles on Political Selection in Spanish Municipalities

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Abstract

How do economic cycles, especially recessions, affect the competence of politicians as measured by their education? This study examines the causal effect of unemployment shocks during the Great Recession of 2007/2008 on the selection of local politicians in Spanish municipalities. Despite extensive research on what forces determine political selection and the competence of politicians, the impact of economic downturns on the quality of politicians, as measured by unemployment, has been thoroughly overlooked. Yet it is important to understand whether crises produce competent leaders who are able to steer society through troubled waters. Using high-quality data from the Spanish Ministry of Labor and Social Economy and the Ministry of Finance, this study analyzes the causal relationship between economic cycles, as measured by unemployment, and the educational level of local politicians. I find that only severe cases of economic downturns have a negative impact on the educational level of politicians.

Keywords: Economic Cycles, Economic Crisis, Political Selection, Education, Political Competency

1 Introduction

The debate on what factors determine the quality and competence of politicians has attracted increasing interest in related literature on political selection in recent decades. Since (Besley, 2005) challenged the traditional assumptions of political economy that politicians only seek self-enrichment and re-election and that institutions alone are responsible for the selection of competent politicians, a remarkable wave of publications has emerged in the current discourse. This literature culminated in the groundbreaking work of Dal Bó and Finan (2018), who presented a review of these two decades of research and developed a model of candidate self-selection in a probabilistic electoral environment that influences the quality of politicians on both the supply and demand sides of politics.

Two key findings relevant to this paper can be noted: First, competent politicians, regardless of the level of government, can significantly influence policy outcomes, highlighting the relevance of this research area (Besley and Reynal-Querol, 2011; Meyersson, 2014; Gulzar, 2021). And second, that societies are able to recognize and select certain characteristics of politicians, which varies over time and context (Gulzar and Khan, 2024; Clots-Figueras, 2012; Dal Bó and Finan, 2018). Nevertheless, some questions remain unanswered, such as how parties influence the quality of politicians, how do external factors affect the composition of the candidate pool, and how group size affects candidate quality.

A growing body of literature explores external factors and their impact on political dynamics, such as economic crises and corruption on political fragmentation and vote shares (Sanz et al., 2022), unemployment on political trust and apathy (Muñoz, 2014), economic crises on electoral outcomes (Kriesi, 2014; Hernández and Kriesi, 2016; Ramos-González, 2024; Funke and Trebesch, 2017), and on polarization and radicalization (Kriesi, 2014; Hernández and Kriesi, 2016; Ramos-González, 2024; Funke and Trebesch, 2017). However, the relationship between external forces such as economic downturns and the competence and quality of politicians and candidates has been largely neglected. Yet it seems intuitive that poor economic conditions, including periods of high unemployment during recessions, would influence the characteristics of elected politicians and the political selection process as a whole. A better understanding of this interplay is particularly relevant in times of crisis, when capable politicians are needed to steer society through troubled waters. To close this gap in the literature, this article explores the research question: How do economic cycles, especially recessions, affect the competence of politicians as measured by their education?

The underlying hypothesis is that economic fluctuations significantly lower the education of local leaders. To test this, I analyze the effects of local unemployment shocks on the educational level of elected politicians in Spanish municipality councils in four election years during the Great Recession 2007/2008.

Two mechanisms underlie the intuition of this argument: First, the demand-side mecha-

nism, which attributes changes in the educational level of politicians to crisis-related changes in voter preferences, which are reflected in vote shares. Secondly, the supply-side mechanism, which states that less educated candidates either decide to run for office or are attractive to certain parties and are nominated by them. Before the crisis, the relatively higher returns to lower levels of education were an incentive to pursue low-skilled jobs in the private sector. However, the recession had a particularly pronounced impact in this area, triggering a rapid decline in returns to lower education and a rise in returns to higher education (Cebolla-Boado et al., 2015; López-Rodríguez et al., 2021). The potential for enhanced financial gains, the opportunity to overcome economic challenges through political engagement, and frustration with a crisis-ridden political environment could motivate lower educated citizens to get involved in local politics and take matters into their own hands. Individuals with higher education could exit politics, as the opportunity costs of political engagement and the returns to higher education increased. In both scenarios, a decline in the educational level of councillors could be observed. In addition, the Spanish party landscape has become increasingly fragmented during the crisis (Sanz et al., 2022). New parties gained strength at national level and put pressure on the traditional parties to recruit and nominate candidates with different levels of education.

To test this, I classify four treatment and control groups based on pre-crisis employment shares: a sector-unspecific group that includes all municipalities, a construction sector group, a service sector group and a sector unspecific high intensity group. The construction sector was one of the hardest hit and has a less educated workforce (Barakat et al., 2010; Dasgupta and Plum, 2022). In contrast, the service sector, covering a broader range of skills and occupations, was less affected, providing a useful comparison. The sector-unspecific group as well as the high intensity group examines the general effect, offering results with higher external validity.

The analysis is divided into two stages and employs a panel Difference-in-Differences (DID) model with two-way fixed effects. In the first stage, pre-crisis employment is estimated on post-crisis unemployment rates. In this way, I test whether the treatment groups experienced a significantly higher unemployment shock after the crisis and whether pre-crisis employment is a robust predictor of unemployment severity after the crisis. In the second and central stage of the analysis, I use the same DID model, using the educational level of local politicians as the outcome variable. This is measured by a weighted education index that is standardized to the size of the local council.

The analysis reveals that severe economic shocks significantly reduce the competence of politicians. This is reflected in a 44.4% decrease in the average education in regions with extreme unemployment shocks, with an average education index of around 1.057. This corresponds to a crisis-related increase of six politicians with a lower level of education in an average-sized council with 13 members. In contrast, the treatment groups, largely

consisting of moderately affected communities, recorded a slightly positive, non-significant increase that corresponds to an increase in the average education index of 2.84%. However, an analysis of the proportions of educational levels reveals a general increase for politicians with a lower level of education. This suggests that the decreasing effect when the groups were not treated intensively is related to the identification strategy used. First, because the formation of treatment and control groups based on pre-crisis employment may not accurately predict and identify the most severe unemployment shocks. Second, because the weighting of the education index distorts the actual proportional dynamic changes.

The findings suggests that while extreme economic downturns have a negative effect on political competence, regions that experience milder economic shocks hardly show such an effect. Thus, indicating that ordinary economic cycles should have minimal to no effect on the educational attainment and therefore quality of politicians.

To account for the underlying mechanisms, I construct a counterfactual education index that isolates the crisis effect. This index without the crisis is created by imputing the average vote shares and average education levels of the parties before the crisis to the post-crisis period. Additional analysis shows an overall decline in educational attainment among incumbent parties in both the treatment and control groups. While the general education index within parties declines over time, changes in the educational level of the parties are unlikely to significantly impact the overall effect. Instead, it is found that politicians with an economic background are less represented after the crisis. This leads to the most plausible explanation that the crisis-related economic circumstances can be attributed to individual entry and exit considerations by politicians.

The article begins with an introduction to the economic and political crisis in Spain and the municipal electoral system, followed by a comprehensive review of the relevant theoretical literature. After a description of methods, the results and mechanisms are presented.

2 The Great Recession in Spain

2.1 Economic and Political Crisis

Spain provides a suitable setting for a natural experiment, as the exogenous shock of the Great Recession was particularly severe and long-lasting. The global financial crisis of 2007 and 2008, characterized by the collapse of major financial institutions and a significant downturn in global markets, had a profound and far-reaching impact on Spain. In addition, a political crisis was triggered, characterized by a decline in confidence in democratic institutions, negative consequences for major political parties and the emergence of new parties, as well as an increase in political scandals (Sanz et al., 2022).

Before the crisis, Spain experienced a period of remarkable economic growth. Growth that was mainly driven by the inflated low-intensity sector, which was mainly based on

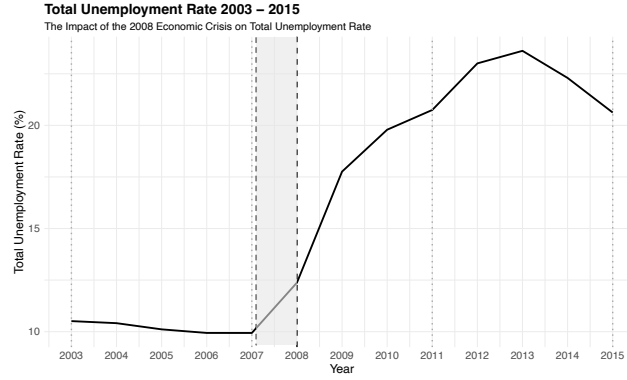


Figure 1: Total National Unemployment Rate in Spain 2003 - 2015.

Note: The plot shows the trend in the total national unemployment rate in Spain from 2003 until 2015. The dashed vertical line marks the shock of the economic crisis. A significant increase in the unemployment rate is observed following the crisis, peaking around 2013, before a slight decline towards 2015.

construction and services, as these sectors were not exposed to international competitive pressure. In 2006 and 2007, most of the new jobs created were in those sectors with construction (33%) contributing around 18% to GDP. This growth was favored by low interest rates and an influx of foreign capital, which led to extensive economic activity. Thus, the Spanish economy experienced a period with GDP growth rates consistently above the European average (Carballo-Cruz, 2011; Royo, 2020).

Because the growth miracle of 2006 was based on "bricks and mortar" (Royo, 2020, p. 127), the Spanish economy was not sufficiently diversified. The collapse of the real estate market triggered a banking crisis as the value of mortgage-backed assets collapsed. Spanish banks, which had invested heavily in the construction sector, suffered significant losses, which in turn led to a credit crunch. The government's efforts to rescue the banks and stimulate the economy led to a sharp rise in public debt.

From 2008 onwards, Spain found itself in one of the biggest economic crises in its history and, due to the economic miracle that preceded it, this crisis struck with full force. The result was a decline in GDP of 3.9% in 2009 and a tremendous impact on the labor market. The crisis manifested itself as a double-tip crisis, as GDP recovered between 2010 and 2011, before falling again by over 5% between 2011 and 2013. Unemployment reached over four million people and peaked at over 26% in 2012, with youth unemployment even higher. In the construction sector alone, unemployment rose by over 150% between the end of 2007 and 2009. In the meantime, the manufacturing and service sectors proved unable to absorb the low-skilled unemployed (Royo, 2020; Sanz et al., 2022; Muñoz, 2014).

The economic crisis also triggered a political crisis, as the Spanish national government initially played down the crisis in order to maintain public confidence and stabilize the political environment in the run-up to the 2007 elections. However, this approach worsened the situation by delaying the necessary responses and obscuring the true extent of the

economic consequences. The inadequate initial response meant that the measures eventually taken by the government were more radical. They focused primarily on austerity measures, cuts in social benefits and tax increases, which in turn increased unemployment further. This situation led to voter frustration and social unrest, which was reflected in the subsequent elections (Hernández and Kriesi, 2016). As a result, new political forces such as *Podemos*, *Ciudadanos* and eventually *VOX*, which promised transparency and an alternative approach to governance, emerged. This change altered the political landscape in Spain, increasing political fragmentation and changing the direction of Spanish politics in the following years, as Sanz et al. (2022) show.

2.2 The Impact on the Educational Level of Municipal Councillors

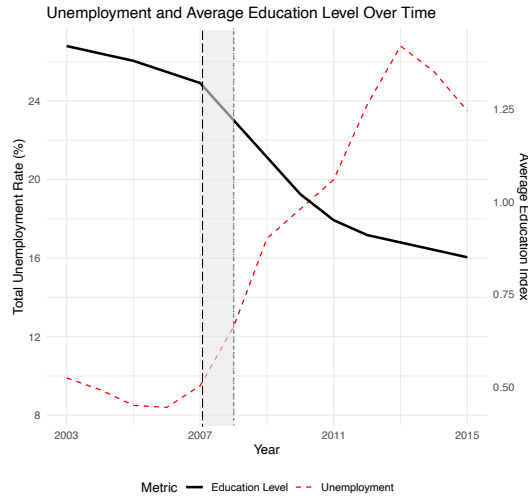


Figure 2: Education Levels in Municipality Councils over National Unemployment.

Note: The plot shows the trend of the weighted education index in municipality councils compared to the total national unemployment rate in Spain. The dashed vertical line marks the onset of the economic crisis, showing a notable shift in trends for both education and unemployment.

Figure 2 illustrates a negative correlation between the educational level of Spanish local politicians and the national unemployment rate. It suggests that the economic crisis influenced the educational level of elected representatives in local councils. In previous literature, the economic crisis has been operationalized to examine political and social processes, such as the educational level of society (Cebolla-Boado et al., 2015; Requena, 2015), political fragmentation due to corruption (Sanz et al., 2022), radicalization and political apathy (Muñoz, 2014). However, the relationship between the effects of economic cycles and the characteristics of local political representatives, evident has never been investigated before.

The observed decline in educational levels raises questions about the factors driving this change. One possible explanation from the supply side is that before the crisis, the returns to higher education were relatively low, while the returns to lower education were

relatively high. This discouraged low-educated citizens from pursuing political careers and low-skilled jobs instead (Cebolla-Boado et al., 2015). However, the economic crisis led to unemployment and a reduction in the returns to low-skilled labor while increasing the returns to higher education. This shift probably led to less educated people seeing politics as a more attractive option, while better educated people took up non-political careers, reducing their representation on local councils. Furthermore, the political crisis resulted in increased party fragmentation, with a rise of new parties, particularly in general elections (Sanz et al., 2022). This compelled established political parties, which still dominated local elections, to re-examine their nomination strategies and attract a more diverse range of candidates, including those with lower educational qualifications.

On the demand side, crisis-induced shifts in voter preferences can lead to the election of candidates with different educational backgrounds. During economic hardships, voters may prioritize candidates who are perceived as more relatable to their issues, reflecting a form of economic voting (Bélanger and Nadeau, 2014). Additionally, voters may vote retrospectively, voting out incumbents perceived to have performed poorly during the crisis. Empirical findings from countries such as Turkey (Armutcu and Tan, 2021), Greece (Nezi, 2012), and Poland (Kotnarowski and Markowski, 2014) support this, showing that economic crises can significantly alter voter preferences and candidate selection.

2.3 The Electoral Dynamics of Spanish Municipalities

In Spain, local councillors are elected every four years using a proportional representation system with closed lists. Voters vote for a particular party by choosing the corresponding ballot paper. It contains as many candidates as there are seats available on the local council. The positioning of candidates on these lists is crucial as it significantly affects their chances of winning key positions, including the office of mayor. The number of seats each party receives is determined according to the *d'Hondt* method, and within each party, the order on the list determines which candidates are elected. As a result, candidates at the top of the list are almost guaranteed a seat, while those at the bottom of the list have fewer chances, regardless of their individual abilities or popularity (Bagues and Campa, 2021).

This system is subject to considerable influence exerted by the party leaders on the selection of candidates, as they determine the order of the lists. Primaries are rare and the election of politicians depends more on the position on the ballot than on their individual popularity among voters. Consequently, there is a discrepancy between the preferences of the voters and the actual qualities of the elected representatives, which even increases during economic crises (see for example Traber et al. (2018)). Party leaders may favor loyal or strategic candidates over potentially more competent or popular candidates. As a result, voters are represented by politicians who might not fully match their preferences, as Sweeting (2009) finds.

Despite this influence of the parties on the selection process, Spanish local elections provide an ideal basis for investigating changes in the educational background of local politicians:

First, because local elections usually require less political experience and campaign resources compared to national or regional elections (Fleischmann and Stein, 1998), making it easier for new candidates to enter the political arena.

Second, because local elections are also more accessible to people without significant political backgrounds, creating a larger and more diverse candidate pool. This accessibility allows economic changes to have a more direct impact on the composition of local councils. Indeed, most councillors in small municipalities are not full-time politicians. In Spanish municipalities with more than 1,000 and less than 10,000 inhabitants, for example, only about 50% of mayors and 3% of councillors are employed full-time by the town hall, according to Bagues and Campa (2021).

And third, because in contrast to the national elections, where new political groupings such as *Podemos* (founded in 2014) and later *VOX* (founded in 2013) quickly gained ground, the party landscape at the municipal level remained relatively stable, at least until 2015. This stability makes local elections particularly useful, as few parties can introduce unobserved distortions in the backgrounds of local politicians. Traditional parties such as the *Popular Party (PP)*, the *Spanish Socialist Workers' Party (PSOE)* and the *United Left (IU)* maintained their dominance in most municipalities, with exceptions in Catalonia and the Basque Country. Only the *Ciudadanos* party (founded in 2006) showed a stronger presence in local elections during the crisis than the newer parties (Sanz et al., 2022).

3 Theory and related Literature

This work contributes to the broader literature on political selection, political behavior, and political entry. Valence models and competency voting models that focus on the qualities of politicians provide a particularly useful framework for examining these dynamics.

Recent literature has increasingly focused on the nuances of political selection, moving beyond the traditional assumption that politicians are merely “single-minded seekers of re-election” (Mayhew, 2004, p. 5) as assumed by early scholars like Buchanan (1983). Besley (2005) challenged this view by highlighting the importance of political selection, emphasizing that the quality of governance is directly connected to the competence of politicians.

Following Besley’s work, a wave of research has emerged, demonstrating that political leaders significantly influence policy outcomes at all levels of government (Besley and Reynal-Querol, 2011; Clots-Figueras, 2012; Washington, 2008; Meriläinen, 2022; Meyersson, 2014). Additionally, recent studies show that societies can effectively select politicians with desirable characteristics, indicating that political selection processes can enhance governance quality

(Bobonis et al., 2016; Dal Bó and Finan, 2018).

However, fundamental questions remain when examining the supply and demand dynamics of political candidacies the determinants of selecting competent leaders. Research on competence voting shows that both external voter preferences and internal party dynamics play a crucial role in shaping the characteristics of the candidate pool. Initial contributions on valence models, focusing on Downsian politics, examines how differences in candidate qualities move platforms towards or away from the average voter (Adams, 1999; Groseclose, 2001; Schofield, 2003). They provide first results on how voters' perceptions of the quality of candidates can influence election outcomes and political platforms. More recent contributions in this area include Evans and Chzhen (2016), Bernhardt et al. (2011), and Kendall et al. (2015).

Agency and screening models also contribute to the theoretical framework of this paper, as discussed by Ferejohn (1986) and Besley (2004). They illustrate how elections serve to both select and discipline politicians, emphasizing the importance of voter accountability in political selection, and are consistent with Besley's (2005) emphasis on the role of selection processes in the quality of governance.

In addition, the debate is increasingly concerned with the composition of the candidate pool, which provides valuable insights into the processes of political entry and selection. Gulzar (2021) distinguishes between an internal entry decision calculus (influencing the supply side of politics) and an external calculus (influencing the demand side). Institutional factors exert an influence that is exogenous to individual entry decisions. The candidate who ultimately holds office is therefore a product of the interaction between these two forces. The external forces can manifest themselves at the group level, such as political gate-keeping, elitism, and contact networks. Also, the institutional nature of electoral systems plays a role. For example, women in single-member constituencies are more likely to be elected under proportional representation than under first-past-the-post voting systems. Institutionalized quotas that determine the selection and pool of candidates also fall into this category (Arora, 2020; Beath et al., 2016; Grossman, 2014; Bagues and Campa, 2021).

Understanding the composition of the candidate pool is crucial for examining the factors that drive individuals to enter politics, which is a key aspect of political self-selection. The literature on political self-selection examines how sociopolitical factors such as compensation for office (commonly measured in wages) and opportunity costs influence the quality of politicians (Dal Bó and Di Tella, 2003; Dal Bó et al., 2017; Brollo et al., 2013; Gagliarducci and Nannicini, 2013). In order to explore the factors that drive people to become politically engaged, it is important to clarify the concept of political entry. The definition of political entry is simple and takes into account whether a person is formally and officially running for political office. The concept of political entry is similar to other measures of political participation, such as voter turnout or voting behavior. However, political entry is more

difficult to measure because the decision to run for office is a rare event that has posed major challenges for empirical research to date. Various solutions have been developed to address this rare event problem, with varying degrees of success. One of the biggest challenges is that political candidates are not normally distributed, so researchers would need to find enough future candidates to allow comparisons between those who run and those who do not (Gulzar, 2021). Therefore, previous literature has attempted to examine either individuals who have already run for office or a subset of individuals who have higher political aspirations and thus the desire and ability to run for office (Crowder-Meyer, 2020). Recent evidence from Pakistan by Gulzar and Khan (2024) in this area shows that individuals are more likely to run for office and that voters vote for them when prosocial motives are emphasized instead of personal gain. In addition, it is important to understand the circumstances that facilitate political participation in a population where the financial costs associated with such participation are significant. This requires an understanding of the political class as a whole. A common method is also to understand the entire population as the comprehensive candidate pool of electable politicians (Gulzar and Khan, 2024). Comparing the whole candidate pool with the candidates who actually enter politics provides an insight into the extent to which democracy produces competent leaders. Research on dynamics between competence, social groups, and parties, such as Banerjee et al. (2011); Galasso and Nannicini (2017); Mattozzi and Merlo (2015), shows how party strategies, social group dynamics and size can influence the quality of candidates.

The motivations behind individual entry decisions can also be explained by a simple cost-benefit model first formulated by Black (1972). This model states that individuals decide to run for office if the benefits of incumbency and the likelihood of winning an election outweigh the costs of campaigning. Extending this model to the returns to education may explain that in times of economic recession and rising unemployment, the returns from political office become higher than those from the private sector. In such scenarios, an individual may choose to run for office because the returns to education and the likelihood of winning an election outweigh the costs of campaigning. In their study of Spain, López-Rodríguez et al. (2021) estimate private returns to education for the period 2008-2019 and find that while average years of schooling have increased, returns to education have stagnated. They report a decline in returns of about 16% in 2019 and attribute this to labor market adjustments as a result of the Great Recession and the post-Great Recession period. These findings support the argument that the economic crisis has led to diminishing returns to lower education, incentives lower educated individuals to enter politics. Although, studies by Cebolla-Boado et al. (2015) and Requena (2015) have examined returns to education and their relationship to the Great Recession, the literature on returns to education and political entry is scarce.

Furthermore, a considerable body of literature deals with the political impact of the economic crisis on several aspects of political behavior (Hernández and Kriesi, 2016; Kriesi,

2014). Muñoz (2014) examines the impact of economic crises on political apathy in Spain. He shows that political disengagement increases significantly after prolonged periods of unemployment, suggesting that economic hardship leads to voter disenchantment and a general lack of interest in political participation. This finding is in line with Gallego (2007), Marx and Picot (2011) or Giugni et al. (2020), showing lower political participation, interest or concern among the unemployed. Besides the crisis, the general economic environment also exerts an influence on the electorate’s voting behavior, which can consequently impact electoral outcomes and selection processes. Wright (2012), for example, examines the relationship between unemployment rates and electoral dynamics and shows that the electorate adapts its voting behavior to economic factors. Economic downturns preceding an election may disadvantage politicians, as the electorate may vote them out of office or re-elect incumbents. This is part of the broad strand of literature on economic voting that is relevant to this paper (see also Healy et al. (2017) and Lippmann (2016)).

In contrast, the literature also examines how economic shocks promote political fragmentation under certain conditions. For example, Sanz et al. (2022) notes that corruption scandals in Spain have led to strong fragmentation, exacerbated by the economic crisis. This fragmentation is reflected in national elections, suggesting spillover effects from local political behavior to broader party dynamics and national contexts. The rise of new political parties such as *Podemos* and *Ciudadanos* benefited in particular from widespread dissatisfaction with traditional parties that were embroiled in corruption scandals and appeared ineffective in managing the economic downturn. Fragmentation could pressure local parties to adapt their nomination strategies. This could influence political selection processes at the local level and change the composition of local councils. This dynamic suggests that while economic crises can lead to political apathy, they can also lead to increased political engagement and a restructuring of the party landscape.

But what constitutes quality and what are competent politicians? The literature generally distinguishes between two concepts: On the one hand, policy performance and the quality of politicians are measured in terms of policy output, outcomes, the number of bills drafted, and the rules and regulations that politicians put in place to accomplish their tasks (Parthasarathy et al., 2019; Pitkin, 1967; Butler and Preece, 2016; Carreri, 2021). On the other hand, competence is measured by distinguishing between either cognitive abilities and characteristics or education. Lasswell (1986) was one of the first to define personality types and then examine the relationship between these and political leadership. Building on this, Dynes et al. (2021) focuses in his work on the *Big Five* personality traits and compares them with a sample of the US population and elected local politicians. Dal Bó et al. (2017) constructs leadership scores and compares Swedish politicians with population samples.

However, as in this paper, education is the most commonly used proxy to measure politicians’ quality and competence in related literature (Gulzar, 2021). For example, Besley

and Reynal-Querol (2011) and Dal Bó et al. (2017) argue that education is sufficient indicator of competence and effective political selection and leadership. In addition, Dahlgraad and Tue Pedersen (2019) shows that political candidates, even at local level, tend to have a higher level of education. Both Carreri and Payson (2020) and Carnes (2013) confirm this observation in the context of the United States, noting that even local politicians tend to have a higher level of education than the population they represent. In addition, Besley and Reynal-Querol (2011) finds that democracies produce more highly educated and thus more competent leaders than autocracies.

In contrast, there are a few studies that criticize the education proxy for political competence. Curto-Grau and Gallego (2021), for example, provides evidence from Spain that politicians with higher levels of education do not perform better than their less educated counterparts in terms of performance and fiscal policy outcomes. Across a broader range of performance indicators, Carnes and Lupu (2016) finds no evidence that better educated politicians necessarily perform better. Freier and Thomasius (2016) also find no impact of education on municipal spending and debt in German municipalities.

My paper draws on the findings that suggest that highly educated politicians tend to be more competent. This is in line with the findings of Heckman and Kautz (2012) who show that educated individuals display higher scores on cognitive and non-cognitive traits that predict job performance. Personality traits such as openness to experience, conscientiousness and emotional stability are also more common among more educated individuals. The correlation between education and desirable skills may be due to a mixture of self-selection of people with these traits seeking post-secondary education and formal education (Curto-Grau and Gallego, 2021).

The discussion of the individual educational characteristics of political candidates must also be considered within the context of political representation. Changes in the educational background of candidates could influence the representation of the political class. (Pitkin, 1967; Bagues and Campa, 2021; Bhusal et al., 2019) The extent to which a democracy produces not only competent leaders but also representative leaders is considered.

4 Empirical Strategy

4.1 Unit of Analysis

The primary unit of analysis in this study focuses on the educational backgrounds of local politicians in Spanish municipalities. The used datasets include all 8,131 municipalities in Spain. I focus on municipalities that reached at least 1,000 inhabitants in 2015. This threshold was chosen to ensure that the sample consists of municipalities that are large enough to provide meaningful results. Spain has around 47 million inhabitants and, according to the Spanish National Statistics Institute (INE), municipalities with more than 1,000

inhabitants make up the vast majority of the population.¹ Municipalities with a total of 45 million inhabitants are therefore included in the sample. After applying this criterion, 3,074 municipalities remained in the analysis. In addition, only municipalities with complete data for all specified election years (2003, 2007, 2011 and 2015) were included in order to obtain a balanced panel data structure with one observation per municipality and election year.

In related literature, the Basque Country and Catalonia are usually not included in studies on Spain (see e.g. Sanz et al. (2022), Dinas (2016), or Curto-Grau and Gallego (2021)), as they have unique political dynamics compared to the other regions. In order to obtain a clearer analysis, it is therefore common in related literature to exclude the regions. However, in order to obtain a more comprehensive overview of the whole of Spain, not to disregard economically strong metropolitan regions such as Barcelona and Bilbao/San Sebastian and to obtain stronger external validity, I refrain from excluding these regions from my sample. In conducting robustness checks, I show that the exclusion of these regions does not have a decisive influence on the results and that the exclusion only slightly increases the effect.

The analysis covers four years with local elections: 2003 and 2007 (pre-crisis period) and 2011 and 2015 (post-crisis period). These years were chosen to capture the impact of the economic crisis as an exogenous shock on local elections and the composition of local councils. The distinction between the pre-crisis period and the post-crisis period allows for a comparative analysis in a natural experiment with sufficient parallel trend analysis. Two observation points before and two after the crisis ensure that a sufficient differential effect is identified. In order to test for parallel trends, placebo tests are also carried out as part of the robustness tests. In this way, I show that slightly divergent pre-crisis trends in the treatment groups do not differ significantly from the control groups.

The municipalities were also divided into treatment and control groups based on their pre-crisis employment share. The construction and service sectors, which cover a wide range of occupations, were hit particularly hard by the crisis and are therefore an important focus area. Municipalities with employment rates at or above the 60th percentile were categorized as high employment municipalities, while municipalities below this threshold were categorized as low employment municipalities. This categorization resulted in 1,230 municipalities in the high employment group (treatment) and 1,844 municipalities in the low employment group (control). In addition, a high-intensity treatment and control group is formed, which has a high employment share before the crisis and extremely high unemployment after the crisis. By comparing the groups with high and low employment shares before the crisis, the aim is to determine whether the municipalities with high employment were exposed to stronger unemployment shocks due to the crisis.

Regarding the educational background of the councillors, the dataset contains back-

¹Municipalities with less than 1,000 inhabitants only account for around 3% of the total population.

ground information on the sector in which they worked prior to their political careers. However, the data on occupational background is unreliable due to inconsistencies in the last or first occupation, as well as the sometimes incorrect allocation and aggregation into sectors. To overcome this problem, the educational attainment of politicians is the primary variable of interest. I created an education index to assess the educational background of the municipality councils. The index weights primary and secondary education and incomplete education with a value of one, vocational training with a value of two and college education (bachelor's, master's, doctorate) with a value of three. This weighted sum is then divided by the number of municipal council seats, which is based on the number of inhabitants in the municipality.²

In addition, the study takes a closer look at the proportion of councillors without a university education and those with a university education in order to observe the dynamic development of education proportions. The aim of this step is to determine whether the proportion of people with a lower or higher level of education is increasing or decreasing, which enables a more differentiated understanding of the effects on dynamic changes in educational backgrounds.

As for the control variables, only a quota dummy is used. The gender quota was introduced in the Spanish local council elections in March 2007 with the Equality Law, which changed the general Spanish electoral law.³ As this can introduce exogenous changes in the candidate pool and also a change in the level of education of the elected politicians, this must be controlled for in the model. Furthermore, the study employs a fixed effects model to account for time-invariant municipal characteristics and uniform time shocks across municipalities, ensuring robust estimation of the crisis's impact.

Controlling for variables such as age, vote shares, voter turnout, education levels in parties, and gender may seem intuitively necessary to fully capture the characteristics of elected representatives. However, the influence of the treatment on the variables can lead to post-treatment biases that may confound the estimated effects.⁴

²The size of municipal councils in Spain is determined by the population of the municipality. For populations between 251 and 1,000 inhabitants, there are seven councillors. As the population increases, the number of councillors rises incrementally: Nine councillors for populations between 1,001 and 2,000, eleven councillors for populations between 2,001 and 5,000, thirteen councillors for populations between 5,001 and 10,000, and seventeen councillors for populations between 10,001 and 20,000. For municipalities with 20,001 to 50,000 inhabitants, there are 21 councillors, and those with 50,001 to 100,000 inhabitants have 25 councillors. For populations exceeding 100,000, one additional councillor is added for every extra 100,000 inhabitants. To ensure the council size is always an odd number, an additional seat is added if necessary.

³The gender quota was first introduced in the 2007 local elections in all municipalities with more than 5,000 inhabitants. For the 2011 elections, the quota was extended to all municipalities with more than 3,000 inhabitants. This threshold was also applied for the 2015 elections (Bagues and Campa, 2021)

⁴For a detailed discussion on avoiding post-treatment bias in audit experiments, see Coppock (2019).

4.2 Model Specifications

In this study, I use a two-stage Difference-in-Differences (DID) approach with two-ways fixed effects to first estimate the impact of the economic crisis on unemployment rates, followed by the estimation of its impact on the educational levels of politicians in Spanish municipalities. The DID method is particularly suitable for this analysis as it controls for unobserved heterogeneity by comparing changes over time between affected and unaffected groups, assuming parallel pre-treatment trends between the two groups. I deliberately avoid a triple DID approach in order to avoid inherent endogeneity problems that may arise with individual outcome variables and their interactions.

4.2.1 Stage 1: Pre-crisis Activity on Delta Unemployment Rates

The first stage estimates effect of the economic crisis on unemployment rates across municipalities. The model framework is specified as follows:

$$Unemployment_{mt} = \alpha + \mu_m + \gamma_t + \delta(PostCrisis \times PreCrisisEmploymentShare) + \epsilon_{mt} \quad (1)$$

where $Unemployment_{mt}$ represents the change in unemployment rate in municipality m and year t . Municipality fixed effects (μ_m) control for unobserved, time-invariant factors specific to each municipality, while year fixed effects (γ_t) account for universal time-specific factors affecting all municipalities. The interaction term ($\delta(PostCrisis \times PreCrisisEmploymentShare)$) captures the differential impact of the crisis in the treatment and control group that are determent by their economic pre-crisis activity.

This model is applied separately for the sector-unspecific and sector-specific treatment groups. Municipalities with pre-crisis employment rates in the 60th percentile and above form the high employment group (treatment), while municipalities below this threshold form the low employment group (control). This results in 1,230 municipalities in the group with high employment before the crisis and 1,844 municipalities in the group with low employment (control). Figure 3 illustrates the left skewed distributed change in unemployment in the municipalities before and after the crisis. The aim of the identification strategy is to ensure that the municipalities in question were affected by stronger shocks. The rationale behind the first stage is that municipalities with higher average economic activity experienced stronger unemployment shocks than municipalities with chronically high unemployment. This first stage is necessary to differentiate the treatment and control groups, as it is necessary to exclude municipalities from the treatment group that may have already experienced a treatment before the crisis. By precisely identifying these groups, the observed changes educational levels can be reliably attributed to the economic crisis, thus increasing the external validity of the analysis.

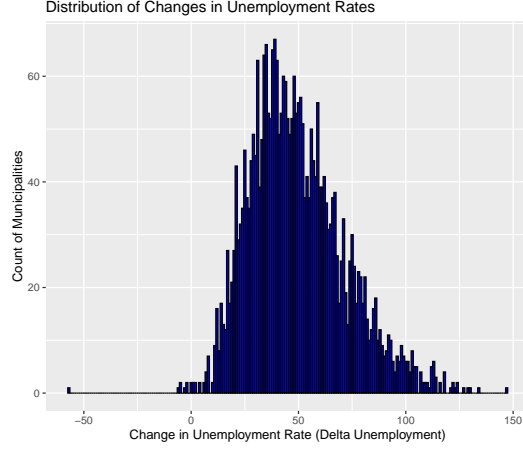


Figure 3: Distribution of Municipalities with varying Unemployment Change after the Crisis.

Note: The histogram shows the distribution of municipalities based on the change in unemployment rates after the crisis. The x-axis represents the change in delta unemployment. The left skewed distribution highlights the varied impact of the crisis on unemployment across different municipalities.

4.2.2 Stage 2: The Effect on Educational Levels of local Politicians

In the second stage, that will be center of analysis, I will estimate the effect of the crisis on the educational level of local politicians in municipalities affected by unemployment shocks. The model framework is specified as follows:

$$PoliticianEducationLevel_{mt} = \beta + \mu_m + \gamma_t + \theta(PostCrisis \times TreatmentGroups) + \epsilon_{mt} \quad (2)$$

where $PoliticianEducationLevel_{mt}$ represents the educational level of candidates in municipality m and year t , measured as average years of education. Municipality fixed effects (μ_m) and year fixed effects (γ_t) control for unobserved, time-invariant factors specific to each municipality and universal time-specific factors, respectively. The interaction term ($\theta(PostCrisis \times TreatmentGroups)$) indicates how post-crisis changes relate to politicians' education levels in crisis affected municipalities.

4.2.3 Counterfactual Imputation and different Outcome Variables

After performing the two-stage analysis, the second model specification is constructed with different dependent variables: (1) *PoliticianEducationLevel*, (2) *CounterfactualEducation* and (3) *DifferentialEducationLevel* (*PoliticianEducationLevel* - *Counterfactual Education*). For the *CounterfactualEducation* variable, a counterfactual imputation method is used to construct a counterfactual education index that is used both as an outcome variable and as a control variable. This variable was developed to assess the potential impact of changes in electoral outcomes and party education levels on the educational composition of local councils during the economic crisis. In this way, this approach accounts for two important sources of distortion: first, the differences in average education levels between political

parties that influence the educational composition of councils and, second, the shifts in vote shares for candidates with different levels of education before and after the crisis.

The counterfactual education index represents the hypothetical level of education that council members would have attained if the economic crisis had not occurred. It is constructed by retaining the educational levels of the parties from before the crisis (2003-2007) and updating only the vote shares to reflect the post-crisis period (2011-2015). This approach isolates the impact of the economic crisis on the educational composition of local councils. The difference between the observed education index and the counterfactual education index makes it possible to isolate the impact of the crisis on the political selection processes and the level of education in local councils:

$$\text{DifferentialEducationLevel}_{mt} = \text{EducationIndex}_{mt} - \text{CounterfactualEducationIndex}_{mt} \quad (3)$$

Using the counterfactual education index as the outcome variable, the estimates provide information on the impact of the crisis. If the estimates are close to zero, this indicates a minimal impact of the crisis on the education level of politicians, suggesting a stable quality of education. This means that the level of education of politicians after the crisis is similar to what it would have been if the crisis had not occurred. Positive estimates mean that the education level of politicians after the crisis is higher than it would have been in the counterfactual scenario, indicating that the crisis had a positive impact on education levels. Negative estimates mean that the education level of politicians after the crisis is lower than it would have been in the counterfactual scenario.

Using the counterfactual education index as a control variable makes it possible to control for several mechanisms. The political parties have different average education levels, and their different electoral success can influence the overall education index. In addition, the crisis may affect the education level of the candidates recruited by the parties. By controlling for the counterfactual education index, I can control for changes in party composition and candidate entry patterns that might otherwise influence the effect.

The calculations involved in constructing the counterfactual education index include:

1. Determining the total effect of the crisis on education levels in councils:

$$\text{Total_Effect}_{it} = \text{Observed_Education}_{it} - \text{BaselineEducation}_{pre-crisis}$$

This step measures the overall change in education levels by comparing the observed education levels during the crisis period with the average education levels before the crisis.

2. To estimate the mechanical effect, I assume that vote shares change as observed during the crisis but that education profiles remain at pre-crisis levels. The formula for

calculating the counterfactual average education level is given by

$$CounterfactualEducation_{it} = \sum_{j=1}^4 (VoteShare_{j,it} \times AvgEducation_{j,pre-crisis})$$

where $VoteShare_{j,it}$ represents the vote share of party j in municipality i at time t , and $AvgEducation_{j,pre-crisis}$ is the average education level of party j members before the crisis.

3. Calculating the mechanical effect arising from shifts in vote shares, assuming pre-crisis education profiles:

$$MechanicalEffect_{it} = CounterfactualEducation_{it} - BaselineEducation_{pre-crisis}$$

This step quantifies the change in education levels that is due to shifts in vote shares, assuming the education profiles of the parties remain constant.

4. Isolating the crisis effect:

$$IsolatedCrisisEffect_{it} = Total_Effect_{it} - Mechanical_Effect_{it}$$

By subtracting the mechanical effect from the total effect, we isolate the impact of the crisis on the educational levels of local councilors.

4.3 Data description

This study uses a comprehensive panel dataset from various high-quality sources to analyze municipal elections, their results, unemployment and the interaction with educational levels and other political characteristics in Spain from 2003 to 2015.

To identify the treated and non-treated municipalities, I first use the unemployment data from the Ministry of Labor and Social Economy and the Ministry of Digital Transformation and Public Service. The dataset contains comprehensive monthly employment and unemployment figures with information on age and gender, broken down by economic sector (construction, industry, agriculture, services) and type of employment (long-term contracts, short-term, transition to long-term, transition to short-term). This dataset is updated every year and is used in this paper for the period from 2003 to 2015. As the data set contains absolute employment and unemployment figures per municipality per month, in order to achieve comparability between municipalities of different sizes, the (un-)employment rates were scaled on the basis of the working population and the total population. To reduce the data set to four election years, the unemployment rates from each of the 12 months were averaged to one year and the non-election years were removed. The entire monthly data set for all years was merely used to present comprehensive unemployment figures.

Educational data and the background information of local politicians is extracted from a dataset collected from each municipality and submitted to the Spanish Ministry of Finance

from where it is available for research purposes. It contains the individual characteristics of local councillors elected in all election years. The most important variables extracted include the level of education of the councillors, their professional background, their party political background, entry and exit data and demographic data such as age and gender. The focus is on the educational level of the individual politicians. The focus on the occupational background is not considered, as it creates a number of shortcomings, since the data set does not describe exactly when the occupation was last practiced and whether it is the occupation originally trained or the occupation last practiced. The dataset was merged with the unemployment figures via municipality code and carefully restructured into a panel format organized by election year and municipality code to enable a longitudinal study of the characteristics of councillors and their development over several election cycles.

In addition, I have added a dataset of electoral data. This dataset was collected by the Spanish electoral authority and is from the Instituto Nacional de Estadística. It contains details such as the vote share of each candidate within their respective parties, the total number of eligible voters, the valid votes and the voter turnout.⁵ The final analysis dataset was an integrated panel created by merging individual datasets based on year and municipality code, so that there is one observation per municipality and year. This data set was then balanced so that only municipalities that are represented in all election years are included. The panel format allowed for two ways fixed effect modeling of the relationships between the economic conditions of the crisis, the characteristics of council members, and the election results in four municipal election cycles.

5 Results

5.1 Stage 1: The Shock and Identification of affected Municipalities

The two-way fixed effects model shows the different effects of the economic crisis on non-sector-specific employment and on municipalities with a high proportion of construction or services. Municipalities were identified that should experience stronger unemployment shocks due to their high economic activity before the crisis. Conversely, those with less pronounced pre-crisis activity or consistently high unemployment were assigned to the control group. The results in Table 1 confirm that the treatment groups experienced a more pronounced increase in the change in the unemployment rate than their control groups. The DID coefficients for the crisis treatment variable "PostCrisis*TreatmentGroups" show a significant increase in unemployment rates in all models.

The coefficient for the crisis treatment variable indicates that the treated municipalities experienced a crisis-induced increase in the unemployment rate that is 23 percentage points

⁵The data set uses a special calculation method in accordance with Article 205.2 of the LOREG, which makes it easier to derive the vote totals for individual candidacies.

higher than in the control group. Given an average change in the unemployment rate of 6.28, this represents a substantial relative increase and highlights the severe impact of the economic downturn on local labor markets.

Table 1: Impact of Economic Crisis on Unemployment Rates in Treatment Groups

Groups	(1) Total	(2) Construction Sector	(3) Service Sector
PostCrisis*TreatmentGroups	0.230*** (0.044)	0.290*** (0.015)	0.179*** (0.029)
Mean Unemployment Change	6.28	2.16	3.84
Observations	12,780	12,780	12,780
Model Specifications:			
Two-Way Model:	YES	YES	YES
Time Fixed Effects:	YES	YES	YES
Municipality Fixed Effects:	YES	YES	YES
Standard Errors Clustered By:	Municipalities	Municipalities	Municipalities

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $p < 0.1$.

The table shows the effect of the economic crisis on unemployment rates in different sectors. The interaction term PostCrisis*TreatmentGroups indicates a significant increase in unemployment rates post-crisis across the sector unspecific group (Total), the construction Sector and the service sector group. The highest increase observed in the construction sector. The mean change in unemployment provides an overview of how unemployment rates have changed in the post-crisis period and sets the coefficients in relation to the overall change.

The sector-specific estimates illustrate the different effects of the crisis. In the construction sector, the treatment effect shows an increase of 29 percentage points, with an average rate of change in unemployment of 2.16, reflecting the vulnerability of the sector due to its central role in the pre-crisis economic boom. The services sector saw a smaller increase of 18 percentage points, with an average rate of change in unemployment of 3.84. The wide range of occupations in this sector, from low to high-skilled jobs, had different effects, making employment figures less vulnerable to the crisis due to the heterogeneity of the occupations grouped in this sector.

Although the first stage results are not the main focus of the study, they play a crucial role in validating the identification strategy and goodness of fit for the second stage. The significant variation between the post-crisis groups suggests that the identified treatment effects are not just artifacts of the model, but reflect real economic shocks that affected municipal labor markets in Spain. The estimates for post-crisis unemployment rates confirm that pre-crisis employment shares are valid predictors of the severity of the shocks in the treatment and control groups. The successful identification strategy can also be seen in Figure 4, which shows parallel pre-crisis trends in the treatment and control groups, which then deviate in the treatment group from the trends in the control group. This visual representation confirms that municipalities with high economic activity experienced stronger shocks before the crisis, as they experienced a sudden change from high activity to high unemployment. The control groups experienced less pronounced shocks, as they either experienced lower activity before the crisis or lower unemployment after the crisis.

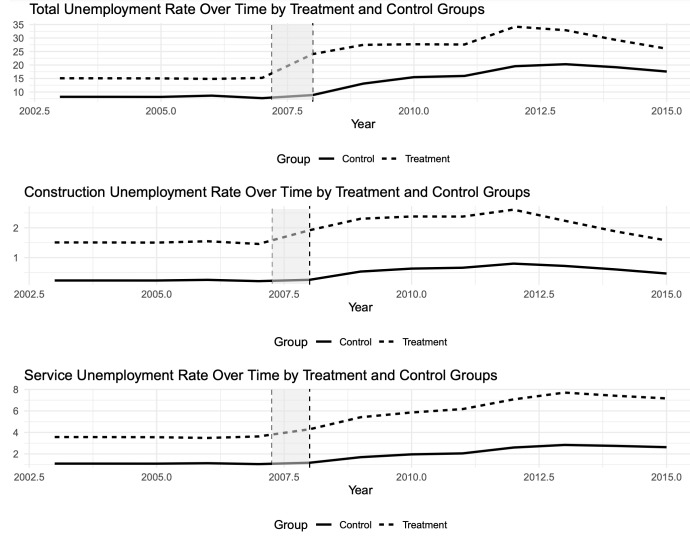


Figure 4: Unemployment in Municipalities with high vs. low Pre-Crisis economic Activity

Note: The plot shows the unemployment rates over time for municipalities with high and low pre-crisis economic activity across different sectors. The dashed vertical line marks the onset of the economic crisis, highlighting the differential impact on treatment and control groups.

5.2 Stage 2: Educational Levels of Council Member

The results of the Difference-in-Differences analysis of the educational levels of local councillors offer insights into the impact of the economic crisis on the various treatment groups. The models demonstrate differential effects of the crisis on the educational composition of local councillors, with the DID estimator reflecting these differential effects. In the baseline model, in which the normalized education index is the dependent variable, the coefficient for $\text{PostCrisis} * \text{TotalTreatmentGroup}$ is 0.030 just below the conventional significance threshold. This suggests a slight increase in the educational level of council members in the treated municipalities following the crisis. Although this trend is not statistically significant, it indicates that local politicians in the areas affected by the economic downturn tend to have higher levels of education.

In the second model, which uses the counterfactual education index as the dependent variable, the coefficient of the DID estimator is remarkably low at 0.002. The low coefficient in this model suggests that the observed effect is a combination of the effects in models 1 and 2, with the crisis-related effect being smoothed out by the counterfactual effect. This suggests that the crisis has influenced the educational composition of those entering local politics beyond what can be attributed to the crisis alone. Model 3, which isolates the crisis effect, shows a positive coefficient of 0.016, which is smaller and less close to reaching significance compared to Model 1.

Model 4, which includes the counterfactual education index as a control variable, shows an increase in the isolated coefficient to 0.017, although it remains statistically insignificant.

Table 2: DID Models for Sector-unspecific Unemployment on Council Education Levels

Outcome Variable:	Education Level	Counterfact. Education	Differential Education Index	Education Index (Counterfact.)
	(1)	(2)	(3)	(4)
PostCrisis*TotalTreatmentGroup	0.030 [*] (0.016)	0.002 [*] (0.001)	0.016 (0.019)	0.017 (0.019)
Quota	-0.017 (0.017)	-0.003 ^{***} (0.001)	-0.028 (0.018)	-0.030 [*] (0.018)
Counterfactual Education				0.168 (0.251)
Observations	12,334	10,299	10,299	10,299
Mean Education Level	1.057	1.045	1.045	1.045

Note: ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$, ^{*} $p < 0.1$;

All models control for time and local fixed effects and cluster the standard errors by municipality. This regression table contains the results of the DiD models examining the impact of sector-unspecific unemployment on the educational attainment of municipalities in Spain. Model (1) estimates the observed level of education as the dependent variable, while model (2) uses the counterfactual education index. Model (3) represents the differential education index, and model (4) uses the education index and controls for the counterfactual index. The coefficient for the interaction term is significant in models (1) and (2), indicating a notable impact of the economic crisis on educational attainment in these specifications. The coefficients in models (3) and (4) are not statistically significant.

The inclusion of the counterfactual education index controls for possible distortions due to fluctuations in the composition of the council caused by varying average education levels of parties and shifts in vote shares for candidates before and after the crisis. However, the counterfactual variable as a control must be interpreted cautiously due to its correlation with the outcome variable; Model 3 helps to contextualize the size of the coefficient.

The consistently low and positive coefficients in all models indicate a minimal trend towards a higher level of education among council members in municipalities affected by the economic crisis. However, after controlling and subtracting the counterfactual variable, no significant effect is observed, suggesting that the crisis has not led to more politicians with lower levels of education entering local politics.

An increase of 0.016 points in the education index means a small but significant shift towards a higher level of education among council members. If this is extrapolated to the treatment group, which includes 1,230 municipalities with more than 1,000 inhabitants, the overall effect can be estimated for the whole treatment group. With an average council size of about 13 councillors per municipality, there are about 16,000 councillors in the treatment group. An increase of 0.016 in the education index suggests that about 256 councillors in the treatment group have a higher level of education. However, this increase is extremely small and it is not possible to distinguish whether this is due to the normal course of events, chance, other factors or the crisis itself.

Several factors could explain this increase. The economic downturn may have disproportionately affected those with a higher level of education, contrary to the assumption

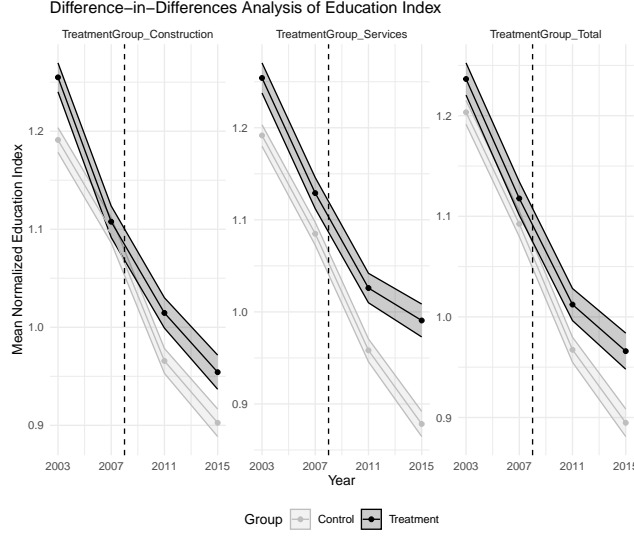


Figure 5: Difference-in-Differences (DID) Results

Note: The plot illustrates the DID analysis of the education index for local councillors across different treatment groups. The vertical dashed line marks the onset of the crisis. The analysis shows a general decline in the education index over time, with the treatment groups consistently maintaining a higher education index compared to the control groups. This trend indicates a shift towards better-educated political leaders during times of economic crisis.

that those with a lower level of education are more affected, so that political positions have become more attractive to those with a higher level of education. It could also be that people with higher levels of education felt compelled to become politically involved to help deal with the crisis, even if they had not lost their jobs. In medium-sized communities, it is common to hold office while holding another occupation (Bagues and Campa, 2021). In addition, political parties may have adjusted their strategies in response to the crisis and an increased political fragmentation, favoring candidates with higher levels of education who were seen as better equipped to deal with economic challenges. Voters facing unemployment may also have favored better-educated leaders because they believed they had the necessary skills to deal with the crisis effectively. However, due to the list-based electoral system in Spain, where party leaders determine the ranking of candidates, the mechanism on the voter side must always be considered in conjunction with the selection mechanism on the party side (Sweeting, 2009).

The counterfactual education index provides valuable insights into these mechanisms by isolating the effects of the crisis from pre-existing trends and party dynamics. The statistically significant changes in the counterfactual education index indicate that the level of education in the councils would have changed even without the crisis. This suggests that the crisis had little impact on the educational attainment of those who entered politics. It also suggests that party nomination strategies and voter preferences during the crisis favored better educated candidates, reflecting an adaptive response to the challenging economic conditions.

Figure 5 illustrates the results of the DID analysis of the education index for local councillors in different treatment groups. The analysis shows a general decline in the education index over time, with a more pronounced decline after the crisis. The treatment groups consistently have a higher education index in all sectors compared to the control groups, as shown by the smoother downward trend.

5.2.1 Sector-specific Treatment Group: Construction

A similar pattern emerges when the sector-specific treatment groups are used. For the construction sector, the DID estimator shows consistently positive non-significant coefficients. The result contradicts the original hypothesis that higher unemployment in the construction sector would lead to a decline in the educational attainment of council members.

Table 3: DID Models for Education Levels - Construction Sector

Outcome Variable:	Education Level	Counterfact. Education	Differential Education Index	Education Index (Counterfact.)
	(1)	(2)	(3)	(4)
PostCrisis*ConstructionGroup	0.016 (0.017)	0.001 (0.001)	0.029 (0.019)	0.017 (0.019)
Quota	-0.016 (0.017)	-0.003*** (0.001)	-0.029 (0.018)	-0.017 (0.018)
Counterfactual Education				0.168 (0.251)
Observations	12334	10299	10299	10299
Mean Education Level	1.057	1.045	1.045	1.045

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $p < 0.1$;

All models control for time and local fixed effects and cluster the standard errors by municipality. This table contains the results of difference-in-differences (DID) models to examine the impact of the economic crisis on educational attainment in the construction sector. Model (1) uses the observed level of education as the dependent variable, while Model (2) uses the counterfactual education index. (3) represents the differential education index, and (4) uses the education index and controls for the counterfactual index. The coefficients for the PostCrisis*ConstructionGroup interaction term are not statistically significant, indicating a limited impact of the economic crisis on educational attainment in construction sector strong municipalities.

One possible explanation is that the economic downturn in the construction sector might have led to a reassessment of career options among more educated individuals. Faced with economic uncertainty, these individuals could have seen an opportunity to contribute to economic recovery by entering local politics. The influx of more educated individuals might have been driven by the perception that their skills and knowledge were needed to navigate through the crisis effectively.

The counterfactual education index also illustrates this dynamic: the crisis led to a minimal increase in the counterfactual education index for the construction sector. Even when considering the educational composition that would have existed without the crisis, an increase in the educational level of council members can be observed. This indicates that the crisis had an impact on the educational composition of the councils that went beyond

the already existing trends.

Although the positive coefficient of the third model is not statistically significant, it suggests that the actual level of education in the treated municipalities was higher after the crisis than in the counterfactual scenario. This implies that the crisis may have prompted better-educated individuals to participate more actively in local politics, aiming to contribute to the recovery process and improve governance during challenging times.

5.2.2 Sector-specific Treatment Group: Services

In the service sector, the coefficients for the interaction term are positive and in some cases statistically significant. This suggests that the economic crisis pushed educated individuals from this heterogeneous sector into municipality councils.

Table 4: DID Models for Education Levels - Services Sector

Outcome Variable:	Education Level	Counterfact. Education	Differential Education Level	Education Index (Counterfact.)
	(1)	(2)	(3)	(4)
PostCrisis*TreatmentGroupServices	0.038* (0.017)	-0.003** (0.001)	0.001 (0.019)	0.017 (0.019)
Quota	-0.018 (0.017)	-0.003** (0.001)	-0.027 (0.018)	-0.017 (0.018)
Counterfactual Education				0.168 (0.251)
Observations	12334	10299	10299	10299
Mean Education Level	1.057	1.045	1.045	1.045

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$;
All models control for time and local fixed effects and cluster standard errors by municipality. This table presents the results from difference-in-differences (DID) models examining the impact of the economic crisis on education levels in the services sector. The significant coefficient in model (1) suggests a notable impact of the crisis on education levels, while the negative coefficient in model (2) indicates a decrease in the counterfactual education index. The results of models (3) and (4) are not statistically significant.

The counterfactual education index suggests that the educational composition of council members in the treated municipalities would have been lower in the absence of the crisis, underlining the impact of the crisis on increasing the educational attainment of political candidates.

The sector-specific analysis for the service sector shows that the crisis has contributed to higher levels of education among councillors, due to both the parties' strategic nominations and voters' preference for qualified leaders in difficult economic times. The results of the analysis suggest that the economic crisis has had small effects on the educational attainment of councillors in different sectors. The positive and in some cases significant coefficients for the DID estimators indicate that more educated people are entering local politics. However, this trend is barely significant and negligible. It is therefore difficult to conclude that crises affect political competency by manipulating the supply and demand for educated leaders.

5.2.3 Quotas

The coefficients for the quota dummy variables in all models are consistently negative. This suggests that municipalities with gender quotas tend to have slightly lower average education levels of council members. However, the small size of these coefficients indicates that while quotas have an effect, they do not drastically alter the educational composition of councillors.

These results should be interpreted with caution as they do not necessarily imply that gender quotas reduce the quality of elected officials. For example, Bagues and Campa (2021) provides evidence from Spain that the introduction of quotas is more likely to expand the pool of candidates from which leaders are selected, thereby improving the overall quality of leadership. The analysis shows that while quotas may slightly lower the average educational level of council members, the overall impact is relatively small. This underlines the fact that the quota variable is nevertheless indispensable as a control in the models.

5.3 Refined Analysis of Educational Proportions and Crisis Impact

Following the implementation of the first DID models, which revealed initial trends, the next step is to examine the proportion of educational levels in the local councils. This part focuses on the proportion of lower education levels (primary and secondary education, vocational training) and the higher education level (Bachelor, Master, PhD).

Table 5: DID Models for Educational Proportions

	(1) Total		(2) Construction		(3) Services	
Proportion	Lower Edu.	College	Lower Edu.	College	Lower Edu.	College
PostCrisis*TreatmentGroups	0.033* (0.015)	-0.006 (0.006)	0.007 (0.015)	-0.004 (0.006)	0.031* (0.015)	-0.007 (0.006)
Quota	-0.003 (0.015)	-0.014* (0.006)	-0.001 (0.015)	-0.014* (0.006)	-0.003 (0.015)	-0.014* (0.006)
Observations	12334		12334		12334	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $p < 0.1$;

All models control for time and local fixed effects and cluster the standard errors by municipality. This table presents the results of DID models examining the impact of the economic crisis on education shares in Spanish municipalities. Columns (1), (2) and (3) show the results for the total, construction and services sectors. The dependent variables are the proportion of councillors with low education and with tertiary education. The significant coefficients in the lower education category indicate a noticeable increase in lower educated councillors.

The results in Table 5 for these proportions provide a differentiated insight into the dynamic change in the proportional education levels in local councils. The analysis shows that the coefficient of low education in all treatment groups was positive at 0.033 after the crisis, indicating a modest but notable increase in the proportion of people without tertiary education after the crisis. In the service sectors, the coefficients were slightly smaller at 0.031. Conversely, the coefficients of the interaction term for the college education category

were negative and non-significant in all treatment groups.

These results suggest that although the normalized education index provides a broad measure of the educational composition of local councils, it may not fully capture the dynamic changes in educational levels caused by the economic crisis. This limitation results from the construction of the index itself, which weights varying levels of education differently. For example, one highly educated council member may offset the presence of several less educated new politicians, which distorts the actual proportions and expected impact of the crisis on educational attainment and blurs the effects.

In addition, variations in pre-crisis employment around the 60th percentile used to define the treatment and control groups may lead to inaccurate sorting and spillovers of these groups. Some municipalities that maintained high employment and were not as severely affected by the crisis could still be sorted into the treatment group based on their pre-crisis employment levels, which could affect the observed treatment. Although the average increase in unemployment in the groups is higher than in the control groups, some municipalities could bias the result.

To investigate the effect further, I refined the methodology and selected municipalities that had both very high pre-crisis employment rates and very high post-crisis unemployment rates in all sectors analyzed. This approach was intended to identify the regions that experienced the strongest shocks. This leads to an intensive treatment group of 749 treatment municipalities and 667 control municipalities. Within this refined group, 65% are in the construction group and 49% are in the services group.

Table 6: Stage 1 - Post-Crisis Unemployment in High Intensity Municipalities

Group	Intense Treatment
PostCrisis*IntenseTreatment	2.869*** (0.046)
Unemployment Rate Change	6.238
Observations	5,624

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

All models control for time and local fixed effects. The table shows the impact of pre-crisis employment on post-crisis unemployment rates in intensively treated municipalities. The coefficient for the interaction term is statistically significant, indicating a substantial effect of the crisis on unemployment rates in the intensively treated municipalities.

The DID model with the high-intensity group confirms the expected effects on unemployment rates. There is a strong increase in unemployment rates after the crisis for the intensive treatment group compared to the control group. Specifically, municipalities in the intensive treatment group experience an additional 2.869 percentage point increase in unemployment rates compared to the overall average change of 6.238 percentage points. This corresponds to about a 46% higher average increase in unemployment in the intensive treatment group.

With a sharp drop in the education index of 0.469, which corresponds to around 44.4%, the crisis had a strong impact on the high intensity treatment group. With an average ed-

Table 7: Summary of DID Models

Outcome Variable:	Avg. Education Index	Counterfact. Education	Differential Education Level	Education Index (Counter- fact.)
	(1)	(2)	(3)	(4)
PostCrisis*IntenseTreatmentGroup	-0.469*** (0.037)	-0.003** (0.001)	-0.439*** (0.040)	-0.442*** (0.041)
Quota	0.056 (0.037)	-0.003* (0.001)	0.029 (0.038)	0.026 (0.038)
Counterfactual Education				-0.110 (0.561)
Observations	5616	4670	4670	4670
Mean Education Level	1.057	1.045	1.045	1.045

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

All models control for time and local fixed effects and cluster the standard errors by municipality. This table presents the results of DiD models examining the impact of the economic crisis on different education indices in Spanish municipalities. Model (1) uses the average education index as the dependent variable, while model (2) uses the counterfactual education index. The significant coefficients indicate a notable impact of the economic crisis on educational attainment in the intensive treatment group.

ucation level of 1.057 and an average council consisting of about 13 members, this decrease translates into an average increase of around six council members with lower education levels. In the counterfactual education index model, the coefficient of -0.003 shows a slight decrease in the level of education, even in a scenario without a crisis. This suggests that education levels would have fallen slightly due to other factors, such as changes in vote shares or the average education level of party candidates. This could be due to changes in voter preferences, changes in party composition or other socio-political factors. However, the observed decline of -0.469 offers a contrast and shows that the crisis has exacerbated this decline beyond the modest expected change. The differentiated education index with a coefficient of -0.439 isolates the crisis-related treatment effect from mechanical effects. This significant negative deviation confirms that the crisis not only halted potential improvements in educational attainment, but also reversed progress. When controlling for the counterfactual education index, the coefficient remains significant at -0.442, underlining the robustness of the negative impact of the crisis on educational outcomes.

Several factors explain why the high-intensity treatment group shows the expected effect. On one hand, the shock may have led to people with lower levels of education moving into local councils after losing their jobs in order to contribute effectively to the economic recovery. On the other hand, the crisis may have increased the opportunity cost of political participation for those with higher education, who may have turned to more stable or lucrative opportunities in the private sector. There has also been a slow diversification of the economy, which has brought new opportunities (Ortega and Peñalosa, 2014). As a result, the candidate pool in these communities may have shifted toward those with lower levels of education, for whom political office became more attractive due to the higher returns to

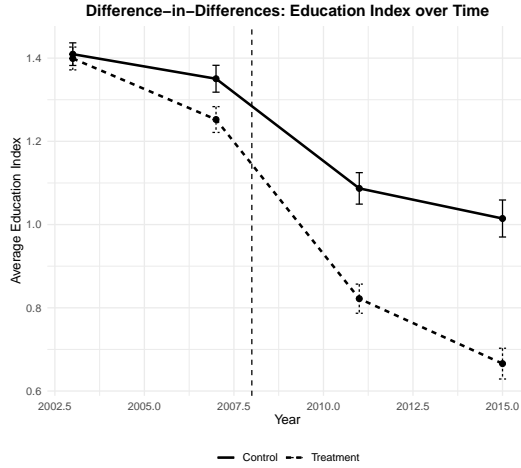


Figure 6: DID for High Intensity Groups

Note: The plot shows DiD analysis of the education index over time for the high intensity treatment groups. The vertical dashed line indicates the onset of the economic crisis. The analysis reveals a noticeable divergence between the treatment and control groups, with the treatment group experiencing a sharper decline in the education index. This suggests that the crisis had a pronounced impact on the educational composition of councils in intensively treated municipalities.

education.

Furthermore, the significant negative deviation from the counterfactual education index suggests that the crisis was not just a temporary setback, but a significant disruption that changed the trajectory of educational attainment in these communities. This suggests that in severely affected regions, the potential for improvement in education was not only halted but reversed, leading to a continued deterioration in the educational composition of the councils.

5.4 Discussion of Mechanisms

The analysis reveals that the crisis did not lead to a significant increase in educational levels in moderately affected municipalities. However, reducing the treatment group to the municipalities that experienced a severe shock allows a causal estimate of the hypothesized effect. As a result and to answer the underlying research question, it can be concluded that conventional business cycles should have little influence on the quality of politicians. Only exceptionally strong fluctuations might have an impact on the competence of politicians.

The high level of educated politicians in the municipalities before the crisis supports the observed effect, which can be attributed to the economic upswing before the crisis. The economic environment of exceptional growth in Spain before the crisis probably contributed to the higher educational level of local politicians, in the same way that the recession contributed to their lower level during the crisis. Consequently, better educated candidates were elected to political office before the crisis. The subsequent decline in educational at-

tainment during the crisis may therefore appear more pronounced, highlighting the contrast between the growth and recession periods. However, the pre-crisis level of education may also overstate the observed effects and limit the generalizability of the results. The exceptional economic boom followed by a severe downturn is a unique context that may not be directly transferable to other countries, situations or economic cycles. Although the results provide valuable insights into the impact of severe economic shocks, extrapolating them to more moderate economic fluctuations or other geographical contexts may lead to incorrect conclusions.

To understand not only whether but also how the crisis affects the educational background of politicians, it is important to discuss the underlying mechanisms behind this effect, which unfolds on both the supply and demand side of politics:

On the demand side, voters cast their votes for candidates with different educational backgrounds. Voter behavior changes during an economic crisis (Nezi, 2012), favoring candidates who are perceived as more representative or competent in dealing with the crisis because they are affected themselves. This dynamic could lead to candidates with lower levels of education being elected as voters' preferences temporarily change. Due to the limited data available, it is not possible to conduct a detailed analysis of the mechanism by examining electoral close races and comparing the educational level of the winning and losing candidates. As a result, it is not trivial to determine whether voters prefer candidates with higher or lower levels of education. However, the counterfactual index provides an approximation, even if it is not as accurate as an exact comparison of close candidate races. It shows that while the crisis has led to a decline in overall educational attainment, controlling for expected trends in the absence of the crisis can mitigate this effect, accounting for the influence of voter preferences and party compositions.

On the supply side of politics, parties, their candidates and the pool of candidates play a crucial role. Individuals decide to join a party or run for office within the party. Distinguishing between new candidates with no previous political experience and party members nominated by the parties is proving difficult, as the parties might have adapted their candidate recruitment and nomination strategies in response to the fragmentation pressures caused by the crisis (Sanz et al., 2022). They may have increased candidate representation by attracting less educated candidates and nominating candidates who appeal to a broader base of voters affected by the crisis. As a result, the crisis should also manifest itself in the average education levels in the individual parties and influence the general effect. Therefore, lower education levels in the parties that provide members to the councils should be responsible for the overall decline in education levels. However, this is not in line with Traber et al. (2018), who finds that the nomination and list positioning strategies of parties are less congruent with voters' preferences in times of crisis.

However, to investigate the party mechanism, I ran the DID models with the average

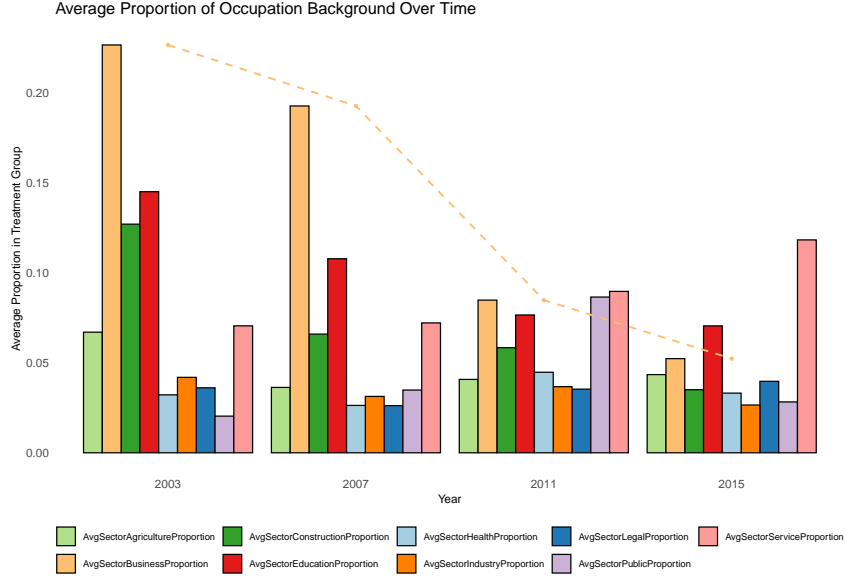


Figure 7: Average occupational Sector Background of Council Members

Note: The plot shows the average proportion of council members' occupational backgrounds over time. Each color represents a different occupation sector. The vertical dashed line indicates the onset of the economic crisis. The plot reveals shifts in the composition of council members' occupational backgrounds over the years, with notable changes following the crisis period.

level of education by party as the dependent variable, considering only the most successful parties. The full results in the appendix display consistently significant negative coefficients for the post-crisis estimates for the major parties (PSOE, PP, IU).⁶ This indicates a decline in the educational level of party members after the crisis, which points to a general decline in educational levels rather than a phenomenon limited to specific parties. However, the decline between the treatment and control groups is neither distinguishable nor significant. Only *Ciudadanos* (see appendix) shows a slight increase in education levels in the service sector, which is also not crisis-related. The observed decline indicates a crisis-related effect, which, however, generally occurs in treated and non-treated municipalities and contributes to the general decline in the education index. For these reasons and due to representation inconsistencies caused by the crisis, it can be concluded that there is no plausible basis for assuming a party mechanism driving the effect.

The individual mechanism of economic motivations on the supply side can explain the observed effect. During an economic downturn, individuals with higher levels of education may be less inclined to seek political positions that do not offer significant financial benefits. As a result, they may opt for more stable and lucrative opportunities in the private sector, reducing the quality of the candidate pool for local council members and leading to an

⁶Ciudadanos only provides reliable estimates in the sector-specific sectors. Podemos and Vox were only represented in the 2015 elections, but have not yet put forward many candidates (compared to the national elections). Major parties from the autonomous regions of the Basque Country and Catalonia have been excluded from the analysis. The municipalities from these regions have also been excluded from the analysis.

overall decline in educational attainment. Before the crisis, the returns to lower education were relatively high (López-Rodríguez et al., 2021), leading many less educated people to enter the labor market early, rather than invest more in higher education. The crisis may have significantly increased the returns to higher education, making it more profitable for educated people to aspire to work in the private sector rather than politics. This shift further contributed to the decline in the educational attainment of local councillors.

Figure 7 displays the composition of local councillors by sectoral employment background over time. It provides additional insight into the entry and exit dynamics of politicians. Although the data on occupational background is not entirely reliable, it indicates broader shifts in the composition of the candidate pool. The increase in councillors from the service sector after the crisis suggests that economic hardship has driven more people from this sector into politics. This influx could be attributed to economic necessity, as individuals from these sectors sought stable political positions in response to the loss of opportunities in the private sector.

Conversely, the decrease in council members from the business sector could be due to higher opportunity costs and higher returns to education in the private sector after the crisis. This trend points to the individual economic mechanism, as the corporate sector offered more opportunities after the crisis as the Spanish economy started to differentiate (Ortega and Peñalosa, 2014). This has led to higher returns to education and higher opportunity costs associated with leaving the private sector for political positions. Consequently, highly educated individuals from the corporate sector may have opted to stay in or return to the private sector as it offers more lucrative opportunities than political office.

As for the construction sector, Figure 7 shows an initial decline in the share of council members from this sector before the crisis, followed by a stabilization at a lower level after the crisis. This trend can be attributed to the pre-crisis construction boom, which led to a high number of employees in this sector. However, after the crisis, the construction sector was hit hard, leading to high unemployment. Many workers from this sector may have left politics as they focused primarily on finding new employment opportunities or coping with the economic consequences. The stabilization at a low level after the crisis indicates that fewer people from the construction sector returned to or entered politics, probably because the sector did not fully recover from its pre-crisis level.

However, although Figure 7 provides contextualization and additional insight into trends in local politicians' backgrounds, it should be noted that these observations should be interpreted with caution as they are purely descriptive. Running a DID model with these sectoral proportions as outcome variables would lead to a number of complications. The main reason for this is that the reliability of the occupational background data is not sufficiently robust, which could lead to misleading conclusions.

6 Robustness

To first confirm the DID assumption of pre-crisis parallel trends, I conducted a placebo test for both stages. The coefficient for the `PlaceboCrisis*TreatmentGroup` (see appendix) interaction term is not statistically significant, suggesting that the treatment and control groups did not differ significantly during the placebo-crisis period. The same applies to the extreme treatment group model, which graphically shows a somewhat steeper decline in the crisis in the treatment group. Again, I find no significant change compared to the control group. This supports the assumption of parallel trends and confirms that the differential effect observed in the analysis is due to the economic crisis and not to pre-existing trends or other independent factors, which increases the confidence in causality claims in this context.

Additionally, I also examine the impact of excluding municipalities from the Basque Country and Catalonia. The exclusion of these regions was considered to ensure that the results are not unduly influenced by their particular political dynamics. However, it was found that the results of the difference-in-differences analysis remained consistent even when these municipalities were excluded from the sample. Interestingly, the proportions for primary and secondary education increased when the Basque Country and Catalonia were excluded. This gives the results additional certainty, as the observed effects are not just artifacts of the political characteristics of these regions. Rather, they contribute to the external validity of the findings. The coefficients for the main outcome variables, including the normalized education index, the counterfactual education index and the education index difference, showed no significant changes, underlining the robustness of the results.

I also varied the weights of the education index to ensure that the results were not driven by weighting properties. Again, the results remain robust, even if the units of the coefficients vary proportionally to the varying size of the index.

7 Conclusion

I provide causal evidence that economic cycles influence the quality and competence of political leaders, especially during severe economic crises. Using a Difference-in-Differences approach, I show how such crises significantly alter the educational dynamics of local council members. In municipalities that experienced milder recession shocks, the crisis led to a barely visible increase in the number of educated politicians. However, in economically active municipalities where unemployment increased rapidly due to the crisis, a significant decrease in the average educational level of municipal council members was observed. These results indicate that normal economic fluctuations should have no influence on the competence of local politicians. Only when municipalities are exceptionally hard hit the selection process is influenced, which is the case in rare instances of a severe economic downturn. This can discourage educated individuals from entering politics or attract less educated candidates.

The Spanish economic growth period before the crisis has probably influenced the pre-crisis political landscape. High education indices before the crisis support these findings. Following the same logic as the observed effect, an economic upturn should lead to better educated politicians, as conversely a downturn leads to lower educated politicians. This was evident in highly active municipalities with very high unemployment after the crisis, where the education index fell sharply. The economic boom led to a generally high level of education in local councils, which then declined over time in both the treatment and control groups as a result of the crisis, with the decline being more pronounced in the high-intensity treatment group than in the control groups.

The study also highlights the limitations of using a weighted education index to fully capture these dynamics. Although the index provides a comprehensive overview of educational attainment, it cannot fully capture the proportional dynamics within communities, potentially leading to inaccurate conclusions. The refined analysis, which included a more precise identification of municipalities, revealed the need to consider both general and sector-specific effects in order to fully understand the impact of the crisis on political choice.

This results of the study improve the understanding of the intersection between economic conditions and political competence and provides a nuanced perspective that goes beyond traditional institutional factors. However, it also opens up several avenues for further research. Future studies could address some of the limitations of this study and extend the analysis. Due to a lack of data on the candidate pool, a more detailed examination of it, comparing the educational background of those who run for election with that of those who are elected, could provide more insights into how voters' preferences shift during economic crises and whether candidates with lower levels of education are more likely to be elected. Additionally, further research on the relationship between changes in the educational background of politicians and changes in their political performance is required. Curto-Grau and Gallego (2021) have already examined how the education of local politicians affects fiscal policy outcome and political performance in Spain. Examining how political outcomes change as a result of crisis-related changes in the educational attainment of councillors could provide a more accurate answer to the question of whether crises produce better or worse leaders.

Furthermore, examining the temporal evolution of the effects in moderate economic cycles and examining the geographic and economic background of communities would provide a more detailed understanding of the underlying mechanisms. A longitudinal study could address this and shed light on whether the observed trends are consistent or specific to the financial crisis. An additional comparative analysis of the Spanish context with other countries could improve the generalizability of the results.

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Appendices

A Descriptive Statistics

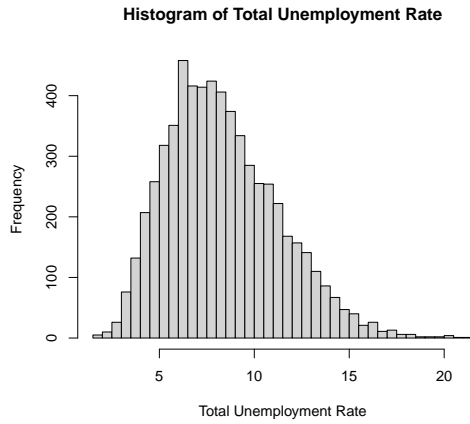


Figure 8: Distribution of Unemployment Rate in all years in Spanish Municipalities - The histogram shows the distribution of total unemployment rates across Spanish municipalities, with most municipalities having unemployment rates between 5% and 10%. The distribution is right-skewed, indicating that while the majority have moderate unemployment rates, a smaller number of municipalities experience significantly higher unemployment.

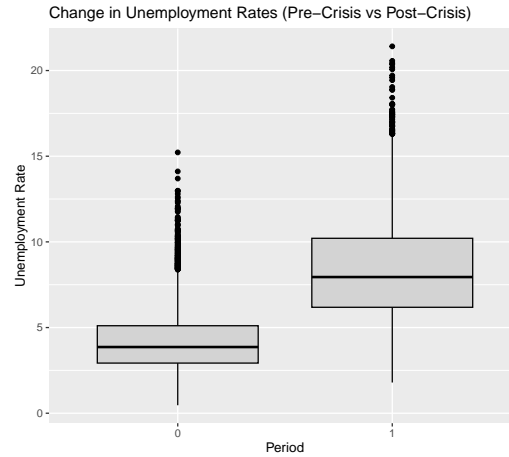


Figure 9: Pre- and Post-Crisis Unemployment - The boxplot compares the unemployment rates in Spanish municipalities before (0) and after (1) the financial crisis. It shows a noticeable increase in unemployment rates post-crisis, with higher median and greater spread, including more outliers. This indicates that the financial crisis led to significantly higher and more variable unemployment rates across municipalities.

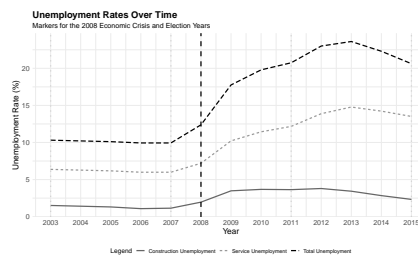


Figure 10: Unemployment rates over time across different sectors in, highlighting a sharp increase following the 2008 financial crisis.

B DID Models for Average Education by Party

Table 8: The table shows that the educational attainment of councillors in the PSOE, PP, and IU parties significantly decreased after the crisis, as indicated by the negative coefficients for the PostCrisis variable. The interaction term PostCrisis suggests that the decline in educational attainment was less pronounced in the treatment group municipalities, although these interaction effects are not statistically significant.

Party	PSOE	PP	IU
PostCrisis	-0.191*** (0.014)	-0.190*** (0.015)	-0.223*** (0.036)
TreatmentGroupTotal	0.012 (0.017)	0.032. (0.018)	0.021 (0.036)
QuotaDummy	0.023. (0.013)	0.019 (0.014)	-0.028 (0.028)
PostCrisis:TreatmentGroupTotal	0.012 (0.021)	0.016 (0.022)	0.063 (0.046)
Observations	10896	10215	3357

Note: $\cdot p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

All models control for time and local fixed effects and cluster standard errors by municipality.

Table 9: The table indicates that the educational attainment of councillors in the PSOE, PP, and IU parties significantly decreased after the crisis, as reflected by the negative coefficients for the PostCrisis variable. The coefficients for the TreatmentGroupConstruction variable are not statistically significant, suggesting no notable difference in educational attainment for councillors from the construction sector, except for one significant decrease. The interaction terms PostCrisis:TreatmentGroupConstruction show no significant mitigating effect on the decline.

Party	PSOE	PP	IU	Cs
PostCrisis	-0.187*** (0.015)	-0.188*** (0.015)	-0.224*** (0.036)	
TreatmentGroup_Construction	-0.008 (0.017)	0.008 (0.019)	0.005 (0.038)	-0.010 (0.079)
QuotaDummy	0.015 (0.013)	0.026 (0.014)	-0.032 (0.028)	0.200 (0.119)
PostCrisis:TreatmentGroupConstruction	0.008 (0.021)	0.009 (0.022)	0.065 (0.047)	
Observations	10896	10215	3357	488

Note: $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

All models control for time and local fixed effects and cluster standard errors by municipality.

Table 10: The table shows that educational attainment among PSOE, PP, and IU councillors significantly decreased after the crisis, as indicated by the negative and highly significant PostCrisis coefficients. However, the positive coefficients for the TreatmentGroupServices variable suggest that councillors from the services sector in these parties had higher educational attainment levels, with significant results for PSOE, PP, IU, and Cs. The interaction terms PostCrisis: TreatmentGroupServices do not show significant effects, indicating that the decline in educational attainment post-crisis is not mitigated by being in the services sector.

Party	PSOE	PP	IU	Cs
PostCrisis	-0.189*** (0.014)	-0.192*** (0.015)	-0.191*** (0.034)	- -
TreatmentGroupServices	0.050** (0.017)	0.058** (0.018)	0.090* (0.036)	0.178* (0.080)
QuotaDummy	0.003 (0.013)	0.013 (0.014)	-0.042 (0.028)	0.145 (0.121)
PostCrisis:TreatmentGroupServices	0.026 (0.022)	0.033 (0.023)	0.016 (0.046)	- -
Observations	10896	10215	3357	488

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

All models control for time and local fixed effects and cluster standard errors by municipality.

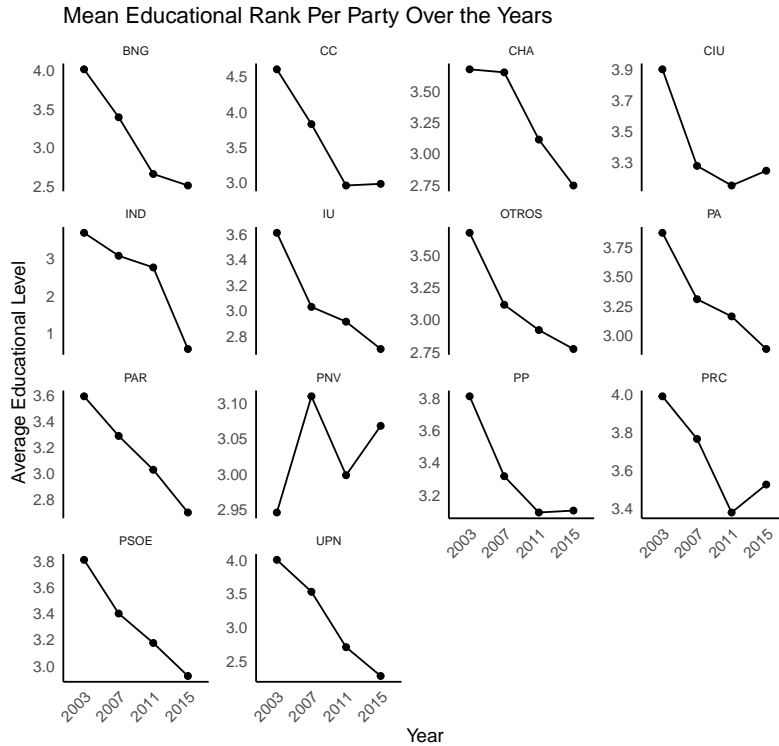


Figure 11: The figure illustrates varying trends in the average educational levels of councillors across different Spanish political parties from 2003 to 2015. While most parties show a decline in educational levels following the economic crisis, some, like PNV and PA, exhibit stabilization or even slight improvement between 2011 and 2015. It is noteworthy that this graph includes only established parties that were have obsevation in every electoin year, excluding newer parties like *Podemos*, *C's*, or *VOX*, which emerged later and might have different educational trends.

C Model without Catalonia and Basque Country

Table 11: The tables indicate that after the economic crisis, the normalized education levels of councillors in the treated group saw a marginally significant increase, with stronger significance when including the Basque Country and Catalonia. The negative impact of quota policies on education levels is consistent across both analyses, with significant effects on counterfactual education.

Outcome Variable:	Normalized Education Index	Counterfact. Education	Education Index Dif- ference	Normalized Educa- tion Index (Control)
	(1)	(2)	(3)	(4)
PostCrisis:TreatmentGroupTotal	0.033 (0.018)	0.002 (0.0001)	0.016 (0.019)	0.018 (0.019)
QuotaDummy	-0.027 (0.018)	-0.003** (0.001)	-0.029 (0.018)	-0.032 (0.018)
CounterfactualEducation				-0.106 (0.2627)
Observations	10103	9056	9056	9056

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$.

All models control for time and local fixed effects and cluster standard errors by municipality.

Table 12: DID Models Education Levels in Construction Group. Significant positive effect of the economic crisis on the normalized education index of council members in the construction sector, with greater significance when the Basque Country and Catalonia are excluded.

Outcome Variable:	Normalized Educa- tion Index	Counterfact. Educa- tion	Education Index Dif- ference	Normalized Educa- tion Index (Control)
	(1)	(2)	(3)	(4)
PostCrisis:TreatmentGroupConstruction	0.041* (0.018)	0.001 (0.001)	0.037 (0.019)	0.0378* (0.019)
QuotaDummy	-0.028 (0.018)	-0.002** (0.001)	-0.031 (0.018)	-0.034 (0.018)
CounterfactualEducation				-0.106 (0.263)
Observations	10103	9056	9056	9056

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$.

All models control for time and local fixed effects and cluster standard errors by municipality.

Table 13: DID Models for Education Levels in Services. The post-crisis period has led to a marginally significant positive effect on the normalized education index for council members in the services sector when the Basque Country and Catalonia are excluded. Including these regions, the second table shows a significant positive effect on educational attainment and a significant negative effect on counterfactual education, indicating regional differences in educational outcomes in the service sector after the crisis.

Outcome Variable:	Normalized Education Index	Counterfactual Education	Education Index Difference	Normalized Education Index (Control)
	(1)	(2)	(3)	(4)
PostCrisis:TreatmentGroupServices	0.0199 (0.019)	-0.0029** (0.001)	0.0049 (0.020)	0.0017 (0.020)
QuotaDummy	-0.026 (0.018)	-0.002* (0.001)	-0.028 (0.018)	-0.030 (0.018)
CounterfactualEducation				-0.099 (0.263)
Observations	10103	9056	9056	9056

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$.

All models control for time and local fixed effects and cluster standard errors by municipality.

Table 14: DID Models for Education Proportions. The table shows that the post-crisis period significantly increased the proportion of lower-educated councillors in both the overall and service sectors, while the quota policy significantly reduced the proportion of councillors with higher education in all sectors. The results remain robust even excluding Catalonia and the Basque Country, supporting the finding that the impact of the crisis had a positive effect on the proportion of lower educated councillors.

	Total		Construction		Services	
	Lower Education	College	Lower Education	College	Lower Education	College
PostCrisis * PreCrisisShare	0.032* (0.015)	-0.005 (0.006)	0.007 (0.015)	-0.003 (0.006)	0.030* (0.014)	0.007 (0.006)
QuotaDummy	-0.002 (0.014)	-0.014* (0.005)	-0.001 (0.015)	-0.014* (0.006)	-0.003 (0.014)	-0.014* (0.006)
Observations	12334		12334		12334	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$.

All models control for time and local fixed effects and cluster standard errors by municipality.

D Placebo Tests

Table 15: Placebo Test for Education Index - Results indicate that the coefficient for PlaceboCrisis:GroupTreatment is not statistically significant, which suggests that the treatment and control groups did not diverge significantly during the placebo crisis period (2005-2008). This supports the parallel trends assumption.

Outcome Variable:	Normalized Education Index
QuotaDummy	-0.014 (0.017)
Placebo Crisis * ControlGroup	-0.025 (0.019)
Placebo Crisis * TreatmentGroup	-1.27 (0.206)
Observations	12334

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

All models control for time and local fixed effects and cluster standard errors by municipality.

Table 16: Placebo Test for Education Index in high intensity Group - The results indicate that the coefficient for PlaceboCrisis*GroupTreatment is not statistically significant, which suggests that the treatment and control groups did not diverge significantly during the placebo crisis period (2005-2008). This supports the parallel trends assumption.

Outcome Variable:	Education Index
QuotaDummy	-0.002 (0.036)
Placebo Crisis * ControlGroup	-0.035 (0.021)
Placebo Crisis * TreatmentGroup	0.074 (0.058)
Observations	5933

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

All models control for time and local fixed effects and cluster standard errors by municipality.

E Education Index - Different Weights

The reason for the different weighting scheme is to emphasize the higher value and division between basic education, vocational training and academic education. Apart from a shift in the scaling, the same effect remains in all the different weighting schemes.

E.1 Different Weights: Primary*1 and Tertiary*3

Table 17: DID Models for Education Index with Different Weights in the Total Treatment Group

Outcome Variable:	Normalized Education Index	Counterfact. Education	Differential Education Index	Education Index (Control: Counter- factual)
	(1)	(2)	(3)	(4)
PostCrisis*TreatmentGroup_Total	0.018 (0.017)	0.002* (0.001)	0.016 (0.017)	0.017 (0.017)
QuotaDummy	-0.038* (0.016)	-0.003*** (0.001)	-0.035* (0.016)	-0.037* (0.016)
Counterfactual Education				0.246 (0.225)
Observations	10299	10299	10299	10299

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$

All models control for time and local fixed effects and cluster standard errors by municipality.

Table 18: DID Models for Education Index with Different Weights in the Construction Sector

Outcome Variable:	Normalized Educa- tion Index	Counterfact. Educa- tion	Differential Educa- tion Index	Education Index (Control: Counter- factual)
	(1)	(2)	(3)	(4)
PostCrisis*TreatmentGroup_Construction	0.026 (0.017)	0.001 (0.001)	0.025 (0.017)	0.026 (0.017)
QuotaDummy	-0.039* (0.016)	-0.003*** (0.001)	-0.036* (0.016)	-0.038* (0.016)
Counterfactual Education				0.246 (0.225)
Observations	10299	10299	10299	10299

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$

All models control for time and local fixed effects and cluster standard errors by municipality.

Table 19: DID Models for Service Education Index with Different Weights

Outcome Variable:	Normalized Education Index	Counterfact. Education Education	Differential Education Index	Education Index (Control: Counter- factual)
	(1)	(2)	(3)	(4)
PostCrisis*TreatmentGroupServices	0.003 (0.017)	0.003** (0.001)	0.0002 (0.017)	0.002 (0.017)
QuotaDummy	-0.036* (0.016)	-0.003** (0.001)	-0.034* (0.016)	-0.036* (0.016)
Counterfactual Education				0.251 (0.226)
Observations	10299	10299	10299	10299

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$

All models control for time and local fixed effects and cluster standard errors by municipality.

E.2 New Weights: Primary and Secondary*1, Vocational*2, Tertiary*3

Table 20: DID Models for Education Index in the Total Treatment Group

Outcome Variable:	Normalized Education Index	Counterfact. Education Education	Differential Education Index	Education Index (Counter- factual)
	(1)	(2)	(3)	(4)
PostCrisis*TreatmentGroupTotal	0.016 (0.024)	0.002* (0.001)	0.015 (0.024)	0.016 (0.024)
QuotaDummy	-0.068** (0.022)	-0.003*** (0.001)	-0.065** (0.022)	-0.067** (0.022)
Counterfactual Education				0.335 (0.314)
Observations	10299	10299	10299	10299

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$

All models control for time and local fixed effects and cluster standard errors by municipality.

Table 21: DID Models for Education Index in the Construction Treatment Group

Outcome Variable:	Normalized Educa- tion Index (1)	Counterfact. Educa- tion Index (2)	Differential Educa- tion Index (3)	Education Index (Counter- factual) (4)
PostCrisis*TreatmentGroupConstruction	0.036 (0.023)	0.001 (0.001)	0.034 (0.023)	0.035 (0.023)
QuotaDummy	-0.070** (0.022)	-0.003*** (0.001)	-0.068** (0.022)	-0.069** (0.022)
Counterfactual Education				0.331 (0.314)
Observations	10299	10299	10299	10299

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$

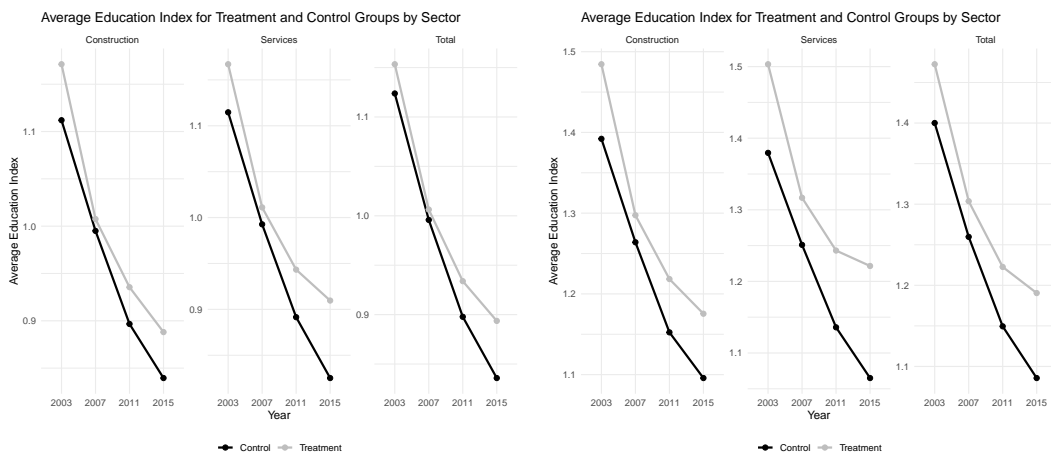
All models control for time and local fixed effects and cluster standard errors by municipality.

Table 22: DID Models for Education Index in the Services Treatment Group

Outcome Variable:	Normalized Education Index (1)	Counterfact. Education Index (2)	Differential Education Index (3)	Education Index (Counter- factual) (4)
PostCrisis*TreatmentGroupServices	0.014 (0.0240)	0.003** (0.0009)	0.011 (0.0240)	0.013 (0.0241)
QuotaDummy	-0.066** (0.022)	-0.003** (0.001)	-0.063** (0.022)	-0.065** (0.022)
Counterfactual Education				0.334 (0.3140)
Observations	10299	10299	10299	10299

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, $\cdot p < 0.1$

All models control for time and local fixed effects and cluster standard errors by municipality.



(a) DID Plot with Weights: Non-College*1 and College*3 (b) DID Plot with Weights: Non-College*1, Vocational*2 and College*3

Figure 12: Comparison of DID Plots with Different Weighting Schemes