Electoral Incentives to Obtain EU Grants

Francisco José Veiga[1,*], Linda Gonçalves Veiga[1], and Otto Swank[2]

Abstract: Political agency models predict that electoral concerns induce politicians to put effort into making policies that benefit citizens. We exploit the introduction of mayoral term limits in Portugal to investigate how electoral incentives affect incumbents' efforts to obtain EU grants. We focus on EU grants because getting them requires effort. Moreover, by obtaining EU grants, mayors can do more for their citizens. We focus on Portugal because it provides a quasi-natural experimental setting to determine the causal effect of electoral incentives on effort. We find that term-limited mayors receive about 30% less EU money than mayors eligible for reelection.

Keywords: Political Agency; Effort; Term limits; EU grants

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[*]**Correspondence address:** fjveiga@eeg.uminho.pt

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1 Introduction

This paper exploits the introduction of mayoral term limits in Portugal to investigate how electoral incentives affect incumbents' efforts to acquire EU grants. We find that term-limited mayors receive about 30% less EU money than mayors eligible for reelection. Our findings support political accountability models that show that elections enable voters to motivate politicians to exert effort into policies that promote the general interest (Barro, 1973; Ferejohn, 1986).

By now, there is a vast empirical literature on how elections incentivize politicians. This raises the question of why another empirical paper on this topic. We discuss three strands in the empirical literature on electoral incentives to demonstrate our contribution. First, several studies examine the effects of term limits and term length on legislative efforts. An attractive feature of these studies is their focus on measures that are close to legislators' actual efforts, such as bills introduced, bills cosponsored, and abstentions. Titiunik (2016) examines the effects of term duration on legislative behavior in states with randomly assigned term length [see also Titiunik and Feher (2018)]. She shows that senators in Arkansas, Illinois, and Texas with shorter term lengths exert less legislative effort. Exploiting a natural experiment in the Argentine Congress, Dal Bó and Rossi (2011) also finds that shorter term length reduces legislative efforts. Fouirnaies and Hall (2022) find that term-limited U.S. state legislators exert less legislative effort using an individual-level difference-in-difference design. Overall, the studies on legislator behavior convincingly show that term length and term limits affect legislative output. However, these studies do not show that the electorate ultimately benefits from these efforts.

After the Second World War, macroeconomists emphasized that governments should stabilize macroeconomic fluctuations. The political-business cycles literature - the second strand - argues that elections give incentives to politicians to *create* rather than stabilize cycles. Nordhaus (1975) argues that with myopic voters, governments try to achieve good economic outcomes when elections come near. Hibbs (1977) and Alesina (1988) argue that elections generate partisan cycles. The empirical literature on political business cycles is extensive.[1] Importantly, the general insight of this strand in the literature is that elections give *adverse* incentives to politicians and lead to undesired fluctuations.[2] [3]

Studies belonging to the third strand test political accountability models that show that elections enable voters to induce politicians to promote the general interest. The seminal paper is by Besley and Case (1995), who report that term-limited U.S. governors "reduce the effort expended to keep taxes and expenditures down" (see Besley and Case, 1995, p. 781). The term-limit effect was mainly caused by Democratic Governors raising taxes in their last term. Likewise, in Lopes da Fonseca (2020), Portuguese right-wing, term-limited mayors tend to pursue more conservative policies. A straightforward interpretation of these results is that being eligible for reelection weakens politicians' incentives to pursue partisan policies. However, evidence that politicians eligible for reelection move away from their preferred policy to increase their chances of reelection does not show that elections enable voters to induce politicians to promote the general interest. Partisan cycles are, after all, the result of elections. Hence, these studies show that electoral concerns weaken distortive behavior rather than motivate good behavior. Using the same natural experiment as Lopes da Fonseca

[1] See Dubois (2016) and Potrafke (2010) for reviews.
[2] An exception is Rogoff (1990), who argue that political budget cycles may be an efficient mechanism for diffusing information about the incumbent's competence and help voters to select more able politicians.
[3] Aidt and Shvets (2012) examine how electoral incentives induce legislators to bring more pork to their districts. In their study, electoral incentives also hurt society.

(2020) and us, Veiga and Veiga (2019) provide support for the Nordhaus model. Testing the existence of political budget cycles, they find that lame-duck mayors have smaller total expenditures and revenues than mayors eligible for reelection, especially in *election years*. Thus, electoral concerns *aggravate* fluctuations.

The above discussion about the second and third strands in the literature on electoral incentives shows that it is often difficult to discriminate empirically between political business cycle models and political accountability models. However, a small number of studies report direct evidence that elections motivate politicians to promote the general interest. First, using audit reports, Ferraz and Finan (2011) show that mayors with reelection incentives are less corrupt. As corruption can be seen as a "public bad," this result is in line with the central prediction of the political accountability model. Second, De Janvry *et al.* (2012) estimate the impact of a cash transfer program on school dropout rates. The national government finances the program. Municipalities determine who should receive the transfers. By comparing term-limited (second-term) mayors with first-term mayors who are reelected in the next election, De Janvry *et al.* (2012) control for differences in mayors' abilities. They report that the program's impact on school dropout was 36% higher in municipalities with mayors eligible for reelection. However, in the context of the same program, Frey *et al.* (2021) depict a more nuanced picture of electoral concerns on mayors' behavior. Using a regression discontinuity design, they show that electoral incentives induce Brazilian mayors to support the non-poor rather than the poor.[4]

Ideally, to test if electoral concerns incentivize politicians to exert effort, we need a political activity that (1) requires an incumbent's effort and (2) benefits all citizens. This

[4]For Mexico, Motolinia (2021) also presents evidence that electoral incentives can lead to particularistic legislation.

paper investigates how term limits affect Portuguese mayors' incentives to obtain grants funded by the European Union (EU). We focus on EU grants because getting them requires substantial effort. To obtain grants, a municipality must monitor calls, seek collaboration, and prepare grant proposals. Receiving grants relaxes a municipality's budget constraint significantly. From 1998 to 2022, it formed, on average, 8.8% of municipality revenues in Portugal. By obtaining EU grants, a mayor can do more for her citizens without raising taxes. As a result, citizens' preferences regarding EU grants are relatively homogeneous.[5] Section 3 provides further background on EU grants. Hence, EU grants satisfy the two requirements for testing the central prediction of political agency models. Obtaining them requires substantial effort and benefits all citizens.[6]

Our analysis focuses on *Portugal* for two reasons. First, mayors play a pivotal role within municipal executives. They enjoy considerable discretion in selecting their team of civil servants - a key factor in securing EU grants. Second, Portugal introduced mayoral term limits, which became binding in the 2013 municipal elections. This institutional change provides a quasi-natural experimental setting, constituting an ideal testing ground to analyze the effects of electoral incentives to obtain EU grants. It allows us to use a difference-in-differences approach across different groups of mayors before and after the reform. Most existing empirical studies on the impact of electoral concerns on public finance compare the policies of term-limited politicians with those of non-term-limited politicians. Our DiD approach allows for a causal interpretation of the estimated effects.

[5]EU grants finance a wide variety of projects. Two types of projects stand out. Among the Portugal 2020 projects, 231 were concerned with creating pedestrian and cycling paths, and 178 were concerned with wastewater treatment plant construction. These projects have the features of a public good.

[6]Previous studies have investigated the allocation of national transfers to municipalities [see, for example, Brollo and Nannicini (2012)]. These studies typically find that political alignment influences the allocation of these grants. Due to this, the allocation of national transfers is less appropriate for testing the main predictions of political accountability models. Political alignments between the EU and Portuguese municipalities seem far less strong.

To determine the causal effects of term limits on the EU grants municipalities received, we employ a dynamic Two-Way Fixed Effects (TWFE) model. Our sample covers six municipal elections, three terms before term limits become binding, and three terms (or cohorts) after term limits become binding. The estimates reveal that, on average, mayors not eligible for reelection obtain about 30% less EU funding. As, on average, EU grants form 8.8% of a municipality's revenues, 30% less funding means that, on average, a municipality's budget is 2.64% lower when its mayor is not eligible for reelection.

Since our study covers multiple treatment timings, we cannot rule out heterogeneous treatment effects. To detect possible heterogeneous treatment effects, we present event-study plots for each cohort separately. The plots for the three cohorts display similar patterns. We also use recently developed DiD estimators that account for heterogeneous treatment effects.[7] These estimators confirm our results.

2 Background: EU grants

The EU provides financial support through a wide variety of programs.[8] In Portugal, EU funds have been used to finance investment projects across practically all municipal intervention areas, including transportation, sewage, water supply, educational infrastructure, and housing (urban rehabilitation).[9] The European Regional Development Fund (ERDF) and the Cohesion Fund (CF) are Portuguese municipalities' most relevant funding sources. The

[7]For surveys of this recent literature see de Chaisemartin and D'Haultfœuille (2023) and Roth *et al.* (2023).
[8]Since joining the European Economic Community in 1986, Portugal benefited from seven programming cycles, five of which are covered in the paper: The Community Support Framework (1994-99), the Community Support Framework (2000-06), the National Strategic Reference Framework (2007-13), Portugal 2020 (2014-20), and most recently, Next Generation EU (2021-22) and Portugal 2030 (2021-29). The total allocation for the Portugal 2020 programming cycle was 26.89 billion euros.
[9]To illustrate, Table 1 of the Online Appendix provides data on the projects funded under the Portugal 2020 programming cycle, categorized on thematic objectives. Table 2 lists the investment priorities of the three main thematic objectives.

main objective of these programs is to reduce regional inequalities and foster sustainable development. EU funds contribute significantly to public investment.[10] In Portugal, EU cohesion funds formed 84% of government capital investment in 2017, the highest percentage among EU member states (EC, 2017). Furthermore, for the 1995-2023 period, Portuguese municipalities, on average, accounted for 45% of total public investment.

EU funding generally follows a shared management model, wherein the EU establishes priorities and strategic pillars, and member states define national strategic objectives and thematic domains. The Agency for Development and Cohesion handles the overall technical coordination of the European structural and investment funds in Portugal. The allocation of European funds to municipalities or other entities typically occurs through competitive calls to thematic or regional operational programs. Municipal project applications must satisfy selection criteria specific to the call. Typically, the technical managing authority for the program assesses applications, oversees project selection, and ensures that the spending aligns with EU and national priorities. Technical managing authorities regularly undergo audits by both national and EU entities.

Two features of EU funding procedures are essential for estimating the effect of term limits on mayors' efforts to acquire EU funds. First, acquiring EU grants requires effort, but effort does not guarantee the acquisition of grants.[11] Preparing EU grant proposals involves a series of complex steps, from identifying suitable funding opportunities to preparing a detailed and convincing proposal. Municipalities must demonstrate how their projects align with the EU's objectives and priorities and provide solid evidence of their capacity to deliver.

[10] Cohesion policy is the EU's main investment policy, accounting for 8,5% of government capital investment across the EU from 2015 to 2017 (EC, 2017).
[11] During the 2014-2020 programming cycle (Portugal 2020), the approval rate for *accepted* applications stood at 66% (AD&C, 2023).

Collaboration between different departments and consultation with external experts is often required to meet all requirements and criteria. Additionally, careful preparation of budgets and detailed timetables are essential, as is the ability to anticipate and mitigate risks. Our data shows how much EU money municipalities receive per year.[12] We are aware that this is only an imperfect measure of effort. Our measure does not include the effort made by mayors' teams that eventually did not lead to the acquisition of EU grants. Our empirical strategy relies on the assumption that the efforts mayors put into acquiring grants are closely related to the amount of EU money received.

Second, EU funding procedures take time. There are two main lags between a municipality's efforts to obtain EU funding and the actual transfer of EU money: the proposal lag, which is the time between the mayor's team efforts and the EU's funding decision, and the implementation and transfer lag, which encompasses the time between the EU's funding decision and the actual transfer of funds to the municipality, including the project implementation phase. Typically, payments are made in installments: an initial payment at the start of the project, interim payments, and a final payment upon project completion.

To form an idea about the length of these delays, we collected data on the projects funded under the PT2020 framework (2014-20) with mainland municipalities as project leaders (see Table 1 of the Online Appendix). Regarding the proposal lag, we found that most calls remain open for several months (usually 3 or 4), and most decisions are announced 30 to 60 working days (1.5 to 3 months) after the closure of a call. From the start of the calls to the commencement of the projects, the average duration is 246 days (around 8 months), with

[12]Although the dataset used to construct Tables 1 and 2 of the Online Appendix contains data on the total funding approved for each project, it does not indicate how much was transferred each year. Additionally, since only the project leader is indicated, it is not possible to know if there were partner institutions and how much funding they received. Due to these caveats of project data, we use municipal accounts data in our estimations (see Section 5.1).

a median of 216 days. This period accounts for the time required for proposal submission, evaluation, approval, and the preparation phase before the project implementation begins. Regarding implementation and transfer lags, the 4,269 projects led by municipalities in mainland Portugal had an average duration of 1,046 days, nearly 3 years, with a median of 897 days and a standard deviation of 668.8 days. The deadline for submitting the final request for funds typically ranges from 60 to 90 days after the end date of the project. The agency managing the European funds then has a maximum of 45 working days to transfer the funds to the municipality.

Due to these lags, there is no one-to-one relationship between receiving EU money and the mayor in office. Our event study plots approach allows us to deal with these lags in a flexible way.

3 Background: Portuguese Municipalities

On the mainland of Portugal, municipalities are the second-highest level of government, just below the central government. There are 278 municipalities.[13] Municipal elections are held countrywide every four years. Regarding the elections for the Municipal Council, voters cast ballots for closed party or independent local lists. The head of the list that receives the most votes becomes the mayor. After the election, the mayor forms a small team out of the

[13]There are 308 municipalities in Portugal, 278 on the mainland and 30 on the archipelagos of Madeira (11) and Azores (19). Municipalities in the islands can obtain grants from their regional governments and are entitled to ultra-periphery grants by the EU, which are unavailable to mainland municipalities. Therefore, to assure full comparability across municipalities, only the 278 located on Portugal's mainland are included in the sample used in the empirical analysis.

elected council members. The size of this team depends on the municipal population.[14] In addition, the mayor appoints directors of key municipal services.

The mayor's team operates as the executive body. As its figurehead, the mayor is the driving force behind policy initiatives, including applying for EU grants. The mayor's team prepares the municipal budget, which has to be approved by the Municipal Council and the Municipal Assembly. As far as we know, EU grants in the budget have never been challenged or disapproved, highlighting their attractiveness for municipalities.

Before the 2013 local elections, there were no constraints on the number of consecutive terms a mayor could serve. Due to this, many mayors were reelected, resulting in prolonged tenures in office. In 2013, 31 mayors had held their positions for over two decades. In 2005, Law 46/2005 was enacted to enhance mayoral turnover, imposing a limit of three successive terms. However, as a transitory measure permitted all mayors to seek re-election in 2009, the law only came into effect during the 2013 elections. In the 2013 elections, 149 of the 278 mayors were ineligible for re-election in the (mainland) municipalities. The number of term-limited mayors was smaller in the following two local elections, with 38 not eligible for re-election in 2017 and 46 in 2021.

Table A.1 in the Appendix presents data on municipalities' revenues. More than half of their revenues come from the national government or the EU. On average, European grants

[14]The number of municipal councilors with full-time executive functions that the mayor may appoint to her team equals one for 20.000 or less inhabitants; two for a population above 20.000 and below 100.000; and three for municipalities with 100.000 or more inhabitants. Porto and Lisbon have four councilors with executive powers. Two part-time councilors may be appointed for each full-time position available.

constitute 8.8% of municipalities' effective revenues and are mostly capital (96%). National grants to municipalities are predominantly formula-determined. How much formula-determined budget a municipality receives depends on its population, geographic characteristics, and fiscal capacity. By definition, the allocation of formula grants to municipalities does not depend on mayors' efforts. Consequently, formula grants form an excellent candidate for placebo falsification.

4 Hypotheses

Theoretical studies on political agency employ principal-agent models with the electorate (voters) as the principal and the politician (mayor) as the agent. In the context of our application, the key feature of the principal-agent model is that voters want their mayor to exert effort to obtain EU grants. As effort is costly, the mayor must be motivated. To provide incentives, voters coordinate on a voting rule that stipulates that if the municipality acquired sufficient EU grants, they reelect their mayor with a higher probability.

Obviously, voters can only incentivize their mayor to apply for EU grants if their mayor is eligible for reelection. This is why the introduction of binding term limits in 2013 in Portugal changed mayors' incentives. This brings us to our central hypothesis:

Hypothesis 1. *The introduction of term limits causes term-limited mayors to receive fewer EU grants than mayors eligible for reelection.*

Hypothesis 1 presents the main prediction of the political agency approach to electoral competition applied to effort provision. As such, we regard it as the primary hypothesis to be tested. Hypothesis 1 does not mean that term-limited mayors have no incentives to apply

for EU grants at all. Other career concerns may induce them to do so, or they may care about the population's well-being.

Mayors must allocate their efforts to various tasks. When elections approach, mayors might allocate more time to their campaigns and less time to EU grant applications (Titiunik, 2016). Thus, a multi-task model leads to the alternative hypothesis that term-limited mayors acquire more EU grants in the second part of their terms.

As discussed in Section 2, term limits became binding in Portugal in the 2013 elections but were announced in 2005. Before 2005, most mayors likely believed they could be re-elected many times. In 2005, however, mayors knew that they could only be reelected a limited number of times. If mayors look more elections ahead, the *announcement* of term limits weakens their incentives to exert effort to acquire EU grants in the 2005-2009 period. Hypothesis 2 results:

Hypothesis 2. *In the 2005-2009 term, mayors closer to their final terms acquired fewer grants.*

5 Data and empirical methodology

This section describes the data gathered and the empirical strategy followed to test our two hypotheses.

5.1 Data

We have built an extensive panel database covering all 278 Portuguese mainland municipalities with annual data from 1998 to 2022. This data set contains information on municipal

accounts, demographic and socioeconomic data for local jurisdictions, and election data for local and central governments.[15] Municipal revenue data was collected from the Directorate General of Local Authorities (*Direção Geral das Autarquias Locais* - DGAL). Electoral and other political data were obtained from the Ministry of Internal Affairs (*Ministério da Administração Interna* – MAI). Socioeconomic and demographic data were mostly obtained from the Portuguese Institute of Statistics (*Instituto Nacional de Estatística* - INE), and unemployment data from the Institute for Employment and Professional Training (*Instituto do Emprego e da Formação Profissional* - IEFP).

The revenues from EU grants used as the dependent variable are measured in euros per capita at constant prices in 2021. Since DGAL uses the cash-basis accounting method, revenues from EU grants (and other sources) are registered in the year cash is received. Due to the considerable variation across municipalities in the levels of per capita grants received, we take their natural logs. We use several control variables in our specifications. The EU conditions part of its funding decisions on local socioeconomic circumstances. To account for the need for EU assistance, we include the first lags of the average real wage in the private sector, the unemployment rate, and the share of senior citizens in the municipal population as control variables.

We also control for differences across municipalities regarding political circumstances. As more experienced mayors may be more able, we control for experience effects (Alt *et al.*, 2011). Specifically, we include a variable for the number of consecutive years the incumbent mayor has been in office. As age may also proxy experience and length of the political career, we also control for the mayor's age (in years). The presence of swing voters (Case,

[15] We use data after 1998 because three municipalities (Odivelas, Trofa, and Vizela) were created in that year and because 1997 is the first year for which there is data on municipal unemployment (one of the control variables used).

2001; Dahlberg and Johansson, 2002; Johansson, 2003; Cadot *et al.*, 2006) is proxied by electoral volatility in the municipality, calculated as the average of the changes in the vote shares of the five main political parties from the two preceding legislative elections, divided by the national average change. We expect that little electoral volatility weakens a mayor's incentives to exert effort.[16]

5.2 Empirical Analysis

To test our primary hypothesis that term-limited mayors put less effort into acquiring EU grants, we exploit the introduction of term limits that became binding in the elections of 2013. This exogenously determined institutional change (by a law approved in the Portuguese parliament) provides a quasi-natural experimental setting that can be used to assess the causal effects of term limits, which determine electoral incentives, on the mayor's effort to obtain EU grants. We apply a difference-in-differences (DiD) approach across time, with mayors being eligible for reelection and mayors not being eligible for reelection.

The empirical analysis uses the panel database described in Section 5.1. The sample period (1998 to 2022) covers a total of six complete 4-year terms, with three municipal elections before term limits became binding (2001, 2005, and 2009) and three with term-limited mayors (2013, 2017, and 2021). Of the 278 municipalities, 149 had term-limited mayors in the 2010-2013 term,[17] 38 in 2014-2017 and 46 in 2018-2021, while the remaining 45 municipalities never had a term-limited mayor during the sample period. Thus, there are

[16]Descriptive statistics for all variables used in this paper are reported in Table A.1 in the Appendix.
[17]Since these mayors were elected in October 2009 and inaugurated some weeks later, they governed their municipalities for just one or two months in 2009. They did not influence the intergovernmental grants received that year. Therefore, in the dataset, we treat their terms as starting in 2010. The same procedure is used for the following elections.

three treatment cohorts of municipalities, starting in 2010, 2014, and 2018, respectively, and a never-treated group of 45 municipalities.[18]

Our empirical analysis consists of three stages:

1. We estimate a dynamic Two-Way Fixed Effects (TWFE) DiD model to generate event study plots that are used for two purposes. First, the plots are used to check the balance between treatment and control groups.[19] According to Hypothesis 2, anticipation effects are possible, as term limits were announced in 2005 but only became binding for the 2013 elections. Second, the plots provide information about the timing of treatment effects, enabling us to determine the lags between mayors' efforts in acquiring EU grants and municipalities receiving EU money.

2. Since our application has multiple periods and three treatment timings, the standard DiD approach would compare newly-treated municipalities with already-treated ones. In stage 1, we avoid bad comparisons by excluding municipalities after their treatment window ends. In stage 2, we use recently developed DiD estimators that account for heterogeneous treatment effects and variations in treatment timing. These estimates are presented in the Appendix.

3. Finally, we use a placebo falsification. To this end, we replace our dependent variable EU grants with formula-determined grants. As how much formula-determined budget

[18]The data for 2022 is used only to check if the effects of term limits persist after the term-limited mayors of the 2018 cohort leave office.

[19]The validity of the DiD framework requires that treated and control municipalities exhibit similar trends in EU grants in the pre-treatment period and that treatment assignment is as-if random. We believe that both requirements are met in our setting. First, Figure 1 of the Online Appendix shows that the EU grants received by treated and not-yet-treated (control) municipalities exhibit similar behaviour, and the joint nullity of pre-treatment effects is never rejected in our estimations. Second, Table 3 of the Online Appendix shows that treatment assignment is uncorrelated with the control variables used in the estimations, except for the obvious case of the mayor's years in office (which legally determines whether a mayor is term-limited or not). Finally, balance tests, shown in Table 4 of the Online Appendix, provide further support for the validity of the DiD framework.

a municipality receives does not depend on mayors' efforts, formula grants are suitable for placebo falsification.

6 Empirical Results

This section first discusses the empirical specification and presents the event plots of the dynamic TWFE model. Next, it shows the results of the placebo tests.

6.1 Dynamic TWFE DiD model

Let $TL^j_{i,t}$ be a dummy indicator equal to 1 j periods relative to i's first year of treatment ($j = 0$). We estimate the following dynamic TWFE specification:

$$ln(g_{it}) = \sum_{j=-8}^{-2} \delta_j TL^j_{it} + \sum_{j=0}^{3} \delta_j TL^j_{it} + \sum_{j=4}^{5} \delta_j TL^j_{it} + \mathbf{X}'_{it}\gamma + \mu_i + \lambda_t + \varepsilon_{it}, \tag{1}$$

$$i = 1, ..., 278 \qquad t = 1998, ..., 2022$$

where $ln(g_{it})$ is the natural logarithm of EU grants in municipality i in year t, $\mathbf{X}_{it}$ is the vector of control variables, μ_i are municipality fixed effects, λ_t are year fixed effects, and ε_{it} is the error term.

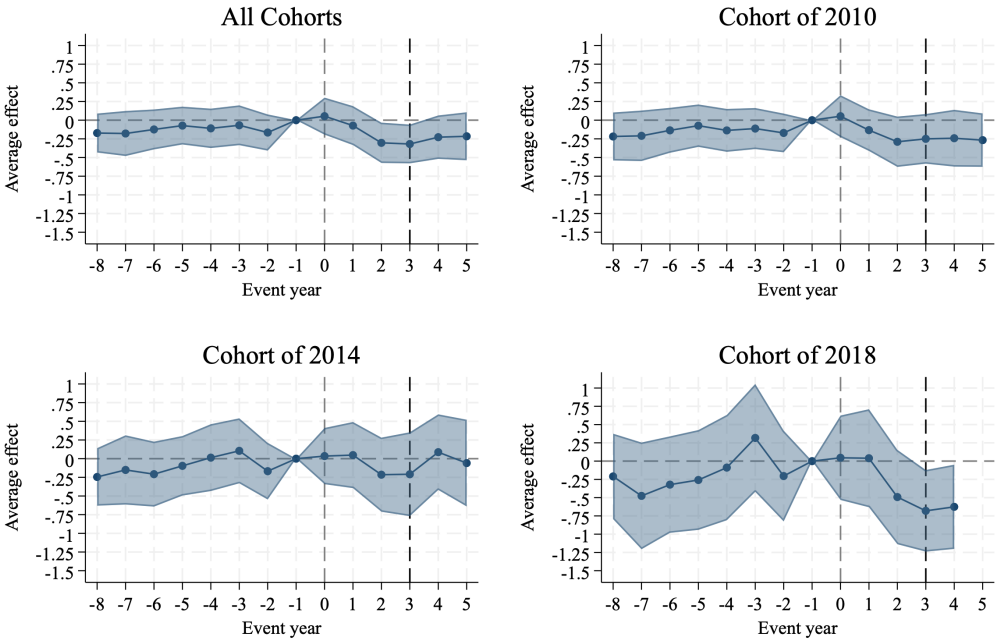
The first term of the right-hand side of (1) includes the pre-treatment period dummies (the first pre-treatment period, $j = -1$, is used as baseline). Following de Chaisemartin and D'Haultfœuille (2023), we apply endpoint binning to the pre-treatment (placebo) period. That is, TL^{-8}_{it} equals one for all observations eight years or more before treatment. The

parallel-trends assumption requires that the control and treatment groups are comparable in the pre-treatment period. Thus, the pre-treatment parameters must be close to zero. Anticipation of term limits jeopardizes the validity of this assumption (see Hypothesis 2). The second term represents the treatment years, the term in which municipality i's mayor is not eligible for reelection. Because of the proposal and implementation lags, we expect δ_0, and possibly δ_1, to be close to zero. The third term includes two lagged-treatment effects. Because of the proposal and implementation lags, δ_4 and δ_5 could be negative. As we exclude municipalities for $j > 5$, we do not have coefficients for those years. In estimating (1), never-treated and not-yet-treated municipalities form the control group. The coefficients δ_0 to δ_5 represent treatment.

Figure 1 displays the estimates of the effects of term limits (δ_j) on EU grants. The estimated Average Treatment Effects on the Treated (ATET) and t-statistics for event years 0 to 5 are reported in Table A.2 in the Appendix. The top-left graph presents the estimates for the entire sample. At the beginning of event year 0, a term-limited mayor takes office. At the end of event year 3, she leaves office. The estimates for the pre-treatment years are nearly at the zero line and are never statistically significant. This indicates that the municipalities in the treatment and control groups are similar. The estimate for δ_1 and especially the estimate for δ_0 are also nearly zero. However, the estimates for δ_2 and δ_3 are negative (-0.303 and -0.319, respectively) and significantly different from zero. These results indicate a time lag of at least one, and more likely, of two years. The estimates for the lagged-treatment coefficients ($j > 3$) are also negative but not statistically significant.[20] However, the hypothesis that the estimated effects of years 3 and 4 are equal is not rejected

[20]Including municipal-specific trends leads to larger estimated effects (see Figure 2 and Table 6 of the Online Appendix) but takes away much of the variation in grants, making the estimates potentially less reliable.

Figure 1. *Average Treatment Effects of Term Limits on EU Grants*



Notes: This figure shows the estimated effects (ATET) of mayoral term limits on the EU grants received by Portuguese mainland municipalities. Event-study plots for dynamic TWFE estimations, using the never-treated and the not-yet-treated municipalities as the control group. Standard errors are clustered at the municipal level and 95% confidence intervals are shown. The vertical dashed lines indicate the first and last years of the treatment period. Estimated ATET and t-statistics for the post-treatment period are reported in Table A.2.

(see the last row of Table A.2). Thus, although there seems to be a return to pre-treatment levels, it may not be immediate. Overall, the top-left graph of Figure 1 provides support for Hypothesis 1 that term-limited mayors acquire fewer EU funds. Moreover, the graph

indicates a time lag of two years.[21] Figure 1 does not provide support for the multi-task model, predicting that mayors running for reelection acquire fewer EU grants.

The other three graphs in Figure 1 present event-study plots for each cohort separately. In all cases, the estimates for the pre-treatment years do not significantly differ from zero. This gives extra credibility to the parallel-trends assumption. The estimates for the 2010 cohort do not provide support for hypothesis 2, which posits that mayors whose final term would begin in late 2009 acquired fewer grants in the 2005-2009 term. Since the estimated effects for event years -5 to -1 are not statistically significant, there is no indication of anticipation effects.

Though the estimates for δ_j for each cohort are less precise than the estimates for the entire sample, the graphs show very similar patterns. For each separate cohort, the estimates indicate the most pronounced effects in the last two years of limited mayors' terms. Moreover, for the 2010 and 2018 cohorts, the estimates remain negative after the term-limited mayor leaves office ($j > 3$). As the sample ends in 2022, we cannot present estimates for the second post-treatment year of the cohort of 2018.

Recent studies argue that TWFE estimations may be biased in settings with multiple periods and cohorts if treatment effects are heterogeneous (de Chaisemartin and D'Haultfœuille, 2023; Roth *et al.*, 2023). To further check the robustness of our results, we test for the effects of term limits on EU funding using the DiD estimators that account for heterogeneous treatment effects and variations in treatment timing proposed by Borusyak *et al.* (2024), Callaway and Sant'Anna (2021), de Chaisemartin and D'Haultfœuille (2021), Sun

[21] As a robustness check, a static TWFE DiD model, described in Section 3 of the Online Appendix, was also estimated. The results reported in Table 5 of the Online Appendix are consistent with those of the baseline dynamic model, further indicating that municipalities with term-limited mayors receive fewer EU grants in the last two years of the 4-year term.

and Abraham (2021), and Wooldridge (2021). In the Appendix, Figure A.1 presents the event plots of the estimates (see also Table 7 of the Online Appendix).[22] Generally, the results for these alternative estimators are similar to those for the baseline TWFE model (Figure 1), reproduced in the top-left corner of Figure A.1.[23]

6.2 Placebo

Our finding that the pre-treatment coefficients are close to zero confirms the validity of the DiD approach. Another well-known way to determine the validity of the DiD approach is placebo falsification.

A good candidate for placebo falsification is data on formula-determined national grants. These grants are determined by a formula stipulated in the local finance law. Hence, the allocation of these grants does not depend on its mayor's effort, nor on whether she is term-limited or not.

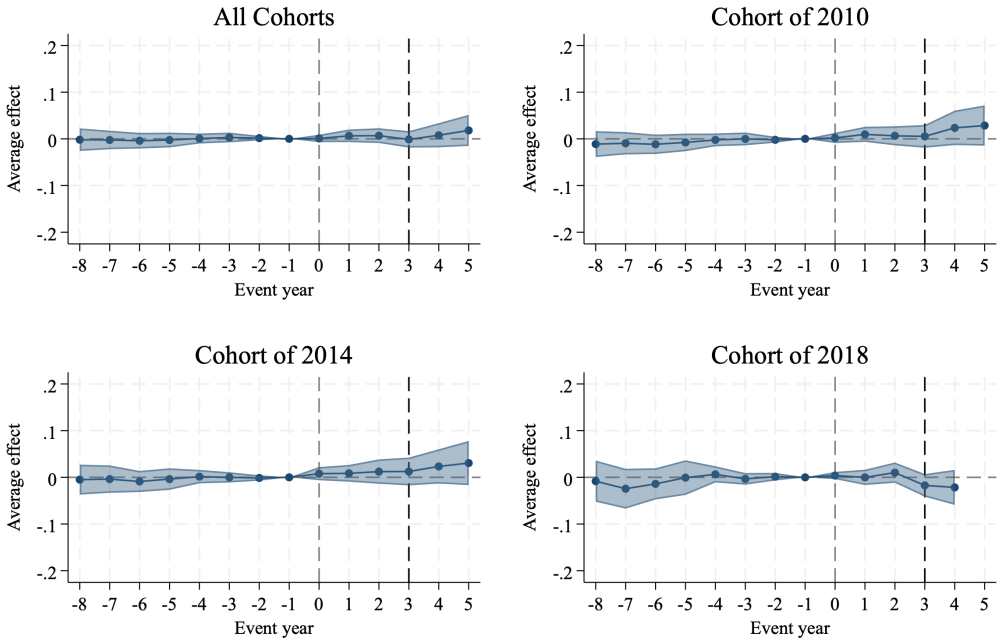
We estimate (1), and replace $ln(g_{it})$ with the natural logarithm of formula-determined national grants to generate event-study plots for the entire sample and for each cohort separately. The event plots, shown in Figure 2, indicate that our findings regarding the effects of term limits on EU funding are not the result of unobservables not captured by the year fixed effects, the municipality fixed effects, or the control variables. All coefficients are close to zero, showing that term limits do not affect the allocation of formula-determined grants across municipalities (see also Table 9 of the Online Appendix).[24]

[22]Figure A.1 closely follows Figure 3 of de Chaisemartin and D'Haultfœuille (2023), and part of their *Stata* code was used. Event year -1 is the baseline, except for Borusyak *et al.* (2024) which uses event year -8, and Wooldridge (2021) for which no estimates of pre-treatment placebos are reported.

[23]To further check the robustness of the results, we also estimated the models excluding the control variables. The results, shown in Figure 3 and Table 8 of the Online Appendix, are similar to those obtained when including the set of control variables (Figure A.1).

[24]Additional robustness checks to our baseline results consisted of estimating the baseline TWFE DiD model for EU grants on two restricted samples. First, to better filter out eventual seniority effects, the municipalities

Figure 2. *Average Treatment Effects of Term Limits on Formula-Determined Grants*



Notes: This figure shows the estimated effects (ATET) of mayoral term limits on the formula-determined grants received by Portuguese mainland municipalities. Event-study plots for dynamic TWFE estimations, using the never-treated and the not-yet-treated municipalities as the control group. Standard errors are clustered at the municipal level and 95% confidence intervals are shown. The vertical dashed lines indicate the first and last years of the treatment period. Estimated ATET and t-statistics for the post-treatment period are reported in Table 9 of the Online Appendix.

7 Conclusion

We have investigated how being eligible for reelection affects Portuguese mayors' incentives to apply for EU grants. Our main finding is that term-limited mayors reduce their efforts to

whose term-limited mayors had been in office for over 20 years were excluded from the sample. As shown in Figure 4 and Table 10 of the Online Appendix, the results remain essentially the same. Second, bigger municipalities (with a population above 100.000 inhabitants) were excluded to check the hypothesis that the effects of term limits are larger in smaller municipalities, where mayors play a more prominent role and have greater difficulty shifting most of the grant application process to their teams and staff. As shown in Figure 5 and Table 11 of the Online Appendix, the results are indeed stronger than those of the baseline estimations.

acquire EU funding. In the last two years of their terms, term-limited mayors receive about 30% less EU money than mayors eligible for reelection. The estimates do not reveal any announcement effects.

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Appendix

Table A.1. *Descriptive Statistics*

VARIABLES	N. Obs.	Mean	S.D.	Min.	Max.
Real per capita grants, at 2021 prices (Source: DGAL)					
Log of European Union Grants	5,752	3.86	1.52	0.00	7.09
Log of Formula Grants	5,752	6.02	0.74	4.08	7.81
European Union Grants	5,752	99.81	113.49	0.00	1,200.64
Formula Grants	5,752	533.87	380.55	59.10	2,472.95
EU Grants (% Effective Revenues)	5,752	8.79	7.33	0.00	64.47
Formula Grants (% Effective Revenues)	5,751	47.29	17.09	3.02	87.94
Effective Revenues	5,752	1,053.04	498.31	206.78	3,706.30
Political variables (Source: MAI)					
Term-limited mayor (TL)	5,752	0.16	0.37	0.00	1.00
Mayor's years in office	5,752	8.30	6.54	1.00	37.00
Mayor's age (in years)	5,752	52.20	8.13	25.00	78.00
Mayor 1st or 2nd term	5,752	0.60	0.49	0.00	1.00
Electoral volatility	5,752	0.96	0.29	0.12	3.12
Economic and demographic variables (Source: IEFP and INE)					
L.Average real wage	5,752	899.02	172.30	581.36	2,391.92
L.Unemployment rate	5,752	6.61	2.70	1.38	18.48
L.% Population above 65 years old	5,752	22.42	6.24	7.99	45.87

Note: To avoid missing or large negative values of Log EU grants, they are set to zero when EU grants are smaller than one.

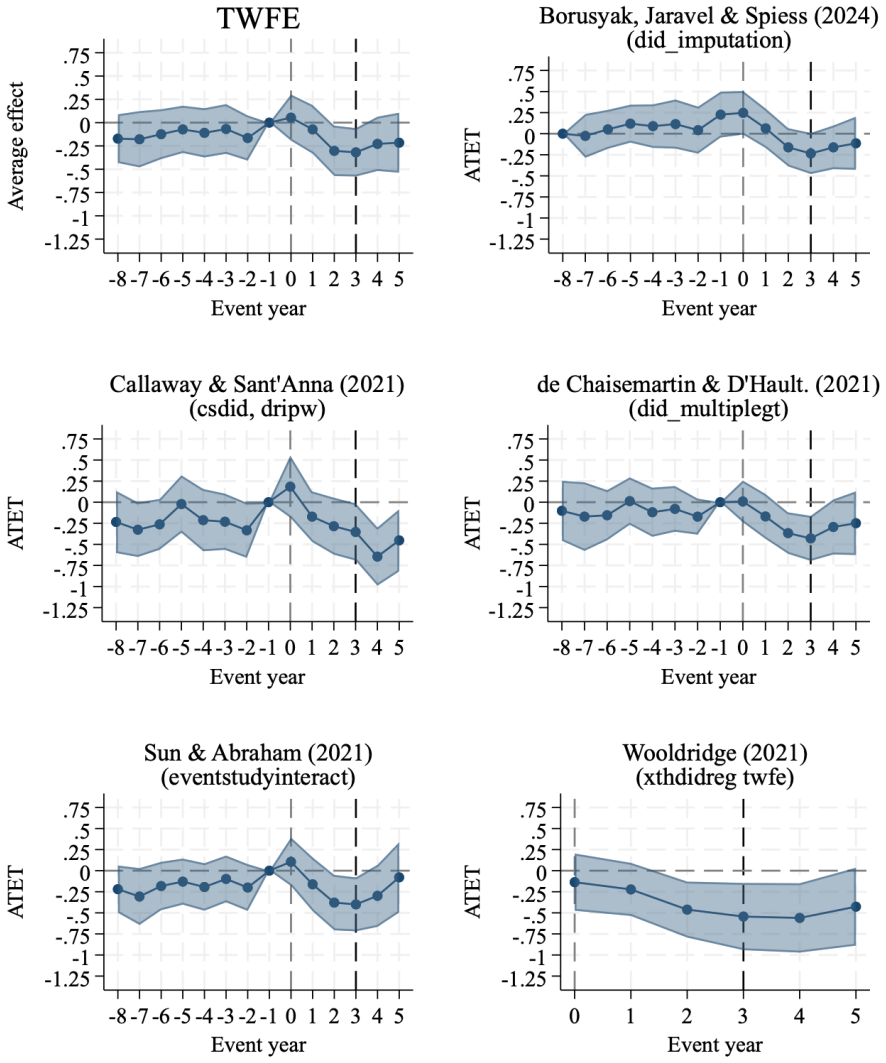
Sources: Directorate General for Local Authorities (DGAL), Ministry of Internal Affairs (MAI), National Institute of Statistics (INE), Institute of Employment and Professional Training (IEFP).

Table A.2. *Dynamic DiD Model Results*

	(1)	(2)	(3)	(4)
Event Year	All cohorts	Cohort of 2010	Cohort of 2014	Cohort of 2018
0	0.054	0.053	0.035	0.046
	(0.425)	(0.371)	(0.181)	(0.156)
1	-0.072	-0.133	0.048	0.039
	(-0.544)	(-0.935)	(0.213)	(0.115)
2	-0.303**	-0.289*	-0.215	-0.492
	(-2.198)	(-1.680)	(-0.847)	(-1.492)
3	-0.319**	-0.250	-0.209	-0.681**
	(-2.404)	(-1.474)	(-0.727)	(-2.387)
4	-0.228	-0.241	0.087	-0.626**
	(-1.534)	(-1.244)	(0.338)	(-2.126)
5	-0.216	-0.267	-0.059	
	(-1.314)	(-1.464)	(-0.200)	
Observations	5,752	4,972	2,822	2,255
Adj. R-squared	0.442	0.444	0.421	0.427
Test for the joint nullity of the pre-treatment effects				
P-value	0.851	0.791	0.587	0.306
Test for the equality of the effects in event years 3 and 4				
P-value	0.500	0.959	0.361	0.778

Notes: Estimated ATET obtained using the dynamic TWFE specification. The control group includes the never-treated and the not-yet-treated municipalities. All estimations include control variables and account for municipal and year fixed effects. T-statistics, based on robust standard errors, clustered by municipality, in parentheses. Significance level: *** p<0.01, ** p<0.05, * p<0.10.

Figure A.1. *ATET Accounting for Heterogeneous Treatment Effects*



Note: This figure shows the estimated effects (ATET) of mayoral term limits on the formula-determined grants received by Portuguese mainland municipalities. Event-study plots obtained using the estimators (and *Stata* commands) indicated in each graph. The control group includes the never-treated and the not-yet-treated municipalities. The estimated ATET and t-statistics for the post-treatment period are reported in Table 7 of the Online Appendix.

Affiliations

[1]Escola de Economia e Gestão - NIPE, Universidade do Minho, Braga, Portugal

[2]Erasmus School of Economics, Rotterdam, The Netherlands

References

AD&C (2023). 'Boletim informativo dos fundos da união europeia', Agência para o Desenvolvimento e Coesão, I.P. December 31. Downloadable at https://www.adcoesao.pt/wp-content/uploads/bi_35.pdf.

Aidt, T.S. and Shvets, J. (2012). 'Distributive politics and electoral incentives: Evidence from seven US State legislatures', *American Economic Journal: Economic Policy*, vol. 4(3), pp. 1–29.

Alesina, A. (1988). 'Credibility and policy convergence in a two-party system with rational voters', *The American Economic Review*, vol. 78(4), pp. 796–805.

Alt, J., de Mesquita, E.B. and Rose, S. (2011). 'Disentangling accountability and competence in elections: Evidence from US term limits', *The Journal of Politics*, vol. 73, pp. 171–186.

Barro, R.J. (1973). 'The control of politicians: an economic model', *Public choice*, vol. 14, pp. 19–42.

Besley, T. and Case, A. (1995). 'Does electoral accountability affect economic policy choices? Evidence from gubernatorial term limits', *The Quarterly Journal of Economics*, vol. 110(3), pp. 769–798.

Borusyak, K., Jaravel, X. and Spiess, J. (2024). 'Revisiting event-study designs: Robust and efficient estimation', *The Review of Economic Studies*, vol. 91(6), pp. 3253–3285.

Brollo, F. and Nannicini, T. (2012). 'Tying your enemy's hands in close races: The politics of federal transfers in Brazil', *American Political Science Review*, vol. 106, pp. 742–761.

Cadot, O., Roller, L. and Stephan, A. (2006). 'Contribution to productivity or pork barrel? The two faces of infrastructure investment', *Journal of Public Economics*, vol. 90, pp. 1133–1153.

Callaway, B. and Sant'Anna, P.H. (2021). 'Difference-in-differences with multiple time periods', *Journal of Econometrics*, vol. 225(2), pp. 200–230.

Case, A. (2001). 'Election goals and income redistribution: Recent evidence from Albania', *European Economic Review*, vol. 45(3), pp. 405–423.

Dahlberg, M. and Johansson, E. (2002). 'On the vote-purchasing behavior of incumbent governments', *American Political Science Review*, vol. 96(1), pp. 27–40.

Dal Bó, E. and Rossi, M.A. (2011). 'Term length and the effort of politicians', *The Review of Economic Studies*, vol. 78(4), pp. 1237–1263.

de Chaisemartin, C. and D'Haultfœuille, X. (2021). 'Difference-in-differences estimators of intertemporal treatment effects', *arXiv preprint arXiv:2007.04267*.

de Chaisemartin, C. and D'Haultfœuille, X. (2023). 'Two-way fixed effects and difference-in-differences with heterogeneous treatment effects: A survey', *The Econometrics Journal*, vol. 26(3), pp. C1–C30.

De Janvry, A., Finan, F. and Sadoulet, E. (2012). 'Local electoral incentives and decentralized program performance', *Review of Economics and Statistics*, vol. 94(3), pp. 672–685.

Dubois, E. (2016). 'Political business cycles 40 years after Nordhaus', *Public Choice*, vol. 166, pp. 235–259.

EC (2017). 'Seventh report on economic, social and territorial cohesion', European Commission, Directorate-General for Regional and Urban Policy Unit. Brussels, Belgium. Available at https://ec.europa.eu/regional_policy/sources/reports/cohesion7/7cr.pdf.

Ferejohn, J. (1986). 'Incumbent performance and electoral control', *Public Choice*, vol. 50(1/3), pp. 5–25.

Ferraz, C. and Finan, F. (2011). 'Electoral accountability and corruption: Evidence from the audits of local governments', *American Economic Review*, vol. 101, pp. 1274–1311.

Fouirnaies, A. and Hall, A.B. (2022). 'How do electoral incentives affect legislator behavior? evidence from us state legislatures', *American Political Science Review*, vol. 116(2), pp. 662–676.

Frey, A. *et al.* (2021). 'Do reelection incentives improve policy implementation? accountability versus political targeting', *Quarterly Journal of Political Science*, vol. 16(1), pp. 35–69.

Hibbs, D.A., J. (1977). 'Political parties and macroeconomic policy', *American Political Science Review*, vol. 71(4), pp. 1467–1487.

Johansson, E. (2003). 'Intergovernmental grants as a tactical instrument: Empirical evidence from Swedish municipalities', *Journal of Public Economics*, vol. 87(5-6), pp. 883–915.

Lopes da Fonseca, M. (2020). 'Lame ducks and local fiscal policy: Quasi-experimental evidence from Portugal', *The Economic Journal*, vol. 130(626), pp. 511–533.

Motolinia, L. (2021). 'Electoral accountability and particularistic legislation: evidence from an electoral reform in mexico', *American Political Science Review*, vol. 115(1), pp. 97–113.

Nordhaus, W. (1975). 'The political business cycle', *Review of Economic Studies*, vol. 42(2), pp. 169–190.

Potrafke, N. (2010). 'The growth of public health expenditures in OECD countries: Do government ideology and electoral motives matter?', *Journal of Health Economics*, vol. 29, pp. 797–810.

Rogoff, K. (1990). 'Equilibrium political budget cycles', *American Economic Review*, vol. 80(1), pp. 21–36.

Roth, J., Sant'Anna, P.H., Bilinski, A. and Poe, J. (2023). 'What's trending in difference-in-differences? A synthesis of the recent econometrics literature', *Journal of Econometrics*, vol. 235(2), pp. 2218–2244.

Sun, L. and Abraham, S. (2021). 'Estimating dynamic treatment effects in event studies with heterogeneous treatment effects', *Journal of Econometrics*, vol. 225(2), pp. 175–199.

Titiunik, R. (2016). 'Drawing your senator from a jar: Term length and legislative behavior', *Political Science Research and Methods*, vol. 4(2), pp. 293–316.

Titiunik, R. and Feher, A. (2018). 'Legislative behaviour absent re-election incentives: findings from a natural experiment in the arkansas senate', *Journal of the Royal Statistical Society Series A: Statistics in Society*, vol. 181(2), pp. 351–378.

Veiga, L. and Veiga, F. (2019). 'The effects of electoral incentives on fiscal policy: Evidence from a legislative change at the local government level', *Journal of Law, Economics & Organization*, vol. 35(2), pp. 394–421.

Wooldridge, J.M. (2021). 'Two-way fixed effects, the two-way Mundlak regression, and difference-in-differences estimators', *Available at SSRN 3906345*.