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DISCUSSION
PAPER

// ANNIKA HAVLIK

Political Budget Cycles in
European Public Procurement

POLITICAL BUDGET CYCLES IN EUROPEAN PUBLIC PROCUREMENT

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Abstract

This paper studies whether political budget cycles occur in public procurement in the European Union. Using project-level data from Tenders Electronic Daily (2008-2018), I analyze different steps along the procurement process, namely the publication of the contract notice, the awarding of the contract, and the completion of the project. While there is no evidence of an increased activity in project completions, I find an increase in public procurement contract notices and awards prior to national parliamentary elections. This effect is more pronounced for visible and labor-intensive projects and can be interpreted as a “credible election promise”, as the budget for the project is only committed at the time of the award and not spent yet.

JEL codes: D72, D73, H57

Keywords: Public procurement, political budget cycles, elections, European Union.

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1 Introduction

How do elected politicians use public procurement to ensure to stay in office? This paper studies pre-election behavior of incumbent governments and asks whether there are political budget cycles (PBCs) in public procurement. PBCs describe the phenomenon of fiscal variables following an election cycle. Nordhaus (1975) was the first to formalize a theory in which governments manipulate macroeconomic variables in order to gain votes with a backward-looking electorate. Over time, studies relaxed the assumption of a backward-looking electorate¹ and also studied electoral cycles in fiscal variables like public expenditure, taxes or deficit (for reviews, see, e.g., De Haan and Klomp 2013, Philips 2016).

Public procurement is the procedure where public authorities purchase work, products, and services from firms and accounts for around 14% of GDP in the European Union (European Commission 2020a). Therefore, it is a major spending category of the public sector and a useful tool for politicians to deliver public goods to specific voter groups. Thereby, a project can be of a very local nature, e.g., a school or a park, and thus serve a limited group of voters in the sense of pork barrel politics. It can also be of large-scale, e.g., a highway or broadband expansion, so that many voters can benefit from the project. Moreover, delivering a public procurement project involves many steps over a long period of time, from first budgetary decisions over public tenders up to the completion of the project. This lengthy process offers several possibilities for manipulating the timing of certain steps that may serve the incumbent government.

I use project-level public procurement data from Tenders Electronic Daily (TED) for all Member States of the European Union (EU) to test for PBCs of different project steps as well as for different spending and visibility categories. I hypothesize that public procurement contracts increase in size and number prior to each election.

¹See, for example, Rogoff and Sibert (1988) who assume temporary information asymmetries between the government and the electorate or Shi and Svensson (2006) who find that PBCs are present as long as some voters are uninformed about the manipulation.

Moreover, I test whether more “visible” projects are awarded close to elections. Thereby, visible projects are defined in three different ways: First, I use the definition of visible projects already employed in the literature. These categories are, for example, transportation, electricity or recreational buildings. Second, I ask whether labor-intensive projects are undertaken, as the workers of a firm receiving a public procurement contract are also potential voters. Finally, I test in particular whether or not larger projects are typically initiated in the run up to elections.

In the estimation, I employ panel fixed effects regressions and event study analyses with a Poisson pseudo-maximum-likelihood (PPML) estimator. I find evidence that the amount and aggregate value of public procurement contract notices (calls for tenders) and awards is higher prior to elections and interpret this result as a “credible election promise”, as the money is not spent yet and only committed. Furthermore, the project is not yet delivered at the time of the awarding of the contract, hence citizens might have to wait until construction work is finished to benefit from the potential public good. Additionally, there is evidence, which suggests that more contracts for visible projects are awarded prior to elections. This is true for the amount and aggregate value of projects defined as visible in the literature and for the amount of labor-intensive projects. However, I do not find that projects are bigger prior to elections.

This paper adds two contributions to the literature. First, it is possible to study various key dates of public procurement, namely the call for tenders, the award of a contract, and the completion of a project. Second, an analysis of various specific spending and visibility categories is also possible. In particular, whether or not bigger projects are present prior to elections, more labor-intensive projects or projects in specific categories, which are identified as visible in the literature.

To my knowledge, there are only two other papers that study political budget cycles in public procurement. Chong et al. (2014) find that public work contracts in French municipalities are more likely to end prior to legislative elections in case the mayor

runs for reelection compared to municipalities where the mayor does not run for another term. Marx (2018) studies development projects funded by the World Bank in Sub-Saharan Africa and finds that national incumbent governments are rewarded for the completion of visible projects prior to the election. Both papers concentrate on the completion of public procurement contracts. While Chong et al. (2014) only study this point in time, Marx (2018) finds a dominance of the completion over the initiation of new projects. In my analysis, I find stronger effects for the initiation of contracts, i.e., publishing a contract notice and awarding a contract, than for their completion. In my view, this is the more logical result, as it is easier for the incumbent to control the beginning of a public procurement project than the end, as construction projects often take unforeseeable delays.² Moreover, both papers study very specific projects, public works projects and projects funded by the World Bank respectively, while I use the universe of public procurement areas on the national level in the European Union.

The “classical” literature on PBCs mostly relies on aggregate figures of fiscal variables that are only suggestive of how the manipulation works. A meta-study on the more recent PBC literature by Philips (2016) finds a small but statistically significant increase in public expenditure and debt around elections, controlling for fiscal variables, countries, data, methods, and other features. However, this result only provides little evidence on the mechanisms of how politicians try to win the support of voters.

Some cross-country studies on PBCs employ disaggregated data for different spending categories to shed more light on the mechanisms. Enkelmann and Leibrecht (2013) conclude that PBCs predominantly exist for new Eastern European democracies and particularly in the spending categories administration, environment, as well as economic and social expenditure. Bove et al. (2017) observe that OECD countries have higher social expenditures around elections at the expense of military spending.

²One very extreme example would be the new Berlin Airport BER that has a nine year delay (Lopez 2019).

Vergne (2009) finds no effect for infrastructure spending in developing countries but rather an increase in wages and subsidies, while Schuknecht (2000) detects the existence of public investment cycles. These papers are just a small selection of existing papers analyzing different spending categories. De Haan and Klomp (2013) provide an overview and explain differences in findings with heterogeneous level of development, institutional quality, level of democracy, and constitutional rules. Besides these cross-country studies, more recent papers often analyze local public goods in single countries.³ Many of these studies analyze very specific spending categories and therefore manage to pin down the underlying mechanism. However, the caveat is that their results are not generalizable. They lack external validity, as they often exploit reforms or an institutional environment specific to the country in question.

Even though the studies mentioned have some indication on the specific manipulation, there are two distinct differences to this paper. First, most of them refer to annual public budget data, whereas project-level public procurement data is used in this paper. Second, these papers study a different point in time compared to the time frame taken into consideration in this paper. While the main focus in this paper is on publishing a call for tenders and the awarding of a contract, so-called election promises, the other papers study the point in time when money is spent, which is not yet the case for the two events analyzed here.⁴ While I also study different categories of public procurement, I place a particular focus on categories that are perceived as visible such as large projects and projects with a higher labor force.

I also contribute to the literature on favoritism in public procurement. These papers study the effect of connections between firms and politicians and how these connections influence public procurement outcomes. Connections are defined as do-

³See Foremny et al. (2018) for an overview of sub-national studies on PBCs.

⁴I also study the point in time of the completion a project, when most of the money has been spent. But as there are only a few observations that indicate the completion date, I focus on the other two events.

nations to political parties or politicians (Boas et al. 2014, Ruiz 2020, Titl and Geys 2019), CEOs and politicians sharing the same educational background (Do et al. 2019), CEOs being (former) members or sympathizers of a political party (Goldman et al. 2013, Straub 2014) or being part of the same social network (Schoenherr 2019). The general finding of the papers is that connected firms often receive more (valuable) public procurement contracts in the event that their political connection has won the election. Moreover, Mironov and Zhuravskaya (2016) observe for Russia that firms bribe local politicians around elections for public procurement contracts and that in corrupt jurisdictions unproductive firms receive public procurement contracts. While this strand of the literature rather analyzes the effects on public procurement after elections, I study the mechanisms of public procurement before elections. Moreover, increased public spending or a higher number of public procurement contracts before elections is perfectly legal, while favoritism as studied in the previously mentioned strand of the literature may or may not be legal, in particular with regard to corruption.

2 Hypotheses, data and empirical model

2.1 Theoretical considerations

I test several hypotheses concerning the existence of PBCs in European public procurement, i.e., I analyze whether there are election cycles in public procurement. With public procurement projects, the incumbent is able to target very specific voter groups in order to gain their votes, also known as pork barrel politics. At the same time, the incumbent can also implement huge projects, e.g., highways or broadband expansion, which many citizens can benefit from and therefore enables the incumbent to foster her chances of reelection.

Public procurement is a lengthy process with many steps involved until the project is finally delivered.⁵ There are different ways of initiating a project; either the government or administration itself intend on implementing a project or the project can be initiated by citizens via different forms of direct democracy. In both cases, a proposal has to be made to the responsible representative body who then decides whether the budget is approved. If this is the case, the call for tenders (also called contract notice) for a public procurement project is subsequently published and firms can submit their bids. The length of the period, in which the firms can apply, is defined in the call for tenders. After the submission deadline, the public procurement authority chooses the winning offer according to the criteria that were also defined in the contract notice⁶ and the contract is awarded to one or several firms. Afterwards, the project phase starts, which can be very short, e.g., if the project is the purchase of new pencils for a public authority, or very long, e.g., the construction of a new highway. Finally, once the project is completed there may be an opening ceremony where politicians cut ribbons and declare the project finished or open. While the payment for supplies projects happens more or less simultaneously with project delivery, there will be several payments throughout the duration of the project for works or service projects that have a longer duration.

In the data, which is used for the analysis, I observe the following three project steps: the contract notice, the project award, and the completion of the project. An increase in the call for tenders can be seen as a signal that the government is ready to invest, while the award (that is followed by the call) directly obliges the government to undertake the public expenditure.⁷ Moreover, the firm winning the contract is made public at the time of the contract being awarded. Employees of

⁵Of course, the specific steps might vary across different countries, but the rough steps are similar everywhere.

⁶The types of procedures in TED are: award without prior publication of a contract notice, competitive dialogue, negotiated without a call for competition, negotiated with a call for competition, open, and restricted.

⁷Of course, the budget was already approved at this point in time, and this is also a signal, but I do not observe this event in my data.

the winning firm are another potential group of voters. As no immediate public expenditure is undertaken with the contract award, especially for projects with a long time duration, I define the contract award as a “credible election promise”. Finally, the project completion is arguably the most visible part of the process and also the one where the incumbent can signal the most competence. However, manipulating the timing of the end of the project in a way that it happens not too long before and not after the election might be more difficult than manipulating the timing of the contract notice and the contract award. Especially with construction projects, there are often unforeseen delays which can defer the project completion. Timing the contract notice and award in a way that fits to the election schedule in order to signal competence to voters is much easier. Therefore, I expect a bigger political budget cycle effect for contract notices and awards.

Hence, the first set of hypotheses is:

H1a: *More (valuable) public procurement calls for tenders are published prior to an election.*

H1b: *More (valuable) public procurement contracts are awarded prior to an election.*

H1c: *More (valuable) public procurement projects are completed prior to an election.*

I thereby also test whether there are heterogeneous effects according to the type of contract, i.e., a services, works or supplies contract. As mentioned before, a public procurement contract on supplies has a shorter project period than services or works contracts on average, which makes it more likely for incumbents to deliver a project within a quicker time scale and with less chance of delay. Chong et al. (2014) find a PBC effect for the completion of works contracts in French municipalities. So-called “ribbon-cutting” in front of new buildings or other infrastructure projects is often a very prominent event, which attracts a lot of media attention. Hence, works projects

might be a popular tool to gain votes for elected politicians despite the high levels of uncertainty with regard to timing.

Moreover, I analyze heterogeneous effects according to the object of the contract, i.e., the sector classified in the International Standard Industrial Classification (ISIC). As previously discussed in the introduction, there is a substantial amount of literature studying PBCs in different spending categories. There is no universal result which expenditure categories dominate prior to elections. De Haan and Klomp (2013) provide an overview of papers studying different spending categories and discuss different determining factors for the heterogeneous findings.

The literature agrees, however, that only spending more will not lead to reelection for incumbents. The spending has to be visible for citizens. Without the electorate being aware of the project, the incumbent cannot gain any votes on the grounds of this project being initiated. Therefore, it is necessary that projects are made visible to the general public. A large bulk of public procurement might not be visible and also not interesting to voters, such as the purchase of office supplies for public servants. Hence, I distinguish between visible and non-visible projects according to three different visibility categories. First, I classify projects as visible as already done in the literature. Chong et al. (2014) classify visible projects in the context of France as streets and public buildings such as sports, recreational, social buildings and schools. Marx (2018) studies the effect of project completion on electoral success in Africa and classifies visible projects as being in the transportation, electricity, water, education, and health sector. Second, I classify projects according to the labor intensity of the sector they correspond to. Higher labor intensity means that the project needs a higher labor force on average and this labor force consists of potential voters. Finally, I test whether larger projects are present before elections assuming that bigger projects have a higher visibility. I identify large projects as projects with a high value in monetary terms.

Therefore, the second set of hypotheses is:

H2a: *More (valuable) projects are published / awarded / completed prior to an election that are classified as visible in the literature.*

H2b: *More (valuable) labor-intensive projects are published / awarded / completed prior to an election.*

H2c: *More (valuable) big projects are published / awarded / completed prior to an election.*

2.2 Data

Public procurement data: The data on public procurement contracts are taken from Tenders Electronic Daily (TED), a platform provided by the European Commission containing all public procurement notices and awards whose values exceed a certain threshold outlined in the EU Public Procurement Directives 2014/23/EC and 2014/24/EC. The lowest threshold for certain types of services is 139,000 euros.⁸ Moreover, countries also have the possibility to publish contracts below the thresholds on the platform on a voluntary basis.

The TED data contains information on the contracting authority including the address, details on the procured goods like the main activity and the final price, the number of bidders, as well as information on the winning bidder. In my analysis, I examine the time frame 2008 to 2018.

While the platform tries to harmonize public procurement information across Europe, there is a large heterogeneity across countries, as some countries only publish the information required, while other countries publish contracts with values below the thresholds voluntarily. In addition, it is well possible that politicians increase the number of contracts below the thresholds or even break down big contracts

⁸More information on the thresholds can be taken from European Commission (2020b) or from the mentioned Directives.

into several small ones to be able to speed up the procedure without compliance of rules for contracts above the thresholds as found in Castellani et al. (2018) for Italy. While Germany publishes much less than 10% of the total public procurement volume, Latvia publishes more than 50% according to an estimation by Skuhrovec (2017).

As I study national elections, I only include public procurement contracts from national authorities; a demand also made by Potrafke (2020) who finds different effects of government ideology on the budget composition comparing central and general government data. Table 1 shows the different authority types present in TED. Unfortunately, there are some categories which are not clearly identifiable as national or non-national. These are called “Body governed by public law”, “Other”, and “Not specified” and make up for a substantial share of the database. I focus my analysis on the categories “Ministry or any other national or federal authority” and “National or federal agency / office”, which are clearly identified as being governed by the national government.

Table 1: Authorities in TED

Authority	Notices		Awards		Completions	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
National or federal ministry / authority	191,993	10.09	190,563	10.87	29,208	9.49
Regional or local authority	583,227	30.66	517,039	29.49	110,772	35.98
Water, energy, transport and telecommunications	183,000	9.62	156,455	8.92	27,482	8.93
European Union institution / agency	10,380	0.55	10,533	0.6	175	0.06
Other international organization	879	0.05	602	0.03	87	0.03
Body governed by public law	408,100	21.45	390,517	22.27	54,482	17.7
Other	401,024	21.08	345,539	19.71	67,609	21.96
National or federal agency / office	31,862	1.67	30,766	1.75	4,620	1.5
Regional or local agency / office	52,940	2.78	47,997	2.74	10,091	3.28
Not specified	38,941	2.05	63,309	3.61	3,343	1.09
Total	1,902,346	100	1,753,320	100	307,869	100

Source: own calculations from TED data.

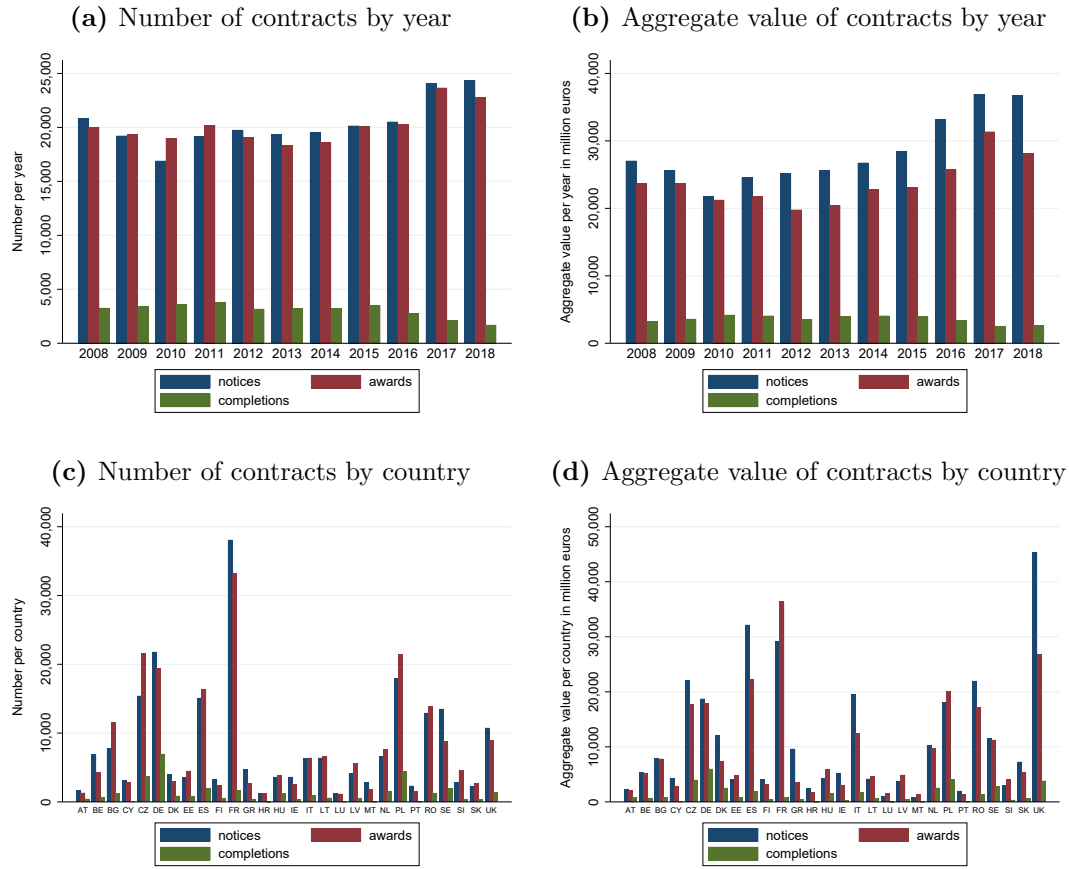
Figure 1 plots the number and aggregate value of national contracts both by country and by year. In each sub-figure, the values are shown for contract notices, contract awards, and contract completions. The number of contracts by year (sub-figure a) is quite stable over time, with slightly higher levels in 2017 and 2018. The

number of contract completions is only a small fraction of the notices and awards, as very few observations in the data have the contract completion date indicated. The amounts of contract notices and awards are very close together. Reasons for deviations between these two numbers might be: contract notices that are canceled before the award, the notice and the award not taking place in the same year, notices being split up into several awards, several notices being combined into one award, awards without prior notices. For the aggregate value of contracts (sub-figure b), we see a slight increase between 2010 and 2017. The notices constantly have a higher value than the awards.

Turning to the number of contracts by country (sub-figure c), the highest number of contract notices and awards is from France, followed by the Czech Republic, Germany, and Poland. Germany has the highest number of contract completions available. The picture changes when looking at the aggregate value of contracts (sub-figure d). Here, the United Kingdom has the highest value of contract notices, but with a huge gap to its value of contract awards. France's value of contract awards is still higher, with Spain ranking in third, followed by the Czech Republic, Germany, Italy, Poland, and Romania.

The database classifies the contracts into three broad categories: services, supplies, and works. Table 2 shows the number of contract awards per category for the national authorities named above. The category services has the highest aggregate value and also the highest number, followed by the supplies category.

Figure 1: Summary statistics for public procurement contracts



Note: The figures plot the amount and aggregate value of contracts by year and country for contract notices, awards, and completions. Only national contracts from the categories “Ministry or any other national or federal authority” and “National or federal agency / office” are included. Source: own calculations from TED data.

Table 2: Number and value of contract awards by type for national authorities

Contract	Aggregate value in bio. euros	Number
Services	124.78	112,884
Supplies	93.88	84,224
Works	71.53	16,828

Source: own calculations from TED data.

Table A1 in the Appendix lists the number and aggregate values of contract awards by sector according to the section in the International Standard Industrial Classification of All Economic Activities (ISIC) Revision 4. The matching between public procurement contracts and ISIC sections was done manually via the Common Pro-

curement Vocabulary (CPV) 2008 version indicated for each public procurement contract in TED.⁹ The first two digits of the CPV correspond to the product division that can be easily matched to the ISIC section. Table A9 in the Appendix presents the matching of CPV and ISIC codes. Some ISIC sections correspond to several CPV divisions, especially for Manufacturing, while a few CPV divisions correspond to several ISIC sections. Table A1 shows that Manufacturing is the largest sector in number and value of contracts. The construction sector nearly has the same aggregate value but much less contracts. The second largest sector in the number of awards is “Professional, scientific and technical advice”.

Election data: The data on national elections is taken from the Voter Turnout Database by the International Institute for Democracy and Electoral Assistance (International IDEA) and contains information on the election year, whether it was a parliamentary or presidential election and the turnout. The election months were collected by hand. The sample from 2008 to 2018 contains 81 parliamentary elections and 30 presidential elections in the European Union.

Control variables: I include economic and demographic variables from Eurostat. These are GDP growth rate, government expenditure as share of GDP, unemployment rate, population size, and the share of population being younger than 15 and older than 64 years of age. Public procurement can serve as a tool for anti-cyclical spending, hence we might expect a negative effect of the GDP growth rate on public procurement. Moreover, I include a variable capturing the ideology of the government, as this is often correlated with public expenditure. I choose the seat share of social democratic and left parties in parliament from the “Comparative Political

⁹Some observations in the TED data still contain the CPV 2003 version. This was updated manually.

Data Set” (Armingeon et al. 2020).¹⁰ General summary statistics of the variables employed are provided in Table A2 in the Appendix.

2.3 Empirical model

The project-level data allows me to conduct an analysis on a very detailed level. I aggregate the public procurement data to the monthly level by country. The main analysis uses a Poisson pseudo-maximum-likelihood (PPML) model by Santos Silva and Tenreyro (2006). They show that with heteroskedastic data, log-linearized estimation equations, and count data, the PPML estimator is less biased than OLS. The authors also show that their estimator is a good way to deal with zeros in the dependent variable. The method is frequently used for trade data (Santos Silva and Tenreyro 2006), but also has applications in estimating effects on merger and acquisition deals (Todtenhaupt et al. 2020). Public procurement data can be seen as count data. Moreover, when analyzing specific product categories, the dependent variable will contain a non-negligible amount of zeros, hence the PPML estimator is the appropriate method to use within this study.

I estimate the following model:

$$Y_{imt} = \exp(x'_{imt}\beta) \text{ with} \tag{1}$$

$$x'_{imt}\beta = \alpha_1 + \gamma \cdot \text{election-year}_{imt} + \delta \cdot \mathbf{X}_{it} + \psi_i + \mu_{mt} + \epsilon_{imt}$$

Y_{imt} is the outcome variable of country i in month m in year t . The outcome is the total value or the number of contract notices, awards or completions.

The variable $\text{election-year}_{imt}$ is defined as the twelve months leading up to an election with the last month being the election month. This “election year” definition is different from the one employed in many papers concerning PBC literature, where

¹⁰The exact definition of this variable is: “Government composition: relative power position of social democratic and other left parties in government based on their seat share in parliament, measured in percentage of the total parliamentary seat share of all governing parties. Weighted by the number of days in office in a given year.” (Armingeon et al. 2020)

the election year is the calendar year when an election is happening. There is no alternative available for these papers if they only have yearly data for their outcome variable. My definition has the advantage that it is more homogeneous than the calendar year definition, as elections happen in different months in different countries. The calendar definition lumps elections in January together with elections in December, which might distort the pre-election effect.

I further include demographic and economic controls \mathbf{X}_{it} as described above. ψ_i are country fixed effects and μ_{mt} are month \times year fixed effects to extract seasonal effects that affect all countries homogeneously. The error term ϵ_{imt} is clustered at the country level.

In order to understand the dynamics of public procurement around elections better, I also use an event study approach to estimate effects for each month. I again use a PPML model.

Following Fuest et al. (2018), the equation for the event study reads as follows:

$$Y_{imt} = \exp(\alpha_1 + \sum_{k=-24}^{+12} (\gamma_k \cdot election_{i(mt+k)}) + \delta \cdot \mathbf{X}_{it} + \psi_i + \mu_{mt} + \epsilon_{imt}) \quad (2)$$

The outcome variable is the same as before. γ_k is the coefficient of interest, i.e., the effect of an election. I include 24 leads and 12 lags to capture the evolution of two years before and one year after the election. The event dummies are binned up at the window ends -24 and +12 like in Fuest et al. (2018), accounting for all elections outside the window. Different to standard practice, I exclude and normalize to zero L1 (the month after the election) instead of F1 (the month before the election), because I am primarily interested in the dynamics before the election. Moreover, country fixed effects, month-year fixed effects, and control variables are also included. The error term ϵ_{imt} is again clustered at the country-level.

A possible endogeneity problem arising from both regression models is that the timing of the election might be endogenous. Due to political scandals or very bad performance, the incumbent might decide to resign and to call an early election. Bad

performance can include bad performance of the economy and therefore also impact public procurement. The control variables can explain part of this endogeneity, when the timing is not only shifted by a few months within one year but when an election is moved up into previous years. In robustness checks, I will include country \times year fixed effects instead of the control variables to reduce potential omitted variable bias. Additionally, I will also exclude elections outside the normal schedule in robustness checks.

3 Results

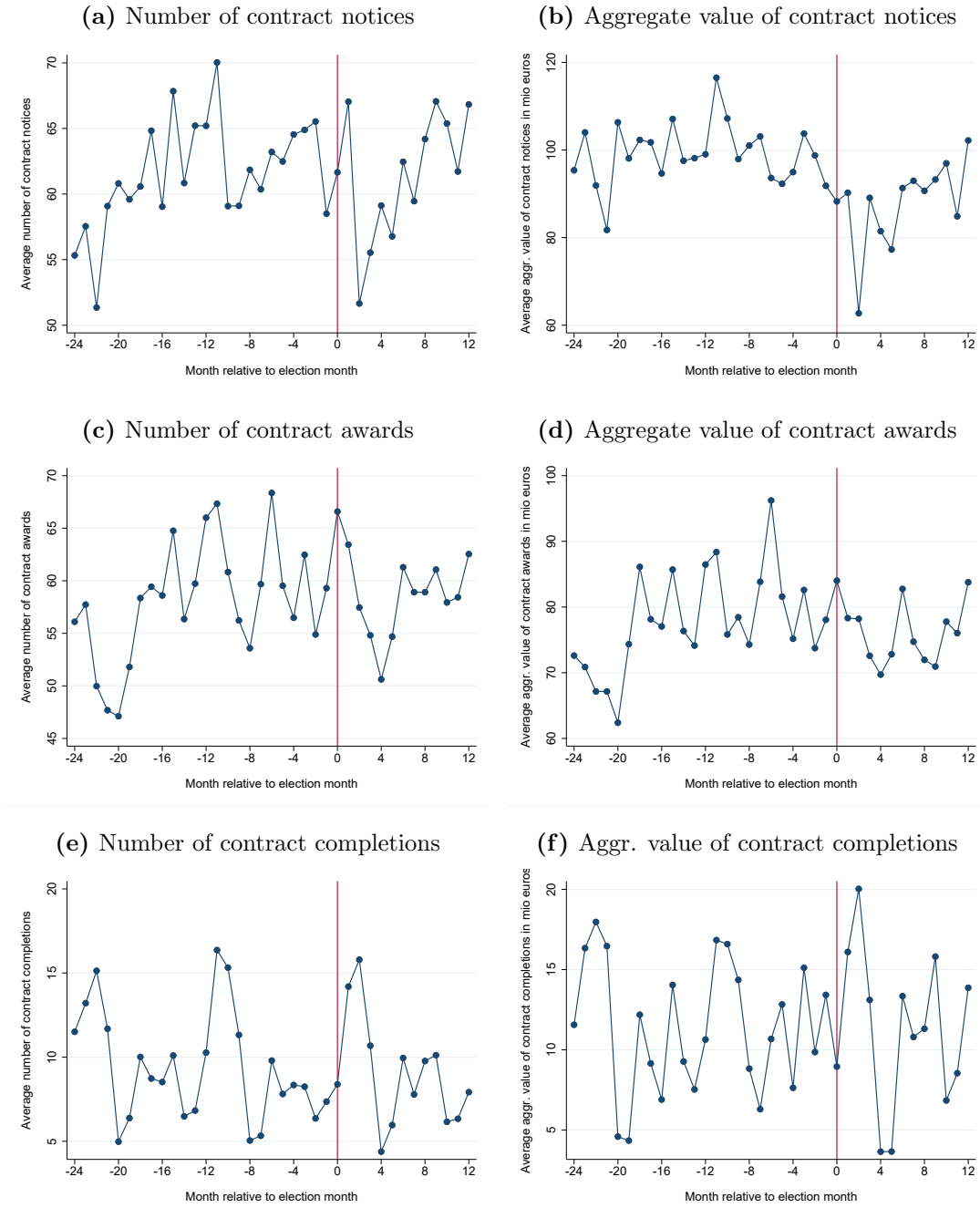
3.1 Baseline

Before turning to the results of the empirical analysis, I present some descriptive graphs. Figure 2 shows the average of contract notices (sub-figures a and b), contract awards (sub-figures c and d), and contract completions (sub-figures e and f) per month around parliamentary elections for both the number and the aggregate value. For the number of contract notices and both contract award graphs, there is a lower level of contracts in the beginning of the observed period, i.e., from 24 to around 16 months prior to the election. For both contract notice graphs and the number of awards, we see a large drop after the election with a quick recovery. These two pieces of evidence could hint to a political budget cycle. We cannot observe any evidence of a political budget cycle for project completions from these graphs.

Table 3 shows the baseline results for equation 1, i.e., the estimation for Hypotheses 1a, 1b, and 1c. I analyze the three different points in time - publishing a public procurement project (columns 1-4), awarding the contract (columns 5-8), and completing the project (columns 9-12) - for the number of public procurement projects and their total value.

For the contract notices, there are statistically significant effects on the 1% level for both the number of contracts and the aggregate value in the parliamentary election

Figure 2: Descriptive evidence



Note: The figures plot monthly averages of the number and the value of contract notices, contract awards, and contract completion around parliamentary elections.

year. This means that in the election year there are on average 8% more contracts and the aggregate value is around 13% higher.¹¹ Also for contract awards around

¹¹For the interpretation of coefficients, one has to apply the transformation $(\exp(\text{coefficient}) - 1) * 100$.

parliamentary elections, the effects for both number and aggregate value are highly statistically significant. For both variables, the effect is around 13%. For both contract notices and awards, the effects in the presidential election year are not statistically significant. For project completions, the only slightly statistically significant effect can be observed for the aggregate value in the parliamentary election year. The effect has a size of around 9%, but is only significant on the 10% level.

Hence, we can observe a political budget cycle for contract notices and awards in parliamentary election years. There is only small evidence for PBCs in contract completions, which could also be explained by the small number of observations for which we know the project completion date. However, the finalization of a project is difficult to manipulate for the incumbent, as many players are involved in projects, especially in large projects. Therefore, the result is only logical that the manipulation happens at the stage of a contract notice and award. Both steps do not involve any expenditures yet. The contract notice can be seen as a signal that the government is ready to invest in the near future and the contract award is a clear commitment to allocate money to a specific contract winner. With the contract awarded, a date for the project to commence is also set and this might be before or after the election. In any case, the contract award is a “credible election promise” to both the contract winner but also the citizens that will potentially benefit from the project.

Table 3: Baseline regression results

Category	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	Contract notices				Contract awards				Contract completions			
	Number		Aggregate value		Number		Aggregate value		Number		Aggregate value	
Parliamentary election year	0.0806*** (0.0290)		0.1259*** (0.0440)		0.1235*** (0.0314)		0.1258*** (0.0343)		0.0153 (0.0203)		0.0867* (0.0510)	
Presidential election year		0.0676 (0.0459)		0.0909 (0.0874)		0.1038 (0.0732)		0.0869 (0.0933)		0.0283 (0.0364)		-0.0367 (0.0814)
GDP growth rate	0.0042 (0.0026)	0.0049* (0.0027)	0.0123*** (0.0027)	0.0129*** (0.0024)	0.0070** (0.0032)	0.0081*** (0.0030)	0.0192*** (0.0033)	0.0200*** (0.0030)	-0.0081 (0.0049)	-0.0079 (0.0050)	-0.0039 (0.0075)	-0.0040 (0.0077)
Unemployment rate	-0.0199** (0.0077)	-0.0198*** (0.0077)	0.0012 (0.0105)	0.0012 (0.0104)	-0.0107 (0.0119)	-0.0097 (0.0118)	-0.0293*** (0.0093)	-0.0287*** (0.0095)	-0.0603*** (0.0174)	-0.0598*** (0.0173)	-0.0770*** (0.0220)	-0.0767*** (0.0223)
Ln population	0.3601 (1.2928)	0.3906 (1.3272)	4.7379** (2.1898)	4.8213** (2.2656)	0.2960 (1.4672)	0.2727 (1.5208)	4.2051*** (1.3632)	4.2369*** (1.4365)	9.0779** (3.6324)	9.0413** (3.5836)	13.7412*** (3.7827)	13.8705*** (3.8247)
Government expenditure / GDP	0.0078 (0.0067)	0.0095 (0.0066)	0.0072 (0.0236)	0.0098 (0.0244)	-0.0129 (0.0141)	-0.0102 (0.0136)	0.0177 (0.0167)	0.0204 (0.0177)	0.0223 (0.0149)	0.0226 (0.0149)	0.0538*** (0.0176)	0.0545*** (0.0178)
Share population under 15	0.0472 (0.0675)	0.0502 (0.0681)	0.0533 (0.0964)	0.0586 (0.1014)	0.2223** (0.1000)	0.2241** (0.1008)	-0.0445 (0.0734)	-0.0406 (0.0769)	0.2173 (0.1332)	0.2164 (0.1319)	-0.0184 (0.1409)	-0.0119 (0.1418)
Share population over 64	0.0224 (0.0703)	0.0182 (0.0698)	-0.0179 (0.0939)	-0.0262 (0.0924)	0.0858 (0.0942)	0.0774 (0.0944)	0.0168 (0.0538)	0.0084 (0.0530)	-0.0020 (0.0895)	-0.0034 (0.0893)	0.0608 (0.0773)	0.0535 (0.0757)
Left seat share in parliament	0.0015** (0.0007)	0.0014** (0.0007)	0.0020*** (0.0004)	0.0020*** (0.0005)	0.0005 (0.0013)	0.0004 (0.0013)	0.0011 (0.0010)	0.0011 (0.0011)	0.0002 (0.0016)	0.0002 (0.0016)	-0.0007 (0.0017)	-0.0007 (0.0017)
Constant	-4.8429 (21.2545)	-5.3784 (21.8307)	-59.3805* (35.8633)	-60.7532 (37.1629)	-6.7520 (24.3203)	-6.3902 (25.2597)	-50.9125** (22.0698)	-51.4489** (23.2447)	969.6820** (475.8082)	985.0164** (474.5168)	1,120.8895 (1,452.8870)	1,170.5916 (1,453.7274)
Observations	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696
Country FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Month x Year FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mean of dependent variable	60.44	60.44	96410332	96410332	57.81	57.81	77165223	77165223	9.33	9.33	12166313	12166313
Pseudo LL	-21929	-22013	-6.560e+10	-6.600e+10	-22596	-22786	-3.780e+10	-3.810e+10	-11895	-11895	-2.140e+10	-2.140e+10

*** p<0.01, ** p<0.05, * p<0.1. The table presents results for the estimation of the model in equation 1. Standard errors are in parentheses and clustered at the level of countries.

Turning to the control variables, the GDP growth rate has several statistically significant and positive effects on contract notices and awards, hence it does not seem that public procurement serves as a anti-cyclical policy tool but rather that better performing countries are also more active in public procurement. However, the effect is quite small, i.e., at most 2%. The unemployment rate mostly has negative effects, which is particularly evident through the negative correlation with the completion of a contract. Here, the coefficients are statistically significant on the 1% level and have a size of more than 7% for a decrease in the unemployment rate by one percentage point. For the ideological variable, we see statistically but not economically significant and positive effects on contract notices.

I cluster the standard errors at the country level. As there are only 28 countries in the sample, the number of clusters might be too small. This might be problematic because too few clusters might lead to an over-rejection (Cameron et al. 2008). Therefore, I reestimate Table 3 using the “score bootstrap” method by Kline and Santos (2012), which is an adaptation of the wild cluster bootstrap that is appropriate for non-linear models (Roodman et al. 2019). The results are collected in Table A3 in the Appendix. The effects for the parliamentary election year keep their statistical significance like before, so too few clusters does not seem to be an issue.

As the effects for presidential elections are not statistically significant, I will focus on parliamentary elections throughout the analysis from now on. Table A4 presents results for different years in the parliamentary election cycle, i.e., from two years before the election until one year after the election. For contract notices (Panel A), the only other statistically significant effect besides the election year is a negative effect on the aggregate value of notices for the post-election year, which is about the same size in absolute value like the positive effect in the election year. For contract awards (Panel B), all election years are statistically significant, at least on the 10% level. The pre-election year has a positive effect on the number and aggregate value of contract awards, but they are less than half the size of the effects

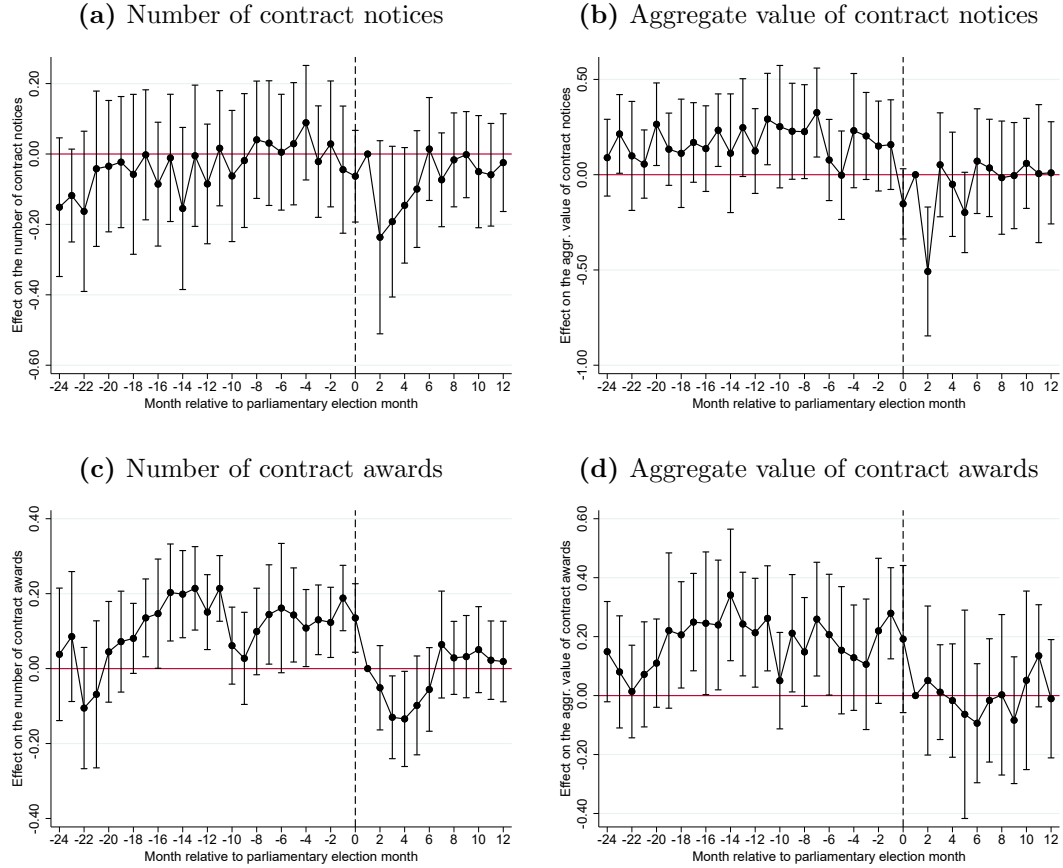
in the election year. The post-election year also has a negative effect here, which is, however, not as high as for contract notices. Again, for the number and value, the effect sizes are half the absolute value of the election year effects in the post-election year. Moreover, there is a lower number and value of contract awards two years before the election, but the coefficient sizes are the smallest of all years in absolute values. Finally, for the project completions (Panel C), the only other statistically significant effect besides the election year for completion values is the pre-election year in the aggregate value regression, which is significant on the 10% level. The effect is negative and bigger in absolute value than the positive effect in the election year.

Because of the few observations of contract completions and the not very significant results, I will not continue to analyze contract completions and will instead focus on contract notices and awards in the following. In the baseline sample, where I do not differentiate between different spending or visibility categories, there is not a large number of zeros in the variables of contract notices and contract awards. Therefore, I do another robustness check and estimate equation 1 as a linear model with the natural logarithm of the dependent variable.¹² The results are collected in Table A5 columns 1-4 in the Appendix. The effects for the number of contract notices and awards have a lower statistical power in the linear model, but are still significant at a level of 5%. The coefficient sizes are also smaller, but still economically meaningful with 7% and 10% more contract notices and awards in the election year, respectively. However, the effects on the aggregate values for both notices and awards lose all statistical power.

Next, I turn to the event study analysis from equation 2 for contract notices and awards in parliamentary elections. Again, I first estimate a PPML model and then a linear model with the dependent variable in log. Figure 3 shows the results of the PPML model and plots the coefficients for the monthly dummies with the 95% con-

¹²To be precise, the dependent variable is: $\ln(\text{variable} + 1)$.

Figure 3: Event study analysis



Note: The figure presents results for the estimation of the event study model in equation 2 as PPML model. Point estimates are plotted with 95% confidence intervals. The results are also collected in Table A6 columns 1-4. Standard errors are in parentheses and clustered at the level of countries.

confidence intervals. Table A6 in the Appendix collects all corresponding results from the event study. For the number of contract notices (sub-figure a), all coefficients show no statistical significance. For the aggregate value of contract notices (sub-figure b), there are a few statistically significant and positive effects in the pre-election period, but overall the effects are statistically not very precise. The level of point estimates is higher in the pre-election period than in the post-election period. The picture is much clearer for contract awards. For the number of awards (sub-figure c), there are clear statistically significant and positive effects between 17 and 11 months before the elections, which then start again seven months before the election up until the election month. After the election, the dummies drop in size and even become

negative and increase to a zero effect again seven months after the election. This observation is consistent with the findings of the analysis for different years of the election cycle in Table A4. For the aggregate value of contract awards (sub-figure d), the statistical power is somewhat lower than for the number of awards, but still presents a similar picture. Turning to the results from the linear regression in Figure A1 in the Appendix, all effects are estimated with less precision, but the overall trend is still the same.

Before I turn to the estimations by category, I exclude elections that were held early, so-called snap elections. There are 26 parliamentary snap elections in my dataset; Table A7 in the Appendix lists these elections. Table A5 columns 5-8 collect the results for the estimation without snap elections. The effects are very robust to this exclusion; they are even bigger than the baseline results in Table 3 in two out of four cases.

As a last robustness check, I include country \times year fixed effects instead of control variables. The results are collected in Table A5 columns 9-12 and are robust to the baseline results.

Until now, I presented robust evidence that there are political budget cycles in public procurement. They are present in both contract notices and awards, for both the number and the aggregate value. I interpret this finding as a “credible election promise”. Although funds for public procurement projects have been approved before posting the call for tenders, awarding the contract makes the project credible, at least for the firm winning the contract. Moreover, I only call it an election promise as the money has not yet been paid out at the time I measure the contract award, which is the date of the winner announcement. The effects on the contract awards are the most robust throughout the regressions. Therefore, I only use contract awards for the following analyses.

3.2 Different categories

In this section, I analyze election cycles in contract awards according to different categories. First, I split up the contracts into the three main types – services, supplies, and works – to see whether the effect observed before is driven by one specific category or whether it is equal across the categories. Second, I split up the contracts according to the sector following the ISIC classification.

Table 4: Election effects by type of contract award

CATEGORY	(1)	(2)	(3)	(4)	(5)	(6)
	Number of contract awards Services	Number of contract awards Supplies	Number of contract awards Works	Aggregate value of contract awards Services	Aggregate value of contract awards Supplies	Aggregate value of contract awards Works
Parliamentary election year	0.1403*** (0.0368)	0.1047*** (0.0290)	0.1014* (0.0573)	0.1552*** (0.0396)	0.0807* (0.0476)	0.2205*** (0.0693)
GDP growth rate	0.0037 (0.0032)	0.0117*** (0.0037)	0.0023 (0.0061)	0.0128*** (0.0046)	0.0258*** (0.0045)	0.0096 (0.0096)
Unemployment rate	-0.0119 (0.0133)	-0.0044 (0.0148)	-0.0464** (0.0207)	-0.0104 (0.0137)	-0.0217 (0.0143)	-0.0865*** (0.0332)
Ln population	0.6557 (1.2217)	-1.0620 (2.1199)	3.9449** (1.7590)	4.9479*** (1.8482)	-0.2530 (1.6724)	5.6105** (2.3027)
Government expenditure / GDP	-0.0120 (0.0094)	-0.0207 (0.0230)	0.0292 (0.0211)	-0.0076 (0.0181)	0.0095 (0.0132)	0.0593*** (0.0228)
Share population under 15	0.1286 (0.0893)	0.3082** (0.1278)	0.0031 (0.0991)	-0.1535** (0.0779)	-0.0261 (0.1005)	-0.1446 (0.1365)
Share population over 64	-0.0126 (0.0928)	0.2240* (0.1159)	0.0345 (0.0931)	-0.1034 (0.0717)	0.2113** (0.0844)	-0.0440 (0.0810)
Left seat share in parliament	0.0012 (0.0011)	-0.0008 (0.0015)	0.0013 (0.0020)	0.0016** (0.0007)	0.0010 (0.0009)	0.0021 (0.0018)
Constant	-9.9576 (20.1130)	10.4594 (34.9505)	-65.2736** (28.6641)	-59.0245** (29.7968)	15.9223 (26.6301)	-75.0382** (38.2184)
Observations	3,696	3,696	3,696	3,696	3,696	3,696
Country FEs	yes	yes	yes	yes	yes	yes
Month × year FEs	yes	yes	yes	yes	yes	yes
Mean dep. variable	30.59	22.79	4.63	30373251	22386944	29737493
Pseudo LL	-16109	-16457	-7993	-2.140e+10	-1.840e+10	-5.820e+10

*** p<0.01, ** p<0.05, * p<0.1. The table presents results for the estimation of the model in equation 1. The dependent variable in each regression only includes contract awards of one category - services, supplies or works, respectively. Standard errors are in parentheses and clustered at the level of countries.

Table 4 collects the results for the three types of contracts. For the number of contract awards, the strongest effect is exhibited by the services category with a point estimate of around 15%. This effect is also statistically significant on the 1% level. The other two categories both have effects of a size of around 11%, while the supplies category coefficient is estimated with much more precision than the one in the works category. For the aggregate value of contract awards, the category with the strongest effect is the works category. The aggregate value of works contracts is

on average around 25% higher in parliamentary election years than in other years. For the services category, this effect is around 17%. Both effects are statistically significant on the 1% level. The effect for the supplies category is weaker and also estimated with less precision. In summary, there is no clear dominance of one category, although there might be a tendency that incumbents prefer to award services and works contracts in election years.

Table 5: Election effects by sector of contract award

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Number of contract awards in a specific sector									
Election year	0.0759 (0.0653)	-0.0390 (0.0404)	0.1213*** (0.0300)	0.1112** (0.0451)	0.1015* (0.0586)	0.1394* (0.0822)	0.2284*** (0.0784)	0.0875** (0.0376)	0.2713** (0.1333)	-0.0009 (0.1341)
ISIC	A	B	C	D/E	F	H	I	J	K	L
Observations	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,200
Control variables	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Month \times Year FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mean dep. var.	.73	1.64	19.56	3	4.58	1.44	.77	6.69	0.69	.16
Pseudo LL	-3473	-4935	-15736	-6206	-7875	-5234	-3274	-8959	-3321	-1132
VARIABLES	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
	Number of contract awards in a specific sector									
Election year	0.0991** (0.0433)	0.0708 (0.0955)	0.2904*** (0.0907)	0.1400 (0.1245)	0.1916* (0.1153)	0.3304** (0.1297)	0.1473*** (0.0430)	0.0024 (0.0000)	0.1240* (0.0648)	
ISIC	M	O	P	Q	R	S/U	V	W	X	
Observations	3,696	3,696	3,696	3,564	3,696	3,696	3,696	2,832	3,696	
Control variables	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Country FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Month \times Year FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Mean dep. var.	10.32	.44	1.43	1.42	.28	.43	3.32	.11	.97	
Pseudo LL	-10633	-2181	-4947	-4709	-1957	-2683	-6841	-777.6	-3708	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table presents results for the estimation of the model in equation 1. The dependent variable in each regression only includes contract awards of one sector as defined in Table A1. Standard errors are in parentheses and clustered at the level of countries.

Table 5 presents the results for the election effect on the number of contract awards by sector.¹³ Many sectors exhibit statistically significant results. The biggest point estimate, which is also statistically significant on the 5% level, is the one for the sector “Other service activities and activities of extraterritorial organizations and bodies” (S/U) with an effect of 39%. This category includes services like car park management, port management, accommodation management, janitorial services, and many more. According to Table A1, it is a quite small category. The second

¹³see Table A1 for sector names

biggest effect is the one in the education sector (P), with 34% more contract awards in parliamentary election years. The categories that follow are “Financial and insurance activities” (K), “Accommodation and food service activities” (I), and “Arts, entertainment and recreation” (R) with the last one having an effect of 21%. Table A8 collects the results for the value of contract awards by sector. There are less categories with statistically significant effects.¹⁴ The education sector has by far the biggest effect, followed by the agricultural (A) and construction (F) sector. As the construction sector has a very high aggregate value, but not such a high number of contract awards, it is logical that the effect is only present for the value of contract awards but not for the amount. Ultimately, the baseline effects seem to be driven by a few sectors, although these are not same when looking at the number of contract awards and their aggregate value, except education that exhibits statistically significant and big effects in both regressions.

3.3 Visible projects

If incumbents aim to signal competence and to get attention with projects they plan to implement, they should put more emphasis on visible projects. In this section, I use three different definitions of visible projects. First, projects are classified into visible and non-visible projects according to the existing literature. As a second step, I analyze projects according to their labor intensity. Firms might need to hire more workers in order to undertake the project or they might just be able to secure jobs due to winning the project. More workers means more potential voters for the incumbent. Finally, I look at different size categories according to the contract value, as bigger projects should be more visible on average.

For the first visibility category, I create a dummy variable that takes the value 1 for visible projects as classified by Chong et al. (2014) and Marx (2018) (see section 2.1) according to the two-digit CPV division in TED. The categories classified as visible

¹⁴The categories W and X did not reach convergence in the estimation.

are indicated with an asterisk in Table A9. The results in Table 6 clearly show that the effects for visible contracts awards (columns 1 and 2) are larger than the effects for non-visible contract awards (columns 5 and 6) for both the number and the aggregate value. However, the effects for non-visible awards are also statistically significant, hence, the incumbent governments do not only rely on visible projects. As a robustness check, I exclude the education category from the visible projects, which had a very strong effect in the analysis in section 3.2. The effects reported in columns 3 and 4 of Table 6 decreased a little in comparison with columns 1 and 2, but are still bigger than the effects for non-visible projects.

Table 6: Election effects by visibility of contract award

CATEGORY VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Number	Aggr. value	Number	Aggr. value	Number	Aggr. value
Election year	0.1415*** (0.0385)	0.1675*** (0.0423)	0.1232*** (0.0400)	0.1450*** (0.0431)	0.1127*** (0.0307)	0.0773* (0.0429)
GDP growth rate	0.0081** (0.0041)	0.0160*** (0.0043)	0.0101** (0.0044)	0.0169*** (0.0044)	0.0057* (0.0029)	0.0192*** (0.0038)
Unemployment rate	-0.0167 (0.0145)	-0.0383*** (0.0115)	-0.0207 (0.0140)	-0.0428*** (0.0117)	-0.0081 (0.0122)	-0.0228 (0.0144)
Ln population	1.7246 (1.2003)	6.1620*** (1.6305)	1.7788 (1.2278)	6.3924*** (1.7598)	-0.3016 (1.6778)	2.9502** (1.3433)
Government expenditure / GDP	0.0029 (0.0096)	0.0438** (0.0211)	0.0081 (0.0095)	0.0485** (0.0206)	-0.0203 (0.0175)	-0.0036 (0.0142)
Share population under 15	0.1646* (0.0996)	-0.0558 (0.0782)	0.1566 (0.0967)	-0.0511 (0.0795)	0.2475** (0.1042)	-0.0514 (0.0813)
Share population over 64	-0.0002 (0.0917)	-0.0439 (0.0547)	0.0076 (0.0899)	-0.0413 (0.0549)	0.1440 (0.0960)	0.0882 (0.0625)
Left seat share in parliament	0.0013 (0.0013)	0.0013 (0.0013)	0.0012 (0.0013)	0.0014 (0.0014)	-0.0001 (0.0013)	0.0008 (0.0007)
Constant	-28.8653 (19.9638)	-83.4149*** (26.3793)	-30.3568 (20.5101)	-87.4727*** (28.5112)	1.2156 (27.7026)	-31.4184 (21.8356)
Sample	full	full	no education		full	full
Observations	3,696	3,696	3,696	3,696	3,696	3,696
Country FEs	yes	yes	yes	yes	yes	yes
Month x Year FEs	yes	yes	yes	yes	yes	yes
Mean dep. Variable	20.14	34206373	18.72	33165655.9	37.84	43404436
Pseudo LL	-14358	-3.440e+10	-14011	-3.460e+10	-18933	-2.600e+10

*** p<0.01, ** p<0.05, * p<0.1. The table presents results for the estimation of the model in equation 1. The dependent variable in each regression only includes contract awards of one category - visible or non-visible, respectively. The election year variable only includes parliamentary elections. Standard errors are in parentheses and clustered at the level of countries.

To get an approximation of the labor intensity of each sector for the second visibility definition, I use OECD data on the gross value added (GVA) and employee compensation and calculate the share of employee compensation in GVA (OECD 2020). The two variables are broken down into sectors according to ISIC rev. 4,

therefore I am again able to match the CPVs of the TED data to the ISIC codes. For each country, I only use the most recent available year, hence, the labor intensity variable does not vary over time in my dataset.¹⁵ The matching of CPV to ISIC codes is not the same as for the analysis in Tables 5 and A8, as the sectors in the OECD data are broken down to lower levels of the ISIC classification for some countries. The structure of sectors is also different for each country.

Table 7: Election effects by labor intensity of contract award

VARIABLES CATEGORY	(1)	(2)	(3)	(4)	(5)	(6)
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Below median	Above median
Election year	0.0719* (0.0392)	0.1596*** (0.0441)	0.1062*** (0.0318)	0.1521*** (0.0389)	0.1158*** (0.0340)	0.1306*** (0.0327)
Observations	3,564	3,696	3,696	3,696	3,696	3,696
Control variables	yes	yes	yes	yes	yes	yes
Country FEs	yes	yes	yes	yes	yes	yes
Month \times Year FEs	yes	yes	yes	yes	yes	yes
Mean dependent variable	12.82	11.34	14.7	19.34	23.7	34.04
Pseudo LL	-11345	-10721	-12185	-15279	-14733	-18376

VARIABLES CATEGORY	(7)	(8)	(9)	(10)	(11)	(12)
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Below median	Above median
Election year	0.1294** (0.0522)	0.1368** (0.0564)	0.0900** (0.0444)	0.1334*** (0.0286)	0.1359*** (0.0494)	0.1157*** (0.0294)
Observations	3,564	3,696	3,696	3,696	3,696	3,696
Control variables	yes	yes	yes	yes	yes	yes
Country FEs	yes	yes	yes	yes	yes	yes
Month \times Year FEs	yes	yes	yes	yes	yes	yes
Mean dependent variable	20183942	17973666	17031564	22656435	37407638	39690139
Pseudo LL	-2.400e+10	-2.150e+10	-2.040e+10	-2.340e+10	-3.030e+10	-2.860e+10

*** p<0.01, ** p<0.05, * p<0.1. The table presents results for the estimation of the model in equation 1. The dependent variable in each regression only includes contract awards of one category, i.e., projects with a labor intensity in the respective category. The election year variable only includes parliamentary elections. Standard errors are in parentheses and clustered at the level of countries.

For the analysis, I classify the CPV divisions of the public procurement projects into four different quartiles according to their labor intensity with the fourth quartile having the highest labor intensity. I also do the analysis for CPVs having a labor intensity below or above the median labor intensity. Looking at the results in Table 7 on the quartiles, all effects are statistically significant on conventional levels. The

¹⁵For most countries, the latest year is 2018. For the UK it is 2015 and for Bulgaria, Croatia, Greece, and the Netherlands it is 2017.

highest effects are observed for the number and aggregate value of contract awards with a labor intensity in the second quartile, but the effects for the fourth quartile are only slightly smaller. As the quartile analysis does therefore not give a clear picture, we turn to the regressions below and above the median. For the number of awards, the effect is higher above the median, with 14% more contract awards in the parliamentary election year on average. However, for the aggregate value of contract awards, the effect below the median is bigger than the one above. Here, the effects translates into a higher aggregate value of contract awards by 14.6% in the election year. Therefore, the evidence on whether incumbent governments choose more labor-intensive public procurement projects to gain more votes in the election is mixed.

Finally, I classify the projects according to their size in terms of their contract award value. As for the labor intensity analysis, I split up the projects into quartiles according to their project size and into below and above the median project value before aggregating them to the country-year-month level. The results in Table 8 show a decreasing effect the higher the project size. What this means, is that the highest effect is observed for the number and value of contract awards in the first quartile and the lowest in the fourth quartile. Likewise, the effect below the median project size is bigger than the effect above the project size for both number and aggregate value of contract awards. Hence, incumbent governments do not choose to award bigger public procurement contracts as visible projects before elections to signal their competence.

To summarize this section, incumbents make use of visible projects defined in the literature, e.g., projects in education, health, construction, recreational services before elections to try to convince citizens to give them their vote. There is also some evidence that they increase the number of contract awards of labor-intensive projects. Incumbents do not use bigger projects as a type of visible projects in general to signal competence to voters.

Table 8: Election effects by project size of contract award

VARIABLES CATEGORY	(1)	(2)	(3)	(4)	(5)	(6)
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Below median	Above median
Election year	0.1956*** (0.0390)	0.1368*** (0.0385)	0.1352*** (0.0362)	0.1157*** (0.0304)	0.1675*** (0.0329)	0.1255*** (0.0318)
Observations	3,696	3,696	3,696	3,696	3,696	3,696
Control variables	yes	yes	yes	yes	yes	yes
Country FEs	yes	yes	yes	yes	yes	yes
Month \times Year FEs	yes	yes	yes	yes	yes	yes
Mean dependent variable	12.75	12.64	12.61	12.69	25.39	25.3
Pseudo LL	-14538	-11619	-11256	-11518	-17605	-14917

VARIABLES CATEGORY	(7)	(8)	(9)	(10)	(11)	(12)
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Below median	Above median
Election year	0.1448*** (0.0268)	0.1308*** (0.0395)	0.1311*** (0.0359)	0.1238*** (0.0363)	0.1335*** (0.0353)	0.1248*** (0.0349)
Observations	3,696	3,696	3,696	3,696	3,696	3,696
Control variables	yes	yes	yes	yes	yes	yes
Country FEs	yes	yes	yes	yes	yes	yes
Month \times Year FEs	yes	yes	yes	yes	yes	yes
Mean dependent variable	823224	2645528	7214237	66496608	3468694	73710363
Pseudo LL	-4.920e+08	-1.090e+09	-2.950e+09	-4.080e+10	-1.230e+09	-3.880e+10

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table presents results for the estimation of the model in equation 1. The dependent variable in each regression only includes contract awards of one category, i.e., projects with a project size in the respective category. The election year variable only includes parliamentary elections. Standard errors are in parentheses and clustered at the level of countries.

4 Conclusion

This paper studies whether political budget cycles exist in public procurement across the European Union. Therefore, I analyze different steps of the public procurement process. The results show significant increases in the posting of calls for tenders and the awarding of public procurement contracts prior to national parliamentary elections. There is no evidence of more contract completions before elections. I interpret this finding as a “credible election promise” as at the time of the contract notice and award the budget is only committed, but no expenditure has been undertaken yet. Additionally, citizens cannot profit from the potential public good immediately, as the project most likely takes some time until completion.

The effect is not driven by a specific type of contract, i.e., neither services, supplies, nor works contracts dominate prior to elections. Instead, we observe stronger effects for certain sectors, especially the education sector. Moreover, a higher number and aggregate value of public procurement contracts is awarded for visible projects in parliamentary election years such as public utilities, education, health, construction, and cultural services. Furthermore, more labor-intensive contracts are awarded in parliamentary election years.

The paper is an important contribution to the literature on political budget cycles, as it studies a novel aspect by analyzing different steps of the public procurement process and specific project categories that provides a better understanding of the mechanisms behind political budget cycles.

Public procurement data is a very good tool to analyze these election cycles and should be exploited more in future research, e.g., by investigating product categories on a more detailed level. Additionally, political budget cycles in public procurement should be analyzed for regional and local elections, as many expenditure categories are decentralized, especially in federal countries.

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Appendix

Table A1: Contract awards by ISIC section for national authorities

Section	Aggr. value ¹	Number	ISIC description
A	2270.52	3084	Agriculture, forestry and fishing
B	14215.3	6848	Mining and quarrying
C	87145.64	84189	Manufacturing
D/E	11982.38	12714	Electricity, gas, steam and air conditioning supply, Water supply; sewerage, waste management and remediation activities
F	82578.81	19659	Construction
H	9074.6	6056	Transportation and storage
I	3619.97	3103	Accommodation and food service activities
J	35990.99	27435	Information and communication
K	3564.8	2858	Financial and insurance activities
L	761.1	579	Real estate activities
M	36966.87	43743	Professional, scientific and technical activities
O	3199.34	1762	Public administration and defence; compulsory social security
P	5120.02	5911	Education
Q	6213.02	5349	Human health and social work activities
R	654.42	1136	Arts, entertainment and recreation
S/U	2040.46	1868	Other service activities, Activities of extraterritorial organizations and bodies
V	16914.39	13637	Repair and maintenance services
W	344.33	299	Installation services (except software)
X	5998.33	3924	Postal and telecommunication services

¹ Aggregate value of contract awards in million euros.

Source: own calculations from TED data.

Table A2: Summary statistics

Variable	Obs	Mean	Std.Dev.	Min	Max	Source
Number of contract notices	3,696	60.44	66.87	0	621	TED
Aggregate value of contract notices	3,696	9.640e+07	1.300e+08	0	1.010e+09	TED
Number of contract awards	3,696	57.80763	66.08512	0	896	TED
Aggregate value of contract awards	3,696	7.72e+07	9.60e+07	0	1.18e+09	TED
Number of contract completions	3,696	9.332522	19.65615	0	278	TED
Aggregate value of contract completions	3,696	1.22E+07	2.95e+07	0	4.53e+08	TED
Parliamentary election year	3,696	0.247	0.431	0	1	International IDEA
Presidential election year	3,696	0.0920	0.289	0	1	International IDEA
GDP growth rate	3,696	2.913	5.644	-22.91	34.91	Eurostat
Unemployment rate	3,696	9.151	4.594	2.200	27.50	Eurostat
Ln population	3,696	15.87	1.408	12.92	18.23	Eurostat
Government expenditure / GDP	3,696	45.60	6.536	25.30	65.10	Eurostat
Share population under 15	3,696	15.76	1.710	13.10	21.90	Eurostat
Share population over 64	3,696	17.45	2.378	10.80	22.60	Eurostat
Left seat share in parliament	3,696	33.54	35.66	0	100	CPDS

Table A3: Score bootstrap of baseline table

Category VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Contract notices Number	Aggregate value		Number	Contract awards Aggregate value			Number	Contract completions Aggregate value		
Parliamentary election year	0.081 [2.086] (0.009)		0.126 [2.753] (0.008)		0.124 [2.778] (0.000)		0.126 [2.598] (0.001)		0.015 [0.402] (0.717)		0.087 [2.090] (0.043)	
Presidential election year		0.068 [0.925] (0.514)		0.091 [0.820] (0.514)		0.104 [1.017] (0.413)		0.087 [0.669] (0.870)		0.028 [0.475] (0.656)		-0.037 [-0.328] (0.787)
GDP growth rate	0.004 [0.892] (0.412)	0.005 [1.186] (0.268)	0.012 [1.657] (0.117)	0.013 [2.028] (0.041)	0.007 [1.576] (0.137)	0.008 [1.901] (0.064)	0.019 [2.079] (0.038)	0.020 [2.243] (0.013)	-0.008 [-0.708] (0.598)	-0.008 [-0.690] (0.595)	-0.004 [-0.104] (0.954)	-0.004 [-0.041] (0.984)
Unemployment rate	-0.020 [-1.190] (0.299)	-0.020 [-1.145] (0.310)	0.001 [0.244] (0.808)	0.001 [0.288] (0.768)	-0.011 [-0.794] (0.424)	-0.010 [-0.742] (0.518)	-0.029 [-1.150] (0.277)	-0.029 [-1.093] (0.325)	-0.060 [-1.593] (0.129)	-0.060 [-1.590] (0.115)	-0.077 [-2.058] (0.057)	-0.077 [-2.029] (0.062)
Ln population	0.360 [0.696] (0.498)	0.391 [0.616] (0.569)	4.738 [1.781] (0.095)	4.821 [1.689] (0.116)	0.296 [0.600] (0.610)	0.273 [0.528] (0.629)	4.205 [2.201] (0.041)	4.237 [2.047] (0.047)	9.078 [1.934] (0.034)	9.041 [1.960] (0.029)	13.741 [2.152] (0.033)	13.870 [2.195] (0.033)
Government expenditure / GDP	0.008 [1.585] (0.123)	0.009 [1.644] (0.102)	0.007 [0.847] (0.466)	0.010 [1.025] (0.350)	-0.013 [0.228] (0.830)	-0.010 [0.494] (0.692)	0.018 [2.496] (0.017)	0.020 [2.366] (0.010)	0.022 [-0.125] (0.904)	0.023 [-0.091] (0.939)	0.054 [1.090] (0.324)	0.055 [1.099] (0.299)
Population under 15	0.047 [0.966] (0.396)	0.050 [0.973] (0.389)	0.053 [1.892] (0.076)	0.059 [1.847] (0.092)	0.222 [1.168] (0.287)	0.224 [1.171] (0.294)	-0.045 [0.526] (0.621)	-0.041 [0.540] (0.621)	0.217 [1.026] (0.351)	0.216 [1.030] (0.345)	-0.018 [0.606] (0.555)	-0.012 [0.664] (0.530)
Population over 64	0.022 [0.247] (0.726)	0.018 [0.218] (0.780)	-0.018 [-0.078] (0.942)	-0.026 [-0.112] (0.909)	0.086 [0.787] (0.648)	0.077 [0.759] (0.670)	0.017 [0.283] (0.794)	0.008 [0.246] (0.809)	-0.002 [0.936] (0.373)	-0.003 [0.930] (0.349)	0.061 [1.502] (0.172)	0.053 [1.506] (0.136)
Left seat share in parliament	0.001 [2.459] (0.017)	0.001 [2.393] (0.031)	0.002 [1.391] (0.181)	0.002 [1.399] (0.201)	0.000 [0.329] (0.781)	0.000 [0.318] (0.789)	0.001 [0.590] (0.613)	0.001 [0.587] (0.645)	0.000 [0.425] (0.707)	0.000 [0.420] (0.697)	-0.001 [-0.419] (0.722)	-0.001 [-0.408] (0.715)
N	3696	3696	3696	3696	3696	3696	3696	3696	3696	3696	3696	3696

The table presents results for the estimation of the model in equation 1, i.e., it repeats Table 3 and estimates standard errors according to the score bootstrap method. Wald test z-statistics are reported in brackets and p-values in parentheses. Standard errors are clustered at the level of countries. The results were estimated using the boottest command in Stata by Roodman et al. (2019) with 999 replications and Rademacher weights.

Table A4: Effects of different years in the election cycle

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Number of contract notices				Aggregate value of contract notices			
Parl. pre-pre-election year	-0.0478 (0.0304)				-0.0053 (0.0348)			
Parl. pre-election year		0.0090 (0.0323)				0.0661 (0.0484)		
Parl. election year			0.0806*** (0.0290)				0.1259*** (0.0440)	
Parl. post-election year				-0.0247 (0.0248)				-0.1273*** (0.0368)
Panel B	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Number of contract awards				Aggregate value of contract awards			
Parl. pre-pre-election year	-0.0381* (0.0228)				-0.0443** (0.0225)			
Parl. pre-election year		0.0423** (0.0175)				0.0596* (0.0306)		
Parl. election year			0.1235*** (0.0314)				0.1258*** (0.0343)	
Parl. post-election year				-0.0556*** (0.0192)				-0.0553* (0.0310)
Panel C	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Number of contract completions				Aggregate value of contract completions			
Parl. pre-pre-election year	-0.0461 (0.0477)				0.0335 (0.0662)			
Parl. pre-election year		-0.0068 (0.0421)				-0.1231* (0.0639)		
Parl. election year			0.0153 (0.0203)				0.0867* (0.0510)	
Parl. post-election year				0.0076 (0.0256)				-0.0092 (0.0454)
Observations	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696
Control variables	yes	yes	yes	yes	yes	yes	yes	yes
Country FEs	yes	yes	yes	yes	yes	yes	yes	yes
Month \times Year FEs	yes	yes	yes	yes	yes	yes	yes	yes

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table presents results for the estimation of the model in equation 1, with the difference that the election year variable represents a different year in each regression. Standard errors are in parentheses and clustered at the level of countries.

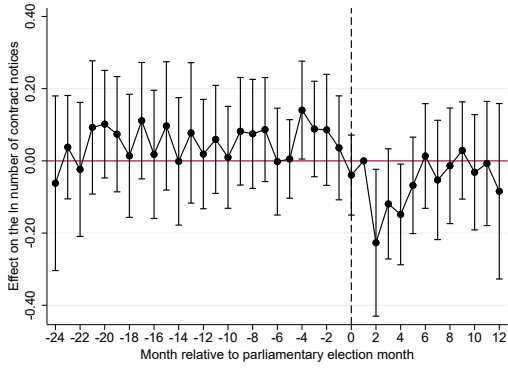
Table A5: Robustness: Linear model, exclusion of snap elections, and country×year FEs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Contract notices		Contract awards		Contract notices		Contract awards		Contract notices		Contract awards	
	Number	Aggr. value	Number	Aggr. value	Number	Aggr. value	Number	Aggr. value	Number	Aggr. value	Number	Aggr. value
Parliamentary election year	0.0681** (0.0302)	0.1084 (0.1462)	0.0992** (0.0374)	0.2797 (0.1689)	0.0782** (0.0327)	0.1436*** (0.0510)	0.1424*** (0.0375)	0.1224*** (0.0357)	0.0558* (0.0327)	0.1314*** (0.0488)	0.1003*** (0.0256)	0.0822** (0.0391)
GDP growth rate	0.0099** (0.0046)	0.0322 (0.0193)	0.0096* (0.0051)	0.0347* (0.0200)	0.0038 (0.0027)	0.0109*** (0.0028)	0.0062* (0.0033)	0.0183*** (0.0030)				
Unemployment rate	-0.0031 (0.0182)	0.0896 (0.0926)	0.0013 (0.0212)	0.0419 (0.0941)	-0.0199** (0.0078)	0.0003 (0.0104)	-0.0107 (0.0122)	-0.0297*** (0.0096)				
Ln population	-1.0773 (2.7769)	-12.7775 (15.7103)	-1.3112 (2.9755)	-10.0486 (15.4667)	0.3934 (1.2973)	4.8667** (2.1744)	0.2818 (1.4814)	4.2893*** (1.3764)				
Gov. expenditure / GDP	0.0111 (0.0071)	0.0184 (0.0590)	0.0084 (0.0098)	0.0280 (0.0495)	0.0078 (0.0067)	0.0067 (0.0235)	-0.0125 (0.0136)	0.0178 (0.0169)				
Share population under 15	-0.1144 (0.1438)	-0.7492 (0.7857)	-0.0705 (0.1604)	-0.8979 (0.7878)	0.0498 (0.0676)	0.0601 (0.0990)	0.2247** (0.0988)	-0.0380 (0.0730)				
Share population over 64	-0.0374 (0.1119)	-0.7711 (0.5946)	0.0020 (0.1211)	-0.6544 (0.5748)	0.0222 (0.0706)	-0.0221 (0.0945)	0.0854 (0.0938)	0.0133 (0.0544)				
Left seat share in parliament	0.0027*** (0.0009)	0.0045 (0.0034)	0.0014 (0.0010)	0.0039 (0.0036)	0.0015** (0.0007)	0.0019*** (0.0004)	0.0005 (0.0013)	0.0011 (0.0010)				
Constant	22.2518 (47.0276)	241.7756 (266.5309)	24.6830 (50.5097)	199.1270 (263.7331)	-5.4006 (21.3129)	-61.4036* (35.6027)	-6.5569 (24.5001)	-52.2676** (22.2740)	4.5050*** (0.0083)	18.8710*** (0.0132)	4.4844*** (0.0068)	18.6152*** (0.0104)
Method	OLS	OLS	OLS	OLS	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML
Election sample	all	all	all	all	no snap	no snap	no snap	no snap	all	all	all	all
Observations	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,660	3,660	3,660	3,660
Country FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country × Year FEs	no	no	no	no	no	no	no	no	yes	yes	yes	yes
Month × Year FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mean dependent variable	3.63	17.06	3.54	17.12	60.44	96410332	57.81	77165223	61.03	97358630	58.38	77924225
Pseudo LL					-21954	-6.560e+10	-22566	-3.790e+10	-18194	-5.000e+10	-16849	-2.860e+10

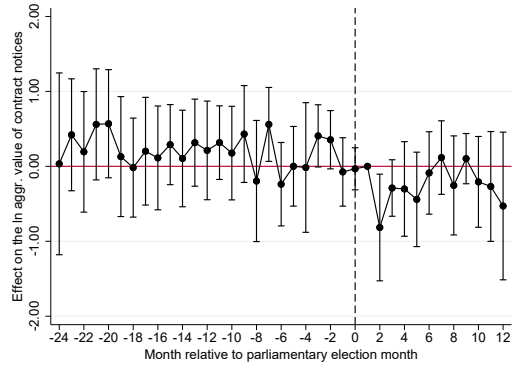
*** p<0.01, ** p<0.05, * p<0.1. The table presents results for the estimation of the model in equation 1. Columns 1-4 estimate a linear model with the dependent variable defined as the natural logarithm, that is ln(variable+1). Columns 5-8 estimate the PPML model but exclude snap elections. Columns 9-12 include country × year fixed effects instead of control variables. Standard errors are in parentheses and clustered at the level of countries.

Figure A1: Event study analysis as linear model

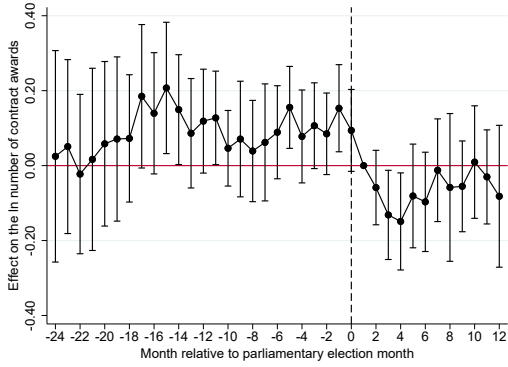
(a) Number of contract notices



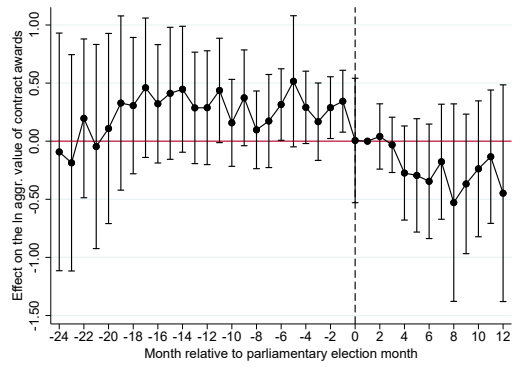
(b) Aggregate value of contract notices



(c) Number of contract awards



(d) Aggregate value of contract awards



Note: The figure presents results for the estimation of the event study model in equation 2 in the linear version. The dependent variable is defined as the natural logarithm, that is $\ln(\text{variable}+1)$. Point estimates are plotted with 95% confidence interval. The results are also collected in Table A6 columns 5-8. Standard errors are in parentheses and clustered at the level of countries.

Table A6: Event study regressions

	(1) Contract notices		(2) Contract awards		(3) Contract notices		(4) Contract awards	
	Number	Aggr. value	Number	Aggr. value	Number	Aggr. value	Number	Aggr. value
Election in $t+24$	-0.1511 (0.1005)	0.0892 (0.1028)	0.0380 (0.0902)	0.1490* (0.0868)	-0.0620 (0.1179)	0.0333 (0.5911)	0.0247 (0.1375)	-0.0922 (0.4984)
Election in $t+23$	-0.1180* (0.0673)	0.2140** (0.1053)	0.0856 (0.0885)	0.0804 (0.0970)	0.0379 (0.0698)	0.4208 (0.3640)	0.0507 (0.1131)	-0.1862 (0.4537)
Election in $t+22$	-0.1629 (0.1161)	0.0986 (0.1459)	-0.1053 (0.0826)	0.0138 (0.0801)	-0.0237 (0.0904)	0.1933 (0.3921)	-0.0226 (0.1036)	0.1965 (0.3330)
Election in $t+21$	-0.0419 (0.1126)	0.0558 (0.0914)	-0.0687 (0.1001)	0.0719 (0.0909)	0.0926 (0.0900)	0.5601 (0.3612)	0.0166 (0.1185)	-0.0460 (0.4281)
Election in $t+20$	-0.0346 (0.0952)	0.2648** (0.1106)	0.0448 (0.0685)	0.1101 (0.0764)	0.1017 (0.0726)	0.5686 (0.3516)	0.0582 (0.1070)	0.1092 (0.3988)
Election in $t+19$	-0.0230 (0.0950)	0.1337 (0.0967)	0.0720 (0.0687)	0.2206 (0.1344)	0.0739 (0.0778)	0.1299 (0.3901)	0.0710 (0.1068)	0.3283 (0.3655)
Election in $t+18$	-0.0577 (0.1159)	0.1122 (0.1451)	0.0807* (0.0477)	0.2060** (0.0920)	0.0139 (0.0831)	-0.0169 (0.3220)	0.0726 (0.0828)	0.3060 (0.2859)
Election in $t+17$	-0.0023 (0.0942)	0.1691 (0.1066)	0.1354** (0.0530)	0.2493*** (0.0843)	0.1114 (0.0785)	0.2019 (0.3503)	0.1850* (0.0933)	0.4600 (0.2923)
Election in $t+16$	-0.0856 (0.0897)	0.1368 (0.1147)	0.1466** (0.0744)	0.2453** (0.1235)	0.0180 (0.0865)	0.1125 (0.3376)	0.1396* (0.0789)	0.3218 (0.2483)
Election in $t+15$	-0.0111 (0.0922)	0.2336** (0.0971)	0.2031*** (0.0660)	0.2395** (0.1123)	0.0968 (0.0866)	0.2895 (0.2605)	0.2073** (0.0854)	0.4120 (0.2768)
Election in $t+14$	-0.1548 (0.1175)	0.1126 (0.1589)	0.1987*** (0.0593)	0.3414*** (0.1138)	-0.0014 (0.0861)	0.1049 (0.3140)	0.1494** (0.0714)	0.4468 (0.2640)
Election in $t+13$	-0.0050 (0.1024)	0.2471* (0.1309)	0.2142*** (0.0568)	0.2427*** (0.0897)	0.0775 (0.0947)	0.3156 (0.2832)	0.0863 (0.0712)	0.2864 (0.2337)
Election in $t+12$	-0.0851 (0.0867)	0.1242 (0.1135)	0.1507*** (0.0510)	0.2132** (0.0942)	0.0188 (0.0738)	0.2125 (0.3207)	0.1187* (0.0676)	0.2882 (0.2387)
Election in $t+11$	0.0164 (0.0835)	0.2920** (0.1224)	0.2140*** (0.0447)	0.2620*** (0.0909)	0.0595 (0.0729)	0.3164 (0.2393)	0.1273** (0.0608)	0.4367* (0.2189)
Election in $t+10$	-0.0625 (0.0950)	0.2521 (0.1639)	0.0613 (0.0524)	0.0506 (0.0835)	0.0098 (0.0688)	0.1769 (0.3044)	0.0463 (0.0492)	0.1577 (0.1823)
Election in $t+9$	-0.0186 (0.0970)	0.2280* (0.1285)	0.0273 (0.0627)	0.2115** (0.1015)	0.0819 (0.0726)	0.4312 (0.3148)	0.0709 (0.0752)	0.3733* (0.2009)
Election in $t+8$	0.0405 (0.0850)	0.2259* (0.1258)	0.0990* (0.0589)	0.1481 (0.0941)	0.0748 (0.0736)	-0.1961 (0.3940)	0.0389 (0.0659)	0.0977 (0.1629)
Election in $t+7$	0.0309 (0.0904)	0.3262*** (0.1191)	0.1445** (0.0676)	0.2594*** (0.0984)	0.0867 (0.0702)	0.5595** (0.2403)	0.0619 (0.0761)	0.1735 (0.1952)
Election in $t+6$	0.0051 (0.0839)	0.0771 (0.1087)	0.1615* (0.0880)	0.2067** (0.1045)	-0.0021 (0.0721)	-0.2384 (0.2713)	0.0890 (0.0605)	0.3153** (0.1499)
Election in $t+5$	0.0291 (0.0886)	-0.0027 (0.1184)	0.1432** (0.0641)	0.1538 (0.1101)	0.0053 (0.0530)	0.0007 (0.2591)	0.1554*** (0.0533)	0.5156* (0.2750)
Election in $t+4$	0.0889 (0.0830)	0.2313 (0.1530)	0.1082** (0.0525)	0.1286 (0.0912)	0.1406** (0.0661)	-0.0154 (0.4215)	0.0778 (0.0604)	0.2911* (0.1518)
Election in $t+3$	-0.0216 (0.0808)	0.2033* (0.1165)	0.1302*** (0.0474)	0.1061 (0.1129)	0.0883 (0.0645)	0.4064* (0.2023)	0.1064* (0.0558)	0.1678 (0.1623)
Election in $t+2$	0.0286 (0.0912)	0.1504 (0.1204)	0.1234*** (0.0478)	0.2197* (0.1256)	0.0859 (0.0749)	0.3547* (0.1894)	0.0849 (0.0530)	0.2887** (0.1295)
Election in $t+1$	-0.0444 (0.0921)	0.1578 (0.1200)	0.1883*** (0.0445)	0.2793*** (0.0789)	0.0361 (0.0702)	-0.0746 (0.2224)	0.1531** (0.0567)	0.3439** (0.1298)
Election in t	-0.0631 (0.0664)	-0.1532 (0.0940)	0.1351*** (0.0466)	0.1917 (0.1273)	-0.0394 (0.0540)	-0.0329 (0.1368)	0.0939* (0.0533)	0.0060 (0.2609)
Election in $t-2$	-0.2365* (0.1399)	-0.5079*** (0.1726)	-0.0511 (0.0574)	0.0511 (0.1290)	-0.2268** (0.0992)	-0.8162** (0.3468)	-0.0586 (0.0484)	0.0406 (0.1369)
Election in $t-3$	-0.1922* (0.1092)	0.0519 (0.1392)	-0.1300** (0.0564)	0.0117 (0.0820)	-0.1192 (0.0743)	-0.2891 (0.1837)	-0.1316** (0.0580)	-0.0315 (0.1160)
Election in $t-4$	-0.1458* (0.0837)	-0.0504 (0.1397)	-0.1343** (0.0648)	-0.0168 (0.0981)	-0.1484** (0.0679)	-0.3018 (0.3076)	-0.1490** (0.0631)	-0.2740 (0.1974)
Election in $t-5$	-0.0996 (0.0846)	-0.1981* (0.1076)	-0.0982 (0.0673)	-0.0635 (0.1803)	-0.0679 (0.0651)	-0.4412 (0.3070)	-0.0810 (0.0674)	-0.2943 (0.2378)
Election in $t-6$	0.0142 (0.0746)	0.0711 (0.1402)	-0.0556 (0.0569)	-0.0937 (0.1030)	0.0135 (0.0706)	-0.0883 (0.2680)	-0.0968 (0.0646)	-0.3454 (0.2401)
Election in $t-7$	-0.0733 (0.0680)	0.0355 (0.1303)	0.0642 (0.0728)	-0.0163 (0.1067)	-0.0528 (0.0805)	0.1167 (0.2392)	-0.0123 (0.0668)	-0.1767 (0.2413)
Election in $t-8$	-0.0167 (0.0681)	-0.0155 (0.1516)	0.0286 (0.0497)	0.0027 (0.1389)	-0.0137 (0.0780)	-0.2545 (0.3221)	-0.0582 (0.0961)	-0.5287 (0.4142)
Election in $t-9$	-0.0018 (0.0624)	-0.0048 (0.1421)	0.0319 (0.0560)	-0.0835 (0.1097)	0.0288 (0.0656)	0.1026 (0.1633)	-0.0553 (0.0590)	-0.3676 (0.2926)
Election in $t-10$	-0.0502 (0.0813)	0.0595 (0.1206)	0.0506 (0.0585)	0.0518 (0.1545)	-0.0316 (0.0778)	-0.2075 (0.2952)	0.0094 (0.0732)	-0.2378 (0.2850)
Election in $t-11$	-0.0590 (0.0744)	0.0056 (0.1848)	0.0225 (0.0534)	0.1350 (0.0884)	-0.0073 (0.0838)	-0.2685 (0.3572)	-0.0302 (0.0612)	-0.1335 (0.2797)
Election in $t-12$	-0.0245 (0.0709)	0.0098 (0.1368)	0.0190 (0.0548)	-0.0107 (0.1023)	-0.0842 (0.1184)	-0.5291 (0.4802)	-0.0818 (0.0923)	-0.4475 (0.4545)
Method	PPML	PPML	PPML	PPML	OLS	OLS	OLS	OLS
Observations	3,024	3,024	3,024	3,024	3,024	3,024	3,024	3,024
Control variables	yes	yes	yes	yes	yes	yes	yes	yes
Month \times Year FEs	yes	yes	yes	yes	yes	yes	yes	yes
Country FEs	yes	yes	yes	yes	yes	yes	yes	yes
Pseudo LL	-17607	-4.840e+10	-16819	-2.870e+10				

*** p<0.01, ** p<0.05, * p<0.1. The table presents results for the estimation of the event study model in equation 2. Columns 1-4 estimate the PPML model. Columns 5-8 estimate a linear model with the dependent variable defined as the natural logarithm, that is $\ln(\text{variable}+1)$. Standard errors are in parentheses and clustered at the level of countries.

Table A7: List of parliamentary snap elections with sources

Country	Election date	Source
Austria	Sep 2008	BBC, September 29, 2008
Austria	Oct 2017	The Guardian, December 16, 2017
Belgium	Jun 2010	Deutsche Welle, June 13, 2010
Bulgaria	May 2013	novinite.com, May 12, 2013
Bulgaria	Oct 2014	BBC, October 4, 2014
Bulgaria	Mar 2017	BalkanInsight, December 20, 2016
Croatia	Sep 2016	Politico, July 16, 2016
Czech Republic	Oct 2013	Deutsche Welle, August 23, 2013
Greece	Oct 2009	Reuters, September 2, 2009
Greece	May 2012	The New York Times, April 11, 2012
Greece	Jun 2012	BBC, May 16, 2012
Greece	Jan 2015	AlJazeera, December 29, 2014
Greece	Sep 2015	BBC, August 20, 2015
Italy	Apr 2008	BBC, February 6, 2008
Latvia	Sep 2011	September 18, 2011
Luxembourg	Oct 2013	VOA News, October 21, 2013
Malta	Jun 2017	BBC, May 1, 2017
Netherlands	Jun 2010	Financial Times, February 23, 2010
Netherlands	Sep 2012	Deutsche Welle, September 13, 2012
Portugal	Jun 2011	The Wall Street Journal, April 1, 2011
Slovakia	Mar 2012	The New York Times, March 11, 2012
Slovenia	Dec 2011	The Slovenia Times, February 7, 2012
Slovenia	Jul 2014	Deutsche Welle, July 13, 2014
Spain	Nov 2011	The New York Times, July 29, 2011
Spain	Jun 2016	The Washington Post, June 22, 2016
United Kingdom	Jun 2017	Independent, April 19, 2017

This table presents parliamentary snap elections excluded for the analysis in Table A5.

Table A8: Election effects by sector on value of contract award

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Aggr. value of contract awards in a specific sector								
Election year	0.2623** (0.1167)	0.0535 (0.0874)	0.1245*** (0.0422)	0.0973 (0.0761)	0.2503*** (0.0709)	-0.0684 (0.0912)	0.0979 (0.1327)	0.1034 (0.0788)	0.0406 (0.1390)
ISIC	A	B	C	D/E	F	H	I	J	K
Observations	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696	3,696
Control variables	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes
Month × Year FEs	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mean dep. var.	426065	5430587	17878068	2272321	28380407	2685311	818574	7977616	1128705
Pseudo LL	-1.870e+09	-2.350e+10	-1.610e+10	-5.320e+09	-5.590e+10	-1.410e+10	-4.360e+09	-1.220e+10	-5.140e+09
VARIABLES	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
	Aggr. value of contract awards in a specific sector								
Election year	-0.8129*** (0.2012)	0.0605 (0.0472)	-0.2927* (0.1698)	0.4711*** (0.1197)	0.2090 (0.1492)	0.2468 (0.2167)	0.5260 (0.3608)	-0.0575 (0.0887)	
ISIC	L	M	O	P	Q	R	S/U	V	
Observations	3,100	3,696	3,696	3,696	3,564	3,668	3,696	3,696	
Control variables	yes	yes	yes	yes	yes	yes	yes	yes	
Country FEs	yes	yes	yes	yes	yes	yes	yes	yes	
Month × Year FEs	yes	yes	yes	yes	yes	yes	yes	yes	
Mean dep. var.	440189	7406146	1411562	1038905	1536982	120973	454347	3696886	
Pseudo LL	-1.880e+09	-9.710e+09	-4.000e+09	-3.590e+09	-4.860e+09	-6.700e+08	-2.760e+09	-9.110e+09	

*** p<0.01, ** p<0.05, * p<0.1. The table presents results for the estimation of the model in equation 1. The dependent variable in each regression only includes contract awards of one sector as defined in Table A1. The election year variable only includes parliamentary elections. Standard errors are in parentheses and clustered at the level of countries.

Table A9: Correspondence CPV and ISIC codes

	CPV label	CPV	ISIC	ISIC rev. 4 label
	Agricultural, farming, fishing, forestry and related products	3	A	Agriculture, forestry and fishing
	Agricultural, forestry, horticultural, aquacultural and apicultural services	77	A	Agriculture, forestry and fishing
	Petroleum products, fuel, electricity and other sources of energy	9	B	Mining and quarrying
	Mining, basic metals and related products	14	B	Mining and quarrying
	Services related to the oil and gas industry	76	B	Mining and quarrying
	Food, beverages, tobacco and related products	15	C	Manufacturing
	Agricultural machinery	16	C	Manufacturing
	Clothing, footwear, luggage articles and accessories	18	C	Manufacturing
	Leather and textile fabrics, plastic and rubber materials	19	C	Manufacturing
	Printed matter and related products	22	C	Manufacturing
	Chemical products	24	C	Manufacturing
	Office and computing machinery, equipment and supplies except furniture and software packages	30	C	Manufacturing
	Electrical machinery, apparatus, equipment and consumables; lighting	31	C	Manufacturing
	Medical equipments, pharmaceuticals and personal care products	33	C	Manufacturing
	Transport equipment and auxiliary products to transportation	34	C	Manufacturing
	Security, fire-fighting, police and defence equipment	35	C	Manufacturing
	Musical instruments, sport goods, games, toys, handicraft, art materials and accessories	37*	C	Manufacturing
	Laboratory, optical and precision equipments (excl. glasses)	38	C	Manufacturing
	Furniture (incl. office furniture), furnishings, domestic appliances (excl. lighting) and cleaning products	39	C	Manufacturing
	Industrial machinery	42	C	Manufacturing
	Machinery for mining, quarrying, construction equipment	43	C	Manufacturing
	Construction structures and materials; auxiliary products to construction (except electric apparatus)	44	C	Manufacturing
	Collected and purified water	41*	D/E	Electricity, gas, steam and air conditioning supply, Water
	Public utilities	65*	D/E	supply; sewerage, waste management and remediation
	Sewage, refuse, cleaning and environmental services	90*	D/E	activities
	Construction work	45*	F	Construction
	Transport services (excl. Waste transport)	60	H	Transportation and storage
	Supporting and auxiliary transport services; travel agencies services	63	H	Transportation and storage
	Hotel, restaurant and retail trade services	55	I	Accommodation and food service activities
	Radio, television, communication, telecommunication and related equipment	32	J	Information and communication
	Software package and information systems	48	J	Information and communication
	IT services: consulting, software development, Internet and support	72	J	Information and communication
	Financial and insurance services	66	K	Financial and insurance activities
	Real estate services	70	L	Real estate activities
	Architectural, construction, engineering and inspection services	71*	M	Professional, scientific and technical activities
	Research and development services and related consultancy services	73	M	Professional, scientific and technical activities
	Business services: law, marketing, consulting, recruitment, printing and security	79	M	Professional, scientific and technical activities
	Administration, defence and social security services	75	O	Public administration and defence; compulsory social security
	Education and training services	80*	P	Education
	Health and social work services	85*	Q	Human health and social work activities
	Recreational, cultural and sporting services	92*	R	Arts, entertainment and recreation
	Other community, social and personal services	98*	S/U	Other service activities, Activities of extraterritorial organizations and bodies
	Repair and maintenance services	50*	V	Repair and maintenance services
	Installation services (except software)	51*	W	Installation services (except software)
	Postal and telecommunications services	64*	X	Postal and telecommunication services

This table presents the matched CPV division codes in the TED data with the ISIC rev. 4 section codes.



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