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Elections for sale? Evidence from cash transactions around elections in Italy

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Elections for sale? Evidence from cash transactions around elections in Italy*

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Abstract

This paper studies the dynamics of electoral corruption in the context of local elections in Italy. It exploits the asynchronous nature in the timing of mayoral elections to estimate a relationship between elections and the municipality-level amount exchanged through cash transactions. Cash transactions are sourced from a unique comprehensive dataset, taken from the Aggregate Anti–Money Laundering (AML) Reports between 2008 and 2018, which all Italian financial intermediaries are mandated to file with reference to transactions worth €15,000 or more. The difference-in-difference estimates, including municipality and time fixed effects, suggest that the municipal elections in Italy systematically trigger an anomalous increase in the volume of cash transactions, which we interpret as evidence of electoral corruption, i.e. an intense circulation of money to secure electoral support in the shadow of the law. Exploring the heterogeneity of our main result along several potential mediating factors confirms some intuitively appealing patterns, such as tighter competition, the presence of active criminal organizations, as well as the size of the municipality budget, let us show which significantly affects the volume of cash transactions. Our results can be used to define better anticorruption policies on political campaign practices specifically focusing on cash payments. The same approach can be easily applied to other countries and contexts, by drawing on the data submitted to AML authorities by financial intermediaries.

Keywords: Cash transactions, Corruption, Elections, Money-Laundering, Statistical modelling.
JEL classification: D72, D73, F33, G28, K42

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1 Introduction

Despite the recent wave of democratisation across the globe, free and fair elections, the cornerstone of functioning democracies, are still widely plagued by all sorts of illegal practices (Lehoucq, 2003). Interference with voters' behaviour can go from mild nudging by local (traditional or economic) elites using their power to preserve the *status quo*, to intimidation or outright violence to either prevent opponent's supporters from voting or to compel the electorate to support specific candidates (Acemoglu et al., 2013; Dal Bó et al., 2006). Instead of intimidation or violence, given the local circumstances, politicians may resort to financial or economic transfers to voters to "buy" their vote. There are multiple strategies which can be adopted to buy votes, some of which involve more subtle exchanges or rewards rather than a direct transfer of money into voters' pocket, and the political economic literature has considered the issue extensively (Schaffer, ed, 2007).

Although much is known, a quantification of the phenomenon, particularly in the context of mature democracies, featuring an effective secret ballot, is largely missing.

The recent paper by Aidt et al. (2020), bridging the gap between the traditional political business cycle literature and the one on electoral fraud, documents for a large sample of countries the existence of a regular increase of circulating money (M1) in the period immediately preceding national elections. This rise is interpreted as evidence of an increase in the demand for money to finance vote buying operations taking place around elections. Accordingly, the abnormal increase in M1 is more pronounced in weakly institutionalised countries, in elections where international election monitors reported vote buying or in close elections.

Despite the extensive and convincing strategies provided by Aidt et al. (2020) to support their interpretation, a potential confounding factor in their analysis is the change in money supply which could be implemented by accommodating central bank authorities previous to elections to please incumbent politicians. As for vote buying, one would expect this mechanism, well established in the political business cycle literature, to emerge more in weakly institutionalised settings and in the context of close elections.

This paper adopts a similar empirical strategy as the one in Aidt et al. (2020), but it focuses on the effects of local elections within one country only, Italy. In our setting, we can confidently shut down the monetary supply channel. Due to a series of exogenous historical shocks, Italian local elections are asynchronous - with different municipalities voting at different dates and years in our sample - and even a politically-minded central bank would find it cumbersome to follow

the dynamics of asynchronous local elections. Moreover, our analysis includes time fixed effects which entirely absorb any country wide monetary or fiscal policy which the central bank or the government may implement.

Since the logic of vote buying requires liquid resources to be distributed to voters in some form (e.g., gifts, vouchers, and proper monetary transfers)[1], we focus our attention on the cash transactions worth €15,000 or more recorded and reported by banks, contained in a unique dataset compiled by the Italy's anti-money laundering central authority, the so-called Financial Intelligence Unit, or FIU.

Typically, cash is the favourite means of payment for settling opaque transactions, since it ensures anonymity and hinders traceability. That is why most criminals' earnings take the form of cash (FATF, 2015). In addition, cash commonly plays a key role in the process of laundering those earnings, originating both from the illicit activities readily generating cash proceeds (such as drugs trafficking and extortion) and from almost all other types of unlawful conducts, even those, such as cyber-crime, which one would associate to more innovative and sophisticated payment instruments (Europol, 2015). In addition to anecdotal or investigative evidence on the robustness of the link between criminal economy and cash, recent empirical studies provide some further support for this hypothesis. Ardizzi et al. (2014) apply a revised version of the currency demand approach to quantify the amount of cash transactions related to criminal activities, whilst Giammatteo (2019) refines it by using extremely granular data on cash payments. Recent studies (Giammatteo et al., 2021) also attempt to provide evidence on the causality effect of cash on the underground economy (of which illegal economic activities represent a relevant share), showing that a larger use of cash contributes to the widening of the shadow economy. On account of all this, one could argue that an unexplained surge in the use of cash in the proximity of elections may be sensibly interpreted as a signal of anomalous, if not outright unlawful, electoral practices, which may include vote buying or other forms of corruption.

Our analysis documents the existence of a consistent local increase in cash transactions in the three months preceding a local mayoral election. The pattern is robust to including municipality specific trends and municipality-year fixed effects, which may ultimately control for any residual local business cycle dynamics. Moreover, we control for the total volume of bank transactions at the municipality level to capture pre-electoral abnormal economic activities. According to our

[1]We think of vote buying also in the form of vote turnout buying (Nichter, 2008).

preferred specification cash transactions increase on average by €25 *per capita* in the three months preceding the local election. To put it in context, this amount represents an increase by 4% with respect to the average monthly amount of cash transactions.

An ultimate proof of the illegal nature of the activities funded with the cash transaction lies beyond the scope of our empirical analysis. Nonetheless, we corroborate our interpretation with two alternative heterogeneity tests. First, we show that the level of political competition clearly shapes the extent of abnormal cash transactions. More precisely, and in line with the intuition, cash transactions increase in the level of local political competition. When politicians expect fierce competition, they are induced to resort to less conventional methods to secure votes.

Second, we explore the role of organised crime as an intermediary agent in the relationship between politicians and voters, notoriously endemic in some parts of Italy and whose involvement in electoral matter is well studied in the literature (Buonanno et al., 2016; De Feo and De Luca, 2017; Alesina et al., 2019; Daniele and Dipoppa, 2017; Acemoglu et al., 2020). Going back to the Dal Bó et al. (2006) paper, it is well known that criminal organisations resort to violence and intimidation to steer votes to their preferred/endorsed candidates. If this is the case, we should expect municipalities featuring active criminal organisations to display less cash transactions in preparation to local elections, as alternative "cheaper" practices can be employed to bank votes. In other words, politicians in these municipalities may adopt more subtle practices to signal to voters the expected voting behaviour, under the tacit or explicit threat of retaliation in case of voters non-compliance. We find strong support for this intuition: the abnormal dynamics in cash transactions in the period preceding local elections all but disappears in municipalities prone to organised crime activities.

Finally, and to further strengthen the confidence in our results, we run a battery of falsification tests in which we pretend local elections occurred 24 months after the actual election day. In line with the logic of the test, we find no systematic abnormal cash transactions around those "fake" elections.

Overall, the results of these additional tests bolster our interpretation of abnormal cash transactions constituting evidence of opaque monetary transfers used to alter the free and fair implementation of democratic elections.

In the rest of the paper we proceed as follows. Next section discusses the related economic literature on vote buying. We then present our data in Section 3. Section 4 lays out our empirical

strategy. We then discuss our results and additional tests in Section 5 and offer some concluding remarks.

2 Related literature

In addition to the research discussed in the Introduction, our study broadly relates to the literature on vote buying. Politicians typically distribute monetary benefits or strategically allocate funds and projects to secure electoral support (Moser, 2008). Crucially, by looking at intrinsically opaque cash payments, this work intends to shed light more on the former phenomenon than on the latter.

Vote buying can be used to either mobilise voters in politicians' own constituencies, or to weaken support for their political rivals: as Morgan and Várdy (2012) put it, "lukewarm supporters are paid to show up at the polls, whereas lukewarm opponents are paid to stay home". Vote buying comes with distributional consequences: politicians rewarding voters ex-ante for their votes reduce their post electoral public good provision and investments (Keefer and Vlaicu, 2017). Also while incumbents are in the position of adopting clientelistic platforms, their challengers have an incentive to engage in outright vote buying (Vicente and Wantchekon, 2009).

Historical accounts and evidence of vote buying abound, mostly relating to political systems where the lack of a secret ballot systematically breached vote secrecy (Cox, 1987; Gash, 1977; Kinzer, 1982). The gradual introduction of an effective secret ballot in modern democracies, supported by modernization, in the forms of increased income, education and urbanisation, made vote buying more challenging, though still widespread (Aidt and Jensen, 2017; Baland and Robinson, 2008). Several strategies can be devised to monitor voters compliance with the implicit vote buying contract, some of which relying on payment being conditioned on aggregate vote results (De Luca, 2014). Developing this intuition Rueda (2017) finds a robust negative correlation in the context of Colombia between the average polling station size and the intensity of vote buying, which can be attributed to a higher aggregate monitoring ability. Likewise, Lehoucq (2003) shows that vote buying may be more material in less populated constituencies, where the electoral race may be restricted to a small group of candidates, typically two, requiring the winner to obtain just one more vote than the opponent, a result that shows up in our findings. For the same reasons, vote buying may be more effective if voter participation is low, since gaining a few votes may be sufficient for winning the elections. In turn, low participation may be the result of effective negative vote buying.

A number of studies investigate the factors fostering vote buying. Finan and Schechter (2012)

identify reciprocity as the key factor enabling vote buying arrangements even in the context of secret ballot. Accordingly, they show that politicians target reciprocal individuals when engaging in vote buying. These results square with the finding in Cruz (2019), which highlights the role of social networks on vote buying using survey data from the Philippines. Individuals with a more dense social network are more likely to be targeted by vote buying. Hence, paradoxically a tight-knit social network, found to be beneficial along several dimensions for the development of a society, can also be used as a monitoring mechanism for targeting individuals for vote buying. Complementing the role of reciprocity norms, poverty has also been identified as a powerful enabling factor. Relying on an extensive survey covering several African countries Jensen and Justesen (2014) show that poor voters are more likely to accept personal monetary benefits in exchange for their vote.

The value of a vote for politicians also shapes the intensity of vote buying. Fiercer electoral competition increases the value of the marginal vote, thereby providing extra incentives to opportunistic politicians (Jensen and Justesen, 2014; Keefer and Vlaicu, 2017). In a tight race, it is crucial to win swing voters over, which is typically done by distributing monetary benefits, while own supporters votes are secured by granting jobs and contracts (Murugesan, 2020).

A series of recent studies analyse indirectly vote buying by exploring the effect of anti-vote buying experimental campaigns. Vicente (2014) conducts a randomised field experiment in São Tomé and Príncipe, distributing a voter education campaign against vote buying. Combining the experimental results with electoral data, he shows that the campaign reduced the influence of money offered on voting, decreased voter turnout and favoured the incumbent. Blattman et al. (2019) studies the results of a similar campaign implemented in Uganda in 2016. The campaign did not reduce offers of gifts in exchange for votes by politicians. Nevertheless, it had a beneficial effect on the electoral results, as though accepting gifts from politicians, treated voters were more likely to vote for their preferred candidate. Cruz et al. (2016) shows how increasing relevant information among voters does not necessarily reduce vote buying. More specifically, providing voters with information about a major spending program and the proposed allocations of mayoral candidates just prior to municipal elections in the Philippines increased vote buying among treated voters. The interpretation offered by the authors is that the information raised voter expectations regarding incumbent performance and incumbents increased their vote buying effort in response. Finally, the experimental paper by Leight et al. (2020) highlights an important consequence of vote buying on accountability: in the lab setting voters who receive payments are less willing to punish politicians

for rent seeking, and this reduction in punishment is larger in magnitude when payments are widely targeted.

3 Data

We combine data from three main sources to implement our analysis.

The source of data for cash transactions is the Aggregate Anti-Money Laundering Reports (S.AR.A. from the Italian acronym). The Italian anti-money laundering law (Legislative Decree no. 231/2007) mandates banks and other financial intermediaries to file to the Italian FIU monthly anonymous reports concerning all transactions worth 15,000 euros or more, aggregated by customer's economic sector and bank branch, in addition to other criteria. In the period of our analysis (January 2008 - December 2018), intermediaries reported on average 86,3 million aggregate records per year, corresponding to a yearly average of 35 trillion euros. For our research, we focus on cash transactions, which (considering jointly withdrawals and deposits) represent a small share of the bank reports, just a yearly average of 1.25% in terms of value and about 8% in terms of number of transactions. From S.AR.A data we compute the monthly *per capita* cash transactions by summing up the value of withdrawals and deposits which is then standardised by the municipality demographic size. This variable turns out to be the response variable of our estimated models. We also quantify the monthly *per capita* non-cash transactions that measure the value of all the other financial transactions (excluding cash) that take place in the municipality and divide it by its population.

We complement S.AR.A. cash transaction data with information on banks' stock of outstanding loans and deposits per year, that is, their main assets and liabilities, which were taken from the publicly accessible database of the Bank of Italy, the Italian Central Bank, collecting most of data extracted from the reports all banks file under prudential supervision obligations. In the period of our analysis, on average 665 banks operated in Italy and the yearly overall stock of loans amount on average to 1,776 trillion euros, whilst their customers' deposits were in excess of 1,242 trillion euros. We construct the *per capita* loan and deposit by dividing by population the average annual amount of loan and deposit available at the municipality level.

Data on 16,857 local elections spanning the period from January 2008 to December 2018 is provided by Ministry of Interior and regional election offices. Local elections take usually place every five years and the main electoral cycle includes no more than half of the municipalities; 4,091

municipalities out of 7,939 in our sample held the elections on June 7^{th} 2009 and 3,955 on May 25^{th} 2014. As for the month of the year in which elections are held, the large majority takes place either in May or June. More than 70% of local elections were in cities with a population less than 5,000 inhabitants. For each election we consider information about the date in which they occur and the share of votes for each candidate running for the mayoral seat . From these data we compute two variables measuring the degree of competitiveness in the local election: the difference between the votes share of the two most votes candidates, and the Hirschmann-Herfindahl index (HHI) measuring the concentration of votes for the candidates running for mayor.

We considered also the following two indicators that measure the presence of criminal organizations on a local scale. The first index ($Crime\ infiltration\ index$) is developed by Italy's FIU and measures the share of the companies infiltrated by organised crime at the provincial level (UIF, 2021). The companies are identified on the basis of the FIU's own set of confidential information. The index measures the potential "proximity" of a company to a criminal organization.

The second index ($Mafia\ Unime$) is derived from maps produced by a research centre on criminal organizations at the University of Messina (CSDCM, Unime, 1994) identifying mafia-rigged municipalities and mafia families cited in the news in the previous decade.

Table 1 explains all the variables used in the paper, instead the main descriptive statistics of the quantitative variables are shown in Table 2.

4 Empirical strategy

Our analysis aims at detecting abnormal cash transactions around the electoral cycle, which we interpret as a measure of vote buying or similar practices of electoral corruption aiming at delivering private rewards in exchange for votes. Intuitively, politicians or their agents should acquire liquidity in the weeks or months preceding the election day to fund their "electoral" activities. While we expect most action to take place before the election day, we can't exclude that some transfers related to electoral deals may be liquidated ex-post, i.e. after the election itself. Accordingly, we estimate the following formal model:

$$\begin{aligned} CT_{i,t} &= \beta_E Election_{i,t} + \beta_{pre} PreElection_{i,t} + \beta_{post} PostElection_{i,t} + \\ &+ X'_{i,t}\gamma + \alpha_i + \delta_t + \mu_i t + \psi_{i,t} + \epsilon_{i,t} \end{aligned} \tag{1}$$

where $CT_{i.t}$ is the amount of *per capita* cash transaction in municipality i at time t, considering time on a monthly scale. Moreover, $Election_{i,t}$ is a dummy equal to 1 for the month in which the election takes place in municipality i and zero otherwise, whereas the variables $PreElection_{i,t}$ and $PostElection_{i,t}$ are dummies identifying months preceding and following the election month in municipality i. We estimate two alternative versions of the model adopting two different time brackets: one in which $PreElection_{i,t}$ take up the value 1 for twelve months before and $PostElection_{i,t}$ for twelve months after the election, and one in which they are equal to 1 for just three months before or after, respectively. The idea is to identify the relevant period where the unusual election-driven cash movement is concentrated. Crucially, we include a battery of municipality fixed effects to absorb time invariant local characteristics (α_i), and time fixed effects capturing common shocks across the economy (δ_t) in all our specifications. In more demanding specifications we also include municipality specific trends μ_i, and then we gradually enrich our model by including *per capita* loans, deposits, and non-cash transactions in municipality i at time t (all included in the vector $X_{i,t}$), which is a proxy for the monthly level of overall economic activity in the municipality.[2] In the last specification we add municipality-specific year fixed effects ($\psi_{i,t}$). Here we are essentially testing whether above and beyond any municipality specific shock unfolding in the current year, notably related to the electoral or political business cycle, the months around the election still display an anomalous volume of cash transactions.

Finally, $\epsilon_{i,t}$ is a random error term, capturing all omitted factors, which we allow to be heteroscedastic and correlated across time. Specifically, the standard errors we report are clustered at the municipality level.

The coefficients of interest are the three betas, capturing the average difference in cash transactions in the month of the election (β_E), and in the year/trimester before (β_{pre}) and after (β_{post}) the election month.

We estimate model (1) on the entire sample of Italian municipalities in the period from January 2008 to December 2018, and on the subset of small municipalities, those with 5,000 inhabitants or less. The rationale for the latter subsample analysis is that financial strategies underlying electoral activities in larger municipalities are likely be more sophisticated. In other words, while it is reasonable to expect vote buying in relatively small municipalities to be funded with cash flows originating from local bank agencies, we expect similar operations in larger cities to encompass

[2]Data for loans and deposits are only available as year average.

more diversified strategies, involving transfers from domestic economic hubs (for instance, Milan or Rome) or even foreign financial institutions, possibly in tax havens.

Fruthermore, we set up an additional specification of Model (1), described in Appendix B, which mainly addresses the operative goal to single out those municipalities featuring the most anomalous volume of cash transactions in the proximity of elections.

5 Results

The estimates of equation 1 when run on the full sample of Italian municipalities are reported in Table 3. In Panel A, we test for the existence of anomalous cash transactions in the year preceding and following the month in which the local elections take place. In column 1, in addition to the three dummies of interests, capturing the month of the elections and the 12 months preceding and following the election, respectively, we include time and municipality fixed effects. The coefficients for the months preceding local elections, for the month of the election and for the following ones are negative. None of the coefficients is, however, statistically significant except the coefficient for the period following the elections that is negatively significant. This coefficient for the twelve months preceding the elections becomes positive in the additional specifications, where we include municipality specific trends (column 2), *per capita* loans (column 3), *per capita* deposits (column 4), and non-cash transactions (column 5). Here also the coefficient for the election month becomes positive but none of the coefficients is significant. In column 6, we include a battery of municipality-year fixed effects, potentially capturing some residual political business cycle effects, for instance working through the differential disbursement of public funds in the calendar year of the election. The coefficient for the period preceding elections remains positive but turns statistically significant at less than 10%. The coefficient of 1.319 measures the average increase in the *per capita* cash transactions in each of the 12 months preceding local elections. The coefficient for the month of the election is positive, but it is not statistically significant. Cash transactions are not significantly different in the period following local elections. The negative coefficient turns non significant in our most demanding specifications.

Although the results in Panel A are suggestive of some action taking place previous to local elections involving cash transactions, they do not seem to provide strong evidence. In Panel B, we reduce the time bracket around elections from 12 to 3 months, following the intuition that most electoral deals and vote buying operations are likely to be sealed closer to the election date. The

coefficients for the three months preceding the election are now consistently positive and significant at less than 1% in the most demanding specifications. The coefficient of 6.53 in column 6 measures the average increase in the *per capita* cash transactions in each of the 3 months preceding local elections. Again looking at our preferred specification in column 6, the month of election display a positive but not significant coefficient, whereas the post-election period does not reveal any differential amount of cash transactions.

In Table 4 we repeat the estimation of model 1 on the subsample of Italian municipalities in which we exclude large municipalities (with a population above 5,000, representing less than 30% of our sample), under the assumption that these latter group may feature more sophisticated financial practices behind electoral illicit operations (e.g., lack of links between local operations and local branches, shadow financial institutions, transfer from or to tax havens). Table 4 has the same structure of the previous table with Panel A looking at the 12 month period preceding and following the election month, and Panel B focusing on the 3 months before and after instead. The coefficients for the preceding period are consistently positive and statistically significant usually at less than 1%. As for Table 3, the lower coefficients in Panel A with respect to Panel B suggests that most action in cash transaction is taking place closer to the elections, where electoral operations are more frequent. The magnitude of the coefficients increases with respect to the corresponding models in Table 3 confirming the intuition that larger municipalities may either feature less vote buying (or similar practices), or simply may adopt other more sophisticated financial means to fund those operations. According to the coefficient in column 6 of Panel B, the average increase in the *per capita* cash transactions in each of the 3 months preceding local elections is of €8.30. This represents the 4% of its mean in the subsample excluding large municipalities. The coefficients for the election month are positive and similar to the ones for preceding months in magnitude, but they are not statistically significant. As for the months following local elections, we find some weakly negative coefficients, smaller in magnitude with respect to the preceding period, and never confirmed in our most demanding specifications.

Do the results in Table 3 and 4 show beyond doubt evidence for illicit electoral practices like vote buying? Controlling for municipality-year fixed effects, municipality trends as well as monthly non-cash transactions, like we do in our most loaded specifications, leaves little scope for alternative interpretations which do not directly involve local election dynamics. Even though an ultimate proof of the illegal nature of the activities funded with the opaque cash transaction lies beyond the

scope of our empirical analysis, we implement two alternative heterogeneity tests, which provide further support for our interpretation.

First, borrowing from Aidt et al. (2020), we reason that politicians' incentives to engage in vote buying, or practices of the sort, are clearly increasing in electoral competition. If a candidate enjoys a substantial advantage over any opponent in expectation, she won't bother spending energy and money trying to convince marginal undecided voters to cast their ballot in her favor. Similarly, opponent candidate will not find it worth their while to reduce their gap from the leading candidate, if the margin she is enjoying is substantial. Conversely, when candidates expect to receive similar share of votes, then the value of capturing marginal votes is considerable and we expect all legal and illicit strategies to be adopted by competing politicians and their campaigning agents.

Formally, we amend model (1) including three further terms in which the dummies identifying the election month, the pre- and post-election period are interacted with a measure of electoral competition.

$$\begin{aligned} CT_{i,t} &= \beta_E^{'} Election_{i,t} + \beta_{pre}^{'} PreElection_{i,t} + \beta_{post}^{'} PostElection_{i,t} + \\ &+ \theta_E Election_{i,t} \times Competition + \theta_{pre} PreElection_{i,t} \times Competition + \\ &+ \theta_{post} PostElection_{i,t} \times Competition + X_{i,t}^{\prime} \gamma^{'} + \alpha_i^{'} + \delta_t^{'} + \mu_i^{'} t + \psi_{i,t}^{'} + \epsilon_{i,t}^{'} \end{aligned} \tag{2}$$

The coefficients θ_E, θ_{pre} and θ_{post} capture the impact of the level of competition on the abnormal cash transactions we pinned down so far.

Table 5 reports the estimates from this exercise when adopting the difference between the first and second mayoral candidate as our preferred measure of electoral competition. We focus on the trimesters preceding and following the election, as this is the period where abnormal cash transactions have been detected. In both Panel A (full sample) and Panel B (excluding large municipalities) we find that the coefficient for the interaction term between competition and the three months preceding as well as the three months following local election is significantly negative at 5% and 1% level, respectively in the most demanding specifications. Excluding large municipalities does not change the picture much. The interpretation is that a larger difference between first and second candidate decreases the amount of cash transactions in the months surrounding local elections; or that fiercer competition increases cash transactions around elections. The magnitude of the effect is far from negligible. Using the results reported in column (6) of Panel B, one standard

deviation decrease of the difference between the first and the second mayoral candidate generates an increase of *per capita* cash transactions of €9.42 in the three months before and of €7.02 in the three months after the elections.

The second heterogeneity test explores the role of organized crime in the relationship between politicians and electorate. There is a consistent literature showing that organized crime endorses specific politicians in exchange for all sorts of later favor, ranging from the allocation of public procurement contracts to local businesses run by some of their members or affiliates, to the implementation of policies favorable to their activities, or simply turning an eye blind on their illicit local traffics. Relying on the solid body of evidence on the functioning of organized crime when engaging in the electoral sphere essentially adopting intimidation and outright violence to influence voters, we conjecture that municipalities prone to organized crime should display a lower degree of abnormal cash transactions, as a "cheaper" technology is available to secure extra votes.

As for the previous test, we amend model (1) including the interaction term between our preferred measure of organized crime (*Crime infiltration index*) and the dummies identifying the election month, the pre- and post-election periods, with the non interacted terms being absorbed by the municipality fixed effects.

$$\begin{aligned} CT_{i,t} &= \beta_E^{''} Election_{i,t} + \beta_{pre}^{''} PreElection_{i,t} + \beta_{post}^{''} PostElection_{i,t} + \\ &+ \lambda_E Election_{i,t} \times Infiltration + \lambda_{pre} PreElection_{i,t} \times Infiltration + \\ &+ \lambda_{post} PostElection_{i,t} \times Infiltration + X_{i,t}^{\prime} \gamma^{''} + \alpha_i^{''} + \delta_t^{''} + \mu_i^{''} t + \psi_{i,t}^{''} + \epsilon_{i,t}^{''} \end{aligned} \tag{3}$$

The results of the estimates produced with this augmented model are reported in Table 6, which has the same structure of Table 5. The message delivered from the test is strong and clear: all coefficients for the interaction terms between our dummy variable for the trimester before the elections and our indicator measuring the presence of organized crime are negative and significant at less than 1%. The coefficients of the interactions are not directly comparable with those non interacted but we get an idea of the magnitude by looking at the effect of one standard deviation increase in the $Crime\ infiltration\ index$, which leads to a decrease in *per capita* cash transactions of €17.21 in the three months preceding the elections, when using the coefficients of column (6) of Panel B. Indeed, the presence of organized crime entirely wipes out the abnormal cash transactions

around local elections we observe elsewhere in Italy. We interpret these results as evidence of the adoption by criminal organization of alternative methods to influence local voters in which intimidation and violence are used instead on monetary rewards. An alternative interpretation, which however does not affect the main message of our study, is that organized crime members are more skillful in carrying our opaque transactions leaving no trails in the banking system. Either way, it shows that whatever electoral service is dealt with by the local criminal organizations in certain areas of Italy, elsewhere involves the use of an abnormal amount of cash.

6 Falsification, robustness, and discussion of the results

To support our interpretation of the results we perform a falsification test whereby the month of the election is moved forward by 24 months. In other words, we pretend local elections took place 24 months later, and test whether we detect any abnormal cash transactions in the period preceding and following these fake election months. The results of this test are summarized in Table 7. Even though some significant coefficients arise in some of our specifications (of opposite sign to the ones we find in the main tables), there is no systematic evidence comparable with our main analysis, thereby confirming the validity of our main results.

Furthermore Table A1 in the appendix we test the robustness of our results on the role of electoral competition by adopting an alternative measure of local electoral competition, the Herfindahl–Hirschman concentration index (HHI) of the vote shares of mayoral candidates. The results confirm the pattern from Table 5 with a clear significant effect of electoral competition on the level of cash transactions around elections: the tighter the electoral competition (i.e., the lower the HHI), the larger the level of cash transaction. In terms of magnitude, using the coefficients of the most demanding specification of Panel B, one standard deviation decrease in the HHI results in €9.10 increase in *per capita* cash transactions in the three months preceding the elections and €8.86 in the three months following the elections.

Table A2 in the appendix reports the estimates we obtain when adopting an alternative measure of organized crime, the $Unime\ Mafia$ index. The results confirm the negative effect of the presence of organized crime on cash transactions before elections. Differently from the results of Table 6, now we used a binary index to identify mafia municipalities, and the results are coherent with the previous ones. The terms for the trimester before the elections and the presence of organized crime are negative and significant at less than 1% (except column 6 of Panel B which is significant at 5%

level).

The results discussed so far provide clear evidence of the existence of atypical cash transactions occurring in particular in the months before municipal elections, which increase with the intensity of electoral competition, and that we interpret as evidence of electoral corruption. Alternative interpretations focusing on the characteristics of the municipality, the sophistication of its financial infrastructure, the effect of business and/or political cycle can be safely ruled out given the municipality, time, and municipality-year fixed effects included in the model. A further possibility might be that our model captures electoral campaign expenditure which may be legitimate and not necessarily evidence of electoral corruption. If this was the case, however, these *cash* transactions would be correlated to the non-cash transactions occurring around elections, and we control for them in our model. Therefore, what we are capturing is really the anomalous cash transactions occurring around municipal elections that cannot be explained by the *normal* campaign expenditures measured by the non-cash transactions.

7 Conclusions

We study the dynamics of electoral corruption in the context of local elections in Italy. Exploiting the asynchronous nature in the timing of mayoral elections and a unique Bank of Italy's dataset on local cash transactions, we estimate a causal relationship between elections and the municipality-level amount exchanged through cash transactions. Our difference-in-difference estimates, including municipality, time, municipality-year fixed effects and municipality specific trends to control for political and electoral business cycles, suggest that municipal elections in Italy increase the *per capita* volume of cash transactions by about 2.6% on average (4%, excluding bigger municipalities), mainly concentrated in the three months preceding the election day. Given the inherent opaque nature of cash as a means of payment, we interpret this abnormal cash volume as evidence of activities implemented in the shadow of the law to secure electoral support. Exploring the heterogeneity of our main result reveals that tighter competition increases the amount of pre-electoral cash transactions. Furthermore, the presence of active criminal organizations, typically resorting to intimidation and violence in their mediating role between politicians and voters, is found to cancel out the abnormal volume of cash transations around elections. The proposed methodology is also extended to identify abnormal local trends by estimating municipality electoral effects on cash movements (for further details see Appendix B).

Our results can be used to define better anticorruption policies on political campaign practices specifically focusing on cash payments. All the same, the empirical findings seem to show that measures to reduce the use of cash (such as the enforcement of thresholds on cash transactions, which have long been applied in Italy) may act as an effective deterrent to unlawful financial conducts.

At a more operational level, municipalities featuring the most significant surge in cash transactions can be earmarked for enhanced monitoring by financial institutions and competent institutions in the eve of elections to the end of reporting opaque financial movements to the FIU. Finally, our approach can be easily applied to other countries and contexts, by drawing on the data submitted to AML authorities by financial intermediaries.

Tables

Table 1: Description of the variables used in the study

Variables	Description
Monthly *per capita* cash transaction	For a given municipality and month, sum of the value of withdrawals and deposits from S.AR.A. data. This sum is standardised by the municipality demographic size. It is the response variable of the estimated models
Monthly *per capita* non-cash transactions	For a given municipality and month, sum of the values of all the financial transactions (excluding cash) from S.AR.A. data. The total amount is divided by the municipality population size
Yearly *per capita* loans	For each municipality, yearly *per capita* loans from the banking reports file for prudential supervision obligation
Yearly *per capita* deposits	For each municipality, yearly *per capita* deposits from the banking reports file for prudential supervision obligation
Population	Population at the census of Italian municipalities
Election dates	Dates of local elections for each Italian municipality between January 2008 and December 2018
Electoral competition - Difference 1^{st}-2^{nd} candidates	Given a municipality election, difference between the votes share of the two most voted candidates
Electoral competition - HHI mayoral's vote shares	For a given election, the Hirschmann-Herfindahl index is computed to measure the concentration of votes for the candidates running for mayor
Organised crime - Crime infiltration index	Share of the companies infiltrated by organised crime at the Italian provincial level. Infiltrated companies are identified on the basis of the Italian FIU's own set of confidential information, for further details see (UIF, 2021)
Organised crime - Mafia Unime	Indicator that identify mafia-rigged municipalities and mafia families cited in the news in the previous decade for the regions of Campania, Calabria and Sicily (CSDCM, Unime, 1994)

Table 2: Descriptive statistics of the main variables included in the analysis for all the municipalities and the sub-sample excluding large municipalities (with a population above 5,000 inhabitants)

Variables	N	mean	sd	min	max
Panel A: All municipalities					
Monthly *per capita* cash transaction (CT)	1033311	248.21	334.68	0.00	53680.00
Yearly *per capita* loans	1033311	9067.42	15821.61	0.00	1067412.25
Yearly *per capita* deposits	1033311	8469.71	17885.75	0.00	1980211.88
Monthly *per capita* non-cash transactions	1033311	5577.11	16160.11	0.00	5001902.00
Electoral competition - Difference 1^{st}-2^{nd} candidates	1024232	0.28	0.28	0	1.00
Electoral competition - HHI mayoral's vote shares	1024232	0.51	0.19	0.14	1.00
Organised crime - Crime infiltration index	1033311	0.018	0.012	0.004	0.063
Organised crime - Mafia Unime	1033311	0.04	0.19	0.00	1.00
Panel B: Excluding large municipalities					
Monthly *per capita* cash transaction (CT)	733360	198.58	309.39	0.00	53680.00
Yearly *per capita* loans	733360	6030.99	10765.60	0.00	188825.72
Yearly *per capita* deposits	733360	6492.02	7884.80	0.00	135756.38
Monthly *per capita* non-cash transactions	733360	3264.80	7566.85	0.00	1402923.75
Electoral competition - Difference 1^{st}-2^{nd} candidates	728633	0.31	0.31	0	1.00
Electoral competition - HHI mayoral's vote shares	728633	0.56	0.19	0.16	1.00
Organised crime - Crime infiltration index	733360	0.017	0.011	0.004	0.063
Organised crime - Mafia Unime	733360	0.01	0.12	0.00	1.00

Table 3: Cash transactions around local elections.

Dependent Variable: Cash transactions						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Twelve months						
Pre Election months (12)	-0.580	0.715	0.724	0.714	0.853	1.319*
	(0.793)	(0.736)	(0.735)	(0.733)	(0.751)	(0.720)
Election month	-2.122	-0.373	-0.370	-0.395	0.358	0.412
	(3.585)	(3.611)	(3.611)	(3.611)	(3.627)	(3.646)
Post Election months (12)	-2.244***	-1.248*	-1.236*	-1.234*	-0.923	-0.948
	(0.723)	(0.671)	(0.666)	(0.665)	(0.696)	(0.841)
Observations	1033311	1033311	1033311	1033311	1033311	1033275
R^2	0.552	0.612	0.612	0.612	0.628	0.698
Panel B: Three months						
Pre Election months (3)	3.755*	5.040**	5.036**	5.014**	4.900***	6.532***
	(2.066)	(2.008)	(2.008)	(2.008)	(1.890)	(1.913)
Election month	-1.549	-0.199	-0.201	-0.225	0.426	2.168
	(3.527)	(3.551)	(3.551)	(3.551)	(3.566)	(3.526)
Post Election months (3)	-2.816***	-1.448	-1.450*	-1.473*	-1.408	-0.319
	(0.932)	(0.881)	(0.881)	(0.882)	(0.925)	(0.941)
Observations	1033311	1033311	1033311	1033311	1033311	1033275
R^2	0.552	0.612	0.612	0.612	0.628	0.698
Time FE	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	
Municipality Trend		✓	✓	✓	✓	✓
per capita loans			✓	✓	✓	
per capita deposits				✓	✓	
per capita non-cash transactions					✓	✓
Municipality-year FE						✓

Notes: Standard errors clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Cash transactions around local elections - excluding large municipalities.

Dependent Variable: Cash transactions						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Twelve months						
Pre Election months (12)	1.895**	2.956***	3.021***	3.051***	2.133***	1.649**
	(0.836)	(0.750)	(0.758)	(0.758)	(0.701)	(0.820)
Election month	0.572	1.352	1.377	1.417	2.500	2.072
	(5.353)	(5.413)	(5.415)	(5.415)	(5.448)	(5.417)
Post Election months (12)	-1.864**	-1.630**	-1.626**	-1.544**	-0.868	-1.191
	(0.772)	(0.704)	(0.702)	(0.702)	(0.795)	(0.883)
Observations	733360	733360	733360	733360	733360	733326
R^2	0.500	0.558	0.558	0.559	0.617	0.682
Panel B: Three months						
Pre Election months (3)	8.274***	8.774***	8.781***	8.814***	6.768***	8.301***
	(2.226)	(2.160)	(2.161)	(2.163)	(1.563)	(1.596)
Election month	0.580	1.135	1.144	1.159	2.268	4.034
	(5.289)	(5.341)	(5.342)	(5.342)	(5.366)	(5.325)
Post Election months (3)	-2.682**	-2.128**	-2.122**	-2.127**	-2.282**	-1.392
	(1.112)	(1.058)	(1.060)	(1.065)	(1.140)	(1.193)
Observations	733360	733360	733360	733360	733360	733326
R^2	0.500	0.558	0.558	0.559	0.617	0.682
Time FE	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	
Municipality Trend		✓	✓	✓	✓	✓
per capita loans			✓	✓	✓	
per capita deposits				✓	✓	
per capita non-cash transactions					✓	✓
Municipality-year FE						✓

Notes: Standard errors clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: The role of electoral competition on cash transactions.

Dependent Variable: Cash transactions						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All municipalities						
Difference 1^{st}-2^{nd} candidates	8.708**	3.028	3.011	2.870	3.655	5.175**
	(3.461)	(2.480)	(2.475)	(2.458)	(2.417)	(2.143)
Pre Election months (3)	7.604**	6.632**	6.628**	6.572**	6.327**	9.523***
	(3.034)	(2.966)	(2.965)	(2.966)	(2.782)	(2.741)
Pre Election months × Difference	-15.91***	-7.367	-7.374	-7.208	-6.712	-11.90**
	(6.121)	(5.921)	(5.921)	(5.922)	(5.560)	(5.111)
Election month	3.171	2.536	2.532	2.485	3.357	6.218
	(5.702)	(5.727)	(5.727)	(5.728)	(5.740)	(5.716)
Election month × Difference	-17.59**	-10.03	-10.03	-9.917	-10.75	-14.35*
	(8.464)	(8.421)	(8.421)	(8.421)	(8.416)	(8.645)
Post Election months (3)	1.537	1.303	1.296	1.259	1.500	3.161**
	(1.504)	(1.418)	(1.418)	(1.420)	(1.462)	(1.597)
Post Election months × Difference	-15.49***	-9.326**	-9.313**	-9.240**	-9.992***	-11.71***
	(4.022)	(3.810)	(3.809)	(3.806)	(3.807)	(4.510)
Observations	1024232	1024232	1024232	1024232	1024232	1024196
R^2	0.551	0.611	0.611	0.612	0.628	0.698
Panel B: Excluding large municipalities						
Difference 1^{st}-2^{nd} candidates	5.776	5.351**	5.360**	4.970**	3.966*	5.332**
	(3.516)	(2.444)	(2.431)	(2.387)	(2.401)	(2.410)
Pre Election months (3)	14.84***	13.06***	13.06***	12.98***	9.236***	11.71***
	(3.704)	(3.609)	(3.608)	(3.611)	(2.571)	(2.539)
Pre Election months × Difference	-21.44***	-14.80**	-14.77**	-14.36**	-8.743*	-11.22**
	(6.907)	(6.667)	(6.665)	(6.663)	(5.125)	(4.668)
Election month	5.748	4.266	4.256	4.166	5.547	8.237
	(8.678)	(8.735)	(8.736)	(8.736)	(8.749)	(8.717)
Election month × Difference	-16.12	-10.09	-10.04	-9.651	-10.59	-12.99
	(11.27)	(11.25)	(11.25)	(11.25)	(11.25)	(11.46)
Post Election months (3)	1.384	0.333	0.316	0.197	-0.0951	1.455
	(1.737)	(1.642)	(1.641)	(1.640)	(1.631)	(1.867)
Post Election months × Difference	-12.16***	-7.413*	-7.343*	-6.939*	-6.679*	-8.359*
	(4.203)	(3.962)	(3.952)	(3.936)	(3.831)	(4.660)
Observations	728633	728633	728633	728633	728633	728599
R^2	0.499	0.557	0.557	0.558	0.616	0.681
Time FE	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	
Municipality Trend		✓	✓	✓	✓	✓
per capita loans			✓	✓	✓	
per capita deposits				✓	✓	
per capita non-cash transactions					✓	✓
Municipality-year FE						✓

Notes: Standard errors clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Organised crime (Crime infiltration index) and cash transactions around elections.

Dependent Variable: Cash transactions						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All municipalities						
Trimester$_{-1}$	13.13***	15.67***	15.70***	15.66***	14.19***	15.33***
	(5.011)	(4.882)	(4.885)	(4.885)	(4.517)	(4.480)
Infiltration x Trimester$_{-1}$	-486.4***	-551.2***	-553.2***	-552.4***	-481.8***	-454.9***
	(184.1)	(180.7)	(181.0)	(180.9)	(166.9)	(161.7)
Infiltration x Election month	721.7	662.8	661.6	661.6	677.0	654.9
	(445.8)	(448.1)	(448.1)	(448.1)	(448.2)	(447.2)
Election month	-15.47***	-12.98**	-12.96**	-12.98**	-12.63**	-10.44*
	(5.385)	(5.386)	(5.387)	(5.387)	(5.387)	(5.409)
Trimester$_{+1}$	-1.446	0.931	0.940	0.927	0.695	2.661
	(1.879)	(1.853)	(1.855)	(1.856)	(1.831)	(2.084)
Infiltration x Trimester$_{+1}$	-71.77	-124.1	-124.7	-125.2	-109.7	-153.7*
	(79.52)	(80.76)	(80.88)	(80.88)	(80.69)	(92.04)
Observations	1033311	1033311	1033311	1033311	1033311	1033275
R^2	0.552	0.612	0.612	0.613	0.628	0.698
Panel B: Excluding large municipalities						
Trimester$_{-1}$	21.07***	22.51***	22.52***	22.35***	16.88***	16.74***
	(5.754)	(5.597)	(5.598)	(5.599)	(3.813)	(3.668)
Infiltration x Trimester$_{-1}$	-726.5***	-780.0***	-780.3***	-768.8***	-574.0***	-478.1***
	(220.2)	(213.3)	(213.3)	(213.3)	(150.0)	(141.8)
Election month	-17.69**	-16.27*	-16.27*	-16.36*	-14.47*	-13.00
	(8.602)	(8.642)	(8.644)	(8.643)	(8.650)	(8.642)
Infiltration x Election month	1038	989.1	989.4	995.2	950.9	968.5
	(771.5)	(777.1)	(777.2)	(777.2)	(777.3)	(773.9)
Trimester$_{+1}$	-3.983*	-2.671	-2.675	-2.696	-1.751	-0.499
	(2.099)	(2.040)	(2.041)	(2.046)	(2.051)	(2.392)
Infiltration x Trimester$_{+1}$	73.34	30.27	30.88	31.78	-30.64	-50.03
	(94.07)	(91.60)	(91.64)	(91.49)	(93.98)	(112.5)
Observations	733360	733360	733360	733360	733360	733326
R^2	0.500	0.558	0.558	0.559	0.617	0.682
Time FE	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	
Municipality Trend		✓	✓	✓	✓	✓
per capita loans			✓	✓	✓	
per capita deposits				✓	✓	
per capita non-cash transactions					✓	✓
Municipality-year FE						✓

Notes: Standard errors clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Falsification exercise: centering at 24 months after the real elections.

Dependent Variable: Cash transactions						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Full Sample						
Trimester$_{-1}$	0.179	-1.626	-1.651	-1.561	-1.582	-2.417*
	(1.267)	(1.209)	(1.209)	(1.209)	(1.201)	(1.243)
Month t+24	1.932*	0.0154	-0.00939	0.0717	-0.542	-1.198
	(1.030)	(0.990)	(0.990)	(0.988)	(1.022)	(1.097)
Trimester$_{+1}$	2.787**	1.145	1.121	1.202	0.913	-0.0954
	(1.160)	(1.126)	(1.122)	(1.122)	(1.129)	(1.157)
Observations	1033311	1033311	1033311	1033311	1033311	1033275
R^2	0.552	0.612	0.612	0.612	0.628	0.698
Panel B: Excluding large municipalities						
Trimester$_{-1}$	-1.162	-2.752*	-2.851*	-2.744*	-2.405	-2.456
	(1.612)	(1.548)	(1.554)	(1.552)	(1.559)	(1.587)
Month t+24	1.129	-0.594	-0.695	-0.602	-0.972	-0.837
	(1.268)	(1.229)	(1.234)	(1.228)	(1.332)	(1.365)
Trimester$_{+1}$	1.919	0.450	0.350	0.427	-0.168	-0.656
	(1.544)	(1.511)	(1.511)	(1.511)	(1.551)	(1.647)
Observations	733360	733360	733360	733360	733360	733326
R^2	0.500	0.558	0.558	0.559	0.617	0.682
Time FE	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	
Municipality Trend		✓	✓	✓	✓	✓
per capita loans			✓	✓	✓	
per capita deposits				✓	✓	
per capita non-cash transactions					✓	✓
Municipality-year FE						✓

Notes: Standard errors clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

A Appendix

Table A1: The role of electoral competition on cash transactions - Alternative measure of electoral competition: Concentration (HHI) index of mayoral candidates' vote shares

Dependent Variable: Cash transactions						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All municipalities						
HHI of candidates' vote shares	25.21***	2.167	2.252	1.834	1.109	8.175**
	(5.509)	(3.845)	(3.857)	(3.832)	(3.801)	(3.421)
Trimester_{-1}	11.84**	6.143	6.132	5.848	5.913	13.79***
	(5.199)	(5.101)	(5.101)	(5.112)	(4.705)	(4.402)
HHI x Trimester_{-1}	-17.13**	-2.966	-2.959	-2.413	-2.718	-14.89**
	(8.598)	(8.394)	(8.394)	(8.418)	(7.721)	(6.988)
Election month	12.17***	7.523*	7.503*	7.319*	9.017**	14.46***
	(4.166)	(4.100)	(4.099)	(4.109)	(4.172)	(4.436)
HHI x Election month	-27.41***	-15.29***	-15.26***	-14.93***	-16.99***	-24.11***
	(4.699)	(4.530)	(4.526)	(4.551)	(4.599)	(5.516)
Trimester_{+1}	9.015***	5.868*	5.840*	5.755*	7.219**	9.630***
	(3.166)	(3.069)	(3.070)	(3.078)	(3.205)	(3.591)
HHI x Trimester_{+1}	-23.20***	-14.09**	-14.04**	-13.90**	-16.73***	-19.18***
	(5.937)	(5.755)	(5.756)	(5.767)	(5.926)	(6.906)
Observations	1024232	1024232	1024232	1024232	1024232	1024196
R^2	0.551	0.611	0.611	0.612	0.628	0.698
Panel B: Excluding large municipalities						
HHI of candidates' vote shares	10.27*	4.941	5.092	4.454	1.995	6.236
	(5.796)	(3.939)	(3.961)	(3.890)	(4.004)	(4.118)
Trimester_{-1}	27.62***	22.82***	22.81***	22.41***	14.12***	17.15***
	(7.530)	(7.371)	(7.371)	(7.370)	(5.014)	(4.679)
HHI x Trimester_{-1}	-34.89***	-25.64**	-25.63**	-24.80**	-13.51*	-15.97**
	(11.37)	(11.09)	(11.10)	(11.09)	(7.846)	(7.066)
Election month	11.31	7.115	7.089	6.719	8.965	12.05
	(9.085)	(9.101)	(9.099)	(9.100)	(9.143)	(9.349)
HHI x Election month	-18.99**	-10.69	-10.63	-9.916	-11.97	-14.08
	(8.166)	(8.056)	(8.049)	(8.050)	(8.061)	(8.938)
Trimester_{+1}	9.298**	6.257*	6.211*	5.843	5.835	7.529*
	(3.763)	(3.581)	(3.574)	(3.563)	(3.589)	(4.137)
HHI x Trimester_{+1}	-20.98***	-14.73**	-14.64**	-13.97**	-14.32**	-15.55**
	(6.472)	(6.159)	(6.149)	(6.129)	(6.068)	(7.125)
Observations	728633	728633	728633	728633	728633	728599
R^2	0.499	0.557	0.557	0.558	0.616	0.681
Time FE	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	
Municipality Trend		✓	✓	✓	✓	✓
per capita loans			✓	✓	✓	
per capita deposits				✓	✓	
per capita non-cash transactions					✓	✓
Municipality-year FE						✓

Notes: Standard errors clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

Table A2: Organised crime and cash transactions around elections - alternative measure of organized crime (Unime Mafia).

Dependent Variable: Cash transactions						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All municipalities						
Trimester$_{-1}$	4.395**	5.714***	5.711***	5.682***	5.565***	7.066***
	(2.158)	(2.098)	(2.098)	(2.098)	(1.974)	(1.991)
Mafia x Trimester$_{-1}$	-13.87***	-14.60***	-14.62***	-14.46***	-14.42***	-11.44***
	(3.466)	(3.172)	(3.172)	(3.171)	(3.083)	(2.943)
Election month	-1.330	0.0392	0.0374	0.0111	0.701	2.413
	(3.694)	(3.720)	(3.720)	(3.720)	(3.736)	(3.692)
Mafia x Election month	-4.823	-5.234	-5.232	-5.179	-6.022	-5.217
	(4.787)	(4.589)	(4.589)	(4.587)	(4.588)	(4.666)
Trimester$_{+1}$	-2.905***	-1.531*	-1.534*	-1.555*	-1.440	-0.292
	(0.975)	(0.924)	(0.924)	(0.926)	(0.969)	(0.977)
Mafia x Trimester$_{+1}$	1.788	1.675	1.694	1.654	0.560	-0.466
	(3.216)	(3.282)	(3.283)	(3.281)	(3.303)	(4.270)
Observations	1033311	1033311	1033311	1033311	1033311	1033275
R^2	0.552	0.612	0.612	0.613	0.628	0.698
Panel B: Excluding large municipalities						
Trimester$_{-1}$	8.577***	9.055***	9.061***	9.085***	7.020***	8.490***
	(2.266)	(2.200)	(2.201)	(2.203)	(1.592)	(1.620)
Mafia x Trimester$_{-1}$	-16.30***	-15.10***	-15.07***	-14.58***	-13.59***	-10.01**
	(5.826)	(5.426)	(5.415)	(5.399)	(5.040)	(4.184)
Election month	0.703	1.240	1.247	1.257	2.401	4.149
	(5.390)	(5.443)	(5.444)	(5.444)	(5.468)	(5.426)
Mafia x Election month	-6.658	-5.652	-5.572	-5.282	-7.195	-6.070
	(8.662)	(8.464)	(8.460)	(8.447)	(8.379)	(8.203)
Trimester$_{+1}$	-2.692**	-2.154**	-2.149**	-2.156**	-2.263*	-1.357
	(1.131)	(1.077)	(1.079)	(1.084)	(1.161)	(1.213)
Mafia x Trimester$_{+1}$	0.410	1.278	1.391	1.486	-1.126	-1.773
	(5.459)	(5.358)	(5.363)	(5.335)	(5.209)	(6.714)
Observations	733360	733360	733360	733360	733360	733326
R^2	0.500	0.558	0.558	0.559	0.617	0.682
Time FE	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	
Municipality Trend		✓	✓	✓	✓	✓
per capita loans			✓	✓	✓	
per capita deposits				✓	✓	
per capita non-cash transactions					✓	✓
Municipality-year FE						✓

Notes: Standard errors clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

B Appendix

The methodological strategy described in Section 4 allows to evaluate the significance movement of average cash transactions in the year/trimester both before and after the election months. This analysis gives a general overview of the phenomenon on a national scale. However, in order to detect specific local patterns at a municipality level, in this section an additional model specification is proposed. The Model 1 is adjusted including municipality fixed effects before and after the elections, and the corresponding model equation is:

$$\begin{aligned} CT_{i,t} &= \beta_{iE} Election_{i,t} + \beta_{ipre} PreElection_{i,t} + \beta_{ipost} PostElection_{i,t} + \\ &+ X'_{i,t}\gamma + \alpha_i + \delta_t + \mu_i t + \psi_{i,t} + \epsilon_{i,t} \end{aligned} \tag{4}$$

For a given municipality i, the coefficients of interest are the associated β_i capturing the average difference in cash transactions in the trimester/year before (β_{ipre}) and in the trimester/year after (β_{ipost}) the election month.

The Model 4 is estimated for small municipalities (that have a population between 0 and 5000 inhabitants), selecting those with a complete monthly time series in the period between 2008 and 2018. Figure 1 shows $\hat{\beta}_{ipre}$ and $\hat{\beta}_{ipost}$ for each municipality. The results indicates that on a municipality scale the phenomenon of cash movements around elections is quite complex and locally diversified. Some municipalities feature a marked increase of cash transactions either after or before elections, instead in others such increase can be observed in both periods. As one may expect, in some cases there is even a contraction in cash transactions around elections. By ordering the municipality estimated effects $\hat{\beta}_{i-}$, we can obtain a ranking of the cities according to the movement of *per capita* cash transactions around the electoral periods. This result can be used to operational ends so as to control for potential corruptive practices in the proximity of elections.

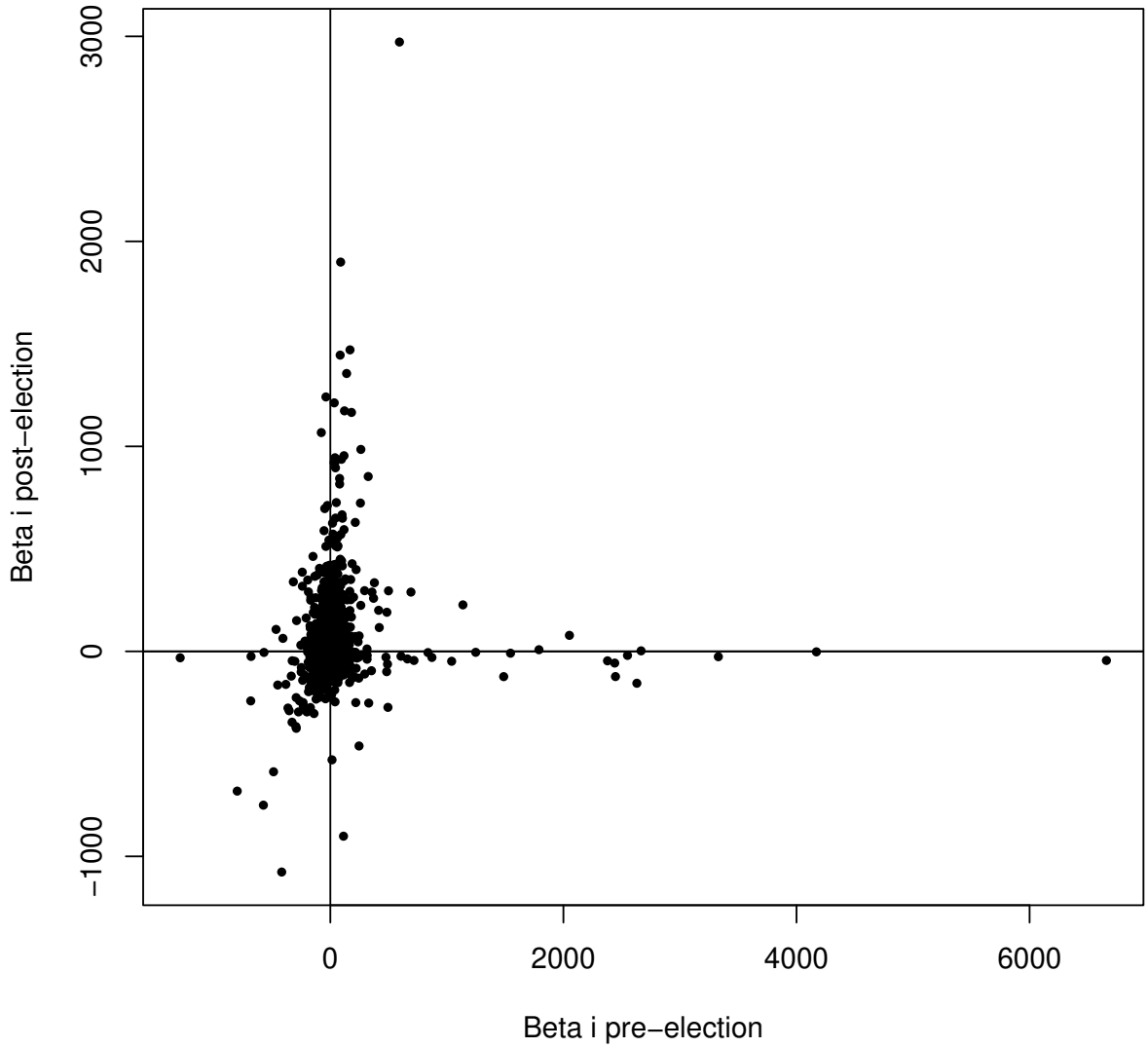

Figure 1: Estimated municipality effects $\hat{\beta}_{ipre}$ and $\hat{\beta}_{ipost}$ of Model (4), excluding cities with more than 5,000 inhabitants. For a given municipality, they capture the average difference in *per capita* cash transactions in the trimester before and after the election months.

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