The Price of a Vote: Evidence from France, 1993-2014

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ABSTRACT

What is the price of a vote? This paper investigates this consequential controversy by analyzing a new comprehensive dataset of all French municipal and legislative elections over the 1993-2014 period. We begin by documenting the evolution of campaign finance in France, and show that both the amount and sources of campaign contributions vary widely from one candidate to another, in particular depending on their political party. We

then turn to the empirical analysis and tackle a number of empirical challenges. First, we rely on recent methodological innovations to handle the special characteristics of multiparty data. Second, to overcome the endogenous nature of campaign spending, we propose a new instrument based on a change in legislation. We find that an increase in spending per voter consistently increases a candidate's vote share both for municipal and legislative elections, and that the effect is heterogeneous depending on the parties and on the sources of campaign funding. According to our estimations, the price of a vote is about 6 euros for the legislative elections, and 32 euros for the municipal ones. Simulations show that small changes in spending patterns and caps can have a large impact on electoral outcomes and seats. Our results suggest that political finance needs to be tightly regulated.

Keywords: Elections, Campaign financing, Campaign expenditures, Campaign finance reform, Multiparty electoral data

JEL Classifications: D72, P48, H7

1 Introduction

Is democracy about the median voter or does money make a difference? In their seminal work, Grossman and Helpman (1996, 2001) have highlighted the different mechanisms through which special interest groups may affect policy in modern democracies. Among others, interest groups make campaign contributions to affect the likelihood that a candidate is elected. With rising inequality, there is today growing concern that money may increasingly corrupt politics. Such a risk explains why, in the majority of the developed countries, there is legislation to control and limit the amount both firms and individuals can give to either or both politicians and political parties. In the United States, where most of these regulations have been removed during the last decades[1], the last elections smashed previous records for outside expenditures (Kuhner, 2015), and mega donors fuel the rising costs of elections.[2]

In France, a number of important reforms providing public funds for campaigns and parties and limiting campaign spending have been enacted since 1988 (Gunlicks, 1993). However, campaign spending is still at the core of the debate, as the trial over the 2012 Nicolas Sarkozy's campaign overspend ("Bygmalion affair") reminded us.[3] Moreover, not only the amount but the overall structure and composition of spending matter, in particular the sources of campaign contributions (Vanberg, 2008). E.g., the 2017 campaign of today's French president Emmanuel Macron, absent the financial pot of a traditional political party, was largely funded by donations, unlike other candidates.

How much does campaign spending influence the election? This empirical question has important implications for the debates over the relevance of campaign finance reforms. Although it has generated a very important literature both in economics and in political sciences, previous studies have reached conflicting conclusions. As highlighted by Ansolabehere et al. (2003), *"the links from an individual campaign contribution to the election prospects of candidates (...) are not very firm."* While the traditional view that challenger spending is more effective than incumbent spending has been discussed at length, the jury is still out, with a number of opposing views. On the one hand, some argue that challenger spending has much greater marginal returns that incumbent spending (Abramowitz, 1988; Jacobson, 1978, 1980, 1985, 1990, 2006; Palda and Palda, 1998; Gerber, 2004). On the other hand, others claim that the marginal effects of incumbent and challenger spending are roughly equal (Green and

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[1]In the United States, since 1976, the Supreme Court has struck down a host of campaign finance reforms, the most recent change being the Supreme Court's 2014 opinion in McCutcheon v. FEC (see e.g. Kuhner, 2014; Post, 2014).

[2]In the 2014 elections, 31,976 donors – equal to roughly one percent of one percent of the total population of the United States – accounted for $1.18 billion in disclosed political contributions at the federal level, i.e. 29% of all fundraising that political committees disclosed to the Federal Election Commission in 2014 (OpenSecrets.org). During the 2016 Presidential election, 1% of donors give 67% of the money.

[3]While in the United States a candidate can go over the spending threshold specified by the campaign finance law – and in this case is not eligible for public funding –, campaign overspending is forbidden by law in France.

Krasno, 1988; Gerber, 1998; Foucault and François, 2005). Finally, according to Levitt (1994), money does not influence election outcomes, while Ferguson et al. (2016) find the relations between money and major party votes are well approximated by straight lines.

In this article, we seek to address this consequential controversy by analyzing a new comprehensive dataset of all the French municipal and legislative elections since the 1990's. France has enacted important reforms granting public funding for campaigns and parties and regulating political financing since 1988. Our dataset covers four municipal and five legislative elections, with a total of around $40,000$ candidates. The data is mostly paper data that we digitize and merge from various historical sources. Producing these data is our first contribution.

We start by documenting the evolution of campaign finance in France. Regarding the legislative elections, we observe a strong decrease in spending after the 1993 election, from around €22,000 per candidate on average in 1993 to €10,000 in 2007. This is due to changes in regulation, with a decrease in the spending limit for legislative elections (but no change for the municipal ones) as well as the prohibition of donations from legal entities introduced by law in 1995 for all the elections. Despite this prohibition, spending for municipal elections increased between 1995 and 2001 (by about €2,000 per candidate), but have been decreasing since then. On the contrary, we observe an increase in spending for legislative elections between 2007 and 2012.[4]

Furthermore, we show that both the amount and sources of campaign contributions vary widely from one candidate to another. In particular, private donations represent a much higher share of funding for right-wing than for left-wing candidates in both municipal and legislative elections. On average, right-wing candidates receive an extra €3,400 in private donations in municipal elections compared to left-wing candidates, while candidates from the extreme left and the extreme right receive nearly no donations. This extra €3,400 translate directly in right-wing candidates getting €4,200 more in total revenues, and spending €3,000 more for their campaign. The difference is even more striking for legislative elections where on average candidates from the right-wing party receive €18,000 in private donations, compared to slightly less than €10,000 for the Socialist party candidates, €2,300 for the Communist party candidates, and less than €500 for the other parties. Like for the municipal elections, this is reflected in the candidates' total spending.

We then investigate the effect of an increase in campaign spending on electoral results. France – like the vast majority of democracies around the globe[5] – has a multiparty electoral system, which raises a number of empirical challenges. In particular, the OLS regression model traditionally used for the analysis of two-party system is inappropriate when three

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[4]Unfortunately, spending data for the 2017 legislative elections are still not available.

[5]As highlighted by Tomz et al. (2002), *"in the postwar period, the United States stands alone as the only industrialized country with a consistent two-party system."*

or more parties compete in elections. To tackle these challenges, we rely on the multiparty electoral data literature and the recent methods developed therein. Katz and King (1999) have first proposed a comprehensive statistical model for analyzing multiparty, district-level elections such as the French elections. However, their statistical model is computationally demanding, and hence slow and numerically imprecise with more than three parties (Honaker et al., 2002). We thus follow the approximate methods produced by Honaker et al. (2002) and Tomz et al. (2002). Their methods work with many parties without making too many theoretical compromises.

Two fundamental features of multiparty voting data are that the vote share obtained by each candidate falls within the unit interval, and that the sum of the vote shares in each district is equal to one. Concretely, following Katz and King (1999), Honaker et al. (2002) and Tomz et al. (2002), we calculate the natural log of each party's share of the vote, relative to that of a reference party (multivariate logistic transformation). We then use this transformed vote share for each party as a dependent variable and regress each on a set of explanatory variables – including election fixed effects and district fixed effects – via a seemingly unrelated system of equations (SUR). To perform this analysis we use *Clarify*, a statistical suite incorporated on Stata (King et al., 2000; Tomz et al., 2001).

An additional complication comes from the fact that all parties do not field candidates in every election district. Hence, the SUR model may drive information loss; in particular, the information from district elections that are not fully contested (i.e. where all the parties do not run) is dropped by this model. Two alternative strategies have been proposed to tackle this issue, and we use them in turn. First, we estimate the effect of campaign spending on votes only in fully contested districts. However, by doing so, we may lose useful information. We then follow Honaker et al. (2002) and use their "full information approach".[6] To do so, we input the observed voting data for all the parties using the *Amelia* imputation software (Honaker et al., 2000), and study the "effective vote", that is the value of the vote shares that we would observe if all parties were contesting in all districts. This approach treats the problem of explaining the effective vote in partially contested districts as a missing data problem. The assumption here is that a party that chooses not to contest an election would have received fewer votes than any of the parties that did run if it had contested the election.

We perform a number of counterfactual estimations and obtain a positive impact of spending on votes, both for municipal and legislative elections. This effect is statistically and economically significant: would candidates from the right-wing party have been banned from spending during the last legislative election campaign, the party would have received 2.3 million fewer votes at the national level in the first round of the election. According to our

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[6]A third alternative approach consists of running a separate analysis for each pattern of contestation (Tomz et al., 2002). However, such an approach does not work well for complex patterns of partial contestation such as the one we observe in France.

estimates, the price of a vote is of around 6 euros for legislative elections. Knowing that on average the right-wing party candidates spent €8,200 more than the socialist party candidates, the extra private donations they receive give them a 1,367 to 2,734 vote advantage, depending on whether their electoral gain happens at the expense of the socialist party, which corresponds to 3 to 6% of the votes cast in the first round. In other words, relatively small changes in spending patterns and caps make a very large difference in electoral outcomes and seats.

Regarding municipal elections, we find the price of a vote to be higher: according to our estimates, the price of a vote for municipal elections is of around €32. Note that candidates tend to spend more for municipal than for legislative elections. Assuming that candidates from the right would have received the same amount in private donations as candidates from the left during the last municipal elections (2014) (which would amount to a €4.6 million decrease in the total amount of private donations received by right-wing candidates compared to what they received), everything else equal, this would have decreased the total number of votes obtained by right-wing candidates at the national level by nearly 260,000. In other words, one needs €18 in private donations to buy a vote. Hence, the role of money appears to be substantial in French municipal elections, though not as extreme as for legislative elections. This could be due to the fact that voters have better sources of information about the candidates running for more local elections.

Finally, determining the causal impact of spending on votes is complicated by the endogenous nature of campaign spending. A number of papers in the literature have tried to tackle this question, using different strategies to address the endogeneity issue.[7] For example Levitt (1994) uses repeat challengers in U.S. Congressional elections to deal with endogeneity, and Gerber (1998) instruments spending with variables that affect a candidate's ability to raise campaign funds, such as her wealth level.[8] In the face of conflicting results in the existing research, Jacobson (2006) focuses on changes in support for candidates over the course of a campaign using survey data. Estimating the impact of political advertising on presidential election outcomes in the U.S., Spenkuch and Toniatti (2016) exploit exogenous variation in the number of impressions across county borders driven by Federal Communications Commission (FCC) regulations.[9]

In this paper, exploiting a change in campaign finance legislation, we propose a new

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[7]An important number of papers have also treated campaign spending as exogenous. See e.g. Palda and Palda (1998) on the 1993 French legislative elections and Jacobson (1978, 1990) on the U.S..

[8]Related to this literature on the impact of spending on candidates' vote share, there is a large literature on the effects of campaign spending on the electoral fate of citizen initiatives. This literature faces similar identification issues. To solve the endogeneity problem, de Figueiredo et al. (2011), who analyze ballot propositions in California from 1976 to 2004, use how concentrated the costs and benefits of an initiative are as a new instrument for spending.

[9]As an alternative empirical strategy, one could use field experiments to study campaign-spending effects (see e.g. Gerber, 2004, for a review of this literature).

instrument for campaign spending. In 1995 France enacted a law which prohibited candidates from receiving donations from legal entities. This law was applied for the first time in the 1997 legislative elections. We exploit the fact that this change in legislation only affected those candidates who previously relied on private donations from legal entities. According to our estimates, an additional euro received from legal entities in 1993 is associated with a €0.46 decrease in total revenues between 1993 and 1997.[10] We focus on the candidates who ran both in the 1993 and in the 1997 elections and instrument the change in spending between 1993 and 1997 by the 1993 amount of donations received from private entities. This allows us to compute a predicted value for the 1997 spending. Reassuringly, the magnitude of the effect we obtain when estimating the impact of the predicted spending on the vote shares is only slightly lower than the magnitude of the effect of the actual spending, and is statistically significant at the one-percent level. In other words, our results do not seem to be driven the endogenous nature of campaign spending.

Why does campaign spending yield an electoral benefit? While many factors may be at play, we provide some suggestive evidence of the existence of a mobilization effect. More precisely, we show that campaign spending is positively associated with turnout at elections, and that the effect is both statistically and economically significant. For example, for legislative elections, a one-standard deviation increase in total spending by registered voters increases turnout by 5 percent of a standard deviation.

Our contribution to the existing literature is fourfold. First, there is a lack of empirical information about the flow of money and its impact on politics outside the case of the United States.[11] Yet it is critical in this area to develop a broad comparative perspective in order to better understand and analyze the forces at play. In this paper, we document the long-run evolution of campaign resources and spending in France[12] and show that, despite regulations limiting campaign spending, money still plays an important role in French politics. In a recent working paper, François et al. (2016) also investigate the effects of campaign spending on electoral outcomes in France, but they only focus on the 1993 and 1997 legislative elections and do not instrument for spending. On the contrary, we consider four municipal and five legislative elections, and propose a new instrumental variable in a multiparty electoral setting. Considering both local and national elections is of particular importance given that we obtain

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[10]Such a drop may be explained by the fact that the 1997 French legislative elections were unexpected. While a general election was not due constitutionally until 1998, on April 1997, the French President Jacques Chirac announced the dissolution of the National Assembly and a general election was scheduled to take place in May.

[11]An exception is Foucault and François (2005) who investigate the effect of campaign spending on the 1997 French legislative elections. However, their focus is on a single election while we consider all the municipal and legislative elections from 1993 to 2014, providing an overview of the evolution of campaign spending in France resulting from changes in the legislation. Scarrow (2007) reviews the literature on the impact of money in politics in democracies outside of the United States. A recent paper in this literature is Avis et al. (2017) who investigate the effects of campaign spending limits on political competition in Brazil.

[12]Ansolabehere et al. (2003) document the sources and amounts of campaign contributions in the U.S..

heterogeneous effects, and show in particular that the price of a vote is higher for municipal elections, a new finding in the literature.

Our findings could have important implications for other countries which, just like France, have limited campaign spending by law. This is the case in the United Kingdom, but also in Belgium, Canada, Chile, France, Israel, New Zealand, as well as South Korea, among many others (Gunlicks, 1993; Nassmacher, 2009; Speck, 2013; Avis et al., 2017). Second, as we highlighted above, France has a multiparty electoral system, like the vast majority of the democracies around the globe. Hence, the empirical approach we use in this paper could be of use for the analysis of campaign finance in a number of other countries. In particular, rather than simply comparing the marginal effects of incumbent and challenger spending, we take advantage of the richness of our data to investigate the extent to which some parties suffer relatively more from the competition of (and money spent by) others. Specifically, we show for example that spending by the Communist party both reduces votes for the Socialist party, and, to a lower extent, for the right-wing party, with no direct effect on other political organizations (e.g. the extreme right). Furthermore, we investigate the heterogeneous effects of spending depending on the sources of revenues (e.g. personal contributions vs. private donations). Finally, we propose a new empirical strategy to overcome the empirical issues linked to the endogeneity of spending.

The remainder of the paper is organized as follows. Section 2 provides historical background on the evolution of campaign finance laws in France. Section 3 introduces the new dataset we built for this study and provides descriptive statistics. Section 4 details the empirical strategy used in this paper. In Sections 5 and 6, we estimate the relationship between campaign spending and vote shares, both in municipal and in legislative elections. Section 7 shows that our results are robust to instrumenting campaign spending. In Section 8, we provide additional results and discusses our findings. Finally, Section 9 concludes.

2 Historical Background and Today's Rules

2.1 Campaign Finance Reform in France

French legislation on campaign and party financing has changed quite dramatically since the 1980's. Financing rules are now stable and mainly focus on the following aspects of political finance: (i) public funding of campaigns (through the reimbursement of campaign costs), (ii) public funding of political parties, (iii) regulation of the donations to candidates and political parties, and (iv) campaign spending caps.

France has enacted important legislation granting public funding for campaigns and parties and introducing spending caps since 1988.[13] Although candidates were reimbursed as early

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[13]This section partly draws on Gunlicks (1993) for the 1988-1993 period.

as 1962 for certain campaign costs, this is much later than in other countries. The laws of 1988 opened the way for a complete redesigning of the legislation on political financing.[14] Before that, parties were treated as simple associations (subjected to the law of 1 July 1901). They were not allowed to accept donations (from either legal or natural persons) and did not receive public subsidies. Political parties relied – at least officially – solely on membership dues, capped to 100 Francs (i.e. around €25[15]), and the party group of caucus assessment. In this Section, we review the different reforms that have been enacted in France since 1988. Those readers who choose to skip these historical details may go directly to Section 2.2.

1988-1990 The laws of 1988 regulated political financing. First, they introduced transparency regarding political funds (Articles 1 to 7). Since then, members of the government as well as some elective officials have been required to declare their wealth and assets. Political campaigns themselves were rethought with the prohibition of advertising on television and radio and the limitation of advertising in newspapers and telephone calls (phone-banking), prohibited in the three months preceding the elections.

These laws also introduced direct public funding of parties as well as additional indirect public funding in the form of public reimbursement of candidates for election campaign costs. Regarding direct party funding, the funding was granted in proportion to the number of deputies in the national assembly (*"Assemblée Nationale"*) and in the Senate (*"Sénat"*). The introduction of public party funding led to the requirement that the parties must present a financial statement.

With the 1988 laws, candidates were also allowed to receive donations. These donations were limited, however: a natural person (i.e. an individual) could donate a maximum of 30,000 Francs by year (€7,300) and a legal person (i.e. a corporation) a maximum of 50,000 Francs (€12,000) to a candidate. Donations of more than 1,000 Francs must be paid by check. In addition, donations may only cover up to 20% of the total campaign expenditures. Contributions to candidates carried tax privileges. The donations to a candidate may be deducted from taxes up to 1.25 percent of the income of a natural person and to 2 pro mille of the turnover of a company.

Finally, since 1988, political parties have been considered as regular corporate bodies, even if they are not registered as associations. Parties may receive private donations, the amounts of which are also limited. Donations may not exceed 50,000 Francs per year from a natural person and 500,000 Francs (€121,000) from a legal person. Any donation of more than 1,000 Francs must be paid by check.

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[14]Laws no. 88-286 and no. 88-227 of 11 March 1988.

[15]In the paper, for the sake of comparability, we convert all the monetary numbers in constant 2014 euros.

1990-1995 The 1990 law[16] introduced further financing of political parties and candidates. First, Article 10 modified the allocation of public party funding and established the division of the amount budgeted into two equal parts. The first part was allocated for the funding of parties and political associations and was dependent upon the results of the 1992 national assembly election. This part was set aside for the parties and political groups that ran candidates in at least 75 constituencies. The distribution was carried out in relation to the number of votes on the first ballot. The second part of the public subventions was allocated to those parties and associations represented in parliament. These subventions were granted in proportion to the number of deputies in parliament.

Second, the 1990 law was on the limits on election expenditures, and it clarified the funding of political activities. Donations to political parties were tax deductible in the amount of 1.25 percent of the income of a natural person, and 2 pro mille of the sales of a legal entity.

Third, since the 1993 elections, legislative election candidates have been entitled to a flat rate campaign cost refund. In 1993, the candidates who obtained more than 5% of the votes in their constituency receive public support amounting to $50,000$ Francs (around €$12,000$). The remaining candidates received nothing. Campaign expenditures were limited, however. In order to qualify for public funds, the candidates were required to keep within the following prescribed limits of expenditures for the campaign: in the last three months prior to the election, each candidate for a seat in the national assembly couldn't spend more than $500,000$ Francs (€$121,000$) in her electoral district ($400,000$ Francs in the constituencies with less than $80,000$ inhabitants). Finally, the legislation also required candidates to account for the campaign costs incurred. Regarding municipal elections, the public refund could not exceed 50% of the spending limit for the 1995 elections.

The 1990 law also created the *"Comission Nationale des Comptes de Campagne et des Financements Politiques"* (CNCCFP) that has been checking and approving the accounts of political parties and candidates' campaigns since then. If an account is declared invalid by the Commission, candidates and political parties may face fees and legal sanctions and even ineligibility. All the legislative election candidates have to provide a detailed account of their spending and revenues to the CNCCFP within the six months following the election, as well as only municipal election candidates running in cities larger than 9,000 inhabitants. Candidates have to appoint a financial representative (*"mandataire financier"*) who is the intermediary between the CNCCFP and the candidate. The representative is in charge of collecting funding and managing the campaign account.

1995-2003 The law of 1995[17] marked an important change in party and election financing in France with the prohibition of donations from legal entities (and in particular for corpo-

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[16]Law no. 90-55 of 15 January 1990.
[17]Law no. 95-65 of 19 January 1995.

rations). This means that since 1995 only "natural" persons (i.e. physical individuals) can make political donations. The maximum amount of donations from natural persons remained the same. This change reduced the revenues of those candidates who were relying a lot on donations from legal entities (and we will exploit it in the empirical analysis).

The 1995 law also modified the public financing of election campaigns. Candidates obtaining more than 5% of the votes received as a flat rate reimbursement for campaign cost a sum equal to 50% of the campaign expenditure limit for the legislative elections (much higher than the previous 10% threshold). The payment of the flat rate for campaign costs was based on the condition that the respective candidate actually incurred these expenses during the campaign.

Finally, the 2003 law[18] focused on public party funding. It modified the division of the amount budgeted. The first part was allocated for the funding of those parties and political groups that ran candidates that receive more than 1% of the votes in at least 50 constituencies.

2.2 Today's Rules

Since 2003, candidates can finance their campaign from: donations (only from natural persons); personal contributions; party contributions[19] and contributions in kind. A natural person may contribute up to €4,600 to each campaign, and donate yearly a maximum of €7,500 to political parties or groups. Donations to both campaigns and parties are tax deductible. As of 2017, the tax deduction was equal to 66% of the value of the donation, up to 20% of the taxable income, which means that an individual who gives €1,000 to a candidate (and whose income is high enough) can reduce her taxable income by €660.

As to the funding of campaigns, candidates who win more than 5% of the votes in the first ballot are reimbursed for their personal contributions to campaign spending up to 47.5% of the spending limit.[20] The spending limit varies depending on the elections and the size of the electoral districts.

2.2.1 Spending Limits

Municipal elections Spending limits for campaign expenditures have been introduced with the 1990 law (the *"dépenses de propagande"*, meaning the expenditures related to the printing of ballots, campaign letters to the voters and campaign posters are directly paid by the state and are not included in this limit). They are summarized in Figure 1. For municipal elections,

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[18]Law no. 2003-327 of 11 April 2003.

[19]In 2014, party contributions to electoral campaigns (*"aides financières aux candidats"*) have represented on average 9.6% of total parties spending (9.37% for the Socialist party but 1.05% for the right-wing party UMP). Public party funding is regulated by Law no. 2003-327 of 11 April 2003. €63 million have been allocated to political parties in 2015.

[20]Candidates are not refunded if their accounts are not approved by the CNCCFP.

the spending limit depends on the size of the city for cities larger than $9,000$ inhabitants. (For cities below $9,000$ inhabitants, there is no spending limit and no requirement to provide an account for campaign spending and revenues.[21]) The spending limit is higher for candidates qualified for the second ballot of the election. E.g. for the 2008 municipal elections, the maximum amount that can be spent per inhabitant for candidates not qualified to the second round (respectively qualified) was €$1,22$ up to the 15,000th inhabitant (respectively €$1,68$), €$1,07$ from the 15,001st inhabitant to the 30,000th (respectively €$1,52$) until the last bracket of €$0,53$ (respectively €$0,76$) from the 250,001st inhabitant. Those coefficients have not been modified since 1995, even with the transition to the euro.[22] (They have simply been discounted every three years to follow the evolution of the price index.)

Legislative elections   For legislative elections, the spending limit does not differ depending on whether candidates qualified for the second round. Moreover, contrary to municipal elections, rules have changed since the 1993 elections. From 1991 to 1995, candidates were allowed to spend up to $500,000$ Francs (€$121,000$) per election, and only $400,000$ Francs for constituencies with less than $80,000$ inhabitants. Since 1995, there is a new spending limit composed of a flat rate and an additional amount depending on the size of the constituency. In 1995, candidates were allowed to spend up to $250,000$ Francs (€$52,403$) per election plus 1 Franc (€0.15) per inhabitant of the constituency. Those amounts were set to €$38,000$ and €$0,15$ per inhabitant with the euro changeover, and have been updated every three years since then. Interestingly, the change from a flat function of the population size (below and above the $80,000$ inhabitant threshold) to a linear relationship sharply decreased the spending limit faced by candidates for legislative elections.

[Figure 1 about here.]

2.3   Electoral System

Municipal elections   The French electoral system for municipal elections is a two-round list system with proportional representation (*"scrutin de liste à deux tours avec représentation proportionnelle"*). If a list obtains the absolute majority in the first round, then half of the seats are attributed to this list, and the other seats are shared between all the other lists following the proportional representation with highest averages method. If no list obtains the absolute majority in the first round, then there is a second round where only the lists which obtained more than 10% of the recorded votes can take part. Half of the seats are attributed

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[21] We thus don't have spending data for these smaller cities and they are not included in our analysis.

[22] Before 1995, there was only one coefficient. In other words, the spending limit was the same for all the candidates, whether or not they qualified for the second ballot.

to the list which obtains most votes and the other seats are shared between all the other lists following proportional representation.

Legislative elections The French electoral system for legislative elections is a two-round system. The 577 constituencies are single-member constituencies. In this article, we focus on the 555 constituencies that are in metropolitan France, excluding the French overseas territories. If a candidate obtains the absolute majority in the first round, as well as a minimum of 25% of all the registered voters, then she is elected. If no candidate obtains the absolute majority in the first round, then there is a second round where the two most-voted candidates and the candidates who obtained more than 12.5% of the registered voters can take part. The candidate who obtains the majority of the votes then win.

3   Data and Descriptive Statistics

We create a new, exhaustive dataset on campaign financing, expenditures and electoral results at the candidate level, for all the municipal elections since 1995 and the legislative elections since 1993. Producing this data is our first contribution. We do it by computing and merging information from several sources, in particular data on electoral results from the Interior Ministry and campaign spending and revenues data collected from the CNCCFP's paper reports (described in more detail below). Our dataset also includes information on electoral districts' socioeconomic and demographic information from the census. In the online Appendix Sections B.2 and B.3, we describe in details the different steps we followed to merge the information together, and in particular identify the candidates between sources and from one election to another. In this section, we present each dataset in turns and provide descriptive statistics.

3.1   Data on Electoral Results

The electoral data comes from the Centre de Données Socio-Politiques (CDSP), the Interior ministry, Bach (2011) and Cagé (2017).[23] We have data for the four municipal elections which have taken place in France since the first campaign finance laws, in 1995, 2001, 2008 and 2014. Our electoral data are exhaustive with respect to the municipalities for which we have campaign expenditures information. Similarly, we have information for all the five legislative elections since 1993.

Our data contains information for 12,325 different candidates for municipal elections, and 28,540 for legislative elections. Table 1 presents descriptive statistics on the number of

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[23]We had to combine data from all these different sources because, except for the most recent years, the CDSP and the Interior ministry data do not provide the names of the candidates. Yet we need this information to identify candidates running multiples times.

candidates running in the first round of each election. On average, around four candidates run in the first round of municipal elections. The number of candidates is much higher on average for legislative elections and it is increasing over time (from 9.6 on average in 1993 to 12 in 2012). As explained by François and Phélippeau (2015), changes in the legislation regarding public funding to political parties has led to a sharp increase in the number of candidates running for legislative elections. Indeed, the subsidy granted to a political party now depends on the number of candidates fielded by the party in the previous general election. The amount of the subsidy also depends on the vote shares obtained by the candidates in the first ballot (funding is granted to parties that run candidates that receive more than 1% of the votes in at least 50 constituencies).

[Table 1 about here.]

Political parties   For each of the candidates running, we obtain information on his or her political party for legislative elections, and either on their political party or political coalition for municipal elections (more on this below). This information comes from the newspaper *Le Monde*.[24] In the online Appendix Section A, we detail for each election the list of the parties running and the coalitions at play.

In the empirical analysis, for the legislative elections, we focus on the five political parties that have consistently presented candidates in the majority of the districts during our period of interest, namely (from the extreme left to the extreme right): (i) the "Parti Communiste" (PC) (or Communist party); (ii) the Green party (whose name as changed a number of time during the period); (iii) the "Parti Socialiste" (PS) (Socialist party); (iv) the right-wing party (as detailed in the online Appendix, the name of this party has also changed a number of times during our period of interest[25]); and (v) the "Front National" (FN) (National Front, the French extreme-right party). In the empirical analysis, candidates from other smaller political parties (or without political affiliation) enter in the "other" category. This "other" category is needed in order to perform the SUR analysis.[26]   Online Appendix Table A.1 provides information on the number of districts in which each political party presented candidates for all the elections.

Regarding municipal elections, while the information regarding the specific political party to which a candidate is affiliated is sometimes available, most often candidates categorize themselves as "diverse left" (respectively "diverse right") or "union of left" ("union of right").

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[24]In the electoral data made public by the Interior Ministry, information on candidates' political parties are often missing, imprecise or incomplete. On the contrary, journalists at *Le Monde* had, since the 1980's, made a very detailed work at classifying each candidate depending on its party. We thank the newspaper for agreeing to share this information with us.

[25]Given the electoral coalitions at play from 1993 to 2012, candidates from the center-right party are part of the right-wing party in our analysis.

[26]We indeed calculate natural log of each party's share of the vote relative to that of this other party.

This is illustrated in the online Appendix Table A.3. Hence in the empirical analysis, for the sake of consistency, we focus on four categories: the extreme left, the left, the right, and the extreme right.

3.2 Data on Election Campaign Costs and Expenditures

We collect very detailed data on election campaign costs and expenditures. The data are paper data that we digitize and merge from the official reports on election campaign costs and expenditures (*"Publication simplifiée des comptes de campagne"*) published by the CNCCFP. Online Appendix Figure B.1 provides an example of this data.

We focus on two types of elections: the local (municipal city-level) elections and the legislative (general) elections. For local elections, we have data for all the elections since 1995 (1995, 2001, 2008 and 2014). For legislative elections, we have data for all the elections since 1993 (1993, 1997, 2002, 2007 and 2012). This data is at the electoral district level; for municipal elections our data covers all the electoral districts with more than 9,000 inhabitants, since the campaign financing rules are only enforced for these municipalities.

Total spending Table 2 presents summary statistics on total spending. The upper table presents the numbers for municipal elections, the bottom table for legislative elections. (Online Appendix Figures D.1 and D.2 plot the distribution of the spending per registered voters, respectively for municipal and legislative elections.) All the number are in constant 2014 euros.

Regarding municipal elections, the average spending per candidate is equal to €22,802. Normalized by the number of registered voters, candidates spend on average €1.16 per voter. Candidates tend to spend less on average for legislative elections: €14,712, which amount to €0.21 per registered voter. Despite the fact that there are more candidates running for legislative than for municipal elections, the average total spending per voter (summed over all the candidates) is lower for legislative elections (€2.31 vs. €4.85).

[Table 2 about here.]

Regarding legislative elections, we observe a strong decrease in spending after the 1993 election. (Online Appendix Figure D.3 illustrates the evolution of campaign spending for both municipal and legislative elections.) This is due to the change in regulation we describe in Section 2, with a strong decrease in the spending limit for the legislative elections (but no change for the municipal ones).[27] The drop in the number of observations in 2012 is due to a change in the reporting requirement rules: since the 2012 election, candidates who obtain

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[27]Moreover, not only do we observe a decrease in the average spending by candidate but also a decrease in the total amount spent (summed over all the candidates). Hence, while in 1993 more than 110 million euros have been spent in the legislative elections by candidates, this number is equal to 90 million in 1997.

less than 1% of the cast votes do not have to report their spending. Note however that the increase in average spending between the 2007 and the 2012 legislative elections is not due to this drop in the number of candidates reporting, as illustrated in the online Appendix Figure D.5 where, for the sake of comparison, we plot from 1993 to 2012 the campaign resources of only those candidates who obtained more than 1% of the cast votes. While those candidates tend to have higher revenues on average, the trends are similar (a drop from 1993 to 2007 and then an increase).

Because different candidates are willing to spend different amounts – and can, inasmuch as they respect the spending limit – the focus of this article is on the impact of differences in spending on the probability of being elected. Figure 2 shows the raw relationship between the proportions of total spending and total (first round) votes received by candidate by district. In the upper Figure 2a, we plot this relationship for the legislative elections, and in the bottom Figure 2b for the municipal elections. The correlation is positive for the nine elections under consideration and the relationship seems to be well approximated by a straight line. This finding is consistent with the results of Ferguson et al. (2016) who consider U.S. data.

[Figure 2 about here.]

One can also notice from Figure 2 that the slope of the relation between spending share and vote share appears to be significantly higher for legislative elections than for municipal elections (a result to which we will return below). Obviously, correlation does not imply causality and the goal of the article is to determine the extent to which this relationship is causal.

Sources of funding So far, our focus has been on candidates' spending. Let us now look at their revenues.[28] Note that while most often total revenues are equal to total spending, this is not always the case. The difference between revenues and spending is called the balance of the campaign account (*"solde du compte de campagne"*). By law, it is forbidden to have a negative balance: in this case, accounts are not approved and financial and legal sanctions apply. However, candidates can decide to have a positive balance, i.e. to spend less than their revenues. In the case of a positive balance, the remaining amount has to be given to a state approved association or to a political party. E.g. Alain Juppé, then candidate for the June 1995 municipal elections in Bordeaux (and Prime Minister since May 1995), had a positive balance equal to €117, 000 (it spent €168, 000 but received €222, 000 in private donations, of which €172, 000 donations from seven legal entities).

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[28]There is large literature on the determinants of campaign contributions (see e.g. Chamon and Kaplan, 2013; Cotton, 2009, 2012; Petrova et al., 2017). In this paper, we take contributions as given, but investigate the extent to which electoral results vary depending on the nature of the contributions.

Our dataset provides revenue data by source: (i) private donations (since 1995, only individuals are allowed to finance campaigns; legal entities are not allowed to donate) ; (ii) party contributions; (iii) contribution in kind; (iv) personal contribution; and (v) others. Table 3 provides summary statistics on the relative importance of these different sources of funding. (Numbers are average for all the years included in our dataset; in the online Appendix Figure D.6, we plot the evolution of the relative importance of the different sources of funding.)

Municipal election candidates' revenues come mainly from private donations (16%)[29] and personal contributions (74%). Parties contribute much more for legislative than for municipal elections. While party contributions represent on average around 28% of the revenues of legislative election candidates, personal contributions nonetheless represent the highest share of total revenues in every instance (74% for municipal and 51% for legislative elections).

[Table 3 about here.]

How does funding vary depending on the political party for which the candidate is running? Tables 4 and 5 present summary statistics, respectively for candidates running for legislative and municipal elections. With respect to legislative elections, we concentrate on the differences between the five main political parties that are our focus in the empirical analysis, namely the Communist party, the Green party, the Socialist party, the right-wing party, and the extreme-right party. It appears that private donations represent a much higher share of funding for the right-wing party candidates (27.2%) than for the candidates of all the other parties. Moreover, the difference is statistically significant at the 1% level between the Socialist party and the right-wing party, even though private donations are relatively more important for the Socialist party (17.8%) than for the Communist (12.3%), Green (5.6%) and extreme-right (1.2%) parties. On average, compared to Socialist party candidates, the right-wing party candidates receive an extra €8,200 in private donations in legislative elections. This is of particular importance given that, as we will see in the empirical analysis part of the paper, the effect of spending on electoral results is partly driven by private donations.

With respect to municipal elections, consistent with the strategy we follow in our empirical analysis, we categorize the candidates into four categories: the extreme left, the left, the right, and the extreme right. Similar to what we observe for the legislative elections, right-wing candidates rely much more on private donations (which represent 21% of their total revenues) than candidates from other parties. Moreover, the extra €3,400 in private donations received by right-wing candidates compared to left-wing candidates are not compensated by lower party and/or personal contributions. They translate directly in right-wing candidates

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[29]Unfortunately, we only have data on the total amount of private donations received, not on the number of donors and their individual contributions. Vanberg (2008) develops a model in which the composition of a candidate's campaign budget matters. Using data from the US Congress, Dharmapala and Palda (2002) find a negative relationship between the concentration of contributions and vote share.

getting €4,200 more in total revenues, and spending €3,000 more. (Again, the differences are statistically significant at the 1% level.)

[Table 4 about here.]

[Table 5 about here.]

3.3 Controls

Finally, we collect municipal-level demographic data for municipal elections. Demographic and unemployment data from the French census is available in electronic format (on the website of the French National Institute of Statistics). The census took place in 1990, 1999, 2008, and 2013. We compute the share of the population by age group, occupation and degree. For each measure, we interpolate both the numerator and denominator between census years using a natural cubic spline (Herriot and Reinsch, 1973) and divide the two to obtain an estimate of the relevant share.

Regarding legislative elections, unfortunately the controls are not available at the electoral-district level, and they cannot be computed directly from the municipal-level information given a number of municipalities are split between different legislative districts. The demographic controls are thus computed at the department-level, using the same census information. Consequently, electoral districts located within the same department (county) will have the same values for those controls.

4 Empirical Strategy

There are two main empirical challenges we have to deal with: first, the multiparty nature of the French electoral system, and second, the endogeneity of spending. In this section, we begin by describing the characteristics of multiparty data. We present our IV strategy in Section 7.

Katz and King (1999) have been the first to propose a statistical model for analyzing multiparty data. We closely follow their seminal analysis here. Let vote share$_{cmt}$ denotes the proportion of the vote in district m ($m = 1, ..., M$) and election t for candidate c ($c = 1, ..., C$). Two fundamental features of multiparty voting data are that each proportion falls within the unit interval

$$\text{vote share}_{cmt} \in [0, 1] \text{ for all } m \text{ and } c \tag{1}$$

and the set of vote proportions for all the parties in a district sum to one:

$$\sum_{c=1}^{C} \text{vote share}_{cmt} = 1 \text{ for all } m. \qquad (2)$$

A good statistical model of multiparty voting data should satisfy the constraints in equations 1 and 2. Katz and King (1999) propose such a model; unfortunately, it is slow and numerically imprecise with more than three parties, which is the case of France. We thus follow here the practical alternative to Katz and King (1999) that has been provided by Tomz et al. (2002). Concretely, we use SUR, a multiequation version of OLS. Following Katz and King (1999) and Tomz et al. (2002), we convert the votes to an unbounded scale by applying the multivariate logistic transformation. Specifically, we calculate the natural log of each party's share of the vote, relative to that of a reference party.

Our presentation here closely follows the one in Tomz et al. (2002). We denote each party by j ($j = 1, ..., J$) and the vector of $J - 1$ log ratios for electoral district m as $Y_m = \left[ln\left(V_{m1}/V_{mJ}\right), ln\left(V_{m2}/V_{mJ}\right), ..., ln\left(V_{m(J-1)}/V_{mJ}\right) \right]$ and assume it is multivariate Normal with mean vector μ_m and variance matrix Σ. We then model μ_m as a linear function of explanatory variables (x) and effect coefficients (β), such that $\mu_m = \left[x_{m1}\beta_1, x_{m2}\beta_2, ..., x_{m(J-1)}\beta_{(J-1)} \right]$. To estimate β and Σ, we use Tomz et al. (2002)'s variant of SUR that employs the Feasible Generalized Least Squares (FGLS) algorithm.

Hence our empirical specification for the legislative elections is the following:

$$\text{vote share}_{\text{Communist } mt} = \alpha_1 + \sum_{j=1}^{5} \beta_{1j} \text{spending}_{jmt} + \sum_{j=1}^{5} \delta_{1j} \text{Incumbent}_{jmt} + \mathbf{X}'_{\mathbf{mt}}\boldsymbol{\kappa_1} + \lambda_{1m} + \eta_{1t}$$

$$\text{vote share}_{\text{Green } mt} = \alpha_2 + \sum_{j=1}^{5} \beta_{2j} \text{spending}_{jmt} + \sum_{j=1}^{5} \delta_{2j} \text{Incumbent}_{jmt} + \mathbf{X}'_{\mathbf{mt}}\boldsymbol{\kappa_2} + \lambda_{2m} + \eta_{2t}$$

$$\text{vote share}_{\text{Socialist } mt} = \alpha_3 + \sum_{j=1}^{5} \beta_{3j} \text{spending}_{jmt} + \sum_{j=1}^{5} \delta_{3j} \text{Incumbent}_{jmt} + \mathbf{X}'_{\mathbf{mt}}\boldsymbol{\kappa_3} + \lambda_{3m} + \eta_{3t}$$

$$\text{vote share}_{\text{Right } mt} = \alpha_4 + \sum_{j=1}^{5} \beta_{4j} \text{spending}_{jmt} + \sum_{j=1}^{5} \delta_{4j} \text{Incumbent}_{jmt} + \mathbf{X}'_{\mathbf{mt}}\boldsymbol{\kappa_4} + \lambda_{4m} + \eta_{4t}$$

$$\text{vote share}_{\text{Extreme right } mt} = \alpha_5 + \sum_{j=1}^{5} \beta_{5j} \text{spending}_{jmt} + \sum_{j=1}^{5} \delta_{5j} \text{Incumbent}_{jmt} + \mathbf{X}'_{\mathbf{mt}}\boldsymbol{\kappa_5} + \lambda_{5m} + \eta_{5t}$$

$$(3)$$

where t indexes the election (1993, 1997, 2002, 2007, and 2012), m the district & j the political parties (Communist party, Green party, Socialist party, Right-wing party, and Extreme-right party). For each party j, vote share$_{jmt}$ is the log ratio of the party's share of the vote in district m and election t relative to that of the "other party". The share of the vote of this

"other party" is the sum of the share of the votes of the candidates running for smaller parties (not included in the analysis) or with no political affiliation.[30] We estimate the equations simultaneously via seemingly unrelated regression.

Regarding the independent variables, Incumbent$_{jmt}$ is an indicator variable equal to one if the incumbent is from the political party j. The vector $\mathbf{X_{mt}}$ contains municipality-level controls. λ_m and η_t denote fixed effects for electoral districts and elections, respectively.

Our main explanatory variable of interest is spending. spending$_{jmt}$ is equal to the political party j's spending per registered voter in district m and election t. (To take into account the fact that the marginal returns from spending may be decreasing (Green and Krasno, 1988; Gerber, 1998; de Figueiredo et al., 2011), we also add square spending variables to the regressions.) For example the coefficient β_{11} tells us how a 1-euro increase in spending per voter by the Communist party affects the log ratio for the Communist party. We use the *Clarify* suite on Stata to perform the analysis and to interpret these coefficients in terms of votes. In particular, we draw $1,000$ simulations of the parameters to infer counterfactuals that we describe in the next Section.

Finally, note that the empirical specification for municipal elections is similar, to the exception of the choice and classification of the political coalitions at play (extreme left, left, right, and extreme right). Moreover, elections took place in 1995, 2001, 2008, and 2014 for municipal elections.

Dealing with "missing data" Political parties do not run everywhere. When one or more parties do not run in a district, this district is considered to be "partially contested" (as opposed to "fully contested districts"). How can one deal with partially contested districts? A first solution consists of excluding these districts from the analysis. This is what we do in Section 5 where we estimate the effect of spending on votes only in fully contested districts.

However, this approach is not entirely satisfying. First, by dropping a number of electoral districts, we lose potentially useful information. Second, this might result in a nonrepresentative sample (King et al., 2001; Tomz et al., 2002). As an alternative, Tomz et al. (2002) suggest running a separate analysis for each pattern of contestation, i.e. to conduct two analyses, one on the subset of fully contested districts, and another one on the subset of partially contested districts. Yet, this approach does not work well for complex patterns of partial contestation, such as the one we observe in France.

Given that we have highly variegated patterns of contestation, we prefer to follow Katz and King (1999) and Honaker et al. (2002) who address the problem of partial contestation by estimating the *effective* rather than the *actual* vote. The effective vote is the values of

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[30]Hence the "other party" won't be the same for example for the legislative and for the municipal elections. In each specification, when presenting the results, we provide descriptive statistics on the relative importance of this "party".

vote share$_{jmt}$ that we would observe if all the parties contested the election in district m. In districts with all parties contesting, the effective vote is equal to the observed vote. In partly contested districts, the effective vote for all parties is unobserved but it can be estimated. Such an estimation can be performed under a number of reasonable assumptions. We follow Honaker et al. (2002) here and assume that the non-contesting party would have received fewer votes than the parties that did nominate candidates. We then proceed in two steps. First, we use the *Amelia* imputation software to impute the observed voting data for all the parties. We perform 5 imputations. The outcome from Amelia is thus five imputed data sets, with appropriate weights to perform the SUR analysis on *Clarify*. *Clarify* indeed appropriately combines the results, and computes our quantities of interest automatically using the SUR methodology described above. We present the results of this "full information approach" in Section 6.

5 Results: Fully Contested Districts

5.1 Legislative Elections

5.1.1 Log Ratios

Table 6 presents the results for legislative elections for the fully contested districts. An observation is a district x election. If we first focus on our five main independent variables of interest (spending by the Communist party, the Green party, the Socialist party, the right-wing party and the extreme right party), the β's tell how a 1-unit change in spending by these different political parties would alter the log ratio for a particular political party. Hence, we find that a one-euro increase in spending by the Communist party increases the log ratio of the Communist party share of the vote – relative to the "other" party – by 1.15, and that this result is statistically significant at the 1% level. (Online Appendix Table C.3 presents summary statistics on the other party's vote share. During our period of interest and in the fully contested districts under consideration here, it obtained on average 15.8% of the votes cast in the first round.) More generally, if we look at the diagonal numbers, we see that all the parties benefit from increasing their spending (increase in the log ratio by 1.15 for the Communist party, 2.91 for the Green party, 0.60 for the Socialist party, 2.09 for the right-wing party, and 0.55 for the extreme-right party), and that the effects are always statistically significant at the 1% level.

[Table 6 about here.]

Moreover, spending by different parties may also directly affect the vote shares obtained by other parties. Hence, not only does spending by the Communist party lead to an increase

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in vote shares for this party (relative to the "other" party), but it is also of interest to note that it has a statistically significant negative effect on the Socialist party (with no effect on the Green, right-wing, or extreme-right parties). Similarly, the Socialist party also negatively suffers from spending by the Green party, and spending by the Socialist party negatively affects the vote shares of the Communist and of the Green party.

5.1.2 Counterfactual Estimate

By construction, given that we use time-varying party fixed effects in equation (3) (η_{1t},..., η_{5t}), our model is able to replicate the evolution of national vote shares. This is illustrated in the online Appendix Figure D.7 where we plot the actual vote shares obtained at the national level by the five main parties in the first round of the elections together with the expected value of the vote shares predicted by the SUR model.[31] The interesting question is to see how these vote shares vary if spending changes.

We perform a first counterfactual estimation. We assume that the right-wing party was not allowed to spend money (spending by the right-wing party is set to zero in all the districts/years), everything else being equal. To what extent would it have affected the results? To answer this question, we compute the total number of votes obtained by each party under this assumption. We aggregate these votes at the national level. (But the counterfactual is estimated at the electoral district / election level: hence, for each districts / election, we have the expected value of the vote shares obtained by the different political parties.)

To get a sense of the magnitude of the treatment imposed here, note that on average, during our period of interest, right-wing candidates spent €0.64 per registered voters. In 1993, they spent more than €1 (online Appendix Table C.1 presents the average spending per eligible voters by political parties for the 5 legislative elections). Hence, over all the right-wing party candidates, no spending in 1993 would have implied at the national level a decrease by more than €20.7 million in the amount spent.

Figure 3 plots the vote shares obtained by the different political parties in the model when the right-party candidates are not allowed to spend. It appears clearly that a ban on the right-wing party spending would have decreased the votes received by this party in all the five elections. The Socialist party would have mostly benefited from it.

[Figure 3 about here.]

In Table 7, we compute the associated by price of a vote. We find that this price varies between €4.8 and €6.6. For example for the 1993 legislative elections, assuming that the right-wing party candidates were not allowed to spend (upper Table 7), this would have led

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[31]What is more striking is that we are also able to replicate the between-district variations in party vote shares, as illustrated in the online Appendix Figure D.8 with the example of the socialist party.

to a decrease by 3.7 million in their number of votes at the national level. Given that the implied change in spending would have been of around €20.7 million, it implies that the price of a vote is equal to €5.5.

[Table 7 about here.]

5.2 Municipal Elections

Table 8 presents the results for municipal elections. In the case of these elections, the extreme left and extreme right parties have only presented candidates in a few districts. For example, for the 2008 municipal elections, the extreme right is present in only 138 districts (out of 1,002) (see e.g. online Appendix Table A.4). Hence, we consider here only the left and right, and include the candidates from all the other parties (or with no party) in the "other" category.

The results we obtain for municipal elections are consistent with our findings for the legislative ones: spending by the left increases the log ratios of the vote shares of the left (with respect to the "other" party) while spending by the right has a positive effect on right-wing candidates' vote shares. The magnitude of the effect is about the same for the left and the right. We find that a one-euro increase in spending per voter by the left party increases the log ratio of the left party share of the vote relative to the "other" party by 0.32.[32] Moreover, there is no direct statistically significant effect on spending by the left on the right vote shares. Adding square spending variables to the regressions, we also show that spending has diminishing returns.[33]

[Table 8 about here.]

How substantial is the role of money in French municipal elections? To answer this question, we perform a number of counterfactual estimations. First, we assume that the right-wing party was not allowed to spend money (spending by the right-wing party is set to zero in all the districts/years), everything else being equal. Second, we perform the opposite thought experiment, and assume that all the right-wing party candidates spent €4 per eligible voters. Figure 4 plots the vote shares obtained by the left, the right, and the other candidates at the national level depending on the different scenarios.

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[32] Online Appendix Table C.4 presents summary statistics on the other party's vote share. During our period of interest and in the fully contested districts under consideration here, it obtained on average 9.1% of the votes cast in the first round.

[33] With respect to the legislative elections, we estimate how well our model is doing by comparing the actual votes obtained by each political coalition with the estimated distribution of the votes we obtain conditional on the true values of the explanatory variables. In the online Appendix Figure D.9, we plot the actual vote shares obtained by the left-wing coalition, the right-wing coalition, and the remaining candidates in the first ballot together with the expected value of the shares predicted by the SUR model. Our model does very well at predicting the vote shares in all the four elections.

[Figure 4 about here.]

Not surprisingly given the estimates of Table 8, we find that the right-wing party would have suffered from a ban, while allowing all its candidates to spend €4 per voter would have allowed it to obtain nearly 50% of the votes in 1995, 2001 and 2014, and 45% in 2001. What is the implied price of a vote? We compute it in Table 9 for each counterfactual scenario / election. According to our estimates, the price of a vote for municipal elections is equal to about 32 euros. Interestingly, this price is higher than for legislative elections. This could be due to the fact that voters have better sources of information as to the candidates running for more local elections. We discuss in Section 8 the channels through which campaign spending may play a role: spending may decrease the cost of information for voters. If this cost is lower for municipal than for legislative elections, then it may be more costly to mobilize voters for the municipal ones.

[Table 9 about here.]

5.3   Depending on the Sources of Funding

Hence, spending by candidates has a positive effect on their vote shares. Does this effect vary depending on the sources of funding? Determining whether this is the case is of particular importance given that, as we have noted above, different candidates rely on different sources of funding, and in particular differ regarding the importance of the private donations they receive. In this Section, we estimate equation (3) but rather than considering spending as a whole, study independently the effect of personal contributions, private donations and party contributions. (The in-kind contributions and the contributions from other sources – these two categories taken together represent on average less than 5% of the total campaign revenue both for legislative and for municipal elections – are also included as independent variables, but we do not report the point estimates in the tables for the sake of space.)

Legislative elections   Table 10 presents the results for the legislative elections.

[Table 10 about here.]

A number of findings can be highlighted. First, for all the political parties, we find that personal contributions have a positive and statistically significant impact on their vote shares. On the contrary, with the exception of the Green party and the right-wing party, party contributions seem not to matter.

Regarding private donations, they have a positive and statistically significant effect but only for the right-wing party and the socialist party. Moreover, the magnitude of the effect is much more important for the right-wing party. This is of particular importance given that

on average the right-wing candidates receive €18,000 in private donations, i.e. more than €8,000 than the socialist party candidates, while candidates for the other three parties receive nearly no donations. According to our estimates, an increase by one euro in the amount of private donations received increases the log ratio of the vote shares for the right-wing party by 0.42.

Municipal elections If we now turn to municipal elections, we find similarly that, for the two main parties (left and right), party contributions only marginally matter. The results are presented in Table 11. Private donations and personal contributions, on the contrary, increase the vote shares of both the right and the left with respect to the other party. E.g., a one-euro increase in private donations per voter of the right-wing party increases the log ratio of the right-wing party share of the vote relative to the other party by 0.23. The magnitude of the effect is lower (but still statistically significant at the one-percent level) for personal contributions, with a point estimate of 0.17.

[Table 11 about here.]

Counterfactual experiment: equalizing the amount of private donations What would be the effect of equalizing the amount of private donations to campaigns? Our empirical setting allows us to perform such an estimation. We assume that, everything else being equal, in each electoral district and for each municipal election, right-wing parties receive the same amount of private donations per voter as left-wing parties. In a large majority of the cases, this amounts to assuming a decrease in the amount of private donations received by the right-wing party. As illustrated in the online Appendix Table C.2, in each of the municipal elections, candidates from the right-wing party have indeed consistently received on average more donations than those from the left-wing parties (€0.23 less per voter on average).

Table 12 presents the results of our estimation. If in each electoral district, the amount of private donations received by the right-wing party candidates had been constrained to be equal to the one received by the left-wing party candidates, it would have translated in a decrease of around €3.4 millions in the total amount of private donations received by right-wing candidates in 1995, €1.7 million in 2001, €2.3 million in 2008, and €4.6 million in 2014. What would have been the impact on the number of votes received by the right-wing party candidates? In the 2014 elections, the right-wing party candidates would have received 259,357 less votes (summed over all the electoral districts). In other words, the cost of a vote in the 2014 municipal elections was of around €18 in private donations.

[Table 12 about here.]

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Mechanisms Why do private donations matter more than other sources of funding? First, it may be due to a signaling effect: for example citizens may choose to vote for the candidate who they know is receiving more donations, because they anticipate she will win (a "bandwagon effect"[34]). (Citizens may also chose both to vote for a candidate, and to contribute money to her campaign.)

Second, citizens may vote for the candidates who receive more private donations if these candidates are also those that spend more because they are "impressed" by money. Money can indeed buy influence over "impressionable" voters (Baron, 1994; Grossman and Helpman, 1996). For example the size of contributions may show a candidate's ability as a fundraiser (Potters et al., 1997) or affect voters' perceptions about the social benefits of a project (Helsley and O'Sullivan, 1994).[35] Private donations can also be seen as an effective instrument to provide voters with useful political information if donors are more likely to give money to high-quality candidates. However, Snyder et al. (2010) show that large donations and donations from individuals provide no informational benefit.

Moreover, private donations can benefit the candidate by deterring challengers. E.g. Epstein and Zemsky (1995) develop a signaling model in which the incumbent employs strategic fundraising to deter strong challengers from running. They show that by raising a lot of funds, the incumbent tries to convince potential challengers that she is of "high" quality, and thus very hard to beat in an election. However, they find that only in certain limited cases does fundraising actually deter quality challengers from entering the race.

Third, the relative importance of private donations may come from the fact that they are the main source of spending differences between candidates in a given electoral district. There are indeed more variations in private donations than in personal contributions. If candidates are not willing (or able) to spend their own money, then they are limited by the reimbursement threshold with respect to their personal contribution.

6   Results: Full Information Approach

In this Section, we follow the "full information approach" of Honaker et al. (2002). In other words, we focus on the effective rather than the actual vote and treat the problem of explaining the vote in partially contested districts as a missing data problem. The steps of our empirical analysis are described above (Section 4). We do it for the legislative elections, given that for these elections we use party level data.

Table 13 presents the results. An observation is as before a district/election but our

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[34]There is a large literature on bandwagon effects, i.e. the fact that pools may lead to changes in preferences. See e.g. Simon (1954); Fleitas (1971); Gartner (1976); Duffy and Tavits (2008); Großer and Schram (2010). However, in a recent study, Gerber et al. (2017) find no causal evidence of bandwagon effects with respect to actual voting.

[35]Lohmann (1993) develops a similar argument regarding the size of mass political action.

sample now includes $2,571$ observations (given that the partially contested districts are now part of the analysis). Reassuringly, the results we obtain are consistent with the ones in Table 6. First, for all the five parties that are part of our analysis (Communist party, Green party, Socialist party, right-wing party and extreme-right party), we obtain a positive and statistically significant effect of spending on their vote shares. Second, the magnitude of the effects is roughly the same, with point estimates varying between 1.08 and 3.93 depending on the political parties. In particular, the magnitude of the estimates is nearly unchanged for the smallest parties (e.g. the Communist party with a point estimate equal to 1.15 both in Table 13 and in Table 6) which are the ones for which imputed votes in the highest number of districts.

[Table 13 about here.]

Hence, the two approaches that have been proposed in the literature to tackle the issue of not fully contested districts (estimating the effects only in fully contested districts, and studying effective rather than actual votes) give consistent results, with a statistically and economically significant impact of spending on the vote shares.

7 IV Estimation

Determining the causal impact of spending on votes is complicated by the endogenous nature of campaign spending. The endogeneity can drive the results in a number of different directions. On the one hand, bias can come from the fact that it is difficult to measure the quality of a candidate empirically. Yet high-quality candidates are likely to receive a higher share of the votes and have high campaign expenditures. This may lead us to overestimate the effect of spending on votes. On the other hand, one may underestimate the effect of spending if candidates having a hard time spend large amounts to win[36], whereas candidates with a high probability of winning can spend less and still win.

We propose a new instrumental variable to deal with spending endogeneity. Our strategy uses a change in legislation.[37] In 1995, France enacted a law according to which it was no longer allowed for a candidate to receive donations from legal entities. This law was applied for the first time for the 1997 legislative elections. Interestingly for us, it did not affect all the candidates the same way: some candidates were relying strongly on private donations from legal entities, while others were not, as illustrated in Table 14. While the average amount of

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[36]This was for example the case of Nicolas Sarkozy in the 2012 presidential election.

[37]There is a large literature on contribution limits in the U.S.. E.g. Stratmann et al. (2006) investigate whether campaign contribution restrictions have an effect on candidates' vote shares and find that they narrow the margin of victory of the winning candidate; Primo and Milyo (2006) study the effects of changes in campaign finance laws on political efficacy, Hamm and Hogan (2008) on patterns of candidacy, and Barber (2016) on the ideologies of legislators in office.

private donations received from legal persons in 1993 is €8,600, the median is €0. On average, these donations represented 22.6% of the total private contributions (both from individuals and legal entities), and 12.6% of the candidates' total revenues.

[Table 14 about here.]

More precisely, among the 5,116 candidates who ran for the 1993 legislative elections and for which we have spending data[38], 3,431 (67%) received no private donations from legal persons, while 1,685 received at least some. Conditional on receiving at least some legal persons' private donations, the average amount received was equal to €0.39 per eligible voter, and represented 67% of the total private donations received.

Online Appendix Table C.5 shows the extent to which the amount of private donations received from legal entities varied depending on the political party. Not surprisingly given the differences in the overall importance of private donations previously highlighted, candidates from the Socialist party and the right-wing party take the lion's share with, respectively, in 1993 €4,482 and €7,750 in donations from legal entities.

We instrument the change in spending between the 1993 and the 1997 legislative elections by the donations from legal entities received in 1993. Given that for our IV strategy to be implemented we need the candidates to be present both in 1993 and 1997, our sample of candidates here is limited to those 1,496 candidates who ran in both elections. Among them, 768 candidates (53%) received no donations from legal entities in 1993, while the others received at least some. In the online Appendix Table C.6 we present summary statistics similar to those in Table 14 but only for the candidates who run both in 1993 and in 1997 and that we can use in our IV estimation. Those candidates received relatively more donations from legal persons (€16,011), and these donations represent around one third of the total private donations they received.

Figure 5 illustrates that the candidates who rely strongly on donations from legal persons – and that we observe both in 1993 and in 1997 – were not able to recover from the ban. On average, an additional euro received from legal persons in 1993 is associated with a 0.46 decrease in total revenues between 1993 and 1997. As highlighted in the introduction, this may be partly due to the fact the 1997 French legislative elections were unexpected (the next elections were not due until May 1998 when the French President Jacques Chirac announced in April 1997 the dissolution of the National Assembly).

[Figure 5 about here.]

In Table 15, we present the results of the estimation of the following equation:

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[38]A total of 5,333 candidates ran in 1993; we don't have spending data for 4% of them.

$$\Delta\text{spending}_{cjm} = \alpha + \beta\text{donations legal entities}_{cjm} + \phi_j + \zeta_m + \epsilon_{cjm} \qquad (4)$$

where c indexes the candidates, j the political party and m as before the district. $\Delta\text{spending}_{cjm}(=$ $\text{spending}_{cjm1997} - \text{spending}_{cjm1993})$ is the difference between the amounts candidates who run both in the 1993 and in the 1997 legislative elections spent in 1993 and in 1997.[39] ϕ_j and ζ_m denote fixed effects for political party and electoral district, respectively. An observation is a candidate. Standard errors are clustered at the district level.

[Table 15 about here.]

For each candidate, we obtain from the estimation of equation (4) the predicted value of the change in spending between 1993 and 1997 (using the estimate in column (2), with party fixed effects). From this predicted value, we compute the predicted 1997 spending. We then use this predicted value as our outcome of interest and estimate the following model:

$$\text{vote share }_{\text{Socialist } m1997} = \alpha_1 + \sum_{j=1}^{2}\beta_{1j}\text{ predicted spending}_{jm1997} + \sum_{j=1}^{2}\delta_{1j}\text{ Incumbent}_{jm1997} + \mathbf{X'_{m1997}\kappa_1}$$

$$\text{vote share }_{\text{Right } m1997} = \alpha_2 + \sum_{j=1}^{2}\beta_{2j}\text{ predicted spending}_{jm1997} + \sum_{j=1}^{2}\delta_{2j}\text{ Incumbent}_{jm1997} + \mathbf{X'_{m1997}\kappa_2}$$

$$(5)$$

Compared to the previously described equation (3), we focus here on the Socialist and the right-wing party and include the candidates from the other parties in the "other" category. The dependent variables of interest are thus the log ratio of the Socialist and of the right-wing party share of the vote relative to that of the newly defined other category. We do so because, given the constraint that we need the candidates to have run both in 1993 and in 1997, we only have a few districts that are fully contested if we take all five parties into account. Moreover, given that we are only focusing on the 1997 elections here, we cannot introduce district and election fixed effects as before. However, the vector $\mathbf{X'_{m1997}}$ contains the same district-level controls as before.

Table 16 presents the results of the estimation (we use as before the *Clarify* suite to estimate equation (5)). Note that we only have here results for one election (1997) and 116 districts (the districts where the same candidates both from the socialist and the right-wing party ran in 1993 and in 1997). Hence it is not surprising that the point estimates are different to the ones previously obtained. What is of interest here is to compare the naive estimates

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[39]Note that no district-level controls are included here given that we only have one year (1997) and control for district fixed effects.

(using the actual spending) and the estimates we obtain when focusing on the predicted value of spending.

Using both the actual and the predicted value of spending, we obtain that spending by the Socialist party has a positive and statistically significant effect on the vote shares of the party. Moreover, once we instrument for spending, we find that the socialist party spending also has a negative effect on the vote shares obtained by the right-wing party. Taking into account both effects, we conclude that the IV effects are only slightly smaller than the OLS estimates, suggesting that our findings are not driven by the endogeneity of spending.

[Table 16 about here.]

Party-level estimation   The main issue with Table 16 is that, given we need the same candidates both from the socialist and the right-wing party to run in 1993 and in 1997, we only have information for 118 districts. This may explain why, even when considering the actual spending of the right-wing party, we find no statistically significant effect of spending on votes (contrarily to previous results).

We also applied the same IV methodology to the set of all electoral districts where both the socialist party and the right-wing party have candidates in 1993 and 1997 (even if the identity of the candidates change). In effect, this is assuming that private donations by legal entities are made to parties rather than to specific candidates, at least in part. In the online Appendix Figure D.10, we plot as before the correlation between the amount of private donations received from legal entities in 1993 and the change in total revenues between 1993 and 1997, but an observation is now a political party rather than a candidate. This correlation is negative and nearly as strong as the one where we focus on candidates running twice: an additional euro from legal entities is associated with a €0.33 decrease in total spending.

The results of the SUR estimations are reported in Table 17. When considering these 463 districts, we find that the IV point estimates are only slightly lower than the OLS estimates, both for the right-wing party and the socialist party. Moreover, they are statistically significant at the one-percent level.

[Table 17 about here.]

8   Additional Results and Discussion

Turnout   In this paper, we show that spending at elections has a positive effect on the vote shares of the spending party. According to our estimates, the price of a vote in legislative elections is of around 6 euros, while it is equal to 32 euros for the municipal ones. Why is this the case? Herrera et al. (2008) identify different roles of campaign spending. First,

spending can move party sympathizers to effectively vote, what they call the "mobilization effect" of campaign spending. Second, spending can help persuade undecided voters or voters leaning to the other party of the merits of one party's policies by providing information (see e.g. Baron, 1994; Coate, 2004; Prat, 2002a,b; Schultz, 2007). This is the "persuasion effect" of spending. Finally, campaign spending can be used to dissuade sympathizers of the other party from voting.

To estimate the extent to which spending has a mobilization effect, we investigate the impact of spending on turnout at legislative and municipal elections. Our empirical specification is the following:

$$\text{turnout}_{mt} = \alpha + \beta \, \text{total spending}_{mt} + \phi \, \text{competitiveness}_{mt} + \mathbf{X}'_{\mathbf{mt}} \boldsymbol{\kappa} + \lambda_m + \eta_t + \epsilon_{mt} \quad (6)$$

where as before t indexes the election (1995, 2001, 2008, and 2014 for municipal elections; 1993, 1997, 2002, 2007, and 2012 for legislative elections) and m the district. The outcome of interest, turnout_{mt}, is the turnout in the first round of the election. $\text{total spending}_{mt}$ is the total amount spent by candidates (per registered voter) in district m and election t. We consider alternately this aggregated variable and the spending of the different political parties taken individually. The vector $\mathbf{X}_{\mathbf{mt}}$ contains the same municipality-level controls as before (demographic controls and incumbency dummies). We also control here for the competitiveness of the election ($\text{competitiveness}_{mt}$), i.e. the number of candidates running. Standard errors are clustered at the district level.

Table 18 presents the results for the legislative elections. A one-euro increase in total spending by registered voters increases turnout by 0.25 percentage points. This effect is mainly driven by spending by the Green party, the Socialist party and the right-wing party. Spending by other parties seems not to affect turnout. In the online Appendix Table C.7 we report the standardized coefficients (Beta coefficients). A one-standard deviation increase in spending by the Green party increases turnout by 6 percent of a standard deviation. The magnitude of the effect is of 4 percent of a standard deviation for the socialist and the right-wing party.

[Table 18 about here.]

Table 19 presents the results for the municipal elections. We find a positive and statistically significant effect of spending on turnout. This effect is driven by all the parties to the exception of the extreme left. In terms of magnitude, the mobilization effect of spending is more important for municipal than for legislative elections. A one-standard deviation increase in total spending by candidates increases turnout by 25 percent of a standard deviation (online Appendix Table C.8 reports the beta coefficients).

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Such a positive effect of spending on turnout can be rationalized by the fact that spending decreases the cost of information for voters. It is consistent with previous findings in the literature, in particular regarding the positive impact of door-to-door canvassing on voter turnout (see e.g. Gerber and Green, 2000) and on voter registration (Braconnier et al., 2017). Note however that this large effect may be partly driven by the fact that parties may decide to spend more in districts where they anticipate a high participation.

[Table 19 about here.]

Donations from legal persons   The IV strategy we present in Section 7 relies on the 1995 legal person donations ban. The assumption we implicitly make here is that this ban was actually obeyed and that firms stopped contributing to campaigns. Obviously, it may be that at least a number of these firms found different ways to contribute after the ban, e.g. through unreported in-kind contributions or by encouraging their employees to contribute. We do not deny this possibility and indeed such hidden contributions may have happened to a certain extent. For example in the U.S. context, Tahoun and Vasvari (2016) document an interesting direct channel through which firms influence the political process, namely the amount and terms of the personal debt taken on by politicians and their close family members.[40]

However, the fact that we show that a number of candidates were not able to recover from this ban – with a decrease both in the total amount of campaign contributions they received and in their probability of being elected – shows that at least an important share of the existing donations by legal persons disappeared after the ban. We do not claim in this article to be able to capture all the different forms money can take in politics, and we are well-aware of all the limitations attached to the use of official records. It is nonetheless important to highlight that *despite all these limitations* we do find in this paper that campaign contributions influence votes.

Spatial and temporal correlation   Using spatial and time data requires paying careful attention to the possible correlations between observations that give rise to heteroscedasticity, which can bias the estimates of standard error coefficients. Electoral data, by their nature, are subject to such pitfalls since electoral districts are geographically defined, as demonstrated by Ferguson et al. (2016). If serial correlation is well known and often corrected for, it is not the case for spatial correlation, which creates the same type of bias. Nearby units are dependent and this within-cluster error can lead to erroneously low standard errors. It is therefore necessary to correct standard errors for spatial and temporal correlation. We do that following Conley (1999), Hsiang (2010) and Fetzer (2014). The program estimates the

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[40]On the benefits flowing from firms to politicians, see also Bertrand et al. (2008). Ferguson et al. (2017) illustrate the different "shades" money can take in U.S. politics.

model (OLS) a first time to recover the variance-covariance matrix of residuals. The next step consists in including this matrix to recompute the standard errors of the estimates.

In our main specification, we use Seemingly Unrelated Regressions to take into account the multiparty nature of our data. SUR regression accounts for the interdependence of the multiple equation by correcting the variance-covariance matrix. Correcting for those two dimensions is a difficult process. We may need to make additional assumptions on this matrix (and possibly define the joint hypothesis associated with these two dimensions we want to account for). A more cautious way to proceed would be to correct for the spatial and time correlation on every equation separately. The underlying assumption is the following: if the correction for time and space correlation does not change the estimates in the single regression taken independently, there is no reason to expect that spatial and time correlation will bias the estimates of the SUR model. Like so, we present the differences in the two models (non-corrected vs corrected for time and spatial correlation) for every party estimated independently. We use different values of the parameters of Conley's spatial correction.

The ranges chosen for spatial correction for legislative elections are respectively 50km, 100km and 200km in Tables E.1, E.2 and E.3, respectively, in the online Appendix. The lag for over-time correlation is set to 1 time period (6 years for municipal elections and 5 years for legislative)[41]. For every party but PC and PS, the results are robust to correction for space and time correlation, in the sense that we do not observe change in the significance levels of coefficients for these parties. Interestingly, the coefficient is more significant for left-wing parties when we apply this correction. Results for municipal elections are presented in Tables E.4, E.5 and E.6. Once again, the results are robust to correction for space and time correlation. If anything, the results become even more significant when time and space correlation are taken into account.

9   Conclusion

What role does money play in direct democracy? In this paper we have investigated the impact of campaign spending on votes in local (municipal and legislative) elections in France over three decades. We exploit changes in legislation to estimate the causal effect of spending on votes, and use recent methodological innovations to handle the special characteristics of multiparty data. We find that, despite strict limitation in campaign spending and contributions, money still plays an important role in French politics. In particular, we highlight the particular role played by private donations. The results we obtain question the relevance of existing legislation to control and limit the amount private individuals can give to candidates. If it is relative cheap to buy a vote (around €6 for municipal elections and €32 for the leg-

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[41]Results are available upon request for higher lags and do not change the conclusions

islative ones according to our estimates), then it means that the current level of contribution limits may be too high. Obviously, determining the optimal level of contribution limits is beyond the scope of this paper.

We hope nonetheless that these results will benefit the public debate. While it seems that political power is increasingly conditioned upon wealth (see e.g. Ferguson, 1995; Ferguson et al., 2013), lessons can be drawn from France to improve legislation in other countries, e.g. in the United Kingdom where, like in France, campaign spending by candidates is subjected to strong limitations.[42] We leave this to future research.

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[42]This is not to say that there is no difference between the French and the British cases. In the U.K. for example, while spending is limited, donations are not.

References

Abramowitz, A. I. (1988). Explaining senate election outcomes. *American Political Science Review*, 82(2):385–403.

Ansolabehere, S., de Figueiredo, J. M., and Snyder James M., J. (2003). Why is There so Little Money in U.S. Politics? *Journal of Economic Perspectives*, 17(1):105–130.

Avis, E., Ferraz, C., Finan, F., and Varjão, C. (2017). Money and Politics: The Effects of Campaign Spending Limits on Political Competition and Incumbency Advantage. Working Paper 23508, National Bureau of Economic Research.

Bach, L. (2011). Should Politicians be Forbidden Multiple Office-Holding? Evidence from France. Mimeo.

Barber, M. J. (2016). Ideological Donors, Contribution Limits, and the Polarization of American Legislatures. *The Journal of Politics*, 78(1):296–310.

Baron, D. P. (1994). Electoral Competition with Informed and Uniformed Voters. *The American Political Science Review*, 88(1):33–47.

Bertrand, M., Kramarz, F., Schoar, A., and Thesmar, D. (2008). Politicians, Firms and the Political Business Cycle: Evidence from France. Working paper.

Braconnier, C., Dormagen, J.-Y., and Pons, V. (2017). Voter Registration Costs and Disenfranchisement: Experimental Evidence from France. *American Political Science Review*, pages 1–21.

Cagé, J. (2017). Media Competition, Information Provision and Political Participation: Evidence from French Local Newspapers and Elections, 1944-2014. CEPR Discussion Papers 12198, C.E.P.R. Discussion Papers.

Chamon, M. and Kaplan, E. (2013). The Iceberg Theory of Campaign Contributions: Political Threats and Interest Group Behavior. *American Economic Journal: Economic Policy*, 5(1):1–31.

Coate, S. (2004). Political Competition with Campaign Contributions and Informative Advertising. *Journal of the European Economic Association*, 2(5):772–804.

Cotton, C. (2009). Should we tax or cap political contributions? A lobbying model with policy favors and access. *Journal of Public Economics*, 93(7):831–842.

Cotton, C. (2012). Pay-to-play politics: Informational lobbying and contribution limits when money buys access. *Journal of Public Economics*, 96(3):369–386.

de Figueiredo, J. M., Ji, C. H., and Kousser, T. (2011). Financing Direct Democracy: Revisiting the Research on Campaign Spending and Citizen Initiatives. *Journal of Law, Economics, & Organization*, 27(3):485–514.

Dharmapala, D. and Palda, F. (2002). Are Campaign Contributions a Form of Speech? Evidence from Recent US House Elections. *Public Choice*, 112(1/2):81–114.

Duffy, J. and Tavits, M. (2008). Beliefs and Voting Decisions: A Test of the Pivotal Voter Model. *American Journal of Political Science*, 52(3):603–618.

Epstein, D. and Zemsky, P. (1995). Money Talks: Deterring Quality Challengers in Congressional Elections. *The American Political Science Review*, 89(2):295–308.

Ferguson, T. (1995). *Golden Rule: The Investment Theory of Party Competition and the Logic of Money-Driven Political Systems.* University of Chicago Press, Chicago.

Ferguson, T., Jorgensen, P., and Chen, J. (2013). Party Competition and Industrial Structure in the 2012 Elections. *International Journal of Political Economy*, 42(2):3–41.

Ferguson, T., Jorgensen, P., and Chen, J. (2016). How Money Drives US Congressional Elections. INET Working Paper 48, INET Working Paper Series.

Ferguson, T., Jorgensen, P., and Chen, J. (2017). Fifty Shades of Green. High Finance, Political Money, and the U.S. Congress. Report, Roosevelt Institute.

Fleitas, D. W. (1971). Bandwagon and Underdog Effects in Minimal-Information Elections. *American Political Science Review*, 65(2):434–438.

Foucault, M. and François, A. (2005). Le rendement des dépenses électorales en France. Le cas des élections législatives de 1997. *Revue économique*, 56(5):1125–1143.

François, A. and Phélippeau, É. (2015). *Le financement de la vie politique: Réglementations, pratiques et effets politiques.* Armand Colin.

François, A., Visser, M., and Wilner, L. (2016). Using Political Financing Reforms to Measure Campaign Spending Effects on Electoral Outcomes. CESifo Working Paper 6232.

Gartner, M. (1976). Endogenous Bandwagon and Underdog Effects in a Rational Choice Model. *Public Choice*, 25:83–89.

Gerber, A. (1998). Estimating the Effect of Campaign Spending on Senate Election Outcomes Using Instrumental Variables. *The American Political Science Review*, 92(2):401–411.

Gerber, A., Hoffman, M., Morgan, J., and Raymond, C. (2017). One in a Million: Field Experiments on Perceived Closeness of the Election and Voter Turnout. Working Paper 23071, National Bureau of Economic Research.

Gerber, A. S. (2004). Does Campaign Spending Work? *American Behavioral Scientist*, 47(5):541–574.

Gerber, A. S. and Green, D. P. (2000). The Effects of Canvassing, Telephone Calls, and Direct Mail on Voter Turnout: A Field Experiment. *The American Political Science Review*, 94(3):pp. 653–663.

Green, D. P. and Krasno, J. S. (1988). Salvation for the Spendthrift Incumbent: Reestimating the Effects of Campaign Spending in House Elections. *American Journal of Political Science*, 32(4):884–907.

Großer, J. and Schram, A. (2010). Public Opinion Polls, Voter Turnout, and Welfare: An Experimental Study. *American Journal of Political Science*, 54(3):700–717.

Grossman, G. M. and Helpman, E. (1996). Electoral Competition and Special Interest Politics. *The Review of Economic Studies*, 63(2):265–286.

Grossman, G. M. and Helpman, E. (2001). *Special Interest Politics*. MIT Press.

Gunlicks, A. B. (1993). *Campaign and Party Finance in North America and Western Europe*. Westview Press.

Hamm, K. E. and Hogan, R. E. (2008). Campaign Finance Laws and Candidacy Decisions in State Legislative Elections. *Political Research Quarterly*, 61(3):458–467.

Helsley, R. W. and O'Sullivan, A. (1994). Altruistic voting and campaign contributions. *Journal of Public Economics*, 55(1):107–119.

Herrera, H., Levine, D. K., and Martinelli, C. (2008). Policy platforms, campaign spending and voter participation. *Journal of Public Economics*, 92(3-4):501–513.

Herriot, J. G. and Reinsch, C. H. (1973). Algorithm 472: procedures for natural spline interpolation [E1]. *Commun. ACM*, 16(12):763–768.

Honaker, J., Joseph, A., King, G., and Scheve, K. (2000). Amelia: A Program for Missing Data. Technical report.

Honaker, J., Katz, J. N., and King, G. (2002). A Fast, Easy, and Efficient Estimator for Multiparty Electoral Data. *Political Analysis*, 10(1):84–100.

Jacobson, G. C. (1978). The Effects of Campaign Spending in Congressional Elections. *The American Political Science Review*, 72(2):469–491.

Jacobson, G. C. (1980). *Money in Congressional Elections*. Yale University Press.

Jacobson, G. C. (1985). Money and Votes Reconsidered: Congressional Elections, 1972-1982. *Public Choice*, 47(1):7–62.

Jacobson, G. C. (1990). The Effects of Campaign Spending in House Elections: New Evidence for Old Arguments. *American Journal of Political Science*, 34(2):334–362.

Jacobson, G. C. (2006). Campaign spending effects in U.S. Senate elections: Evidence from the National Annenberg Election Survey. *Electoral Studies*, 25(2):195–226.

Katz, J. N. and King, G. (1999). A Statistical Model for Multiparty Electoral Data. *The American Political Science Review*, 93(1):15–32.

King, G., Honaker, J., Joseph, A., and Scheve, K. (2001). Analyzing Incomplete Political Science Data: An Alternative Algorithm for Multiple Imputation. *The American Political Science Review*, 95(1):49–69.

King, G., Tomz, M., and Wittenberg, J. (2000). Making the most of statistical analyses: Improving interpretation and presentation. *American Journal of Political Science*, 44(2):341–355.

Kuhner, T. (2014). *Capitalism v. Democracy: Money in Politics and the Free Market Constitution*. Stanford University Press.

Kuhner, T. (2015). American Plutocracy. Working paper.

Levitt, S. D. (1994). Using Repeat Challengers to Estimate the Effect of Campaign Spending on Election Outcomes in the U.S. House. *Journal of Political Economy*, 102(4):777–798.

Lohmann, S. (1993). A Signaling Model of Informative and Manipulative Political Action. *The American Political Science Review*, 87(2):319–333.

Nassmacher, K.-H. (2009). *The Funding of Party Competition: Political Finance in 25 Democracies*. Nomos.

Palda, F. and Palda, K. (1998). The Impact of Campaign Expenditures on Political Competition in the French Legislative Elections of 1993. *Public Choice*, 94(1/2):157–174.

Petrova, M., Sen, A., and Yildirim, P. (2017). Social Media and Political Donations: New Technology and Incumbency Advantage in the United States. CEPR Discussion Papers 11808, C.E.P.R. Discussion Papers.

Post, R. C. (2014). *Citizens Divided*. Harvard University Press.

Potters, J., Sloof, R., and van Winden, F. (1997). Campaign expenditures, contributions and direct endorsements: The strategic use of information and money to influence voter behavior. *European Journal of Political Economy*, 13(1):1–31.

Prat, A. (2002a). Campaign Advertising and Voter Welfare. *The Review of Economic Studies*, 69(4):999–1017.

Prat, A. (2002b). Campaign Spending with Office-Seeking Politicians, Rational Voters, and Multiple Lobbies. *Journal of Economic Theory*, 103(1):162–189.

Primo, D. M. and Milyo, J. (2006). Campaign Finance Laws and Political Efficacy: Evidence from the States. *Election Law Journal: Rules, Politics, and Policy*, 5(1):23–39.

Scarrow, S. (2007). Political Finance in Comparative Perspective. *Annual Review of Political Science*, 10:193–210.

Schultz, C. (2007). Strategic Campaigns and Redistributive Politics*. *The Economic Journal*, 117(522):936–963.

Simon, H. A. (1954). Bandwagon and Underdog Effects and the Possibility of Election Predictions. *The Public Opinion Quarterly*, 18(3):245–253.

Snyder, J. M., Prat, A., and Puglisi, R. (2010). Is Private Campaign Finance a Good Thing? Estimates of the Potential Information Benefits. *Quarterly Journal of Political Science*, 5(3):291–318.

Speck, B. (2013). Money in Politics: Sound Political Competition and Trust in Government. Oecd background paper.

Spenkuch, J. L. and Toniatti, D. (2016). Political Advertising and Election Outcomes. Technical report.

Stratmann, T., J., F., and Aparicio-Castillo (2006). Competition policy for elections: Do campaign contribution limits matter? *Public Choice*, 127(1):177–206.

Tahoun, A. and Vasvari, F. P. (2016). Political Lending. Working Papers Series 47, Institute for New Economic Thinking.

Tomz, M., Tucker, J. A., and Wittenberg, J. (2002). An Easy and Accurate Regression Model for Multiparty Electoral Data. *Political Analysis*, 10(1):66–83.

Tomz, M., Wittenberg, J., and King, G. (2001). CLARIFY: Sfotware for Interpreting and Presenting Statistical Results, Version 2.0. Technical report.

Vanberg, C. (2008). One Man, One Dollar? Campaign contribution limits, equal influence, and political communication. *Journal of Public Economics*, 92(34):514–531.
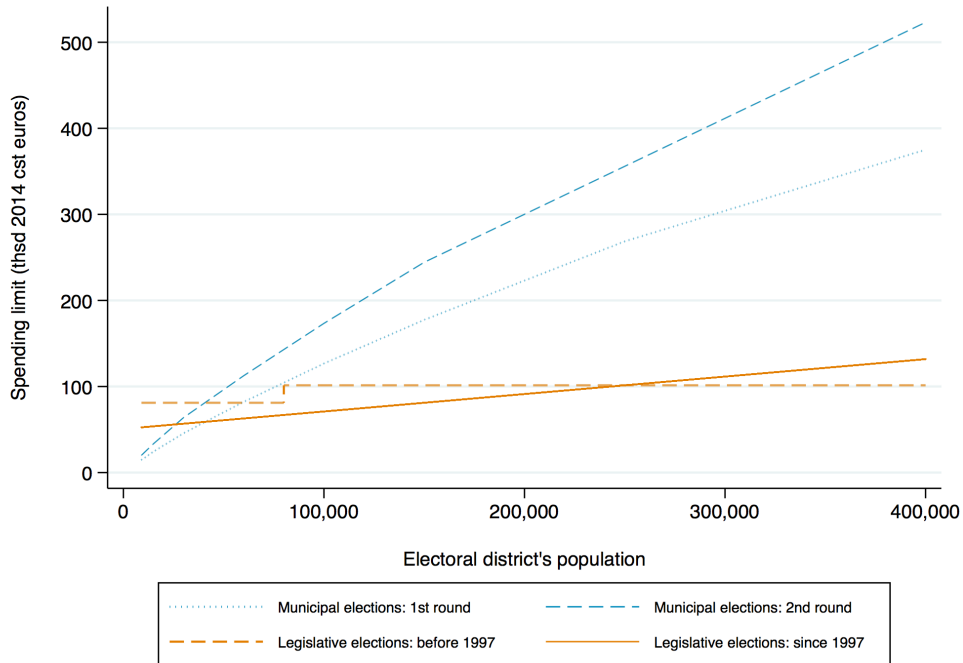
(a) Change in spending limits' rules
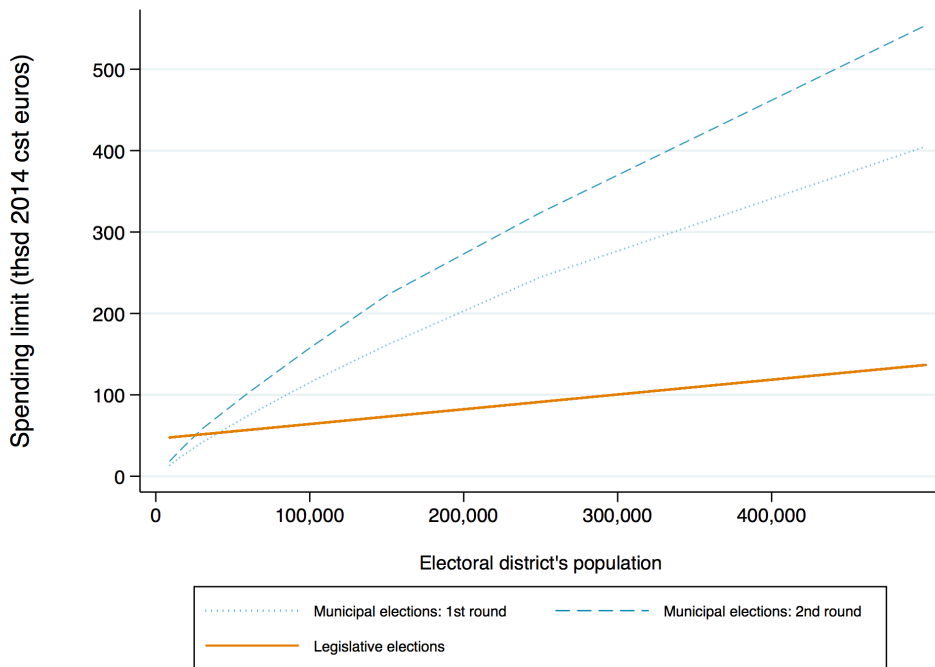
(b) Today's rules

Notes: The figures plot the spending limit depending on the electoral districts' population. In the upper figure 1a, we illustrate the decrease in the spending limit introduced by the law of 1995. Bottom figure 1b plots today's rules as they apply for municipal and legislative elections. Campaign finance legislations are described in details in the text and in the online Appendix.

Figure 1: Spending limits

(a) Legislative elections
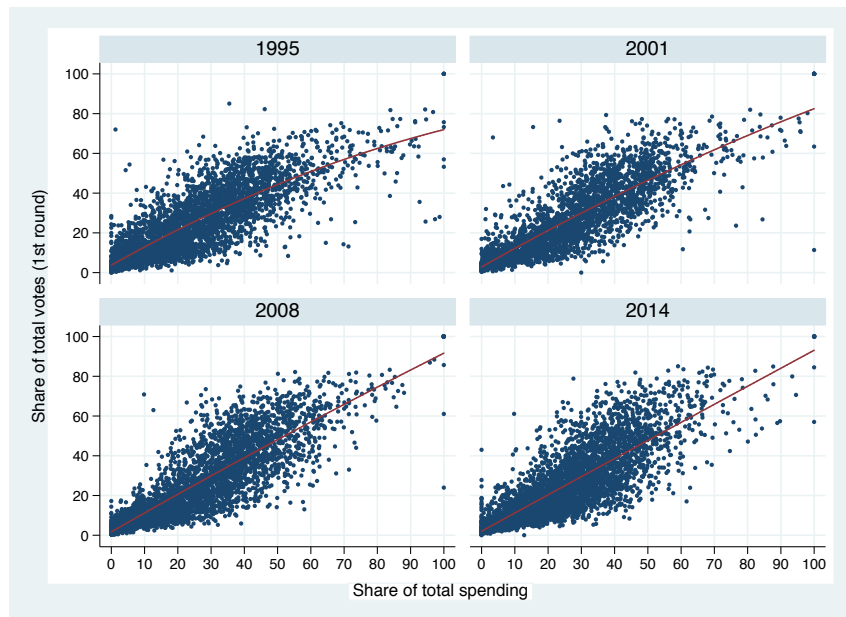
(b) Municipal elections

Notes: The figure plots the relationship between the proportions of total spending and total (first round) votes received by candidate by district. The upper figure 2a shows this relationship for the legislative elections. The bottom figure 2b shows this relationship for the municipal elections.

Figure 2: Relationship between the proportions of total spending and total votes
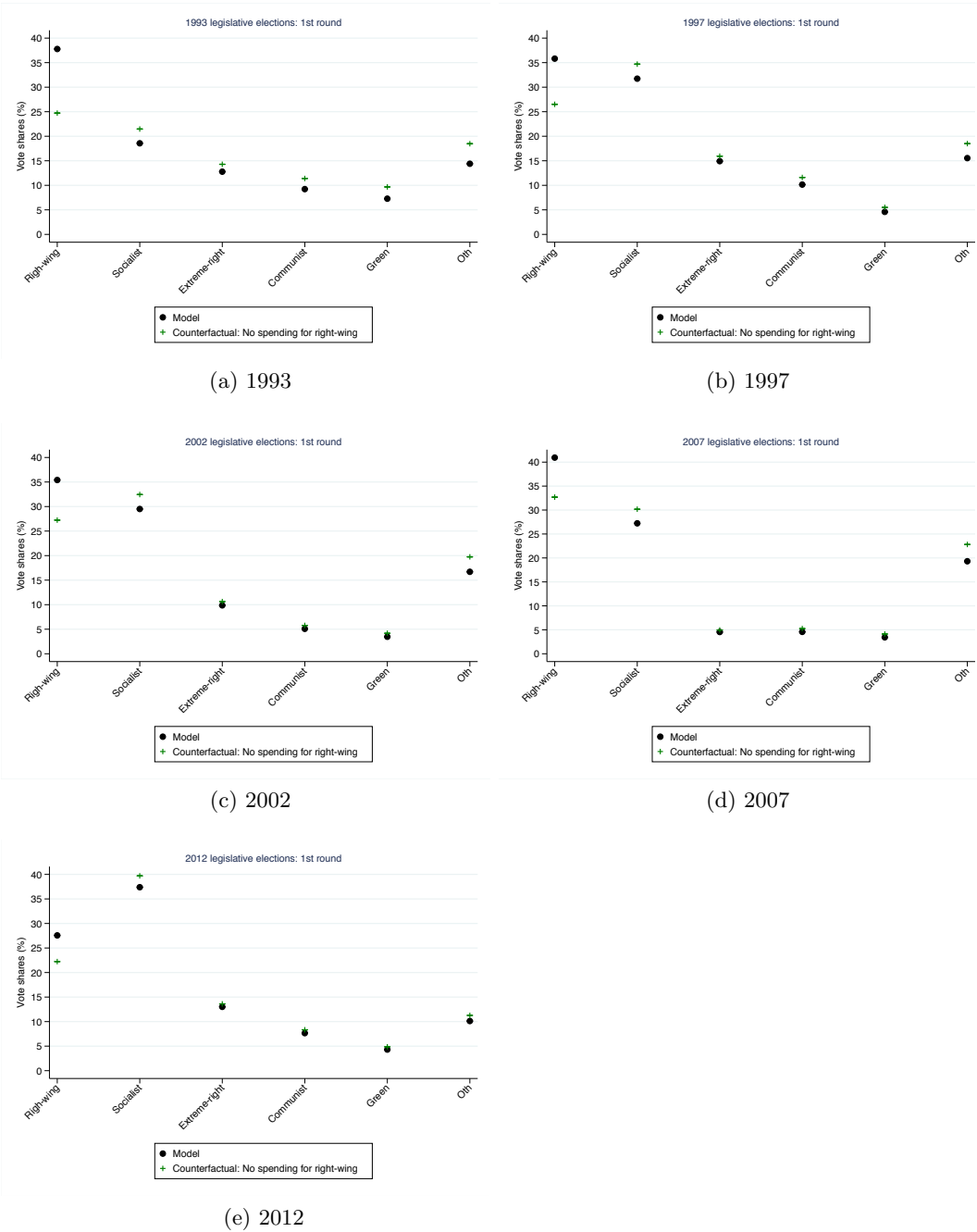
(a) 1993

(b) 1997

(c) 2002

(d) 2007

(e) 2012

Notes: The figure shows how the share of the votes obtained by the different parties at the national level would have changed (compared to the model) in each of the five legislative elections if the candidates running for the right-wing party in all the electoral districts / years would have spent €0. The change in the number of votes received by each party in each electoral district / year is obtained by using the *Clarify* statistical suite: (i) first, we estimate equation (3) (the results are similar to the ones presented in Table 6); (ii) second, the program draws 1,000 simulations of the main and ancillary parameters from their asymptotic sampling distribution; (iii) finally, we set the value of the right-wing party spending per voter equal to 0 in all the electoral districts / elections, and use the *simqi* command to simulate the votes obtained by the different parties in each electoral districts / elections in this case (we set the number of simulations to be used when calculating expected values to 1,000; all the other explanatory variables are set to their real value). We then sum up for each elections all the votes at the national level to obtain the vote shares of the parties.

Figure 3: Legislative elections, Fully contested districts: Counterfactual estimation: no campaign spending in all the electoral districts / years by the candidates running for the right-wing party
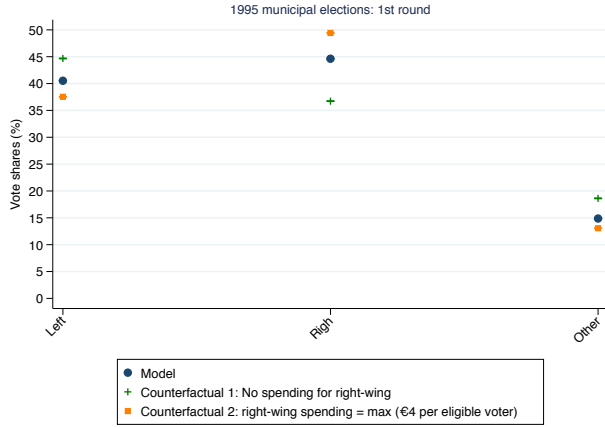
(a) 1995
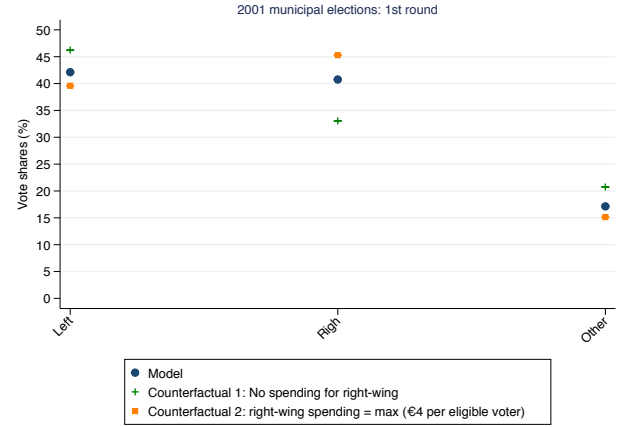
(b) 2001
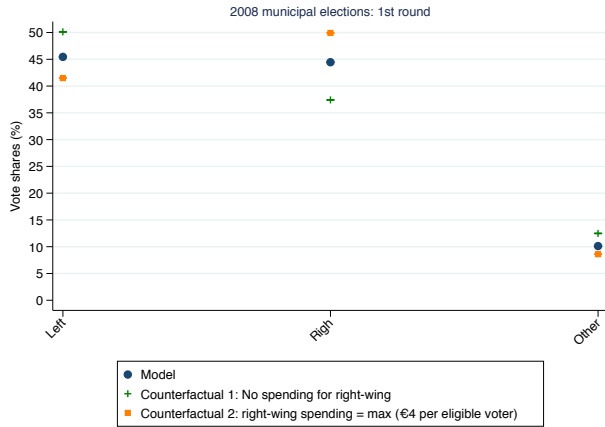
(c) 2008
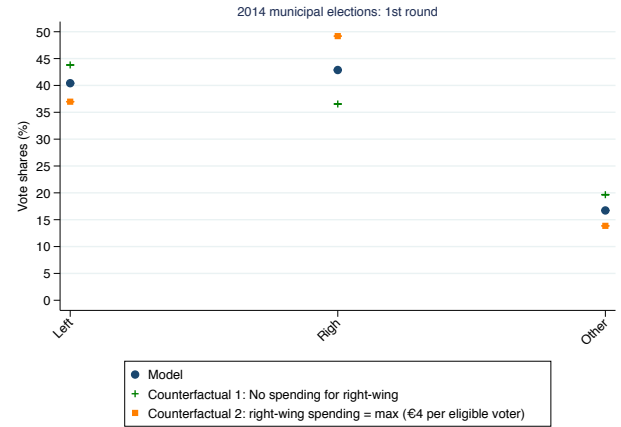
(d) 2014

Notes: The figure shows how the share of the votes obtained by the different parties at the national level would have changed (compared to the model) in each of the four municipal elections if the candidates running for the right-wing party in all the electoral districts / years (i) had spent €0 (first conterfactual) or (ii) had spent €4 per eligible voter (second conterfactual). For both counterfactuals, the change in the number of votes received by each party in each electoral district / year is obtained by using the *Clarify* statistical suite: (i) first, we estimate equation (3) (the results are similar to the ones presented in Table 8); (ii) second, the program draws 1,000 simulations of the main and ancillary parameters from their asymptotic sampling distribution; (iii) finally, for the first counterfactual, we set the value of the right-wing party spending per voter equal to 0 in all the electoral districts / elections, and use the *simqi* command to simulate the votes obtained by the different parties in each electoral districts / elections in this case (we set the number of simulations to be used when calculating expected values to 1,000; all the other explanatory variables are set to their real value). For the second counterfactual, we perform a similar analysis but set the value of the right-wing party spending per voter equal to €4 in all the electoral districts / elections. We then sum up for each elections all the votes at the national level to obtain the vote shares of the parties.

Figure 4: Municipal elections, Fully contested districts: Counterfactual estimations
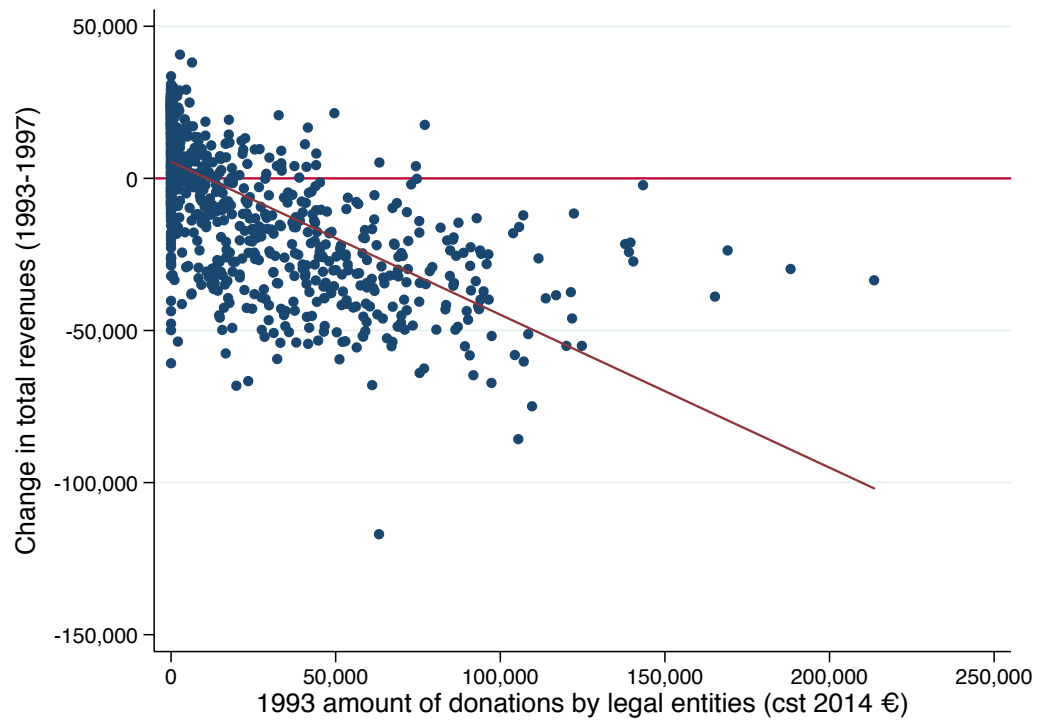
Notes: The figure plots the correlation between the change in total revenues between 1993 and 1997 the donations from legal entities received in 1993. An observation is a candidate.

Figure 5: Change in total revenues between 1993 and 1997 depending on the donations from legal entities received in 1993

Table 1: Summary statistics: Number of candidates running in the first round

	Number of candidates 1st round					
	Mean	Median	sd	Min	Max	N
Municipal elections						
1995	4.3	4.0	1.7	1	10	945
2001	3.8	3.0	1.8	1	11	933
2008	4.1	3.0	2.6	1	22	1,002
2014	4.2	4.0	1.8	1	15	1,052
Legislative elections						
1993	9.6	9.0	2.6	5	22	555
1997	11.5	11.0	3.8	4	30	555
2002	15.7	15.0	3.9	7	37	555
2007	14.6	14.0	3.1	8	32	555
2012	12.0	11.0	3.3	7	26	540

Notes: The table presents summary statistics on the number of candidates running in the first ballot of municipal and legislative elections. The observations are at the electoral district level. The drop in the number of electoral districts between the 2007 and the 2012 legislative elections (from 555 to 540) comes from the 2010 redistricting of electoral boundaries. While the total number of legislative constituencies was unchanged (577), 4 new constituencies were created within oversea French territories, as well as 11 constituencies for French residents overseas. Hence the total number of metropolitan France constituencies was decreased to 540.

Table 2: Summary statistics: campaign spending

(a) **Municipal elections**

	Spending (cst 2014 €)					
	Mean	Median	sd	Min	Max	N
Total spending per candidate						
1995	23,389	14,235	31,151	0	426,652	3,839
2001	25,335	14,922	35,409	0	477,550	3,485
2008	21,768	13,346	29,909	0	393,380	3,742
2014	21,177	13,094	28,694	0	458,914	4,435
Per candidate & per voter						
1995	1.24	1.14	0.89	0.00	4.80	3,784
2001	1.32	1.27	1.06	0.00	22.76	3,082
2008	1.11	1.10	0.75	0.00	3.92	3,742
2014	1.05	1.01	0.71	0.00	3.98	4,435
Total spending per voter						
1995	4.95	4.66	2.47	0.00	14.99	945
2001	4.37	4.23	3.26	0.00	52.62	933
2008	4.14	3.87	1.88	0.43	13.31	1,002
2014	4.43	4.18	1.86	0.44	12.31	1,052

(b) **Legislative elections**

	Spending (cst 2014 €)					
	Mean	Median	sd	Min	Max	N
Total spending per candidate						
1993	21,637	11,143	26,916	0	170,564	5,116
1997	15,113	2,186	19,400	0	75,226	6,040
2002	11,261	1,414	17,148	0	81,169	7,981
2007	11,323	654	17,063	0	76,281	7,190
2012	18,282	17,320	17,164	0	71,351	3,942
Per candidate & per voter						
1993	0.33	0.16	0.42	0.00	4.08	5,116
1997	0.23	0.03	0.30	0.00	1.87	6,040
2002	0.17	0.02	0.26	0.00	1.58	7,981
2007	0.15	0.01	0.24	0.00	1.50	7,190
2012	0.23	0.20	0.22	0.00	1.29	3,942
Total spending per voter						
1993	3.01	2.84	1.20	0.49	9.10	555
1997	2.48	2.36	0.74	0.00	6.24	555
2002	2.38	2.15	0.91	0.81	7.40	555
2007	2.00	1.87	0.66	0.63	5.34	555
2012	1.70	1.63	0.52	0.00	4.51	540

Notes: The table presents summary statistics on spending by candidates running in municipal and legislative elections. For the "total spending per candidate" and the total spending "per candidate & per voter" variables, an observation is a candidate/election. For the "total spending per voter" variable, an observation is an electoral district / election. The upper Table 2a shows the results for the municipal elections, and the bottom Table 2b for the legislative elections.

Table 3: Summary statistics: campaign revenue per sources of funding

(a) **Municipal elections**

	Mean	Median	sd	Min	Max	Obs
Private donations (%)	15.9	5.8	22.5	0	100	15,123
Party contributions (%)	7.3	0.0	19.9	0	100	15,124
Personal contributions (%)	73.9	84.6	29.2	0	100	15,121
In-kind contributions (%)	2.5	0.0	7.6	0	100	15,219
Other (%)	0.3	0.0	2.5	0	94	15,219

(b) **Legislative elections**

	Mean	Median	sd	Min	Max	Obs
Private donations (%)	15.4	0.0	26.9	0	100	24,738
Party contributions (%)	28.2	5.2	37.4	0	100	24,765
Personal contributions (%)	50.9	56.9	41.5	0	100	24,730
In-kind contributions (%)	4.5	0.0	14.6	0	100	24,820
Other (%)	0.8	0.0	4.9	0	100	24,820

Notes: The table presents summary statistics on candidates' campaign revenue depending on the sources of funding. An observation is a candidate/election. The upper Table 3a presents the statistics for the municipal elections, and the bottom Table 3b for the legislative elections.

Table 4: Summary statistics: Legislative elections, campaign revenue per sources of funding, depending on the political party

	(1) Communist	(2) Green	(3) Socialist	(4) Right	(5) Extreme right	(6) Socialist vs. Right
	mean/sd	mean/sd	mean/sd	mean/sd	mean/sd	b/t
% of total revenues						
Private donations (%)	12.3	5.6	17.8	27.2	1.2	-9.4***
	(22.3)	(16.0)	(21.7)	(26.0)	(5.2)	(-14.0)
Party contributions (%)	16.3	27.4	12.5	29.0	2.1	-16.5***
	(30.6)	(37.9)	(20.1)	(21.2)	(12.0)	(-28.7)
Personal contributions (%)	68.4	61.6	66.1	39.4	95.2	26.6***
	(37.5)	(40.0)	(30.6)	(28.5)	(15.5)	(32.2)
In-kind contributions (%)	2.1	4.4	2.5	3.1	0.9	-0.6***
	(9.1)	(12.1)	(4.7)	(5.8)	(6.4)	(-4.2)
In euros						
Private donations (cst 2014 €)	2,355	439	9,692	17,916	259	-8,224***
	(7,773)	(1,852)	(17,526)	(26,164)	(1,678)	(-13)
Party contributions (cst 2014 €)	1,545	876	5,057	14,625	273	-9,568***
	(3,964)	(2,098)	(9,159)	(13,269)	(1,945)	(-30)
Personal contributions (cst 2014 €)	13,328	5,815	24,413	18,002	22,068	6,411***
	(12,773)	(9,244)	(13,039)	(13,972)	(11,403)	(17)
In kind contributions (cst 2014 €)	169	174	874	1,338	119	-464***
	(847)	(724)	(1,799)	(2,684)	(786)	(-7)
Total revenues (cst 2014 €)	17,820	7,361	40,810	53,023	22,848	-12,213***
	(22,346)	(10,043)	(20,126)	(28,162)	(11,173)	(-18)
Campaign spending						
Total spending (cst 2014 €)	17,206	7,264	39,121	48,331	22,686	-9,210***
	(15,402)	(10,041)	(17,338)	(20,377)	(11,124)	(-17)
Obs	2,639	2,367	2,678	2,833	2,813	5,511

Notes: The table presents summary statistics on candidates' campaign revenues per sources of funding, depending on their political party. We focus here on the five main parties: communist, green, socialist, right, and extreme right. An observation is a candidate/election. The five legislative elections are included. Column 1 presents the results for candidates running for the Communist party, column 2 for candidates running for the Green party, column 3 for the Socialist party, column 4 for the right-wing party, and column 5 for the extreme-right party. In column 6, we perform a t-test on the equality of means (standard errors are in parentheses) between the Socialist party and right-wing party.

Table 5: Summary statistics: Municipal elections, campaign revenue per sources of funding, depending on the political party

	(1) Extreme left	(2) Left	(3) Right	(4) Extreme right	(5) Left vs. Right
	mean/sd	mean/sd	mean/sd	mean/sd	b/t
% of total revenues					
Private donations (%)	15.3	13.1	21.6	1.7	8.5***
	(28.4)	(18.9)	(24.2)	(8.0)	(20.7)
Party contributions (%)	37.7	6.4	4.4	4.9	-2.0***
	(43.3)	(15.5)	(13.6)	(19.1)	(-7.1)
Personal contributions (%)	38.2	78.2	71.4	91.1	-6.8***
	(43.1)	(24.3)	(27.1)	(22.4)	(-14.0)
In-kind contributions (%)	8.3	1.9	2.2	2.1	0.3***
	(18.4)	(5.0)	(6.0)	(8.2)	(3.2)
In euros					
Private donations (cst 2014 €)	227	3,258	6,635	312	3,377***
	(880)	(6,710)	(12,882)	(1,926)	(18)
Party contributions (cst 2014 €)	351	2,594	2,293	329	-301*
	(651)	(9,968)	(9,031)	(2,568)	(-2)
Personal contributions (cst 2014 €)	958	19,187	19,597	20,113	409
	(2,746)	(23,453)	(24,944)	(22,204)	(1)
In kind contributions (cst 2014 €)	93	464	741	260	278***
	(373)	(1,431)	(3,530)	(1,142)	(6)
Total revenues (cst 2014 €)	1,887	25,575	29,813	21,109	4,238***
	(8,637)	(33,188)	(46,047)	(22,837)	(6)
Campaign spending					
Total spending (cst 2014 €)	1,563	25,185	28,271	20,894	3,086***
	(3,056)	(32,851)	(35,291)	(22,737)	(5)
Obs	1,068	5,994	5,681	1,388	11,675

Table 6: Spending and first round vote share: SUR estimates, Legislative elections (1993-2012), Fully contested districts

	Log ratios of vote shares with respect to other party				
	Communist	Green	Socialist	Right-wing	Extreme-right
Communist spending	1.15***	-0.09	-0.43***	-0.34*	-0.09
	(0.16)	(0.18)	(0.16)	(0.20)	(0.14)
Communist spending-squared	-0.45***	0.14	0.18	0.31**	0.17
	(0.12)	(0.14)	(0.12)	(0.15)	(0.11)
Green spending	0.56*	2.91***	-0.05	0.01	0.15
	(0.28)	(0.31)	(0.28)	(0.35)	(0.25)
Green spending-squared	-0.28	-1.57***	0.43	0.38	0.32
	(0.45)	(0.49)	(0.44)	(0.55)	(0.39)
Socialist spending	-0.25*	-0.17	0.60***	-0.63***	-0.22*
	(0.14)	(0.15)	(0.14)	(0.17)	(0.12)
Socialist spending-squared	0.13*	-0.04	-0.12	0.39***	0.11*
	(0.07)	(0.08)	(0.07)	(0.09)	(0.07)
Right-wing spending	0.52***	0.58***	0.53***	2.09***	0.33***
	(0.13)	(0.14)	(0.13)	(0.16)	(0.11)
Right-wing spending-squared	-0.24***	-0.33***	-0.22***	-0.77***	-0.08
	(0.07)	(0.07)	(0.07)	(0.08)	(0.06)
Extreme-right spending	0.63**	0.22	0.39	0.64*	0.55**
	(0.27)	(0.30)	(0.26)	(0.33)	(0.23)
Extreme-right spending-squared	-0.95**	-0.12	-0.36	-0.78*	-0.25
	(0.37)	(0.41)	(0.37)	(0.46)	(0.32)
Other spending	-1.66***	-1.73***	-1.67***	-2.15***	-1.64***
	(0.06)	(0.07)	(0.06)	(0.08)	(0.05)
Other spending-squared	0.37***	0.39***	0.34***	0.41***	0.36***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Controls					
Communist party Incumbent	0.35***	-0.18	-0.32***	-0.09	-0.07
	(0.12)	(0.13)	(0.12)	(0.15)	(0.10)
Socialist party Incumbent	0.03	0.00	-0.09	-0.04	-0.03
	(0.07)	(0.08)	(0.07)	(0.09)	(0.06)
Right-wing party Incumbent	0.02	0.02	-0.08	-0.04	0.00
	(0.07)	(0.07)	(0.07)	(0.08)	(0.06)
% 15-19 years old	-0.18*	-0.05	-0.16*	0.06	-0.16*
	(0.09)	(0.10)	(0.09)	(0.12)	(0.08)
% 20-24 years old	-0.00	-0.17*	-0.00	-0.09	-0.08
	(0.10)	(0.11)	(0.09)	(0.12)	(0.08)
% 65 of older	0.03	0.03	0.03	0.15***	0.05*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
% no diploma	0.02	0.03	0.01	-0.03	-0.06***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
% higher education	0.06***	0.06***	0.02	0.01	-0.07***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
% blue collar workers	-0.06***	-0.04*	-0.03	-0.09***	-0.08***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Unemployment rate	0.02	-0.05*	0.02	0.02	-0.02
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Election and District FE	Yes				
Observations	1,477				

Notes: * p<0.10, ** p<0.05, *** p<0.01. The model is estimated using SUR estimates. An observation is a district/election. The estimation includes electoral district and election fixed effects. Variables are described in more details in the text.

Table 7: Impact of spending on votes for right-wing party: Legislative elections, counterfactual estimate: no campaign spending in all the electoral districts / years by the candidates running for the right-wing party (everything else being equal)

	Model		No spending by Right			
Year	Votes	Votes	Change in votes	95% CI	Change in spending	Price of a vote
1993	6,683,254	2,907,591	-3,775,663	-3,778,700 , -3,772,627	-€20,753,246	€5.5
1997	7,779,341	4,254,353	-3,524,988	-3,527,681 , -3,522,295	-€17,810,772	€5.1
2002	6,714,300	4,021,466	-2,692,834	-2,695,992 , -2,689,677	-€15,649,208	€5.8
2007	7,053,390	4,536,952	-2,516,438	-2,519,910 , -2,512,966	-€16,588,917	€6.6
2012	9,196,715	6,428,763	-2,767,952	-2,771,085, -2,764,820	-€13,252,376	€4.8

Notes: The table presents the results of the following counterfactual for the legislative elections: no campaign spending in all the electoral districts / years by the candidates running for the right-wing party. The change in the number of votes received by the right-wing party is obtained by using the *Clarify* statistical suite: (i) first, we estimate equation (3) (the results are similar to the ones presented in Table 6); (ii) second, the program draws 1,000 simulations of the main and ancillary parameters from their asymptotic sampling distribution; (iii) finally, we set the value of the right-wing party spending per voter equal to 0 in all the electoral districts / elections, and use the *simqi* command to simulate the votes obtained by the different parties in each electoral districts / elections in this case (we set the number of simulations to be used when calculating expected values to 1,000; all the other explanatory variables are set to their real value).

Table 8: Spending and first round vote share: SUR estimates, Municipal elections (1995-2014), Fully contested districts

	Log ratios of vote shares with respect to other party	
	Left	Right
Left spending	0.31***	-0.01
	(0.03)	(0.04)
Left spending-squared	-0.02***	-0.00
	(0.00)	(0.00)
Right spending	0.07**	0.32***
	(0.03)	(0.03)
Right spending-squared	-0.00	-0.02***
	(0.00)	(0.00)
Other candidates' spending	-0.83***	-0.87***
	(0.03)	(0.04)
Other spending-squared	0.09***	0.08***
	(0.01)	(0.01)
Controls		
Left Incumbent	-0.06	-0.08
	(0.05)	(0.05)
Right Incumbent	-0.07	0.04
	(0.05)	(0.05)
% 15-19 years old	0.01	0.06
	(0.03)	(0.04)
% 20-24 years old	0.03	-0.03
	(0.03)	(0.03)
% 65 of older	-0.06***	-0.04***
	(0.01)	(0.01)
% no diploma	0.08***	0.06***
	(0.01)	(0.01)
% higher education	0.02**	0.01
	(0.01)	(0.01)
% blue collar workers	-0.02***	-0.02*
	(0.01)	(0.01)
Unemployment rate	-0.02**	-0.03**
	(0.01)	(0.01)
Election FE	Yes	
District FE	Yes	
Observations	1,776	

Notes: * p<0.10, ** p<0.05, *** p<0.01. The model is estimated using SUR estimates. An observation is a district/election. The estimation includes electoral district and election fixed effects. Variables are described in more details in the text.

Table 9: Impact of spending on votes for right-wing party: Municipal elections, counterfactual estimates

(a) No spending for right-wing party

| | Model | No spending by Right | | | | |
Year	Votes	Votes	Change in votes	95% CI	Change in spending	Price of a vote
1995	5,575,505	4,587,885	-987,620	-989,308 , -985,931	-€30,948,982	€31.3
2001	4,380,417	3,552,729	-827,688	-828,929 , -826,447	-€27,050,408	€32.7
2008	4,752,801	4,000,451	-752,350	-753,343 , -751,356	-€23,951,700	€31.8
2014	6,202,196	5,286,646	-915,550	-916,988 , -914,112	- €28,906,908	€31.6

(b) Spending equal to €4 per voter for right-wing party

| | Model | Max spending by Right | | | | |
Year	Votes	Votes	Change in votes	95% CI	Change in spending	Price of a vote
1995	5,575,505	6,174,705	+599,200	598,490 , 599,911	+ €19,033,154	€31.8
2001	4,380,417	4,868,240	+487,823	487,080 , 488,566	+ €15,944,856	€32.7
2008	4,752,801	5,336,896	+584,095	583,297 , 584,893	+ €18,823,188	€32.2
2014	6,202,196	7,115,436	+913,240	911,768 , 914,712	+ €28,964,276	€31.7

Table 10: Spending and vote shares depending on the sources of funding: SUR estimates, Legislative elections, Fully contested districts

	Log ratios of vote shares with respect to other party				
	Communist party	Green party	Socialist party	Right-wing party	Extreme-right party
Communist party					
Private donations	-0.07	-0.30*	-0.25*	0.17	0.03
	(0.14)	(0.16)	(0.15)	(0.19)	(0.13)
Party contribution	0.28	0.83***	-0.07	0.35	0.24
	(0.23)	(0.25)	(0.24)	(0.31)	(0.20)
Personal contribution	0.69***	0.10	-0.29***	-0.02	0.06
	(0.10)	(0.11)	(0.11)	(0.14)	(0.09)
Green party					
Private donations	-0.11	-0.23	-0.37	-2.28***	-0.73*
	(0.48)	(0.52)	(0.49)	(0.63)	(0.42)
Party contribution	0.05	1.48***	0.59	1.06*	0.65*
	(0.43)	(0.48)	(0.45)	(0.57)	(0.38)
Personal contribution	0.52***	2.38***	-0.09	0.28	0.33***
	(0.13)	(0.15)	(0.14)	(0.18)	(0.12)
Socialist party					
Private donations	0.02	-0.12*	0.32***	0.05	-0.04
	(0.06)	(0.07)	(0.06)	(0.08)	(0.06)
Party contribution	0.07	-0.33**	0.15	-0.12	-0.06
	(0.13)	(0.14)	(0.13)	(0.17)	(0.11)
Personal contribution	-0.02	-0.19*	0.48***	0.05	0.03
	(0.09)	(0.10)	(0.09)	(0.12)	(0.08)
Right-wing party					
Private donations	0.11**	0.01	0.10**	0.42***	0.18***
	(0.05)	(0.05)	(0.05)	(0.06)	(0.04)
Party contribution	0.10	-0.05	0.06	0.55***	0.07
	(0.08)	(0.09)	(0.08)	(0.11)	(0.07)
Personal contribution	0.12*	0.07	0.15**	0.73***	0.14**
	(0.07)	(0.08)	(0.08)	(0.10)	(0.06)
Extreme-right party					
Private donations	0.83	0.44	0.85	0.27	1.75***
	(0.64)	(0.70)	(0.66)	(0.85)	(0.56)
Party contribution	-0.04	0.36	-0.08	-0.33	0.18
	(0.43)	(0.47)	(0.44)	(0.57)	(0.38)
Personal contribution	-0.01	0.13	0.09	0.15	0.31***
	(0.10)	(0.11)	(0.10)	(0.13)	(0.08)
Other					
Private donations	-0.89***	-0.81***	-0.90***	-1.22***	-0.83***
	(0.06)	(0.07)	(0.07)	(0.08)	(0.06)
Party contribution	-0.70***	-0.96***	-0.71***	-0.90***	-0.62***
	(0.12)	(0.13)	(0.13)	(0.16)	(0.11)
Personal contribution	-0.86***	-0.91***	-1.03***	-1.31***	-0.92***
	(0.05)	(0.05)	(0.05)	(0.06)	(0.04)
Election FE and District FE	Yes				
Controls	Yes				
Observations	1,805				

Notes: * p<0.10, ** p<0.05, *** p<0.01. The model is estimated using SUR estimates. An observation is a district/election. The estimation includes electoral district and election fixed effects, as well as the same controls than in Table 6 (coefficients for the controls are not reported for the sake of space). Variables are described in more detail in the text.

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Table 11: Spending and first round vote share depending on the sources of funding: SUR estimates, Municipal elections, Fully contested districts

	Log ratios of vote shares with respect to other party	
	Left	Right
Left		
Private donations	0.25***	0.04
	(0.04)	(0.04)
Party contribution	0.04	-0.11**
	(0.05)	(0.05)
Personal contribution	0.19***	0.01
	(0.02)	(0.02)
Right		
Private donations	0.01	0.23***
	(0.03)	(0.03)
Party contribution	-0.01	0.07*
	(0.04)	(0.04)
Personal contribution	0.05***	0.17***
	(0.01)	(0.01)
Other		
Private donations	-0.66***	-0.79***
	(0.08)	(0.08)
Party contribution	-0.41***	-0.47***
	(0.08)	(0.09)
Personal contribution	-0.48***	-0.54***
	(0.02)	(0.02)
Election and District FE	Yes	
Controls	Yes	
Observations	1,776	

Notes: * p<0.10, ** p<0.05, *** p<0.01. The model is estimated using SUR estimates. An observation is a district/election. The estimation includes electoral district and election fixed effects, as well as the same controls than in Table 8 (coefficients for the controls are not reported for the sake of space). Variables are described in more detail in the text.

Table 12: Impact of private donations on votes for right-wing party: Municipal elections, counterfactual estimate: right-wing private donations in all the districts / years are equal to the actual amount of the left-wing private donations received in these districts / years

	Model	**Right private donations = left private donations**			
Year	Votes	Votes	Change in votes	Change in private donations	"Private donations" price of a vote
1995	5,570,893	5,385,728	-185,165	-€3,475,324	€18.8
2001	4,384,949	4,280,149	-104,799	-€1,748,970	€16.7
2008	4,754,836	4,627,429	-127,407	-€2,347,980	€18.4
2014	6,207,885	5,948,527	-259,357	-€4,647,410	€17.9

Notes: The table presents the results of the following counterfactual experiment for the municipal elections: the amount of private donations received by all the right-wing party candidates in all the electoral districts / years are equalized to the actual amount of private donations received by the left-wing party candidates in these districts / years. The change in the number of votes received by the right-wing party is obtained by using the *Clarify* statistical suite: (i) first, we estimate equation (3) with spending by sources of funding as independent variables (the results are similar to the ones presented in Table 11); (ii) second, the program draws 1,000 simulations of the main and ancillary parameters from their asymptotic sampling distribution; (iii) finally, we set the value of the private donations received by the right-wing party candidates equal to the value of the private donations received by the left-wing party candidates in all the electoral districts / elections, and use the *simqi* command to simulate the votes obtained by the different parties in each electoral districts / elections in this case (we set the number of simulations to be used when calculating expected values to 1,000; all the other explanatory variables are set to their real value).

Table 13: Spending and first round vote share: SUR estimates, Legislative elections (1993-2012), Full Information Approach

	Log ratios of vote shares with respect to other party				
	Communist party	Green party	Socialist party	Right-wing party	Extreme-right party
Communist party spending	1.15***	0.11	-0.28	-0.02	0.20
	(0.14)	(0.19)	(0.20)	(0.20)	(0.14)
Green party spending	0.29*	3.93***	-2.21***	-0.01	0.09
	(0.17)	(0.23)	(0.25)	(0.25)	(0.17)
Socialist party spending	0.09	0.02	1.63***	-0.02	0.09
	(0.08)	(0.11)	(0.12)	(0.12)	(0.08)
Right-wing party spending	0.31***	0.36***	0.20*	1.91***	0.27***
	(0.08)	(0.10)	(0.11)	(0.11)	(0.07)
Extreme-right spending	0.07	0.11	0.10	0.02	1.08***
	(0.17)	(0.22)	(0.23)	(0.24)	(0.16)
Controls					
Communist party Incumbent	0.27	-0.24	-0.05	0.55**	0.03
	(0.18)	(0.24)	(0.25)	(0.25)	(0.17)
Green party Incumbent	-0.87***	0.35	-0.82**	0.63	0.29
	(0.28)	(0.38)	(0.40)	(0.40)	(0.28)
Socialist party Incumbent	0.09	0.14	0.25*	0.12	0.12
	(0.09)	(0.12)	(0.13)	(0.13)	(0.09)
Right-wing party Incumbent	0.07	0.16	0.22*	0.15	0.16*
	(0.09)	(0.12)	(0.12)	(0.12)	(0.08)
% 15-19 years old	0.36***	0.08	0.19	1.04***	0.25*
	(0.14)	(0.19)	(0.19)	(0.20)	(0.13)
% 20-24 years old	0.20	0.00	0.18	0.04	0.20
	(0.15)	(0.21)	(0.22)	(0.22)	(0.15)
% 65 of older	0.06	0.11	-0.05	0.27***	0.11*
	(0.06)	(0.08)	(0.08)	(0.08)	(0.06)
% no diploma	0.07**	0.00	0.07	-0.00	-0.04
	(0.03)	(0.05)	(0.05)	(0.05)	(0.03)
% higher education	-0.00	0.08*	-0.00	-0.01	-0.10***
	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)
% blue collar workers	-0.07**	-0.07	-0.03	-0.12***	-0.07**
	(0.03)	(0.04)	(0.05)	(0.05)	(0.03)
Unemployment rate	0.04	0.08	0.01	0.05	-0.01
	(0.04)	(0.05)	(0.05)	(0.05)	(0.04)
Election FE	Yes				
District FE	Yes				
Observations	2,571				

Notes: * p<0.10, ** p<0.05, *** p<0.01. The model is estimated using SUR estimates. An observation is a district/election. The vote shares are constructed using the effective rather than the actual votes; voting data for parties not contested in an electoral district are imputed on R using the *Amelia* imputation software. The SUR analysis is then performed on Stata using *Clarify* and the weights generated by *Amelia*. The estimation includes electoral district and election fixed effects. Variables and methodology are described in more detail in the text.

Table 14: Summary statistics: Donations from legal entities

	Legislative elections (1993)					
	Mean	Median	P95	P99	Max	Obs
Donations from legal entities	8,560	0	58,375	102,861	350,355	5,116
Per registered voter	0.13	0.00	0.84	1.59	6.67	5,116
As a % of total revenues	12.4	0.0	70.5	91.0	100	5,116
As a % of total private entities	22.4	0.0	96.5	100	100	5,116

Notes: The table gives summary statistics. Year is 1993. Variables are values for the candidates running in the legislative election. The observations are at the candidate level.

Table 15: Donations from legal entities and change in spending

	Change in total spending (1993-1997)	
Donations from legal entities	-0.47***	-0.35***
	(0.04)	(0.05)
District FE	Yes	Yes
Party FE	No	Yes
R-sq	0.59	0.74
Observations	1,415	1,415
Cluster (district)	541	541
Mean DepVar	-0.08	-0.08
Sd DepVar	0.33	0.33

Notes: * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS. An observation is a candidate. The estimations include district fixed effects. Standard errors are clustered at the district level. Variables are described in more detail in the text.

Log ratios of vote shares with respect to other party

	(1) Naive estimates		(2) IV estimates		(3) IV estimates	
	Socialist party	Right-wing party	Socialist party	Right-wing party	Socialist party	Right-wing party
Socialist Actual spending	1.41***	-0.83*				
	(0.41)	(0.48)				
Socialist Actual spending-squared	-0.63**	0.61*				
	(0.31)	(0.36)				
Right Actual spending	-0.26	0.12				
	(0.18)	(0.21)				
Right Actual spending-squared	0.05	0.04				
	(0.05)	(0.05)				
Socialist Predicted spending			0.64**	-0.70**	0.73***	-0.66**
			(0.30)	(0.34)	(0.28)	(0.33)
Socialist Predicted spending-squared			-0.30	0.35	-0.29	0.38
			(0.23)	(0.26)	(0.22)	(0.26)
Right Predicted spending			-0.20	0.18	-0.26**	0.16
			(0.13)	(0.15)	(0.12)	(0.15)
Right Predicted spending-squared			0.04	-0.04	0.08*	-0.02
			(0.05)	(0.05)	(0.04)	(0.05)
Other Actual spending	-0.78**	-1.01**			-0.73*	-1.01**
	(0.39)	(0.45)			(0.40)	(0.47)
Other Actual spending-squared	0.17	0.24			0.10	0.29
	(0.17)	(0.20)			(0.17)	(0.20)
Controls						
Socialist party Incumbent	0.44***	0.14	0.50***	0.27**	0.37***	0.20
	(0.11)	(0.13)	(0.12)	(0.13)	(0.11)	(0.13)
Right-wing party Incumbent	0.09	0.18	0.14	0.26**	0.05	0.23*
	(0.10)	(0.12)	(0.10)	(0.12)	(0.10)	(0.12)
% 15-19 years old	0.39***	0.35***	0.37***	0.41***	0.28**	0.41***
	(0.11)	(0.13)	(0.12)	(0.13)	(0.12)	(0.14)
% 20-24 years old	-0.10	-0.13*	-0.07	-0.15**	-0.06	-0.17**
	(0.06)	(0.07)	(0.07)	(0.07)	(0.06)	(0.08)
% 65 of older	0.08***	0.07***	0.09***	0.10***	0.05**	0.08***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
% no diploma	0.02	0.02	0.01	-0.00	0.04**	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
% higher education	0.06***	0.04	0.06***	0.05**	0.05**	0.06**
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)
% blue collar workers	-0.00	-0.01	0.01	-0.00	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment rate	-0.03*	-0.04**	-0.04**	-0.05**	-0.02	-0.04**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Observations	118		118		118	

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The models are estimated using SUR estimates. Model (1) investigates the effect of the actual 1997 spending of the candidates on the log ratio of their vote shares with respect to the other party. Models (2) and (3) study the impact of the predicted spending. An observation is a district (1997 legislative elections). Variables are described in more detail in the text.

Table 17: IV Estimation: analysis performed at the party level

	Log ratios of vote shares with respect to other party					
	(1) Naive estimates		(2) IV estimates		(3) IV estimates	
	Socialist	Right-wing	Socialist	Right-wing	Socialist	Right-wing
Socialist Actual spending	1.04***	-0.11				
	(0.23)	(0.23)				
Socialist Actual spending-squared	-0.31*	0.17				
	(0.18)	(0.17)				
Right Actual spending	0.03	0.34***				
	(0.11)	(0.11)				
Right Actual spending-squared	0.00	-0.01				
	(0.04)	(0.04)				
Socialist Predicted spending			0.53***	-0.17	0.65***	-0.01
			(0.16)	(0.16)	(0.14)	(0.14)
Socialist Predicted spending-squared			-0.25**	-0.06	-0.26***	-0.08
			(0.10)	(0.10)	(0.09)	(0.09)
Right Predicted spending			0.02	0.15*	0.07	0.21***
			(0.08)	(0.08)	(0.07)	(0.07)
Right Predicted spending-squared			-0.00	-0.05	-0.01	-0.06**
			(0.03)	(0.03)	(0.03)	(0.03)
Other Actual spending	-0.81***	-1.09***			-0.68***	-0.97***
	(0.13)	(0.13)			(0.14)	(0.14)
Other Actual spending-squared	0.11**	0.18***			0.09**	0.17***
	(0.04)	(0.04)			(0.05)	(0.04)
Controls	Yes		Yes		Yes	
Observations	463		463		463	

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The models are estimated using SUR estimates. Model (1) investigates the effect of the actual 1997 spending of the candidates on the log ratio of their vote shares with respect to the other party. Models (2) and (3) study the impact of the predicted spending. An observation is a district (1997 legislative elections). Controls are the same than in Table 16 (coefficients for the controls are not reported for the sake of space). Variables are described in more detail in the text.

Table 18: Spending and first round turnout: Legislative elections

	Turnout	Turnout	Turnout
Total spending	0.24***		
	(0.08)		
Communist party spending		-0.46	-0.46
		(0.36)	(0.35)
Green party spending		2.16***	2.12***
		(0.50)	(0.49)
Socialist party spending		0.66***	0.71***
		(0.22)	(0.22)
Right-wing party spending		0.50**	0.51**
		(0.20)	(0.20)
Extreme-right spending		-0.14	-0.06
		(0.39)	(0.39)
Spending by other candidates		0.01	0.13
		(0.12)	(0.12)
Number of candidates			-0.10***
			(0.02)
Election FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
R-sq	0.88	0.88	0.88
Observations	2,758	2,758	2,758
Clusters (districts)	572	572	572
Mean DepVar	62.4	62.4	62.4
Sd DepVar	4.9	4.9	4.9

Notes: * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS. An observation is an electoral district / year. All the estimations include electoral district fixed effects and election fixed effects as well as district-level controls. The controls are the same as in Table 6 (coefficients for the controls are not reported for the sake of space). Standard errors are clustered at the district level. Variables are described in more detail in the text.

Table 19: Spending and first round turnout: Municipal elections

	Turnout	Turnout	Turnout
Total spending	0.85***		
	(0.06)		
Extreme-left spending		0.47	0.38
		(0.82)	(0.80)
Left spending		1.00***	0.97***
		(0.10)	(0.10)
Right spending		0.71***	0.68***
		(0.08)	(0.08)
Extreme-right spending		0.85***	0.80***
		(0.17)	(0.18)
Spending by other candidates		1.06***	1.02***
		(0.13)	(0.12)
Number of candidates			0.11**
			(0.05)
Election FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
R-sq	0.83	0.83	0.83
Observations	3,743	3,743	3,743
Clusters (districts)	1,078	1,078	1,078
Mean DepVar	57.9	57.9	57.9
Sd DepVar	6.6	6.6	6.6

Notes: * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS. An observation is an electoral district / year. All the estimations include electoral district fixed effects and election fixed effects as well as district-level controls. The controls are the same controls than in Table 8 (coefficients for the controls are not reported for the sake of space). Standard errors are clustered at the district level. Variables are described in more detail in the text.