DISCUSSION PAPER SERIES

DP12614
(v. 2)

THE HETEROGENEOUS PRICE OF A VOTE: EVIDENCE FROM FRANCE, 1993-2014

Julia Cagé and Yasmine Bekkouche

PUBLIC ECONOMICS

CE
PR

THE HETEROGENEOUS PRICE OF A VOTE: EVIDENCE FROM FRANCE, 1993-2014

Julia Cagé and Yasmine Bekkouche

THE HETEROGENEOUS PRICE OF A VOTE: EVIDENCE FROM FRANCE, 1993-2014

Abstract

What is the impact of campaign spending on votes? Does it vary across election types and across political parties? Estimating these effects requires comprehensive data on spending across candidates, parties and elections, as well as identification strategies that successfully deal with the endogeneity of campaign spending. We provide novel contributions in both of these areas. We build a new comprehensive dataset of all French municipal and legislative elections over the 1993-2014 period. We propose two new instruments to overcome the endogenous nature of campaign spending; they rely on the fact that candidates are differentially affected by regulation on campaign funding depending on the source of funding they depend on the most. 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 party. In particular, we show that spending by extreme-right candidates has much lower returns than spending by other parties. Our findings help reconcile the conflicting results of the existing literature, and improve our understanding of the mechanisms at play.

Julia Cagé - julia.cage@sciencespo.fr
Sciences Po Paris and CEPR

Yasmine Bekkouche - yasmine.bekkouche@psemail.eu
Paris School of Economics

The Heterogeneous Price of a Vote:
Evidence from France, 1993-2014[*]

Yasmine Bekkouche[†1] and Julia Cagé[‡2]

[1]Paris School of Economics
[2]Sciences Po Paris and CEPR

June 28, 2019

Abstract

What is the impact of campaign spending on votes? Does it vary across election types and across political parties? Estimating these effects requires comprehensive data on spending across candidates, parties and elections, as well as identification strategies that successfully deal with the endogeneity of campaign spending. We provide novel contributions in both of these areas. We build a new comprehensive dataset of all French municipal and legislative elections over the 1993-2014 period. We propose two new instruments to overcome the endogenous nature of campaign spending; they rely on the fact that candidates are differentially affected by regulation on campaign funding depending on the source of funding they depend on the most. 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 party. In particular, we show that spending by extreme-right candidates has much lower returns than spending by other parties. Our findings help reconcile the conflicting results of the existing literature, and improve our understanding of the mechanisms at play.

Keywords: Elections, Campaign financing, Campaign expenditures, Campaign spending limits, Campaign finance reform, Multiparty electoral data, Heterogeneous effects of campaign spending

JEL No: 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) 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 growing concern today that money may increasingly corrupt politics. Such a risk explains why, in most 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 (Scarrow, 2007; Cagé, 2018). In the United States, where most of these regulations have been removed during the last decades, recent elections have smashed previous records for outside expenditures (Kuhner, 2015).[1] 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; Cagé, 2018). The role of money in politics is widely debated there, as in many democracies.

How much does campaign spending influence elections? This empirical question has important implications for the debates over the relevance of campaign finance reforms. Although it has generated a substantial literature both in economics and in political science, previous studies have reached conflicting conclusions (Ansolabehere et al., 2003).[2] 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 Krasno, 1988; Gerber, 1998; Foucault and François, 2005). This research on campaign spending and votes has usually focused on the US, a country where there is no limit on campaign spending, which may lead researchers to find small effects of an additional dollar. In this paper, we estimate the effect of campaign spending in a country – France – that has adopted campaign spending caps.[3] This may help reconcile the conflicting results of the existing literature that mainly centers on the US, where there is no such limit.

Furthermore, to our knowledge, the issue of whether the effect of campaign spending varies depending on the political parties, and whether some parties suffer relatively more from the money spent by others, has not received much attention. Be that as it may, a

---

[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] See also Kalla and Broockman (2018) who have performed a systematic meta-analysis of a large number of field experiments and conclude that the effects of campaign contact and advertising on Americans' candidates choices in general elections is zero.

[3] The vast majority of Western democracies have introduced campaign spending limits for parties or candidates; the U.S. is one of the few exceptions among rich countries (see e.g. Avis et al., 2017).

deeper understanding of the mechanisms through which campaign spending could influence the elections may be gained by evaluating heterogeneity in the impact of spending.

Specifically, in this article, we shed new light on this debate by analyzing a new comprehensive dataset of all French municipal and legislative elections since the 1990s. France – like the vast majority of democracies around the globe[4] – has a multiparty electoral system, which raises a number of empirical challenges but allows us to study heterogeneity in campaign spending. Furthermore, France has enacted important reforms granting public funding for campaigns and parties and regulating political financing since 1988. We rely on these reforms to propose new instruments to overcome the endogenous nature of campaign spending. Our dataset covers four municipal and five legislative elections, with a total of around 45, 000 candidates. The data is mostly paper data that we digitize and merge from various historical sources. We analyze the effect of spending on votes separately for legislative and for municipal elections; the differences we obtain throw light on the mechanisms at play.

In the first part of the paper, we estimate the average effect of candidates' expenditures on vote shares using three different specifications. We first rely on the literature on discrete choice models and use an extended version of the Conditional Logit model. Our estimations, which include fixed effects for electoral districts and elections, as well as in some specifications fixed effects for candidates (to capture unobserved candidate heterogeneity), also control for observed candidates' characteristics, and for time-varying electoral district-level demographic and socio-economic covariates. We obtain a positive and statistically significant correlation between campaign spending and vote share, whether we consider the legislative or the municipal elections. According to our most conservative estimates, a one-percentage-point increase in the spending share is associated with a 1.8% increase in the ratio of the number of votes over abstention for the legislative elections, and with a 0.8% increase in this ratio for the municipal elections.

We then show that our results are robust to instrumenting campaign expenditures.[5] We use two different IV strategies for legislative and municipal elections separately. Our first

---

[4] 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."*

[5] A number of papers in the literature have tried to tackle the endogeneity question, using different strategies. 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. 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 (2018) exploit exogenous variation in the number of impressions across county borders driven by Federal Communications Commission (FCC) regulations. As an alternative empirical strategy, one could use field experiments to study campaign-spending effects (see Gerber, 2004, for a review of this literature). Finally, related to this literature on the impact of spending on candidates' vote share, there is a large body of 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 concentrations of costs and benefits of an initiative as a new instrument for spending.

instrument exploits a change in campaign finance legislation. In 1995 France enacted a law prohibiting candidates from receiving donations from legal entities. This law was enforced 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. We focus on the candidates who ran in both the 1993 and 1997 elections, and instrument the change in spending between 1993 and 1997 by the amount of donations received in 1993 from private entities. Our second instrument relies on the regulation of political party public funding. Political parties in France receive direct public funding granted in proportion to their electoral results in the most recent legislative elections. Legislative election scores result in important changes in the amount of public funding received by parties. Our identification assumption relies on the fact that at the time of a municipal election, the capacity of a political party to contribute to its candidates' campaign expenditures depends on its electoral results at national elections many years earlier. Hence, we focus on the candidates who run in two consecutive municipal elections and instrument the change in campaign expenditures by the change in the amount of public funding received by their party, interacted with their reliance on party contributions during the previous election. Our results are robust to implementing these IV strategies, and thus do not seem to be driven by the endogenous nature of campaign spending.

Finally, while the Conditional Logit model relies on the Independence of Irrelevant Alternatives (IIA) assumption, we relax this assumption and exploit the multiparty dimension of the French elections. 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, district fixed effects, and the previously described district-level covariates – via a seemingly unrelated system of equations (SUR). We obtain a positive impact of spending on votes, both for municipal and legislative elections. This effect is statistically and economically significant.

The second part of the paper studies the heterogeneity of the effect of spending depending on political parties. According to our estimates, the price of a vote is around €6 for legislative elections for the right-wing party and for the Green party, and it is stable through time. This price is slightly higher for the Socialist party (it varies between €11 and €16 depending on the electoral years) and for the Communist party, with no variation over time. Last, we find that the price of a vote is much higher for the extreme-right party than for the other parties. In other words, campaign spending seems to be less efficient for this party. In most of our specifications, the impact of campaign spending by extreme-right candidates is not even statistically significant. We discuss a number of potential explanations: a stigma effect

3

(if there is a stigma attached to far-right candidates, it may be more difficult for them to persuade undecided voters); a valence disadvantage (if disadvantaged candidates choose more extremist positions); and a salience effect (issues far-right candidates capitalize on – such as opposition to mass migration – are very salient, so there may be less room for campaigns to reduce voter uncertainty about their policy positions; besides, to the extent that extreme-right voters may be more ideological and vote for the extreme-right candidates regardless of their characteristics, they may be less responsive to campaigns).

Furthermore, we document the cross-effects of campaign spending. E.g. we show that in the legislative elections, the Socialist party candidates suffer from additional spending by the Communist party. This most probably reflects the ideological proximity between these two parties. On the contrary, spending by the left-wing parties does not seem to draw voters away from the right-wing party.

Regarding municipal elections, we find the price of a vote to be higher than for legislative elections: according to our estimates, the price of a vote for municipal elections is around €25-26 for the left-wing party candidates, and €28-29 for the right-wing party candidates, and is stable through time. This higher price could be due to the fact that voters have better sources of information about the candidates running for more local elections. Note also that while left-wing (respectively right-wing) spending increases the left-wing (respectively right-wing) share of the vote relative to smaller parties (gathered together as the reference party), it does not directly affect the share of the vote of the right-wing (respectively left-wing) party. In other words, voters do not seem to cross partisan lines.

More generally, why does campaign spending yield an electoral benefit? The main spending category for both legislative and municipal French elections is "printing advertising"[6]: candidates spend money to ensure that voters will know them and their election platform. Using electoral district heterogeneity in education and revenue, we show that our results seem to be driven by information rather than persuasion. Second, the cross-effects of campaign spending seem to indicate that campaigns matter through the increase in the salience of a number of issues. Finally, we provide some suggestive evidence of the existence of a mobilization effect, while spending does not seem to draw voters away from the other side. We show that campaign spending is positively associated with turnout at elections, and that the effect is both statistically and economically significant.

Our contribution to the existing literature is fourfold. First, there is a lack of empirical information on the flow of money and its impact on politics outside the case of the United States.[7] Yet it is critical in this area to develop a broad comparative perspective in order to

---

[6]Contrary to what we observe in the U.S., there are restrictions in France regarding broadcast advertising. In particular, paid advertising on radio and television is prohibited.

[7]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

better understand and analyze the forces at play. A number of recent papers in the literature have studied the case of Brazil. E.g. Da Silveira and De Mello (2011), in the context of gubernatorial elections in that country, investigate the impact of television advertising on election outcomes; however, they only focus on the winner and runner-up, and do not take into account the multiparty nature of the Brazilian electoral system.[8]

In this paper, we document the long-term evolution of campaign resources and spending in France, highlighting heterogeneous effects depending on the political parties, 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. In contrast, we construct a new comprehensive dataset of spending and votes: we consider four municipal and five legislative elections, provide extensive descriptive statistics on spending behaviors, and propose two new instrumental variables in a multiparty electoral setting. Considering both local and national elections is of particular importance given that we obtain 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 for example in Belgium, Canada, Chile, Israel, New Zealand, South Korea, the United Kingdom, among many others (Gunlicks, 1993; Nassmacher, 2009; Speck, 2013; Avis et al., 2017). While the existing literature obtains conflicting results regarding the impact of campaign expenditures on votes, this may be due to the fact that that this literature has mostly centered on the U.S., where campaign spending is not capped. Hence, given that candidates' expenditures keep growing in U.S. elections, the decreasing returns of spending may dominate. On the contrary, in countries like France where spending is limited, we show that the marginal returns of spending are actually positive.

Second, as we highlighted above, France has a multiparty electoral system, like the vast majority of the democracies around the globe. Therefore, 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 are impacted relatively more by the competition from (and money spent by) others. In particular, we show that spending by extreme-right is much less efficient than spending by other political parties. We think this new finding is of particular importance 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.

[8]See also Avis et al. (2017) who investigate the effects of campaign spending limits on political competition in Brazil.

today's context of rising populism in a number of Western countries. 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. In Section 4, we use three different empirical strategies – Conditional logit, IV estimates, and Multivariate logistic transformation – to estimate the average effects of candidates' expenditures on vote shares. In Section 5, we investigate the heterogeneity of the effects of spending depending on the political parties, and study the cross-effects of campaign expenditures. In Section 6, we discuss the different mechanisms at play and the external validity of our findings. Finally, Section 7 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 1980s. 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 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.[9] In this Section, we briefly describe the different aspects and changes that are of use in our empirical analysis. In the online Appendix Section A, we review the different reforms that have been enacted in France since 1988.

The laws of 1988 regulated political financing.[10] They 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. Candidates were allowed to receive donations, whose maximum amount was limited, however. The 1990 law[11] established the division of the public party funding into two equal parts: the first part depends upon the results of the last legislative elections, the second part is allocated in proportion to the number of deputies in parliament.

The 1990 law also created the *"Comission Nationale des Comptes de Campagne et des Financements Politiques"* (CNCCFP), which has been checking and approving the accounts of candidates' campaigns accounts since then. 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 municipal election candidates running in cities larger

---

[9]This section partly draws on Gunlicks (1993) for the 1988-1993 period and on Cagé (2018) for recent years.

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

[11]Law no. 90-55 of 15 January 1990.

than 9,000 inhabitants.

Finally, the law of 1995[12] marked an important change in party and election financing in France with the prohibition of donations from legal entities (and in particular from corporations). This means that since 1995 only "natural" persons (i.e. physical individuals) can make political donations. This change reduced the revenues of those candidates who were relying heavily on donations from legal entities (and we will exploit this in the empirical analysis).

2.2 Today's rules

Since 2003, candidates can finance their campaign from: donations (only from natural persons), personal contributions, party contributions, and contributions in kind. A natural person may contribute up to €4, 600 to each campaign, and donate an annual 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.

With regard 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.[13] 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 that the expenditures related to the printing of ballots, campaign letters to voters and campaign posters are directly paid by the state and are not included in this limit). They are summarized in the online Appendix Figure E.1. For municipal elections, the spending limit depends on the size of the city for cities larger than 9, 000 inhabitants. (For cities with fewer than 9, 000 inhabitants, there is no spending limit and no requirement to provide an account of campaign spending and revenues.[14]) 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 could 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

---

[12]Law no. 95-65 of 19 January 1995.

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

[14]We thus do not have spending data for these smaller cities and they are not included in our analysis.

euro (they have simply been discounted every three years to follow inflation).[15]

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 fewer than $80,000$ inhabitants. Since 1995, the spending limit is 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 at €$38,000$ 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 imposed on candidates for legislative elections.

Note that for both the municipal and the legislative elections, candidates spend less than the spending limit (see Section 3.2 below).

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 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 an absolute majority in the first round, as well as a minimum of 25% of all registered voters, then she is elected. If no candidate obtains an absolute majority in the first round, there is a second round where the two most-voted candidates and

---

[15]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.

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 wins.

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 C.2 and C.3, we describe in detail 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 turn 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).[16] 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 campaign expenditures information exists (i.e. all the municipalities above 9,000 inhabitants). Similarly, we have information for the five legislative elections since 1993.

Our data contains information for 12, 012 different candidates for municipal elections, and 26, 928 for legislative elections. Online Appendix Table D.1 presents descriptive statistics on the number of 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 increases over time (from 9.3 on average in 1993 to 11.5 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

---

[16]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 multiple times.

first ballot (funding is granted to parties fielding candidates who receive more than 1% of the votes in at least 50 constituencies).

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 C.1 provides an example of this data.

Total spending Table 1 presents summary statistics on total spending. The upper table presents the numbers for municipal elections, the bottom table for legislative elections. (Online Appendix Figures E.2 and E.3 plot the distribution of the spending per registered voters, respectively for municipal and legislative elections.) All figures are in constant 2014 euros.

Regarding municipal elections, the average spending per candidate is equal to €22, 801. 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, 742, which amounts 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.

[Table 1 about here.]

The drop in the number of observations in 2012 is due to a change in the reporting requirement rules for legislative elections: since the 2012 election, candidates who obtain 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.[17]

Spending categories Political campaigning can take a number of different forms. E.g. the Federal Election Commission (FEC) in the United States classifies the candidates' disbursements into eight broad purpose categories: administrative, advertising, contributions, fundraising, materials, refunds, travel and other. The main difference between France and the United States is that there are restrictions in France regarding broadcast advertising (which is forbidden). Online Appendix Figure E.5 plots the share represented by the different

---

[17]In the online Appendix Figure E.4, 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).

spending categories for the 2008 and 2014 municipal elections and for the 2007 and 2012 legislative elections in France.[18] Perhaps surprisingly, expenditures on meetings only represent a relatively small share of the total disbursements.[19] For municipal and legislative elections, the main category of candidates' disbursements is print advertising (e.g. expenditures on printed leaflets and posters).

Spending with respect to the limit   On average, candidates spend less than the spending limit, for both municipal and legislative elections (online Appendix Table D.2). This is most probably due to the campaign reimbursement rules (only up to 47.5% of the spending limit), and to unequal access to large private contributions (Cagé, 2018).[20] This may also be due to unequal access to loans: not only on average do candidates spend less than the spending limit, but they also spend less than the reimbursement limit. To be reimbursed for their personal contributions, candidates have to actually incur the expenses to begin with. If they have limited personal resources, this requires them to obtain a loan at the beginning of the campaign. But banks often refuse to give candidates a loan; given that public reimbursement is conditional on obtaining more than 5% of the votes, they consider that loaning candidates money is too risky.

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 spending differences on the probability of being elected. Figure 1 shows the raw relationship between the proportions of total spending and total (first round) votes received by candidate by district. In the upper Figure 1a, we plot this relationship for the legislative elections, and in the bottom Figure 1b 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.

[Figure 1 about here.]

One can also notice from Figure 1 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.

---

[18]Unfortunately, this information is not available at the candidate level; we draw here on the summary statistics published since 2007 by the CNCCFP. Not being available at the candidate level, this information cannot be used systematically in our empirical analysis to estimate the efficiency of the different forms of spending; but at least it provides us with some aggregate information on why money may matter.

[19]Note however that this is specific to the local elections. For presidential elections in France, meetings are the main expenditure categories. In comparison, in the United States – where broadcast advertising is allowed – the main disbursement category is the media.

[20]For a formal model of small campaign contributions, see in particular Bouton et al. (2018).

Sources of funding So far, our focus has been on candidates' spending. Let us now look at their revenues. 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 a political party.

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) contributions in kind; (iv) personal contributions; and (v) other sources. Online Appendix Table D.3 provides summary statistics on the relative importance of these different sources of funding.[21] Municipal election candidates' revenues come mainly from private donations (15.9%)[22] and personal contributions (73.9%). Parties contribute much more for legislative than for municipal elections. While party contributions represent on average around 28.3% of the revenues of legislative election candidates, personal contributions nonetheless represent the highest share of total revenues in every instance (73.9% for municipal and 50.9% for legislative elections).

How does funding vary depending on the political party fielding the candidate? Tables 2 and 3 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 the focus of our empirical analysis, namely the Communist party, the Green party, the Socialist party, the right-wing party, and the extreme-right party.[23] 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 (17.7%) than for the Communist (12.3%), Green (5.6%) and extreme-right (1.2%) parties. On average, compared to Socialist party candidates, right-wing party candidates receive an extra €8,257 in private donations in legislative elections.

With respect to municipal elections, consistently with the strategy we follow in our empirical analysis, we categorize the candidates into three main categories: the left, the right,

---

[21] In the online Appendix Figure E.6, we plot the evolution of the relative importance of the different sources of funding.

[22] 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 candidates' 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.

[23] In the online Appendix Section B, we provide detailed information on French elections, and in particular describe the different political parties at play for each election during our period of interest.

and the extreme-right. Similar to what we observe for the legislative elections, right-wing candidates rely much more on private donations (which represent 21.6% of their total revenues) than candidates from other parties. Moreover, the extra €3,388 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 into right-wing candidates obtaining €4,346 more in total revenues, and spending €3,200 more. (Again, the differences are statistically significant at the 1% level.)

[Table 2 about here.]

[Table 3 about here.]

3.3 Data on candidates' characteristics

For all the candidates included in our dataset, we determine their political party (or their political coalition). This information comes from the newspaper *Le Monde*.[24] In the online Appendix Section B, we detail for each election the list of the parties running and the coalitions at play. We also collect information on the candidates' sex, as well as on their political mandates. In particular, we determine whether the candidates were at the time of the election or previously, senator, member of parliament, mayor, departmental councilor, regional councilor, or member of the European Parliament. We also compute an indicator variable equal to one if the candidate is a Minister and to zero otherwise.

The information on political mandates comes from a number of different data sources.[25] For the legislative and municipal elected offices, we use the same source as for the vote shares. For the senatorial and departmental elections, we recover a list of all the elected representatives since 1990 with the exact dates of their offices from the Senate's official website. For the members of the European Parliament, we obtain a list of all the elected members by year of election from the Ministry of the Interior.

Finally, we compute the information on whether candidates have served as Ministers from Wikipedia. More precisely, we download the universe of French politicians from Wikipedia, assuming that all the politicians that have served as minister have a Wikipedia article. We then merge this information with our list of candidates. Online Appendix Table D.4 presents descriptive statistics for the candidate-level controls.

---

[24]In the electoral data made public by the Interior Ministry, information on candidates' political parties is often missing, imprecise or incomplete. In contrast, journalists at *Le Monde* have, 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]Surprisingly enough, there is no dataset centralizing the list of all the people that were elected at some point to an elected office in France. The Ministry of the Interior has recently published an official directory (*"Répertoire national des élus"*). This directory includes information, for a number of elected representatives, on their sex, age, and profession. However, this directory only covers recent years and legislative and municipal elections. Hence it only includes information on candidates' characteristics for 5,454 candidates out of the 10,290 candidates running for municipal elections.

3.4 District-level controls

Finally, we collect time-varying district-level demographic covariates. Demographic and unemployment data from the French census are available in electronic format (on the website of the French National Institute of Statistics – INSEE). 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 then interpolate both the numerator and denominator between census years.

Furthermore, we build a completely new dataset on the annual investment spending in infrastructure of the French municipalities, from the paper-format archives of the Ministry of Finances covering the 1993-1997 time period. For the more recent period (1998-2014), we obtain similar data directly in electronic format from Godefroy and Henry (2016). We think it is particularly important to control for these investments because they may be a determinant of the donations to candidates, in particular from legal entities before their prohibition.

Lastly, we also control for the annual number of firms, of employees, the total payroll, as well as the share of the employees who are part of the top 1% of the income distribution[26]. These are from the "Déclaration Annuelle de Données Sociales" (DADS), a detailed French database on wages. Online Appendix Table D.5 presents summary statistics for these controls.

4 The effects of candidates' expenditures on vote shares

To investigate the impact of campaign spending on votes, 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 campaign spending. In this paper, we thus use three different empirical strategies to explore this question, and study municipal and legislative elections separately. The first strategy is the more general and exploits the use of fixed effects and control variables (Section 4.1). The second strategy alleviates the endogeneity concern by instrumenting the expenditures (Section 4.2), while the third strategy exploits the multiparty system structure of the French elections and thereby relax the IIA assumption (Section 4.3).

4.1 Baseline estimations

4.1.1 Empirical strategy

To estimate the average effect of candidates' expenditures on vote shares, we first rely on the literature on discrete choice models.[27] Given that we have aggregated data, we use

---

[26]The threshold is defined at the national level.

[27]In our context, it would be incorrect to simply estimate the impact of expenses on candidates' vote shares given that, within a district, candidates' vote shares are interdependent. Discrete choice models used mostly in applied IO face the same kind of empirical challenges when it comes to estimate the impact of product characteristics (mostly price) on interdependent market shares (see e.g. Berry et al., 1995; Nevo, 2000).

an extended version of the Conditional Logit model that can accommodate characteristics of the choices available to the voter, in particular candidates' campaign spending (see e.g. Alvarez and Nagler, 1998). For a choice among $c = 1, ..., C$ candidates C_c with observed characteristics X_c (among which the share of the district total spending represented by the candidate[28]) and unobserved characteristics e_c, the utility of an individual i choosing the candidate c is $U_{ic} = \beta X_c + e_c + \epsilon_{ic}$, where the ϵ_{ic} are draw from a type-I extreme value distribution uncorrelated across choices and individuals. We can then define the probability that an individual i chooses candidate c by:

$$P_{ic} = \frac{exp(\beta X_c + e_c)}{\sum_k exp(\beta X_k + e_k)}$$

Given that only aggregate voting data is available (we do not have information on the voting choice of each individual voters), the idea, in the spirit of Berry et al. (1995), is to approximate this probability with the proportions associated with each choice, i.e. in our context the number of votes obtained by each candidate c, s_c. We define the choice 0 as the "outside option" of the individuals which is to abstain. We can then show that:

$$ln(P_{ic}) - ln(P_{i0}) = \beta(X_c - X_0) + e_c$$

from which:

$$ln(s_c) - ln(s_0) = \beta(X_c - X_0) + e_c \tag{1}$$

Hence, for each district, we have $C - 1$ observations and we estimate equation (1) with $X_0 = 0$.[29] Formally, we estimate the following model:

$$ln\left(\frac{s_{cmt}}{s_{0mt}}\right) = \alpha + \beta\text{spending share}_{cmt} + \mathbf{X_{mt}}\gamma + \mathbf{Y_{ct}}\delta + \mathbf{Z_c}\kappa + \zeta_m + \omega_{jt} + \epsilon_{cjmt} \tag{2}$$

where c indexes the candidates, j the political parties, t the electoral years and m the electoral districts. $ln\left(\frac{s_{cmt}}{s_{0mt}}\right)$ is the logarithm of the ratio of the number of votes obtained by candidate c in district m in election t over the abstention in district m in election t.

Regarding the independent variables, spending share$_{cmt}$ is the share of the district m total spending represented by candidate c in electoral year t. The vector $\mathbf{X_{mt}}$ contains the time-varying district-level covariates described above, i.e. the share of the population by age group,

---

[28]As an alternative, we consider the total spending of each candidate (rather than its share). In a robustness check below, we show that doing so does not affect our results.

[29]Given that the outside option is abstention. The main issue with this specification is that it relies on the assumption that the ratio of the probabilities of choosing alternative c to alternative k for voter i is independent of the probability of choosing the other alternatives (Independence of Irrelevant Alternatives). We relax this assumption in Section 4.3.

occupation and degree, the investment spending in infrastructure, the number of firms, the number of employees, the total payroll, and the share of the employees who are part of the top 1% of the income distribution. We also control for the total spending at the district level, for the number of candidates running, as well as for the number of registered voters.

The vector $\mathbf{Y_{ct}}$ contains the time-varying candidates' characteristics (their political mandates – e.g. an indicator variable equal to one if the candidate is departmental councilor, and to zero otherwise – and an indicator variable equal to one if the candidate is the incumbent and to zero otherwise), and the vector $\mathbf{Z_c}$ the candidates' characteristics that are constant over time (such as their sex). ζ_m denote fixed effects for electoral districts, and ω_{jt} are political party-election fixed effects. Standard errors are clustered at the district level.

Finally, note that our data allows us to follow candidates over time. Hence, in some specifications, taking advantage of this feature, we estimate models that control for individual candidate fixed effects. In this case, the specification becomes:

$$ln\left(\frac{s_{cmt}}{s_{0mt}}\right) = \alpha + \beta \text{spending share}_{cmt} + \mathbf{X_{mt}}\gamma + \mathbf{Y_{ct}}\delta + \xi_c + \omega_{jt} + \epsilon_{cjmt} \qquad (3)$$

The identifying assumption here is that the candidates' quality is constant over time conditionally to the electoral "popularity" of their political party in a given year. The main caveat of this specification is that in this case we have to limit our sample of analysis to those candidates who run multiple times.

4.1.2   Results

Table 4 presents the results.[30]

Legislative elections   For legislative elections (upper Table 4a), absent any control (Column (1)), a one-percentage-point increase in the share of the total spending represented by a candidate leads to a 6.7% increase in the ratio of the number of votes obtained by the candidate over abstention. The magnitude of the effect is nearly unchanged when we introduce district-level controls (Column (2)), and only slightly decreases once the candidate-level controls are introduced (Column (3)).

In Columns (4) and (5), we focus on the candidates who run multiple times. Introducing candidate fixed effects more than halves the estimated coefficients. According to our preferred estimation with election fixed effects, candidate fixed effects and election-party fixed effects (Column (5)), a one-percentage-point increase in the spending share of the candidate is associated with a 1.8% increase in the ratio of the number of votes she obtained over abstention.

---

[30]We do not report the coefficients for the controls in the table for the sake of space and readability. They are reported in the online Appendix Table D.6 for the legislative elections, and in the online Appendix Table D.7 for the municipal elections. We consistently find in all the specifications that the fact of being the incumbent is positively associated with the vote share obtained by the candidates.

In comparison, we obtain a 5% increase when controlling for district fixed effects, but not for candidate fixed effects (Column (4)). This suggests that candidates' unobserved heterogeneity matters. Note that while the magnitude of the coefficient estimated with candidate fixed effects is smaller, the effect is nonetheless economically significant. On average, the total spending in an electoral district for legislative elections amounts to €161,702. Hence, a one-percentage-point increase in the spending share of a candidate corresponds on average to an additional €1,617 in campaign spending. If we consider Column (5), such an increase leads to a 1.8% increase in the vote share, which corresponds on average to 53 additional votes.[31] In other words, the price of a vote may be estimated at around €23.6.

Municipal elections   The magnitude of the effect is lower for municipal elections (bottom Table 4b). Depending on the specification, we find that a one-percentage-point increase in the spending share increases the vote share by between 0.8 (when candidate fixed effects are included – Column (5)) and 3% (absent any control – Column (1)). These effects are statistically significant at the one-percent level. How can we interpret these results with regard to the monetary value of a vote? On average, the total spending in an electoral district for municipal elections amounts to €89,843. Hence, a one-percentage-point increase in the spending share of a candidate corresponds on average to an additional €898 in campaign spending. If we consider our most conservative estimates, such an increase leads to a 0.8% increase in the vote share, which corresponds on average to 18 additional votes[32]. In other words, the price of a vote for municipal elections is equal to around €43.

Note that this price is higher than for legislative elections. Our favorite explanation for this difference is that the cost of information acquisition may be lower for municipal than for legislative elections. Municipal election electoral districts are indeed much smaller on average (around 19,000 registered voters) than electoral districts for legislative elections (around 73,000 registered voters). Citizens may have more information on their candidates – and acquire this information more easily – in smaller electoral districts. We come back to this point in Section 6.

[Table 4 about here.]

Robustness   In the online Appendix Table D.8, we show that these findings are robust to using the amount spent by each candidate as our main explanatory variable of interest rather than the share of the total district spending represented by the candidate. When we do so, we also control for the candidate's spending-squared because the marginal returns from spending may be decreasing (see e.g. Green and Krasno, 1988; Gerber, 1998; de Figueiredo et al., 2011).

---

[31]The average number of votes received by a legislative-election candidate is 3,778.

[32]Assuming no change in abstention; on average, municipal election candidates receive 2,607 votes.

We find that, for both the legislative and the municipal elections, there is a positive effect of the total amount spent by a candidate (normalized by the number of registered voters in her electoral district) on the share of the votes she obtains. While negative, the candidate's spending-squared coefficient is no longer statistically significant once we control for candidates fixed effects. This might not be surprising given that campaign expenditures are capped at a relatively low level – in international comparison – in France. Hence, given that candidates never spend more than five euros per registered voter, marginal returns of spending may turn out to be constant.

Overall, we find a positive correlation between spending and votes, for both legislative and municipal elections. However, these findings may be driven by the endogeneity of spending. In particular, the fact that the magnitude of the estimates strongly decreases when we introduce candidate fixed effects highlights the importance of candidates' unobserved characteristics (and in particular of candidates' unobserved quality, which leads us to overestimate the impact of spending when using a naive approach). While candidate fixed effects allow us to capture candidates' characteristics that are constant over time, there may still be a bias due to fluctuating candidates' characteristics or to the specifics of a given election. Hence, in the next section, we propose two new instruments to overcome the endogenous nature of campaign spending.

4.2 IV estimation

Determining the causal impact of spending on votes is complicated by the endogenous nature of campaign spending. This 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 to an overestimation of the effect of spending on votes. On the other hand, one may underestimate the effect of spending if candidates who are struggling spend large amounts to win, whereas candidates with a high probability of winning can spend less and still win. In this section, we use two different IV strategies for the legislative and municipal elections separately, both relying on the fact that candidates are differentially affected by regulations on campaign funding depending on the source of funding they rely on the most.

4.2.1 Legislative elections: using a change in legislation

We propose a new instrumental variable to deal with spending endogeneity for legislative elections. Our strategy uses a change in legislation. 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. Note that the 1997 elections were unexpected: although the next legislative elections were not due until May 1998, President Jacques Chirac decided to dissolve the National Assembly in April 1997.[33]

Interestingly for us, the 1995 ban did not affect all the candidates in the same way: some candidates were relying strongly on private donations from legal entities, while others were not, as illustrated in Table 5. While the average amount of private donations received from legal persons in 1993 was €8,560, the median was €0. On average, these donations represented 22.4% of the total private contributions (both from individuals and legal entities), and 12.4% of the candidates' total revenues.

[Table 5 about here.]

More precisely, among the 5,116 candidates who ran for the 1993 legislative elections, 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 D.9 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 took the lion's share.

The idea of our instrumental variable strategy is to instrument the change in spending between the 1993 and the 1997 legislative elections by the donations from legal entities received in 1993. Our exclusion restriction is that the donations from legal entities received in 1993 have no direct effect on the change in the votes obtained by the candidate between 1993 and 1997. These donations only affect the change in the votes through their effect on the change in spending, given the control variables in the second stage. To make the exclusion restriction more plausible, we show below that our IV estimations are robust to performing the analysis within party, i.e. using first only the right-wing candidates and then only the Socialist party candidates.

Analysis at the candidate level 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 1,527 candidates who ran in both elections.[34] Among them, 768 candidates (53%) received no donations from legal entities in 1993, while the others received at least

---

[33]Note that no other changes in campaign finance regulation took place between 1993 and 1997 for legislative elections.

[34]I.e. 25% of the candidates present in 1997. To reduce the information loss, we perform below a similar analysis but at the party level. We show that our main findings are robust to doing so.

some. In the online Appendix Table D.10, we present summary statistics similar to those in Table 5 but only for the candidates who ran in both 1993 and 1997 and that we can use in our IV estimation. Those candidates received relatively more donations from legal persons (€15,753), and these donations represent around one third of the total private donations they received.

Figure 2 illustrates that the candidates who relied strongly on donations from legal persons – and which we observe in both 1993 and 1997 – were not able to recover from the ban. On average, an additional euro received from legal persons in 1993 is associated with a 0.6 decrease in total revenues between 1993 and 1997. This may be partly due to the fact that, as highlighted above, the 1997 elections were unexpected; hence candidates may not have had time to raise money from other sources.

[Figure 2 about here.]

Specifically, we estimate the following two equations:

$$\Delta\text{spending share}_{c9793} = \alpha + \beta\text{donations legal entities}_{c1993} + \mathbf{Y_{c97}}\gamma + \zeta_m + \eta_j + \epsilon_{cmt} \quad (4)$$

$$ln\left(\frac{s_{c97}}{s_{0m97}}\right) - ln\left(\frac{s_{c93}}{s_{0m93}}\right) = \Gamma + \Theta\,\widehat{\Delta\text{spending share}}_{c9793}$$
$$+ \mathbf{Y_{c97}}\gamma + \zeta_m + \eta_j + \epsilon_{cmt} \quad (5)$$

where c indexes the candidates, j their political party, t the electoral year and m as before the district. $\Delta\text{spending share}_{c9793}(= \text{spending share}_{c1997} - \text{spending share}_{c1993})$ is the difference between the share of spending represented by candidate c in 1993 and in 1997 (for those candidates who ran in both the 1993 and 1997 elections).[35] $\mathbf{Y_{c1997}}$ is a vector including the candidates' characteristics in 1997, and η_j and ζ_m denote respectively fixed effects for political parties and electoral district. To control for pretrends, in some specifications we also include the vote share obtained by the candidate's party in the electoral district in 1988 as an explanatory variable. An observation is a candidate. In the first stage (equation (4)), donations legal entities$_{c1993}$ is the amount of donations from legal entities per registered voter received by candidate c in 1993.

The IV estimates are reported in Table 6. The first stage estimates are reported in Columns (1) to (3), and the second stage estimates are reported in Columns (4) to (6). In the

---

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

first stage, the donations received from legal entities in 1993 by candidate c in district m are strongly correlated with the change in the share of the total district spending represented by the candidate between 1993 and 1997. As expected, candidates who receive more donations from legal entities in 1993 spend relatively less in 1997. We find that a €1 increase in the amount of donations from legal entities per register voter received by a candidate in 1993 leads to a 6.7 to 12.1 percentage-point decrease in the share of the total district spending represented by the candidate. We also report tests of the instrument. In all specifications, the Kleibergen-Paap LMtest rejects the null hypothesis that the equation is under-identified. The weak instrument statistics also exceed the Stock and Yogo (2005) tabulation, suggesting that weak instrument is not a concern.

The second stage results show that there is a statistically significant positive effect of spending on votes. An increase of one-percentage-point in the change in the total spending share represented by a candidate between 1993 and 1997 leads to a 0.6 to 0.8% increase in the change in the vote share obtained by this candidate. The results are robust to controlling for the candidate-level characteristics as well as for the candidate's party vote share obtained in 1988 in the electoral district.[36]

What is the magnitude of the IV estimates compared to that of the OLS estimates? In the online Appendix Table D.11, we present the results of the estimation of equation (5) but with the actual rather than the instrumented change in the spending share as our main explanatory variable of interest. When we do so, we obtain that an increase of one-percentage-point in the change of the total spending share represented by a candidate between 1993 and 1997 leads to a 0.9 to 1.3% increase in the change of the vote share obtained by this candidate. Hence the IV effects are only slightly smaller than the OLS estimates. Note that both the IV and the symmetric OLS estimates here rely on candidates who ran in both 1993 and 1997 and use first difference; first differencing allows us to eliminate the constant unobserved characteristics. Hence, the IV only reduces the bias due to time-varying characteristics. The fact that introducing candidate fixed effects strongly reduces the magnitude of the estimated coefficient (see Table 4a above) but that the IV estimates are only slightly smaller than the OLS estimates indicates that variation in a given candidate's unobserved characteristics over time is small relative to unobserved differences across candidates.

[Table 6 about here.]

Within party analysis As we highlighted above, our exclusion restriction is that the donations from legal entities received in 1993 have no direct effect on the change in the votes

---

[36]In the online Appendix Table D.13, we show that our results are robust to considering the amount spent by each candidate rather than the share of the total district spending she represents as our main outcome of interest.

obtained by the candidate between 1993 and 1997. To make this exclusion restriction more plausible, we perform the same analysis but restricting our sample of analysis to the right-wing candidates (who benefited most from donations from legal entities before their prohibition). Online Appendix Table D.12a presents the results. We find that our IV estimations are robust to performing the analysis using only the right-wing candidates.

While the right-wing candidates were the ones who benefited the most from the donations from legal entities, candidates from the Socialist party also received a relatively high amount of donations from firms in 1993 (Online Appendix Table D.9). Hence, we perform a similar analysis but focusing only on Socialist party candidates. It is striking to see that, despite the low number of observations, we still obtain a positive and statistically significant effect of the change in spending on the change in vote share (online Appendix Table D.12b).

Analysis at the party level   The main issue with the previous empirical strategy is that, because we need candidates to have run in both the 1993 and 1997 elections, we are left with only 1,527 candidates. In other words, we lose nearly four-fifths of our sample. Moreover, the candidates who ran in both 1993 and 1997 are not representative of all the candidates who ran in 1997: they have an higher probability to have other mandates (such as mayor and departmental councilor), to be male, and to spend more (online Appendix Table D.14).

Hence, as an alternative empirical strategy, we estimate equations (4) and (5) but at the party rather than at the candidate level, i.e. we attribute all the donations received by a candidate and the amount spent by the candidate to her political party. For this strategy to be implemented, the only thing we need is the political parties to be present in the electoral district both in 1993 and 1997. Table 7 presents the results. They are consistent with those we obtain in Table 6.

[Table 7 about here.]

Overall, at least for legislative elections, our results do not seem to be driven by the endogenous nature of campaign spending.

4.2.2   Municipal elections: using regulation of the public funding of political parties

For municipal elections, we propose an alternative instrument based on the specifics of the French regulation of the public funding of political parties. Political parties have received direct public funding in France since 1990. Public funding is granted in proportion (i) to the number of votes obtained in the first round of the most recent legislative elections (e.g. the amount of public funding received by a given party between 1993 and 1997 was a function of the score obtained by the party's candidates in the 1993 legislative elections); and (ii) to the

number of deputies belonging to the party in the national assembly and in the Senate (see e.g. François and Phélippeau, 2015; Cagé, 2018). As illustrated in Figure 3, legislative election scores result in important changes in the amount of public funding received by the parties. E.g. the total amount of public funding received by the right-wing party more than doubled between 2002 and 2003 (from 20 million euros a year to nearly 40 million euros), due to the electoral success of the party in the 2002 legislative elections. On the contrary, the amount of public funding received by the Socialist party decreased by nearly 10 million euros during the same time period.[37]

[Figure 3 about here.]

Empirical specification   Our identification assumption relies on the fact that at the time of a municipal election, the capacity of a political party to contribute to its candidates' campaign expenditures (party contributions) depends on its electoral results at national elections many years earlier. E.g. the capacity of the Socialist party to contribute to its candidates' campaign expenditures in 2008 was a function of the electoral score of the party 6 years earlier, in 2002, and was not a function of the party popularity at the time of the election. Furthermore, candidates differ in their reliance on public funding. As reported in Table D.3a, while party contributions represent on average 7.3% of candidates' revenues for municipal elections, the median is zero and the maximum value 100% (the standard deviation is 19.9). Hence only those candidates from a given party who have previously relied on party contributions should be affected by a negative shock to their party capacity to contribute to their electoral campaign.

Therefore, focusing on the candidates who run in two consecutive municipal elections, we estimate the effect of a change in their campaign expenditures on the vote share they obtain in the first round of the election, where we instrument the change in campaign expenditures by the change in the amount of public funding received by their party interacted with their reliance on party contributions during the previous election. More precisely, for the sake of the identification, we perform a within-party analysis and focus on the Socialist party candidates. During our period of interest, the Socialist party has faced both episodes of decrease and increase in public funding. We focus on the Socialist party because it tends to devote a large share of its public funding to its candidates. Our empirical strategy is best illustrated by the online Appendix Figure E.8 where we plot the correlation between the change in the Socialist party candidates' total expenditures between 2001 and 2008 and their reliance on party contributions in 2001. It appears clearly that the more the candidates relied on the party funding in 2001, the less they spent in 2008 compared to how much they spent in 2001.

---

[37]The evolution of the total amount of public funding for political parties is reported in the online Appendix Figure E.7. In constant terms, public funding for political parties reaches its highest amount in France in 1994, and has been decreasing since then.

23

Specifically, we estimate the following two equations:

$$\Delta \text{spending}_{ct} = \alpha + \omega \, \text{reliance on party contributions}_{ct-1} * \text{Decrease in public funding received by party}_{tt-1}$$
$$+ \mathbf{Y_{ct}}\delta + \phi_c + \lambda_t + \epsilon_{ct} \quad (6)$$

$$ln\left(\frac{s_{ct}}{s_{0mt}}\right) - ln\left(\frac{s_{ct-1}}{s_{0mt-1}}\right) = \Gamma + \Theta \widehat{\Delta \text{spending}}_{ct} + \mathbf{Y_{ct}}\delta + \phi_c + \lambda_t + \epsilon_{ct} \quad (7)$$

where as before t index the elections (we only consider the municipal elections here; the first municipal election in 1995 is by definition not included in the estimation – but we use it to compute the estimations for the 2001 election), and c the candidates. We control for both candidates and year fixed effects, and also include time-varying candidate-level controls ($\mathbf{Y_{ct}}$). Decrease in public funding received by party$_{tt-1}$ is an indicator variable equal to one if the Socialist party faces a decrease in its public funding between $t-1$ and t and to zero otherwise. reliance on party contributions$_{ct-1}$ is the share of candidate c total revenues represented by party contributions in $t-1$. Our exclusion restriction is that, conditionally to the controls, the change in the public funding received by the party for candidates who relied on party contributions in the previous period only impacts their vote share through the change in their campaign spending. This restriction is likely to hold due to the time interval between the legislative elections (which determines the public funding received by the parties) and the municipal elections. Previous legislative elections results do not reflect the popularity of the party at the time of the municipal elections (if anything, we should observe the opposite given that the governing party tends to lose in local pools).

Results Table 8 presents the results. In Columns (1) to (3) we report the first-stage estimates. The second-stage estimates are reported in Columns (4) to (6). Regarding the first stage, we find the interaction between the reliance on and the decrease in the party public funding to be negative and statistically significant at the one-percent level. The second-stage estimates are consistent with the OLS estimates: an increase in the amount spent by a candidate leads to an increase in the vote share she obtains. Again, this is reassuring as to the fact that our results do not seem to be entirely driven by the endogeneity of campaign spending.

[Table 8 about here.]

For the sake of comparison, in the online Appendix Table D.15, we report the OLS estimates (using the sample of observations focused on Socialist party candidates only). Contrary

to what we obtain when considering the legislative elections, we find that the magnitude of the IV estimates is twice as large as that of the OLS estimates. This may come from the fact that while both our IV strategies for the legislative and for the municipal elections may suffer from biases, the biases should work in opposite directions. Indeed, while our IV for the legislative elections may be upward biased, our IV for municipal elections should be downward biased due to mean reversion. Indeed in France, political parties tend to lose local elections following their victory at previous national elections.

4.3 Multiparty estimation

Our previous estimates rely on the IIA assumption, which may not work in the electoral competition context. In this section, we finally relax this assumption. In the next section, we will investigate the extent of heterogeneity in the impact of campaign spending depending on the political parties concerned.

4.3.1 Empirical strategy

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$_{cmt}$ denote 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

$$\text{vote share}_{cmt} \in [0, 1] \text{ for all } m \text{ and } c \tag{8}$$

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

$$\sum_{c=1}^{C} \text{vote share}_{cmt} = 1 \text{ for all } m. \tag{9}$$

A good statistical model of multiparty voting data should satisfy the constraints in equations (8) and (9). 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.

Reducing the set of political parties   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 was changed a number of times 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 also changed a number of times during our period of interest); 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.[38] Online Appendix Table B.1 provides information on the number of districts in which each political party fielded candidates for all the elections.

Municipal elections are much less partisan than legislative ones.[39] A number of candidates prefer not to state a party affiliation and simply categorize themselves as "diverse left" (respectively "diverse right") or "union of left" ("union of right"). This is illustrated in the online Appendix Table B.2. Hence in the empirical analysis, for the sake of consistency, we focus on two categories: the left and the right, and classify the other candidates in the other category.[40]

Empirical specification   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:

---

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

[39] Nadeau et al. (2018) review the literature on municipal elections in France; the majority of studies agree on the fact that legislative and presidential elections exhibit a stronger partisan mobilization while those aspects are only residual for municipal elections (see also Gaxie and Lehingue, 1984).

[40] In some of the specifications, we also include the extreme-right as a third party of interest. Doing so reduces the number of electoral districts we can use for identification, but does not impact our main findings. In the robustness section, for the sake of comparison, we also apply this classification in three broad categories – left, right, and extreme-right – to the legislative elections, and show that the results are consistent.

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

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

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

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

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

$$(10)$$

where t indexes the election (1993, 1997, 2002, 2007, and 2012), m the district, and 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.[41] 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, and to zero otherwise. The vector $\mathbf{X_{mt}}$ contains the previously described district-level controls: the share of the population with no diploma, and with higher (post-secondary) education, the share of the population aged between 15 and 19, between 20 and 24, and above 65 years old, the share of the working population made up of blue-collar workers, the unemployment rate, the investment spending in infrastructure, the number of firms, the number of employees, the total payroll, the share of the employees who are part of the top 1% of the income distribution, and the number of candidates running in district m and year t. 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. 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

---

[41]Hence the "other party" will not be the same 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".

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 below. The empirical specification for municipal elections is similar, with the exception of the choice of the political parties at play. Moreover, elections took place in 1995, 2001, 2008, and 2014 for municipal elections.

Finally, note that 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"). When estimating equation (10) above, we only estimate the effect of spending on votes in fully contested districts. In the robustness Section 4.3.3 below, we show that our estimations are robust to rather addressing the problem of partial contestation by estimating the effective rather than the actual vote (Katz and King, 1999; Honaker et al., 2002).

4.3.2 Results

Legislative elections Table 9 presents the results for legislative elections for the fully contested districts.[42] An observation is a district-election.

If we first consider the impact of a candidate spending on her own votes (looking at the diagonal numbers), we find that it is positive and statistically significant for all the parties, with the exception of the extreme-right, for each we do not obtain any statistically significant effect. E.g., 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 1.36, and that this result is statistically significant at the 1% level.[43] In other words, all the parties benefit from increasing their own spending (increase in the log ratio by 2.88 for the Green party, 0.69 for the Socialist party, and 2.45 for the right-wing party – we explain below how these different magnitudes can be interpreted in terms of the price of a vote). We also obtain decreasing marginal returns of spending for all the parties, with the exception of the extreme-right.

[Table 9 about here.]

Municipal elections Table 10 presents the results for municipal elections.[44] In the case of these elections, the extreme-left and extreme-right parties have only presented candidates in a few districts. 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.

---

[42]The coefficients for the district-level controls are not reported here for the sake of space. They are reported in the online Appendix Table D.16.

[43]Online Appendix Table D.17 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. In the Robustness Section 4.3.3 below, we show that our results are robust to dropping the districts where the vote share of the "other" party is below a certain threshold.

[44]As for legislative elections, the coefficients for the district-level controls are not reported here for the sake of space. They are reported in the online Appendix Table D.20. Online Appendix Table D.21 presents summary statistics on the other party's vote share.

The results we obtain for municipal elections are consistent with our findings for the legislative elections: 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-wing party increases the log ratio of the left-wing party share of the vote relative to the "other" party by 0.38, and that a one-euro increase in spending per voter by right-wing party candidates increases the log ratio of their vote share by 0.35. Moreover, there is no direct statistically significant effect of spending by the left on the right vote shares. Adding square spending variables to the regressions, we also show that spending has diminishing returns.

[Table 10 about here.]

Because we think it is preferable to estimate the impact of campaign spending in a high-enough number of electoral districts, we have included the extreme-right in the "other party" category in Table 10. In the online Appendix Table D.22, we show that our estimates are robust to including the extreme-right as a third party (and thereby reducing the number of electoral districts to those districts where the left, the right, and the extreme-right have fielded candidates in all the elections). When we do so, the coefficient for the effect of spending on the right-wing party on the right-wing vote share is nearly unchanged. The coefficient for left-wing spending is nearly twice as high as what it is when the extreme-right is included in the other category; however, we find that spending by the left increases the votes for the extreme-right. So overall the effect is unchanged. Finally, we find a positive effect of spending by the extreme right on the extreme-right vote share. Obviously, these results have to be interpreted carefully given the low number of observations. But it is reassuring that they go in the same directions as the results we obtain when including the extreme-right party in the other category.

4.3.3 Robustness checks

Before investigating the heterogeneous effects of campaign spending depending on the political parties, we finally perform a number of robustness checks.

Full information approach In Section 4.3.2 above, we estimated the effect of spending on votes in fully contested districts. 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, we follow here 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 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 partially 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) and assume that the non-contesting party would have received fewer votes than the parties that did nominate candidates. We then proceed in two stages. First, we use the *Amelia* imputation software to impute the observed voting data for all the parties. We perform five 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 for the legislative elections in the online Appendix Table D.23. An observation is as before a district-election but our sample now includes 2,575 observations (given that the partially contested districts are now part of the analysis). Reassuringly, the results we obtain are consistent with those in Table 9. First, for all 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 0.48 and 3.65 depending on the political party. 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 1.72 in Table D.23 and to 1.36 in Table 9) which are those for which we imputed votes in the highest number of districts.

Random coefficient approach   The multiparty estimation presented in this section allows us to relax the IIA assumption (on which the Conditional Logit model presented in Section 4.1 relies), but not to instrument for the endogeneity of spending. Hence, we verify here whether our findings are robust to an alternative approach relaxing the IIA and instrumenting for spending. Specifically, we estimate a random coefficient logit model (Berry et al., 1995; Nevo, 2000). Following Rekkas (2007), we assume that parties can be considered "consumption goods", whose characteristics impact the utility of voters. Candidates' spending represents the endogenous price variable, and we instrument this "price" by the district-level average of campaign spending by registered voters in the previous election, a lagged measure of the closeness of the race, and the interaction of these variables with the incumbency indicator variable, the average spending by registered voters by opposing parties in the same electoral district, the average spending by registered voters by the same party across all other districts. The model we estimate is presented in detail in the online Appendix Section F, together with the results.

Reassuringly, the main findings of this alternative approach are consistent with the results presented in Section 4.3.2 above. First, we show that the average coefficient on campaign spending across voters is positive and statistically significant. Second, when considering heterogeneity across political parties, we find that extreme-right candidates benefit less from increasing their campaign spending than right-wing and left-wing candidates. Interestingly, extreme-right candidates are also less affected by other parties' campaign expenditures. We do not want to give too much weight to these results given that they rely on strong assumptions, in particular regarding the instrument set we use for the price (all these concerns are detailed in the online Appendix Section F). However, we think that the fact that our main findings are robust to the use of a number of different empirical models gives confidence as to their empirical validity, and to a causal interpretation of the positive relationship between spending and votes.

Three-political categories classification For municipal elections, we map the parties into three political categories: left, right, and extreme-right. For the sake of comparison, we perform a similar analysis for the legislative elections. Online Appendix Table D.24 presents the results. Consistently with our previous estimates, we find that spending by the left (respectively spending by the right) increases the log ratio of the vote shares for this party relative to the other party. The effect of the extreme-right spending on the extreme-right vote shares is not statistically significant. Furthermore, the magnitude of the estimated coefficients is higher than that obtained for the municipal elections – this is in line with our previous estimates pointing toward a higher efficiency of campaigns for legislative than for municipal elections.

Dropping outliers Until now, in the municipal elections analysis, we have included all cities with more than $9,000$ inhabitants. To make sure that our results are not driven by outliers, as an additional robustness check, we exclude from our sample of electoral districts all the districts included in the biggest three French cities, namely Paris, Marseille, and Lyon. Online Appendix Table D.25 presents the results. We find that neither the magnitude nor the statistical significance of our coefficients is affected by the exclusion of these three cities.

Finally, for the legislative elections where we consider five political parties (the Communist, the Green, the Socialist, the Right-wing and the Extreme-right party), the vote share of the "other" party may be very low in some districts. To make sure that our results are not driven by the districts with a very low fraction of votes for the "other party", as an additional robustness check, we estimate equation (10) only on the districts where the share of the votes for the "other party" is above 5%. Online Appendix Table D.26 presents the results. Despite the lower number of observations ($1,311$ compared to $1,451$), the results we obtain are

consistent with those presented in Table 9, regardless of whether we consider the magnitude or the statistical significance of the estimated coefficients.

In this section, we have used three different empirical strategies to investigate the effect of campaign spending on vote shares. All the specifications show that the impact is significant, for both elections, and greater for municipal elections. We also show that it is not entirely driven by the endogeneity of spending. In the next section, we exploit further the multiparty nature of our data.

5 The heterogeneous price of a vote

In this section, using the last estimation strategy (multivariate logistic transformation and SUR), we investigate the heterogeneous effects of campaign spending depending on the political party, and study the cross effects of spending.

5.1 Cross-effects of campaign spending

One of the main advantages of the approach presented above is that it allows us to investigate whether some parties suffer relatively more from the money spent by others, an issue that has not received much attention in the existing literature.[45] Spending by different parties may indeed directly affect the vote shares obtained by other parties, but with heterogeneous effects. Investigating the cross-effects of campaign spending may help to improve our understanding of party closeness as perceived by the voters. This may also contribute to the literature on stability and change in voting behavior.

If we first consider the legislative elections (Table 9), we find that not only does spending by the Communist party lead to an increase in vote shares for this party (relative to the "other" party), but that it also has a statistically significant negative effect on the Socialist party vote shares (with no effect on the Green and right-wing parties). Hence spending by Communist party candidates may help to convince voters "on the left" to vote for the Communist rather than the Socialist candidate. Interestingly, this effect is not symmetric: the Communist party candidates do not suffer from additional spending by the Socialist party.

Spending by the left-wing parties (the Communist, the Green, and the Socialist party) does not seem to draw voters away from the right-wing party. This is not surprising given campaigns increasingly focus on mobilizing supporters rather than on persuading undecided voters (see e.g. Panagopoulos, 2016, in the U.S. context – in a multiparty context such as the French one, this can take the shape of left-leaning campaigns aimed at mobilizing voters

---

[45]More precisely, there is a very large body of literature on on the spatial positioning of political parties and ideological proximity (among many others Downs, 1957; Adams and Somer-Topcu, 2009; Adams, 2012; Williams and Whitten, 2015). However, although it measures parties' policy shifts, this literature does not consider the role played by campaign spending on changing citizens' votes.

on the left rather than persuading voters on the right).[46] Moreover, while a campaign can have a mobilization effect, there is increasing evidence that this is unlikely to lead voters to cross partisan lines (see e.g. Kalla and Broockman, 2018) (we will come back to this point in the mechanism section below). Hence, while spending by the Communist party draws voters away from the Socialist party who are relatively close in ideology (both parties are on the left), it does not lead right-wing voters to cross partisan lines.

Perhaps surprisingly, spending by the right-wing party leads to an increase in vote shares for all the main political parties under consideration relative to the "other" party (the category that groups together all the small parties). Furthermore, we find a similar effect when considering the municipal elections (Table 10): not only does spending by the right-wing party increase the log-ratio of the right-wing party share of the vote, but it also increases the log ratio of the left-wing party share of the vote (while spending by the left-wing party has no direct effect on the right-wing party vote share).

While the magnitude of the effect of right-wing spending is much higher for the log ratio of the right-wing party share of the vote (for both legislative and municipal elections), it is nonetheless of interest to understand how spending by the right may increase the vote shares of the left-wing parties. Our favorite explanation is the following: while in essence money is spent by the right-wing party with the purpose of mobilizing voters from the right, it can also have a "backlash effect". In particular, it may lead voters from the left – aware of the fact that the right-wing party is investing a lot of money in the battle for votes – to vote strategically (i.e. for the top left-wing parties) rather than expressively (for smaller parties with no chance of winning) (see e.g. Pons and Tricaud, 2018). One could in principle expect such a "backlash effect" to be at play for all the political parties. The fact that we observe it for the right but not for the left most probably comes from the fact that the left is usually more divided than the right; hence leftist supporters have more room to divide their vote (and so also to vote strategically).

5.2 The far-right exception

Finally, we perform a number of counterfactual estimations to estimate the price of a vote for each of the political parties under consideration, and its change over time.[47]

---

[46]Note however that there is evidence that persuasive communication may be effective. Pons (2018) evaluates the effect of door-to-door canvassing in the context of the 2012 French presidential election. He finds an increase in the vote share obtained by the Socialist party candidate (who implemented the canvassing campaign) and provides evidence of a persuasion effect.

[47]Reassuringly, our model is able to replicate the evolution of national vote shares. This is illustrated in the online Appendix Figure E.9 where we plot the actual vote shares obtained at the national level by the five main parties in the first round of the legislative elections together with the expected value of the vote shares predicted by the SUR model. We are also able to replicate the between-district variations in party vote shares, as illustrated in the online Appendix Figure E.10 with the example of the Socialist party.

Legislative elections   For each of our five political parties of interest (the Communist party, the Green party, the Socialist party, the right-wing party, and the extreme-right party), we assume that all their candidates spent one more euro per registered voter that they actually did and estimate how that impacts the number of votes they obtain, everything else equal. We perform this counterfactual estimation separately for each of the political parties (hence we perform a first counterfactual estimation assuming that all the right-wing party candidates face a one-euro increase in spending per voter in all districts/years, everything else equal; then a second counterfactual estimation assuming that all the Socialist party candidates face a one-euro increase in spending per voter in all districts/years, everything else equal; etc.)

Then, for each of the counterfactual estimations, we compute the total number of votes obtained by each party under this assumption. We aggregate these votes at the national level.[48] We can then compute the average price of an additional vote for each of the parties and electoral years. Figure 4 plots the results. First, we find that the price of a vote is fairly stable over time. This finding is not obvious. Many argue that with the introduction of new technologies, in particular the Internet, it has become increasingly cheap for candidates to run in elections. Here, we do not find major changes in recent decades.[49].

Second, we show that the price of a vote varies depending on the political party. According to our estimates, the price of a vote is lowest for the Green party (between €4 and €7 depending on the elections) and for the right-wing party (€6-€7). It is higher for the Communist party (€15-€26) and for the Socialist party (€11-€16). Finally, it is much higher for the extreme-right party than for the other political parties (between €21 and €55), and this difference is persistent through time.

[Figure 4 about here.]

How can we rationalize the fact that campaign spending seems to be less efficient for the extreme-right than for the other political parties? A first potential explanation is the existence of a stigma effect. As we will discuss in Section 6, a key function of electoral campaigns is to reduce voter uncertainty about the policy positions of the candidates. To the extent to which there may be a stigma attached to the extreme-right, it may be more difficult for extreme-right candidates to persuade undecided voters. To investigate whether this is the case, we use the results obtained by the extreme-right candidates in the 1988 legislative elections as a proxy for the stigma associated with the vote for the extreme-right (our assumption here is that in electoral districts where citizens are accustomed to voting for the extreme-right – before the beginning of our period of interest – there may be a lower stigma). We split

---

[48]But the counterfactual is estimated at the electoral district / election level: hence, for each district / election, we have the expected value of the vote shares obtained by the different political parties.

[49]On the long-term evolution of the cost and efficiency of campaigning technologies, see Cagé and Dewitte (2018).

our electoral districts using the median (9.1% of the votes in the first round), and estimate equation (10) separately for low-stigma districts thus defined (online Appendix Table D.18) and for high-stigma districts (online Appendix Table D.19). The coefficient associated with the impact of a one-euro increase in spending by the extreme-right party on the log ratio of the extreme-right party share of the vote is much higher in low-stigma districts (0.22) than in high-stigma districts (0.07). However, it is not statistically significant in either case.

Second, campaign expenditures may be less efficient for extreme-right candidates because these candidates are less effective campaigners. This would be the case for example if these candidates suffer from a valence disadvantage. A number of models in the literature have indeed shown that disadvantaged candidates choose more extremist positions (see in particular Ansolabehere and Snyder, 2000; Groseclose, 2001; Aragones and Palfrey, 2002).[50] Furthermore, there is considerable anecdotal evidence on the fact that the extreme-right party in France has serious difficulty fielding quality candidates across the country in legislative elections.

Finally, the lower efficiency of campaign spending for the extreme-right party may be linked to the salience of the issues it capitalizes on, such as opposition to mass migration. The "Front National" stance on immigration is the toughest in France; this controversial position is well-known and so campaign spending may not affect citizen's knowledge of a candidate's position (see e.g. Le Bras, 2015). On the contrary, voters may be unaware of or misperceive the Green party candidates' position on issues such as the development of local currencies (which are not a priority issue for voters). Hence campaign expenditures by Green party candidates can make people aware of these issues and change their minds at the time of voting.

Besides, to the extent that far-right voters may be more ideological – and so vote for the extreme-right candidates regardless of their characteristics – they may also be less responsive to campaigns.[51] E.g., using data on parliamentary elections in Finland, Kestilä-Kekkonen and Söderlund (2014) have shown that being guided by the characteristics of the party leader is a much stronger predictor of the far-right vote than being affected by district-level candidate characteristics. Consistently with this finding, Le Pennec-Caldichoury and Vertier (2019) show that in the first round of the 1993 French legislative elections, political manifestos of the extreme-right candidates tended to be similar (all following the same national model), while the manifestos of the candidates of the other parties were varying at the local level, depending on the candidates' characteristics.

---

[50] The empirical evidence is scarce, however, with the exception of Stone and Simas (2010) who show, using data from the 2006 U.S. midterm elections, that challenger extremism results from a character disadvantage (see also Adams et al., 2011).

[51] For a recent review of the literature on the determinants of the far-right vote, see Stockemer et al. (2018). A large share of voters casting their ballot for the far-right are looking for ideological identification.

Municipal elections   Finally, we perform a similar analysis for the municipal elections. First, we assume that all the candidates from the right-wing party spent one additional euro per eligible voters. Second, we perform the same counterfactual estimation but for all the candidates from the left-wing party, everything else equal. Figure 5 plots the resulting estimated price of a vote.

[Figure 5 about here.]

According to our estimates, the price of a vote for municipal elections is equal to about €25-26 for the left-wing party, and €28-29 for the right-wing party. It is stable through time. Interestingly, this price is higher for these two main parties 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 6 below 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.

6   Discussion

In this section, we discuss the mechanisms behind the positive impact of campaign spending we uncover and the external validity of our main findings.

6.1   Why does money matter?

In this article, we have shown that money plays a role in the electoral process: by increasing their electoral spending, candidates increase the number of votes they obtain on average. Why is this so? Before discussing the different mechanisms that may be at play, it is important to investigate how candidates allocate their resources among different categories of activities.[52]

Resource allocation and information provision   As we highlight in Section 3.2, political campaigning can take a number of different forms. For municipal and legislative elections, the main category of candidates' disbursements is print advertising (e.g. expenditures on printed leaflets and posters). Candidates spend money to ensure that voters will know them and their election platform. Hence campaign spending may simply play a role by providing voters with information on candidates.[53] A key function of electoral campaigns is indeed to reduce voter uncertainty about the policy positions and characteristics of different candidates (Lenz, 2009; Peterson, 2009).[54]

---

[52]For a review of the literature on how campaigns matter, see Jacobson (2015).

[53]See Coate (2004a) and Coate (2004b) for a theoretical framework.

[54]Consistently, Larreguy et al. (2018), using data from Mexico, find that campaign advertising is most effective in poorly informed and politically uncompetitive electoral precincts.

36

As we highlight above, the relatively lower efficiency of campaign spending for the extreme-right may come from the fact that the positions of the extreme-right party's candidates are well-known – so there is less room to reduce uncertainty – while the salience of a number of issues defended by political movements such as the Green party is lower, so that campaign expenditures increase voter knowledge.

Information vs. persuasion   While the provision of information on candidates to voters through campaign spending may help rationalize our findings, other mechanisms may be at play. Herrera et al. (2008) identify different roles of campaign spending. First, spending can move party sympathizers to effectively vote, which they call the "mobilization effect" of campaign spending. Second, spending can help persuade undecided voter, or voters leaning towards the other party, of the merits of one party's policies by providing information (see e.g. Acharya et al., 2019; Baron, 1994; Coate, 2004b; 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 disentangle between the persuasion and the information effects of spending, we rely on the fact that, as highlighted by Jacobson (2015), *"campaigns matter, but not for everyone"*. In particular, citizens vary in their susceptibility to persuasion by political campaigns. For instance, persuadable voters tend to be the least educated voters.

To investigate whether the channel is persuasion, we first estimate equation (2) separately for electoral districts that are above / below the median regarding the share of the population with higher education. Online Appendix Table D.28 presents the results. We find no statistically significant difference between the effect of spending on votes in high-education vs. low-education electoral districts for legislative elections once we control for candidate fixed effects (upper Table D.28a). If anything, in the absence of candidate fixed effects, the magnitude of the estimated coefficient is slightly lower for districts that are above the median in terms of the share of the population with higher education. Furthermore, if we turn to municipal elections (bottom Table D.28b), we find that the impact of campaign spending is statistically significantly higher in electoral districts with a higher share of citizens with higher education. However, this difference vanishes after controlling for candidate fixed effects.

In the online Appendix Table D.29, we perform a similar analysis in terms of heterogeneity but rather considering the share of white-collar workers (and similarly splitting our sample between districts that are above / below the median). We find no statistically significant difference in the effect of campaign spending depending on the share of white-collar workers in the district for legislative elections (upper Table D.29a). The results are similar for municipal elections (bottom Table D.29b).

Finally, we use an additional proxy for information based on newspaper penetration at the

department level.[55] We split our departments depending on the median value of newspaper penetration, defined as the number of local daily newspapers sold normalized by the department population (the data is from Cagé (2017)). Online Appendix Table D.30 presents the results. We find a slightly higher effect of campaigns in districts where news penetration is low compared to districts where it is high. Hence, campaigns seem to matter more in places where people are less informed to begin with. However, the difference is not or barely statistically significant.

Municipal vs. legislative elections   The importance of information provision as a channel through which campaign spending matters may also rationalize our finding that the price of a vote is higher for municipal than for legislative elections. In the absence of electoral campaigns, voters indeed have better sources of information on the candidates running for more local elections. In contrast, campaigns play a more important role at reducing voter uncertainty for legislative elections.

To test the validity of this explanation, we investigate whether the effect of spending in municipal elections is stronger in large districts (where voters have less knowledge about their candidates) than in small districts. We split our sample of municipal districts in two using the median value of the number of registered voters. Online Appendix Table D.27 presents the results. Whether we estimate equation (2) (with party fixed effects) or equation (3) (with candidate fixed effects but only on the subset of candidates who run multiple times), we find that the impact of spending on votes is much higher in large districts than in small districts, and that the difference is statistically significant. Hence, the lower efficiency of spending for municipal compared to legislative elections seems to come from the fact that in small municipal districts voters already have information regarding their candidates. However, the impact of spending increases with the size of the district. This result indicates that information should be considered as an important channel for understanding the impact of campaign expenditures.

A signaling effect   Citizens may choose to vote for the candidate whom they know is receiving more donations, because they anticipate that she will win (a "bandwagon effect"[56]). They may also vote for the candidates who receive more private donations if these candidates

---

[55]While this measure may be a better proxy for information and citizens' susceptibility to persuasion by campaigns, its main caveat comes from the fact that we do not have variation at the district level. So we need to attribute the department value to all the electoral districts included in the department, although there may be variation within departments.

[56]There is a large body of 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). While in a recent study Gerber et al. (2017) find no causal evidence of bandwagon effects with respect to actual voting, Feigenbaum and Shelton (2013) show that fundraising is subject to bandwagoning in the context of U.S. primary elections.

are also those who 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 prove a candidate's ability as a fundraiser (Potters et al., 1997) or affect voters' perceptions regarding the social benefits of a project (Helsley and O'Sullivan, 1994).[57] 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. What is more, unlike in the US, candidates for French local elections hardly communicate on the donations they receive. Finally, the absence of heterogeneity depending on voters' educational level seems to indicate that the impact we obtain here may not be due to impressionable voters.

Deterring challenger   Another channel through which campaign spending may matter is through a dissuasion effect; spending by a candidate – and in particular by the incumbent – may indeed deter challengers (see e.g. Epstein and Zemsky, 1995)[58]. To investigate whether it is the case, we rely on our IV strategy for the legislative elections, exploiting the ban on private donations from firms that was decided in 1995. We investigate how the number of candidates and the spending of the other candidates changed between 1993 and 1997 depending on the change in the incumbent's spending, where we instrument this change by the amount of private donations from firms received by the incumbent in 1993.

Online Appendix Table D.31 presents the results. The upper panel (Table D.31a) investigates the impact of a change in the incumbent's spending on the number of candidates running in the district (an observation is an electoral district in 1997). As expected given the results of Section 4.2.1, the first-stage estimates are negative and statistically significant: an increase in the amount of private donations from legal entities received by the incumbent in 1993 leads to a drop in the incumbent's spending in 1997 compared to 1993. The second-stage estimates show that an increase in the incumbent's spending does not seem to deter the entry of challengers; on the contrary, we find that an increase in the incumbent spending instrumented by the donations from legal entities received in 1993 leads to an increase in the number of candidates.

Furthermore, if rather than considering the number of challengers standing for election we investigate the impact of a change in the incumbent's spending on spending by her challengers (Table D.31b; the observation is a candidate in 1997), we find that this spending increases. In other words, there does not seem to be a deterring effect of private donations. If anything,

---

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

[58]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.

we find the opposite. This finding is consistent with the results of Epstein and Zemsky (1995) who find that only in certain limited cases fundraising actually deters quality challengers from entering the race.

Turnout   In his literature review on the impact of campaign spending, Jacobson (2015) highlights that campaign spending can persuade people to vote who would not otherwise do so. Hence, we finally investigate the impact of spending on turnout at legislative and municipal elections. Our empirical specification is the following:

$$\text{turnout}_{mt} \quad = \quad \alpha \quad + \quad \beta\,\text{total spending}_{mt} \quad + \quad \mathbf{X}'_{\mathbf{mt}}\boldsymbol{\kappa} \quad + \quad \lambda_m \quad + \quad \eta_t \quad + \quad \epsilon_{mt} \quad (11)$$

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. 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 district-level controls as before. Standard errors are clustered at the district level.

Table 11 presents the results for the legislative elections. A one-euro increase in total spending by registered voters increases turnout by 0.32 to 0.46 percentage-points depending on the specifications. This effect is mainly driven by spending by the Green party and by the Socialist party, and to a lower extent by spending by the right-wing party. Spending by the other parties seems not to affect turnout. Note however that these results should be considered carefully given they are just correlations.

[Table 11 about here.]

The results for the municipal elections are presented in the online Appendix Table D.32. We find a positive and statistically significant effect of spending on turnout (Column (1)), that is robust to controlling for district-level controls (Column (2)). This effect seems to be driven by all the parties (whether we consider the left-wing party, the right-wing party, or all the other parties gathered in the "other" category). The magnitude of this mobilization effect is slightly higher than for legislative elections.

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.

6.2   External validity

With the exception of a number of recent articles, the literature on campaign spending has so far focused primarily on the United States. Yet, it is critical in this area to develop a broad comparative perspective in order to better understand and analyze the forces at play. Our paper focuses on the specific case of France; a key question is then to determine whether we should expect the patterns we have uncovered in this country to be repeated in other contexts.

A number of aspects of the French campaign finance regulation can also be found in other countries (see Cagé, 2018, for a review of the different regulations at play in Western democracies). First, France has limited campaign spending by law. This is the case of a number of other countries, such as Belgium, Brazil, Canada, Chile, Israel, New Zealand, the United Kingdom and South Korea, among many others. Hence our findings could have important implications for these countries. Second, France, like the vast majority of the democracies around the globe, has a multiparty electoral system. 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 are impacted relatively more by competition from (and money spent by) others. Specifically, we show for example that spending by the extreme-right party is less "efficient" than for traditional parties. This may indicate a stigma effect, or reflect the fact that extreme-right candidates may suffer from a valence disadvantage. This finding may inform the debate on the rise of populist parties in Western democracies.

Finally, estimating the effect of campaign spending in a country that has adopted campaign spending caps such as France may help reconcile the conflicting results of the existing literature that mainly centers on the US. In this article, we do find a positive effect of spending, and show that this effect is not driven by the endogeneity of campaign expenditures. In a country where spending reaches unlimited amounts, given decreasing marginal returns of spending, it is not surprising to obtain an insignificant marginal effect of one euro of additional expenditures. On the contrary, in countries like France where spending is limited by law, we estimate positive and statistically significant effects of campaign expenditures.

7   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 investigate whether the impact of campaigns varies across candidates, election types, and political parties. We find that, despite strict limitations on campaign spending and contributions, money still plays an important role in French politics. We show that these effects are not driven by the endogeneity of campaign spending.

Investigating the heterogeneity of the impact of campaign expenditures depending on the parties and election types allows us to improve our understanding of the channels through which campaigns matter. In particular, we show that campaigns are less efficient for municipal than for legislative elections, and provide evidence that this is most probably due to the fact that information provision is an important driver of campaign efficiency. We also document the fact that the magnitude of the impact of expenditures varies depending on the political parties. In particular, we show that spending by extreme-right candidates has much lower returns than spending by other party. In recent years, far-right political parties have made major gains in elections throughout the West. Our results may shed some light on the mechanisms driving their electoral success.

We hope these results will benefit the public debate regarding the relevance of existing spending caps and the optimal level of contribution limits (even if determining this optimal level is beyond the scope of this paper). While it seems that political power is increasingly conditioned upon wealth, 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.[59] We leave this to future research.

---

[59]This is not to say that there is no difference between the French and the British cases. In the UK 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.

Acharya, A., Grillo, E., Sugaya, T., and Turkel, E. (2019). Dynamic Campaign Spending. techreport.

Adams, J. (2012). Causes and Electoral Consequences of Party Policy Shifts in Multiparty Elections: Theoretical Results and Empirical Evidence. *Annual Review of Political Science*, 15(1):401–419.

Adams, J., Merrill, S., Simas, E. N., and Stone, W. J. (2011). When Candidates Value Good Character: A Spatial Model with Applications to Congressional Elections. *The Journal of Politics*, 73(1):17–30.

Adams, J. and Somer-Topcu, Z. (2009). Moderate Now, Win Votes Later: The Electoral Consequences of Parties' Policy Shifts in 25 Postwar Democracies. *The Journal of Politics*, 71(2):678–692.

Alvarez, R. M. and Nagler, J. (1998). When Politics and Models Collide: Estimating Models of Multiparty Elections. *American Journal of Political Science*, 42(1):55–96.

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.

Ansolabehere, S. and Snyder, J. M. (2000). Valence Politics and Equilibrium in Spatial Election Models. *Public Choice*, 103(3/4):327–336.

Aragones, E. and Palfrey, T. R. (2002). Mixed Equilibrium in a Downsian Model with a Favored Candidate. *Journal of Economic Theory*, 103(1):131–161.

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.

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

Berry, S., Levinsohn, J., and Pakes, A. (1995). Automobile Prices in Market Equilibrium. *Econometrica*, 63(4):841–890.

Bouton, L., Castanheira, M., and Drazen, A. (2018). A Theory of Small Campaign Contributions. NBER Working Papers 24413, National Bureau of Economic Research, Inc.

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: Evi-

dence from French Local Newspapers and Elections, 1944-2014. CEPR Discussion Papers 12198, C.E.P.R. Discussion Papers.

Cagé, J. (2018). *Le prix de la démocratie.* Fayard (English version: The Price of Democracy, Harvard University Press, forthcoming).

Cagé, J. and Dewitte, E. (2018). It Takes Money to Make MPs : New Evidence from 150 Years of British Campaign Spending. techreport.

Coate, S. (2004a). Pareto-Improving Campaign Finance Policy. *The American Economic Review*, 94(3):628–655.

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

Da Silveira, B. S. and De Mello, J. M. P. (2011). Campaign Advertising and Election Outcomes: Quasi-natural Experiment Evidence from Gubernatorial Elections in Brazil. *The Review of Economic Studies*, 78(2):590–612.

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.

Downs, A. (1957). *An Economic Theory of Democracy.* Harper.

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.

Feigenbaum, J. J. and Shelton, C. A. (2013). The Vicious Cycle: Fundraising and Perceived Viability in US Presidential Primaries. *Quarterly Journal of Political Science*, 8(1):1–40.

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.

Gaxie, D. and Lehingue, P. (1984). *Enjeux municipaux: la constitution des enjeux politiques dans une élection municipale.* Publications du Centre universitaire de recherches adminis-

tratives et politiques de Picardie. Presses Universitaires de France.

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.

Godefroy, R. and Henry, E. (2016). Voter turnout and fiscal policy. *European Economic Review*, 89(C):389–406.

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.

Groseclose, T. (2001). A Model of Candidate Location When One Candidate Has a Valence Advantage. *American Journal of Political Science*, 45(4):862–886.

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.

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.

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.

Jacobson, G. C. (2015). How Do Campaigns Matter? *Annual Review of Political Science*, 18(1):31–47.

Kalla, J. L. and Broockman, D. E. (2018). The Minimal Persuasive Effects of Campaign Contact in General Elections: Evidence from 49 Field Experiments. *American Political Science Review*, 112(1):148–166.

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

Kestilä-Kekkonen, E. and Söderlund, P. (2014). Party, leader or candidate? dissecting the right-wing populist vote in Finland. *European Political Science Review*, 6(4):641–662.

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.

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

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

Larreguy, H. A., Marshall, J., and Snyder, J. J. M. (2018). Leveling the playing field: How campaign advertising can help non-dominant parties. *Journal of the European Economic Association*, 16(6):1812–1849.

Le Bras, H. (2015). *Le pari du FN*. Angles et Reliefs. Autrement.

Le Pennec-Caldichoury, C. and Vertier, P. (2019). Strategic Adjustment of Campaign Messages: Evidence from French Legislative Elections (1958-1993). techreport.

Lenz, G. S. (2009). Learning and Opinion Change, Not Priming: Reconsidering the Priming Hypothesis. *American Journal of Political Science*, 53(4):821–837.

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.

Nadeau, R., Foucault, M., Jérôme, B., and Jérôme-Speziari, V. (2018). Élections municipales françaises : une revue de la littérature. In Nadeau, R., Foucault, M., Jérôme, B., and Jérôme-Speziari, V., editors, *Villes de gauche, villes de droite. Trajectoires politiques des municipalités françaises de 1983 à 2014*, chapter 1. Presses de Sciences Po, Paris.

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

Nevo, A. (2000). Mergers with Differentiated Products: The Case of the Ready-to-Eat Cereal

Industry. *The RAND Journal of Economics*, 31(3):395–421.

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.

Panagopoulos, C. (2016). All about that base: Changing campaign strategies in U.S. Presidential elections. *Party Politics*, 22(2):179–190.

Peterson, D. A. M. (2009). Campaign Learning and Vote Determinants. *American Journal of Political Science*, 53(2):445–460.

Pons, V. (2018). Will a five-minute discussion change your mind? A countrywide experiment on voter choice in France. *American Economic Review*, 108(6):1322–1363.

Pons, V. and Tricaud, C. (2018). Expressive Voting and Its Cost: Evidence From Runoffs With Two or Three Candidates. *Econometrica*, 86(5):1621–1649.

Post, R. C. (2014). *Citizens Divided. Campaign Finance Reform and the Constitution.* 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.

Rekkas, M. (2007). The Impact of Campaign Spending on Votes in Multiparty Elections. *The Review of Economics and Statistics*, 89(3):573–585.

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. (2018). Political Advertising and Election Results. *The Quarterly Journal of Economics*, 133(4):1981–2036.

Stock, J. H. and Yogo, M. (2005). Testing for Weak Instruments in Linear IV Regression. In *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothen-*

berg, pages pp. 80–108. Cambridge: Cambridge University Press.

Stockemer, D., Lentz, T., and Mayer, D. (2018). Individual Predictors of the Radical Right-Wing Vote in Europe: A Meta-Analysis of Articles in Peer-Reviewed Journals (19952016). *Government and Opposition*, 53(3):569–593.

Stone, W. J. and Simas, E. N. (2010). Candidate Valence and Ideological Positions in U.S. House Elections. *American Journal of Political Science*, 54(2):371–388.

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.

Vanberg, C. (2008). One Man, One Dollar? Campaign contribution limits, equal influence, and political communication. *Journal of Public Economics*, 92(34):514–531.

Williams, L. K. and Whitten, G. D. (2015). Don't Stand So Close to Me: Spatial Contagion Effects and Party Competition. *American Journal of Political Science*, 59(2):309–325.

(a) Legislative elections
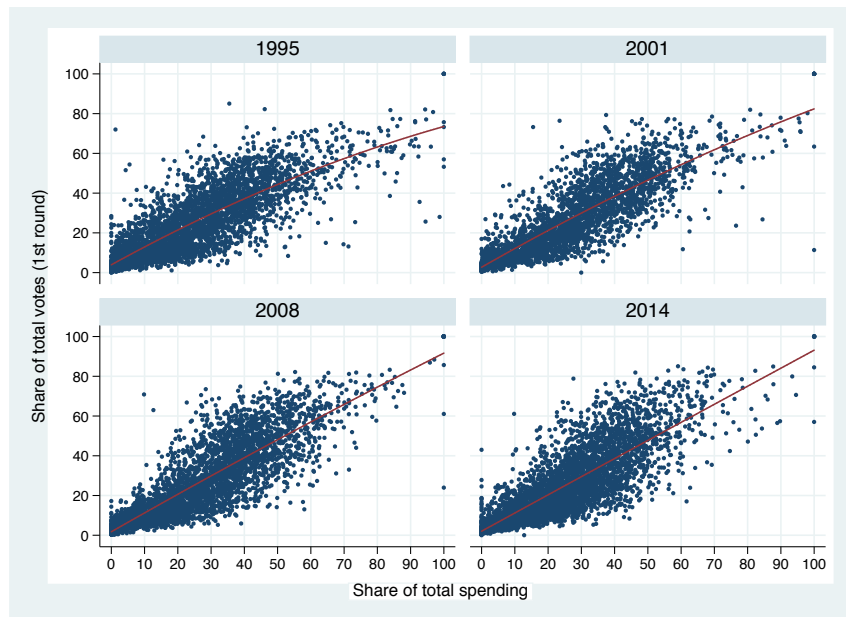
(b) Municipal elections

Notes: The figure plots the relationship between the proportions of total spending and total (first round) vote share received by the candidates. An observation is a candidate-electoral district. The upper figure 1a shows this relationship for the legislative elections. The bottom figure 1b shows this relationship for the municipal elections.

Figure 1: Relationship between the proportions of total spending and total vote share
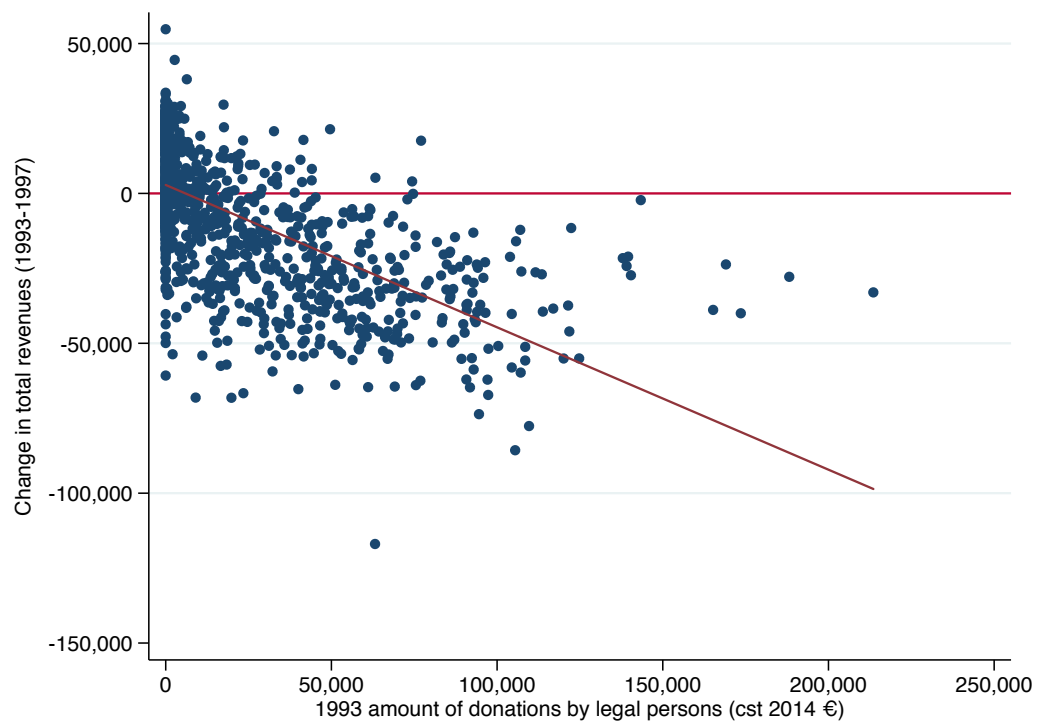
Notes: The figure plots the correlation between the change in total revenues between 1993 and 1997 and the donations from legal entities received in 1993. An observation is a candidate.

Figure 2: Change in total revenues between 1993 and 1997 depending on the donations from legal entities received in 1993
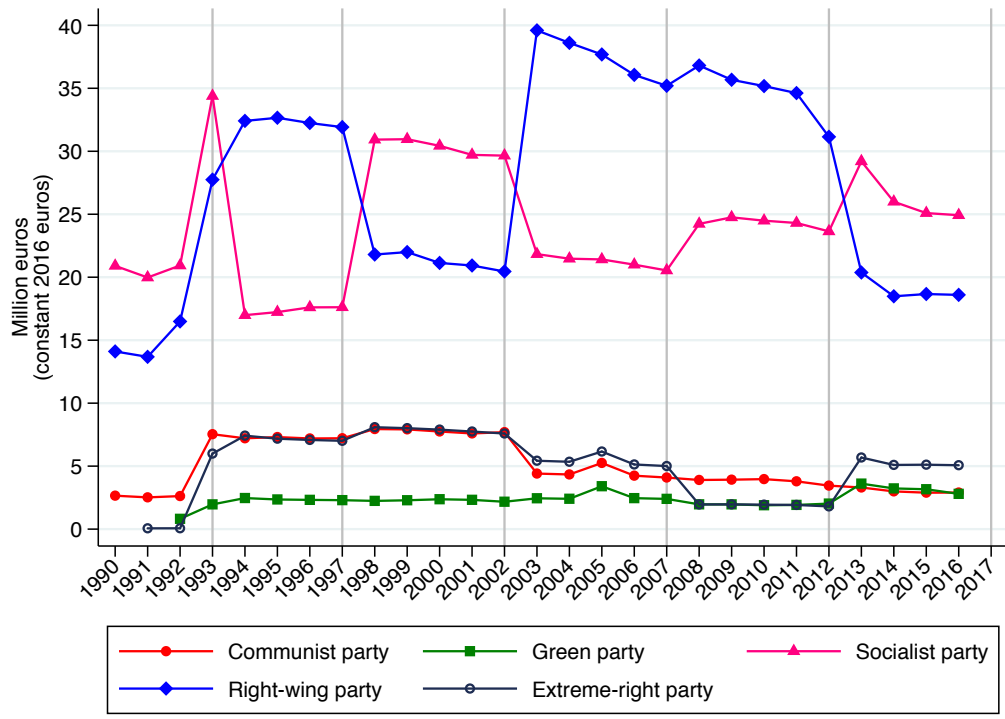
Notes: The figure plots the annual amount of direct public funding received by the Communist party, the Green party, the Socialist party, the right-wing party and the extreme-right party in France between 1990 and 2017. The vertical gray bars indicate the years in which legislative elections took place.

Figure 3: Direct public funding received by political parties: illustration for the five main parties, 1990-2017
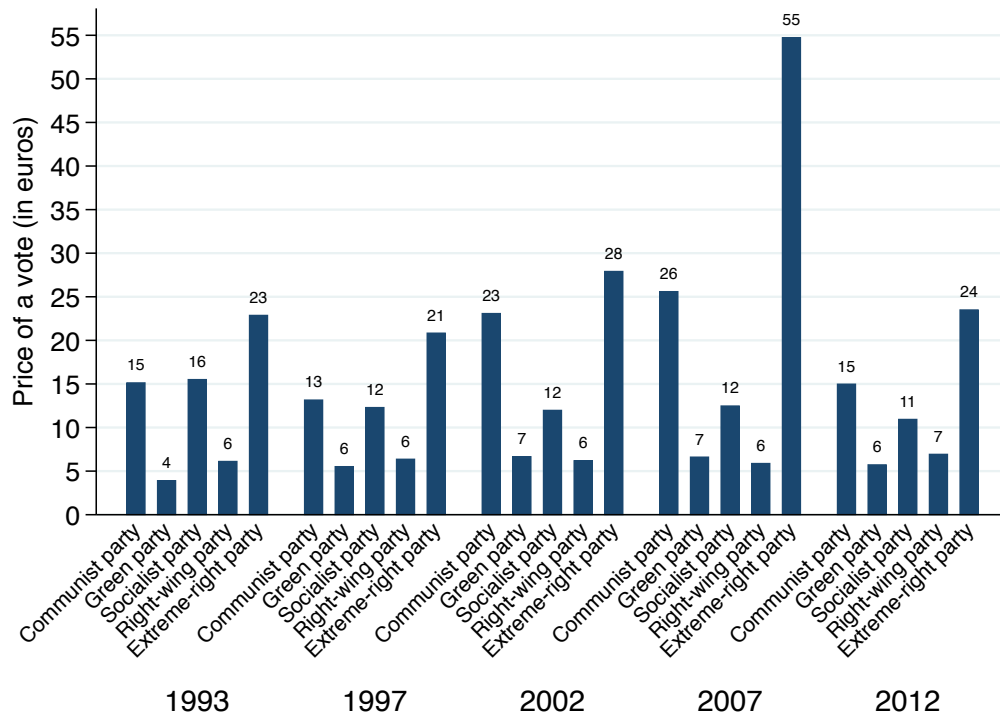
Notes: The figure plots the average price of a vote, depending on the time period and on the political party. These prices are obtained performing the counterfactual estimations that are described in Section 5.2.

Figure 4: Legislative elections: Estimation of the price of a vote, depending on the time period and on the political party
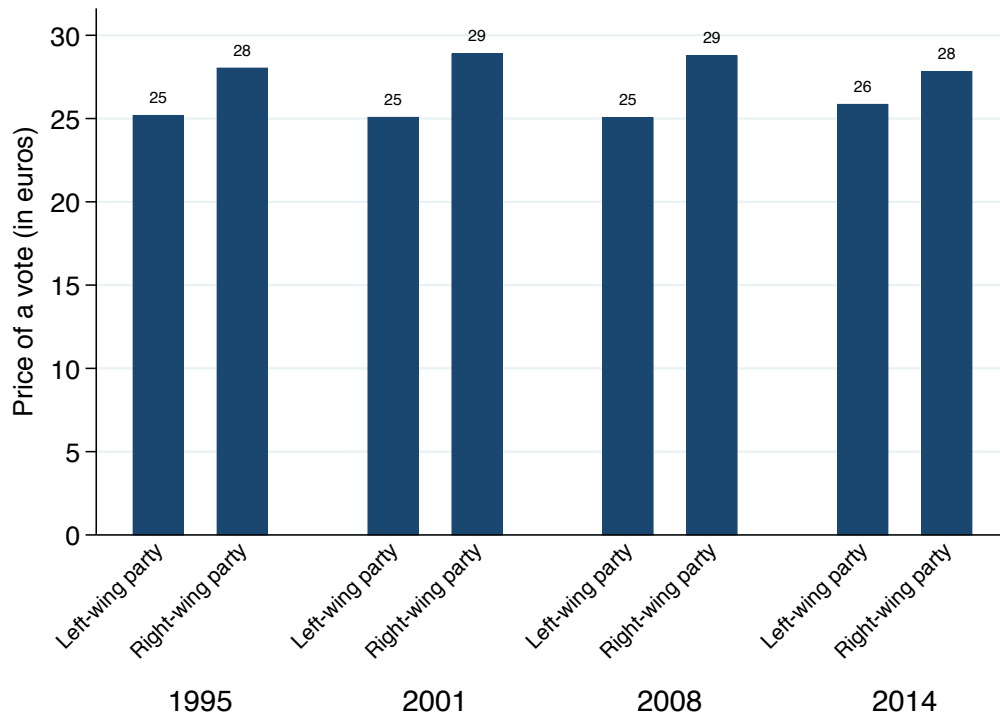
Notes: The figure plots the average price of a vote, depending on the time period and on the political party. These prices are obtained performing the counterfactual estimations that are described in Section 5.2.

Figure 5: Municipal elections: Estimation of the price of a vote, depending on the time period and on the political party

Table 1: Summary statistics: campaign spending

(a) **Municipal elections**

	Spending (cst 2014 €)					
	Mean	Median	sd	Min	Max	N
Total spending per candidate						
1995	23,382	14,214	31,154	0	426,652	3,835
2001	25,335	14,922	35,409	0	477,550	3,485
2008	21,770	13,346	29,908	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	3,780
2001	1.31	1.27	0.92	0.00	4.51	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	4.94	4.66	2.46	0.00	14.99	945
2001	4.32	4.23	2.85	0.00	14.14	934
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	15,293	2,379	19,484	0	75,226	6,042
2002	11,253	1,414	17,139	0	81,169	7,981
2007	11,303	649	17,050	0	76,281	7,186
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	0.04	0.30	0.00	1.87	6,042
2002	0.17	0.02	0.26	0.00	1.58	7,981
2007	0.15	0.01	0.24	0.00	1.50	7,186
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	2.51	2.39	0.75	1.00	6.27	555
2002	2.38	2.15	0.92	0.81	7.40	555
2007	2.00	1.86	0.66	0.63	5.34	555
2012	1.71	1.63	0.52	0.45	4.51	539

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 1a shows the results for the municipal elections, and the bottom Table 1b for the legislative elections.

Table 2: Summary statistics: Legislative elections, campaign revenue per sources of funding, depending on the political party

	(1) Communist party	(2) Green party	(3) Socialist party	(4) Right-wing party	(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	17.7	27.2	1.2	-9.5***
	(22.3)	(16.0)	(21.6)	(26.0)	(5.2)	(-14.3)
Party contributions (%)	16.4	27.9	12.4	29.0	2.1	-16.6***
	(30.8)	(38.2)	(20.0)	(21.1)	(12.2)	(-29.1)
Personal contributions (%)	68.2	61.3	66.3	39.5	95.2	26.8***
	(37.6)	(40.1)	(30.5)	(28.5)	(15.6)	(32.7)
In-kind contributions (%)	2.1	4.4	2.5	3.1	0.8	-0.6***
	(9.1)	(12.0)	(4.8)	(5.8)	(6.3)	(-4.1)
In euros						
Private donations (cst 2014 €)	2,341	436	9,611	17,868	262	-8,257***
	(7726.5)	(1843.3)	(17427.5)	(26102.3)	(1688.0)	(-13.4)
Party contributions (cst 2014 €)	1,547	878	5,036	14,625	277	-9,589***
	(3961.2)	(2087.4)	(9150.8)	(13288.5)	(1952.9)	(-30.2)
Personal contributions (cst 2014 €)	13,374	5,778	24,525	18,015	22,055	6,510***
	(12,891)	(9,237)	(13,059)	(14,004)	(11,438)	(17)
In kind contributions (cst 2014 €)	171	181	936	1,426	121	-490***
	(849)	(735)	(1,861)	(2,749)	(790)	(-8)
Total revenues (cst 2014 €)	17,840	7,330	40,822	53,019	22,837	-12,197***
	(22,318)	(10,032)	(20,053)	(28,141)	(11,217)	(-18)
Campaign spending						
Total spending (cst 2014 €)	17,238	7,232	39,152	48,327	22,672	-9,175***
	(15,478)	(10,030)	(17,292)	(20,416)	(11,164)	(-17)
Obs	2,627	2,307	2,564	2,708	2,751	5,272

Notes: The table presents summary statistics on candidates' campaign revenues by sources of funding, depending on their political party. We focus here on the five main parties: Communist party, Green party, Socialist party, right-wing party, and extreme-right party. 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 the right-wing party.

Table 3: Summary statistics: Municipal elections, campaign revenue per sources of funding, depending on the political party

	(1) Left-wing party	(2) Right-wing party	(3) Extreme-right party	(4) Left vs. Right
	mean/sd	mean/sd	mean/sd	b/t
% of total revenues				
Private donations (%)	13.1	21.6	2.0	-8.5***
	(19.0)	(24.2)	(8.6)	(-20.7)
Party contributions (%)	6.4	4.5	5.0	1.9***
	(15.5)	(13.7)	(19.3)	(6.8)
Personal contributions (%)	78.2	71.3	90.8	6.9***
	(24.3)	(27.1)	(22.7)	(14.2)
In-kind contributions (%)	1.9	2.2	2.1	-0.3***
	(5.0)	(5.9)	(8.2)	(-3.2)
In euros				
Private donations (cst 2014 €)	3,251	6,639	360	-3,388***
	(6696.2)	(12885.1)	(2057.4)	(-17.7)
Party contributions (cst 2014 €)	2,577	2,335	333	243
	(9931.3)	(9071.2)	(2550.9)	(1.4)
Personal contributions (cst 2014 €)	19,135	19,573	20,016	-439
	(23,433)	(24,925)	(22,085)	(-1)
In kind contributions (cst 2014 €)	468	745	258	-277***
	(1,447)	(3,527)	(1,135)	(-6)
Total revenues (cst 2014 €)	25,495	29,841	21,059	-4,346***
	(33,133)	(45,969)	(22,725)	(-6)
Campaign spending				
Total spending (cst 2014 €)	25,106	28,306	20,872	-3,200***
	(32,797)	(35,321)	(22,628)	(-5)
Obs	5,998	5,705	1,407	11,703

Table 4: Effect of candidates' share of total spending on votes (logarithm of the ratio of the number of votes over abstention)

(a) **Legislative elections**

	All candidates			Multiple times candidates	
	(1)	(2)	(3)	(4)	(5)
Share of district total spending	0.067***	0.065***	0.061***	0.050***	0.018***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Election FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	No
Party FE	Yes	Yes	Yes	Yes	No
Election-Party FE	Yes	Yes	Yes	Yes	Yes
Candidate FE	No	No	No	No	Yes
District-level controls	No	Yes	Yes	Yes	Yes
Candidate-level controls	No	No	Yes	Yes	Yes
R-sq (within)	0.28	0.29	0.30	0.39	0.13
Observations	29,769	27,385	27,066	9,502	9,062
Cluster (district)	572	568	568	551	551
Mean DepVar	-2.8	-2.8	-2.8	-2.1	-2.0
Sd DepVar	1.6	1.6	1.6	1.5	1.5

(b) **Municipal elections**

	All candidates			Multiple times candidates	
	(1)	(2)	(3)	(4)	(5)
Share of district total spending	0.030***	0.029***	0.024***	0.018***	0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Election FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	No
Party FE	Yes	Yes	Yes	Yes	No
Election-Party FE	Yes	Yes	Yes	Yes	Yes
Candidate FE	No	No	No	No	Yes
District-level controls	No	Yes	Yes	Yes	Yes
Candidate-level controls	No	No	Yes	Yes	Yes
R-sq (within)	0.39	0.41	0.45	0.43	0.22
Observations	14,841	13,043	12,888	5,864	5,618
Cluster (district)	1,079	1,054	1,054	932	892
Mean DepVar	-1.4	-1.4	-1.3	-1.0	-1.0
Sd DepVar	1.1	1.0	1.0	1.0	1.0

Notes: * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS estimates. An observation is a candidate-election. The dependent variable is the logarithm of the ratio of the number of votes obtained by a candidate over abstention. All the estimations include district fixed effects, election fixed effects, and party interacted with election fixed effects. The model in Columns (1) to (4) also includes party fixed effects, while the model in Column (5) also includes candidate fixed effects. Standard errors are clustered at the district level. The time-varying district-level controls include the share of the population by age group, occupation and degree, the investment spending in infrastructure, the number of firms, the number of employees, the total payroll, the share of the employees who are part of the top 1% of the income distribution, the total spending at the district level, the number of candidates running, and the number of registered voters. The candidate-level controls include her sex (except in Column (5)), indicator variables for the candidates' political mandates, and an indicator variable equal to one if the candidate is the incumbent and to zero otherwise. Coefficients for the controls are not reported for the sake of space. The upper Table 4a estimates the effect of the share of the district total spending represented by the candidate on the log of the ratio of the votes obtained by the candidate over the abstention for the legislative elections. The bottom Table 4b estimates the same model for the municipal elections. Variables are described in more detail in the text.

Table 5: 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 6: Legislative elections: IV estimates, candidate-level analysis

	Change in spending share			Change in vote share		
	(1)	(2)	(3)	(4)	(5)	(6)
Donations from legal entities	-12.121***	-7.007***	-6.948***			
	(1.007)	(1.145)	(1.141)			
Change in spending share				0.008***	0.006**	0.007**
				(0.002)	(0.003)	(0.003)
District FE				Yes	Yes	Yes
Party FE				No	Yes	Yes
Candidate-level controls				No	Yes	Yes
Party district vote share in 1988				No	No	Yes
Observations	1,527	1,527	1,527	1,527	1,527	1,527
F-stat for Weak identification				145	37	37
Underidentification (p-value)				0.00	0.00	0.00
Mean DepVar				-0.05	-0.05	-0.05
Sd DepVar				0.5	0.5	0.5

Table 7: Legislative elections: IV estimates, party-level analysis

	Change in spending share			Change in vote share		
	(1)	(2)	(3)	(4)	(5)	(6)
Donations from legal entities	-12.239***	-5.518***	-6.940***			
	(1.015)	(1.080)	(1.136)			
Change in spending share				0.005***	0.007*	0.010***
				(0.002)	(0.004)	(0.004)
District FE				Yes	Yes	Yes
Party FE				No	Yes	Yes
Party district vote share in 1988				No	No	Yes
Observations	2,834	2,834	2,834	2,834	2,834	2,834
F-stat for Weak identification				145	26	37
Underidentification (p-value)				0.00	0.00	0.00
Mean DepVar				-0.04	-0.04	-0.04
Sd DepVar				0.6	0.6	0.6

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The models are estimated using IV estimates. Standard errors are clustered at the district level. Columns (1) to (3) report the first stage estimates (the dependent variable is the change in the share of spending) and Columns (4) to (6) the second stage estimates (the dependent variable is the change in the vote share (in log)). An observation is a political party-electoral district. All the political parties present in an electoral district both in 1993 and in 1997 are included. All the estimations include district fixed effects, and estimations in Columns (2)-(3) and (5)-(6) include party fixed effects. In columns (3) and (6) we control for the vote share obtained by the political party in the district in 1988. Coefficients for the controls are not reported for the sake of space. Variables are described in more detail in the text.

Table 8: Municipal elections: IV estimates

	Change in candidate spending			Change in vote share		
	(1)	(2)	(3)	(4)	(5)	(6)
Reliance * Decrease	-0.022***	-0.022***	-0.022***			
	(0.005)	(0.005)	(0.005)			
Change in candidate spending				0.243***	0.235***	0.235***
				(0.073)	(0.075)	(0.075)
Election FE				Yes	Yes	Yes
Candidate FE				Yes	Yes	Yes
Candidate-level controls				No	Yes	Yes
Party district vote share in 1989				No	No	Yes
Observations	371	371	371	371	371	371
F-stat for Weak identification				22.5	22.3	22.3
Underidentification (p-value)				0.00	0.00	0.00
Mean DepVar				-0.04	-0.04	-0.04
Sd DepVar				0.4	0.4	0.4

Notes: * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using IV estimates. Standard errors are robust. Columns (1) to (3) report the first stage estimates (the dependent variable is the change in the candidate spending) and Columns (4) to (6) the second stage estimates (the dependent variable is the change in the vote share (in log)). An observation is a candidate. All the estimations include candidate fixed effects and election fixed effects. The candidate-level controls include indicator variables for the candidates' political mandates, and an indicator variable equal to one if the candidate is the incumbent and to zero otherwise. Coefficients for the controls are not reported for the sake of space. Variables are described in more detail in the text.

Table 9: 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 party	Green party	Socialist party	Right-wing party	Extreme-right party
Communist party spending	1.36***	0.04	-0.39***	-0.22	0.03
	(0.15)	(0.17)	(0.15)	(0.19)	(0.13)
Communist party spending-squared	-0.64***	-0.01	0.09	0.24*	0.05
	(0.11)	(0.12)	(0.11)	(0.14)	(0.10)
Green party spending	0.40	2.88***	-0.08	0.15	0.14
	(0.29)	(0.33)	(0.29)	(0.37)	(0.26)
Green party spending-squared	-0.42	-2.20***	-0.02	-0.00	0.10
	(0.53)	(0.59)	(0.53)	(0.67)	(0.47)
Socialist party spending	-0.09	-0.10	0.69***	-0.12	-0.06
	(0.16)	(0.18)	(0.16)	(0.21)	(0.14)
Socialist party spending-squared	0.06	-0.05	-0.19**	0.09	0.04
	(0.10)	(0.11)	(0.10)	(0.12)	(0.09)
Right-wing party spending	0.76***	0.75***	0.88***	2.45***	0.66***
	(0.12)	(0.13)	(0.12)	(0.15)	(0.11)
Right-wing party spending-squared	-0.34***	-0.39***	-0.42***	-0.98***	-0.28***
	(0.07)	(0.07)	(0.06)	(0.08)	(0.06)
Extreme-right spending	0.47*	-0.03	0.18	0.12	0.30
	(0.25)	(0.27)	(0.25)	(0.32)	(0.22)
Extreme-right spending-squared	-0.55	0.48	-0.03	-0.06	0.24
	(0.34)	(0.38)	(0.34)	(0.44)	(0.30)
Other spending	-1.59***	-1.69***	-1.68***	-2.24***	-1.63***
	(0.07)	(0.07)	(0.07)	(0.08)	(0.06)
Other spending-squared	0.39***	0.45***	0.39***	0.51***	0.40***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
Election and District FE	Yes				
District-level controls	Yes				
Observations	1,451				

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. The coefficients for the district-level controls are not reported here for the sake of space. They are reported in the online Appendix Table D.16. Variables are described in more details in the text.

Table 10: 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	0.38***	0.05
	(0.04)	(0.05)
Left spending-squared	-0.03***	-0.01
	(0.00)	(0.01)
Right spending	0.06*	0.35***
	(0.03)	(0.04)
Right spending-squared	-0.00	-0.02***
	(0.00)	(0.01)
Other candidates' spending	-0.91***	-0.94***
	(0.04)	(0.05)
Other spending-squared	0.12***	0.10***
	(0.01)	(0.01)
Election and District FE	Yes	
District-level controls	Yes	
Observations	1,589	

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 11: Spending and first round turnout: Legislative elections

	Turnout	Turnout	Turnout	Turnout
Total spending	0.32***	0.46*		
	(0.09)	(0.27)		
Communist party spending			0.10	0.13
			(0.40)	(0.44)
Green party spending			2.96***	1.44***
			(0.58)	(0.49)
Socialist party spending			1.05***	1.03***
			(0.26)	(0.32)
Right-wing party spending			0.46**	0.61*
			(0.23)	(0.32)
Extreme-right spending			-1.06**	-0.33
			(0.46)	(0.48)
Spending by other candidates			0.08	0.17
			(0.13)	(0.29)
Election FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
District-level controls	No	Yes	No	Yes
R-sq	0.85	0.89	0.85	0.90
Observations	2,759	2,530	2,759	2,530
Clusters (districts)	572	568	572	568
Mean DepVar	62.4	62.2	62.4	62.2
Sd DepVar	4.9	4.8	4.9	4.8

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. District-level controls are included in Columns (2) and (4). 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.