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Does campaign spending affect electoral outcomes?

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ABSTRACT

This study investigates the effect of candidates' expenditure on elections' results focusing on run-off elections' data. Our analysis, based on all run-off municipal elections in Israel between 1993 and 2008, shows that candidates' share of the vote is not substantially affected by their campaign spending. This outcome contradicts recent results showing that, in a developing country where voting is compulsory, campaign expenditures have a significant effect on vote shares. Yet, it is in line with the evidence of earlier studies based on developed countries showing that the effect of campaign spending is limited. This leads us to suggest that campaign spending may be effective in developing countries with consolidating democracies because compulsory voting forces the relative poor population to turn out and vote, and this population is relatively more impressionable by campaign spending on media advertisements.

1. Introduction

Scholars and policymakers worldwide are interested in analyzing the effect of candidates' campaign expenditures on elections' results because of their concern to preserve a fair democratic process. In every democracy the suspicion arises that individuals with financial resources find a way of influencing policy by making generous donations to candidates. This may be by gaining access to elected politicians (Hall and Wayman, 1990), or by helping to bring about the election of a candidate sympathetic to contributors' ideological and policy preferences (Grossman and Helpman, 2001). This suspicion is justified if campaign spending affects the elections' results. There is also a possibility that candidates with deep pockets use their money to gain an unfair advantage in an election campaign. This would be a cause for concern only if more money made for more votes.

Despite the importance of the issue at hand and the vast interest surrounding it, a definite answer as to whether or not campaign expenditures affect electoral outcomes has proven elusive. There are three main difficulties which affect scholars' ability to identify the effect of campaigning on elections. These are (i) the limited information about the supply side of donations; (ii) partial data on the demand side for donations; and (iii) insufficient data about candidates' resources.

The first difficulty, connected to the supply side of donations, is related to the fact that the characteristics of candidates and voters in an electoral district are correlated with the amount of donations a candidate receives and with the electoral results. For example, a charismatic and well-liked candidate who has a better chance of winning the election is able to obtain donations more easily than a less liked candidate. Thus, we observe a positive correlation between campaign expenditures and electoral results even if in reality it may be the case that expenditures do not have an effect on the popular support for a candidate. Therefore, lack of information on the supply side of donations causes an upward bias on the estimated coefficients. This bias increases as researchers have less available information on the characteristics of the candidate and the electoral district. In general, when only information about the characteristics of incumbent candidates is available, including it into the estimated model could lead to a different bias in the obtained estimates of the effect of expenditure by an incumbent vis-à-vis that of a challenger.

Similarly, a right-wing candidate in a district where voters tend to support left-wing policies may find it difficult to obtain votes and donations, while a left-wing candidate in a district with left-wing

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voters has an easier time gaining votes as well as donations. This creates a positive statistical correlation between the number of votes obtained by a contender and the resources available to her. This positive correlation, deriving from the voters' characteristics in a given district, exists even if in reality expenditures have no effect whatsoever on voters' support.

The second difficulty, which arises from the partial information concerning the demand for donations, is related to candidates' incentive to raise more money when they assess an a priori close contest, compared to their behavior when they expect an easier win in the elections. These situations, when the coefficients are affected by reverse causality, cause a downward bias in the estimated effect of expenditures on electoral support because candidates who win an ex-post close-run race spend more than those who win easily.

Finally, measuring the genuine resources available to candidates, especially the incumbent, is another challenge confronting a study of this kind. The resources accessible to incumbents, such as an official car, free stationery, postage, and telephone services, as well as public appearances, would tend to create a bias if not properly accounted for by the econometrician. Overall, the three empirical difficulties associated with estimating the effect of campaign expenditures on electoral results are so acute that they make it hard to know in advance even the direction of the bias on the estimated coefficients.

In the current study we overcome the difficulties associated with estimating the effects of campaign expenditures on electoral outcomes by using data on run-off elections.[1] The available data, institutional framework, and chosen empirical specification allow us to overcome the severe difficulties of the task at hand. In particular, we focus on all run-off elections in the four mayoral elections in Israel between 1993 and 2008. Our main finding is that expenditures on an election campaign have a weak or negligible effect on the elections' outcomes. The estimated coefficients show that the elasticity of electoral support, as measured by the share of votes in support for a given candidate, with respect to campaign expenditures is in the order of 0.034. This implies that a candidate's standard deviation increase in campaign expenditures (that is, increasing her expenditures by almost 70 percent) leads to an increase of her vote share of only 2 percent.

Levitt (1994) made the first attempt to estimate the effect of campaign expenditures on election's outcomes using repeated elections. He focused on all elections for the U.S. Congress between 1972 and 1990 in which the same two candidates competed in the same district at two different points in time. He found that candidates' expenditures had a relatively weak effect on elections' results. This finding led him to conclude that an expenditure limit should be imposed in these elections and that public funding is unnecessary.

The institutional details behind our case study give us a qualitative advantage over those behind Levitt's (1994) case study. In contrast with the relatively long interval (two or more years) between the two election campaigns in Levitt's (1994) study, the run-off municipal elections in Israel are held 14 days after the first round elections, so that there are virtually no changes between the two electoral contests. The time element is important because the characteristics of the candidates, as they are known to the public, could change in the wake of the accumulation of experience by the incumbent and the exposure of his or her voting record on specific subjects, as well as other events (like embarrassing scandals) occurring between the two repeated elections. Events of this kind affect donations and electoral results. Moreover, according to Levitt's (1994) approach the differences in the two candidates' ability to obtain funds should remain constant over time, even though changes have occurred in the characteristics of the candidates or the electorate in their district. In other words, the identification strategy of Levitt (1994) is problematic if there are changes between the two points in time in the candidates' ability to obtain donations. Yet, Levitt (1994) is able to estimate the effect of campaign expenditures on elections' results only if there were changes in resources over time.

In the present study, public funding regulations that apply to municipal elections in Israel affect the candidates' resources in the first and second round elections. In the first round, public funding is determined by the relative strength of the party headed by the candidate. In the run-off election, however, public resources are divided equally between both candidates irrespective of the party's relative size in the municipality. In addition, the allowed expenditure ceiling in elections shifts between the two rounds. In the first one it depends on a party's relative size, while in the second it is the same for both candidates. This exogenous change in resources and expenditure ceiling makes it possible to identify more precisely the effect of spending on elections' results.

We estimate how the change in available resources between elections in the first and second round and between the two candidates affects the change on the relative support for a candidate between the first and second round elections and between the two candidates. As already noted, our results show that this impact is not of a substantial magnitude or statistically significant. These results are robust to different subsamples of municipalities, different time periods and for different stratifications of the available sample of municipalities with run-offs elections. This null effect is obtained even though the level of public financing of local elections in Israel is very generous, as is indicated by its level per voter, which is higher than that observed in the U.S. presidential elections of 2008 (we are aware of the limitations of this comparison, and it is used solely as an illustration).

There is a striking similarity between the institutional framework of mayoral elections in Israel and that of gubernatorial elections in Brazil, which were recently examined in the important contribution of Da Silveira and De Mello (2011). In their study, Da Silveira and De Mello (2011) follow the course set by Levitt (1994) and use run-off elections to estimate the effect of spending on electoral results. They focus on 34 run-off gubernatorial elections in three election campaigns in Brazil, but using data from thousands of polling stations in those electoral districts. In contrast to Levitt (1994), Da Silveira and De Mello (2011) find that campaign expenditures, in the form of TV advertisement, have a significant effect on electoral results.

Similarly to mayoral elections in Israel, the run-off elections in Brazil are held soon after the general elections (14 days after in the Israeli case and 28 days after in the Brazilian case). In Brazilian gubernatorial elections, political parties receive public funding in kind – in the form of TV advertising time. The amount of time a party receives in the general elections depends on a party's relative size, while in the run-off election it is divided equally between the two candidates. The nature of the contest in the two rounds is also the same in both countries. Several candidates may participate in the general election while the run-off election is only between the two candidates that obtained the most votes in the first round.

[1] There are, of course, other approaches to estimate the effects of campaigning on voting. The most prominent approach is to use instrumental variables to study the question at hand. This approach was pioneered by Jacobson (1978, 1985, 1990) and continued, among many others, by Green and Krasno (1988), Abramowitz (1988, 1991), Gerber (1998), Palda and Palda (1998) and Rekkas (2007). Alternative approaches focus exclusively on close races (Erikson and Palfrey, 2000; Moon, 2006) or look for more detailed information on the sources of campaign contributions (Ansolabehere and Gerber, 1994; Benoit and Marsh, 2008). See Stratmann (2005) for a survey of the literature.

That said, there are two important aspects on the institutional framework of Brazil's gubernatorial elections that raise questions regarding the external validity of Da Silveira and De Mello (2011) results to developed countries. In contrast with the practice in most developed countries, in Brazil voting is compulsory. Fornos et al. (2004) show that compulsory voting brings about a substantial increase in turnout in Latin American countries. Given that voters' turnout is positively correlated with income at the individual level (Blais, 2000; Norris, 2002), compulsory voting is basically forcing relatively poor individuals to cast a vote. Poorer individuals are less politically aware and lack strong pre-existing political attitudes. Therefore, they are more prone to being influenced when exposed to persuasive advertising (Zaller, 1992). This may be the reason that Da Silveira and De Mello (2011) find that the effect of TV broadcasts on voting patterns was greater in underprivileged districts.

The second institutional framework that is particular to Brazil's gubernatorial elections and is less common in developed countries are the constraints imposed on TV and radio advertising. In Brazil's gubernatorial elections public funding is given in the form of time on TV and radio, and candidates are unable to increase their use of TV and radio telecasts beyond their allotted time. As a consequence, candidates may be forced to stop advertising even if the marginal benefits of telecasts exceed their marginal cost. This reason may account for the substantial effect of TV time on voters' support, which may not be present when candidates can choose freely the desired amount of TV and radio advertising.

Our study generalizes the findings of Da Silveira and De Mello (2011) to developed countries. It allows us to study the effects of campaign expenditures on elections' outcomes when voting is not compulsory, and when candidates are free to choose the allocation of campaign expenditures as they see fit. There are a large number of important institutional differences between developed and developing countries that may explain why voters in developing countries are more sensitive to campaigning than voters in developed countries. We mentioned above two possible explanations that are consistent with the available evidence. These explanations are speculative in nature and need to be tested. Of course, one could think of a number of other reasons and channels that could explain the different findings for developed and developing countries. We hope that future research will shed light on the channels driving the different reactions to campaign expenditures.

2. Institutional framework

The present study covers the four municipal election campaigns that took place in Israel in 1993, 1998, 2003, and 2008. Voting is not compulsory in local elections and is executed by dropping two voting slips of different colors in a ballot box, one for mayoral elections and one for the council elections. Every mayoral candidate must head a party which is competing in the municipal election, but not every party has to have a mayoral candidate.

In order to be elected as mayor in the first round a candidate must obtain a plurality and at least 40 percent of the votes. If none of the candidates obtains at least 40 percent of the votes in the first round, a run-off election between the two candidates that obtained the most votes is held 14 days after polling day. In the run-off election the candidate with the most votes is elected. If there is only one candidate in the run-off election (usually because the other candidate renounced to run in this election) she is appointed mayor, provided the number of votes she gains is greater than the number of votes against her.

The funding regulations and expenditure ceiling, which were first determined by law in 1993 (Municipalities Law), were virtually identical in all four electoral years examined in this study.[2] According to these regulations the State gives each municipality a fix amount of money per constituent, which in the 2008 election amounted to NIS 42 (equivalent to $11).[3] The amount of funding a party is entitled to receive from the central government is proportional to the party's share on the elected council, which is equal to the number of votes it received divided by the number of total seats on the council. Determining public funding on the basis of the results of the elections for the incoming council instead of the outgoing one creates uncertainty regarding public funding of the first round. During the electoral campaign the party does not know how much funding it will obtain. In other words, a candidate's expenditures are based on an assessment of his or her party's success in the first round.

To cope with potential problems of credit constraint, a party is entitled to obtain an advance payment equivalent to one seat if it did not have a representative on the outgoing council, or to 60 percent of the number of its seats on the outgoing council. While this rule creates inequality between candidates in the first round, it is replaced by the provision of an equal advance payment in the second round. This constitutes another source of the exogenous differences on public campaign funding between the two rounds, which helps the identification strategy used in the current study.

The regulation that limits campaign spending also gives rise to uncertainty, and as a result parties are liable to exceed that limit, claiming that they did so in good faith on the basis of their estimation of success in the election. By law, parties may not exceed the expenditure ceiling beyond: (i) Double the public funding for which a party is eligible; (ii) Double the public spending for which the party would be eligible if it had retained all its seats on the outgoing council; (iii) 1.5 times the amount of public funding for which the party would be eligible if it won three seats. The expenditure ceiling for a party with a national affiliation (that is, a party which is represented in the Israeli Parliament) is according to (i).

Both the total amount of funding and the funding ceiling change from the first round to the second round. In contrast with the elections in the first round, the funding rules in run-off elections do not give an advantage to a candidate who heads a party with more representatives on the local council. The amount of public funding for each of the two candidates in the run-off round for the mayoralty is identical, and is equivalent to 120 percent of the amount to which a party with one seat on the council is entitled in the regular election. The expenditure ceiling is also identical for both candidates, and is equivalent to one third of the amount of the overall funding for the municipality in the regular election.[4]

[2] Until 1977 there was no public funding of municipal elections. From 1978 to 1992 funding regulations were issued as a provisional order and renewed each time. Between 1993 and 2008 the restrictions on donations were tightened and the unit of calculation altered, but the public funding regulations for first and second round elections remained unchanged.

[3] For purposes of comparison, the amount of money given per constituent is higher than the combined amount spent by Barack Obama and John McCain in the 2008 presidential election in the U.S., which was $4 per constituent (Source: Federal Elections Commission). Note that campaign spending in the U.S. presidential election in 2008 was far higher than it had been in any previous campaign. The comparison with campaign spending in the U.S. presidential campaign is far from straightforward because of the economies of scale of that campaign, but it does indicate that campaign spending in Israel's local elections is not negligible.

[4] The combination of the two rules regarding the amount of funding and the expenditure ceiling creates a higher funding ceiling in large municipalities (relative to small ones) because the number of seats on a local council rises with the number of residents.

The funding regulations apply equally to independent local parties and to parties with a national affiliation (e.g., Likud, Labor), with one difference: the public funding for parties with a national affiliation is at the national level and not at the local level, thus giving the national party freedom to maneuver in the allocation of resources among various municipalities. The headquarters of a national party can allocate a large amount of campaign funding to a given municipality if it assesses that this improves its candidate's chances of being elected. It can do this by allocating fewer resources to another municipal election in which its candidate's chances of winning are weak.[5] This can have an adverse effect on the democratic process because the freedom to maneuver could tip the scales in favor of parties affiliated with a national party vis-à-vis independent local parties. However, this rule is in line with the view that accords democratic value to boosting national parties at the expense of local ones.

Public funding accounts for 70 percent of total campaign spending in the first round and for almost 80 percent in the second one. The difference in public funding regulations between the two rounds gives rise to changes in the candidates' financial abilities, and this helps us identify the causal effect of campaign expenditures on electoral outcomes. In general, it is possible to examine whether the financial advantage embodied in public funding, advance payment, and ceiling in the first round – which benefits a candidate who heads a large party on the council – compared with the public funding, advance payment, and ceiling in the second round, translates into differences in votes between the two candidates between the two rounds.

3. Empirical strategy

The econometric model we use is especially designed to estimate the effects of the difference in expenditure between the two candidates and between the first and second round elections on the difference in the share of votes between the two candidates and the two elections. In particular, consider the following model

$$V_{1,r,i} - V_{2,r,i} = \alpha_0 + \alpha_1 R_r + \alpha_2 (EX_{1,r,i} - EX_{2,r,i}) + \alpha_3 X_i + \upsilon_{r,i}, \quad (1)$$

where $V_{1,r,i}$ represents the vote share for candidate 1 in round r, where candidate 1 is the candidate that obtained a plurality in the first round elections in municipality i and r either refers to a first round election or to a run-off election. In order to compare the candidates' popularity between the two rounds, for each election, we focus exclusively on the share of support for a given candidate out of the total votes for the two candidates that make it to the run-off elections. Similarly, $V_{2,r,i}$ represents the share of votes in round r obtained by the candidate who finished in second place in the first round elections in the same municipality i. Let us denote the difference in the vote share of the candidates in round r in municipality i by $\Delta V_{r,i}$.

R_r is a round fixed effect which takes a value of one for run-off elections and zero for general elections. This variable captures the differences surrounding electoral campaigns in each of the two rounds, the most important of them is perhaps the different number of candidates in the first round and the run-off. X_i is a vector that includes all the characteristics of the candidates and the municipality that are constant across rounds. Regarding the candidates' characteristics, X_i includes their age, education, experience, etc. With respect to the municipality, this vector includes its demographic characteristics (e.g., population size, and residents' ethnicity, income, age and religiosity), as well as constant political preferences of the local population.

Our main variable of interest is $EX_{j,r,i}$. This variable denotes the campaign expenditures of candidate j at round r of the elections in municipality i. In our empirical analysis we use the share of the candidate's expenditures out of the total expenditures of the two candidates, as well as the real expenditure per voter. By using the candidate's relative expenditures, model (1) is basically estimating the elasticity of the vote share in support for a candidate with respect to his or her campaign expenditures. We denote the difference in campaign expenditures in round r in municipality i by $\Delta EX_{r,i}$

The main coefficient of interest is α_2. While the overall consensus is that this coefficient is not negative, related studies disagree as to whether or not this coefficient is positive and of a substantive magnitude. Scholars agree that campaign spending by means of advertising and bringing voters to the polling booth on election day increases the number of voters. They also agree, however, that the marginal effect of campaigning decreases with the level of expenditures, especially at high levels of expenditure. Simply put, the reservoir of voters is limited, so that campaign spending must encounter saturation when a given number of constituents has been reached. A candidate who nears saturation regarding the reservoir of his or her voters must spend an ever-increasing amount to attain an additional vote. Therefore, the magnitude of α_2 depends on the location of the candidate on the curve linking expenditures to number of voters.

It is especially interesting to ascertain whether the candidates stop on the ascending or flat section of the expenditure curve. For example, Gerber (2004) claims that candidates' fear of losing may bring them to overspend on campaign expenditures and, therefore, to the flat part of this curve. Alternative, depending on the sources behind campaign contributions, it may be that large amounts of campaign expenditures deter ideological voters from participating in the political process if they suspect that after the elections politicians will cater to special interest groups (Prat, 2002).

Model (1) assumes that, except for R_r, the effect of all the other explanatory variables does not change between rounds. This implies that the effect of a candidate's characteristics (e.g., age, experience, etc.) is the same in the first and second round. This assumption also applies to α_2, the effect of the candidates' expenditures during an election campaign. This is a problematic assumption if the effect of campaigning during the general election is different from the effect of campaigning during the runoff elections. The voters' saturation mentioned above may cause such a difference on the effects of campaigning between rounds.

We think that this is not a major concern of our empirical design for a number of reasons. First, we expect that rational candidates competing in the runoff elections spend money campaigning only if they believe that this effort pays off at the ballot box. Secondly, strategic candidates take voters' saturation into account when they decide how to distribute their campaign spending across rounds. If candidates expect voters to be saturated during the second round, they would transfer part of their funds to the first round to increase their probability of obtaining 40 percent of the popular vote (and wining the elections outright during the first round). Hence, the strategic behavior of candidates counterbalances concerns related to voters' saturation and assures that the effects of candidates' expenditures are similar across rounds. Finally, the empirical results below show that the

[5] In addition, parties with a national affiliation perceive their budget as being malleable. Various reports of the State Comptroller over the years show that these types of parties often exceed the budget allocated to it by the national party, which has to pay in retrospect for these excesses.

Table 1
Mayoral run-offs elections in Israel.

	1993	1998	2003	2008	Total
Number of municipalities with first-round elections	160	161	156	163	640
Number of municipalities with run-off elections	26	33	44	31	134
One candidate dropped out before the second round	0	2	2	1	5
One (or more) candidates did not submit a financial report	0	1	4	6	11
Reports do not separate expenditures between first and second round	7	3	0	0	10
Report not found in State Comptroller's archive	5	2	1	0	8
Number of observations in empirical analysis	14	25	37	24	100

Data source: Archives of the State Comptroller Office.

effects of campaigning on turnout are robust to different specifications and subsamples of elections. This is the case even when the candidates that make it to the runoff elections obtained little support from the overall population in the general elections, and therefore the reservoir of votes they are competing from is far from saturated.

Under this assumption, model (1) can be formulated twice, once for the first round elections and then for the run-off elections. Subtracting the model that corresponds to the first round elections from that that corresponds to the run-off elections we obtain

$$\Delta V_{RO,i} - \Delta V_{FR,i} = \alpha_1 + \alpha_2(\Delta EX_{RO,i} - \Delta EX_{FR,i}) + \varepsilon_i, \quad (2)$$

where *RO* (*FR*) denotes the differences across candidates corresponding to the run-off (first round) elections. Model (2) allows us to estimate the causal effect of campaign expenditures on electoral support by looking at the effect of the difference in differences in campaign expenditures between the two candidates between the two electoral rounds on the difference in differences in the share of the vote between the two candidates between the two electoral rounds.

Model (2) is the model we estimate in our empirical analysis. Note that X_i, the vector of the characteristics of the candidates and of the municipality, is not included in model (2) because it is constant across rounds. As a consequence, our estimation of the effect of candidates' spending on election's results is not affected by omitted variable bias driven by lack of data on candidates' and municipality's characteristics. That said, there are other concerns with model (2) that we take into account in our estimations. For example, candidates may use a strategic allocation of campaign funds as a function of their beliefs of making it to the second round. Additionally, prior to a second round, a coalition may be formed between candidates standing for election in that round and candidates who did not reach it. This element is particularly important since candidates that make it to the second round obtain, on average, about 60 percent of the voters' support in the first round. That is, 40 percent of the voters don't vote in the first round in support for a candidate that finishes in first or second place in these elections. We address these two concerns in the empirical analysis below.

4. Data description

In order to estimate the effect of campaign spending on mayoral election outcomes we used data from four campaigns in municipalities where run-off elections were held for mayor (in 1993, 1998, 2003, and 2008). As displayed in Table 1, in those four elections 134 run-offs were held. As this table shows, our data set includes only 100 run-offs elections since five candidates resigned before the second round, eleven did not submit a report to the State Comptroller, ten did not distinguish between their expenditures during the first and second rounds, and eight reports were not found in the State Comptroller's archive.[6]

For the purposes of our econometric analysis we combined three different sources of information: data on candidates' public funding and expenditures, data on the elections' results, and data on the characteristics of the candidates and the municipalities. The main database consists of one hundred municipalities in which run-off elections were held, and alongside it we constructed a secondary database of all the municipalities in which regular elections were held in 2008. The information on all the municipalities in Israel is used to compare our results to those that would be obtained based on expenditures and votes shares of only the first round elections.

4.1. Data on candidates' expenditures

For the purposes of this study we use data on candidates' campaign expenditures in the first and second rounds of municipal elections. These data come from reports of the State Comptroller for each of the last four local election campaigns during the time period at issue. These reports summarize the State Comptroller's examinations of the accounts of all the parties and lists that took part in local elections.

For the elections of 2008, the reports contain detailed information on the expenditures of every candidate, regardless of whether the candidate belongs to a local independent party or to a party with a national affiliation. For the electoral campaigns of 1993, 1998 and 2003, however, the reports only include detailed information on the expenditures of local independent parties. Regarding parties with a national affiliation, the reports only include their nation-wide expenditures stratified across parties. For these elections, therefore, we assign expenditures to a party with a national affiliation in a given municipality according to the relative size of this municipality out of all the municipalities in which the national party presented a contender to the local elections.[7]

Table 2 presents summary statistics on candidates' expenditures and public funding. The table shows that on average, candidates that reach the run-off elections spend similar amounts in the first and second round. Total campaign expenditures by these candidates are similar to the amount of public funding they receive. In the first round, public funding covers on average seventy percent of

[6] Out of the 34 municipalities omitted from the estimation, 23 were from the Arab sector. Despite this high number, the representation of Arab municipalities in the data set is still relatively high in comparison with their proportion of the population. Therefore, the omission of these municipalities is not a cause for concern.

[7] We believe that this is a sensible rule to assign expenditures to the different municipalities. That said, we show below that our results are robust to restricting the research population to municipalities in which we have exact information on candidates' campaign expenditures.

Table 2
Summary statistics on campaign expenditures and public funding.

Number of municipalities	Run-off elections					First round elections of 2008
	1993	1998	2003	2008	Average	
	14	25	37	24	100	159
First round elections:						
- Total public funding per constituent	63	63	55	42		
- Public funding per constituent in first round to candidates that reached run-off elections	29.58 (10.86)	15.37 (12.75)	17.46 (12.15)	12.30 (8.88)	17.40 (12.46)	17.02 (10.46)
- Expenditures per constituent of the leading candidate in first round	17.62 (9.30)	14.99 (15.01)	10.56 (6.68)	12.56 (8.72)	13.13 (10.30)	17.25 (11.30)
- Expenditures per constituent of the second candidate in first round	16.06 (11.86)	12.10 (7.88)	11.02 (6.71)	10.35 (6.56)	11.83 (7.95)	11.39 (7.72)
Run off elections:						
- Total public funding per constituent for run-off elections	13.63 (5.31)	11.86 (4.79)	11.26 (3.93)	8.92 (3.47)	11.18 (4.46)	–
- Expenditures per constituent in run-off elections of the leading candidate in the first round	11.59 (7.76)	7.96 (4.22)	7.26 (6.81)	5.24 (2.09)	7.56 (5.81)	–
- Expenditures per constituent in run-off elections of the second candidate in the first round	10.55 (7.53)	6.40 (5.45)	6.60 (5.08)	4.66 (2.70)	6.64 (5.37)	–

Note: All campaign expenditures and campaign public funding are expressed in 2008 NIS. All means are simple averages. Standard deviations appear in parentheses. Data Source: Reports of the State Comptroller, various years.

the candidates' total expenditures. In the second round, public funding covers on average eighty percent of candidates' expenditures. The table also shows that candidates' expenditures in the second round are substantially lower than in the first. This comparison attests to the importance of public funding (which is far less generous in the second round compared to the first round), and its impact on candidates' budgets, especially given the short period between the first and second rounds, which restricts the ability to raise and spend money. The impact of public funding on candidates' expenditures is particularly important for our identification strategy, which focuses on this exogenous change on candidates' available funds to estimate its effects on voters' support. The exogenous decrease in public funding for the second round compared to candidates' available public funding for the first round alleviates the concern that the results of our analysis are affected by voters' saturation to campaigning during the run-off elections.

In addition, the table presents public funding and candidates' expenditures for all the municipal elections of 2008. This column shows that there are marked differences in the amount of expenditures between the leading candidate and the candidate that finishes in second place, which in part is due to reverse causality and omitted variable bias. This shows the difficulty of estimating the effect of campaign expenditures on voters' support by focusing exclusively on general elections.

4.2. Data on municipal elections

Municipal elections in Israel are held for all municipalities on the same day, and are administered by the National Supervisor of Elections in the Interior Ministry. This is the source for our data on elections' results. The available information on municipal elections includes the number of constituents, the number of mayoral candidates in the first round, the number of votes received by each mayoral candidate in each round, the number of votes obtained by each party in the first round, the nature of the candidate's party (independent or affiliated with a national party), and whether any of the candidates is serving as the incumbent mayor. We also gathered data on some of the candidates' characteristics such as their age and gender. These data are described in Table 3.

Table 3 shows that first and second rounds municipal elections in Israel are characterized by a high turnout rate, which tend to be much higher than those observed in developed countries (Ben-Bassat and Dahan, 2012). In fact, there isn't a substantial difference in the turnout rate between the two rounds. In 2008, for example, the average turnout rate in the first round in all municipalities was 68 percent, which is equal to the turnout rate in run-off elections.[8]

The table also shows that the first round elections in municipalities with run-off elections are very disputed. On average, there are four candidates running for mayor on these municipalities. The leading candidate tends to obtain over 33 percent of the votes whereas the other candidate that makes it to the run-off receives around 27 percent of the votes. This is also evident from a relatively low Herfindahl-Hirschmann index (HHI) of concentration.[9] Whereas the HHI tends to be over 0.4 for all municipalities in the elections in the first round (it equals 0.433 for the elections of 2008), this index hoovers around 0.25 in first round elections for municipalities who have also a second round.

The candidate that obtains the highest share of votes in the first round wins in the run-off election 61 percent of the times. Note, however, that if the incumbent mayor participates in a run-off election his or her probability of winning is on average 46 percent. Although there is an incumbency advantage in the first round (incumbent mayors succeed 63 percent of the times in their reelection bid in the first round elections of 2008), the low percentage of incumbent mayors elected in run-off elections is a consequence of negative selection. Simply put, only relatively less popular incumbents are forced to participate in run-off elections.

4.3. Data on the characteristics of the municipalities

Our analysis focuses mainly on municipalities which required a runoff election in order to choose their mayor. A possible concern

[8] Note, however, that turnout in the first round elections of 2008 for municipalities with a run-off election in that year equals 72 percent. This rate is higher than the average turnout for all municipalities because of the high frequency of run-off elections in Arab municipalities, which are characterized by very high turnout in local elections (Ben-Bassat and Dahan, 2012).

[9] The Herfindahl-Hirschmann index of concentration is equal to the sum of the squared shares of votes of each candidate in the first round. The higher the index the more concentrated the votes are in support of a low number of candidates.

Table 3
Summary statistics on electoral outcomes and municipalities economic and demographic characteristics.

Number of municipalities	Run-off elections					First round elections of 2008
	1993	1998	2003	2008	Average	
	14	25	37	24	100	159
Turnout rate	0.726 (0.13)	0.781 (0.23)	0.624 (0.19)	0.677 (0.16)	0.690 (0.20)	0.678 (0.16)
Share of votes for leading candidate in first round	32.58 (3.79)	33.50 (5.51)	32.61 (5.42)	31.59 (6.42)	32.58 (5.47)	52.85 (16.20)
Share of votes for candidate in second place in first round	28.00 (6.56)	28.76 (5.30)	27.05 (6.15)	24.59 (5.97)	27.02 (6.07)	30.78 (10.68)
Share of votes in second round for leading candidate in first round	50.11 (2.90)	53.57 (7.73)	50.15 (12.79)	51.59 (5.15)	51.35 (9.13)	–
Success rate of leading candidate in round 1	0.429	0.680	0.595	0.667	0.610	–
Success rate of the incumbent mayor	0.333	0.571	0.389	0.533	0.464	0.625
Harfindahl-Hirschmann index of all candidates	0.255 (0.052)	0.266 (0.056)	0.244 (0.053)	0.238 (0.055)	0.250 (0.054)	0.433 (0.157)
Herfindahl-Hirschmann index of candidates who did not reach round 2	0.468 (0.243)	0.527 (0.246)	0.398 (0.181)	0.419 (0.217)	0.445 (0.219)	–
Socio-economic index	5.00 (2.04)	4.36 (2.38)	4.78 (1.97)	4.83 (2.30)	4.72 (2.15)	5.08 (2.26)
Proportion of Arab municipalities	0.286	0.560	0.378	0.458	0.430	0.340
Number of Residents	14,174 (18,691)	15,175 (26,428)	17,712 (17,429)	17,174 (24,023)	16,453 (21,485)	29,778 (63,138)

Note: All means are simple averages. Standard deviations appear in parenthesis. The socio-economic index is valid for 2006 and does not change over time. Data Source: Interior Ministry, various years.

with this sample of municipalities is that they are not necessarily representative of the entire population of municipalities in Israel. To alleviate this concern, we also examine the robustness of the results across different types of municipalities, stratifying them according to some of their characteristics, like their population size, their socio-economic level, and whether they are composed of a Jewish or Arab majority.[10]

The three rows at the bottom of Table 3 display the available characteristics of the municipalities.[11] The table shows that the socio-economic level of our sample of interest is not different from that of the general population. That said, the sample of interest contains a relatively large share of municipalities with an Arab majority of residents and a lower number of residents when compared to all municipalities in Israel. In principle, this is a reason for concern since, according to the reports of the State Comptroller, Arab municipalities have lower levels of reporting and compliance with the regulations regarding funding of local elections than Jewish municipalities. We carefully address this difference in our analysis and show that the results of the paper are robust to the exclusion of Arab municipalities. We perform the same robustness test regarding municipalities' number of residents.[12]

5. Main results

This section presents the main results of our paper. Let us start with a simple scatter plot of the relationship between the difference in expenditures and the difference on voters' support between the two leading candidates for each municipality in the first round

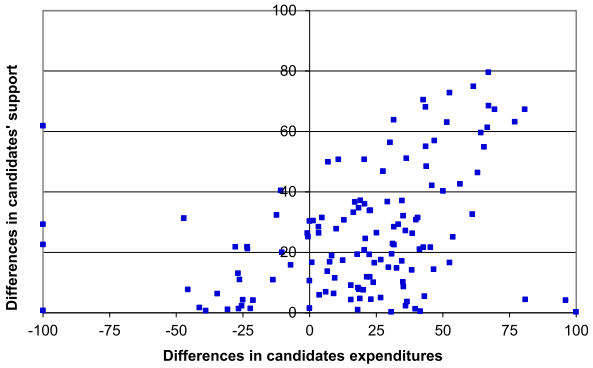

Fig. 1. Differences in candidates' expenditures and support – first round elections of 2008.

elections of 2008, as described in model (1).[13] A simple observation of the raw data may lead us to the conclusion that there is a positive and substantial relationship between campaign expenditures and voters' support. That is, candidates that spend more money during the campaign also obtain a larger share of the votes. A similar conclusion is obtained from Table 4, which shows that this correlation is statistically significant for various specifications focusing on different data samples.[14] That conclusion, however, is not valid since the relationship depicted in Fig. 1 and Table 4 suffers from the serious biases described in the introduction. We present it here simply as a reference point to the main results, which are based on the estimation of model (2).

Table 5 shows the main results of our analysis based on the estimation of model (2). The results shown in Table 5 and Fig. 2, based on the effects of the difference in differences in campaign expenditures between the two candidates between the two

[10] At the request of the Interior Ministry, the Central Bureau of Statistics in Israel divides municipalities into ten socio-economic clusters. The socio-economic cluster of a municipality is determined by its residents' characteristics, like their age, average income, unemployment level, level of motorization, and years of education. The socio-economic cluster affects the financial allocations that municipalities receive from the central government.

[11] The latest available socio-economic index is from 2006. This is not a concern since municipalities' clusters change very slowly over time (Spivak and Justman, 2001).

[12] The observed differences in terms of the number of residents of municipalities with run-off elections and the rest of the municipalities disappear once we exclude from the sample the ten most populous municipalities in Israel.

[13] Fig. 1 includes only data from 2008 because the data on candidates' campaign expenditures in first round elections are not available for earlier years for municipalities without run-off elections.

[14] The sign and statistical significance of the coefficients remain the same if we replace the difference in the *share* of expenditures by both competitors with the difference in the *level* of spending per constituent between the two candidates.

Table 4
The effect of campaign expenditures on voters' support (first round elections of 2008).

	All localities	Without localities with zero observations	Jewish localities	All localities	All localities
	(1)	(2)	(3)	(4)	(5)
Difference in Expenditures in First Round	0.194*** [0.067]	0.343*** [0.065]	0.298*** [0.110]	0.161** [0.068]	0.145** [0.067]
Incumbent Mayor				7.833** [3.856]	5.087 [3.818]
Challenging Candidate (?)				−8.021* [4.342]	−8.341** [4.136]
Age Difference				−0.184 [0.122]	−0.152 [0.117]
Gender				−6.339 [15.326]	−3.285 [14.367]
Socio-Economic Index					2.276*** [0.763]
Population Size (in thds)					−0.003 [0.017]
Constant	22.224*** [1.908]	18.526*** [1.523]	24.144*** [3.423]	27.164* [15.371]	13.666 [15.075]
Adjusted R^2	0.1104	0.2337	0.1868	0.1674	0.2112
Number of Observations	132	125	98	132	132

Note: Estimated via OLS. Dependent variable is the difference in the relative support between two candidates with most votes in general municipal elections of 2008. Robust standard errors appear in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

electoral rounds on the difference in differences in the share of the vote between the two candidates between the two electoral rounds, are substantially different from those observed in Table 4. Fig. 2 clearly depicts that there isn't a strong correlation between campaign expenditures and voters' support.[15] Table 5 confirms that the effect of campaign expenditures on voters' support is negligible and not statistically different from zero.[16]

The elasticity estimated on the basis of model (2) is small and not of a substantial magnitude for different sub-samples of the data. It equals 0.034 when using all run-off elections, and it does not change much when we restrict our sample to municipalities for which we have the candidates' actual campaign expenditures (Columns 2 to 6). We first examine whether the estimated elasticity changes when we exclude two outliers (Column 2), or the ten municipalities in which one candidate (or both of them) submitted a report to the State Comptroller stating that he or she did not have any campaign expenditures during the elections (Column 3) because the veracity of such a report is questionable. The elasticity of campaigning on voters' support rises slightly to 0.048 and 0.054 respectively, for these sub-samples. These coefficients are only marginally statistically significant.

We also restrict the sample to include only Jewish municipalities given the State Comptroller's claims casting doubts on the veracity of the reports in Arab Municipalities.[17] Restricting the estimation to Jewish municipalities increases the estimated elasticity of campaigning on voters' support to 0.085, a level that is not of a substantial magnitude. According to this coefficient, if a candidate increases her campaign expenditures by 50 percent (evaluated at the average, this implies an expenditure of NIS 30 per voter instead of NIS 20 per voter) her share of voters' support increases only by 4.25 percentage points.

The low (and not statistically significant) estimated elasticity is not sensitive to the exclusion of municipalities for which we had to calculate the expenditure of candidates affiliated with a national party (Columns 5 and 6). It is also not affected when we look at different election campaigns over time (Columns 7 to 10), and when we stratify the sample according to municipalities' socio-economic index and number of residents (Columns 11 to 14). These results are substantially different from those observed in Table 4 and from those reported by Da Silveira and De Mello (2011), which apply a similar identification strategy to gubernatorial elections in Brazil. In particular, Da Silveira and De Mello (2011) report an elasticity of campaigning on voting shares equal to 0.27.[18]

A comparison of Tables 4 and 5 reveals that focusing exclusively on first round elections delivers coefficients that suffer from a positive bias. One of the causes for the positive bias in the first round elections is the system of public funding implemented in Israel. As explained earlier, public funding for a candidate's party depends on the number of votes that he or she is expected to obtain in the first round elections. As a consequence of this mechanism, candidates who believe that they will gain many votes are able to spend more in campaigning. Therefore, this funding mechanism causes a mechanical association between campaign spending and voters' support in the first round, which results in the positive bias of the estimated coefficients.[19]

6. Sensitivity analysis

While the characteristics of the two candidates and of the municipality where the elections are conducted do not vary during the two-week interval between the first and second round, there are some differences between these two rounds that may potentially affect our results. Whereas in the run-off elections there are only two candidates competing against each other, there is no restriction on the number of candidates competing in the first round elections.

[15] This figure also shows that there are two outlier data points in terms of differences in differences in candidates' support. In the elections of 2003 in Rame and Kfar Kana the candidate that obtained a slight majority in the first round (the share of the votes of the leading candidate out of the votes for both candidates was 50.9 in Rame and 58.4 in Kfar Kana) did not run in the second round and received a very small fraction of the votes in this round (8.26 percent in Rame and 2.78 in Kfar Kana). Column 2 in Table 5 shows that removing these two observations from our analysis does not affect our results.

[16] The estimated effect remains small and non-significant also when we use the differences in differences in the levels of expenditures per constituent between the two candidates as our main independent variable of interest instead of focusing on their share of expenditures.

[17] As an indication that reports submitted by Arab municipalities are less reliable note that nine of the ten municipalities in which the candidates stated that they had no expenses were Arab municipalities. Moreover, a failure to submit a report to the State Comptroller is more frequent in Arab municipalities.

[18] Recent evidence from Mexico further highlights the difference on the effects of campaigning on voters' support between developing and developed countries. Larreguy et al. (2014) find that providing exogenous regional access to political advertising based partially on previous vote shares at the national level has a significant and substantial effect on voters' support in Mexico, which like Brazil, is classified as a consolidating democracy.

[19] Allocations by the national party to the subsidiary local party constitute another factor which could cause the estimated coefficient to be upwardly biased. Expenditures by a local party with a national affiliation are not necessarily equivalent to public funding because they may be influenced by forecasts made by the national party regarding the candidate's chances of winning. The national party may allocate more funds to a candidate with good chances of winning than to one who is expected to lose the election, thereby creating an association between spending and voters' support through their assessments.

Table 5
The effects of differences in candidates expenditures between candidates between rounds on the differences on candidates' support between candidates between rounds.

Variable	All	Excluding Rame and Kfar Kana	Excluding entries with zero expend	Excluding Arab municipalities	Excluding entries with estimated expenditures	Excluding entries with national parties	Without 1993 elections
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Difference of candidates' expenditures between the two rounds	0.034 [0.037]	0.048* [0.028]	0.054* [0.033]	0.085** [0.035]	0.022 [0.040]	0.033 [0.045]	0.050 [0.038]
Constant	−8.428** [3.383]	−8.457** [3.468]	−8.313** [3.768]	−6.368** [2.890]	−16.899** [7.670]	−16.641 [12.032]	−1.373 [2.590]
Adjusted R-Squared	0.0124	0.0720	0.0493	0.2330	−0.0213	−0.0505	0.0291
Number of Observations	100	98	90	57	67	53	86

Variable	Without 1998 Elections	Without 2003 Elections	Without 2008 Elections	Socio-economic index		Population size	
				Above median	Below median	Above median	Below median
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Difference of candidates' expenditures between the two rounds	0.027 [0.048]	0.023 [0.040]	0.030 [0.042]	0.059 [0.038]	0.038 [0.053]	0.041 [0.064]	0.010 [0.039]
Constant	−8.413*** [3.344]	−8.406*** [3.332]	−8.420** [3.363]	−6.818* [3.883]	−9.761* [5.782]	−9.475** [4.657]	−7.980* [4.590]
Adjusted R-Squared	−0.0365	0.0682	0.0097	0.1577	−0.0103	−0.0224	0.0110
Number of Observations	75	63	76	50	50	50	50

Note: Estimated via OLS. Dependent variable is the difference between candidates between rounds of the relative support for each candidate. Robust standard errors, adjusted for clustering at the municipality level, appear in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

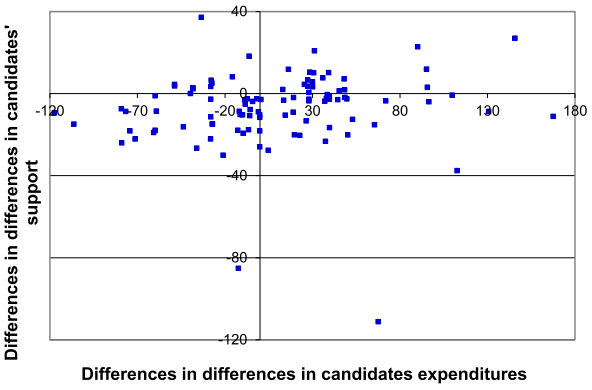

Fig. 2. Differences in Differences in expenditures and support between candidates between first and second round elections.

The changing characteristics of the two election campaigns as well as strategic considerations in the allocation of resources may affect candidates' behavior, and hence the results of our estimation. The results could be influenced by (i) ceiling effects if the two candidates in the second round obtained also a substantial share of votes in the first round; (ii) the formation of coalitions immediately after the first round elections but prior to the second round; and (iii) saturation effects if the candidates already spent a large amount of money campaigning during the first round elections. This section examines whether any of these concerns affect the main conclusions of this paper.

6.1. Forming coalitions prior to the run-off elections

In the framework of a coalition agreement some of the candidates who lost in the first round may give a public endorsement to one of the candidates who have gone forward to the second round. This may cause a downward bias in the estimated coefficient of interest, since the candidate who forms a broad coalition with candidates who lost in the first round may spend less money in campaigning because she is confident of the strength of the coalition. Meanwhile, her opponent spends more in order to defeat her. In this case the candidate heading the coalition spends less but gains more votes, while her opponent spends more but receives fewer votes.

Clearly, the importance of forming coalitions increases with the share of voters who did not vote for either of the 2 second-round candidates. This factor is potentially important in local elections in Israel since on average about 40 percent of voters did not vote in the first round for either of the candidates competing in the run-off elections. This also lead us to believe that the results are not affected by ceiling effects, since run-off candidates are competing for the support of a sizable share of the electorate.

Unfortunately, we do not have direct information about either coalitions formed (if this was indeed the case) prior to the run-off elections or the extent of voters' compliance with candidates' endorsement of a specific candidate in the second round. Consequently, we examine the sensitivity of the results to the conditions which encourage or discourage the formation of coalitions, such as the share of the population which did not vote for either of the 2 second-round candidates, how disperse the votes obtained by candidates who do not make it to the run-off elections are, the participation in the election of an incumbent candidate, and the relative power of the candidates who reached first, second, and third place in the first round.[20]

In order to examine the sensitivity of our main findings we divided the observations into two groups for each of the parameters presented above, and estimated model (2) for both groups. The results of these estimations appear in Table 6. This table shows that the estimated effect of campaign spending on elections' outcomes is consistently low across the different subsamples. The results suggest that in some situations that are less conducive to the formation of coalitions, campaign spending has a significant effect on voters' support. This is the case when we restrict the sample to municipalities in which candidates that do not reach the run-off

[20] Municipal elections in Israel do not deal with ideological issues prevalent at the national level. As a consequence, most of the parties competing in municipal elections are local parties unaffiliated with national parties. Local parties do not have a defined ideology regarding issues on the national arena and are prone to form coalitions with any other party willing to promote their demands at the municipal level.

Table 6
The effects of differences in candidates expenditures between candidates between rounds on the differences on candidates' support between candidates between rounds.

Variable	All	Votes for candidates that do not make run-off		HHI of candidates that do not make run-off		Vote share of candidate with most votes in first round	
		Above median	Below median	Above median	Below median	Above median	Below median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Difference of candidates' expenditures between the two rounds	0.034 [0.037]	0.005 [0.058]	0.073** [0.035]	0.088** [0.035]	−0.010 [0.054]	0.068 [0.042]	0.031 [0.049]
Constant	−8.428** [3.383]	−12.555** [6.036]	−4.085*** [1.065]	−4.792*** [1.093]	−11.868* [6.007]	−7.577** [3.537]	−9.643 [6.037]
Adjusted R-Squared	0.0124	0.0309	−0.0373	0.0601	−0.0651	0.0255	−0.0360
Number of Observations	100	50	50	50	50	50	50
Candidates' expenditures							
Expenditures in first round of elected candidate	11.7	10.2	13.2	13.0	10.4	14.0	9.4
Expenditures in second round of elected candidate	7.8	6.6	9.1	8.9	6.8	8.9	6.8
Expenditures in first round of second place candidate	13.3	10.7	15.8	15.7	10.9	15.6	10.9
Expenditures in second round of second place candidate	6.4	5.4	7.3	7.2	5.5	7.4	5.4

Variable	Votes difference between candidates in first and second place		Votes difference between candidates in second and third place		Incumbent in race	
	Above median	Below median	Above median	Below median	Yes	No
	(8)	(9)	(10)	(11)	(12)	(13)
Difference of candidates' expenditures between the two rounds	0.012 [0.078]	0.045 [0.030]	0.059 [0.044]	0.020 [0.055]	0.065 [0.043]	0.029 [0.057]
Constant	−21.095*** [5.084]	−1.317 [1.534]	−2.789 [2.022]	−13.955** [5.666]	−6.226* [3.348]	−11.882* [7.132]
Adjusted R-Squared	0.0607	−0.0012	−0.0098	−0.0245	0.0572	−0.0367
Number of Observations	50	50	50	50	56	44
Candidates' expenditures						
Expenditures in first round of elected candidate	12.4	11.0	12.9	10.5	13.1	10.0
Expenditures in second round of elected candidate	9.0	6.7	8.2	7.5	7.5	8.3
Expenditures in first round of second place candidate	11.8	14.8	14.4	12.1	13.0	13.6
Expenditures in second round of second place candidate	5.7	7.0	6.8	5.9	6.7	6.0

Note: Estimated via OLS. Dependent variable is the difference between candidates between rounds of the relative support for each candidate. Robust standard errors, adjusted for clustering at the municipality level, appear in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

election are not very popular (column 3), or when the distribution of votes for candidates who loose in the first round is highly disperse (column 4). That said, the significant coefficients are not of an important magnitude, and the remaining estimated coefficients are not even significant. For example, the results are robust to whether or not the leading candidate receives a high share of votes in the first round (columns 6 and 7), or whether there is a third candidate that receives a significant support in the general elections (columns 10 and 11).[21] These results confirm our beliefs that ceiling effects are not affecting the estimation. If at all, we observe null coefficients in cases where ceiling effects are less likely to affect our results (i.e., when a higher share of votes went for candidates that did not make the run-off elections or when those votes are not concentrated on a low number of candidates).

The bottom rows of each panel of Table 6 present the average expenditures of the winner and loser of the run-off election for each subgroup. These rows show that there aren't any clear differences in the candidates' expenditures across the two subgroups to lead us to believe that the possibility of forming a coalition is substantially affecting our estimation. For example, by looking at columns 2 and 3, we observe that candidates' spending in both rounds is correlated with a sizable portion of the electorate not voting for the candidates that contend in the run-off elections. That said, the elected candidate's expenditures in the second round as a share of her total expenditures equal 40 percent in both cases. The contender share of expenditures in the second round is also very similar for both groups of elections, and equals 0.33 percent according to the second column and 0.31 percent according to the third column. Finally, regardless of the political strength of candidates that do not make it to the second round, the elected candidate ends up outspending the contender in the second round by almost 20 percent (0.182 according to column 2 and 0.198 according to column 3). These facts are consistent across every other pair of subgroups. These observations, together with the estimated coefficients across subgroups, lead us to conclude that political alliances (to the extent that they occur) do not affect our results.

6.2. Strategic allocation of resources

Candidates who believe they have a chance of advancing to the second round may spend less money in the first round while keeping back reserves for the run-off elections. This possibility should not have a marked effect on the precision of the estimation of the effectiveness of campaign spending if the two candidates who move forward to the second round make similar forecasts. However, candidates may behave differently if they have different

[21] Results are the same when we tabulate the sample by the leading candidate's party share of the votes for the local council instead of the mayoral election.

Table 7
Share of campaign expenditures in first round elections out of candidates' total expenditures.

	Median	First place	Second place
Share of Campaign Expenditures in General Elections out of Candidates' Total Expenditures for:			
- All available municipalities		0.61 (97)	0.63 (95)
- Only Jewish Municipalities		0.64 (57)	0.65 (56)
- Municipalities in which the Incumbent Mayor Participated in run-off Elections		0.65 (55)	0.63 (55)
- Difference in Share of Votes between First and Second Place in first round elections is greater than Median	4.8	0.62 (50)	0.61 (48)
- Share of Votes for Winner of first-round elections is lower than the median	34.24	0.61 (47)	0.62 (44)
- Share of votes for candidates that finish third or lower in first round elections is lower than median	38.14	0.59 (48)	0.65 (49)
- Difference in Share of Votes between Second and Third Place in first round elections is lower than Median	5.48	0.61 (46)	0.59 (44)
- Herfindahl-Hirschmann Index below the Median	0.38898	0.62 (48)	0.64 (45)

Note: Number of observations appears in parentheses. The median value of all categories is calculated based on all elections.

beliefs regarding their chances of advancing to the second round. For example, while one candidate may be relatively sure of advancing to the run-off stage, her opponent may be involved in a contested race for second place in the general elections. In this case, the contestants for second place may not be able to leave significant reserves for the second round because of the risk of not reaching the second round at all.

Table 7 examines whether candidates' allocation patterns are sensitive to their place in the general elections as well as other characteristics of the election. The table shows that candidates spend 61 percent of all their campaign expenditures in the first round. Importantly, the table also shows that the behavior of the candidate who finishes in first place in the first round is not significantly different from the behavior of the candidate who finishes in second place. In particular, it is evident from the table that candidates do not keep reserves back for the second round even if they have substantial chances of making it to the run-off elections. For example, the candidate that finishes in first place in the first round does not seem to save money for the run-off elections even when (i) she wins the first round elections by an important margin of votes; (ii) when the candidate that finishes in third place is not that popular; (iii) or when the share of votes for the candidate in first place is less than the median.

These figures (together with the results in Table 6) alleviate concerns regarding the effects of voters' saturation to campaigning on the estimated coefficients. The tables show that the popularity of the leading candidate (as measured by her vote share in the first round), or the popularity of the candidate in second place vis-à-vis the candidate in third place, do not affect the estimated coefficients or the candidates' campaign expenditures across rounds.

As already mentioned above, it is likely that candidates' decisions are affected by their beliefs of winning the election or making it to the second round. If that is the case, and given that public funding is substantially lower for the run-off elections, we should expect that candidates that are more likely to make it to the run-off elections spend less money during the first round. Yet, even in these cases where we should not expect saturation effects (e.g., when the leading candidate and the candidate in second place are very popular) the estimated coefficients are not substantial or statistically significant.

6.3. Replacing campaign expenditures with party size in the outgoing council

A remaining concern with our identification strategy may be that even the differences in differences in campaign expenditures between the two leading candidates and between the two electoral rounds are correlated with some of the candidates and municipalities' characteristics. This subsection alleviates this concern by focusing exclusively on candidates' public funding.

Public funding depends entirely on the candidates parties' share in the incoming council, which is clearly affected by the candidates and municipalities' characteristics as well as the elections' results. Therefore, we use as our variable of interest the share of seats gained by the candidates' parties in the previous first round elections. Given the persistence on voters' preferences, expenditures ceiling on local parties, and the size of the advance payment of a party's share of public funding, there is a positive correlation between candidates' expenditures in ongoing elections and their party's share on the outgoing council. This correlation equals 0.2942 and, while significant at the 1 percent level, is not particularly high.

The analysis in this subsection uses as our main explanatory variable the differences in candidates parties' share of seats gained in the municipal council in the previous election between candidates and between rounds. Given that public funding in the second round is the same for both candidates, we assign an equal share to both candidates participating in the run-off elections. Importantly for our purposes, this variable is exogenous to the results of the present election campaign. A candidate who heads a party with a large share in the outgoing council has an (exogenous) advantage in terms of resources in the first round vis-à-vis a candidate from a smaller party or one from a new party. This exogenous advantage vanishes in the second round because of the equal division of public funding between the two candidates in that round. Thus, it is possible to examine whether the contraction of the exogenous advantage in public funding translates into a decline in the share of votes gained by the candidate with that advantage.

Table 8 presents the results of this robustness test. The regressions based on the share of parties in local councils yield very similar results to those observed in Table 5. When we focus on this alternative explanatory variable we also observe that the estimated elasticity of voters' support on campaign funding is positive, yet neither of a substantial magnitude nor statistically significant. This result is robust to all the different subsamples of municipalities that appear in the different columns of Table 8.

7. Conclusions

This study shows that the expenditures of candidates in an election have little effect on elections' results. This outcome is confirmed by several sensitivity tests conducted in the framework of this study. This finding is fundamentally different from the substantial effect of campaigning found in gubernatorial elections in Brazil and congressional elections in Mexico, but is consistent with many of the studies focusing on developed countries, first and foremost the U.S. [Jacobson (1978, 1985, 1990), Levitt (1994), Gerber (2004)]. Unlike most of those studies, however, we use data from run-off elections, which are held two weeks after the first round elections together with exogenous changes in public funding

Table 8
The effects of differences in candidates parties' share of local council seats between candidates between rounds on the differences on candidates' support between candidates between rounds.

Variable	All	Excluding Rame and Kfar Kana	Excluding entries with zero expend	Excluding Arab municipalities	Excluding entries with estimated expenditures	Excluding entries with national parties	Without 1993 elections
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Difference of candidates' expenditures between the two rounds	0.024 [0.021]	0.025 [0.020]	0.016 [0.020]	0.008 [0.024]	0.065* [0.037]	0.058 [0.042]	0.029 [0.023]
Constant	−5.985** [2.6ss08]	−5.976** [2.617]	−5.650** [2.773]	−7.059** [3.047]	−12.879** [6.255]	−5.168 [8.754]	−0.841 [0.235]
Adjusted R-Squared	0.0033	0.0350	0.0067	0.1179	−0.0152	−0.0379	0.0127
Number of Observations	91	89	82	52	59	46	78

Variable	Without 1998 Elections	Without 2003 Elections	Without 2008 Elections	Socio-economic index		Population size	
				Above median	Below median	Above median	Below median
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Difference of candidates' expenditures between the two rounds	0.033 [0.028]	0.031 [0.023]	0.005 [0.024]	−0.007 [0.025]	0.069 [0.043]	0.037 [0.030]	−0.008 [0.030]
Constant	−5.938** [2.647]	−5.948** [2.655]	−6.082** [2.547]	−8.004** [3.253]	−2.039 [4.337]	−8.773* [4.745]	−4.356 [2.725]
Adjusted R-Squared	−0.0273	0.0775	−0.0040	0.0798	0.0200	−0.0276	0.0133
Number of Observations	69	58	68	46	45	46	45

Note: Estimated via OLS. Dependent variable is the difference between candidates between rounds of the relative support for each candidate. Robust standard errors, adjusted for clustering at the municipality level, appear in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

between rounds, which allow us to overcome concerns related to omitted variable bias and reverse causality.

The level of economic development in Israel, its democratic institutions, and the fact that voting is voluntary may be the reasons for the difference between our results and those found by Da Silveira and De Mello (2011). Moreover, the ban on buying additional TV advertising time in Brazil beyond the allocated portion may be forcing candidates to stop advertising at a point where the marginal productivity of campaign spending is still high, whereas generous public funding in Israel brings the candidates to an outcome where marginal productivity is low.

The small effect of campaign spending that we find is surprising. It immediately leads us to the question: why do candidates invest time and effort in fund-raising for an election campaign if these funds have little or no effect? The puzzle behind this question is amplified when we notice that, according to newspapers' reports, some candidates disobey the law in order to further increase their resources. While we do not investigate why the effect of campaign spending on electoral results is so small, we raise below several hypotheses for this fact which are based on the related literature and are consistent with our findings.

The first hypothesis, already stated above, is that the low marginal productivity of financial resources may reflect exaggerated public funding which leads candidates to excessively high levels of spending. This hypothesis, however, is not convincing if the marginal amount spent in campaigning comes from donations. A second hypothesis is that the candidates do not behave rationally and invest in fund-raising despite its low productivity. This hypothesis would appear to be reasonable in view of the emotional turmoil in which contestants find themselves during an election campaign, which is not conducive to making efficient decisions. However, we have no indications whatsoever regarding this hypothesis. Another possibility is that candidates may be behaving rationally and best responding to each other. Yet, their spending cancels each other out and they end up in an inefficient equilibrium whereby popular support for each candidate would have been the same without any campaign spending.

A third hypothesis is that the low effect is consistent with the contention that fund-raising increases financial resources and serves to increase the number of votes, but also suppresses the motivation of the ideological public to vote for a candidate, so that in the final event the marginal amount of money from fund-raising has limited effect (if any). Of course, the extreme case of ineffectiveness is valid if the candidate who raises funds is not aware of the full suppression of ideological votes caused by fund-raising.

Finally, the low effect may stem from the insurance concept that candidates could attribute to campaign spending. Candidates who expect to win would still spend money in an election campaign in order to avoid rare instances of losing, so that the measured effectiveness of expenditure is low or zero. In effect, there may be extreme cases in which more expenditures may even detract from the number of votes.

It is important to test these hypotheses because the policy implications of our study depend, to a great extent, on the mechanism that brings about an insignificant effect of spending on electoral outcomes. We hope that additional studies will shed more light on these mechanisms.

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References

Abramowitz, Alan I., 1988. Explaining senate election outcomes. Am. Polit. Sci. Rev. 82 (2), 385–403.
Abramowitz, Alan I., 1991. Incumbency, campaign spending, and the decline of competition in U.S. house elections. J. Polit. 53 (1), 34–56.

Ansolabehere, Stephen, Gerber, Alan, 1994. The mismeasure of campaign spending: evidence from the 1990 U.S. house elections. J. Polit. 56 (4), 1106–1118.
Ben-Bassat, Avi, Dahan, Momi, 2012. Social identity and voting behavior. Public Choice 151 (1–2), 193–214.
Benoit, Kenneth, Marsh, Michael, 2008. The campaign value of incumbency: a new solution to the puzzle of less effective incumbent spending. Am. J. Polit. Sci. 52 (4), 874–890.
Blais, Andre, 2000. To Vote or not to Vote: the Merits and Limits of Rational Choice Theory. University of Pittsburgh Press, Pittsburgh.
Da Silveira, Bernardo S., De Mello, João M.P., 2011. Campaign advertising and election outcomes: quasi-natural experiment evidence from gubernatorial elections in Brazil. Rev. Econ. Stud. 78 (2), 590–612.
Erikson, Robert S., Palfrey, Thomas R., 2000. Equilibria in campaign spending games: theory and data. Am. Polit. Sci. Rev. 94 (3), 595–609.
Fornos, Carolina, Power, Timothy J., Garand, James C., 2004. Explaining voter turnout in Latin America, 1980 to 2000. Comp. Polit. Stud. 37 (8), 909–940.
Gerber, Alan, 1998. Estimating the effect of campaign spending on election outcomes using instrumental variables. Am. Polit. Sci. Rev. 92 (2), 401–411.
Gerber, Alan, 2004. Does campaign spending work? Am. Behav. Sci. 47 (5), 541–574.
Green, Donald Philip, Krasno, Jonathan S., 1988. Salvation for the spendthrift incumbent: reestimating the effects of campaign spending in house elections. Am. J. Polit. Sci. 32 (4), 884–907.
Grossman, Gene, Helpman, Elhanan, 2001. Special Interest Politics. MIT Press, Cambridge.
Hall, Richard L., Wayman, Frank W., 1990. Buying time: moneyed interests and the mobilization of bias in congressional committees. Am. Polit. Sci. Rev. 84 (3), 797–820.
Jacobson, Gary C., 1978. The effects of campaign spending in congressional elections. Am. Polit. Sci. Rev. 72 (2), 469–491.
Jacobson, Gary C., 1985. Money and votes reconsidered: congressional elections, 1972–1982. Public Choice 47 (1), 7–62.
Jacobson, Gary C., 1990. The effects of campaign spending in house elections: new evidence for old arguments. Am. J. Polit. Sci. 34 (2), 334–362.
Larreguy, Horacio A., Marshall, John, Snyder Jr., James M., 2014. Leveling the Playing Field: How Equalizing Access to Political Advertising Helps Locally Non-dominant Parties in Consolidating Democracies. Unpublished Manuscript. Harvard University.
Levitt, Steven D., 1994. Using repeat challengers to estimate the effect of campaign spending on election outcomes in the U.S. house. J. Polit. Econ. 102 (4), 777–798.
Moon, Woojin, 2006. The paradox of less effective incumbent spending: theory and tests. Br. J. Polit. Sci. 36 (4), 705–721.
Norris, Pippa, 2002. Democratic Phoenix: Reinventing Political Activism. Cambridge University Press, New York.
Palda, Filip, Palda, Kristian, 1998. The impact of campaign expenditures on political competition in the French legislative elections of 1993. Public Choice 94 (1–2), 157–174.
Prat, Andrea, 2002. Campaign spending with office-seeking politicians, rational voters, and multiple lobbies. J. Econ. Theory 103 (1), 162–189.
Rekkas, Marie, 2007. The impact of campaign spending on votes in multiparty elections. Rev. Econ. Statist. 89 (3), 573–585.
Spivak, Avia, Justman, Moshe, 2001. The socio-economic dynamics of local authorities. Econ. Q. 48 (4) in Hebrew.
State Comptroller, 1994. Report on the Results of the Review of the Accounts of the Parties and Lists that Participated in the Local Elections held in November 1993 (in Hebrew).
State Comptroller, 1999. Report on the Results of the Review of the Accounts of the Parties and Lists that Participated in the Local Elections held in November 1998 (in Hebrew).
State Comptroller, 2004. Report on the Results of the Review of the Accounts of the Parties and Lists that Participated in the Local Elections held in October 2003 (in Hebrew).
State Comptroller, 2009. Report on the Results of the Review of the Accounts of the Parties and Lists that Participated in the Local Elections held in November 2008 (in Hebrew).
State Comptroller, 2010. Report on the Results of the Review of the Accounts of the Parties and Lists that Participated in the Local Elections held in November 2008 (in Hebrew).
Stratmann, Thomas, 2005. Some talk: money in politics. A (partial) review of the literature. Public Choice 124 (1–2), 135–156.
Zaller, John R., 1992. The Nature and Origins of Mass Opinion. Cambridge University Press, Cambridge.