Returns to Political Contribution in Housing Markets

Rui Yu*

January 1st, 2020

PRELIMINARY AND INCOMPLETE

Abstract

Are there returns to political contribution? This paper investigates whether political donation influences regulation in the market for one of the largest asset classes in the U.S.—real estate. Using new data on local campaign donors linked to sellers of new construction in Corelogic, a regression discontinuity design tests whether political contribution purchases regulatory outcomes. Donating around a thousand dollars to a narrowly elected mayor significantly increases the donor's sales of new construction by 12 percent. Nesting these estimates in a model of a competitive policy market, I derive the price of a regulatory permit in U.S. municipalities; a firm can pay a mayor $67,567 for regulatory approval of new housing. These findings are consistent with a modest investment return on contributing to a local politician in the U.S.

*Yu: Wharton School, University of Pennsylvania, ruiyu@wharton.upenn.edu
I thank my advisers Fernando Ferreira and Joe Gyourko for guidance and support on the project. I thank Qingqing Chen, Tom Cui, Don Davis, Matt Davis, Gilles Duranton, Felipe Flores-Golfin, Caitlin Gorback, Jessie Handbury, Nina Harari, Christian Hilber, Rhiannon Jerch, Ben Keys, Jeanna Kenney, Jake Krimmel, Corinne Low, Marc Meredith, Tatiana Mocanu, Rafael Pucci, Jonah Rexer, Stuart Rosenthal, Todd Sinai, Katja Seim, Holger Sieg, Elisabet Viladecans-Marsal, Hongyu Xiao, and participants in BEPP 900, Wharton Urban Lunch, IEB/UEA Summer School, European Meetings of the UEA, and MIDAS research seminar for helpful comments. Support from Zell/Lurie Real Estate Center, GAPSA, Wharton Doctoral Programs, and Mack Institute Research Fellowship are gratefully acknowledged. Ryan Infante, Lauren Kim, and Johann Portmann provided excellent research assistance and work by Digital Divide Data is appreciated.

1 Introduction

> Like most situations, its 20 percent technique, and 80 percent politics and communication.
>
> *Orientation to the Land Development Process*, National Association of Home Builders

Regulation is important for addressing market failures, but policy in practice strays from the optimal prescribed by economic theory. The theoretical literature has in turn modeled the agency frictions in the political process underlying regulation (Stigler [1971], Laffont and Tirole [1991]). However, empirical work on that political process faces several challenges. First, data and measurement of how politicians and interest groups interact are elusive. Second, the highly strategic setting of politics limits opportunities for credible inference.

This paper investigates whether political contribution can influence regulation and, in turn, prices and quantities in the economically important real estate market. In the U.S., mayors overseeing approvals for property development also solicit monetary contributions from development firms to fund election campaigns. Why do firms and individuals donate to politicians? Can donors influence the regulatory process if their beneficiary comes to power? If so, does the political process underlying regulation affect market prices and quantities?

To make progress on addressing these questions, I exploit a quasi-experiment to estimate the return on contributing to a mayor in the U.S. Specifically, I compare construction industry donors of the winning candidate to donors of the runner-up in a regression discontinuity (RD) design around close races. The winning candidate of a close election is as-good-as randomly selected (Lee and Lemieux [2010]); in effect, a subset of political donors is randomly treated with financial connection to the mayor overseeing regulation. If these donors then enjoy differential project approvals or sales of new construction, such outcomes may be attributable to their political contributions.

To implement the research design, I assemble the first dataset of campaign contributions to mayoral candidates in the U.S. I contacted municipal clerks from across the country and visited boards of elections for handwritten campaign disclosure reports. These were manually digitized into micro-data describing the contributor, donation amount, recipient, and where available the contributor's employer, occupation, and residential address. Donors from the construction industry were linked to their sales of new construction from the Corelogic dataset of property transactions. The resulting dataset documents one aspect of the local political process and links it to subsequent market prices and quantities.

I find that donating to a mayor significantly increases subsequent sales of new housing by 5 to 12 percent. The effect of contribution on firm revenues is noisier, suggesting different types of properties underly these transactions. These effects are generated by a contribution of around $1,000 to the winning candidate. Nesting these estimates in a model of a competitive policy market, firms earn a quantity return of 0.0148 permits per thousand dollars donated.

This implies that to guarantee regulatory approval of a single housing unit, firms need to pay $67,567 to the mayor. That price of a permit represents 13% of the average sale value of a home in the sample. Relative to existing estimates of mark-ups in the construction industry, these findings are roughly consistent with a modest investment return on local political contributions.

This paper contributes to the literature on the political economy of regulation. How the political process impacts which policies get implemented and how distorted those policies are remain empirical challenges to the literature (Bombardini and Trebbi [2019]). Large, lucrative returns to lobbying the U.S. federal government (Kang [2015]) on one hand imply failure in arbitrage or entry in the political market. On the other hand, the literature on federal campaign contributions find little to no benefit to donors (Ansolabehere et al. [2003], Stratmann [2005]). This paper assembles new data on local campaign finance and estimates credible returns to political spending.

The political economy of real estate development has a long tradition in the social sciences (Molotch [1976]). There is recent and growing interest in economics on the theory (Glaeser et al. [2005], Hilber and Robert-Nicoud [2013]) and empirics (Solé-Ollé and Viladecans-Marsal [2012, 2013], Parkhomenko et al. [2019]) of politics underlying land use regulations. This stems from the implications of inelastic housing supply on cost of living (Quigley and Rosenthal [2005]), migration (Ganong and Shoag [2017]), and even aggregate efficiency (Glaeser and Gyourko [2018], Gyourko and Molloy [2015], Hsieh and Moretti [2019]). This paper brings evidence on the role of politics underlying the stringency, on the margin, of local housing supply regulation.

Finally, I innovate on the RD design around close elections (e.g., Lee and Lemieux [2010], Ferreira and Gyourko [2009], Anagol and Fujiwara [2016]) by applying it for causal inference in campaign finance. My empirical design expands research on the impact of political contributions on share price returns (Akey [2015]) and procurement in Brazil (Arvate et al. [2013], Boas et al. [2014]). Related to this paper is Colonnelli et al. [2018], who find political supporters and donors enjoy higher access to local government jobs in Brazil. My paper complements Colonnelli et al. [2018] in at least two ways. One, I study how political contributions influence regulation and quantities produced by firms. Second, I assess the scope for patronage in a large, developed economy—the U.S.

I review the institutional details around local campaign finance and construction regulation in Section 2. Section 3 outlines a simple model of a policy market. In Section 4, the empirical design for measuring the returns to political contribution is proposed. Section 5 introduces the new dataset on local campaign finance, and Section 6 presents results. I review the implications of these estimates in Section 7.

2 Institutional Context

This section describes the institutional context around local elections and campaign finance. It then broadly reviews the regulatory process for approving new construction. In particular, I review the scope for discretion by mayors in the permitting process.

2.1 Local Elections and Campaign Finance

Soliciting contributions to fund campaigns is a core responsibility of candidates running for political office in the U.S. Local races are no exception. States regulate campaign finance in local elections, with counties and municipalities supplementing those rules.[1] Candidates running for office open a candidate committee that receives and spends campaign donations, and these committees record transactions for disclosure. Appendix Figure 5 displays an example of a disclosure report retrieved from microfiche.

Throughout the election year, committees file disclosure reports to a filing authority at regular deadlines. States designate the filing authority. Figure 2 displays whether the filing authority is the state, county, or city across the U.S. State filing authorities tend to have greater availability of campaign data. All contributions over a threshold must be reported on disclosure reports. Figure 2 shows the maximum donation amount with which the donor can remain anonymous. Above the threshold, a committee must report the donor's name, whether they are individuals, businesses, or political committees, the contribution date, and amount donated. Some states require individual donors to disclosure their occupation and employer whenever a contribution exceeds a specified amount, which is shown in Figure 2. Finally, donors cannot give more than a specified limit, displayed in Figure 2.

2.2 Local Permitting Process

Though federal and state governments play some role, in the U.S. local governments largely regulate land use and permit new construction (Gyourko and Molloy [2015], NAHB). The rules and procedures around obtaining a building permit vary widely across localities.

Generally, any new construction or major renovation to a building require permits from the local permitting authority. The local authority checks proposed projects for compliance with existing zoning, safety, and structural regulations. During review, regulators may solicit feedback from technical staff and community members. Compliant proposals receive one or more permits; only then can development legally proceed. Over 98% of privately-owned

[1] Citizens United v. FEC lifted limits on contributions to independent expenditures committees but upheld donor disclosure rules. The ruling effectively renders local and state regulations on independent expenditure committees unenforceable. Since disclosure is reinforced it aids my empirical strategy.

residential structures in the U.S. fall under the jurisdiction of such a permitting authority (Bureau [2012]).

The permitting process and local regulations are perceived by market participants as major risks and costs to supplying new construction. Entering the approval process requires investing in technical proposals, though the project may be rejected. Complying with environmental, structural, and land use regulations increase costs. Moreover, applicants accrue carrying costs while proposals are reviewed, which on average takes six months but as much as five years (Emrath [2016]). In a survey of builders and developers by the National Association of Home Builders (NAHB), an industry trade group, complying with regulation is perceived to cost almost a quarter of the sale price of a single family home (Emrath [2016]).

Given risks in the local regulatory process, the NAHB advises that the mayor "[...] must be the community's visionary leader and be willing to implement the plan or it will bog down in NIMBY opposition when developments apply for approval." (NAHB) The role of mayors in permitting varies based on form of local government, e.g., mayor-council versus council-manager, and executive responsibility, e.g., weak versus strong mayors. Particularly in mayor-council governments with strong mayors, they have formal and informal scope for intervening in the local permitting process.

Formally, the mayor appoints and oversees regulators, decides bills affecting construction regulation, and proposes the municipal budget on development incentives and property taxes. The mayor may even override zoning rules for specific development projects, such as in New York City (NYCEDC [2019]). Informally, the mayor corrals support for or opposition to development via local media, community members, and other organs of local government like city councils (Kim [2019]). They may be tacit gatekeepers to municipal programs for development, such as tax incentives and urban renewal initiatives.

There are frequent anecdotal reports suggesting mayors sway permitting for personal or political gain. A literature in sociology and urban studies suspects an alliance between the mayor and local developers in shaping the built and economic environment (Molotch [1976]). Media coverage on what appears to be *quid pro quo* exchanges are not uncommon. Mayors have allegedly solicited donations from developers facing regulatory delay (e.g., Mays [2019]), for access to tax-advantaged properties (e.g., Nagl [2019]), and for contracts to build housing projects (e.g., Nirappil [2019]).

3 Model

This section outlines a supply and demand framework for a competitive policy market (Bombardini and Trebbi [2019]). Firms demand permits for new construction and a politician supplies them in exchange for contributions. Though the assumption of price-taking may seem incongruous to politics, the simple framework yields insights to guide empirics. The framework produces a term for the return to political contribution, the source of endogeneity and how it biases estimates, and how a RD design helps resolve those issues.

Permits for new construction Q_i is comprised of $\overline{Q}_i$, which are construction permits from a non-political regulatory process, and $\tilde{Q}_i$, permits purchased from the policy market. In the policy market before the election, firms demand construction permits by making contributions to the candidate's campaign. The candidate commits to supply permits to contributors if elected.

[FIGURE 1 HERE]

Equilibrium in the market is displayed in Figure 1. The supply schedule can be derived from an underlying policy production function for the politician. The demand curve may be micro-founded by the optimization problem for a firm choosing quantities of housing to produce. In practice, the researcher does not observe price, p, but total contributions, $p * \tilde{Q}$. The quantity return to a dollar contribution is then:

$$\frac{1}{p} = \frac{\tilde{Q}}{p\tilde{Q}}$$

However, $\tilde{Q}$ is generally unobserved, as direct outcomes from the political process are unobservable. Using observed Q to calculate the quantity return may result in measurement error:

$$\frac{Q}{p\tilde{Q}} = \underbrace{\frac{1}{p}}_{\text{Quantity Return}} \times \underbrace{\left(1 + \frac{\overline{Q}_i}{\tilde{Q}_i}\right)}_{\text{Measurement Error}}$$

While the error may be negative, typically it is positive and overstates the quantity return. Moreover, if $\overline{Q}_i$ and $\tilde{Q}_i$ are positively correlated, e.g., if high-capacity donors are associated with high-capacity firms, bigger donors would have better outcomes. Attributing those better outcomes, such as more regulatory permits, to donations results in a biased estimate of the return.

Absent observing $\overline{Q}_i$ and $\tilde{Q}_i$ directly, comparing firms with the same $\overline{Q}_i$ and $\overline{Q}_j$ can isolate the true return to contributions. A RD design around close elections is one empirical design to do this. If two firms donate to different candidates and one candidate randomly wins a close election, there is also random assignment of the firm who donated to the mayor. Firms that donated to the mayor and those that did not should be balanced on characteristics, $\overline{Q}_i$, across close elections. In this setting, comparing observed Q_i approximates the true quantity return:

$$\frac{Q_i - Q_j}{p\left(\tilde{Q}_i - \tilde{Q}_j\right)} \overset{RD}{\approx} \frac{\tilde{Q}_i - \tilde{Q}_j}{p\left(\tilde{Q}_i - \tilde{Q}_j\right)} = \frac{1}{p} \tag{1}$$

4 Empirical Design

This section outlines the empirical design to estimate the impact of political contributions on approvals of new construction. To address issues of measurement and endogeneity outlined in Section 3, I compare firm outcomes in a RD design around close elections.

The first-best setting to assess benefits from political contributions is via randomized experiment. One set of firms is randomly treated with donation to the mayor, while other firms are not. The randomization restores conditional mean independence among unobserved firm outcomes and donations. Absent experimental variation, any observational relationship between political and economic outcomes is beset by confounders. In addition to firm-specific confounders outlined in Section 3, they may arise due to factors related to the jurisdiction, such as market size, the candidate, such as electability and platform, and timing, such as business fluctuations.

We replicate the ideal experiment by comparing donors to winners and donors to runners-up in close elections. When election margins are narrow, the winning candidate is decided as-if randomly. When contributors give money to one candidate but less to the other, close elections randomize which contributor donated to the winning candidate.

A RD design encapsulates this identification strategy. For firm i donating to mayoral candidate j, let

$$MV_{c,i,t} = VoteShare^{j}_{c,t} - VoteShare^{-j}_{c,t} \qquad D_{c,i,t} = \mathbf{1}\left\{MV_{c,i,t} \geq 0\right\}$$

where c is the city and t is the election year. $D_{c,i,t} = 1$ indicates that candidate supported by firm i won the election. In practice, a firm may donate to both candidates. I categorize firm i as a supporter of candidate j if i donated more to j than to his/her opponent. The RDD is then:

$$Outcome_{c,i,t} = D_{c,i,t} + f\left(MV_{c,i,t}\right) + D_{c,i,t} \times g\left(MV_{c,i,t}\right) + \gamma_{c,i,t} + \varepsilon_{c,i,t} \tag{2}$$

where $f()$ and $g()$ are flexible polynomials and $\gamma_{c,i,t}$ are fixed effects. $Outcome_{c,i,t}$ are inverse-hyperbolic sine transformations of outcomes for firm i subsequent to election year t in city c. The coefficient of interest is therefore $D_{c,i,t}$, which is the impact of having donated to a mayoral candidate on firm outcomes. Our preferred $\gamma_{c,i,t}$ specification is interacted fixed effects for county-election year-recession years. Standard errors are clustered at the state-level and robust to heteroskedasticity.

I estimate additional specifications to understand the roles of dynamics and contribution size on firm outcomes. First, I estimate a dynamic RD design:

$$Outcome_{c,i,t} = \sum_{t=1}^{T} \tau_t \times [D_{c,i,t} + f(MV_{c,i,t}) + D_{c,i,t} \times g(MV_{c,i,t})] + \gamma_{c,i,t} + \varepsilon_{c,i,t} \tag{3}$$

where τ_t is a fixed effect for months or years since the election. With $Outcome_{c,i,t}$ at the monthly or annual frequency, the coefficient on $D_{c,i,t}$ in Equation 3 disaggregates the impact of political contribution over the course of a mayor's tenure. To measure whether donation size affects business outcomes, I estimate:

$$\begin{aligned} Outcome_{c,i,t} = D_{c,i,t} + ContribAmt_{c,i,t}\beta + ContribAmt_{c,i,t} \times D_{c,i,t} + \ldots \\ \ldots + f(MV_{c,i,t}) + D_{c,i,t} \times g(MV_{c,i,t}) + \gamma_{c,i,t} + \varepsilon_{c,i,t} \end{aligned} \tag{4}$$

As $ContribAmt_{c,i,t}$ is how much donor i gave, the coefficient on the interaction $ContribAmt_{c,i,t} \times D_{c,i,t}$ estimates the impact of an additional dollar of contribution on firm outcomes. Note that although the RD impact of donating to the mayor, $D_{c,i,t}$, is identified, $ContribAmt_{c,i,t} \times D_{c,i,t}$ may still be confounded by unobservables related to contribution size.

RD requires that potential outcomes exhibit local continuity. Absent treatment, outcomes of the treated population would have been continuous across the discontinuity, and outcomes for the untreated be continuous in the treatment area. Without local continuity, any estimated discontinuity may reflect other factors besides the treatment. Appendix B tests for continuity of city, firm, and candidate characteristics.

5 Data

In this section, I describe the datasets needed for the research design in Section 4. The core of this section introduces the new campaign contributions data in U.S. mayoral races. Next, Corelogic data on new housing transactions is reviewed as firm outcomes. I then describe, in detail, the procedure to link contributor names in the contributions data to firm names in the Corelogic dataset. Implications of measurement error in the data are lastly assessed.

5.1 Electoral Data

I use the municipal elections data from Ferreira and Gyourko [2009] subsequently supplemented by research assistants. I combine this dataset with additional mayoral elections data from Jerch et al. [2017] and de Benedictis-Kessner et al. [2016]. Each observation corresponds to a mayoral election, and includes the names of the winner and runner-up and their vote tallies. I drop observations prior to 1990 and remove elections with zero or negative vote counts. I drop elections that are non-competitive, i.e., elections that do not list both winner and runner-up. I define the vote margin of the winner and runner-up as the difference between vote shares of their combined votes.

5.2 Local Campaign Finance Data

To the best of my knowledge, I am the first researcher to collect contribution micro-data in U.S. local elections. Data on contributions are found in PDF disclosure reports filed by candidates. When they exist, reports are located in two sources. Some states and counties maintain databases of campaign finance reports of local candidates. I use a web scraper to download contributions data in these databases. The second source of campaign finance reports are election boards and county or city clerks. I e-mailed clerks from across the country to retrieve PDF disclosure reports. In addition, many reports were retrieved by photographing microfiche records held by a state election board. Assembled PDF's were then manually digitized into computer readable data. Appendix Figure 6 describes to e-mails response rates by city clerks, and Appendix Figure 6 summarizes the geographic coverage of found campaign reports.

In all, the dataset contains 802,649 contributions for 1,022 municipal elections from 1990-2018. Each contribution details the donation date, donor name, type, amount, recipient candidate, local election, and occasionally the donor's residential address, employer, and occupation. Appendix Table 7 summarizes the availability of each variable in the dataset.

[TABLE 1 HERE]

Table 1 presents summary statistics on the campaign contributions dataset. Each panel corresponds to three levels of data aggregation. The top panel examines micro-contributions. Average contribution amount is modest, around $616 and appears driven by outliers. Contributions are aggregated to each recipient candidate in the middle panel. More recipients tend to be winners, as not all candidates receive contributions during an election. While the average candidate receives as much as $178,068, this is attributed to outlying observations; the median candidate receives around $15,533. The last panel aggregates to the local race. Importantly, more than quarter of elections are decided within a 5% electoral margin.

For analysis, I collapse the micro-contribution dataset to contributor-election level. Each observation now corresponds to a unique donor participating in a specific local mayoral election. Some donors, particularly in close races, donate to both winner and runner-up.

5.3 Corelogic Transactions Data

I use Corelogic sales of new construction as $Outcome_{c,i,t}$ to estimate Equation 2. The deeds database in Corelogic is the near-universe of real estate transactions in the U.S. For each sale, the database records the name of the seller and buyer, property address, dollar value of the sale, building characteristics, and whether the structure is new construction. The Corelogic tax database holds tax assessments on the structure, such as physical characteristics like square footage and the year of initial construction. I merge each transaction in the deeds database to its underlying property in the tax database.

Following Driscoll [2018], I then subset transactions to sales of new construction in the following manner. I keep transactions listed in the deeds database as new home sales and arms-length transactions. Excluded are foreclosures, refinances, and home equity lines of credit. Observations missing parcel and county identifiers and sale dates are dropped. Finally, duplicate observations are removed and only the first sale since construction is retained. Like Driscoll [2018], I validate these new home sales by comparing it to the Building Permits Survey dataset from the Census Bureau in Appendix Figure 7. The resulting dataset is transaction-level with the name of the seller, year of sale, year of construction, sale price, and characteristics of the transacted property.

When a transaction is a sale of new construction, the listed seller is often the name of a developer or builder. To document business outcomes of a firm in a city over a period of time, I collapse the transaction-level dataset into seller-by-year observations. Each observation therefore records the volume and value of business each developer or builder undertakes in a municipality in a given year. I use the name of the seller, as well as the municipal site of the property, to match Corelogic outcomes to contributors in local races. The following section explores this matching procedure.

5.4 Matching Local Campaign Finance Data to Corelogic

The empirical design hinges on linking a contributor to its subsequent business outcomes. Since names in the contribution and Corelogic datasets are dissimilar, I undertake a four-step fuzzy matching procedure:

1. Strip corporate tags (e.g., "LLC", "INC", etc.) and abbreviate industry signifiers (e.g., "builder" into "bld", "residential" into "res", etc.) from names of contributors, the name of their employers when available, and names of Corelogic sellers.

2. Compare each name in the contribution data to a name in the Corelogic data using the cosine similarity algorithm. For each pair of names, the algorithm generates a score between 0 and 1, with 1 indicating perfect match.

3. Categorize each link into three groups: invalid matches, unclear matches, and good matches. Thresholds for the similarity score generate these categories, and I determined each threshold by manually matching a subset of links, shown in Appendix Table 8.

4. Manually assess unclear matches with internet search.

The final product of this procedure is a link between names of contributors and names of Corelogic sellers of new construction. These links resulted from good matches and verified unclear matches.

With these name links in hand, I merge the contributor data to the Corelogic data. Recall that the contribution dataset contains the name of the donor, recipient mayoral candidate, and donation amount, all associated with a particular local election. The Corelogic dataset is identified by the name of the seller, year, and the municipal location of new construction. I merge a contributor in an election cycle to that contributor's business outcomes in Corelogic in one jurisdiction subsequent to the election year.

However, the Corelogic dataset only records actual sales of property and does not report on firms who made no sales. I impute a zero for firms who sold no properties over the sample period. Since most contributors are not developers, only contributors appearing at some time or place in the Corelogic dataset is imputed with 0.

[TABLE 2 HERE]

The resulting dataset is firm-municipality-election cycle level detailing contribution amounts to winner and runner-up, electoral margins for that election, and subsequent outcomes such as number and value of properties sold. Table 2 summarizes the merger between Corelogic and contributions. From over half a million contributors and Corelogic transactions, 3,663 observations were linked. Firms in the matched sample tend to do less business than non-contributors in Corelogic. A large share of matched observations have an imputed 0. Important for the RD design, a third, or 880, observations lie within a 5% vote margin. The matched dataset makes it possible to estimate the main specification, Equation 2.

5.5 Measurement Error

Measurement error in the campaign contributions data may pose challenges to the empirical designs in Section 4. Collecting, digitizing, and matching local campaign data creates a selected sample of local races and firms. In addition, unobserved contributing networks and political action committees may complicate reliable measurement.[2] Issues around measure-

[2]U.S. federal and state law requires disclosure of campaign donors. There is confusion about the role of Citizens United vs. FEC and "dark money". The ruling in fact reinforced disclosure rules for contributions in federal elections. Anonymous donations through 501c-3 "social service organizations" constitute a loophole in the court's decision.

ment, and its implications for the empirical design, can be categorized into three groups.

First, if measurement issues are uncorrelated with the random resolution of close elections, RD estimates should be internally valid. Though the dataset is a selected sample of local elections and firms, there is random assignment of firms around the discontinuity. Complex, unobserved contributing networks, similarly, should exhibit balance around close elections. In this way, the RD estimate is internally valid for the observed contributors in the data.

If there is misattribution of firm support for politicians in the data, the effect should be to attenuate the RD estimate. A donor, for example, may be wrongly associated with supporting a candidate. This may be due to unobserved donations or noise in data processing. The effect, however, is that the RD estimate ought to be biased toward zero. Any estimate from the empirical design can be considered a lower-bound on the true impact of contributions.

Measurement error correlated with the actual outcome of elections does, however, threaten internal validity. If, for example, contributions data of winners are more available than those of losers, then there is differential data selection around the discontinuity. Care is taken, during collection, to confirm that candidates missing contribution data in fact never received contributions.

6 Results

The causal impact of political donation on subsequent firm outcomes is presented in this section. The primary specification is the RD design outlined in Section 4.

6.1 Contribution Amount

I first assess how much more money winner-supported donors gave to the mayor relative to runner-up-supported donors. Equation 2, with $Outcome_{c,i,t}$ as donations by firm i to the winner in election c, t, estimates the difference in contributions to the mayor between winning and losing firms. If donors are identical in all other dimensions, this RD estimate is akin to how much a firm was "treated" with donations to the mayor.

[FIGURE 3 HERE]

Figure 3 plots two global cubic polynomials around the discontinuity. There is approximately $\$1,000$ difference in donations to the mayor around the discontinuity. Since firms to the right donated more to the winning candidate, there is by construction a jump at the discontinuity. Firms that donated more to the runner-up candidate typically do not donate to the winner. However, a few firms do donate to both when the election is close.

6.2 Main Results

[TABLE 3 HERE]

I present the core empirical findings on the impact of political contributions on donor outcomes. Table 3 first displays the effect of donations on average housing transactions per year over the mayor's tenure. Donating to a mayor increases subsequent housing transactions by 5 to 12 percent from a baseline mean of 0.153 transactions per year.

[TABLE 4 HERE]

Table 4 displays the impact of donations on annual sale value of new construction. Estimates are significant at the 5% level for higher order polynomials, where donations to a mayor increase revenues by as much as 50 percent. Overall, however, the estimates for sales per year appear imprecise. This may be explained by differences in the underlying characteristics of new construction purchased via donations.

[FIGURE 4 and 5 HERE]

Figures 4 and 5 plot the RD estimates for single and double cubic, global polynomials. The neighborhood around the discontinuity exhibits a jump, corresponding to the $D_{c,i,t}$ coefficients in the Tables 3 and 4. While the polynomial appears to fit well for positive values of the score, $MV_{c,i,t}$, binned values are noisy for negative scores away from the discontinuity. Observations with a negative score correspond to firms that supported the losing candidate. For not close elections, few firms donate to the runner-up.

Donating to the mayor increases a real estate firm's subsequent transactions of new construction. These effects are driven by donations of around $\$1,000$. I review the robustness of these results to alternative specifications in Appendix Section B.1.

7 Discussion

I interpret the reduced-form estimates from Section 6 with the supply and demand framework in Section 3. The model generates an implied quantity return to contribution as well as an implied price of a regulatory permit.

Equation 1 derives the implied quantity return to a contribution. In a setting where characteristics of two firms are otherwise identical, the difference in observed quantities is sufficient to attribute to differences in contributions. The RD design outlined in Section 4 generates experimental variation that ensures balance on characteristics.

Supporters of a narrow winner donate approximately $\$1,000$ more to the mayor than donors who primarily supported the runner-up. Compared to firms who supported the losing candidate, winning donors transact up to 12% more over the mayor's tenure. It implies that winning donors transact 0.015 more units of new construction, since the average firm transacts 0.15 units per year. Setting $1,000 to the denominator and 0.015 to the numerator in Equation 1, we obtain $\frac{1}{p} = 0.000015$ quantity return to a dollar contribution.

This implies that the price of a permit, i.e., the amount of money needed to pay a local politician to guarantee transaction of new housing, is $p = \$67,567$. Given that the average sale price of new construction in the data is $505,387, the price of a permit cost up to 13% of the sale price. De Loecker and Eeckhout [2017] estimate the mark-up for construction firms to be around 16% over marginal cost. Though the average share of the cost of a permit and the mark-up are not comparable, it nonetheless suggests that purchasing a permit reduces the surplus to the suppliers. This is consistent with an interpretation that the investment return to political contribution may be modest.

References

Pat Akey. Valuing changes in political networks: Evidence from campaign contributions to close congressional elections. *The Review of Financial Studies*, 28(11):3188–3223, 2015.

Santosh Anagol and Thomas Fujiwara. The runner-up effect. *Journal of Political Economy*, 124(4):927–991, 2016.

Stephen Ansolabehere, John M De Figueiredo, and James M Snyder Jr. Why is there so little money in us politics? *Journal of Economic perspectives*, 17(1):105–130, 2003.

Paulo Roberto Arvate, Klenio Barbosa, and Eric Fuzitani. Campaign donation and government contracts in brazilian states. 2013.

Taylor C Boas, F Daniel Hidalgo, and Neal P Richardson. The spoils of victory: campaign donations and government contracts in brazil. *The Journal of Politics*, 76(2):415–429, 2014.

Matilde Bombardini and Francesco Trebbi. Empirical models of lobbying. Technical report, National Bureau of Economic Research, 2019.

Census Bureau. Building permits survey, June 2012. URL https://www.census.gov/construction/bps/ about$_{t}he_{s}urveys/$.

Emanuele Colonnelli, Mounu Prem, and Edoardo Teso. Patronage and selection in public sector organizations. *Available at SSRN 2942495*, 2018.

Justin de Benedictis-Kessner, Christopher Warshaw, et al. Mayoral partisanship and the size of municipal government. 2016.

Jan De Loecker and Jan Eeckhout. The rise of market power and the macroeconomic implications. Technical report, National Bureau of Economic Research, 2017.

Eileen Driscoll. Desperate house sellers: Distress among developers. *Available at SSRN 3271791*, October 2018.

Paul Emrath. Government regulation in the price of a new home. May 2016.

Fernando Ferreira and Joseph Gyourko. Do political parties matter? evidence from us cities. *The Quarterly journal of economics*, 124(1):399–422, 2009.

Peter Ganong and Daniel Shoag. Why has regional income convergence in the us declined? *Journal of Urban Economics*, 102:76–90, 2017.

Edward Glaeser and Joseph Gyourko. The economic implications of housing supply. *Journal of Economic Perspectives*, 32(1):3–30, 2018.

Edward L Glaeser, Joseph Gyourko, and Raven E Saks. Why have housing prices gone up? *American Economic Review*, 95(2):329–333, 2005.

Joseph Gyourko and Raven Molloy. Regulation and housing supply. In *Handbook of regional and urban economics*, volume 5, pages 1289–1337. Elsevier, 2015.

Christian AL Hilber and Frédéric Robert-Nicoud. On the origins of land use regulations: Theory and evidence from us metro areas. *Journal of Urban Economics*, 75:29–43, 2013.

Chang-Tai Hsieh and Enrico Moretti. Housing constraints and spatial misallocation. *American Economic Journal: Macroeconomics*, 11(2):1–39, 2019.

Rhiannon Jerch, Matthew E Kahn, and Shanjun Li. The efficiency of local government: The role of privatization and public sector unions. *Journal of Public Economics*, 154:95–121, 2017.

Karam Kang. Policy influence and private returns from lobbying in the energy sector. *The Review of Economic Studies*, 83(1):269–305, 2015.

Elizabeth Kim. 'development needs to happen on that site': De blasio addresses nycha's controversial private housing plan on ues. Online, 3 2019.

Jean-Jacques Laffont and Jean Tirole. The politics of government decision-making: A theory of regulatory capture. *The quarterly journal of economics*, 106(4):1089–1127, 1991.

David S Lee and Thomas Lemieux. Regression discontinuity designs in economics. *Journal of economic literature*, 48(2):281–355, 2010.

Jeffrey C. Mays. De blasio to developers: Donate to my nonprofit. $125,000 came. New York Times, 9 2019$.

Harvey Molotch. The city as a growth machine: Toward a political economy of place. *American journal of sociology*, 82(2):309–332, 1976.

Kurt Nagl. Taylor mayor, development manager indicted on bribery charges. Crain's Detroit Business, 12 2019.

NAHB. Orientation to the land development process. Presentation.

Fenit Nirappil. Audit: Bowser administration awarded millions to developers with low-ranking proposals. Washington Post, 5 2019.

NYCEDC. Land use, zoning, and public policy. Online, 5 2019.

Andrii Parkhomenko et al. The rise of housing supply regulation in the us: Local causes and aggregate implications. 2019.

John M Quigley and Larry A Rosenthal. The effects of land use regulation on the price of housing: What do we know? what can we learn? *Cityscape*, pages 69–137, 2005.

Albert Solé-Ollé and Elisabet Viladecans-Marsal. Lobbying, political competition, and local land supply: recent evidence from spain. *Journal of Public economics*, 96(1-2):10–19, 2012.

Albert Solé-Ollé and Elisabet Viladecans-Marsal. Do political parties matter for local land use policies? *Journal of Urban Economics*, 78:42–56, 2013.

George J Stigler. The theory of economic regulation. *The Bell journal of economics and management science*, pages 3–21, 1971.

Thomas Stratmann. Some talk: Money in politics. a (partial) review of the literature. In *Policy challenges and political responses*, pages 135–156. Springer, 2005.

Figures

Figure 1: Equilibrium in the Policy Market

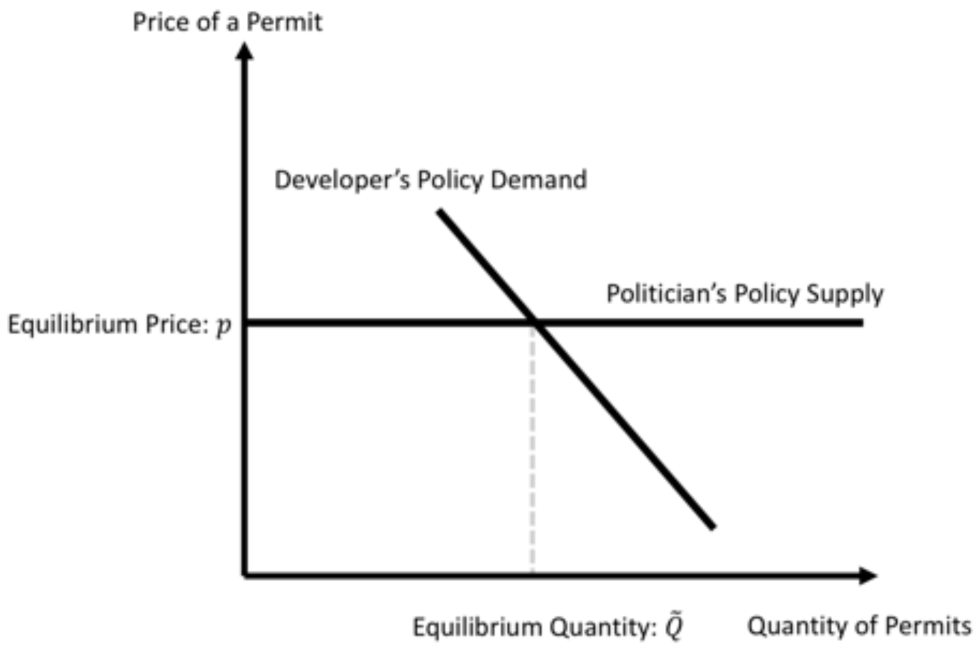
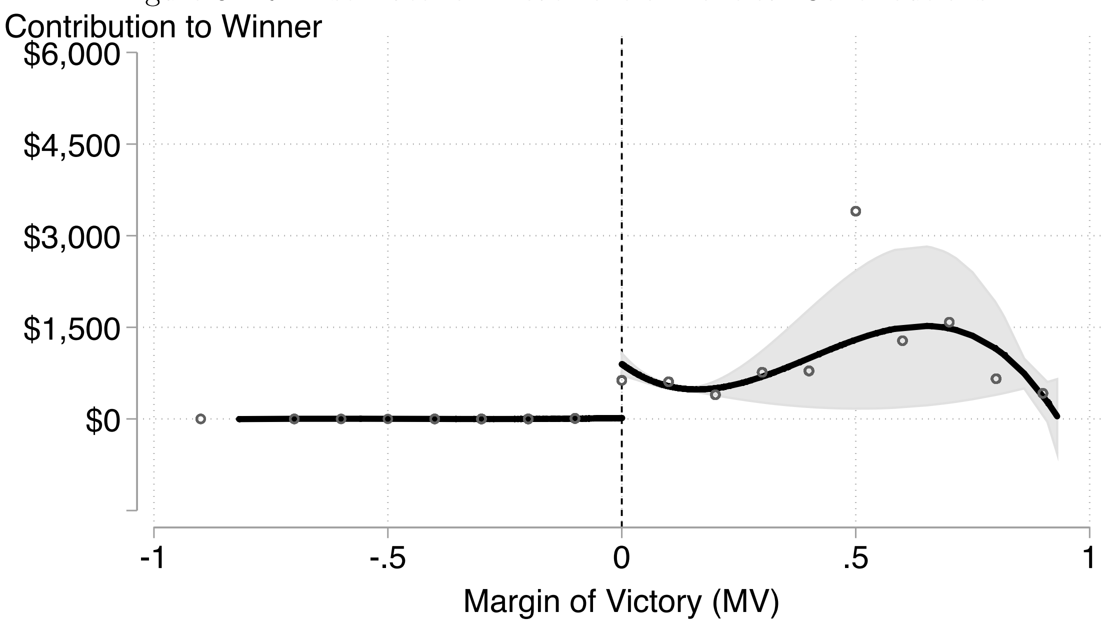


Figure 2: U.S. Local Campaign Finance Law

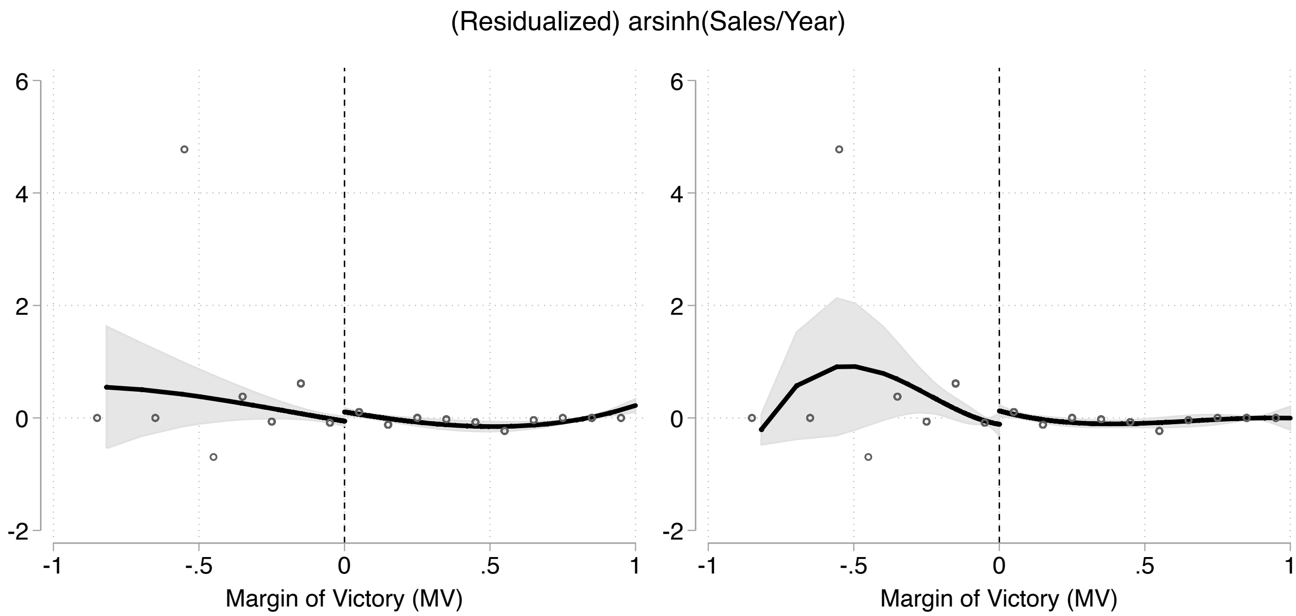
Source: State Campaign Finance Handbooks.

Figure 3: RD Estimate for Treatment of Political Contributions



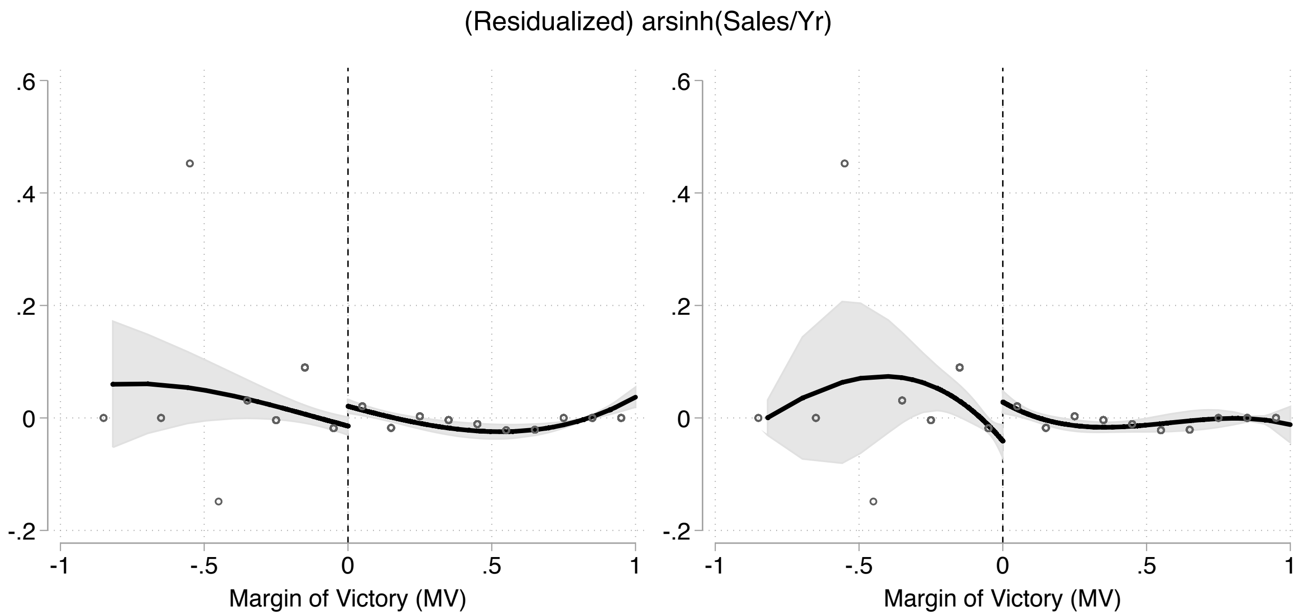
Displayed are two cubic polynomials fitted over contribution amount to the winning candidate. 95% confidence intervals from standard errors clustered by state and robust to heteroskedasticity. Scatter points represent means of 20 equally-spaced bins.

Figure 4: RD Design for Transactions



Displayed are regression discontinuity designs with global cubic polynomials. Left hand plot uses single polynomial; right hand plot uses two polynomials. Outcomes residualized with county-election year-recession fixed effects. 95% confidence intervals from standard errors clustered by state and robust to heteroskedasticity. Scatter points represent means of 20 equally-spaced bins.

Figure 5: RD Design for Sales



Displayed are regression discontinuity designs with global cubic polynomials. Left hand plot uses single polynomial; right hand plot uses two polynomials. Outcomes residualized with county-election year-recession fixed effects. 95% confidence intervals from standard errors clustered by state and robust to heteroskedasticity. Scatter points represent means of 20 equally-spaced bins.

Tables

Table 1: Summary Statistics on Local Campaign Contributions

	Summary Statistics				*Contributions*	
	N	Mean	SD	Median	Mean Count	Received
Contribution						
	802,649	$616	$6,223	$250		
Recipient						
Winner	537,096	$631	$6,700	$250		
Runner-up	228,066	$577	$5,430	$250		
Candidate						
	2,641	$178,060	$983,898	$15,533	221	2,144
Outcome						
Winner	1,350	$250,866	$1,245,967	$23,498	304	1,186
Runner-up	1,291	$101,927	$588,516	$8,585	134	958
Election						
	1,022	$837,022	$6,988,348	$54,306	494	1,023
Vote Margin						
$\geq$ 5%	740	$610,517	$4,408,318	$53,572	481	741
<5%	282	$1,431,397	$11,218,282	$57,519	526	282

Displayed are summary statistics of local contributions to the top two mayoral candidates. Upper panel summarizes contribution-level data. Middle panel aggregates contributions to total received by each candidate. Lower panel summarizes total contributions per local race. Column "Mean Count" tabulates the average number of contributions received at each summary unit. Column "Received" tabulates the number of units receiving any contribution.

Table 2: Summary Statistics on Linked Contribution-Corelogic Data

	Contributions to Corelogic Transactions					
	Count			*Mean*		
	Obs.	No Sales	Sales	Contrib.	Trans./Yr.	Sales/Yr.
Only Contributor						
	526,275	0	0	$791	0.0	$0
Only Corelogic						
	506,476	0	0	$0	3.6	$998,576
Matched						
	3,663	3,423	240	$728	1.3	$657,004
Matched: Vote Margin						
MV $\geq$ 5%	2,783	2,603	180	$687	1.3	$736,720
MV $<$ 5%	880	820	60	$856	1.2	$404,905
Matched: Recipient						
Runner-up	1,085	1,013	72	$698	1.0	$333,898
Winner	2,531	2,370	161	$716	1.5	$795,544
Both	47	40	7	$2,067	2.0	$655,426

Displayed are summary statistics and tabulations for the linkage between local campaign contributors and Corelogic sellers of new housing. Top panel summarizes contributors who were not linked to a Corelogic seller. Second panel corresponds to Corelogic sellers who were not linked to a contributor. Third column summarizes contributors who were linked to a Corelogic seller. These matched observations are further broken down into the final vote margin of the election and beneficiary candidate in the election in the fourth and fifth panels, respectively. Column two tabulates linked observations that made no sales subsequent to the mayor's tenure, while column three summarizes those that did transact. The fourth column reports the average size a contribution. The fifth and sixth columns report the average number of transactions and sale value of new properties, respectively, undertaken in the subsequent years after the election.

Table 3: Regression Discontinuity Results on Transactions

	arsinh(Transactions/Year)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
D	0.00652	0.0520*	0.0495*	0.0955***	0.0494*	0.110***	0.119**
	(0.0231)	(0.0258)	(0.0258)	(0.0332)	(0.0258)	(0.0380)	(0.0512)
$Adj.R^2$	0.131	0.132	0.132	0.132	0.132	0.132	0.131
N	3377	3377	3377	3377	3377	3377	3377
Poly. Deg.	Average	Linear	Square	Cubic	Linear	Square	Cubic
Two Poly.	NO	NO	NO	NO	YES	YES	YES
Neighbor	Global	Global	Global	Global	Global	Global	Global
Dep. Var. Mean	.153	.153	.153	.153	.153	.153	.153

Standard errors in parentheses

D represents the effect of having a beneficiary win a close election on subsequent contributor outcomes. Standard errors clustered at state level and robust to heteroskedasticity. Constant and county-election year-recession fixed effects are included in regressions but suppressed in output. Recession fixed effect is number of NBER recession years during mayoral tenure.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Regression Discontinuity Results on Sales

	arsinh(Sales/Year)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
D	-0.0623	0.223	0.211	0.504***	0.209	0.553**	0.386
	(0.127)	(0.132)	(0.133)	(0.178)	(0.132)	(0.202)	(0.297)
$Adj.R^2$	0.164	0.164	0.164	0.165	0.164	0.164	0.164
N	3377	3377	3377	3377	3377	3377	3377
Poly. Deg.	Average	Linear	Square	Cubic	Linear	Square	Cubic
Two Poly.	NO	NO	NO	NO	YES	YES	YES
Neighbor	Global	Global	Global	Global	Global	Global	Global
Dep. Var. Mean	1.189	1.189	1.189	1.189	1.189	1.189	1.189

Standard errors in parentheses

D represents the effect of having a beneficiary win a close election on subsequent contributor outcomes. Standard errors clustered at state level and robust to heteroskedasticity. Constant and county-election year-recession fixed effects are included in regressions but suppressed in output. Recession fixed effect is number of NBER recession years during mayoral tenure.

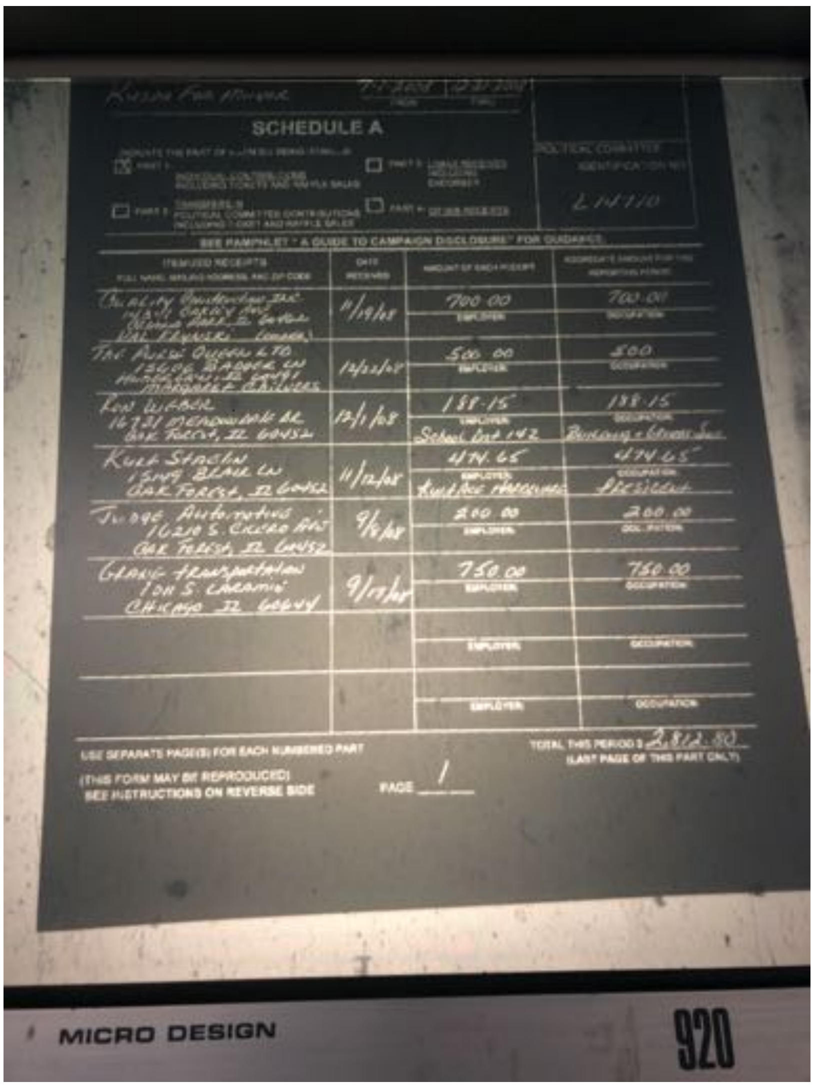
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix

A Data

A.1 Local Campaign Contributions

Table 5: Example Report



SCHEDULE A

POLITICAL COMMITTEE IDENTIFICATION NO. L14710

SEE PAMPHLET "A GUIDE TO CAMPAIGN DISCLOSURE" FOR GUIDANCE

ITEMIZED RECEIPTS	DATE RECEIVED	AMOUNT OF EACH RECEIPT	AGGREGATE AMOUNT FOR THE REPORTING PERIOD
Quality [illegible] Inc	11/19/08	700.00	700.00
The Pizza Queen LTD	12/22/08	500.00	500
Ron Weber, 16731 Meadowlark Dr, Oak Forest, IL 60452	12/1/08	188.15	188.15
Kurt Stasin, Oak Forest, IL 60452	11/12/08	474.65	474.65
Judge Automotive, 16210 S. Cicero Ave, Oak Forest, IL 60452	9/6/08	200.00	200.00
Grand Transportation, Chicago IL	9/17/08	750.00	750.00

USE SEPARATE PAGE(S) FOR EACH NUMBERED PART

(THIS FORM MAY BE REPRODUCED)
SEE INSTRUCTIONS ON REVERSE SIDE

PAGE 1

TOTAL THIS PERIOD $ 2,812.80
(LAST PAGE OF THIS PART ONLY)

Table 6: Local Clerks' E-mail Response Rates

	E-mailed	*Responded*		*Some Reports*		*Both Reports*	
	N	N	(%)	N	(%)	N	(%)
Municipality							
	1,097	685	62%	349	32%	314	29%
State							
CA	158	134	85%	110	70%	98	62%
LA	46	11	24%	0	0%	0	0%
NJ	20	16	80%	0	0%	0	0%
FL	54	46	85%	38	70%	38	70%
IN	102	56	55%	23	23%	20	20%
TX	39	35	90%	20	51%	19	49%
NC	206	84	41%	26	13%	23	11%

Displayed are summary of panel data.

Table 7: Campaign Contribution Variable Availabilities

	Fraction Non-Missing	Count
Contributor Name	1.000	858,944
Contributor Zip	0.962	826,440
Contribution Type	1.000	858,944
Contributor Occupation	0.430	369,043
Contributor Employer	0.346	297,438
Contribution Amount	1.000	858,944
Contribution Date	0.902	774,873
Contribution Notes	0.011	9,227
Contributor City	0.503	432,407
Contributor Address	0.207	177,731
Contributor State	0.492	422,557
Contribution Type 2	0.074	63,735
Observations	858944	

Figure 6: Campaign Reports for Municipal Elections

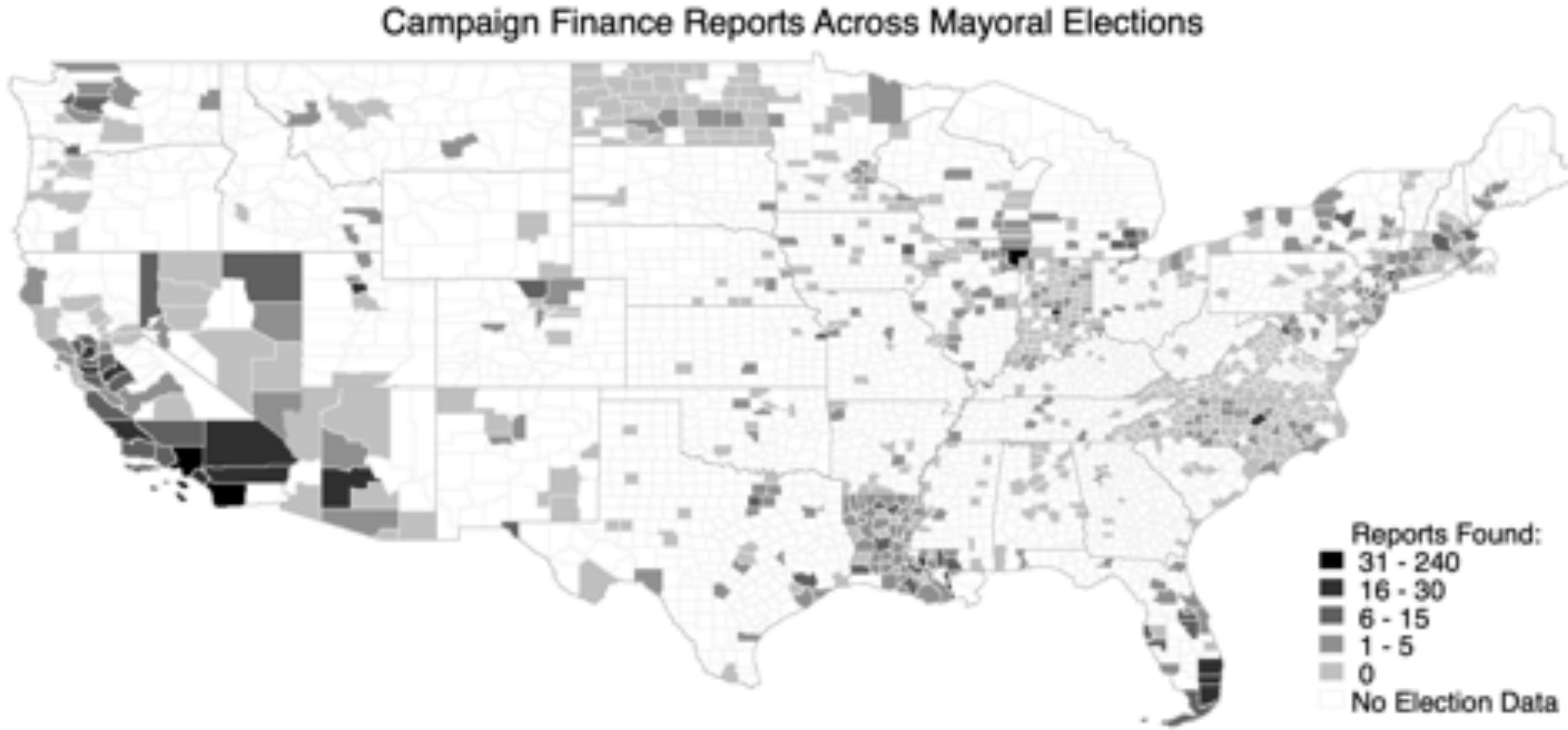


Figure 7: Validation Corelogic New Home Sales

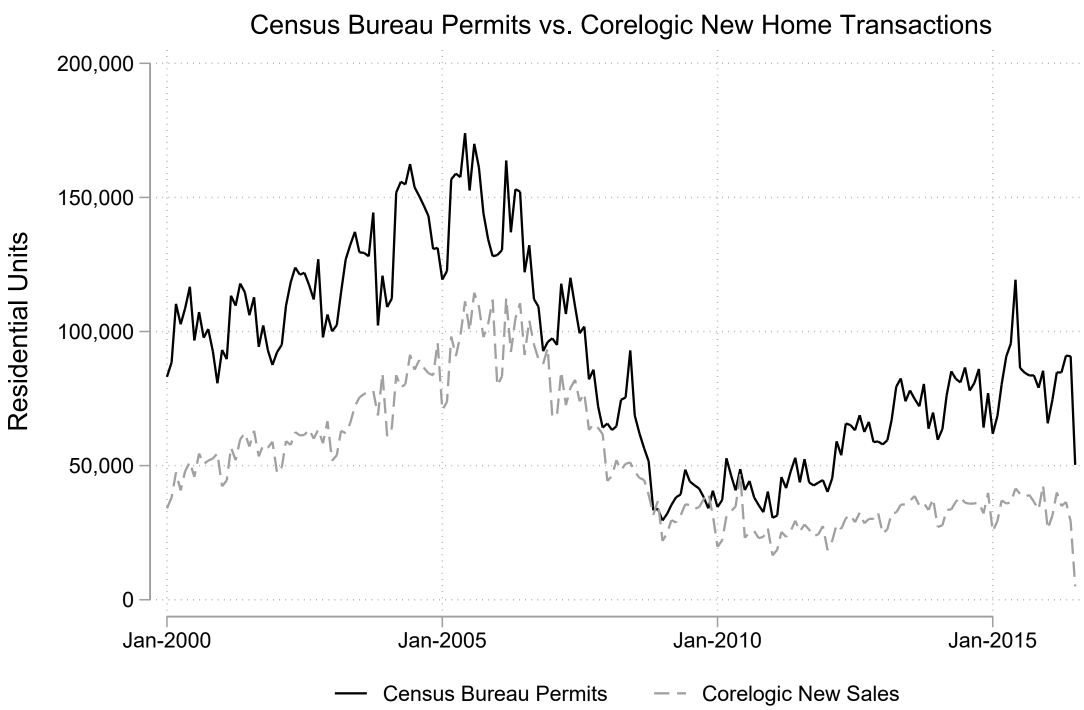
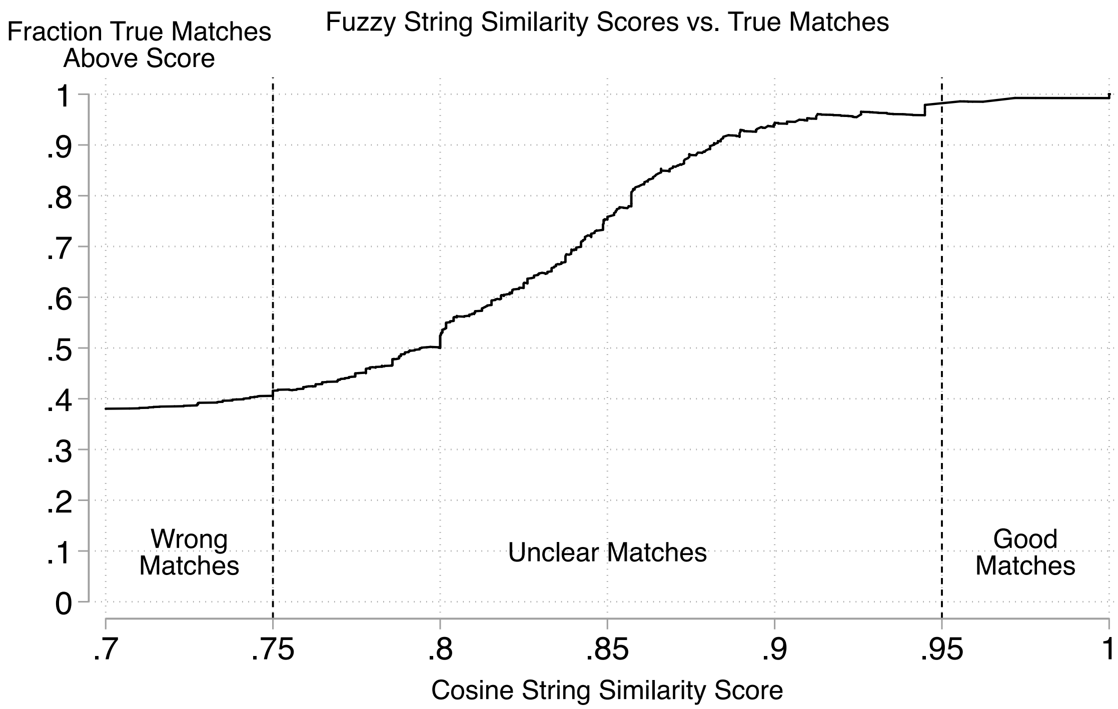


Figure 8: Corelogic-Contributor Link Validation

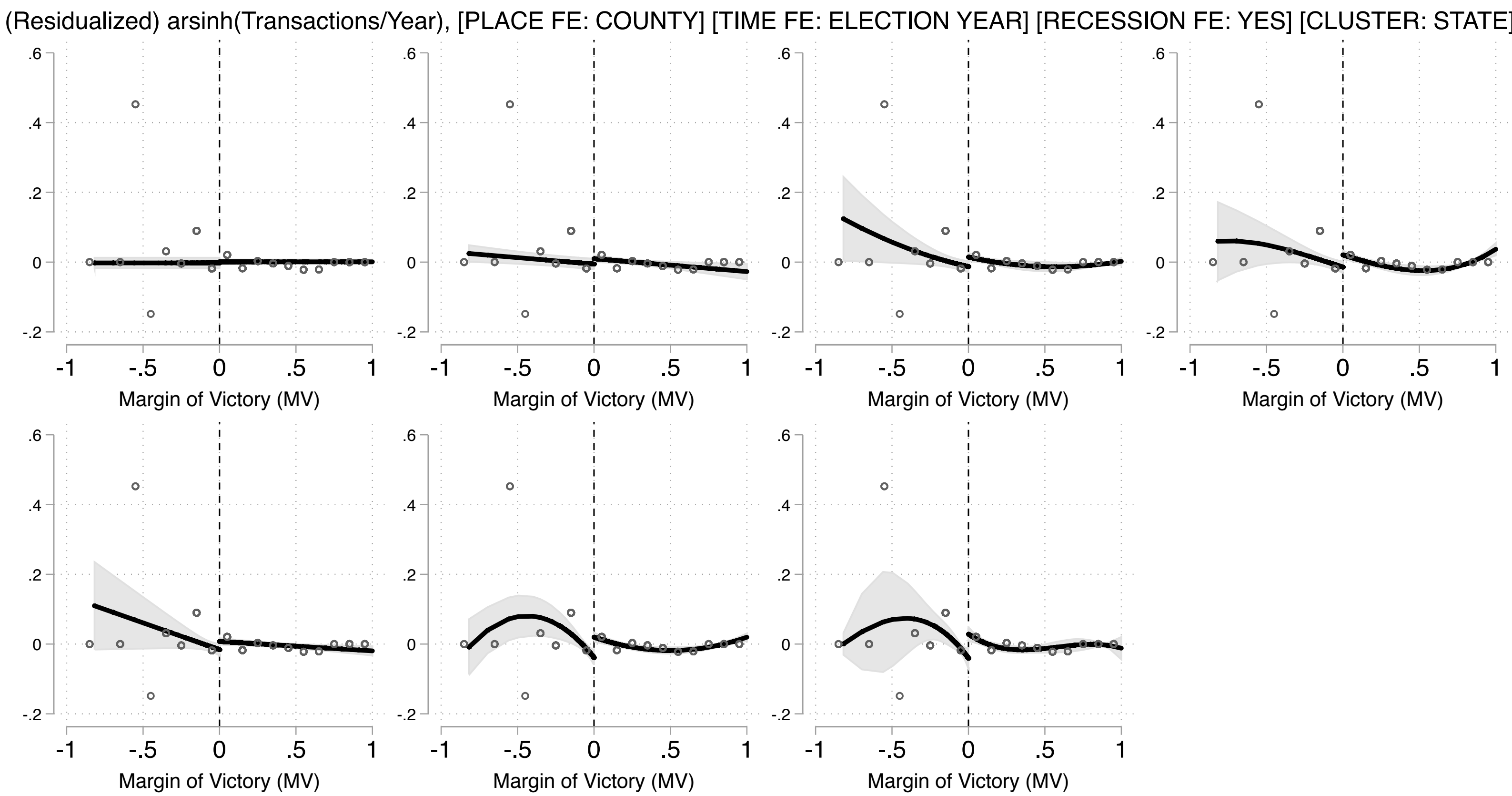


B Robustness

B.1 Alternative Specifications

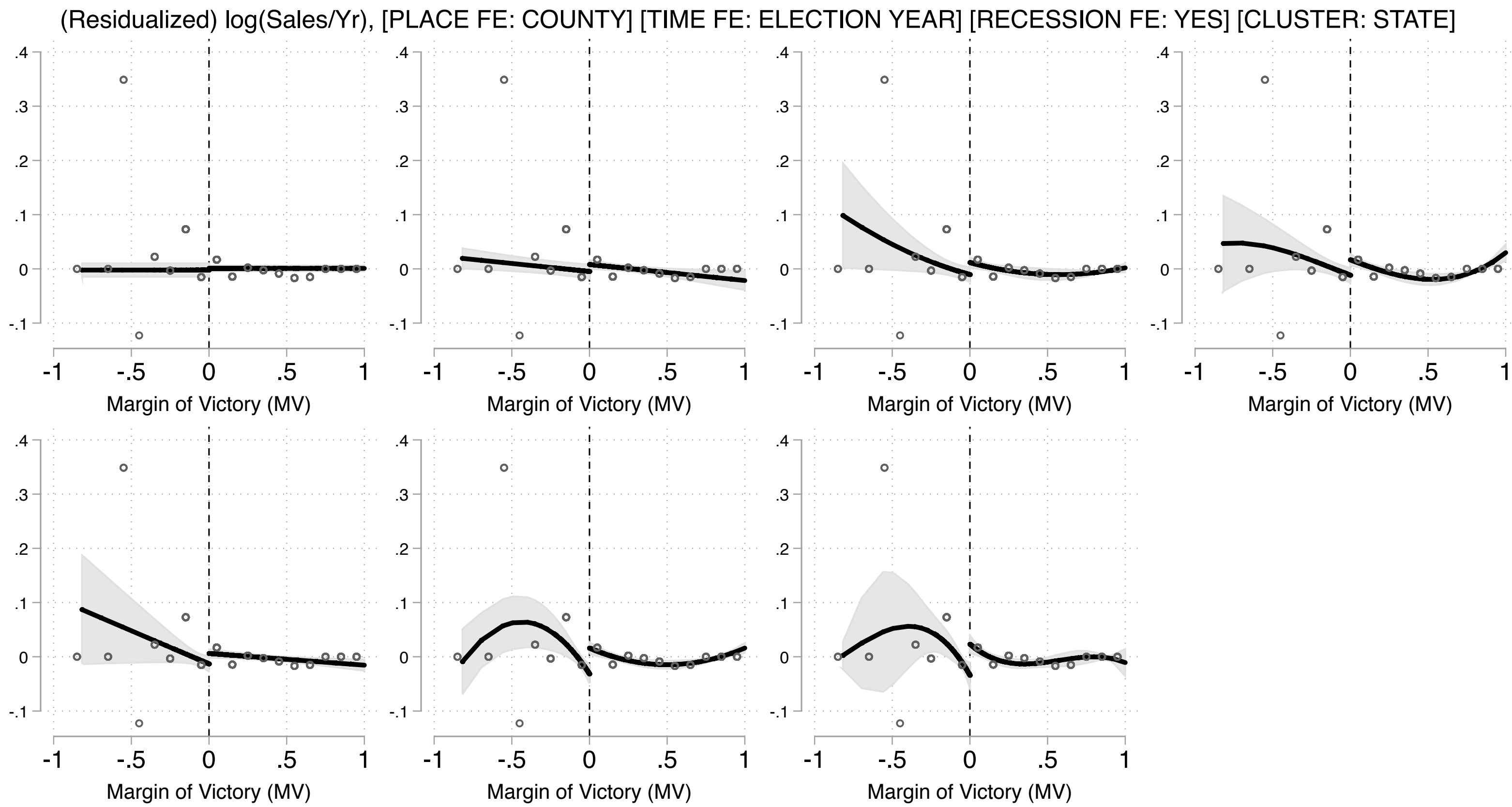
B.1.1 RDD with Transactions

Figure 9: RDD with Alternative Specifications



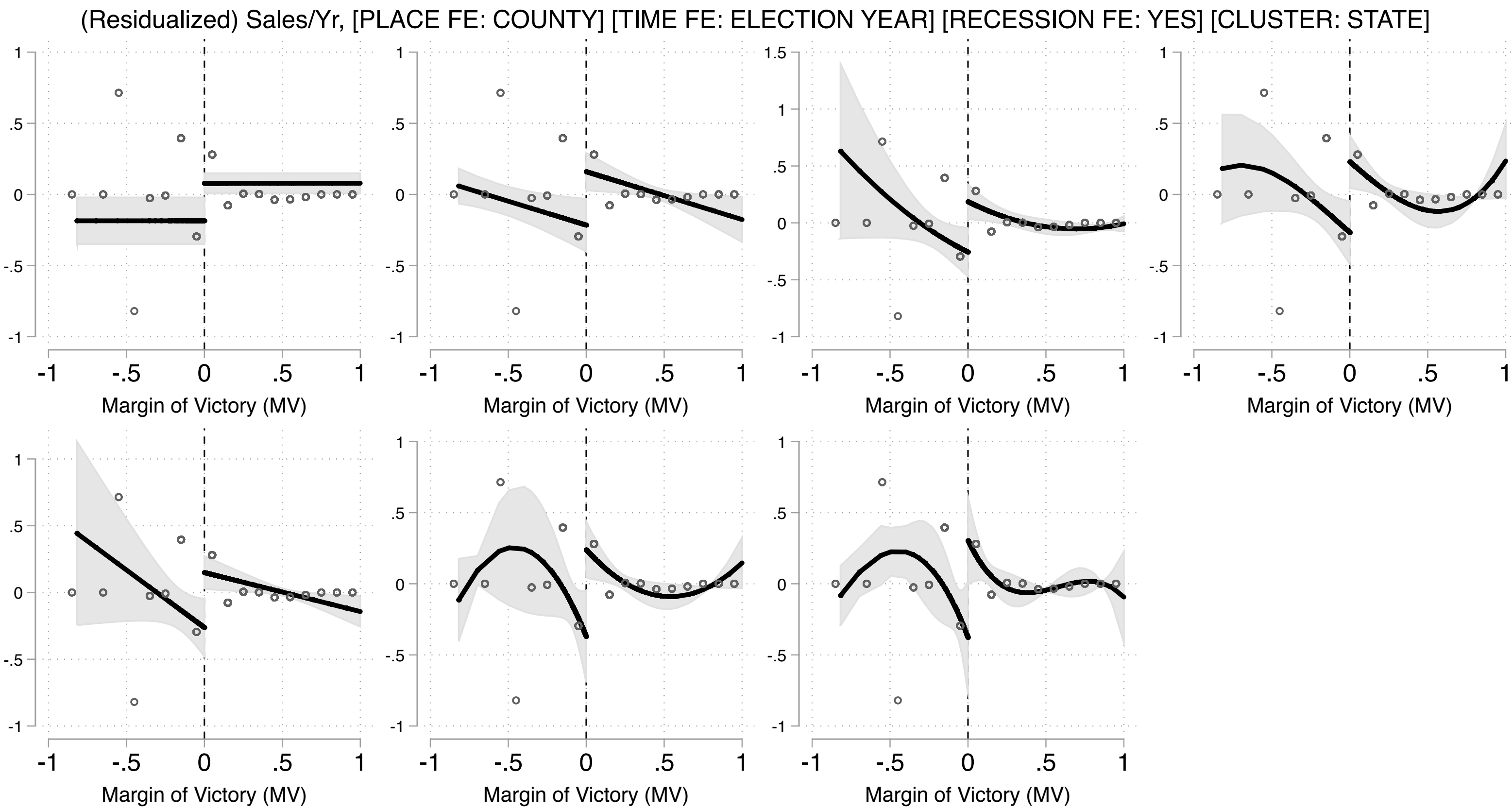
Displayed are global polynomial fits for a regression discontinuity design around close elections.

Figure 10: RDD with Alternative Specifications



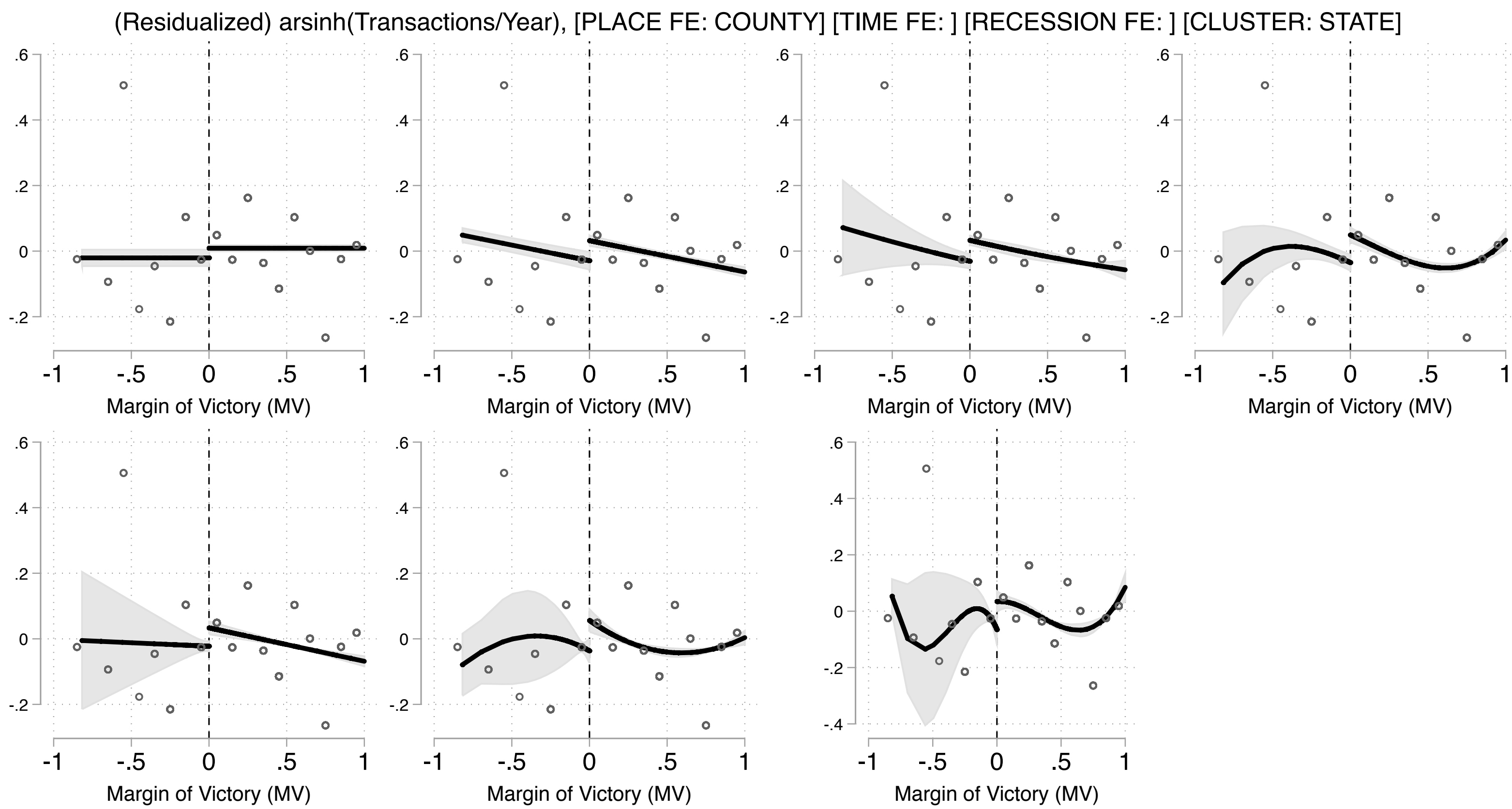
Displayed are global polynomial fits for a regression discontinuity design around close elections.

Figure 11: RDD with Alternative Specifications



Displayed are global polynomial fits for a regression discontinuity design around close elections.

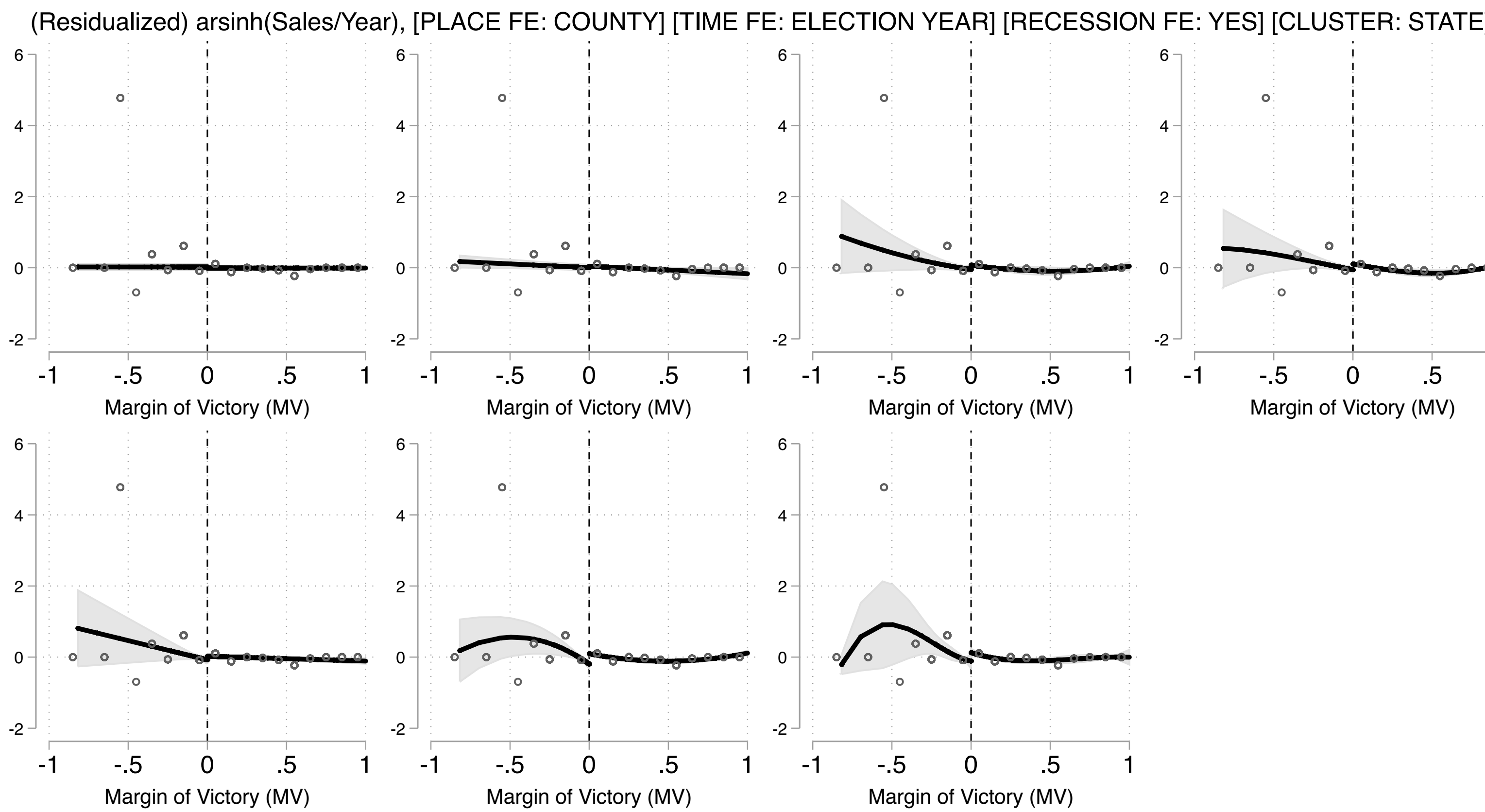
Figure 12: RDD with Alternative Specifications



Displayed are global polynomial fits for a regression discontinuity design around close elections.

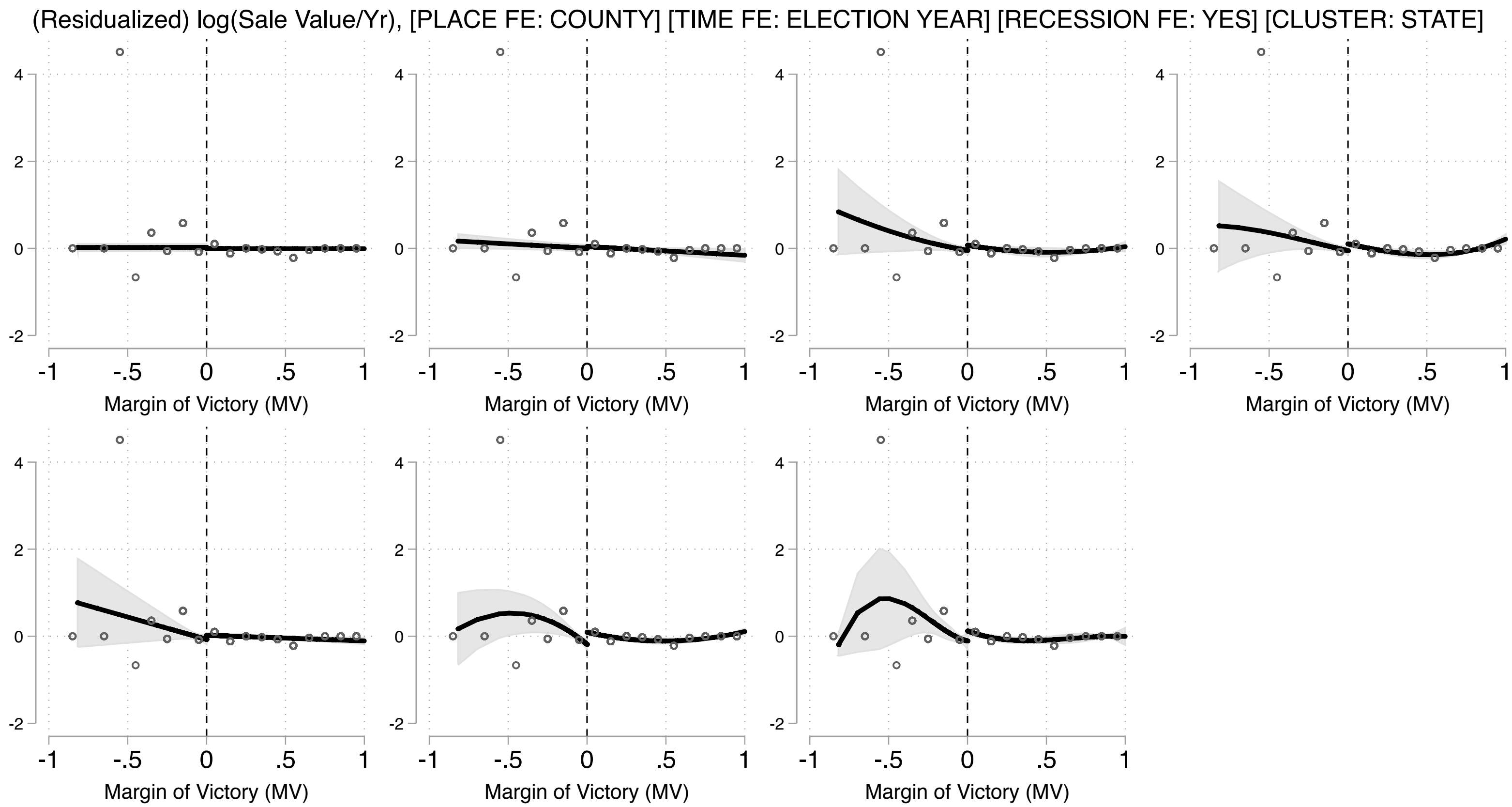
B.1.2 RDD with Sales

Figure 13: RDD with Alternative Specifications



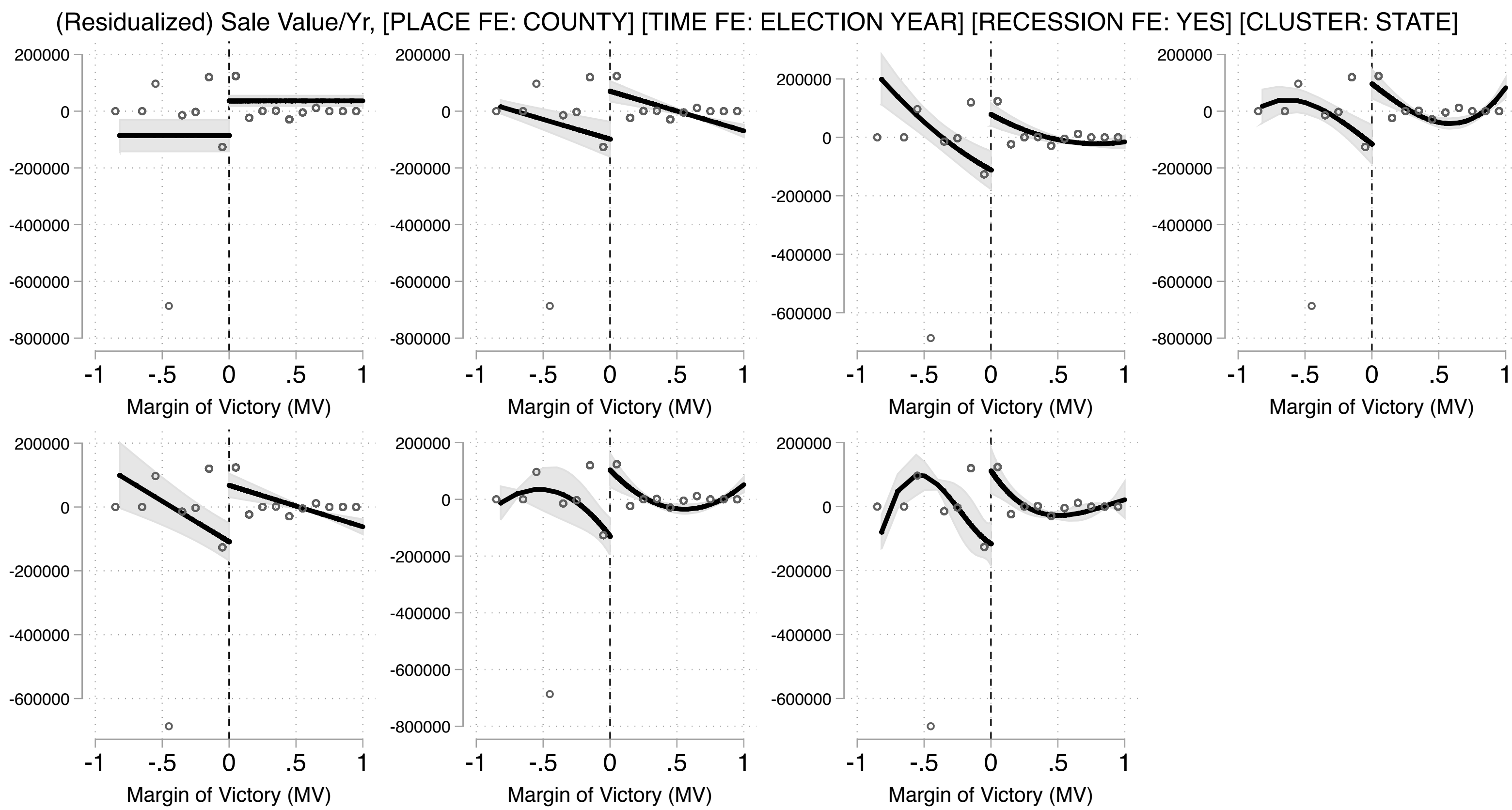
Displayed are global polynomial fits for a regression discontinuity design around close elections.

Figure 14: RDD with Alternative Specifications



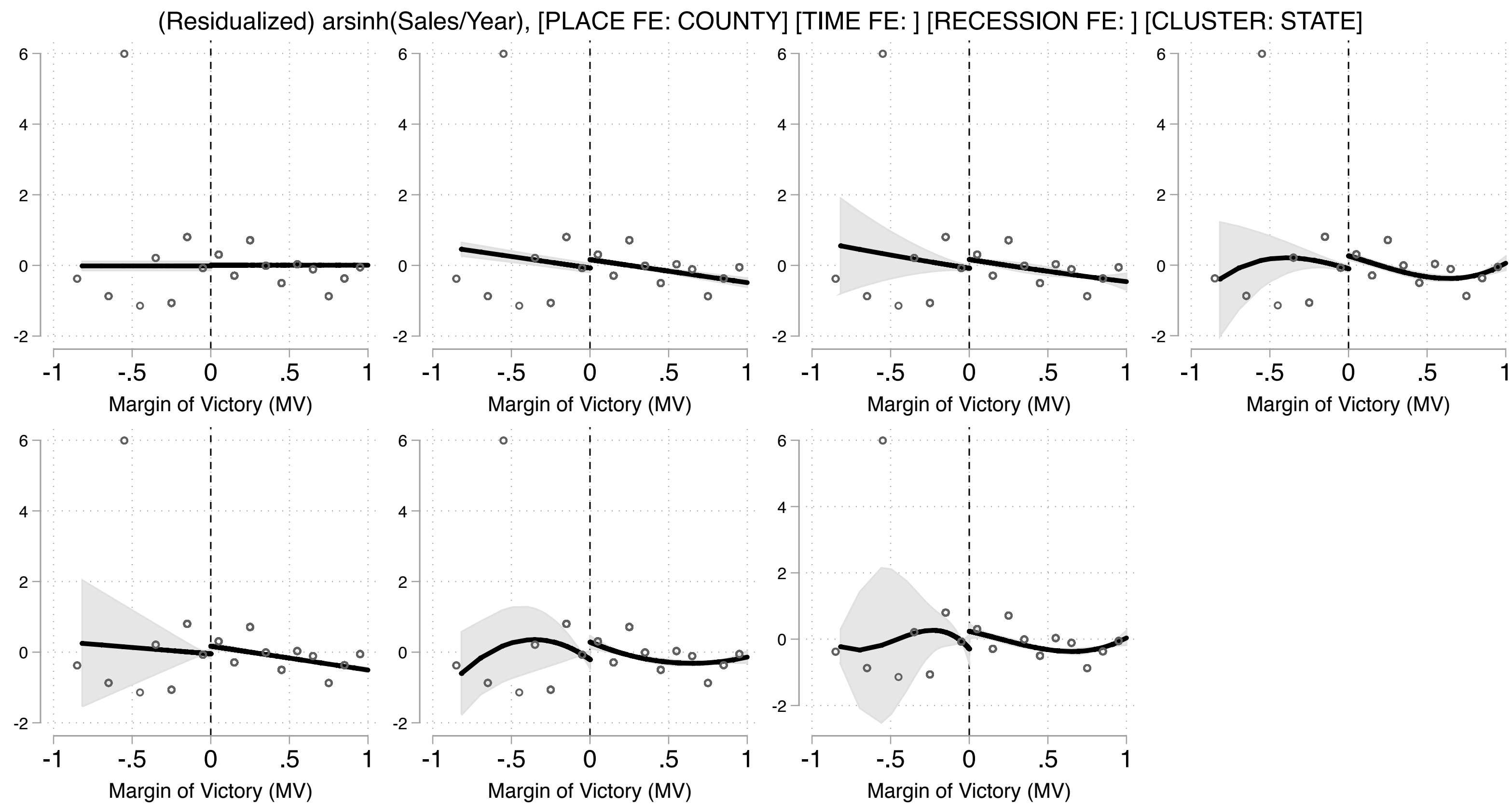
Displayed are global polynomial fits for a regression discontinuity design around close elections.

Figure 15: RDD with Alternative Specifications



Displayed are global polynomial fits for a regression discontinuity design around close elections.

Figure 16: RDD with Alternative Specifications



Displayed are global polynomial fits for a regression discontinuity design around close elections.