Testing the Self-Interested Voter Hypothesis
Evidence from the Macron victory in France

Preliminary - comments welcome

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Abstract

Narrow material campaign promises can win elections. This paper evidences that a promise to abolish a broad-based housing tax for eighty percent of households accounted for a substantial share of Emmanuel Macron’s electoral success in the 2017 French presidential election. Using a pre-treatment spatial exposure design based on the size of the tax cut at the municipality level, instrumented by formulaic real estate assessments established in the 1970s, I show that a one standard deviation in township exposure to the tax cut for the average household was associated with a c. 1.5 percentage point increase in the Macron vote share in the first round of the election, enough for the promised repeal to allow him to reach the run-off stage. These results are robust to adjusting for a rich variety of observable characteristics of the municipality’s electorate, including the predicted vote share for Macron from nation-wide polling shifts prior to the campaign promise. They also hold in a battery of robustness tests, when comparing only neighbouring towns, and when using other elections as placebo tests. Using high-frequency Internet search, polling, and prediction market data, I show that the timing of the promise to cut the housing tax coincided with a significant increase in voter information search, in Macron’s first- and second-round polling intentions, and in his predicted chances of victory, with an overall effect consistent with estimated coefficients based on pre-determined local variation. My results evidence the crucial role of distributive politics for marginal voters, even in elections marked by ideological polarization around non-economic issues.

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1 Introduction

American journalist and satirist H.L. Mencken once famously quipped that "every election is a sort of advance auction sale of stolen goods"\(^1\). The cynicism of that proposition notwithstanding, it has long been a widely accepted tenet of political economy discussions, that rational voters would elect candidates based on their narrow self-interest, and that expected material gains from one policy platform over another could push marginal voters to choose one side in electoral contests.\(^2\) During local or national campaigns, candidates regularly promise redistributive transfers, reductions in taxes, or "pork-barrel" government spending targeted towards certain locations or demographic groups, but also rules and regulations that favor specific production factors or segments of the electorate. Are these electoral promises "cheap talk", or do such campaign announcements indeed shape voting behavior? Can politicians win elections by merely promising higher transfers or lower taxes on certain constituencies once elected? While a staple of theoretical modelling of electoral behavior, credible causal empirical evidence on the so-called "self-interested voter hypothesis" remains relatively scant.

In this paper, I exploit substantial and conditionally exogenous spatial heterogeneity in exposure to the effects of a nationwide policy platform, to estimate the impact of campaign promises on electoral support. I avail myself of the peculiarities of the highly disputed first round of the 2017 French presidential election, when newcomer candidate Emmanuel Macron promised to repeal a local and residence tax, the taxe d’habitation. As described in section 2, the housing tax ("taxe d’habitation" was a widely unpopular levy, mostly because its value was computed based on outdated rental values and \textit{ad hoc} square footage estimates assessed in the early 1970s, generating substantial implicit redistribution between households across areas that had substantially evolved over time (see subsection 2.2). Since the tax base used these formulaic 1970 assessments, never updated since at the municipality level, pre-determined local variation in exposure to the housing tax burden was credibly exogenous, conditional on current real estate market values and local tax rates. Adjusting for these elements with administrative data from five million home sales, and controlling for a battery of socio-demographic and electoral characteristics, I show, using exhaustive administrative figures from more than 35,000 townships, that local differences in expected benefits from the tax cut – instrumented by the formulaic 1970 tax base assessments – explain a substantial share of variation in Macron’s electoral support, over and beyond his predicted success based on local voting body composition.

\(^1\)Sham Battle, The Baltimore Evening Sun, October 26, 1936
\(^2\)See e.g. Downs (1957), Lizzeri and Persico (2001), and Lindbeck and Weibull (1993); or Persson and Tabellini (2016) for a general treatment.
Estimating and documenting the efficacy of campaign promises in delivering electoral support is a crucial step in giving empirical credence to the theory of the self-interested voter. However, causal identification issues often plague the direct quantification of the causal relationship from policy platform commitments to voter behavior. Indeed, because the benefits of voting for candidate A, from the point of view of voter X, are not randomly assigned, merely estimating whether potential beneficiaries of a campaign promise are more likely to support a candidate or party is subject to substantial endogeneity concerns, for five main reasons.

First, neither platforms nor policy preferences are uni-dimensional. The determinants of voters’ decisions, whether economic or not, are many-fold, and identifying the precise impact of one electoral promise out of the many that constitute a politician’s platform is a delicate task. Conversely, because regulatory reforms, public good provision rules, and tax and spending policies have complex consequences for individual situations, it is often hard to pinpoint ex ante precisely who stands to gain from a given material campaign promise, such as an income tax cut, and thus to link targeted groups to their electoral response. From an econometric perspective, this implies that whether a voter is a beneficiary from a given candidate’s platform is measured with substantial error, which could blur any directional relationship between support and potential rewards.

Second, expected gains from a platform are usually not randomly assigned, but rather the outcome of a rational decision by candidates, which can reflect expected electoral strength. Thus, reverse causality may amplify or attenuate the correlation between the individual benefits from a policy platform, on the one hand, and the likelihood to vote for a candidate, on the other. If, for example, campaign promises respond endogenously to potential electoral support (e.g. because a candidate is trying to mobilize potential supporters, or to counter weakness in a given category of voters), the direct impact of electoral promises on electoral support will be obfuscated by reverse causality.

Third, concrete policy preferences, and ideological alignment with a party or candidate, have substantial overlap. If voters tend to favor some contender for ideological or “identity” reasons, these confounding factors may preclude a direct estimation of the impact of campaign promises on political support. As an example, affluent voters may be strong believers in school choice, and also likely to lose less more from austerity measures; if some parties tend to support both school choice and austerity, they will do particularly well among this constituency. Empirically, this means that alternative observed or unobserved determinants of voting behavior, such as demographic characteristics or personal ideology, are likely to be correlated with the potential benefits a voter may derive from

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3See Golden and Min (2013) for a review of empirical work.
the content of policy platforms, leading to omitted variable bias.

Fourth, researchers wishing to identify the causal impact of electoral promises often resort to local heterogeneity in policy benefits (e.g. from promised targeted spending on local infrastructure, such as the construction of a new airport, as in Ahlfeldt and Maennig (2015)). However, they then face an external validity trade-off between using well-identified local variation in electoral promises, and drawing more general implications for the electoral consequences of nationwide tax and spending policy platforms. Indeed, because, by their very nature, locally targeted policies, such as infrastructure spending, rarely represent a substantial share of a country’s income, drawing broader implications for electoral behavior is challenging.

Finally, a key source of voting advantage is the role of incumbent candidates. Because officeholders may campaign differently from newcomers, and also stand different chances in electoral contests, incumbency can be a major source of bias when estimating the impact of policy promises on voting outcomes. Moreover, because voter motivations may include both retrospective and prospective dimensions, and because the credibility of campaign promises may vary between incumbents, with a proven track record, and newcomers, incumbency may hamper the identification of the specific impact of campaign promises in triggering electoral support.

To remedy the aforementioned five challenges, requires conditionally exogenous, but economically substantial variation in the expected benefits awarded to various constituencies by a single, one-dimensional, and nationwide policy measure, not driven by correlates of ideology, in the absence of any incumbency advantage. This paper leverages such credible heterogeneity, in the context of the 2017 French Presidential election, and provides robust evidence that marginal voters indeed take into account their expected gains from politicians’ campaign promises on the national scene, when making electoral decisions. In February 2017, as a presidential challenger who just founded his political party a few weeks earlier, centrist contender Emmanuel Macron promised to scrap the taxe d’habitation (TH) - a controversial real estate levy applicable to both homeowners and renters - for the bottom eighty percent of households by income. He went on to win the election, and actually implemented the promise over three years, from 2018 to 2020, eventually promising its repeal for all households before the end of his five-year term. Under the self-interested voter hypothesis (SIVH), voters with an initially higher housing tax burden, motivated by their narrow material interests, should have been expected to vote in higher numbers for Emmanuel Macron. My experimental design uses differential and conditionally exogenous drivers of pre-treatment exposure to the planned cut in the taxe d’habitation (TH), at the township level across more than 35,000 municipalities, to test the SIVH.
The housing tax burden itself was correlated with unobserved determinants of the propensity of the municipality’s voting body to lean towards one specific candidate. Such endogeneity could arise both because households with different political opinions might select themselves across townships (communes) with varying housing values (spatial sorting); and because townships were free to set their own tax rates in municipal councils, making the rate correlated with local redistributive objectives and thus political ideology. However, unlike in many advanced economies, the tax base for the TH was not devised in reference to current housing market values, but entirely determined by outdated 1970 assessments of a few “reference units” at the municipality-level, never updated since, beyond a nationwide inflation adjustment. Thus, these assessed rental values constitute an instrument for the housing tax burden, which is both strongly relevant and plausibly locally exogenous conditional on current housing values interacted with current local tax rates.

Using the 1970 assessments, conditional on current median home values and socio-demographic characteristics computed from administrative data, to instrument for the locally heterogeneous exposure to the promised tax cut across France’s municipalities, my results demonstrate a strong, positive, economically large and statistically significant deviation of the voting performance of Emmanuel Macron, relative to its predicted value based on past electoral results, in municipalities with a higher initial 1970 average house assessment. The baseline results demonstrate that voters were more likely to vote for Emmanuel Macron when they expected his election to offset a higher initial tax bill. Heterogeneity analysis using census data suggests that localities with a larger share of homeowners and a smaller share of households exempt from the tax were more responsive to the policy. The results survive a battery of robustness checks, ranging from including additional controls, to comparing only municipalities that share a geographic border in a “spatial first difference” design, to using other electoral contests when the TH was not up for debate as placebo tests. Voter search for information about Macron’s proposal on the housing tax, as inferred from Google searches, spiked around the announcement and close to election day. Moreover, aggregate data from both high-frequency polling and prediction markets suggest a nationwide effect of the tax cut announcement consistent with estimated local effects.

This paper thus suggests that material self-interest may still constitute a key motivation for voting behavior, even in ideologically polarized contests such as the 2017 French presidential election, hailed worldwide as a defining showdown between a populist far-right animated by identity concerns and
a progressive center. The results suggest that tax cuts aimed at peculiarly salient, lump-sum, and politically controversial levies, might be especially efficient in triggering increased electoral support.

**Literature review**

Politicians regularly make campaign promises involving substantial amounts of fiscal and non-fiscal redistribution across income, age, or other social groups. A considerable body of theoretical work has studied the role of such “distributive politics” (Weingast, Shepsle, and Johnsen, 1981), and the resulting incentives for politicians to engage in material campaign promises (Feldman, 1982). The pivotal role of such promises is a staple of political science modelling, and the ability of politicians to credibly commit to implement their campaign platforms has been the object of widespread theoretical controversy. While it is commonly accepted that voters may make electoral decisions based on their own self-interest, credible empirical evidence remains limited.

On the one hand, a large empirical literature, summarized early on by Lewis-Beck and Stegmaier (2000), has explored the economic determinants of the vote. Most existing work, however, has focused on the role of cyclical economic outcomes, or windfall gains, for the electoral success of incumbents, at the national or local level. Studies in this strand of literature have made use of either time series evidence (Brender and Drazen, 2008), or, more recently, credibly quasi-random spatial shocks for economic performance or wealth (Brunner, Ross, and Washington, 2011; Bagues and Esteve-Volart, 2016) to test for the role of retrospective or “attributional” motives in the vote share received by incumbents. Some researchers have examined more specifically the role of fiscal transfers for electoral outcomes, using credibly exogenous spatial variation in expenditure outlays (Levitt and Snyder Jr, 1997) or truly randomized cash payouts (Manacorda, Miguel, and Vigorito, 2011; De La O, 2013; Zucco Jr, 2013), although tax cuts have received comparatively less attention.

As in this paper, a handful of contributions have exploited local variation in exposure to a nationwide policy; but usually, the objective is to estimate the *ex post* retrospective electoral impact for local incumbents of tax and spending policies, a related but different question from our focus on campaign promises and their nationwide impact. For example, Casaburi and Troiano (2016) have shown that an increase in tax enforcement intensity in Italy, hitting various regions differentially, had a positive impact on local reelection probabilities. Fetzer (2019) estimates the impact of austerity measures in

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4See e.g. *Financial Times*, April 26, 2017, “Emmanuel Macron offers the patriotic antidote to nationalism”.


the United Kingdom on local and individual-level support for the UKIP party and Britain’s exit from the European Union. However, this strand of literature has heretofore focused on “retrospective”, or so-called “pocketbook”, motives, whereby voters receiving higher (lower) transfers reward (punish) incumbents. While I also rely on plausibly exogenous spatial variation in policy exposure, my focus is on the \textit{ex ante} response of the vote in a national (rather than local) contest to a campaign promise before the program is implemented.

Very few studies have explored the topic of this paper, namely the \textit{ex ante} role of campaign promises of future tax and transfers in shaping electoral support. Some recent work on campaign efficacy has taken advantage of differential quasi-random or truly randomized (Kendall, Nannicini, and Trebbi, 2015; Cruz et al., 2018; Spenkuch and Toniatti, 2018) exposure to information about politicians’ platforms to estimate voting responses, leaving aside the question of differential exposure to actual policies implemented, and focusing on the role of voter knowledge of policies. The main recent empirical study on prospective pocketbook voting and the self-interested voter hypothesis is the work by Elinder, Jordahl, and Poutvaara (2015) about a Swedish Social-Democrat Party campaign proposal affecting tax and transfers differentially for parents with children of various ages. Exploiting survey data and the differential exposure of parents with kids in various age brackets, they demonstrate the qualitative relevance of prospective self-interested voting along that dimension, with exposed parents more likely than their counterparts to vote for the party promising increased transfers. My strategy instead exploits quasi-random geographic variation across locations in exposure to a promised tax cut, relies on exhaustive municipality-level data as opposed to survey evidence, and is concerned with a much larger tax cut proposal, representing one to two percent of household annual income. My paper’s main contribution is thus to expand our understanding of the electoral efficacy of campaign promises at the national level, leveraging differential quasi-random local exposure, and controlling for ideological shifts and socio-demographic composition.

Finally, by focusing on the differential electoral impact of a local residence tax repeal, this paper relates to the literature on the politics of local taxation. Existing work suggests that municipalities tend to reduce local business and real estate tax rates in election years. While several papers have investigated the existence and magnitude of such local political budget cycles (e.g. Aidt and Mooney (2014) in London, Foremny and Riedel (2014) in Germany, or Alesina and Paradisi (2017) for Italy), the role of these taxes for national electoral outcomes remains mostly \textit{terra incognita}. Despite the sizeable effects of local taxes on voters’ net incomes in most advanced economies, this paper is th
first, to my knowledge, in the literature, to explore the interaction between local taxes and national politics.

2 Institutional background

2.1 Political context

My laboratory to study the electoral benefits of material campaign promises is the 2017 presidential election in France. France has a democratic presidential regime, in which the president is elected every five years by popular vote in a two-rounds electoral system. In 2017, the first round pitted eleven candidates against each other; the two candidates who obtained the most votes in the first round (center-left Emmanuel Macron and far-right Marine Le Pen in 2017) advanced to a runoff stage in which they faced each other, two weeks later. The 2017 election witnessed a series of unusual upsets, making it especially well-suited for the study of the electoral efficacy of campaign promises.

First, the incumbent president, Socialist Party’s Francois Hollande, facing historically low popularity ratings, decided not to run for re-election on December 1st, 2016. Such a decision was a rare occurrence in French politics, and triggered a competitive process to replace him on the ballot in the Socialist Party. It is also a major advantage for my design, as the absent of an incumbent candidate offsets the usual difficulty associated with disentangling retrospective voting, motivated by ”rewarding” or ”punishing” incumbents, from the impact of campaign promises.

Second, the two major traditional parties, the right-wing Les Republicains (LR) and left-leaning Parti Socialiste (PS), held open primaries for the first time since the beginning of the Fifth Republic in 1958. Both parties chose ”surprise” candidates, former Prime Minister Francois Fillon for LR and former Education Minister Benoit Hamon for PS, instead of the respective early poll leaders, respectively former LR and PS Prime Ministers Alain Juppe and Manuel Valls. Thus, the competition in the general election was relatively open, with five major candidates (Fillon, Hamon, Macron, Le Pen, and Jean-Luc Melenchon, a far-left party leader) enjoying plausible chances of advancing to the runoff stage as late as two months before the first round.

Third, Francois Fillon, the right-wing candidate for the main opposition party, LR, was engulfed in a political-financial scandal. Le Canard Enchaine, an investigation and satirical weekly newspaper, revealed in January 2017 that F. Fillon had employed his wife and two of his children as parliamentary assistants while a member of parliament, and that they were paid in exchange for no or little amount of actual work. This scandal made Fillon, the early leader in the polls in January, drop to third place.
in a few weeks, and generated substantial volatility in polling intentions.

In this context of heightened political uncertainty among traditional parties, Emmanuel Macron, a former economic advisor and then Economy Minister in Francois Hollande’s cabinet, but a relative newcomer in French politics, mounted a bid for the presidency. He founded a new political party, En Marche, in April 2016, kick-starting his campaign by a show of force in his birth town, Amiens. He then formally announced his bid for the presidency on November 16th, 2016, after a series of encouraging polls suggested he could capture a substantial share of the electorate in the first round. Both Fillon and Hamon had run primary campaigns to the respective right- and left-wing of their own parties, creating substantial political space for a centrist candidacy, according to many observers. On February 24th, 2017, Emmanuel Macron was a guest on one of France’s most watched morning shows, Bourdin Direct. He announced that, if elected president, he would exempt the bottom 80% of households by income from the taxe d’habitation, a local residence tax. On April 23rd, Macron received the most votes in the first round of the presidential election, with 24.01% of the overall vote. He advanced to the second round, facing populist right-wing candidate Marine Le Pen. On May 7th 2017, Macron won the second round of the presidential election with c. 66.1% of the vote, becoming the eighth elected president of the Fifth Republic.

2.2 The French housing tax

The taxe d’habitation (TH) is a housing tax collected by the government on behalf of French municipalities and inter-municipal cooperations. The TH is collected on all furnished housing units and remitted by resident households, irrespective of their ownership status (renters or owner-occupiers). It is one of four main sources of recurring revenue for local authorities in France, along with a property tax (the taxe fonciere sur les proprietes baties), a tax on unbuilt land (taxe fonciere sur les proprietes non-baties), and a local business tax (the Local Economic Contribution or Contribution Economique Territoriale, a successor to the Taxe Professionnelle).

The TH was widely decried as France’s most unfair tax, mostly due to horizontal equity con-
cerns. Households were taxed on the basis of an imputed value, the $VLC_{70}$, that often had little in common with the actual rental value of their house. Implicit burden-shifting from single-family homes and older apartment buildings in city-centers, mostly populated by higher-income households, towards rural periphery towns and large social housing projects in poorer suburbs, regularly led to Parliamentary reports,\footnote{See e.g., among countless examples, Challenges, a popular weekly, on November, 13th, 2014, about “Why the housing tax is the most unfair of all taxes”.} the creation of advisory committees, and popular press outcry. Every year, Senate reports and popular press articles were full of examples of low-income households in some of France’s highest poverty rates rural municipalities, paying higher income taxes than affluent families in the Marais, a formerly immigrant but now fashionable central Paris neighbourhood mostly rehabilitated in the 1980s and 1990s.

The housing tax was particularly burdensome for younger households and poorer individuals in rural townships, given its applicability to renters and its one-time annual lump-sum payment. Moreover, since only 43 percent of households paid any progressive income tax ($Impot sur le revenu$) in 2016,\footnote{Together, the Senate, National Assembly, and two advisory and control bodies, the Cour des Comptes, and Conseil des Prélèvements Obligatoires, authored more than twenty reports dedicated to the need for a general revision the imputed rental values from 1990 to 2017.} this made the $taxe d’habitation$ the only broadly applicable and salient tax payment made by households at almost all income levels above the poverty line.

The TH follows a complex array of rules, deductions, and exemptions. At its core, the tax is the product of a tax base, consisting of historical rental values determined in 1970 and never locally adjusted since, minus several progressive deductions and allowances, times the sum of two tax rates, respectively set by municipalities ($communes$) and inter-municipal cooperations ($Etablissements publics de coopération intercommunale$), with the largest share usually attributable to the municipality.

### 2.2.1 Tax base

The tax base of the TH is an imputed annual renting value of the unit, the so-called $valeur locative cadastrale$, or VLC. The VLC assessment, used for the determination of all other local taxes in France, such as the individual property taxes on built and unbuilt land, is the product of a weighted square footage, and a rental rate.\footnote{Most households not subject to the progressive income tax but receiving wage or pension income do pay the Value Added Tax on consumption, a flat income tax ($CSG$), and social security contributions covering health and unemployment insurance, but because these are either directly subtracted from gross income or included in sale prices, most of these contributions are not as salient as direct tax payments from the point of view of households.}
**Weighted square footage**  The weighted square footage computation started by measuring the actual square footage of a housing unit in 1970. Then, each housing unit was ranked by municipal agents into one of eight “quality categories”, corresponding to eight coarse levels on a ladder from “insalubrious” to “luxury”, as classified arbitrarily and independently in 1970 by civil servants in each town. The assessor then scaled the measured footage, using a formula over-weighting the first twenty square meters and under-weighting additional square footage beyond a threshold that varies according to the unit’s quality, to account for “decreasing returns” in rental services. The “weighted square footage” thus computed is then adjusted upwards for the presence of what were deemed in 1970 to be “comfort” elements. These comfort elements, like the presence of a bathtub (5 additional sq. m or 50 sq. ft), sinks (3 sq. m), running water (10 sq. m), or electricity (2 sq. m), each add a fixed number of “weighted square footage”.

The resulting weighted area is adjusted downwards or upwards by five percent in the presence of an elevator in 1970, and by two multiplicative factors (up to minus or plus twenty percent each): the “maintenance coefficient”, which accounts for the age, maintenance requirements and overall condition of the unit – as of 1970; and the “peculiar situation coefficient”, which takes into account its relative location within a municipality. Both adjustments correspond to the condition of the unit and the desirability of its location according to municipal civil servants as of January 1st, 1970.

**Rental rates**  The weighted square footage obtained after all previous steps was then multiplied by a municipality- and category-specific “rental rate”, defined in 1970, to obtain the imputed rental value. In each town, a few “representative units” (5.2 percent of units nationally) were assessed for each category, with municipal agents recording either their actual market rental rate, observed as of January 1st, 1970, or an imputed rate according to a fixed return on the unit’s last sale price. Each non-reference housing unit was then allocated the municipality- and category-specific rental rate per square meter of weighted square footage of the reference unit. Multiplying the “rental rate” by the “imputed square footage” of the unit yielded a VLC as of January 1970, or VLC70. Newly built housing after 1970 is classified into one of the eight quality categories, and then attributed a virtual VLC70 according to the exact same process.

**Revisions of the VLC - or absence thereof**  Officially, a July 1, 1974 French law calls for the revision of the VLC70 every three years, as well as changes to the imputed square footage of a unit in the case of remodellings or additions. However, because of the extreme complexity and administrative burden of the revision process, the VLC70 were never revised since. They were “actualized” once in
1980, but even then, only a raw province-level multiplicative adjustment factor was used, yielding somewhat updated VLCs, nicknamed VLC80.\textsuperscript{10} These VLC80 have only been updated annually since 1981 according to a national indexation coefficient voted by the French Parliament until 2018. That coefficient, in practice, has been slightly higher than the rent component of CPI inflation nationally, in order to increase revenue for local authorities and compensate for initially low actualization in 1980.\textsuperscript{11}

A July 1990 bill\textsuperscript{12} was the only attempt at wholly revising rental values. Updated market rate assessments were collected throughout the French territory, and this massive effort led to the existence of a shadow rental value database, the VLC90, at the French revenue service (then called the Direction Generale des Impots). According to the planned revision, rental values were updated upwards by more than 50 percent in at least seven percent of cases, and higher-income households would have been hit substantially harder.\textsuperscript{13} However, after several years of fierce debates, the government abandoned the project in the late 1990s, in view of the substantial redistributive effects such a revision would imply. A small scale experiment to revise some VLC in five out of ninety-five provinces was also conducted in 2011, but did not lead to a general updating of VLC used in the housing tax.

The absence of local flexibility in the revision of rates and square footage over more than 45 years led to a substantial geographic disconnect between current market rental valuations at the local level, and the formulaic valuations. In particular, housing units in some regions, such as the Mediterranean Coast, the hinterland of Brittany, or the so-called ”new towns” in the outer Paris area, and in suburban areas within municipalities, were newly built in 1970.\textsuperscript{14} Such homes were thus deemed in good condition, and benefited from then ”modern” amenities (such as a electricity or running water), leading to high rental values in what were, forty-seven years later as of 2016, mostly decayed social housing units or periphery areas.\textsuperscript{14} On the contrary, city centers in most of France’s large cities, including Paris, Bordeaux, or Lyon, were only rehabilitated in the 1980s and 1990s under the so-called “Malraux” fiscal incentive scheme. Along with some newly gentrified rural towns, such areas had

\textsuperscript{10}There are 96 provinces or departements of varying size and population in metropolitan France, each of which contains more than 350 municipalities on average. The maximum decadal nominal actualization coefficient applied was 85 percent, in Paris. The minimum was 41 percent, in the Gers. The standard deviation of nominal decadal actualization across provinces was only eight percent. As a point of comparison, cumulative CPI inflation was over 170 percent over the same 1970-1980 period, according to INSEE, the French national statistical institute.

\textsuperscript{11}The cumulative nominal indexation coefficient from 1980 to 2016 was 3.053.

\textsuperscript{12}Loi n.90-669 du 30 juillet 1990 relative à la révision générale des évaluations des immeubles retenus pour la détermination des bases des impôts directs locaux

\textsuperscript{13}See the June 2012 Senate Ways and Means committee report on revising the VLC, Rapport d’information fait au nom de la Commission des Finances sur la révision des valeurs locatives professionnelles et commerciales

\textsuperscript{14}For historical details, see notably Vignolles (2014)
implausibly low VLC70s and assessed rental rates as of 2017, both due to their decayed condition in 1970, and to their relatively poor geographic situation back then, in spite of the substantial gentrification and population change they witnessed since. Even the "weighted square footage" values had rarely been updated as of 2017, even though virtually all city center housing units had undergone substantial remodellings and additions of "comfort" elements, such as elevators, electricity, bathrooms, or running water, over the previous fourty-seven years. Given their historical determination, the VLC, or assessed values, are mostly outside of the control of today’s municipalities. They are sometimes adjusted on a case-by-case basis in the presence of egregious mistakes, or changes in the rental value due to substantial re-modellings, although there is no penalty for failing to disclose a remodelling or addition to the tax administration. Indeed, smaller municipalities often only receive information from the national revenue service (DGFIP) about the aggregate VLC in the town.

2.2.2 Rates and deductions

Tax rates The municipal tax rate applied to the base, on the other hand, is defined by a vote in city councils every year. As of 2016, there were two levels of the tax in force, at the municipality level, and at the level of the “inter-municipality” (a syndicate of towns who jointly provide a variety of local public services). Tax rates vary widely across municipalities, reflecting both political priorities and funding needs, conditional on assessed values. Given their absence of control over the tax base, the rate of the TH, along with the tax rate of other individual and corporate property contributions also based on the VLC, was one of the main instruments for municipal councils to balance their budget until 2017. Most municipalities in France cannot legally issue debt for any purposes beyond fixed capital investment, and tax rates thus had to vary substantially each year to reflect varying current expenditure needs. The distribution of tax rates as of 2016 is described in figure 1, and exhibits substantial dispersion across municipalities.

Applicable deductions The tax base, obtained by multiplying the rental value by the imputed square footage, is adjusted for a number of deductions, most of which correspond to reductions for the number of dependents living in the household, or special exemptions for older citizens, lower-income households, or people with disabilities. Most deductions are aimed at reducing the burden of the tax for larger and/or underprivileged households. They are defined as a fixed deduction rate (e.g. 10% per additional child) multiplied by the average VLC in the municipality.¹⁵ Specific categories of

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¹⁵One national mandatory deduction is increasing in the number of dependents: the deduction rate can be adapted by municipalities from 10 to 20 percent for the first two children, and from 15 to 25 percent per child after the third. Two
households (people above 60, disabled individuals, and widowers) with an income below a threshold close to the national poverty line, adjusted for household size, are exempt from the tax. Finally, the tax is subject to a ceiling of 3.44% of the household’s annual fiscal income. Most deductions and ceilings are “paid for” by the central government, through inter-governmental grants to municipal authorities compensating for the corresponding lost revenue.\footnote{In 2017, out of EUR 23.9bn (slightly less than two percent of disposable income) of total TH receipts, EUR 1.7bn corresponded to the inter-governmental compensation for exempted households, and EUR 4bn to the inter-governmental compensation of deductions, leaving 18.2bn (76 percent) directly paid by households locally.}

**Summary of the tax computation** The total tax due by a household occupying a housing unit as of January 1\textsuperscript{st} in year \(N\) is thus equal to the product of the tax base (the VLC\textsubscript{70} of the housing unit, multiplied by the 1980 province-specific actualization coefficient, and by the nationwide 1980-to-\(N\) indexation coefficient) minus the sum of local and national deductions (which may depend on household characteristics), times the local tax rates set by municipalities (communes) and inter-municipal cooperations (EPCI). It is then increased by a flat fee of one to three percent of the tax due, to fund the administrative workload for the national government in charge of collecting it. To summarize, the tax due by a household \(h\) residing in municipality \(j\) in year \(t\), for a unit classified in category \(k\), was computed according to the following formula:

\[
\text{Tax}_{hjkt} = \begin{cases} 
0 & \text{if Income}_{ht} \in \Omega_{ht}, \text{the exoneration set} \\
\max \left( \left[ 1 + \text{Fee}_t \right] \times \left( \tau_{jt}^{\text{Com}} + \tau_{jt}^{\text{EPCI}(j)} \right) \times \text{Base}_{hjkt} ; 0.0344 \times \text{Income}_{ht} \right) & \text{otherwise}
\end{cases}
\]

(1)

where the VLC is itself the product of weighted square footage – depending only on the housing unit, and reference rental rates, which depend on the category and municipality:

\[
\text{Base}_{hjkt} = \underbrace{\text{VLC}_{70j_h}}_{\text{VLC}_{jht}} \times \underbrace{\text{WeightedSqFt}_{hk} \times \text{Rate}_{j,k,1970}}_{\text{WeightedSqFt}_{jht}} \times \underbrace{\text{Actualization}_{\text{Dep}(j),1980} \times \text{Index}_{1980,t}}_{\text{Actualization}_{jht}} - \sum_r \text{DeductionRate}_{r,jht} \times \text{VLC}_{jt}
\]

(2)

3 Data construction and description

I use data from a variety of administrative sources in France to construct my outcome variables (the share of registered voters who supported Emmanuel Macron in the first round of the French
presidential election in April 2017), and key sources of variation at the municipality-level (various measures of the initial housing tax burden as of 2016). I also describe below the use of administrative house sales, census, and government finance data for the construction of a series of important controls required to obtain conditionally exogenous variation in the expected benefit from the repeal, notably current housing values, home-ownership shares, and details on the local tax base.

Electoral outcomes I first collect data on electoral outcomes for all municipalities in France in the first and second rounds of the 2017 and 2012 presidential elections. Exhaustive data are gathered and provided by the French Interior Ministry, using figures from the national electoral commission (Commission nationale de recensement des votes). I exclude votes by French citizens in foreign countries and in French territories outside mainland France (except Corsica), since French citizens abroad are exempt from the housing tax. In 2017, all 35,281 municipalities in France’s mainland territory reported exhaustive electoral data. While some municipalities have dropped from the sample from 2012 to 2017, mostly due to mergers between formerly independent towns, I am able to match 35,278 cities in the two elections, corresponding to 99.991% of municipalities with available vote data in 2017.

Local taxation Detailed local taxation administrative data are available for the year 2016 from the Recensement des Elements d’Imposition a la Fiscalite Locale (REI) database designed by the French Treasury. It contains exhaustive figures on all local taxes, including tax rates, average rental values (VLC), as well as municipality-specific rates and number of beneficiaries for all deductions and exemptions. The data include such details for all local taxes, including the TH, but also the taxe fonciere (an individual property tax) and the contribution economique territoriale and its successor, the contribution sur la valeur ajoutee des entreprises, a local corporate business tax.

To compute my preferred measure for the average value of the housing tax burden per household in 2016, $TH_j^1$, I use data from the REI file, dividing the sum of total housing tax receipts (at the municipal and inter-municipal level) by the number of households in a municipality subject to the tax as of 2016. I include the collection fee imposed by the national government, as well as a few small specific “historical” taxes associated with the TH, levied on the same tax return using the same base, which were also subject to the Macron measure.\footnote{These notably include the so-called “taxe GEMAPI” and residence taxes specific to the Greater Paris area, which together represent less than 0.08 percent of overall TH receipts in the sample.} As shown in figure 2, this measure lines up almost exactly with an \textit{ex post} estimate of the average savings per household, provided by a government document published in 2018, after the Macron election, quantifying the benefit of the housing tax
cut at the municipality level. Figure 3a displays the variation in the average tax burden across the French mainland territory. The baseline measure $TH_j^1$ is available for 35,197 municipalities in France that I can merge to both 2017 and 2012 electoral data. These 35,197 municipalities, representing 99.97 percent of municipalities and close to 94 percent of the electorate in the 2017 election, constitute the baseline sample.

Across these main-sample townships or communes, with a median number of registered voters of 345 (mean: 1260), the average housing tax burden (weighted by number of registered voters in the municipalities) was around 733 euro, with a standard deviation of 245 euro. As a share of mean income per household in the township, it represented 2.3 percent on average.

**Housing market values** There does not exist a publicly available set of current market-rate housing values at the municipality level in France. To construct conditionally exogenous variation and control for the role of current housing values in household sorting and local ideological alignment, as described in detail in subsection 4.2, I use the *Demande de Valeurs Foncieres* (DVF) database provided by the French government. The DVF database is an exhaustive repository of c. five million housing transactions that intervened in France over a period of five years (2014 to 2019), recording their exact location, total value, square footage, and, for some observations, specific characteristics of the sale. I match transactions to their municipality, and use the full database to compute median and mean home values, and price per square meter, for home sales in each municipality over the five-year window centered around the 2016-2017 period of interest.

To validate this measure of housing prices, I measure its correlation at the municipality level with the mean assessed rental value (VLC) obtained from the administrative tax data. Long-run persistence in consumption and production amenities suggests that house prices should exhibit substantial autocorrelation, even over close to five decades. Indeed, both measures (the (log) VLC based on 1970 values, and the current (log) median home value) line up relatively closely, as shown in figure 4, with

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18This alternative measure, which has a 95 percent correlation with my baseline $TH_j^1$ figure in the available subset of c. 30,000 municipalities, is not used as the main dependent variable, for two reasons. First, it was not known to households at the time of the election; second, it includes the impact of potential changes to local tax rates between 2016 and 2018. In the robustness section, however, I experiment with a series of alternative measures of the TH burden, including this *ex post* government estimate.

19When including additional controls, the sample size varies slightly according to data availability, because INSEE does not disclose municipality-level data when it can be used to re-identify information about less than fifty households or a hundred individuals.

20See Casanova Enault, Boulay, and Coulon (2019) for a detailed description of the DVF database and potential caveats in the reporting of the data.

21I only include sales of houses and apartments, and exclude sales of unbuilt land and smaller units like garages. I also exclude sales of units below 10 square meters and winsorize the sample by excluding extreme values for the price per sq. meter.
a correlation of 0.57 (0.52 when using the mean home value). Nonetheless, there remains substantial heterogeneity in VLCs even conditional on current home values. A regression at the municipality level of log VLC on log median home value yields an R-squared of only 0.32 (0.27 when using the mean home value), suggesting substantial unexplained variance in mean VLCs across towns conditional on current real estate market conditions, as should be expected, given the almost fifty years lag between the two assessments, and the market value nature of the latter as opposed to the administrative computation of the former.

**Municipality-level characteristics** To control for composition effects at the municipality level and test for heterogeneous responses, I also include municipality-level control variables from a variety of sources. The primary source is the FiLoSoFi database (*Fichiers Localises Sociaux et Fiscaux* or *Localized Social and Fiscal Files*) in 2016. These data, combined by INSEE, the French statistical institute, are designed specifically to cover all taxpayers subject to the TH. They include inputs from several sources, notably tax files, pension scheme managers, and social security services, as well as the full population census. The FiLoSoFi files provide detailed information on population structure, age composition, income levels by decile, the share of disposable income received from capital, labor, or pensions, as well as the share of income paid in taxes or received in welfare benefits. I also use geographic adjacency files from OpenStreetMap, a collaborative open-source geographic information systems project, enabling me to identify and compare neighbouring municipalities. In addition, I obtain the mean income per capita in the municipality, not available in FiLoSoFi, from a government dataset specifying criteria for the attribution of inter-governmental grants, the *Dotation Globale des Collectivites Locales* dataset.

Table 1 describes summary statistics across municipalities for two subsets of controls: those used in the full sample (panel (a)), and those restricted to the subset of larger municipalities (or county seats, *chefs-lieux de canton*) with available details on the full distribution of household income by decile (panel (b)).

**Additional sources** To construct a pre-announcement prediction for the Macron vote share at the local level, I rely on pre-announcement polling data from an Elabe poll published three days before the announcement, including a decomposition of voting intentions by 2012 vote. When demonstrating the importance of the TH effect for Macron’s support at the aggregate level, I avail myself of a variety of additional sources. In particular, I use Internet search data from Google Trends; polling

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data from IFOP’s rolling daily poll; and prediction market data from the website PredictIt, when running event studies on estimated voter interest, victory chances, and polling results around the day when Macron announced the reform in February 2017.

4 Empirical analysis

4.1 Spatial variation in expected benefits and the Macron vote share

Baseline results  To evidence the relevance and quantitative magnitude of the results in raw electoral data, I start from the simplest possible specification. I regress the vote share of candidate Emmanuel Macron $\text{Share}_{j,2017}$, in the first round of the French presidential election, on the average initial housing tax (TH) burden, $TH_j$, in municipality $j$. As described in the preceding section, I use data from all municipalities with available vote results in mainland France and Corsica. The baseline results use ordinary least squares to regress the Macron vote share in the first round of the 2017 election, on housing tax receipts in 2016 (corresponding to the last available year of housing tax assessment known to households before the April 23rd election), as well as a number of controls at the municipality level. The main equation of interest is a cross-sectional regression across all available municipalities in the sample:

$$\text{MacronShare}_{j,2017} = \alpha + \beta TH_j + \gamma X_j + \eta_j$$

(3)

where the preferred computation for the average burden in municipality $j$, $TH_j$, is the dependent variable, and $X_j$ is a (potentially empty) vector of controls at the municipality level. Throughout the paper, following Casaburi and Troiano (2016), I cluster standard errors at the departement level, given the potential for spatial correlation in the error term.

The results are presented graphically in figure 5a, and the estimated coefficients are reported in table 2. They show a strong, positive, economically large, and statistically significant correlation between the average housing tax burden in a municipality and the share of votes obtained by Emmanuel Macron in the first round of the 2017 presidential election. The magnitude is substantial: a one standard deviation increase in the initial TH burden is associated with a 1.7 percentage point

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23 French citizens living abroad are exempt from the TH; France’s overseas departments follow different rules in the setting of the housing tax and were already mostly exempt from it as of 2017; together, these groups represent 6.6 percent of the electorate.

24 See subsection 4.4 for a discussion of spatial correlation and robustness checks using a spatial first differences design.
higher Macron vote share. Going from the twenty-fifth percentile of initial housing tax burden to the seventy-fifth\footnote{Throughout the article, quantiles are re-weighted by the number of registered voters in each municipality.} is associated with a 2.44 percentage points higher Macron vote share in the first round of the presidential election.

The vote share for Emmanuel Macron is likely to be correlated with other features of the municipality’s electorate, which, given the spatial sorting of households across space, could also be related to the initial housing tax burden. While the variation in average TH was evidently correlated with a number of characteristics of the municipality, there remained substantial heterogeneity in the housing tax burden even within narrowly defined strata. Therefore, to adjust for the characteristics of the municipality, I include a series of municipality-level controls which might be correlated with the vote share for candidate Macron. Columns 2 and 3 include such additional controls. Column 2 includes total population from the census, median household income, and mean income per capita, slightly reducing the available sample. Column 3 includes, for a subset of larger municipalities and county seats, additional detailed controls from the FiLoSoFi database, on the structure of the local income distribution, notably the threshold of all income deciles, as well as the share of average local disposable income coming from capital income, pension income, and welfare benefits. Because these additional controls are only available for larger municipalities, they reduce the sample and shift its composition towards larger, richer towns, which, as shown and explained in section 4.3, tend to exhibit a lower response to the promised tax cut. Nonetheless, they tell a consistent story, and quantitative estimates of the tax burden effect remain large. Given the substantial variation in commune size, Columns 4 to 6 repeat the specifications in Columns 1 to 3, but re-weight observations by the number of registered voters in each municipality.

**Adjusting for local ideology** A potential issue with the baseline approach followed above comes from the concern that unobserved determinants of local political ideology might be correlated with the initial housing tax burden. If, for example, even conditional on rich municipality-level socio-demographic and income distribution controls, populations with different political ideologies tend to sort themselves into areas with different productive or consumption amenities reflected in housing values, then real estate tax burdens will be correlated with electoral outcomes, generating a spurious conditional correlation between the Macron vote share and the TH burden. To disentangle the specific role of the tax cut proposal, I adjust my electoral outcome measure (the Macron vote share in the first round) for two different and flexible proxies of the predicted Macron vote share when abstracting
from heterogeneous benefits from the tax cut proposal:

- The polling shift approach. Under this methodology, I predict the 2017 Macron vote share based on a shift-share design, using aggregate vote intentions shifts from 2012 to 2017 before the policy announcements, and local electoral results in 2012. Specifically, I rely on pre-announcement polling data from Elabe, a leading French pollster, that released a February 21st study,\(^{26}\) including a decomposition of voting intentions based on the 2012 first-round vote of the respondent (for the top five 2012 contestants, representing 95 percent of the vote nationally). Given the estimated share \(\lambda_k\) of supporters of candidate \(k\) who stated in the poll they plan to support Macron, I construct the polling shift variable as:

\[
PS_j = \sum_{k=1}^{5} \lambda_k \omega_{jk,2012}
\]

where \(\omega_{jk,2012}\) is the share of 2012 registered voters who supported candidate \(k\) in municipality \(j\). This provides me with a predicted share, in township \(j\), of supporters of any of the top five 2012 candidates, indexed by \(k\), planning to support Macron before he announced the TH exemption.\(^{27}\)

- The prediction error approach. In this alternative methodology, I use the full sample of municipalities, and regress the 2017 vote share of Emmanuel Macron on the vote share (as a share of registered voters) of each of the 10 candidates (plus abstention) in the first round of the 2012 election.

\[
\omega_{j,Mac,2017} = \sum_{k=1}^{11} \beta_k \omega_{jk,2012} + \epsilon_{j,2017}
\]

I then use only the residual of this prediction, as my dependent variable \(PE_j\) for the Macron vote share “purged” from predictable realized shifts due to the ideological composition of the local electorate in \(j\):

\[
PE_j = \omega_{j,Mac,2017} - \sum_{k=1}^{11} \hat{\beta}_k \omega_{jk,2012}
\]

This residualization amounts to adjusting flexibly in the main specification for the share of each candidate in the municipality in 2012. It implicitly neutralizes the impact of the Macron vote shift approach.

\(^{26}\)Fieldwork was conducted five days to three days prior to the tax cut announcement.

\(^{27}\)The polling intentions \(\lambda_k\) used are: 3 percent of 2012 Melenchon voters, 34 percent of Hollande voters, 42 percent of Bayrou voters, 15 percent of Sarkozy voters, and 1 percent of Le Pen voters, intending to vote for Macron in the first round. Since the polling shift predicted Macron vote share is only based on the top five candidates in 2012, representing 95 percent of the vote nationwide, I re-scale the value obtained so that the aggregate number of predicted Macron votes in 2017 matches the actual total number of Macron votes.
platform on the average municipality, thus leaving room for heterogeneous effects depending on the initial tax burden.

The “ideology-adjusted” specification then uses either $PE_j$ or $PS_j$ as the outcome variable, and regresses it, using ordinary least squares, on the preferred measure of the average housing tax burden.

$$PS/PE_{j,2017} = \alpha + \beta TH_{j} + \gamma X_{j} + \eta_{j}$$  \hspace{1cm} (4)

Table 3 summarizes the results of this specification. Column 1 displays the results for the $PE_j$ outcome, which amounts to controlling for the vote share of everyone of the 12 candidates in the 2012 election. Columns 2 and 3 include additional controls, similar to the preceding subsection: column 2 includes widely available controls at the municipality level, while Column 3 includes additional detailed controls on the structure of the local income distribution, available only for larger municipalities. Columns 4 to 6 repeat the same specifications, but for $PS_j$, the “polling shift” approach, as the dependent variable. The results demonstrate that, even correcting for ideological composition, the Macron “excess vote share” in the first round of the 2017 election, whether one uses $PE_j$ or $PS_j$ as the outcome, is still strongly and positively correlated with the average initial housing tax burden in a municipality, even conditional on its predictable component based on past electoral results. Coefficients in column 1 to 5 are all statistically significant at the 1 percent level, and their magnitude is economically large, amounting to an 0.7 percent higher “Macron excess vote share” for a one standard deviation increase in the initial TH burden when using either $PS_j$ or $PE_j$, for our preferred estimates using the largest available sample with controls, in columns 2 and 5.

4.2 Instrumental variables specification

Even conditional on the 2012 presidential election results at the municipality level, and a wide array of observable characteristics, the main identification concern comes from omitted variables driving the correlation between the pre-election housing tax burden $TH_j$, on the one hand, and the Macron vote share adjusted for national 2012-2017 shifts, $PS_j$ or $PE_j$. In particular, a higher value of real estate in the municipality, may be correlated with the unpredictable component of support for Emmanuel Macron, on the one hand, and the initial TH burden, if populations with different preferences sorts into municipalities with higher housing prices; alternatively, local voters with idiosyncratic pref-
ference shocks leading them to prefer Emmanuel Macron may also be more prone to vote for local
officials whose ideology drives them to set high local tax rates for the TH.

However, owing to the specific structure of the housing tax detailed in section 2.2, the tax base
is constructed from 1970 VLC assessments that do not capture house price dynamics or household
sorting from 1970 to 2017. These 1970 VLC are also unlikely to be correlated with 2012-2017 electoral
shocks not accounted for by predictable shifts from supporting specific 2012 candidates to Emmanuel
Macron. Therefore, in this section, I use the average VLC in the municipality (conditional on current
house values and current TH tax rates) as an instrument for the actual tax burden. This strategy
evidently bypasses one potential confounder, the correlation between local ideology and tax rates.
As explained in section 3, the formulaic rental values established in the 1970s are correlated with
current values, since house prices exhibit persistence over time, potentially due to the permanent
nature of exogenous or endogenous production and consumption amenities. Thus, in the main IV
specification, I control for current tax rates, current housing values, and their interaction, as well as
a vector of controls including average receipts from other local taxes also based on the VLC70. I use
as my outcome variable the “Macron excess vote share” constructed in the preceding section (either
$PE_j$ or $PS_j$), which corresponds to the vote share adjusted for nationwide shifts interacted with the
composition of the local electorate. The first stage specification is:

$$TH_{j}^{IV} = \alpha + \beta VLC_j + \gamma X_j + \eta_j$$

while the reduced form specification is the following:

$$PS/PE_{j,2017} = \alpha + \beta VLC_j + \gamma X_j + \eta_j$$

The exogeneity assumption underlying the IV strategy is that, conditional on other local tax re-
ceipts for taxes based on the VLC, and on current home values interacted with current TH tax rates,
the rental values (VLC) only matter for the definition of the TH tax base, and thus, in the context of
the election, any observed correlation with the Macron excess vote share can only be driven by the
electoral impact of the promised repeal, validating the self-interested voter hypothesis.

Reduced form results from this instrumental variable strategy are displayed in figure 6, which
shows the relationship, conditional on controls including current home values and TH tax rates, be-
tween the excess Macron vote share (using the polling shift adjustment) and the average VLC in the municipality. Detailed results from this instrumental variable strategy are reported in table 4. Columns 1 to 3 use the raw Macron vote share $Macron_j$, as the outcome variable. Column 1 includes as controls other local tax receipts for taxes based on the VLC (the property tax, or $taxe$ $fonciere$ $sur$ $les$ $proprietes$ $baties$, and the land-value tax, or $taxe$ $fonciere$ $sur$ $les$ $proprietes$ $non$ $baties$), and current median home values in the municipality, current TH tax rates, and the interaction of the latter two. Column 2 includes additional controls available for – almost – the full sample, while Column 3 includes the set of additional controls available for larger municipalities and county seats already described in the previous section. Columns 4 to 6 repeat the same specifications, but using $PS_j$, the excess vote share adjusted for baseline pre-announcement nationwide polling shifts, as the outcome variable. Across all specifications, I find strongly positive and statistically significant effects of the housing tax burden on the Macron vote share. According to the preferred estimates for the Macron excess vote share (using the polling shift variable in the full sample with controls, in column 5), a one standard deviation increase in the initial TH burden (instrumented by the 1970-determined assessed rental values, and conditional on current home values and tax rates) leads to a c. one percentage point higher excess Macron vote share. The magnitudes of the point estimates are somewhat larger using this instrumental variable strategy than the corresponding values obtained when using ordinary least squares, suggesting that omitted variable bias might slightly attenuate the electoral effect in the baseline OLS regression.

4.3 Additional results

The role of home ownership The main effect of repealing of the housing tax, a reform fully financed initially by higher inter-governmental transfers from the State to local towns, was the implicit lump-sum expected redistribution from low- to high-TH burden municipalities. However, if local taxes are partly or fully capitalized into housing prices, an additional induced effect of the housing tax cut might have been a windfall capital gain for homeowners. Such capitalization effects would imply a stronger electoral response of the Macron vote share to the initial housing tax burden in locations with a higher share of homeowners.

Hence, I investigate next the heterogeneous role of the initial housing tax burden on the vote between municipalities with varying shares of home-owners versus renters. Unlike the property tax ($taxe$ $fonciere$), the burden of the $taxe$ $d’habitation$ in France falls upon both home-owners and renters.
Given the long-run nature of rental contracts and the well-established stickiness in nominal rents, economic incidence may closely follow statutory incidence. Thus both types of households, if they expect to stay in their current town for some period of time, should be expected to react to the tax when making electoral decisions. Nonetheless, any capitalization effects of lower housing taxes into property prices would exclusively benefit homeowners, whose assets would increase in value, generating a windfall capital gain when selling their house. Therefore, the overall net benefit of the Macron proposed reform is expected to be higher for households who own their home than for those who rent it, consistent with the so-called “homevoter hypothesis” (Fischel, 2009).

In the spirit of Ahlfeldt and Maennig (2015), I re-run the ideology-adjusted regressions, adding an interaction term between the share of homeowners in the municipality and the initial TH burden. I use data provided by INSEE and drawing from the full population census (Recensement de la population), providing me with the share of homeowners among primary residences in each municipality as of 2016. The baseline specification is:

\[
\text{MacronShare}_{j,2017} = \alpha + \beta_T \text{TH}^1_j + \beta_O \text{Home-ownership}_{j,2016} + \delta \text{Home-ownership}_{j,2016} \times \text{TH}^1_j + \gamma X_j + \eta_j
\]

(7)

where the coefficient of interest on the interaction term is \(\delta\).

Table 6 summarizes the results. I find that the interaction has a strong, positive, and statistically significant effect on the vote share of candidate Emmanuel Macron. Column 1 uses the baseline OLS specification with only the Macron vote share as a dependent variable and no additional controls beyond home-ownership. Columns 2 to 6 replicate the robustness tests already implemented for the baseline regression: instrumenting both the TH burden and the interaction term by the average VLC in the municipality (and its interaction with homeownership) while controlling for pre-period home values interacted with local tax rates (column 2), introducing municipality-level controls \(X_j\), in the full sample (column 3), and repeating the previous three specifications using the Macron excess vote share as a dependent variable (using the polling shift approach \(PS_j\)) in columns 4 to 6. In all specifications, the additional marginal effect of home-ownership interacted with the TH burden remains economically large, and in all cases but column 6, significant at the five percent level.

To gauge the magnitude of the estimates of such heterogeneous effects, preferred results in columns 5 suggest that for cities at the first decile of home-ownership rates, a one standard-deviation increase

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30Standard rent contracts in France last three years. Moreover, rents cannot be adjusted upwards by more than a nation-wide fixed indexation coefficient every year in the case of continuing rental relationships.
in the housing tax burden in 2016 had an 1.27 percentage point effect on the excess vote share of candidate Macron; but that for those at the ninetieth percentile of home-ownership rates, the marginal effect of a one standard deviation increase on the excess vote share was 1.68 percentage points.

The role of town size  As mentioned above in section 4.1, the effect size in ordinary least squares regressions appears smaller when restricting the sample to larger municipalities. Column 1 of Table 7 shows this heterogeneous effect size more directly, using the raw Macron vote share as an outcome, and suggests that the interaction of population size and initial average TH burden has a negative coefficient estimate. More populated towns appear less responsive to the TH repeal promise. Column 2 shows that this heterogeneous effect also appears when using the $PS_j$ polling shift dependent variable as an outcome.

There are, however, three plausible explanations for the lower estimated effect using OLS in larger cities. First, a potential reason for the lower estimated effects in larger municipalities may simply be measurement error. Indeed, averaging at the municipality level is likely to lead to more attenuation bias in a highly populated and diverse city of 500,000 inhabitants than in a town with a population of 500. Because larger towns have a wider diversity of neighbourhoods and quality categories, averaging the TH burden at the municipality level creates measurement error in the independent source of variation, biasing the effect towards zero in this subset of towns.

Second, because larger towns are characterized by higher incomes on average, the share of the housing tax in the median household budget is smaller in these areas, making a given average euro amount less salient for residents of these cities. Column 3 of table 7 suggests that, when using as an independent variable the ratio of the income tax to median income in the municipality, one cannot reject the absence of heterogeneous effect size for larger municipalities; the same occurs when including directly mean and median income as controls in column 4.

Third, because larger towns often benefit from the presence of larger corporations and associated revenue from local business and corporate property tax, they are able to set lower rates on the politically more salient local residential housing tax, making the housing tax a less politically salient issue in these cities and a less relevant burden on a typical household budget. Column 5 of table 7 indeed shows that, when instrumenting the housing tax by local mean VLC, and the interaction term by the interaction of the mean VLC and population, the effect size for larger municipalities is again not statistically different than for smaller towns.
**Vote-stealing effects**  To investigate the sources of Macron’s advantage in the most TH-burdened cities, I then turn to the differential impact of the Macron TH on various other candidates. Table 5 repeats the instrumental variables specification in table 4 (using the prediction error approach to adjust for ideological composition, instrumenting for the TH burden using the mean VLC in the municipality, and including all controls in the full sample) but using the prediction error outcome for each of the other three major candidates (M. Le Pen, F. Fillon, J-L. Melenchon), as well as the abstention share (one minus turnout). This exercise suggests that most of the impact of the TH on vote shares comes at the expense of support for far-right candidate Marine Le Pen, and, to a lesser extent, led to an small increase in abstention.

**4.4 Robustness**

**Comparing neighboring municipalities**  The spatial auto-correlation in both Macron excess vote shares and initial average housing tax, visible in figures 3a and 3b, suggests a need to account for regional or local shifts in electoral outcomes, potentially driven by unobserved correlates of the housing tax burden. Although all regressions already cluster standard errors at the province level to account for such spatial correlation, I follow two distinct empirical approaches to control more flexibly for such regional shifts.

**Province fixed effects**  The first strategy includes province fixed-effects in the baseline regressions, to account for any additional regional shifts in the support for Emmanuel Macron not accounted for by national polling shifts. This also removes systematic local variation in the TH burden, such as the updating of rental values in 1980 at the province level, or province-level funding needs shocks for local authorities which may have had spillovers on the tax rates set locally by municipalities. Table 8 repeats the specifications of table 4, but including such province fixed effects. The magnitude of the coefficients (using either the IV specification or the OLS, and either the raw vote share or the excess vote share adjusted for polling shifts) is slightly increased relative to the baseline measures, and all estimates remain significant at the 0.1 percent level.

**Spatial first differences**  My second strategy to control for local shocks uses a strategy akin to the spatial first-difference design (SFD) developed by Druckermiller and Hsiang (2018). I use geographic adjacency files provided by OpenStreetMap to compare each municipality $j$ to a neighbouring munic-
ipality \(N(j)\),\(^{31}\) and compute for each \(Y_j\) corresponding to the dependent variable, the instruments, the independent variables, and the controls, a “spatial first difference”, \(\Delta Y_j = Y_j - Y_{N(j)}\). I then regress the difference in electoral outcomes \(\Delta \text{Macron}_j = \text{Macron}_j - \text{Macron}_{N(j)}\) (or \(\Delta \text{PS}_j = \text{PS}_j - \text{PS}_{N(j)}\)) on the difference in initial TH burdens \(\Delta \text{TH}^1_j = \text{TH}^1_j - \text{TH}^1_{N(j)}\), using either OLS or instrumental variables.

This differencing strategy is conceptually close to a first-differences panel data regression over time, when dependent and independent variables are first subtracted their lagged values. As discussed in Druckenmiller and Hsiang (2018), the goal is to remove remaining unobserved spatially correlated heterogeneity. The baseline OLS specification, in equation 8, thus relates the difference in the Macron (excess) vote between two towns that share a geographic border, and their initial relative TH burden.

\[
\Delta \text{MacronShare/PE/PS}_{j,2017} = \alpha + \beta \Delta \text{TH}^1_j + \gamma \Delta X_j + \eta_j
\]  

(8)

I also run the corresponding instrumental variables regression, using as an instrument for the spatial lag in TH burden the spatial difference in mean VLCs, and controlling for the spatial first difference of median home values and its interaction with the spatial first difference of local tax rates, as well as the spatial difference of other local taxes based on the VLC. Table 9 describes the results. The magnitude of the coefficients is stable and significant at the 0.1 percent level across specifications, suggesting the removal of spatially correlated endogeneity indeed makes estimates more precise. IV coefficients are larger than OLS, and overall similar to the baseline IV specifications.

**Varying the definition of the average tax burden** I compute alternative definitions for the municipality-level value of the housing tax burden in 2016, and show the robustness of the results to the use of these alternative measures in table 10. Using data from the REI file, I experiment with a series of alternative measures, including the ratio of total TH receipts to inhabitants (column 1), to registered voters (column 2); the ratio of the average tax payment to the mean income per consumption unit (column 3) and to median household income (column 4) in the municipality; and the euro-denominated value provided by the French Finance ministry publicly available document mentioned in section 3, published in 2018 after the Macron election, quantifying the benefit of the housing tax cut at the municipality level for the ”average” household (column 5).

For ease of interpretation, independent variables are normalized to have a mean of zero and a stan-
standard deviation of one, so that the figure in each column denotes the impact of a one standard deviation increase in the TH burden measure on the Macron excess vote share, using the polling shift approach (\(PS_j\)), and instrumenting the variation by the mean 1970-determined VLC in the municipality. While coefficients vary in magnitude, given the varying definition of the housing tax burden, all imply a quantitatively large effect, consistent with the baseline results.

**Placebo test: the 2012 election**  
In spite of the instrumental variable strategy, and several robustness checks, it is not entirely inconceivable that omitted variable bias (or alternative channels correlated with assessed rental values, even conditional on current house prices and tax rates) could still lead to a spurious correlation between local TH payments (or local VLC) and political alignment. To gauge the risk and potential magnitude of such a bias, I use the 2012 presidential election as a placebo test. The Taxe d’Habitation was not a salient wedge issue during the 2012 election. None of the major candidates campaigned on its repeal, it was not mentioned in any of the televised debates, and only a few proposals to adapt the tax were made, mostly through income-based modulations (in the case of then Socialist candidate and future president Francois Hollande) or proposals to integrate it in the national progressive income tax (in the case of far-right candidate Marine Le Pen). All such proposed measures ranked relatively low on candidates’ platforms, and did not generate any national news coverage, beyond specialized trade publications destined for local officeholders.

As in section 4.1, I purge the vote share of each of the main 2012 contenders from its predictable component by removing the systematic association with previous election results. This time, I use 2007 election results at the municipality-level to construct the \(PE_{j,2012,k}\) “prediction error approach” variable, for \(k\) corresponding to each of the top five candidates in 2012, based on the same methodology as above. I regress the 2012 vote share of candidate \(k\) on the full set of vote shares (as a share of registered voters) of each of the 12 candidates (plus abstention) in the first round of the 2007 election.

\[
\omega_{j,k,2013} = \sum_{l=1}^{l=13} \beta_l \omega_{j,l,2007} + \epsilon_{j,2012}
\]

I then use only the residual of this prediction, as my dependent variable \(PE_{j,2012,k}\) for candidate \(k\)’s vote share “purged” from predictable realized shifts due to the ideological composition of the local electorate in \(j\):

\[
PE_{j,2012,k} = \omega_{j,k,2012} - \sum_{l=1}^{l=13} \hat{\beta}_l \omega_{j,l,2007}
\]
This residualization amounts to adjusting flexibly in the main specification for the share of each candidate in the municipality in 2007.

I then regress the value of $PE_{j,2012,k}$, for each of the top five candidates, on the 2012 housing tax burden gathered from the REI 2012 database, as well as municipality-level controls provided by the FiLoSoFi 2012 data provided by INSEE. Table 11 repeats the ideology-adjusted specification (with controls for population and median income) for the top five candidates. As in all previous specifications, standard errors are clustered at the province level. Only one out of the top five contenders (Francois Bayrou) in 2012 exhibits a correlation of his excess vote share with the initial TH burden significant at the five percent level. The magnitude of that correlation in 2012 is at least one order of magnitude smaller than the effect size measured on the Macron excess vote share in 2017, and the R-squared of 0.003, despite the addition of controls, is negligible, and two orders of magnitude lower than the R-squared of the corresponding ideology-adjusted specification for the Macron excess vote share regressions in column 2 of table 3. Moreover, given that Bayrou endorsed Macron in the 2017 election, even taking as granted the potential presence of a quantitatively small omitted variable bias pushing voters away from centrist candidates in high TH-burden municipalities would lead to our main estimates being biased downwards. At any rate, even if one cannot fully rule out the existence of omitted channels and variables biasing the central estimates, the absence of a statistically significant or quantitatively relevant impact of the TH burden in the previous election provides strong evidence that the TH itself is not conditionally correlated to persistent, unobservable drivers of ideological alignment at the local level, and that the 2017 effect is indeed a reflection of the self-interested voter hypothesis.

5 Aggregate impact

In this final section, I provide suggestive evidence, using aggregate Internet searches, polling, and prediction market data, that Macron’s promise to repeal the housing tax indeed coincided with a rise in his appeal in the broader electorate. Moreover, using back-of-the-envelope calculations, I show that the quantitative magnitudes of these aggregate effects are consistent with the range of implied effects from my spatial heterogeneity estimates.
5.1 Internet searches

Taxpayers use Internet search engines to look for information about their expected tax liability, and tend to do so around particular events, which can be interpreted as a form of rational attention, or a form of salience-based updating. Using Google Trends, Hoopes, Reck, and Slemrod (2015) have documented that taxpayers in the United States search for tax information online especially more around trigger events, and that presidential elections, in particular, are accompanied by increased search effort, notably when candidates make taxes a salient dimension of their policy platform.

Macron announced the policy on February 24th, 2017. Using monthly data from Google Trends’s search engine, I first show, in figure 7, that searches for the housing tax in 2017 and 2018 broke with their regular seasonal pattern (which usually exhibits a substantial spike in October-November, the deadline for payment), reflecting the increased salience of the housing tax during the 2017 presidential campaign. The abnormal attention drawn to the housing tax started with the Macron announcement in February 2017 and spiked in May 2017, the date of the runoff stage of the election. Searches related to the housing tax itself were particularly prominent in the months leading to the first round of the presidential election. They then rose again in July 2017, after a keynote address by newly nominated Prime Minister Edouard Philippe suggested the promised reform might be delayed, and a rift ensued between Macron and part of his cabinet.

Then, again using monthly data, I include as keywords joint searches for the centrist candidate and the housing tax (“taxe habitation Macron”). As shown in figure 8, such joint searches rose fast in the period immediately following the announcement, and remained elevated throughout the campaign, peaking in May, the month of the run-off stage, but reaching high levels even in the following months, notably around and after the July 2017 policy address and subsequent conflict. In figure 9, looking at more granular daily data, by restricting the sample to the year 2017, I show that searches mentioning both Macron and the TH rose fast on the day of the announcement, suggesting widespread interest in the reform. They also rose in the runup to the first round of the election, and in the days following the presidential debate between E. Macron and M. Le Pen in between the two rounds, when the housing tax was one of the salient issues discussed.  

32 Hoopes, Reck, and Slemrod (2015) provide detailed information on the computation of Google’s index for the “propensity to search”, a 0 to 100 index where 100 corresponds to the highest relative value of searches for a term over the specified sample period in a given area. I restrict the sample to France over a ten year period, from January 1, 2010 to January 1, 2020. The results do not depend on the time window used.

33 See e.g. Ouest-France, May 4th 2017, Débat présidentiel. Ce qu’il faut retenir de l’affrontement entre Macron et Le Pen.
5.2 Daily polling results

To provide evidence that the promise to exempt a substantial share of the electorate from the housing tax had a significant and immediate effect on voting intentions for Emmanuel Macron, I use data from daily polls released before and after the announcement. Some pollsters have assembled anecdotal evidence around Election day that the housing tax cut was indeed an emblematic and salient proposal of the Macron campaign. In particular, I use data provided by PollsPosition, a French polls aggregator. These data aggregate all national polls realized in France using a representative sample and a method agreed upon by the National Polling Commission and defined in a July 1977 law. They include data from eight different pollsters. Polls are dated by the median fieldwork date. Using an event study design, I regress the predicted voting intentions for Emmanuel Macron on day fixed effects around the announcement of the policy. As shown in figure 10, Macron’s support (as measured by voting intentions in the adult population for the first round of the 2017 presidential election) rose durably in the days immediately following his morning show announcement of his intention to scrap the housing tax. However, two days before the policy announcement, on February 22nd, 2017, centrist politician and 2012 presidential candidate Francois Bayrou (already mentioned in the placebo analysis in section 4.4) announced his support for E. Macron. The limitation to daily data in the even study cannot allow me to properly disentangle the direct impact of Francois Bayrou’s endorsement from the impact of the proposed housing tax repeal, especially given that all polls used in the specification take between two and three days of fieldwork to be conducted, thus confounding the estimates of the relative impact of the TH tax cut and the Bayrou endorsement. However, the additional c.2 percentage point rise in support after Macron’s proposed TH repeal appears mostly consistent with the aggregate impact estimated from spatial variation in the TH burden.

5.3 Prediction markets

Prediction markets aggregate individual assessments of a race in progress, and, due to the incentives of participants to make accurate forecasts, they can provide high frequency market-based estimates of a candidate’s probability of winning an election. While such data suffer from known limitations

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34 See notably the IFOP Report n. 172, in November 2017, “L’exonération de la taxe d’habitation : mesure totémique du candidat-président Macron”. According to a Harris Interactive April 20th 2017 poll, two days before the first round of the presidential election, among 1022 respondents, a plurality (55 percent) cited the TH repeal as the most memorable and convincing policy platform of the campaign; 72 percent of those intending to vote for Emmanuel Macron cited the policy as the most convincing of the campaign. Another July 2017 Harris Interactive poll, which sampled 978 individuals soon after the presidential election, the repeal of the TH was Macron’s most favored proposal among those tested: 80 percent of respondents favored the policy.

35 I am thankful to Berengere Patault and Alexandre Andorra for sharing the PollsPosition data. These data are now made publicly accessible at https://www.pollsposition.com/home.
(Wolfers and Zitzewitz, 2004), especially for low-liquidity markets, they can help identify the ex ante likely impact of events on electoral outcomes at relatively high-frequency.\textsuperscript{36} I use data retrieved directly from PredictIt,\textsuperscript{37} the most widely used prediction market, in a 30-day window around the reform announcement, on the daily closing price in a contract paying a dollar in case of a Macron win in the election.

It should be noted that, relative to prediction markets for the United States, French markets have much lower volume, given their lesser penetration and social acceptability in the wider French society (Charpentier, 2017). Nonetheless, results displayed in figure In ??, graphically show that, in a thirty day window around the announcements, Macron’s predicted winning probability, as estimating from the closing price of a contract paying a dollar in the case of a Macron victory substantially in the days immediately following the announcement. The fifteen-day means immediately before and after the announcement exhibit a more than ten percentage points difference in estimated winning probabilities. While, akin to the observed polling impact, the rise could partly stem from the endorsement received by Macron from centrist 2012 candidate Francois Bayrou on February 22\textsuperscript{nd}, the sustained rise in Macron’s chances after the announcement, over and beyond the initial gain from Bayrou’s support two days earlier, is likely to reflect market estimates of the effect of the promised housing tax cut.

6 Concluding remarks

In this paper, using a housing tax repeal proposed by candidate Emmanuel Macron in the 2017 French presidential election, I provided evidence that the electorate indeed still responds to campaign promises by candidates, enough to sway a major election in a large OECD country. Towns bearing a higher initial housing tax burden, as predicted by historical assessed rental values from the 1970s still in use as of 2017 and controlling for current housing values, witnessed substantially larger shares of registered voters supporting Emmanuel Macron in the first round of the presidential election, over and beyond his predicted success based on past electoral results. Controlling for local demographic characteristics, the local income distribution, and past electoral outcomes in the municipality has little effect on the estimated impact of the initial housing tax burden. Even when using only variation between neighbouring municipalities, the results still show an economically

\textsuperscript{36}See Coulomb and Sangnier (2014) for an application of the use of such data in the French case in the 2007 presidential election, ten years earlier.

and statistically significant impact of the predicted local tax cut on support for Emmanuel Macron. Heterogeneity analyses suggest an especially strong impact of the promised tax cut in municipalities with a larger share of homeowners, a smaller share of exempt households, and a lower share of secondary residences.

The strengths of using a national policy platform affecting the burden of local taxation as a way to identify the impact of material promises on voting behavior are many-fold. First, there was substantial variation across fine geographic areas in exposure to the tax cut, even among neighbouring municipalities, and conditional on observables likely to affect the performance of each presidential candidate. Second, the nature of the French housing tax, owing to the pre-determined and formulaic nature of its tax base assessment, allows for a clear instrumental variables strategy to deal with potential remaining endogeneity concerns. Third, as demonstrated by opinion polls, Internet searches and prediction markets, the policy was clearly identified by voters throughout the campaign as a key plank of the centrist candidate’s platform, especially given the high salience of the housing tax in the electorate. Finally, because of the absence of an incumbent, voters had relatively little information on any of the contenders’ potential competence as head of State, and were both unlikely to vote based on retrospective evaluation considerations and more sensitive to prospective policy concerns embodied in candidates’ platforms.

Numerous studies have documented with quasi-experimental evidence the retrospective role of economic conditions or windfall transfers in support for incumbents. However, despite self-interested voting being a staple of political economy modelling, there is surprisingly little credible empirical causal evidence on the role of electoral promises. This paper contributes to an emerging literature causally studying the “prospective” voting motive, and in particular, the electoral impact of promised tax cuts. The efficacy of such material campaign promises in delivering votes remains a contentious topic, both among social scientists and practitioners. The self-interested voter hypothesis has recently lost some of its centrality, both in popular discourse, and among academic students of voting behavior (see e.g. Feldman (1982)). Indeed, it has been suggested, both in the academic and political realm, that, as material well-being improved in the long-run, narrow interests lost some of their pre-eminence in driving political behavior. Thomas Frank’s widely acclaimed 2007 book, *What’s the matter with Kansas?* (Frank, 2007), forcefully argued that alternative determinants of the vote, from “cultural anxiety” to altruistic considerations, accounted for the apparent disconnect between voters’ economic self-interest and their political preferences. According to such analysts, potential economic
gains and losses from a policy platform are no longer first-order determinants of voting behavior in advanced economies, and cultural or identity preoccupations have now taken their place. This paper suggests that, even in times of high polarization, costly but credible and salient promised tax cuts may still be enough to win the upper hand in major electoral contests.

References


Appendices

A Figures

Figure 1: **Housing tax rate distribution** The figure is a histogram plotting the frequency of initial housing tax rates by municipality, combining the rate of the municipality and the inter-municipal cooperation agreement.
Figure 2: Validation of the housing tax burden measure The figure is a binned scatter plot plotting the baseline estimate of the initial housing tax burden per household in a municipality, in euros, against a government estimate of average savings per household published in 2018, after the reform had been implemented. The x-axis of each dot is the mean value of the government estimate in the percentile. The y-axis is the average value of the tax burden (baseline measure) in the percentile. The line plots the predicted values from a linear regression model.

Figure 3: The initial TH burden and the Macron excess vote share The left panel maps the initial housing tax burden per household in a municipality, in euros, as of 2016, the last year when the value of the tax was known to households before the presidential election. Darker values denote higher values of the initial TH burden. The detailed computation of the average housing tax burden is explained in section 3. The right panel maps the excess vote share is computed using the “polling shift” approach which adjusts for nationwide swings from 2012 candidates to Emmanuel Macron in polls immediately preceding the week of the announcement of the housing tax repeal. Darker values denote higher values of the excess vote share, the detailed computation of which is explained in section 4.1.
Figure 4: **Validation of the market value measure** The figure is a binned scatter plot plotting the baseline estimate of the mean assessed rental value (VLC) in the municipality, against an estimated median home value in the municipality over the period 2014-2019 from the *Demande de Valeurs Foncieres* database. The x-axis of each dot is the mean value of the housing market value in the percentile. The y-axis is the average value of the municipality-level VLC in the percentile. The line plots the predicted values from a linear regression model.

(a) Macron first-round vote share and housing tax  
(b) Macron first-round vote surprise and housing tax

Figure 5: **Baseline and ideology-adjusted specification** The left panel is a binned scatter plot plotting Macron’s first round vote share in the 2017 French presidential election against the initial housing tax burden per household in a municipality, in euros. The right panel plots Macron’s first round excess vote share against the initial housing tax burden. The excess vote share is computed using the “polling shift” approach which adjusts for nationwide swings from 2012 candidates to Emmanuel Macron in polls immediately preceding the week of the announcement of the housing tax repeal. The x-axis is partitioned into percentiles. The x-axis of each dot is the mean value of the housing tax burden in the percentile. The y-axis is the average value of the Macron (resp. excess) vote share in the percentile. The line plots the predicted values from a linear regression model.
Figure 6: Macron first-round vote surprise and initial VLC: reduced form The figure is a binned scatter plot plotting Macron’s first round excess vote share against the initial average 1970-determined rental value in a municipality, in euros. The excess vote share is computed using the “polling shift” approach which adjusts for nationwide swings from 2012 candidates to Emmanuel Macron in polls immediately preceding the week of the announcement of the housing tax repeal. The x-axis is partitioned into percentiles. The x-axis of each dot is the mean value of the rental value in the percentile. The y-axis is the average value of the excess vote share in the percentile. The line plots the predicted values from a linear regression model.
Figure 7: **Google searches for the housing tax** The figure plots monthly values from Google Trends for searches containing the term “taxe habitation” in France over the period 2008-2020. The index denotes Google’s computation of a propensity to save, normalized to 100 at its maximum over the period. The shaded area denotes the period starting with the Macron repeal announcement, and ending with the finalization of the conflict between Macron and his cabinet over the implementation of the reform.
Figure 8: **Google joint searches for “housing tax” and “Macron”** The figure plots monthly values from Google Trends for searches containing the terms “taxe habitation Macron” in France over the period 2008-2020. The index denotes Google’s computation of a propensity to save, normalized to 100 at its maximum over the period. The shaded area denotes the period starting with the Macron repeal announcement, and ending with the finalization of the conflict between Macron and his cabinet over the implementation of the reform.
Figure 9: **Google joint searches for “housing tax” and “Macron”** The figure plots daily values from Google Trends for searches containing the terms “taxe habitation Macron” in France over the period January to September 2017. The index denotes Google’s computation of a propensity to save, normalized to 100 at its maximum over the period. The lines denote successively the Macron repeal announcement, the first round of the presidential election, the presidential debate, the runoff stage, and the height of the conflict between Macron and his cabinet over the implementation of the reform.

Figure 10: **Polls: first round voting intentions for E. Macron** The figure plots voting intentions for E. Macron in the first round, using all polls aggregated by PollsPosition. The vertical line denotes the Macron repeal announcement.
Figure 11: PredictIt estimated winning probability of Macron The figure plots daily values from PredictIt for the closing price of a contract paying one dollar in the case of a Macron final victory in the French presidential election in a thirty day window around the announcement. The vertical line denotes the Macron repeal announcement; the horizontal line denote the pre- and post-mean for the contract value in the fifteen days periods immediately preceding and following the announcement.
### B Tables

#### Table 1: Summary statistics

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<td>Median Income per household</td>
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<td>Mean income per capita</td>
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Data come from a variety of sources, including the French Interior Ministry, French national statistical institute, French Finance Ministry, French Territorial Planning Authority. The number of available observations for some detailed income distribution variables is lower, reflecting statistical secrecy rules.

#### Table 2: Baseline specification

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</table>

* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001.

Standard errors in parentheses, clustered at the province level. Columns 1 to 3 are unweighted ordinary least squares regressions; Columns 4 to 6 are weighted by the size of the local electorate. Columns 2 and 5 include as controls mean and median income, as well as population size. Columns 3 and 6, in addition to the same controls, include all deciles of income and the share of disposable income coming from pensions, capital income, and social transfers.
Table 3: Ideology-adjusted specification

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* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001

Standard errors in parentheses, clustered at the province level. Columns 1 to 3 are ordinary least squares regressions for the PE$_j$ or "prediction error" dependent variable; Columns 4 to 6 are ordinary least squares regressions for the PS$_j$ or "polling shift" variable. Columns 2 and 5 include as controls mean and median income, as well as population size. Columns 3 and 6, in addition to the same controls, include all deciles of income and the share of disposable income coming from pensions, capital income, and social transfers.

Table 4: Instrumental variables specification

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<td>Yes</td>
</tr>
<tr>
<td>First-stage F statistic</td>
<td>0.0854</td>
<td>0.136</td>
<td>0.446</td>
<td>0.0794</td>
<td>0.148</td>
<td>0.485</td>
</tr>
<tr>
<td>R-Square</td>
<td>0.0856</td>
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<td>0.0782</td>
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<td>0.486</td>
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</table>

* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001

Standard errors in parentheses, clustered at the province level. Columns 1 to 3 are instrumental variable regressions for the raw Macron vote share; Columns 4 to 6 are instrumental variable regressions for the PS$_j$ or "polling shift" dependent variable. Both use 1970-determined mean VLC in the municipality to instrument for the initial TH burden. Columns 1 and 4 include house values interacted with current TH rates, as well as other taxes depending on the VLC as controls. Columns 2 and 5 also include mean and median income, as well as population, as controls. Columns 3 and 6, in addition, include all deciles of income and the share of disposable income coming from pensions, capital income, and social transfers.
### Table 5: Vote-stealing effects

<table>
<thead>
<tr>
<th></th>
<th>(Le Pen)</th>
<th>(Fillon)</th>
<th>(Melenchon)</th>
<th>(Abstention)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial TH burden</strong></td>
<td><strong>-0.00434</strong>****</td>
<td><strong>-0.0000359</strong></td>
<td><strong>0.000254</strong></td>
<td><strong>0.00138</strong>****</td>
</tr>
<tr>
<td></td>
<td><strong>(0.000792)</strong></td>
<td><strong>(0.000731)</strong></td>
<td><strong>(0.000341)</strong></td>
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</tr>
<tr>
<td>Home value controls</td>
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<td>Yes</td>
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<td>No</td>
</tr>
<tr>
<td>Local tax controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Full sample controls</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>R-Square</td>
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<td>0.0186</td>
<td>0.0280</td>
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* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001

Standard errors in parentheses, clustered at the province level. Columns 1 to 4 are instrumental variable regressions for the $PE_j$ or “prediction error” dependent variable, where the dependent variable is the excess vote share of each of the three main contenders besides E. Macron, and excess abstention over the prediction. All use 1970-determined mean VLC in the municipality to instrument for the initial TH burden. All specifications include house values interacted with current TH rates, other taxes depending on the VLC, as well as mean and median income, and local population, as controls.

### Table 6: The role of home-ownership

<table>
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<th></th>
<th>(OLS)</th>
<th>(IV)</th>
<th>(IV)</th>
<th>(OLS)</th>
<th>(IV)</th>
<th>(IV)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Raw Macron vote share</td>
<td>“Polling shift” excess vote share</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Initial TH burden</strong></td>
<td>0.00238*</td>
<td>0.00359**</td>
<td>0.00245*</td>
<td>0.00367****</td>
<td>0.00400****</td>
<td>0.00331****</td>
</tr>
<tr>
<td></td>
<td><strong>(0.00135)</strong></td>
<td><strong>(0.00148)</strong></td>
<td><strong>(0.00146)</strong></td>
<td><strong>(0.000678)</strong></td>
<td><strong>(0.000802)</strong></td>
<td><strong>(0.000708)</strong></td>
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<tr>
<td><strong>Home ownership x TH</strong></td>
<td>0.00700****</td>
<td>0.00735****</td>
<td>0.00444**</td>
<td>0.00255****</td>
<td>0.00339****</td>
<td>0.000609</td>
</tr>
<tr>
<td></td>
<td><strong>(0.00149)</strong></td>
<td><strong>(0.00167)</strong></td>
<td><strong>(0.00205)</strong></td>
<td><strong>(0.000776)</strong></td>
<td><strong>(0.000838)</strong></td>
<td><strong>(0.00106)</strong></td>
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<td>Home value controls</td>
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<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Local tax controls</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full-sample controls</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>R-Square</td>
<td>0.0757</td>
<td>0.0960</td>
<td>0.142</td>
<td>0.0639</td>
<td>0.0815</td>
<td>0.147</td>
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* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001

Standard errors in parentheses, clustered at the province level. Columns 1 to 3 use the raw Macron vote share; Columns 4 to 6 use $PS_j$ or “polling shift” dependent variable. Columns 1 and 4 are OLS regressions; columns 2 to 3 and 5 to 6 are instrumental variable regressions, using 1970-determined mean VLC in the municipality to instrument for the initial TH burden and the interaction of the mean VLC with the home ownership rate to instrument for the interaction term. All specifications include controls for home ownership rates, house values interacted with current TH rates, other taxes depending on the VLC, as well as mean and median income, and local population, as controls.
Table 7: The role of town size

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<th>(OLS)</th>
<th>(OLS)</th>
<th>(OLS)</th>
<th>(IV)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial TH burden</strong></td>
<td>0.00702****</td>
<td>0.00535****</td>
<td>0.00340****</td>
<td>0.00615****</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.000861)</td>
<td>(0.000451)</td>
<td>(0.000483)</td>
<td>(0.000550)</td>
<td></td>
</tr>
<tr>
<td><strong>Pop. ('000) x TH burden</strong></td>
<td>-0.000300****</td>
<td>-0.000187****</td>
<td>-0.0000694</td>
<td>0.000192</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0000932)</td>
<td>(0.00000645)</td>
<td>(0.0000106)</td>
<td>(0.000139)</td>
<td></td>
</tr>
<tr>
<td><strong>Population INSEE</strong></td>
<td>0.000268****</td>
<td>0.000185****</td>
<td>0.0000801</td>
<td>0.000116</td>
<td>-0.000180</td>
</tr>
<tr>
<td></td>
<td>(0.00000714)</td>
<td>(0.00000586)</td>
<td>(0.00000671)</td>
<td>(0.0000102)</td>
<td>(0.000127)</td>
</tr>
<tr>
<td><strong>TH/income ratio</strong></td>
<td>0.616****</td>
<td></td>
<td>(0.105)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pop ('000) x TH/Income</strong></td>
<td>-0.000411</td>
<td></td>
<td>(0.00158)</td>
<td></td>
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<tr>
<td><strong>Home value controls</strong></td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Local tax controls</strong></td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Income controls</strong></td>
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<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td><strong>R-Square</strong></td>
<td>0.0671</td>
<td>0.0619</td>
<td>0.127</td>
<td>0.132</td>
<td>0.0737</td>
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<td>31684</td>
<td>31684</td>
<td>33226</td>
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<td>96</td>
<td>96</td>
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<td>96</td>
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</tbody>
</table>

* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001

Standard errors in parentheses, clustered at the province level. Columns 1 uses the raw Macron vote share; Columns 2 to 5 use the PS$_j$ or “polling shift” dependent variable. Columns 1 to 4 are OLS regressions; column 5 is an instrumental variable regressions, using 1970-determined mean VLC in the municipality to instrument for the initial TH burden and the interaction of the mean VLC with population size to instrument for the interaction term. All specifications include controls for population. Column 5 includes as controls house values interacted with current TH rates, other taxes depending on the VLC. Column 4 includes mean and median income, and local population, as controls.

Table 8: Province Fixed effects

<table>
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<th>(OLS)</th>
<th>(IV)</th>
<th>(IV)</th>
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<td></td>
<td></td>
<td></td>
<td><strong>&quot;Polling shift&quot; excess vote share</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Initial TH burden</strong></td>
<td>0.00824****</td>
<td>0.0102****</td>
<td>0.00473****</td>
<td>0.00553****</td>
<td>0.00637****</td>
<td>0.00319****</td>
</tr>
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<td></td>
<td>(0.000577)</td>
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<td>(0.000837)</td>
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<td><strong>Province FE</strong></td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Home value controls</strong></td>
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<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Local tax controls</strong></td>
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<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Full-sample controls</strong></td>
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<td>No</td>
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<td>Yes</td>
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<tr>
<td><strong>R-Square</strong></td>
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<td>0.0898</td>
<td>0.220</td>
<td>0.132</td>
<td>0.0582</td>
<td>0.135</td>
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<td><strong>Clusters</strong></td>
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</table>

* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001

Standard errors in parentheses, clustered at the province level. Columns 1 to 3 use the raw Macron vote share; Columns 4 to 6 use PS$_j$ or “polling shift” dependent variable. Columns 1 and 4 are OLS regressions; columns 2 to 3 and 5 to 6 are instrumental variable regressions, using 1970-determined mean VLC in the municipality to instrument for the initial TH burden. All specifications include province fixed-effects. Columns 2 to 3 and 5 to 6 include controls for house values interacted with current TH rates, other taxes depending on the VLC. Columns 3 and 6 include mean and median income, and local population, as controls.
Table 9: Spatial first differences

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<th>(OLS)</th>
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<th>(IV)</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SFD(Initial TH burden)</td>
<td>0.00351***</td>
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<td>0.00762***</td>
<td>0.00242***</td>
<td>0.00224***</td>
<td>0.00480***</td>
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<td>No</td>
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<td>Yes</td>
</tr>
<tr>
<td>Local tax controls</td>
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<td>No</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Income controls</td>
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<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>0.0118</td>
<td>0.00529</td>
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</tbody>
</table>

* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001

Standard errors in parentheses, clustered at the province level. Columns 1 to 3 use the raw Macron vote share; Columns 4 to 6 use PS$_{ij}$ or “polling shift” dependent variable. Columns 1, 2, 3 and 5 are OLS regressions; columns 4 and 6 are instrumental variable regressions, using 1970-determined (spatial first difference of) mean VLC in the municipalities to instrument for the initial (spatial first difference) TH burden. All variables, dependent and independent, correspond to $ΔY_j = Y_j - Y_{N(j)}$, with $N(j)$ the closest municipality to $j$ ordered by degrees. IV specifications include controls for house values interacted with current TH rates, other taxes depending on the VLC. Columns 3 and 6 include spatial first differences of mean and median income, and local population, as controls.

Table 10: Alternative measures of the TH burden

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<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
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<td>TH receipts/inhab.</td>
<td>2.580***</td>
<td></td>
<td></td>
<td></td>
<td>1.278****</td>
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<tr>
<td></td>
<td>(0.304)</td>
<td></td>
<td></td>
<td></td>
<td>(0.104)</td>
</tr>
<tr>
<td>TH receipts/registr.</td>
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<td>1.984***</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
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<td>TH/mean income</td>
<td></td>
<td></td>
<td>2.092***</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>(0.346)</td>
<td></td>
<td></td>
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<td>TH/median income</td>
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<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
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<td>R-Square</td>
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</tbody>
</table>

* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001

Standard errors in parentheses, clustered at the province level. All columns are instrumental variable regressions, using 1970-determined mean VLC in the municipality to instrument for the initial TH burden and the interaction of the mean VLC with population size to instrument for the interaction term. All specifications include controls for house values interacted with current TH rates, and other taxes depending on the VLC.
Table 11: Placebo analysis

<table>
<thead>
<tr>
<th></th>
<th>(Melenchon)</th>
<th>(Hollande)</th>
<th>(Bayrou)</th>
<th>(Sarkozy)</th>
<th>(Le Pen)</th>
</tr>
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<tr>
<td>Initial TH burden</td>
<td>-0.000190</td>
<td>0.000478</td>
<td>-0.000768***</td>
<td>-0.000478</td>
<td>-0.000914*</td>
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<td>(0.000464)</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>R-Square</td>
<td>0.000425</td>
<td>0.00130</td>
<td>0.00340</td>
<td>0.0116</td>
<td>0.00527</td>
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</tbody>
</table>

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01, **** p < 0.001

Standard errors in parentheses, clustered at the province level. All columns are OLS regressions, and include controls for population size and median income in 2012. The value of the dependent variable is $PE_{j,k,2012}$, the prediction error relative to 2007 results in the town for each candidate $k$. 