

# Estimating Preferences for the Performing Arts from Referendum Votes

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## Abstract

This paper studies the electoral connection in the domain of cultural policy spending by analyzing direct democratic referendums on financing of the performing arts. Previous empirical investigations into voter preferences for the arts are based on the (strong) assumption of full voter turnout. I show theoretically and empirically that capturing the turnout decision leads to a different interpretation of the regression coefficients.

By using a 2009 referendum in the Swiss canton St.Gallen to move fiscal responsibility of the local theater from the city to the canton, I show that accounting for the actual turnout decision yields quantitatively different results than previous estimates. In particular, I find that coefficients of variables simultaneously enhancing (or simultaneously deteriorating) turnout and preferences for the arts, e.g., income or the share of the old, are over-estimated. However, my analysis supports the view that socio-economic variables and preferences for the arts are highly correlated.

Analyzing post-ballot surveys of federal votes which took place on the same day as the St.Gallen referendum, reveals that voters were indeed on average richer, better educated and older than the total population. While politicians are typically thought of as spending more for the arts than citizens desire, my analysis shows that voters likely have stronger preferences for the arts than the average citizen.

**Keywords:** Theater; Public spending; Referendum; United voting theory

**JEL Classification Numbers:** Z110, Z180, H20, H40

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# 1 Introduction

Public spending contributes significantly to the financing of the performing arts, and is typically decided upon by politicians in parliaments or local councils. Evidence exists on the link between political outcomes and cultural policy (e.g., Benito, Bastida & Vicente 2013; Dalle Nogare & Galizzi 2011; Getzner 2002; Potrafke 2013), though cultural spending usually does not rank high on the electoral agenda. The electoral connection in the case of cultural spending is thus unclear: are legislators, who are typically non-average citizens in terms of education and income, guided by their personal preferences for the arts when deciding on cultural spending? Or do they implement policies desirable for their constituents?

The literature traditionally examines the link between voters preferences and level of public spending for the arts by either one of the following two methods: contingent valuation method (CVM) or the analysis of referendum votes on the arts. Examples of studies employing the first method are Throsby (1984), Throsby and Withers (1986), and Hansen (1997). While benefiting from the existence of individual-level data, CVM studies suffer from widely discussed deficiencies inherent to survey-based data. Referendum votes, in contrast, constitute actual and not hypothetical choices.

The second approach is central to this paper. Most closely related to this paper, Schulze and Ursprung (2000) use the accepted 1994 referendum regarding the Zurich Opera House to investigate drivers of voter preferences. They benefit from a relatively large dataset encompassing 170 municipalities in the canton of Zurich. They find supportive evidence for socio-economic variables – like income and education – affecting voter preferences for the performing arts, which allows them to conclude that preference drivers for the arts are similar in direct and representative democracies. An early advance relying on referendum analyses is by Frey and Pommerehne (1995) focusing on an successful local referendum regarding the purchase of Picasso paintings in the city of Basel, Switzerland. The authors find similar evidence for the important role of socio-economic outcomes in explaining support for the arts.

The two above-mentioned studies optimistically conclude that politicians indeed implement voter preferences when deciding on spending for the arts. However, they both make use of referendums that have been accepted by the voters. In contrast, the literature documents ample evidence from rejected arts referendums. Schneider and Pommerehne (1983) show that acceptance rates depend on the amount the government proposes to spend for the arts. In the 1970s, the

first referendum about increasing funding for the Basel Theater was rejected, while the second one - increasing funding by a smaller amount - got accepted. Getzner (2004) analyses an Austrian referendum regarding the construction of a new theater. Rushton (2005) provides evidence from a U.S. referendum that took place in Detroit in 2002. The results emphasize the importance of the democratic vote for governors as explanatory variable. Potrafke (2013) uses two rejected German referendums from 2010 regarding public spending for concert halls and adds insight on the link between right (high income)- and left-wing (low income) voters.

The above evidence sheds doubt on the conclusion that representatives in parliament implement cultural policies desired by the electorate. It seems more likely that in certain cases voters prefer a lower spending level than what politicians propose. There is seemingly a puzzle between the documented strong relationship between socio-economic variables and preferences for the arts on the one hand, and a relatively high number of rejected cultural referendums on the other one.

I tackle this question by revisiting the link between socio-economic variables and preferences for the performing arts measured using outcomes of referendum votes. Typically, this relation is explored by confronting preference variables of the *entire* population with voting decisions of a *subset* of the population: the voters. While most of the above-mentioned research starts with a micro-funded random utility model of candidate choice, turnout decisions are typically not taken into consideration. Explaining variation in the acceptance rates across municipalities by variation in socio-economic variables referring to the total population rests on the assumption of full voter turnout which is typically not fulfilled. Furthermore, the voting literature contends that socio-economic characteristics affecting support for the arts like education or income are likely to be drivers of turnout by themselves (Wolfinger & Rosenstone 1980).

In this paper, I propose an extension to estimating preferences from referendum votes encompassing the turnout decision. I use a united voting model based on Sanders (1998). The electorate only votes if the utility differential between the status quo and the referendum is large enough. I.e., only voters who care about the outcome of the vote participate. Comparing this model to the model relying on the full-turnout assumption shows that regression coefficients obtained by estimating the latter model might be biased. In particular, variables both affecting turnout and preferences positively (negatively) would have upward- (downward-)biased coefficients. The remedy to the problem is to control for voter turnout. In an empirical application I show that this adjustment does not change the results qualitatively, however, it affects the size of the estimated effects.

I analyze the 2009 cantonal referendum in St.Gallen proposing to shift financial responsibility from the city St.Gallen to the canton. While the new law would render the city fiscally neutral, the canton was expecting additionally up to 5.9 million of annually returning expenses. For citizens of the canton, voting in favor of the referendum was thus equivalent to supporting the arts and agreeing to pay more for them. Voters accepted the legislation narrowly by 51.7%.

The results show that income, share of the old population, travel time to the theater as well as the political orientation are the most powerful drivers of preferences. More than 90% of the variation in the dependent variable can be explained by a manageable number of preference controls.

The econometric model suggests to be cautious when interpreting the results: the variables income and share of the old are positive drivers of turnout as well as of preferences. Since both work in the same direction, controlling for turnout is necessary to estimate the pure preference effect. As expected, the coefficients become smaller but retain their significance. Generally, it turns out that accounting for the turnout decision changes the size of the estimated effects but allows to draw the same conclusions about the link between socio-economic variables and preferences for the arts.

On the same day as the cantonal referendum two federal votes took place for which post-ballot (VOX) surveys are available. Roll-off between votes hardly exists in Switzerland. The surveys can therefore be used to describe the socio-economic characteristics of voters on this day. Indeed, I show that voters were on average wealthier, better educated and older than the average population. This supports the usage of turnout-adjusted estimations when studying voter preferences from referendum outcomes.

The contribution of this paper is thus threefold. First, I show theoretically that estimating voter preferences from referendums assuming full voter turnout might lead to biased results, and propose an adjustment to correct for turnout on the voting day. Second, I use a comparable Swiss referendum to the one in Zurich to show the empirical impact of adjusting for voter turnout. Third, I use voter surveys to draw conclusions about the characteristics of the voting population. I show that voters markedly differ from the average population and might thus implement more high-brow cultural policies than average citizens would prefer.

The remainder of the paper is structured as follows. In Section 2 I give information on the institutional setting and details on the St.Gallen referendum. In the third Section, I present the econometric model, the empirical specification of the model and describe the data. The results are in Section 4. I conclude in Section 5.

## 2 Institutional Background

Direct democracy constitutes a central part of Switzerland’s political life. Up to four times a year, citizens are called to decide on policy questions in referendums (legislature proposed by parliaments) or initiatives (legislature proposed by groups outside the parliament).

“Concert and Theater St.Gallen” (Theater St.Gallen from hereon) is a city theater and concert hall located in the eastern part of Switzerland. It is the only theater in the region - the Zurich Opera being about one hour away - and therefore plays an important role in the region’s cultural life. The city is populated by about 70,000 inhabitants, compared to almost half a million in the canton of St.Gallen.

Like most opera houses and theaters it is highly subsidized. It received annual payments of 23.9 million Swiss Francs of which 55% were provided by the canton and the remainder by the city St.Gallen. This amount corresponds to more than 60% of the total budget. The regulation regarding subsidies was phasing out in 2011, requiring a new regulation. Based on the fact that the majority of visitors comes from municipalities in the canton St.Gallen outside the city (35%) as compared to 29.7% from the city, the new regulation was aiming at shifting the financing of the theater even more to the canton.<sup>1</sup> It was subject to a mandatory fiscal referendum as will be explained below.

The new regulation has the following features: first, the total amount of subsidies increases to 27.1 million Swiss Francs. Second, the canton provides the lion share of 70% whereas the city St.Gallen is responsible for 30%. The theater building (“Stadttheater”) as well as the concert hall (“Tonhalle”) would be under cantonal ownership requiring annual investments of 1.1 million Swiss Francs. In sum, the new regulation excluding infrastructural investments implies an annual increase of payments by the canton amounting to 5.9 million Swiss Francs, compared to a 1.25 million decrease for the city St.Gallen.

The released 1.25 million are dedicated to investments in museums in the city of St.Gallen. Fiscally, the new legislation is thus a zero-sum game for the city St.Gallen. The increase in cantonal subsidies was publicly communicated as an upper bound. Given that 29.8% of 2009’s visitors resided in cantons other than St.Gallen, the canton expected higher inter-cantonal compensations after the planned round of negotiations. 60% of cantonal subsidies comes from the cantonal household, the remaining 40% from a lottery fund (compared to the 40:60 ratio under the old regulation). To

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<sup>1</sup> Visitor numbers were kindly provided by the Theater St.Gallen. They are based on a visitor survey conducted in 2009.

voters it was thus clear that the total amount of cantonal subsidies would increase, and a larger share would be financed by the regular household.

For voters outside the city of St.Gallen, casting an approving ballot in the referendum was thus associated with higher spending for the theater financed by taxes. It can be consequently interpreted as support for the performing arts and the willingness to pay for it.

The cantonal parliament supported this legislation with a majority of 73 against 35 votes. The only party decidedly rejecting the law was the Swiss People's Party (SVP) which is a right-wing party with large popular support.<sup>2</sup> All laws entailing recurring public expenses above 1.5 million Swiss Francs annually are subject to a mandatory fiscal referendum by cantonal law. Voters thus have the last say when it comes to seizable expenditures. All voters receive booklets containing information on all ballot measures prior to the vote. The so called "cantonalization" of the theater was presented to the voters as strengthening the theater's regional importance and cementing quality of performances in the future (Staatskanzlei 2009). An alternative to the new legislation in case of a rejected referendum was not laid out to the voters. In the short run, the old regulation would have stayed in effect. According to the theater's director, politicians would have had to come up quickly with a new proposition in order to secure the financial flows necessary to keep the theater running.<sup>3</sup>

The referendum took place on 27 September, 2009. It was narrowly accepted with 51.7% voting in favor of the new legislation. At municipal level acceptance varied between 25.8 and 68.1%. Turnout amounted to 42.4%, and varied between 31 and 53.7%. The new legislation came into force at the beginning of the year 2010.

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<sup>2</sup> At the time of the referendum, the SVP held 41 of the 120 seats in the cantonal parliament and was thus the party with the largest share of seats.

<sup>3</sup> Personal interview with managing director Walter Signer on 20 October, 2015.

### 3 Empirical Strategy

The general idea is to explain voting results in the referendum for the performing arts by observable, socioeconomic and political characteristics of municipalities. I propose an extension to the standard estimation relating aggregate preference measures with voting outcomes by explicitly modeling the turnout decision. I show which potential biases may arise when turnout is not considered.

#### 3.1 Econometric Model

In the standard theory applied for the estimation of preferences for the arts the decision between the referendum and the status quo is modeled. It thus resembles *candidate choice models* requiring voters to select between two or more candidates. In contrast, *united voting models* explicitly take into account the turnout decision. Such a model based on Sanders (1998) will be presented in the following. While this model was originally meant to study individual voting behavior, I adjust it to accommodate the use of aggregate voting data.

The decision process is based on a standard random utility model in the spirit of McFadden (1974). Citizen  $j$  either votes for the referendum  $r$  or the status quo  $q$ . Otherwise he abstains.<sup>4</sup> He accepts the referendum whenever the utility differential between both alternatives is positive and large enough. Formally,  $vote_j = r$  if  $U_j(r) - U_j(q) > T_j$ , with utility function  $U_j$  and voting threshold  $T_j$ . Subscript  $j$  reflects that utility and threshold can vary across individuals.<sup>5</sup> For notational convenience I drop the individual subscript from hereon. If the citizen's perceived difference between utilities is small, he is indifferent between both options. The higher  $T$  (e.g., because of voting costs), the larger is the utility differential required to make the citizen cast a vote.

In a random utility model the utility function is composed of a deterministic part  $\beta X$  and a random disturbance term  $\epsilon$ , such that utility from voting for the referendum and the status quo are denoted by  $U(r) = \beta_r X + \epsilon_r$ ,  $U(q) = \beta_q X + \epsilon_q$  respectively.  $X$  is a vector of observable individual characteristics and  $\beta_r, \beta_q$  are vectors of parameters, their first elements being constants. Disturbances  $\epsilon_r, \epsilon_q$  are distributed according to a type-1 extreme-value distribution. Writing the voting threshold as a function of observable characteristics  $W$  and parameters  $\gamma$ , such that  $T = \gamma W$ , it follows that the probability of voting for the referendum is the following (cf. Sanders (1998) for

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<sup>4</sup> For simplicity, I refer to voters and citizens in the male form.

<sup>5</sup> The decision rule to vote for the status quo is analogous, and the probability of abstaining equals  $Prob(abstain) = 1 - Prob(vote = r) - Prob(vote = q)$ .

the proof):

$$Prob(vote = r) = \frac{e^{\beta_r X}}{e^{\beta_r X} + e^{\beta_q X} e^{\gamma W}} \quad (1)$$

The difference between this result and the candidate choice model lies in the term  $exp(\gamma W)$ . Both models coincide whenever  $exp(\gamma W) = 1$  or  $T = \gamma W = 0$ . In other words, candidate-choice models rely on the assumption that the entire eligible population votes.<sup>6</sup>

In what follows, I proceed from (1) to arrive at an estimation equation allowing to use proportional data in the absence of individual data. A detailed derivation is presented in the Appendix. Let  $P_r = Prob(vote = r)$  and normalize  $\beta_q = 0$ . Dividing (1) by its nominator, rearranging and taking the natural logarithm yields

$$\log\left(\frac{P_r}{1 - P_r}\right) = \beta_r X - \gamma W \quad (2)$$

Individual vote probabilities  $P_r$  can be substituted with the population means from the voting results if citizens are the same with respect to the control variables. Let  $c_m$  be the number of citizens and  $y_m$  the number of voters accepting the referendum in municipality  $m$ . Taking non-voting into account, the relevant measure is the share of *citizens* accepting the referendum (and not *voters*), and the probability of accepting the referendum in a municipality can be written as  $\hat{P}_m = y_m/c_m$ . Denoting observables related to voting at municipal level by  $X_m$  and turnout variables by  $W_m$ , the estimation equation is the following:

$$\log\left(\frac{\hat{P}_m}{1 - \hat{P}_m}\right) = \hat{\beta}_r X_m - \hat{\gamma} W_m + \epsilon_m \quad (3)$$

It can be shown that to adjust for heteroscedasticity, equation (3) needs to be normalized by the error term's variance  $\sigma^2 = 1/[c_m \hat{P}_m (1 - \hat{P}_m)]$ . The equation is thus estimated by weighted least squares with analytical weights proportional to the variance.<sup>7</sup>

### 3.2 Sources of Bias

The difference to equations estimated based on candidate-choice models lies in the term  $\tilde{\gamma} W_m$ , which is assumed to be zero there. Recall, that it represents factors impacting the voting threshold

<sup>6</sup> Even in places with compulsory voting turnout typically lies below 100%. Bechtel, Hangartner and Schmid (2015) show for the canton Vaud that average turnout never exceeded 90% even when voting is compulsory.

<sup>7</sup> In practice, I estimate the equation using the STATA command `glomit` which is equivalent to the described WLS approach.

$T$ .

Not controlling for turnout-related factors can lead to biased estimates of  $\beta_r$ . In particular, if variables explaining turnout decisions  $W$  are correlated with preference variables  $X$ , the consequence is a biased estimate of  $\hat{\beta}_r$  due to omitted variable bias. The direction of the bias depends on the correlation between the omitted turnout variables and preference variables as well as the dependent variable.

A second source of bias comes from the fact that variables known to affect voter turnout belong to the explanatory variables typically employed to explain preferences for the performing arts. E.g., income and education are both positive drivers of turnout (Wolfinger & Rosenstone 1980). At the same time, research has repeatedly identified a positive relation with acceptance rates in cultural referendums (Frey & Pommerehne 1995; Schulze & Ursprung 2000).

Consider the extreme case that  $X_m = W_m$ , i.e., all variables affecting turnout also affect acceptance. Equation (3) then becomes:

$$\begin{aligned} \log\left(\frac{\hat{P}_m}{1 - \hat{P}_m}\right) &= (\hat{\beta}_r - \hat{\gamma})X_m + \epsilon_m \\ &= \tilde{\beta}_r X_m + \epsilon_m \end{aligned} \tag{4}$$

This manipulation yields further insight regarding the interpretation of coefficients. Ignoring the turnout channel implies that  $\tilde{\beta}_r$  is interpreted, incorrectly though, as the sole impact of preference variables on acceptance rates. In truth, it incorporates the variable's impact on turnout as well. Depending on the sign of  $\gamma$ , the true preference effect  $\hat{\beta}_r$  is either over- or understated.

Suppose that a citizen prefers the referendum to the status quo,  $U(r) - U(q) > 0$ , but did not vote because his voting threshold exceeded the utility difference. Denote the  $k^{th}$  element of  $X$  by  $x_k$  and assume that higher levels of  $x_k$  are related to higher turnout. Consequently,  $x_k$  is negatively related to the turnout threshold  $T = \gamma W$  and it follows that  $\gamma < 0$ . From equation (4) it is easy to see that the estimated  $\tilde{\beta}_r$  is upward biased if preference variables enhance voter turnout ( $\gamma < 0$ ), and downward biased if preference variables depress turnout ( $\gamma > 0$ ). If the preference variable affects acceptance in the same direction as turnout (both positive, or both negative), this results in a too large (or too small) coefficient. If preference variables have a differential impact on acceptance and turnout, the total effect might be biased towards zero. I will come back to this finding when interpreting the empirical results.

### 3.3 Empirical Specification

All voting data and explanatory variables are aggregated at municipal level. At the time of the vote in September 2009 the canton St.Gallen consisted of 78 municipalities.

The data encompass a number of vote variables. The number of eligible citizens, number of citizens voting, and the number of yes and no votes is known for each municipality. I select explanatory variables in line with previous literature.

Whenever possible, variables were collected for the year 2009. If variables were not available for 2009, the closest possible year was selected. Some of the variables are based on the Swiss census. To receive observations for municipalities with few inhabitants, censuses from several years had to be merged together. This was done by the statistical office of the canton of St.Gallen.

The Swiss municipal landscape is characterized by constant changes, i.e., over time several municipalities merged. I adjust the data to accommodate the mergers such that vote and control variables reflect the same geographical areas.

A detailed description of all variables and their sources is provided in the Appendix.

#### VARIABLE SELECTION

Love of opera and theater constitute the predominant motive to support the performing arts. Consumers of the arts have a strong inclination to approving the referendum in order to preserve a high-quality theater (consumption value). However, only a small share of the population qualifies as theater visitors but may nevertheless vote for the referendum. Frey (2013) distinguishes the following non-user values: option (having the possibility of consuming arts in the future), existence (valuing the presence of the theater), bequest (keeping the arts for future generations), prestige (pride in the existence of an important arts institution in the region), and innovation (valuing the theater as a center of creativity).

Income and a higher level of education not only allow financing visits to the theater (which is relatively pricy in Switzerland) but also acknowledging the arts. I measure the variable *Income* by the monthly average taxable income in thousands at municipal level, and *Education* by the share of the population with college or university degree.

Older people, in contrast, have ample time to visit the theater such that municipalities with a higher share of older people should exhibit higher acceptance rates. I measure the *Share old* by the share of the population older than 65.

Self-employment, on the other hand, presents an obstacle to visiting a performance since it is

a time-consuming activity. I take the share of *Self-employed* workers (including family members employed) as a share of the total population.

The first four explanatory variables *Income*, *Education*, *Share old*, and *Self-employed* all have in common that they are typically thought of as affecting turnout decisions as well: the first three variables are positive drivers of turnout while the latter is a negative driver. For all variables, the turnout and the preference effect go in the same direction. The expectation regarding these variables is thus that the coefficient will reflect the joint effect of preferences and turnout.

Travel time reflects another part of the opportunity costs of enjoying an evening in the theater. Thus, the further away a citizen lives from the city of St.Gallen, the longer the visit takes. *Travel time* in minutes is measured by the duration of travel from the center of a municipality to the Theater St.Gallen.<sup>8</sup>

The political landscape usually plays a strong role for direct democratic votes in Switzerland. Rushton (2005) shows the importance of political orientation in explaining support for the arts. Voters identifying with parties follow their voting recommendations. Since the SVP was the only party rejecting the legislation in parliament, I control for the municipal share of votes this party, *Support SVP*, received during the 2008 elections for the cantonal parliament. The higher party support, the lower is the expected acceptance rate.

I employ the number of children aged 0 to 5 year as share of the total population to account for the offspring of parents caring for the future generations and accepting the referendum due to a bequest motive. The variable is called *Share young*.

*Density* captures urbanity and is measured by the number of inhabitants per municipality divided by its size. It controls for different tastes between urban and rural regions

Typically several ballots are held on the same day. On 27 September, 2009 two federal measures and four cantonal measures were decided upon in the canton of St.Gallen. Traditionally, little roll-off exists in Switzerland. The average voter turnout amounted to 42.4%.<sup>9</sup> In the Swiss context, the decision to vote or to abstain is consequently made at the election-date level and varies little with the various measures on the same day. Whether an individual citizen turned out depends on variables connected to the vote on the Theater St.Gallen, but is influenced by the other measures

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<sup>8</sup> Travel time was collected using Google maps. It is measured applying the "no traffic" option. Since performance typically take place in the evenings, the assumption of little traffic is reasonable.

<sup>9</sup> This observation stands in contrast to evidence from the U.S. suggesting lower turnout for less salient ballot measures. A potential explanation is the form of the voting documents: while ballot lists are the norm in the U.S., each ballot measure appears on a separate piece of paper in Switzerland. Thus, there exists no predetermined ranking of measures according to e.g. importance.

as well.

To account for overall levels of turnout, I use the municipal turnout in the last cantonal elections preceding the referendum in 2008, *Turnout election*. Descriptives can be found in Table 1.

Table 1: DESCRIPTIVES

VARIABLES	Mean	Std. Dev.	Min	Max
Acceptance in %	44.99	9.16	25.83	67.12
Acceptance log odds	-0.21	0.38	-1.05	0.71
Turnout	39.38	4.46	30.95	53.74
Income	5.03	0.58	4.26	8.20
Education	20.02	4.88	11.28	34.54
Share old	12.77	2.26	8.82	17.43
Self-employed	9.53	2.89	5.57	19.16
Travel time	30.43	16.02	8	68
Support SVP	32.91	5.63	19.65	47.25
Share young	5.94	0.98	4.25	8.55
Density	3.61	4.18	0.11	27.25
Turnout elections	36.69	4.62	28.11	49.78

NOTE: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Unweighted descriptive statistics. Based on 76 municipalities from the canton St.Gallen. The city St.Gallen is left out because it is dropped in the regressions as well.

## 4 Results

### 4.1 Descriptive Results

I begin with a short graphical analysis of the voting results. The acceptance rates at municipal level are depicted in Figure 1. The two darkest colors represent the accepting municipalities. The municipality marked with the darkest color in the North of the canton is the city of St.Gallen. The darker the color, the higher the acceptance rate.

Several patterns are clearly visible. First, the referendum passed almost exclusively in municipalities adjacent or in proximity to the city St.Gallen. Rapperswil-Jona, the second-largest municipality located in the West of the canton, constitutes the only exception. The further away, the lower is support in the referendum. Especially in the South of the canton, two large clusters are notable. They closely correspond to the two voting districts See-Gaster and Sargans defined by geographical areas. Apart from these patterns, relatively strong variation is visible especially in the West (Toggenburg) and the East (Rheintal) of the canton.

### 4.2 Estimating the United Turnout Model

In this section I estimate the full model including explanatory variables potentially affecting the probability of voting for the referendum and the turnout choice. The observation from the municipality St.Gallen itself is not included because citizens opposing the referendum might nevertheless have the incentive to vote for it (e.g., if they dislike theater but favor higher subsidies for the local museums).<sup>10</sup>

Results are in Table 5. In columns (1)-(8) I control for preference variables one at a time to capture their individual impact on the regression. The full model is estimated in (9) and turnout is added in (10). In the last specifications (11) and (12) I also control for the 8 voting districts of the canton St.Gallen. The district St.Gallen is left out as reference group.<sup>11</sup>

All variables are significant with the expected sign when controlled for individually. The only exception is the share of young (column (7)).

I find a positive relation between income and education and the acceptance rate respectively (columns (1) and (2)). Both variables are known to facilitate consumption and enhance appreciation of the performing arts and confirm the results of the previous literature. Also, the share of old people

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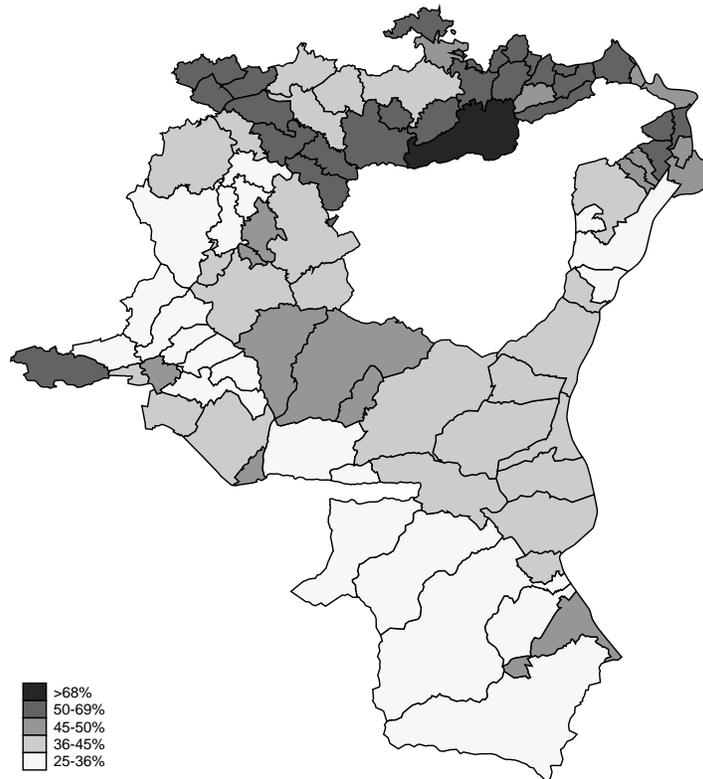
<sup>10</sup>For robustness, I rerun the regressions including the city for St.Gallen. The results are extremely similar and *Education* becomes significant.

<sup>11</sup>The district St.Gallen encompasses more municipalities than the city of St.Gallen.

and self-employment have the expected positive and negative sign respectively (columns (3) and (4)). Travel time in minutes exerts a negative and highly significant influence on acceptance (column (5)). It reflects both the opportunity costs of travel as well as the waning regional importance of the city St.Gallen as already suggested in the graphical analysis. Travel time is the variable with the highest explanatory power: just controlling for travel time, it is possible to explain 44% of the variation of the dependent variable.

The electoral support for the Swiss People’s Party (SVP) relates significantly and negatively to the acceptance for the referendum (column (6)). It suggests that SVP voters follow the policy line of their party in rejecting the new legislation. Alternatively, the vote share of the SVP captures a particular set of preferences against higher government spending for the arts. Similarly to the findings of Rushton (2005), who reports a positive relation with support for the Democrats, I find that the political dimension plays an important role in the explanation of support for the arts.

FIG. 1: ACCEPTANCE RATES IN % AT MUNICIPAL LEVEL



NOTE: Results of the vote regarding the Theater St.Gallen on 27 September, 2009. Acceptance rates are defined as the number of yes votes divided by the total number of votes per municipality. The city of St.Gallen has the highest acceptance rate and is marked with the darkest color.

The variable related to the bequest motive, *share young*, unexpectedly has a negative sign (column (7)). Potentially, parents of young children have less time to visit the theater and prefer to spend their income on family activities. The long-term bequest motive to leave cultural heritage for the future generations seems less relevant in the short term. Density has a positive effect reflecting pro-art preferences in more densely populated areas (column (8)).

In the full model (columns (9)-(12)) income, the share of old people, travel time, and support for the SVP retain their significant coefficients. But the remaining controls turn insignificant. The most likely reason for the insignificant education coefficient is the high correlation between income and education amounting to 0.73. Potentially, the income coefficient picks up part of the education effect as well. Further, note that the travel time coefficient only becomes insignificant when controlling for district fixed effects in columns (11) and (12) because they are highly correlated with travel time.

It should be generally noted that the full model in columns (9) to (12) has very high explanatory power. Controlling for relatively few variables allows explaining up to 91.6% of the variation in the data.

I now turn to the discussion of the two potential sources of bias that were suggested in Section 3 when describing the empirical strategy.

First, I have argued that not controlling for voter turnout might lead to biased estimates of the preference coefficients if they are correlated with turnout. In columns (10) and (12) turnout is controlled for. Comparing columns (9) and (10) as well as (11) and (12) shows that controlling for turnout has little impact on the qualitative results. Significance levels for all variables are the same. At the same time, the turnout control is positive and highly significant suggesting that acceptance was higher in places with higher turnout. Citizens in politically active places thus turned out for the referendum. The tentative analysis from estimating the full model suggests that the bias from leaving out turnout is not severe in the case presented here.

Second, a remark is at place regarding variables predicted to affect both turnout and acceptance of the referendum in the same direction. This pertains to the significant coefficients of the preference variables *Income* and *Share old*. E.g., old age typically fosters turnout since retired people face lower opportunity costs of voting. Similarly, they have more time to attend a theater performance. I showed in Section 3 that variables simultaneously fostering (impairing) turnout and preferences for the arts, have upward- (downward-) biased coefficients. Therefore, the absolute value of the coefficients estimated should be treated as aggregate effects and upper bounds of the true effect if

turnout is not controlled for.

Comparing *Income* and *Share old* coefficients in columns (9) and (10) as well as (11) and (12) respectively, yields the expected result: once turnout is controlled for, the coefficients of both variables become smaller. This means that the pure preference effect is indeed smaller than the aggregate effect. In conclusion this means that what was typically interpreted as a link between socio-economic variables and preferences for the arts, might partly be explained by turnout effects. However, the preference effects point into the expected (positive) direction and are highly significant. It allows to conclude that income and old age have the theoretically predicted effects on preferences for the arts.

Table 2: ESTIMATING THE UNITED TURNOUT MODEL

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Income	0.244*** (0.051)								0.168*** (0.047)	0.144*** (0.036)	0.167*** (0.044)	0.106*** (0.033)
Education		2.812*** (0.745)							0.909 (0.646)	0.540 (0.499)	0.912 (0.596)	0.444 (0.432)
Share old			3.697*** (1.069)						4.149*** (0.882)	2.629*** (0.709)	2.588*** (0.876)	1.781*** (0.638)
Self-employed				-5.506*** (1.496)					-1.131 (0.813)	-0.927 (0.627)	-0.886 (0.775)	-0.814 (0.558)
Travel time					-0.013*** (0.002)				-0.011*** (0.001)	-0.008*** (0.001)	-0.002 (0.003)	-0.004 (0.002)
Share SVP						-2.081*** (0.594)			-0.716** (0.329)	-1.110*** (0.258)	-1.195*** (0.408)	-1.687*** (0.298)
Share young							-11.047*** (4.103)		2.791 (3.074)	1.582 (2.370)	-2.686 (3.158)	-0.850 (2.279)
Density								0.029*** (0.006)	-0.001 (0.004)	0.005 (0.003)	-0.001 (0.005)	0.000 (0.003)
Turnout										2.555*** (0.358)		2.660*** (0.340)
Constant	-2.765*** (0.264)	-2.079*** (0.155)	-2.196*** (0.201)	-1.041*** (0.131)	-1.133*** (0.053)	-0.847*** (0.192)	-0.888*** (0.235)	-1.653*** (0.044)	-2.808*** (0.390)	-3.283*** (0.307)	-2.100*** (0.388)	-2.567*** (0.285)
Observations	76	76	76	76	76	76	76	76	76	76	76	76
Adjusted R <sup>2</sup>	0.228	0.150	0.127	0.143	0.440	0.130	0.077	0.231	0.785	0.872	0.837	0.916
District FE	NO	NO	NO	NO	YES	YES						

NOTE: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The dependent variable is the log odds of acceptance rates at municipal level. Weighted least squares regressions run using STATA command glogit. Standard errors in parentheses. Observations from the city of St.Gallen is excluded. All variables are specified as shares of the municipal population.

### 4.3 Turnout Evidence from Federal Post-Ballot Surveys

After all federal voting days in Switzerland post-ballot surveys, the VOX surveys, are conducted. Randomly selected citizens are contacted by telephone and asked about their voting decisions as well as a wealth of personal information. The questions only concern federal referendums, so the survey cannot be used to analyze preferences for the cantonal vote. However, as mentioned earlier, the turnout decision on a given voting day is highly correlated between the various measures taking place on the same day. The survey can therefore be utilized to explore the characteristics of the voting population and compare it to the total population.

Income, education and age are variables collected during the survey which coincide with variables used in the above regressions. I therefore compare the descriptive statistics from municipal data with the ones from survey respondents. I use only respondents who reported to have voted. Income is reported in five categories in the survey. I translate the average municipal monthly income into the five categories to make it comparable to the survey.<sup>12</sup>

The numbers are presented in Table 3. The first three columns refer to respondents from German-speaking cantons. The following three columns are based on respondents from the canton St.Gallen. Observations drop from more than 200 to roughly 30. The last three columns repeat descriptives from the St.Gallen municipalities for better comparability. Though there are differences between the German-speaking sample and the smaller St.Gallen sample, the trend is clear: voters on the 27 September, 2009 were earning more than the average. More respondents were better educated and the share of the old is about twice as large among voters as among the total population.

This comparison allows to conclude specifically for the voting day the St.Gallen Theater referendum took place that voters differed markedly from average citizens. Importantly, they differed in terms of socio-economic variables like income and old age, which the literature has identified as important drivers of preferences for the arts. This evidence reinforces the above argumentation: in order to estimate the pure preference effect of socio-economic variables on preferences for the arts controlling for turnout is necessary. The main intuition is that voters and average citizens differ with respect to several important explanatory variables.

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<sup>12</sup>The respective categories for monthly income in Swiss Francs are: 1 ( $\leq 3,000$ ), 2 ( $> 3,000$ ), 3 ( $> 5,000$ ), 4 ( $> 7,000$ ) and 5 ( $> 9,000$ ).

Table 3: DESCRIPTIVES OF VOTER CHARACTERISTICS

Source	VOX German			VOX SG			Cantonal descriptives		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
hline									
Income (category)	327	<b>3.25</b>	1.21	30	<b>2.97</b>	1.19	77	<b>2.48</b>	0.53
Education	370	<b>0.39</b>	0.49	31	<b>0.26</b>	0.44	77	<b>0.20</b>	0.05
Share old	374	<b>0.24</b>	0.43	31	<b>0.26</b>	0.44	77	<b>0.13</b>	0.02

NOTE: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Columns (1)-(6) are descriptive statistics of socio-economic variables of the voting respondents in the VOX survey regarding the votes on 27 September, 2009. Columns (1)-(3) are based on respondents from German-speaking regions. Columns (4)-(6) are based on respondents from the canton St.Gallen. Columns (7)-(9) are summary statistics from municipal data in the canton St.Gallen.

## 5 Concluding remarks

The literature often argues that politicians implement expensive cultural policies following their own preferences rather than public demands. This could be due to their own good education and above-average income which both facilitate the consumption of and appreciation for the arts. When using referendum outcomes to analyze public preferences for the performing arts, it should be considered that voters are non-average citizens. They are a relatively large but distinct subgroup of the population. It is thus important to account for voter turnout to control for how representative the decision-maker is compared to average citizens.

This is an interesting result not only from an econometric perspective. If politicians are considered as more high-brow than the citizens, so should be the voters. Voters are of course the relevant group when it comes to decision-making. But most likely, they agree to more spending for the arts than an average citizen would if required to cast a ballot.

This study allows to conclude that variation in socio-economic characteristics has high explanatory power when it comes to explaining variation in preferences for the arts. Similar patterns have been observed in the literature independent of the referendum outcome. Whether a cultural referendum gets accepted or not is not a matter of variation of socio-economic outcomes but much more likely depends on the overall amount of government spending at stake.

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# Appendix

## Proofs

The probability of voting for referendum  $r$  is:

$$Prob(\text{vote} = r) = \frac{e^{\beta_r X}}{e^{\beta_r X} + e^{\beta_q X} e^{\gamma W}} \quad (5)$$

Normalizing  $\beta_q = 1$ , dividing everything by  $e^{\beta_r X}$  and rearranging yields:

$$Prob(\text{vote} = r) = \frac{1}{1 + e^{\gamma W - \beta_r X}} \quad (6)$$

I define  $Z = \beta_r X - \gamma W$  and write the voting probability as  $P = Prob(\text{vote} = r)$ . Solving equation (6) for  $e^Z$  results in:

$$e^Z = \frac{P}{1 - P} \quad (7)$$

Taking the natural logarithm on both sides and substituting back for  $Z$  yields:

$$\log\left(\frac{P}{1 - P}\right) = \beta_r X - \gamma W \quad (8)$$

To account for the fact that individual voting probabilities are unknown to the researcher and only aggregate voting data at municipal level are available, sample means are used for the estimation. Denote the number of citizens in municipality  $m$  by  $c_m$  and the number of yes votes by  $y_m$ . The probability of voting yes in a given municipality is then defined as  $\hat{P}_m = y_m/c_m$ . Substituting into equation (8) yields the following estimation equation:

$$\log\left(\frac{\hat{P}_m}{1 - \hat{P}_m}\right) = \hat{\beta}_r X_m - \hat{\gamma} W_m + \epsilon_m \quad (9)$$

$X_m$  and  $W_m$  are explanatory variables at municipal level related to vote choice and turnout.  $\epsilon_m$  denotes the error term.

## Data sources

## Tables

Table 4: OVERVIEW OF VARIABLES AND DATA SOURCES

Variable	Description	Source
Acceptance rate	Share of voters voting yes in referendum	
Turnout	Share of eligible citizens voting	
Income	Average taxable monthly income per capita in 1,000 Swiss Francs	Federal Department of Finances, Federal Administration of Taxes
Education	Share with tertiary education (college or university degree). Pooled estimates from 2010-2012.	Kanton St.Gallen - Statistical Office
Distance	Categorical variable for distance from municipality to Theater St.Gallen in km: 1: 0-15, 2: 16-30,3: 31-45, 4: 46-60,5: >60km	Google maps
Travel time	Time in minutes from municipality to Theater St.Gallen.	Google maps without traffic option
Self-employed	Share of citizens self-employed (including family members employed). Pooled estimates from 2010-2012.	Kanton St.Gallen - Statistical Office
Share SVP	Vote share for Swiss People Party (SVP) in 2008 cantonal elections	Kanton St.Gallen - Statistical Office
Birthrate	Births as share of total population in 2010	Kanton St.Gallen - Statistical Office
Density	Number of citizens divided by municipality size in hectares	Federal Statistical Office. Areal Statistics.
Turnout elections	Turnout in 2008 cantonal elections	
Share old	Share of citizens older than 65	Kanton St.Gallen - Statistical Office

NOTE: This table provides an overview of the variables used with a short variable description, and the source from which it was retrieved. All variables are measured at municipal level. If nothing else is reported, the data are for the year 2009.

Table 5: ESTIMATING THE UNITED TURNOUT MODEL

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Income	0.233*** (0.072)								0.130*** (0.041)	0.138*** (0.030)	0.146*** (0.039)	0.120*** (0.028)
Education		4.936*** (0.758)							1.460*** (0.539)	0.626 (0.424)	1.229** (0.513)	0.278 (0.386)
Share old			6.390*** (1.223)						4.163*** (0.890)	2.615*** (0.703)	2.630*** (0.875)	1.785*** (0.637)
Self-employed				-8.005*** (1.923)					-1.198 (0.819)	-0.935 (0.623)	-0.928 (0.775)	-0.788 (0.556)
Travel time					-0.017*** (0.002)				-0.012*** (0.001)	-0.008*** (0.001)	-0.003 (0.003)	-0.003 (0.002)
Support SVP						-3.786*** (0.502)			-0.881*** (0.313)	-1.142*** (0.239)	-1.257*** (0.403)	-1.636*** (0.291)
Share young							-20.025*** (4.966)		3.029 (3.099)	1.601 (2.354)	-2.625 (3.159)	-0.950 (2.272)
Density								0.045*** (0.006)	-0.000 (0.004)	0.006* (0.003)	-0.001 (0.005)	0.000 (0.003)
Turnout										2.581*** (0.347)		2.572*** (0.324)
Constant	-2.607*** (0.372)	-2.448*** (0.166)	-2.619*** (0.236)	-0.737*** (0.164)	-0.969*** (0.044)	-0.260* (0.154)	-0.294 (0.279)	-1.686*** (0.050)	-2.662*** (0.381)	-3.263*** (0.299)	-2.005*** (0.377)	-2.606*** (0.281)
Observations	77	77	77	77	77	77	77	77	77	77	77	77
Adjusted R <sup>2</sup>	0.113	0.353	0.257	0.177	0.624	0.423	0.167	0.446	0.887	0.936	0.916	0.957
District FE	NO	NO	NO	NO	YES	YES						

NOTE: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The dependent variable is the log odds of acceptance rates at municipal level. Weighted least squares regressions run using STATA command glogit. Standard errors in parentheses. Observations from the city of St.Gallen is included. All variables are specified as shares of the municipal population.