# Extending the Use and Prediction Precision of Subnational Public Opinion Estimation

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# Codebook

## 1) Swiss analysis I (see Figure 2 in article)

The first Swiss analysis with the findings presented in Figure 2 build on three data sources: a) the VOX survey, which is a standard exit poll conducted after each direct democratic vote in Switzerland; b) the vote outcome of the direct democratic votes; and c) data on the Swiss population structure from the census (2000).

### a) Vox Surveys

We analyze all 186 direct democratic votes on which the Swiss population voted from 1990 to 2010. The project VoxIT collects 2-3 weeks after each vote data on the voting behavior of Swiss citizens with a sample of 500 to 1,000 respondents. VoxIT is financed by the federal government and the polling is executed by a Swiss polling company (GfS) in cooperation with political science departments of Swiss universities. The pooled 186 Vox surveys that we analyze include in total 192,363 observations. See also Kriesi (2005) for a comprehensive investigation of pooled VoxIT data. The cantonal variables in the Voxit.dta dataset come originally from the Contextdata1.dta dataset (the two datasets have been merged, see discussion below on the Contextdata1.dta dataset). We list all variables that are in the dataset below (some of them are not used in our analysis)

*Data File:* Voxit.dta

*Source:* VoxIT data, 1990 – 2010, FORS, Swiss Centre of Expertise in the Social Science (FORS), University of Lausanne, Switzerland.

*Variables:*

Vote decision of respondent (decx):
- Yes (1)
- No (0)

Canton ID (canton):
- Numbering of the cantons according to the classification of the Federal Statistical Office (from 1 to 26)

Education of respondent (educ):
- Mandatory school (1)
- Vocational education (2)
- Academic high school – Gymnasium bzw. Maturität (3)
- Higher vocational education I – Höhere Fach- und Berufsbildung (4)
- Higher vocational education II – Höhere Fachschule (5)
- University degree (6)

Gender of respondent (sexe):
- Male (1)
- Female (2)

Vote ID (AbstNrBFS):
- Referendum number as assigned by the Federal Statistical Office (from 3690 to 5530)

Year of the vote (JAHR)

Age of respondent (age_group):
- 18-34 (1)
- 35-49 (2)
- 50-64 (3)
- over 64 (4)

Region ID (region):
- VD, VS, GE (1)
- BE, FR, SO, NE, JU (2)
- BS, BL, AG (3)
- ZH (4)
- GL, SH, AR, AI, SG, GR, TG (5)
- LU, UR, SZ, OW, NW, ZG (6)
- TI (7)

Canton name (cantonname):

– Abbreviations of the 26 cantons

Cantonal data on employment structure (beschlw_share and oeffbesch_share):

– Cantonal employment and share of employment in the public sector

Shares of Catholics per canton (romkath_share)

– Per cent of Catholics

Shares of Foreigners per canton (foreign_share)

– Per cent of Foreigners

Vote share of Left (leftvote_share)

– Per cent of left vote per canton in federal election 2007 (SP, Greens and small left parties)

Vote share of Right (svpvote_share)

– Per cent of SVP votes per canton in federal election 2007

Shares of German speakers per canton (german_share):

– Per cent of German speakers

Vote participation (teilnahme)

– Respondent voted (1), did not vote (0)

Canton ID (cantonnr):

– Numbering of the cantons according to the classification of the Federal Statistical Office (from 1 to 26)

Vote share of Greens, GP (partyL1s)

– Cantonal vote share of Greens in per cent

Vote share of Social Democrats, SP (partyL2s)

– Cantonal vote share of Social Democrats in per cent

Vote share of Christian Democrats, CVP, CSP (partyL3s)

– Cantonal vote share of Christian Democrats in per cent

Vote share of Liberals, FDP (partyL4s)

– Cantonal vote share of Liberals in per cent

Vote share of  Alliance of Independents, LDU (partyL5s)

– Cantonal vote share of  Alliance of Independents in per cent

Vote share of Swiss People's Party, SVP (partyL6s)

– Cantonal vote share of Swiss People's Party in per cent

Merge identifier (_merge)

Party identification of respondent (partyL)
- – Greens, GP (1)
- – Social Democrats, SP (2)
- – Christian Democrats, CVP, CSP (3)
- – Liberals, FDP (4)
- – Alliance of Independents, LDU (5)
- – Swiss People's Party, SVP (6)
- – No identification with a party (7)

Party identification of respondent (like partyL) as string variable (p02)
- – Abbreviation of party with which the respondent identifies

Income of respondent (like money) as string variable (revenue):
- – Income categories (see money variable below for categories)

Merge identifier (_merge341)

Income of respondent (money):
- – CHF 3.000 and less (1)
- – CHF 3,001 – 5,000 (2)
- – CHF 5,001 – 7,000 (3)
- – CHF 7,001 – 9,000 (4)
- – CHF 9,001 and more (5)
- – No answer (6)
- – Don't know (7)

Share of cantonal population with an income of CHF 3.000 and less (inc_under3k_share)
- – Share of cantonal population with an income of CHF 3.000 and less in per cent

Share of cantonal population with an income of CHF 3,001 – 5,000 (inc_3kto5k_share)
- – Share of cantonal population with an income of CHF 3,001 – 5,000 in per cen

Share of cantonal population with an income of CHF 5,001 – 7,000 (inc_5kto7k_share)
- – Share of cantonal population with an income of CHF 5,001 – 7,000 in per cent

Share of cantonal population with an income of 7,001 – 9,000 (inc_7kto9k_share)
- – Share of cantonal population with an income of 7,001 – 9,000 in per cent

Share of cantonal population with an income of (inc_over9k_share)
- – Share of cantonal population with an income of 9,001 and more in per cent

Merge identifier (_mergefff)

## b) Vote Results of Direct Democratic Votes

*Data File:* BfS data.csv

*Source:* Results on Direct Democratic Votes, 1990 – 2010, Federal Statistical Office, Section Politics, Culture and Media, Neuchatel, Switzerland.

*Variables:*

Share of yes votes per referendum (see AbstNrBFS) and canton (numbering of the cantons according to the classification of the Federal Statistical Office; Jain1 to Jain26):

– Jain1: Share of yes votes in per cent casted for each referendum in ZH
– Jain2: Share of yes votes in per cent casted for each referendum in BE
– Jain3: Share of yes votes in per cent casted for each referendum in LU
– Jain4: Share of yes votes in per cent casted for each referendum in UR
– Jain5: Share of yes votes in per cent casted for each referendum in SZ
– Jain6: Share of yes votes in per cent casted for each referendum in OW
– Jain7: Share of yes votes in per cent casted for each referendum in NW
– Jain8: Share of yes votes in per cent casted for each referendum in GL
– Jain9: Share of yes votes in per cent casted for each referendum in ZG
– Jain10: Share of yes votes in per cent casted for each referendum in FR
– Jain11: Share of yes votes in per cent casted for each referendum in SO
– Jain12: Share of yes votes in per cent casted for each referendum in BS
– Jain13: Share of yes votes in per cent casted for each referendum in BL
– Jain14: Share of yes votes in per cent casted for each referendum in SH
– Jain15: Share of yes votes in per cent casted for each referendum in AR
– Jain16: Share of yes votes in per cent casted for each referendum in AI
– Jain17: Share of yes votes in per cent casted for each referendum in SG
– Jain18: Share of yes votes in per cent casted for each referendum in GR
– Jain19: Share of yes votes in per cent casted for each referendum in AG
– Jain20: Share of yes votes in per cent casted for each referendum in TG
– Jain21: Share of yes votes in per cent casted for each referendum in TI
– Jain22: Share of yes votes in per cent casted for each referendum in VD
– Jain23: Share of yes votes in per cent casted for each referendum in VS
– Jain24: Share of yes votes in per cent casted for each referendum in NE
– Jain25: Share of yes votes in per cent casted for each referendum in GE
– Jain26: Share of yes votes in per cent casted for each referendum in JU

Referendum ID (AbstNrBFS, Variable labelled “data1”):

– Referendum number as assigned by the Federal Statistical Office (from 3690 to 5530)

## c) Swiss Census 2000

*Data File:* census final BfS 11 2012 2.csv

*Source:* Census 2000, Federal Statistical Office, Section Population, Neuchatel, Switzerland.

*Population shares of the categories gender, age and education (joint distributions) for each of the 26 cantons (numbering of the cantons is according to the classification of the Federal Statistical Office):*

Men, age 20-34 and education:
- No education: Total, MenCH 20-34 and Keine Ausbildung abgeschlossen
- Mandatory school: Total, MenCH 20-34 and Obligatorische Schule
- Secondary school: Total, MenCH 20-34 and Diplommittelschule oder berufsvorbereitende Schule
- Vocational education: Total, MenCH 20-34 and Berufslehre
- Academic high school: Total, MenCH 20-34 and Maturitätsschule
- Teacher's education: Total, MenCH 20-34 and Lehrerseminar
- Higher vocational education I: Total, MenCH 20-34 and Höhere Fach- und Berufsbildung
- Higher vocational education II: Total, MenCH 20-34 and Höhere Fachschule
- University of applied sciences: Total, MenCH 20-34 and Fachhochschule
- University: Total, MenCH 20-34 and Universität bzw. Hochschule

Female, age 20-34 and education:
- No education: Total, WomenCH 20-34 and Keine Ausbildung abgeschlossen
- Mandatory school: Total, WomenCH 20-34 and Obligatorische Schule
- Secondary school: Total, WomenCH 20-34 and Diplommittelschule oder berufsvorbereitende Schule
- Vocational education: Total, WomenCH 20-34 and Berufslehre
- Academic high school: Total, WomenCH 20-34 and Maturitätsschule
- Teacher's education: Total, WomenCH 20-34 and Lehrerseminar
- Higher vocational education I: Total, WomenCH 20-34 and Höhere Fach- und Berufsbildung
- Higher vocational education II: Total, WomenCH 20-34 and Höhere Fachschule
- University of applied sciences: Total, WomenCH 20-34 and Fachhochschule
- University: Total, WomenCH 20-34 and Universität bzw. Hochschule

Men, age 35-49 and education:
- No education: Total, MenCH 35-49 and Keine Ausbildung abgeschlossen
- Mandatory school: Total, MenCH 35-49 and Obligatorische Schule

– Secondary school: Total, MenCH 35-49 and Diplommittelschule oder berufsvorbereitende Schule
– Vocational education: Total, MenCH 35-49 and Berufslehre
– Academic high school: Total, MenCH 35-49 and Maturitätsschule
– Teacher's education: Total, MenCH 35-49 and Lehrerseminar
– Higher vocational education I: Total, MenCH 35-49 and Höhere Fach- und Berufsbildung
– Higher vocational education II: Total, MenCH 35-49 and Höhere Fachschule
– University of applied sciences: Total, MenCH 35-49 and Fachhochschule
– University: Total, MenCH 35-49 and Universität bzw. Hochschule

Female, age 35-49 and education:

– No education: Total, WomenCH 35-49 and Keine Ausbildung abgeschlossen
– Mandatory school: Total, WomenCH 35-49 and Obligatorische Schule
– Secondary school: Total, WomenCH 35-49 and Diplommittelschule oder berufsvorbereitende Schule
– Vocational education: Total, WomenCH 35-49 and Berufslehre
– Academic high school: Total, WomenCH 35-49 and Maturitätsschule
– Teacher's education: Total, WomenCH 35-49 and Lehrerseminar
– Higher vocational education I: Total, WomenCH 35-49 and Höhere Fach- und Berufsbildung
– Higher vocational education II: Total, WomenCH 35-49 and Höhere Fachschule
– University of applied sciences: Total, WomenCH 35-49 and Fachhochschule
– University: Total, WomenCH 35-49 and Universität bzw. Hochschule

Men, age 50-64 and education:

– No education: Total, MenCH 50-64 and Keine Ausbildung abgeschlossen
– Mandatory school: Total, MenCH 50-64 and Obligatorische Schule
– Secondary school: Total, MenCH 50-64 and Diplommittelschule oder berufsvorbereitende Schule
– Vocational education: Total, MenCH 50-64 and Berufslehre
– Academic high school: Total, MenCH 50-64 and Maturitätsschule
– Teacher's education: Total, MenCH 50-64 and Lehrerseminar
– Higher vocational education I: Total, MenCH 50-64 and Höhere Fach- und Berufsbildung
– Higher vocational education II: Total, MenCH 50-64 and Höhere Fachschule
– University of applied sciences: Total, MenCH 50-64 and Fachhochschule
– University: Total, MenCH 50-64 and Universität bzw. Hochschule

Female, age 50-64 and education:

– No education: Total, WomenCH 50-64 and Keine Ausbildung abgeschlossen
– Mandatory school: Total, WomenCH 50-64 and Obligatorische Schule
– Secondary school: Total, WomenCH 50-64 and Diplommittelschule oder berufsvorbereitende Schule

– Vocational education: Total, WomenCH 50-64 and Berufslehre
– Academic high school: Total, WomenCH 50-64 and Maturitätsschule
– Teacher's education: Total, WomenCH 50-64 and Lehrerseminar
– Higher vocational education I: Total, WomenCH 50-64 and Höhere Fach- und Berufsbildung
– Higher vocational education II: Total, WomenCH 50-64 and Höhere Fachschule
– University of applied sciences: Total, WomenCH 50-64 and Fachhochschule
– University: Total, WomenCH 50-64 and Universität bzw. Hochschule

Men, age over 64 and education:

– No education: Total, MenCH over 65andMore and Keine Ausbildung abgeschlossen
– Mandatory school: Total, MenCH 65andMore and Obligatorische Schule
– Secondary school: Total, MenCH 65andMore and Diplommittelschule oder berufsvorbereitende Schule
– Vocational education: Total, MenCH 65andMore and Berufslehre
– Academic high school: Total, MenCH 65andMore and Maturitätsschule
– Teacher's education: Total, MenCH 65andMore and Lehrerseminar
– Higher vocational education I: Total, MenCH 65andMore and Höhere Fach- und Berufsbildung
– Higher vocational education II: Total, MenCH 65andMore and Höhere Fachschule
– University of applied sciences: Total, MenCH 65andMore and Fachhochschule
– University: Total, MenCH 65andMore and Universität bzw. Hochschule

Female, age over 64 and education:

– No education: Total, WomenCH 65andMore and Keine Ausbildung abgeschlossen
– Mandatory school: Total, WomenCH 65andMore and Obligatorische Schule
– Secondary school: Total, WomenCH 65andMore and Diplommittelschule oder berufsvorbereitende Schule
– Vocational education: Total, WomenCH 65andMore and Berufslehre
– Academic high school: Total, WomenCH 65andMore and Maturitätsschule
– Teacher's education: Total, WomenCH 65andMore and Lehrerseminar
– Higher vocational education I: Total, WomenCH 65andMore and Höhere Fach- und Berufsbildung
– Higher vocational education II: Total, WomenCH 65andMore and Höhere Fachschule
– University of applied sciences: Total, WomenCH 65andMore and Fachhochschule
– University: Total, WomenCH 65andMore and Universität bzw. Hochschule

## 2) Swiss analysis II (Figure 3 in article)

*Data Files:* Voxit.dta, Contextdata1.dta

*Sources:* Results on Direct Democratic Votes, 1990 – 2010, Federal Statistical Office, Section Politics, Culture and Media, Neuchatel, Switzerland, Cantonal Variables, Federal Statistical Office, Section Population, Neuchatel, Switzerland, see also Leemann and Wasserfallen (2016)

The additional Swiss analysis with the findings reported in Figure 3 investigates further the following 4 public votes in the years 2008 and 2009:

– Initiative for municipal town hall approval of naturalization decisions
– Initiative to limit the government's right to communicate in referendum campaigns
– Referendum against an increase of the VAT for disability insurance
– Initiative to ban the construction of minarets

We use the VoxIT data on these for votes (see information on the Vox survey and source above). In addition to age, gender and education, we use the party identification question as an additional variable on the individual level.

*Additional used variables from Vox surveys:*

Identification with SVP (partyL):
– Yes (6)
– No (all other values)

Share of SVP votes per canton (svpvote_share)
– Per cent of SVP votes per canton in federal election 2007

On the cantonal level, the dataset "Contextdata1.dta" includes a series of variables, which are all provided by the Federal Statistical Office, Section Population, Neuchatel, Switzerland and are also used in Leemann and Wasserfallen (2016).

*Cantonal level variables from Contextdata1.dta:*

Canton ID (canton):
– Numbering of the cantons according to the classification of the Federal Statistical Office (from 1 to 26)

Canton name (cantonname):

– Abbreviations of the 26 cantons

Year (JAHR)

Cantonal data on employment structure (beschlw_share and oeffbesch_share):

– Cantonal employment and share of employment in the public sector in per cent

Shares of Catholics per canton (romkath_share)

– Per cent of Catholics

Shares of Foreigners per canton (foreign_share)

– Per cent of Foreigners

Vote share of Left (leftvote_share)

– Per cent of left vote per canton in federal election 2007 (SP, Greens and small left parties)

Share of SVP votes per canton (svpvote_share)

– Per cent of SVP votes per canton in federal election 2007

Shares of German speakers per canton (german_share):

– Per cent of German speakers

Region ID (region):

– VD, VS, GE (1)
– BE, FR, SO, NE, JU (2)
– BS, BL, AG (3)
– ZH (4)
– GL, SH, AR, AI, SG, GR, TG (5)
– LU, UR, SZ, OW, NW, ZG (6)
– TI (7)

Canton ID (cantonnr):

– Numbering of the cantons according to the classification of the Federal Statistical Office (from 1 to 26)

Vote share of Greens, GP (partyL1s)

– Cantonal vote share of Greens in per cent

Vote share of Social Democrats, SP (partyL2s)

– Cantonal vote share of Social Democrats in per cent

Vote share of Christian Democrats, CVP, CSP (partyL3s)

– Cantonal vote share of Christian Democrats in per cent

Vote share of Liberals, FDP (partyL4s)
– Cantonal vote share of Liberals in per cent

Vote share of Alliance of Independents, LDU (partyL5s)
– Cantonal vote share of Alliance of Independents in per cent

Vote share of Swiss People's Party, SVP (partyL6s)
– Cantonal vote share of Swiss People's Party in per cent

Merge identifier (_merge)

Share of cantonal population with an income of CHF 3.000 and less (inc_under3k_share)
– Share of cantonal population with an income of CHF 3.000 and less in per cent

Share of cantonal population with an income of CHF 3,001 – 5,000 (inc_3kto5k_share)
– Share of cantonal population with an income of CHF 3,001 – 5,000 in per cen

Share of cantonal population with an income of CHF 5,001 – 7,000 (inc_5kto7k_share)
– Share of cantonal population with an income of CHF 5,001 – 7,000 in per cent

Share of cantonal population with an income of 7,001 – 9,000 (inc_7kto9k_share)
– Share of cantonal population with an income of 7,001 – 9,000 in per cent

Share of cantonal population with an income of (inc_over9k_share)
– Share of cantonal population with an income of 9,001 and more in per cent

Merge identifier (_mergeasas)

## 3) U.S. analysis (Figure 4 in article)

The U.S. analysis with the findings reported in Figure 4 replicates and extends the Warshaw and Rodden (2012) study on public support for same-sex marriages in California, Ohio, Wisconsin, Arizona and Michigan on the state senate district level. Please consult Warshaw and Rodden (2012) for further information on the data.

As in the Swiss analysis discussed above, the U.S analysis builds on three data sources: a) survey data from NAES (2004); b) population data from the census factfinder; and c) referendum results of same-sex referendums in the five mentioned states. Please check the Warshaw and Rodden (2012) article and their replication archive for detailed information on each data source. We list below all the variables that we use in our analysis. The only variable that we add to the Warshaw and Rodden (2012) dataset for extending their analysis is the age variable from NAES (2004).

*Data Files:* AZ_GM_SSD.csv, CA_GM_SSD.csv, MI_GM_SSD.csv, OH_GM_SSD.csv, WI_GM_SSD.csv, DATA_v4_ageshares.dta, districts_ssd.csv, gay_marriage_senate.dta, Post-Stratification Data – RImport (SSD).csv

*Sources:* National Anneberg Election Survey (NAES), 2004, The Annenberg Public Policy Center of the University of Pennsylvania, Philadelphia, USA
American Factfinder, United States Census Bureau, U.S. Department of Commerce
Warshaw and Rodden (2012). The replication data can be downloaded here: http://cwarshaw.scripts.mit.edu/data/warshawrodden_mrp_data.zip

*Variables:*

Support for state laws permitting same-sex marriages from NAES 2004 (marriage_yes_pct):
- Yes share in per cent

Race from census (cat_trace, race):
- White (1)
- Black (2)
- Hispanic (3)
- Other (4)

Gender from census (gender):
- Male (0)
- Female (1)

Education from census (education):
- Less than high school (1)
- High school graduate (2)
- Some college (3)
- College graduate (4)
- Graduate school (5)

State Senate District variables from census:
- State senate district ID (ssd_district_uid)
- State region (cregion)
- Share of urban population in per cent (ssd_district_urban)
- Median income (ssd_district_income)
- Share of veterans in per cent (ssd_district_veteran)
- Share of union members in per cent (state_union)
- Share of evangelicals or mormons in per cent (state_religion)
- Share of same-sex couples in per cent (state_gaymarriage)

Support for referendums on state constitutional amendments on same-sex marriages on the district-level for California, Ohio, Wisconsin, Arizona, Michigan collected by Warshaw and Rodden 2012 (marriage_yes_pct):

– Yes share in per cent

Age variable from NAES 2004 added by Leemann and Wasserfallen (age_group):

– 20-24 (1)
– 25-29 (2)
– 30-34 (3)
– 35-39 (4)
– 40-44 (5)
– 45-49 (6)
– 50-54 (7)
– 55-59 (8)
– 60-64 (9)
– 65-69 (10)
– 70-74 (11)
– 75-79 (12)
– 80-84 (13)
– 85-89 (14)
– over 89 (15)

## References


Kriesi, Hanspeter (2005), Direct Democratic Choice, Maryland: Lexington Books. DOI: 10.1017/S153759270707257X.

Leemann, Lucas and Fabio Wasserfallen (2016), The Democratic Effect of Direct Democracy, American Political Science Review 110(4): 750–762. DOI: 10.1017/S0003055416000307

Warshaw, Christopher and Jonathan Rodden (2012), How Should We Measure District-Level Public Opinion on Individual Issues?, Journal of Politics 74(1): 203–219. DOI: 10.1017/S0022381611001204