

Mapping Demographic Composition as a Predictor of Far-Right Success in the 2023 Swiss Federal Election

Exploring Interactions between Anti-Migration Sentiment and Ethnocultural Diversity

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Contents

Introduction	1
Background	2
Switzerland, Democracy and Migration	2
Research Questions and Hypothesis	3
Method	4
Data Set	4
Research Process	5
Generative AI	6
Indicators	6
2023 Swiss Federal Elections	6
Statistical Methods	11
Results	12
Plots	13
Maps	20
Limitations	21
Discussion	22
Conclusion	24
References	25
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Abstract

Lorem Ipsum. . .

Contents

Introduction

Rade: TBD.

From the Assignment Infosheet: “Your group work should consist of a comprehensive analysis of your use case, which you will present to a (hypothetical) client. This analysis should include an in-depth examination of the problem being addressed. Be sure to support your findings with relevant data and insights to effectively communicate the value of your work.”

Also: “In this chapter we want you to use a package that was not mentioned in the main part of the course (data manipulation, visualisation using ggplot2, regular expressions and reporting using Rmarkdown does not count) and perform a task that was not directly discussed in the course. Be creative! Note: Here we don’t want you to use a new statistical/machine learning method. We rather want you to use a method to prepare or display data. It could even be a package that enables you to create prettier documents. What we don’t want to see is you fitting e.g. a regression model to your data. Please insert a separate section in your report and call it “Chapter of choice” such that we can easily recognise it! If you need input: feel free to ask us. Please indicate or highlight in your report what is your chapter of choice.”

“Your analysis must be a story that you would like to sell to a client and in this sense, it should be complete, easy to read, and have a thread (what are you doing, why, conclusions, interpretations, overview . . .). It is completely up to you how the story goes and flows. To create a cohesive narrative in your story, it is essential to address the following key points: Source of the data, Objectives and hypotheses of the analysis, Interpretation of each step, Conclusions drawn from the analysis, Potential limitations of the study. Put yourself into the position of a client and check if your analysis is detailed, comprehensible, and easy to follow.”

Background

Switzerland, Democracy and Migration

Switzerland has a long tradition of democracy, with its modern political system rooted in the 1848 Federal Constitution. The modern Swiss State, along with its constitution and the bicameral legislative system has been established in 1848 (Church, 2013, Chapter 6). Swiss elections take place every four years, with the federal government following a system of direct democracy that allows citizens not only to elect representatives but also to participate in referendums and initiatives. As mentioned before, Switzerland's Federal Parliament consists of two chambers: the National Council (200 members) and the Council of States (46 members). The National Council represents the population proportionally, while the Council of States represents the cantons, with each full canton electing two representatives and six half-cantons electing one. This bicameral system aims at balancing demographic and regional in legislative decisions.

According to the annual overview of the federal office for statistics (Statistik, 2023), Switzerland has a population of 8.8 million people (p. 132), of which around 74% hold Swiss citizenship. The remaining 26% are non-Swiss residents, including permanent residents, cross-border workers, and asylum seekers (p. 142). Swiss nationality is acquired for most citizens through descent and for migrants by naturalization, which is known to be a decentralised process mostly relying on cantonal and municipal approval. Only a fraction of foreign nationals applies for naturalisation. In the last decade, between 30'000 to 45'000 people a year, which corresponds to around 2% of the population eligible for naturalisation (p. 142).

Non-Swiss residents, despite their significant share of the population, have limited political rights at the federal level. Some cantons and municipalities allow foreigners to vote in local elections or even run for office, but they are largely excluded from national decision-making (jura.ch, 2025; ne.ch, 2025). Politics of Switzerland are described as relatively polarized compared to international standards (Jansen & Stutzer, 2024, p. 3)

While many European countries have seen an extraordinary rise of right-wing politics throughout the 2010s, not much had shifted in Switzerland. The right-wing SVP (Schweizerische Volkspartei, in french: Union démocratique du centre UDC) has been part of the governing coalition since the 1990s. Certain segments of the party have been classified as far-right and right-wing extremist, most notably due to the party's hardline positions on migration and strict opposition to any legal protection of social, cultural and religious minorities like swiss muslims or LGBT citizens (Ellermann, 2021, p. 3 & p.102; Jansesberger & Rhein, 2024, pp. 3–5).

The relationship between regional demographic composition and voting behavior has been a subject of ongoing research and debate, particularly if areas with lower proportions of migrants tend to support stricter immigration policies compared to ethnoculturally diverse regions. In this study, we examine the most recent Swiss election to analyze potential correlations between the percentage

of non-Swiss residents and the electoral performance of the Swiss People’s Party (SVP), which centered its campaign on an anti-immigration platform. To control for confounding variables, other demographic markers as age and education will be included.

Research Questions and Hypothesis

The underlying hypothesis posits a positive correlation between ethnocultural homogeneity and the electoral success of the far-right Swiss People’s Party (SVP) in the 2023 Swiss federal elections. Specifically, municipalities with a higher proportion of foreign residents are expected to exhibit lower support for the SVP than those with a more homogeneous Swiss population.

Defining what constitutes a “high” or “low” proportion of the non-Swiss population is inherently subjective. However, current demographic data indicate that 27% of Switzerland’s total population is non-Swiss, with canton-level proportions ranging from 12.9% (Appenzell Innerrhoden) to 42.2% (Geneva). Based on this distribution, a low share of the migrant population can be approximated as below 20%, while a high share is anything above 30%.

To better understand the multitude of factors influencing electoral behaviour, additional variables are incorporated into the analysis, including: citizenship acquisition rate, taxable income per capita, educational attainment levels, and age distribution. These factors help to contextualise the observable effects and differentiate between correlation and causation. Furthermore, to comprehensively examine the SVP’s 2023 electoral success, the analysis includes other political parties to highlight electoral dynamics and explore how voter distributions vary across demographic markers. The derived research question is as follows: “Which demographic factors exhibit a strong relationship with the 2023 Swiss federal election results?” The question can be divided into looking at specific aspects between parties and their respective election performance.

Method

Data Set

All datasets used in this analysis were obtained from the Swiss Federal Office of Statistics (BFS). Each dataset included the BFS municipality ID, with the exception of the dataset on education levels by district, which lacked an ID. Matching this dataset by district name using regular expressions was not feasible due to inconsistencies in district naming conventions. To address this, district numbers were manually added to the table. Aside from this exception, no further modifications were made to the datasets.

Table 1: Overview of Used Datasets

Dataset Description	Dataset ID
Election Results 2023	sd-t-17.02-NRW2023-parteien-appendix.csv
Citizenship Percentage	px-x-0102010000_104_20250127-155044.xlsx
Education	su-e-40.02.15.08.05-2022.xlsx
Citizenship acquisition	px-x-0102020000_201_20250129-134648.xlsx
Age distribution	su-d-01.02.03.06.xlsx
Some income or wealth metric TBD	TBD
Datatable Communes, Districts and Cantons	Gemeindestand.xlsx

Research Process

The process commenced with the specification of a research question and hypothesis, establishing the conceptual foundation for the project. Following this, the necessary datasets were identified and acquired on the BfS-webpage. The initial phase involved exploratory analysis through basic linear models and correlation assessments, serving as a preliminary validation of the research direction. As the project progressed, increasing levels of complexity were introduced, incorporating statistical modelling techniques and advanced visualisations to capture the relationship between demographic indicators, regional dimensions and electoral outcomes in greater depth.

Generative AI

Generative AI was utilised in a limited capacity, primarily for debugging specific error messages in R and refining textual contents. In terms of text composition its primary use was for the correction of grammar and spelling errors, as well as stylistic improvements within certain paragraphs. Beyond these specific functions, the technology was not employed.

Indicators

Election Indicators

Partys Over the past several decades, the distribution of dominant political parties in Swiss national elections has remained relatively stable. The primary parties represented in the federal parliament, along with their respective campaign focuses in the most recent elections, are detailed below (bpb.de, 2023) . For improved readability, this paper will rely on german-language party names.

Table 2: Overview of Parties and Campaign Focus

Party	2023 Campaign Focus
SVP	Right-wing, anti-immigration, anti-welfare, free market policies
SP	Left-wing, pro-welfare, pro-worker policies, reducing cost of living
FDP	Center-right, free market policies and improved access to international markets
Die Mitte	Conservative centrist, pro-defense, tax cuts for married couples
GLP	Progressive centrist, climate protection, EU alignment, liberal market policies
GPS	Left-wing, climate protection, biodiversity, state regulation of business

Regional parties like the far-right Lega in the Canton of Ticino or Movement Citoyen Romande in Geneva have been taken into account for some analysis. Due to their regionality the data for them is scarce and might not yield very reliable results.

Elections

2023 Swiss Federal Elections

The most recent parliamentary elections in Switzerland took place on October 22, 2023. Switzerland’s bicameral parliament comprises the National Council, which proportionally represents the Swiss population with seats allocated to each canton based on its population, and the Council of States, where all cantons have equal representation. As the National Council reflects the population

proportionally, its election results are often regarded as an indicator of trends in public opinion regarding politics and policy.

Geographic Indicators

Municipalities As per January 1st, 2024, Switzerland has 2131 registered municipalities, almost 100 hundred less than the total of 2212 in 2019. The analysis included only the municipalities that could be matched consistently across both elections, which included exactly 2113 municipalities, meaning their municipalityId remained the same from 2019 to 2024. Even though a range of 2113 municipalities to 2212 seems like a significant discrepancy, most of municipalities affected by merges or dissolution do not affect the outcome of the weighted correlation since their population is in almost all cases below 1000 and in many cases below 100. For example the village of Corippo TI was merged in 2019 into a neighbouring community but only had a population of 9 inhabitants at the time of the merger. The disappearance of such small municipalities due to mergers do not affect the outcome of the analysis in any significant way (bfs 2025).

Cantons and Switzerland All the data points (apart from education level) were available on municipality-level. To calculate the corresponding values for each canton, the municipal values were grouped by canton and weighted by population size of the municipality in case of the demographic values or by vote numbers in the case of the election results. In the same way a total for all of Switzerland was calculated and included in some plots to better compare the cantons not only in relation to one another but to the swiss average values.

Demographic Indicators

For our analysis we have focused on the following five demographic indicators below (s. Table). The five indicators are of particular interest for measuring their influence on far-right politics, since previous research has shown them to be a predictor of far-right party’s success.

Table 3: Overview of Demographic Indicators

Indicator	Description	Metric
Non-Swiss Population	People residing in Switzerland without holding Swiss Citizenship	% of total population
Citizenship Aquisition	Rate of Migrants acquiring Swiss citizenship in 2023	% of migrant population
Income per Capita	Normalized taxable income.	in Swiss Francs
Education Level	Highest educational achievement.	3 Grades (Low, Secondary, Tertiary)
Age Ratio	Percentage of people aged >64 in relation to population aged 18-64	% of working age population

Non-Swiss Population The indicator “Non-Swiss Population” represents the percentage of citizens holding another passport than the swiss one per 2023 in relation to the base number of the entire population. Migrants that have acquired swiss citizenship count as swiss population are not disclosed or analysed separately.

Citizenship Aquisition The indicator “Citizenship Acquisition” represents the percentage of citizens acquiring swiss passport in 202X in relation to the base number of the entire migrant population. The rate of absorption of foreign nationals into the swiss society indicates both willingness to become Swiss citizen from a migrant perspective as well as the willingness of local communities to support non-swiss population’s aim to integrate on a citizenship level.

Income Per Capita The Income per capita is a normalized measure used by the Federal Statistical Office to compare income across Switzerland. It represents the income (minus deductibles on federal level) that is recorded by the federal tax office in collaboration with the cantonal tax administrations. Therefore it does not represent the net income, but rather the taxable income.

Education Level Education levels, usually measured in form of the highest achieved school degree, are crucial for economical and social development of populations. They significantly impact

individuals' perception of life and political leanings. The three indicators are as follows: - Low Education: Only obligatory school education, which in Switzerland represents usually 9 school years. - Secondary Education: A professional college degree, usually acquired as a result of an apprenticeship (Berufslehre, Apprentissage) - Tertiary Education: An academic university degree, acquired as a result of a university study program but also includes higher degrees from professional colleges (Höhere Fachschule, Ecole Superieure)

Age ratio The age ratio is a standardized measure of the Federal Statistical Office, that measures the percentage of aged populations (65 and above) in relation to the adult respectively working-age population (18-64). Therefore, high number indicates an outsized aged population.

Statistical Methods

Initially the correlation between migrant population and far-right election success was calculated both weighted and unweighted, meaning each municipality counts as one unit nevertheless of the population size. The unadjusted analysis did not produce a significant correlation, presumably, because both left-wing votership and migrant populations tend to be concentrated in larger cities and therefore could not be represented in an unweighted statistical design. But when adjusted for population size, there were clear correlations visible.

The statistical analysis relies on correlation and linear models. In order to improve the model's performance, the demographic indicators were scaled and weighted. The scaling improves interpretability, numerical stability and measurability of smaller differences while eradicating the influence of outliers. The weighting was necessary for practical reasons since the size of a municipality also can be a predictor of election outcomes and if every municipality counted as one unit this would suppress the outcomes of bigger cities.

Most of the plots did not include statistical models but do rather visualise the election outcome unmodelled.

Results

Plots

Explanatory Analysis of the Dataset

Explanatory Analysis

In order to better understand the results of the analysis we assessed the data set. The main goal was to get an idea of the existing trends and distributions to reason why certain effects might cause correlations or regressions.

The graph visualises the proportion of non-Swiss citizens per canton as well as all of Switzerland. This information is of importance since previous studies (**Tresch S. 15**) show that areas, which do not have large populations of migrants, tend to vote for parties that run on anti-migration campaigns. This highlights an important contradiction, meaning that people who are not exposed to migrant populations tend to be more critical towards migrations, than votes in areas with higher ethno-cultural diversity.

The graph visualises the proportion of different educational layers in the demography. We know from other studies (**bfs 2025**) that most Swiss people do have in fact a Secondary Education degree, which leads us to the assumption that the demographic segment only in possession of an obligatory education might contain a high percentage of non-Swiss populations, particularly refugees which could not complete their schooling programme since they have been forced to leave by war and conflict. Therefore, the Swiss population can be divided roughly in secondary and tertiary educated people. The populations having a secondary-level education are of particular interest since they represent mostly Swiss and Swiss-born migrants, with or without Swiss citizenship, which did not further continue education after receiving their professional degree. From prior studies on this topic, we know that they might be more likely to vote in favour of the far-right party SVP and less likely to vote in favour of left-wing SP and Greens as well as centrist parties GLP and FDP. From the graph we can extract the information that we see some consistency in educational level across Switzerland with some fluctuations from XX on the lower end up to XX on the higher end.

The stacked bar chart illustrates the distribution of education levels across Swiss cantons, displaying the weighted percentage of populations with low education, secondary education and tertiary education. Each bar represents a canton, with CH on the left representing the national average. The chart reveals significant variation in education levels across different regions. Some cantons, such as Zurich (ZH), Geneva (GE), and Zug (ZG), show a higher proportion of tertiary education, reflecting their strong economic and academic infrastructure. In contrast, cantons like Appenzell Innerrhoden (AI), Uri (UR), and Obwalden (OW) have a higher share of secondary education and lower tertiary education levels, which aligns with the prevalence of vocational training in these regions. The share of low education varies but tends to be more pronounced in rural or traditionally working-class cantons.

General Elections 2023

Switzerland held federal elections to renew the National Council and the Council of States on 22 October 2023. Leading up to the 2023 elections, there was considerable anticipation regarding whether the environmental momentum observed in 2019 would persist. 2019 saw a significant gain for parties that center their policies around pro-environmental messaging, most notably the Greens and GLP. However, the results indicated a shift in voter perception on priorities, with the SVP's focus on migration seemingly resonating more with the electorate.

The Swiss People's Party (SVP), known for its anti-migration stance since they first gained momentum in the 1990s, reinforced their image as a party of choice for a voterbase skeptical of migration. In 2023 they achieved significant gains, reversing the losses they experienced in the 2019 elections. In contrast, both the Green Party and the Green Liberal Party faced notable setbacks, losing a considerable portion of the seats they won in 2019.

HERE: Roger Plot of Election results 2023 vs 2019.

Demographic Indicators of Far-Right Success

The this chapter's plots the 2023 election results are visualised against the demographic factors as well as, in the first plot below, against the change in vote share compared to 2019 (y-axis) across Swiss municipalities. Each point represents a municipality, with color indicating the canton and size reflecting the municipality's population.

In the first plot a positive y-value signifies a gain in SVP support, whereas a negative y-value indicates a decline in election performance. Most municipalities show a slight gain but extreme shifts (both gains and losses) are scattered. The color distribution reveals regional variations, highlighting how different cantons experienced varying levels of SVP growth or decline.

The second scatter plot examines the relationship between SVP's vote share in 2023 (x-axis) and the percentage of non-Swiss residents in each municipality (y-axis), which is at the center of the research project. The negative trend in the distribution suggests that municipalities with a higher share of non-Swiss residents tend to have lower SVP support, aligning with the hypothesis that ethnocultural homogeneity correlates with higher far-right support.

Municipalities with low non-Swiss population percentages (below 20%) exhibit a wide range of SVP vote shares but appear most densely around 25-40% of votership, while those with high non-Swiss populations (above 40%) are generally clustered at lower SVP support levels. Larger municipalities, represented by larger circles, tend to have higher shares of non-Swiss residents and lower SVP support, further reinforcing the trend that urban areas with diverse populations are less inclined to vote for the far-right party.

The visual representation of the data points without statistical analysis or any data processing appears to support the hypothesis.

The next plot as shown below illustrates the relationship between SVP's vote share in 2023 (x-axis) and the age quota (y-axis), which likely represents the proportion of elderly residents in a municipality. A broad distribution of points suggests no immediate strong correlation, though municipalities with a lower age quota (below 50%) appear to have more variability in SVP support, while those with a higher age quota tend to cluster in the lower-to-mid SVP vote share range (0-40%). Larger municipalities, indicated by bigger circles, are concentrated at lower age quotas, suggesting that urban areas may have a younger demographic. The data highlights regional differences in how age structure might relate to voting behavior.

The scatter plot illustrates the relationship between SVP's vote share in 2023 (x-axis) and the naturalization rate (y-axis) across Swiss municipalities. The distribution suggests that municipalities with higher SVP support generally have lower naturalization rates, as most points are concentrated near the bottom of the y-axis. There are relatively few municipalities with both high SVP support and high naturalization rates, reinforcing the idea that areas with more frequent citizenship acquisitions may be less inclined to vote for the far-right party.

Larger municipalities, represented by bigger circles, tend to have slightly higher naturalization rates, possibly due to more diverse populations and administrative capacity for processing naturalizations. The plot suggests an inverse relationship between naturalization rates and SVP support, aligning with the broader hypothesis that ethnocultural diversity correlates with lower far-right voting patterns.

The scatter plot illustrates the relationship between the SVP's vote share in the 2023 election on the x-axis and the taxable income per capita in Swiss municipalities on the y-axis. The distribution suggests that municipalities with higher income levels tend to have lower SVP support, as most high-income areas are clustered on the left side of the plot. Municipalities with lower income levels show a broader range of SVP vote shares, but a large concentration of points is visible in the lower to mid-range of SVP support. The presence of a few high-income municipalities with relatively low SVP support reinforces the idea that wealthier areas may be less inclined to vote for the far-right party. Larger municipalities, represented by bigger circles, generally appear in the lower to middle income range, further suggesting that urban and economically stronger regions have lower SVP support.

The scatter plot displays the relationship between the SVP's vote share in the 2023 election on the x-axis and the population size of Swiss municipalities on the y-axis. The population is shown on a logarithmic scale, allowing for better visibility of both small and large municipalities. Larger municipalities, represented by bigger circles, tend to have lower SVP support, while smaller

municipalities exhibit a wider range of vote shares. The clustering of points at lower SVP percentages suggests that more densely populated areas are generally less supportive of the SVP, whereas some smaller municipalities show higher levels of support. The color variations indicate different cantons, reflecting regional differences in electoral behavior.

The scatter plot examines the relationship between the SVP's vote share in the 2023 election on the x-axis and the percentage of people with secondary education in each district on the y-axis. The distribution suggests a possible positive correlation, as districts with higher SVP support tend to have a greater percentage of secondary education graduates. In contrast, districts with lower SVP support show a wider range of secondary education levels, with some clustering around lower percentages. Larger circles, representing more populous districts, appear throughout the graph but seem more concentrated in the lower SVP vote share range. Overall, the variable seems to be very important to understand the electoral success of SVP.

Regression Analysis

The plot presents regression results across Swiss cantons, showing the relationship between various demographic factors and the vote shares of different political parties in the 2023 election. Each facet represents a canton, with factors such as tax income per capita, population with secondary education level, non-Swiss population share, naturalization rate, and age quota displayed on the y-axis. The x-axis represents the effect size on a log scale, indicating the strength and direction of the relationship between each factor and party support. Each colored dot corresponds to a political party, highlighting how demographic variables influenced voting behavior differently across cantons.

In relation to SVP's electoral performance the distribution of points suggests that certain factors have consistent effects across cantons, while others vary significantly. For example, secondary education and non-Swiss population share appear frequently, reflecting their integral role as variables associated with SVP's electoral success. A high share of populations with a secondary level degree (Berufslehre, Apprentissage) shows a strong influence of SVP's success, while a high percentage of non-swiss population is associated with a worse electoral performance. Across Switzerland, both effects seem to be equally strong, indicating that a main voter group for SVP are Swiss nationals without university education in areas without significant migrant populations.

The other predictors show a high variability across cantons. For example income per capita can be positively associated with SVP's electoral success in cantons like Obwalden and Nidwalden, or strongly associated with SVP performing badly in high-income populations for example in Solothurn and Thurgau. Same variability can be seen with Age Quota and Naturalization rate.

The Social Democratic Party (SP) performs better in municipalities with a higher percentage of non-Swiss residents, a higher naturalization rate, and lower taxable income per capita. Its support tends to decline in areas with a strong presence of secondary education graduates and older populations, suggesting that ethnocultural diversity, university-educated populations and politics addressing younger population's needs align with SP's electoral success.

The Mitte party shows stronger electoral performance in municipalities with higher secondary education levels and moderate levels of taxable income per capita. It tends to perform worse in areas with a very high or very low share of non-Swiss residents and lower naturalization rates, indicating that its voter base lives in agglomerations with average percentage of migrant populations and represents a middle-class demographic.

The Green Party performs well in municipalities with a high percentage of non-Swiss residents, high naturalization rates, and lower taxable income per capita, aligning with its progressive stance on migration and environmental policies. The low-income component is particularly interesting and seems to be contradictory to Green's stronghold municipalities being some economically developed cities as Berne, Zurich, Basel and Geneva, but could be influenced to the Greens voter base in rural areas like Valais, Jura or Graubünden or the fact that younger populations who might vote for the greens haven't reached a high income bracket yet. The Greens tends to struggle in areas with a strong secondary education presence and older populations, suggesting that younger, urban voters are its primary support base.

he Green Liberal Party (GLP) gains support in municipalities with higher taxable income per capita and a strong presence of secondary education graduates, highlighting a strong support in agglomerations and possibly strong presence of self-employed professionals or SMEs. It tends to perform worse in areas with lower naturalization rates and fewer non-Swiss residents, suggesting that its voter base consists of educated, urban professionals.

The Free Democratic Party (FDP) performs best in municipalities with high taxable income per capita and a strong secondary education presence, also indicating SMEs and self-employed upper class as well as higher middle class populations being their key voter base.

Two cantonal parties should also be mentioned, especially in terms of their local performance. Lega in Ticino shows a strong positive correlation with lower taxable income per capita and lower secondary education levels, indicating that it performs well in economically weaker areas with lower educational attainment. It is also positively associated with municipalities that have a higher share of non-Swiss residents and higher naturalization rates, suggesting that the party gains support in more diverse regions where migration issues may be politically relevant. Mouvement Citoyens Genevois (MCR) in Geneva is negatively correlated with taxable income per capita, secondary education, non-Swiss population share, and naturalization rates, suggesting that it performs badly in wealthier and well-educated municipalities. Its support decreases in areas with a higher proportion of foreign residents. Both Lega and MCR seem to share some voter base characteristics but especially on the cantonal level there seems to be segmentation with visible differences in indicators of SVP's electoral success versus Lega or MCR.

Maps

Map results of the 2023 elections in Switzerland by canton.

Results of winning party including the second party per canton.

Map results of the 2023 elections in Switzerland by municipality.

Map of the education factor per canton.

Map of the income per capita factor per canton.

Limitations

Procedural limitations of the analysis include the unreliability of election results to establish a causal relationship to voting motivation. Since the far-right SVP campaigned on an anti-migration platform we assume that many voters were mobilised by this issue. But this does not account for non-voters, which represented in 2023 XX% of the population. Also, some people might have been voting for far-right parties for other reasons like fiscal austerity and the far right's opposition to social liberty policies - sometimes called "culture war" issues. And as always in elections, a lot of people stick for many years with the party they most identify with. The election data doesn't include hints to non-voters motivation to abstain from voting and therefore may not be representative of the entire population, leading to biased results.

Some limitations must be noted for the statistical analysis. For the education levels BfS only publishes data per district, not per municipality. The scarcity of data points means a smaller reliability of the indicator. Demographic factors like age ratio, income per capita, and migrant population percentage can be highly correlated, making it difficult to isolate the effect of each variable and leading to multicollinearity. The relationship between election results and demographic factors may not be linear. Linear models may oversimplify these relationships. Also, the chosen demographic indicator might not be conclusive and failing to include relevant variables can lead to biased estimates. The variance of errors may not be constant across observations, violating one of the key assumptions of linear regression (Heteroscedasticity).

Discussion

The regression analysis highlights significant relationships between demographic factors and electoral outcomes in the 2023 Swiss elections. While secondary education levels and the percentage of non-Swiss residents appear as the most consistent predictors of SVP's electoral success, other factors such as income per capita, naturalization rate, and age quota show considerable variability depending on the canton. The data suggests that SVP performs particularly well in municipalities with a high proportion of Swiss nationals holding a secondary-level education (e.g., vocational training) and where the percentage of non-Swiss residents is lower. These trends indicate that SVP's voter base is predominantly composed of Swiss nationals without university education, residing in areas with lower demographic diversity.

The results also highlight distinct electoral profiles of two cantonal right-wing parties, Lega in Ticino and MCR in Geneva, which both overlap and diverge from SVP's voter base. Lega's success in Lega's performance in Ticino is strongly associated with lower levels of taxable income and secondary education, indicating that it appeals to economically weaker municipalities with lower educational attainment. Interestingly, unlike SVP, Lega also correlates positively with a higher share of non-Swiss residents and a higher naturalization rate. This shows that far-right voters are not a monolithic group but come from different communities and might be motivated by a range of issues.

Looking at SVP's main competitors across the political spectrum, the Social Democratic Party (SP) performs best in urbanised municipalities with lower and middle incomes, higher shares of migrants and higher levels of education. The Greens similarly benefits from those variables, showing a significant overlap with SP's voter base in terms of demographic markers. Conversely, the Mitte party appeals to middle-class voters in less ethnoculturally diverse municipalities. The Green Liberal Party (GLP), on the other hand, finds its support diverse urban areas with high share of university-degree educated people. The Free Democratic Party (FDP) shares a similar economically liberal profile to GLP but performs best in high-income municipalities with a strong secondary education presence, suggesting a voter base of SMEs and middle-class professionals like self-employed entrepreneurs.

Despite clear trends and patterns, it remains difficult to establish causality between demographic factors and voting outcomes. While the SVP campaigned heavily on an anti-migration platform, it is impossible to determine whether voters were primarily mobilized by this issue. Many voters may have supported the party for other reasons, such as economic policies, opposition to social liberalism, or long-term partisan loyalty. Additionally, the analysis does not account for non-voters, who made up a significant portion of the electorate in 2023.

Further methodological constraints arise from data availability and statistical modeling limitations. Education levels, for instance, are only published at the district level rather than for individual municipalities, reducing the precision of this variable. Additionally, demographic factors such as age, income, and migration are often highly correlated, creating potential issues of multicollinearity that make it difficult to isolate the independent effect of each variable. The assumption of linear relationships between predictors and election outcomes may also oversimplify the dynamics at play and heteroscedasticity may impact the reliability of the model's estimates.

Conclusion

How to interpret the results.

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