# Can the "1:12 - for fair wages" Popular Initiative vote result be explained by income and income inequality?

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## Introduction

In 2013, Swiss citizens voted on a popular initiative - "1:12 - for fair wages" on federal level demanding to limit the amount of executive pay within a company to a maximum of 12 times that of the lowest paid workers. The popular initiative was rejected to a great extent.
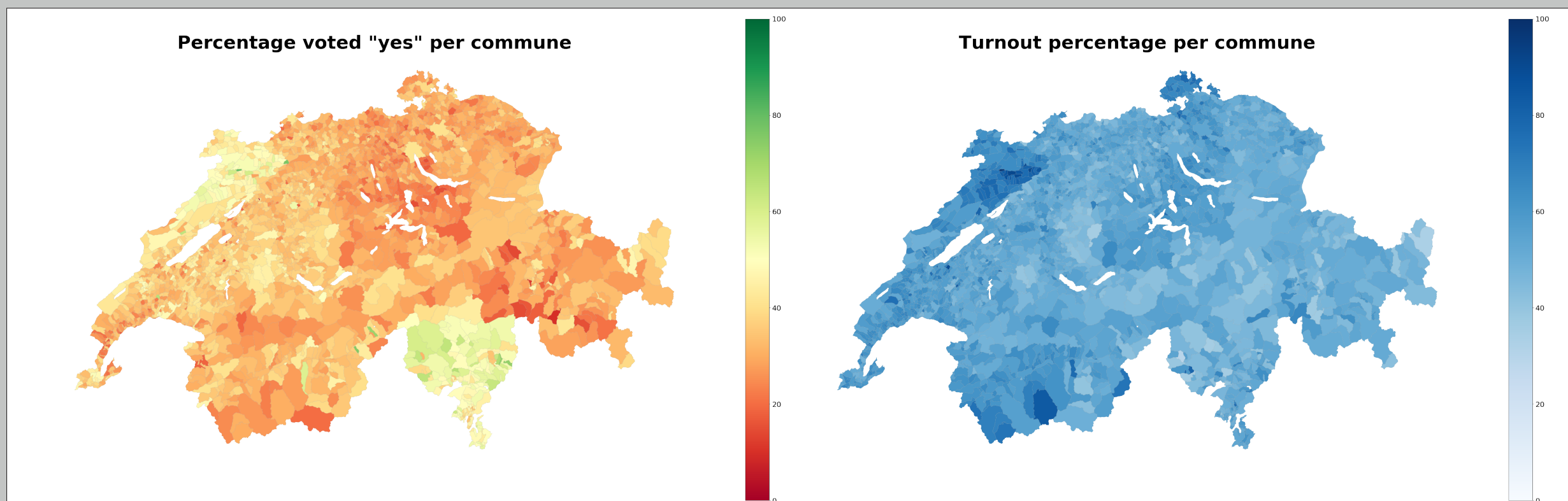


Figure: The popular initiative "1:12 - for fair wages" was rejected with an overall 65.84% nays and a turnout of 55.71%.

But why did the populace turn down this opportunity to reduce the wage gap? Only two regions apparently agreed with the initiative's demands, mainly the canton Tessin and a part of french-speaking Switzerland. What makes these regions special? Is income distribution there especially unequal?
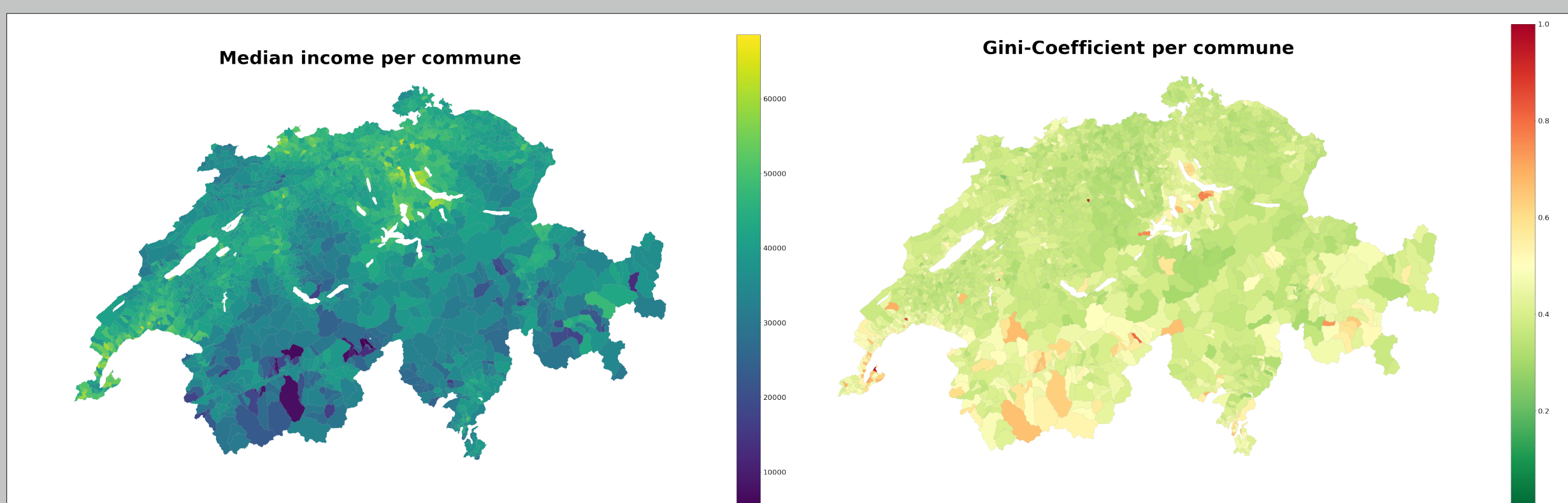


Figure: Income distribution (median, left) and equality (Gini-coefficients, right) in Switzerland in the year 2013 based on equivalised income per capita.

At a first glance, this seems not to be the case. But are income, income inequality and the "1:12" popular initiative voting results really uncorrelated?

### Research questions
▶ Is there a relationship between income inequality (Gini-coefficient) and acceptance of the "1:12 - for fair wages" Popular Initiative?
▶ Is there a relationship between wealth (income) and acceptance of the "1:12 - for fair wages" Popular Initiative?

## Data collection

**Challenge:** Obtaining data to optimally represent the communes historical state (vote, income distribution, communes) at the time of the Popular Initiative vote date (24. November 2013). **Solution:** *Voting data* was obtained from the Federal Statistical Office (cantons OW, NW, AI, AR, BL, BS, UR, SZ, ZG and TG) as well as from the State Chancelleries of the individual cantons (AG, FR, LU, GL, JU, NE, SG, SH, SO, TI, VD, VS, GR, BE and ZH). *Income (tax) data* was obtained from the Federal Tax Administration. For plotting purposes, *geographical data* was obtained from the Federal Statistical Office. Geographical as well as vote data was aggregated to match tax data, which contains communes in their 2014 state.

## Data

**Analysis dataset:** The resulting dataset consisted of n=2343 observations on the variables as shown in the tables below.

| commune | turnout_perc | canton | taxable | mean_income | median_income | gini_coeff | yes_perc |
|---|---|---|---|---|---|---|---|
| Aeugst am Albis | 61.53 | ZH | 1175 | 65698.14 | 53400.00 | 0.45 | 27.49 |
| Affoltern am Albis | 53.61 | ZH | 6916 | 48280.40 | 43500.00 | 0.39 | 32.54 |
| Bonstetten | 62.59 | ZH | 2934 | 58869.42 | 53400.00 | 0.38 | 31.84 |
| Hausen am Albis | 60.84 | ZH | 2003 | 56154.83 | 48187.50 | 0.42 | 34.26 |
| Hedingen | 64.10 | ZH | 2068 | 58153.74 | 49615.08 | 0.41 | 31.41 |

Table: The first 5 rows of the analysis dataset (geographical data not included).

| | turnout_perc | taxable | mean_income | median_income | gini_coeff | yes_perc |
|---|---|---|---|---|---|---|
| count | 2343.00 | 2343.00 | 2343.00 | 2343.00 | 2343.00 | 2343.00 |
| mean | 55.71 | 2129.59 | 47369.02 | 41169.82 | 0.40 | 34.16 |
| std | 7.78 | 7453.23 | 26138.46 | 7408.75 | 0.07 | 8.51 |
| min | 0.00 | 16.00 | 17140.96 | 4800.00 | 0.23 | 0.00 |
| 25% | 50.86 | 366.00 | 40023.35 | 37333.33 | 0.35 | 28.70 |
| 50% | 54.89 | 822.00 | 44879.45 | 41387.18 | 0.38 | 32.92 |
| 75% | 60.10 | 2000.50 | 50251.60 | 45469.44 | 0.42 | 38.33 |
| max | 97.14 | 254158.00 | 1021727.35 | 68600.00 | 0.97 | 79.41 |

Table: Analysis dataset summary.

**Equivalised income**

To compare economic prosperity of households of differing sizes, income is divided by an equivalence factor to obtain the equivalised income. For a single-adult household the equivalence factor equals 1, for a married couple without children 1.5. 0.3 is further added to the factor per child/supported household member.

**Gini-coefficient**

The Gini-coefficient of incomes is a widely used indicator for income inequality. The higher it is, the more unequal the distribution of income. The coefficient ranges between 0 (all incomes are the same) to approximately 1 (all incomes except one are 0).
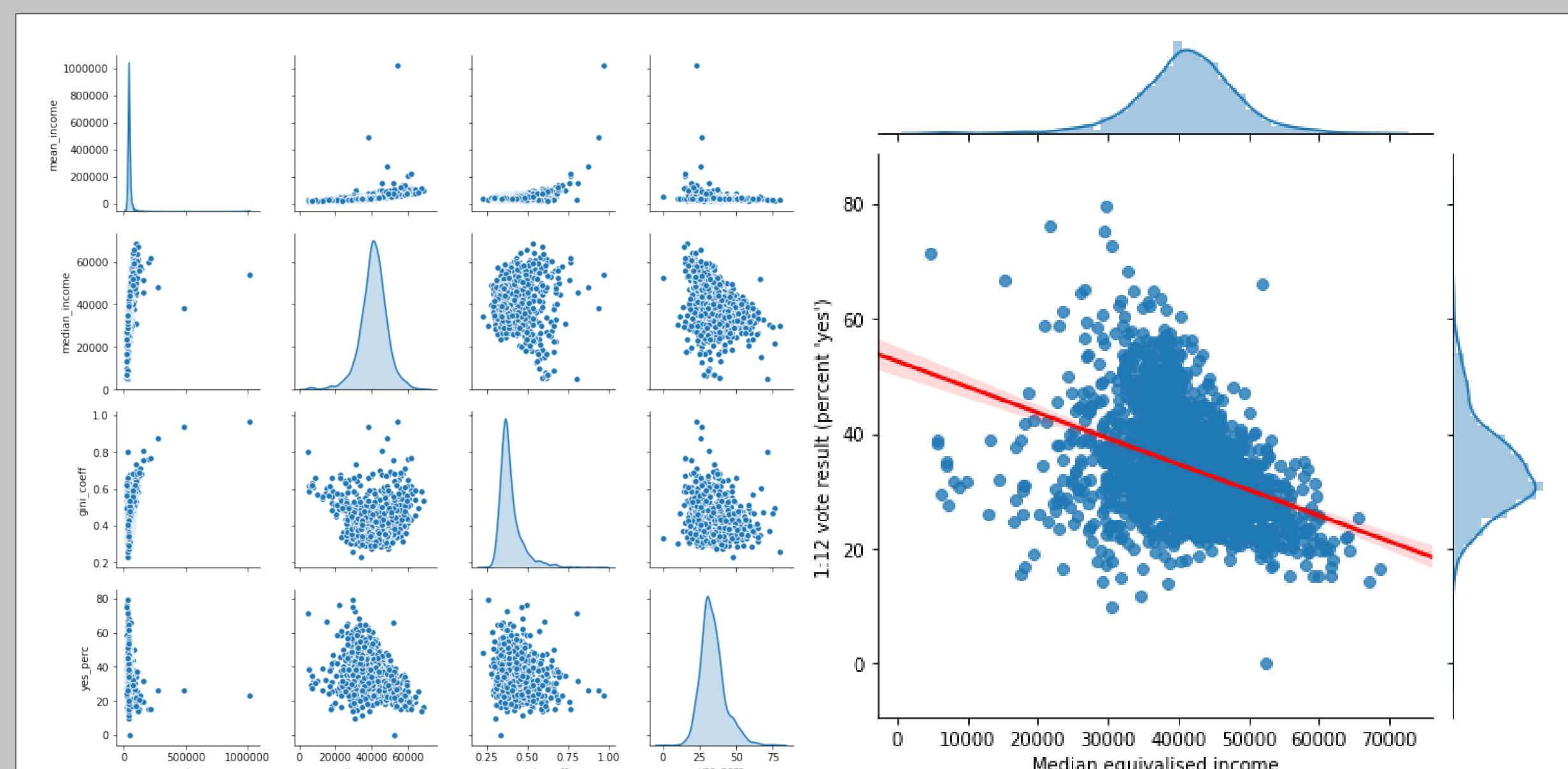
## Exploring correlations



Figure: Variable distributions and associations (left). Association between median equivalised income and vote result (percent 'yes') with linear regression (right).

**Gini-coefficient and vote result were not correlated (pearson, r=-.056). Median income and acceptance of the Popular Initiative are slightly negatively correlated with r=-.39.** simple linear regression was calculated to predict 'Percent yes' based on median income. A significant regression equation was found ($F(1,2341) = 417.8, p<.001$), with an $R^2$ of .151. Commune's Percent 'yes' decreases by 0.0004 whenever median income is increased by 1 CHF.

## Further analysis

To assess if and how this correlation between income and vote result differs between cantons, correlations on canton-level were calculated.

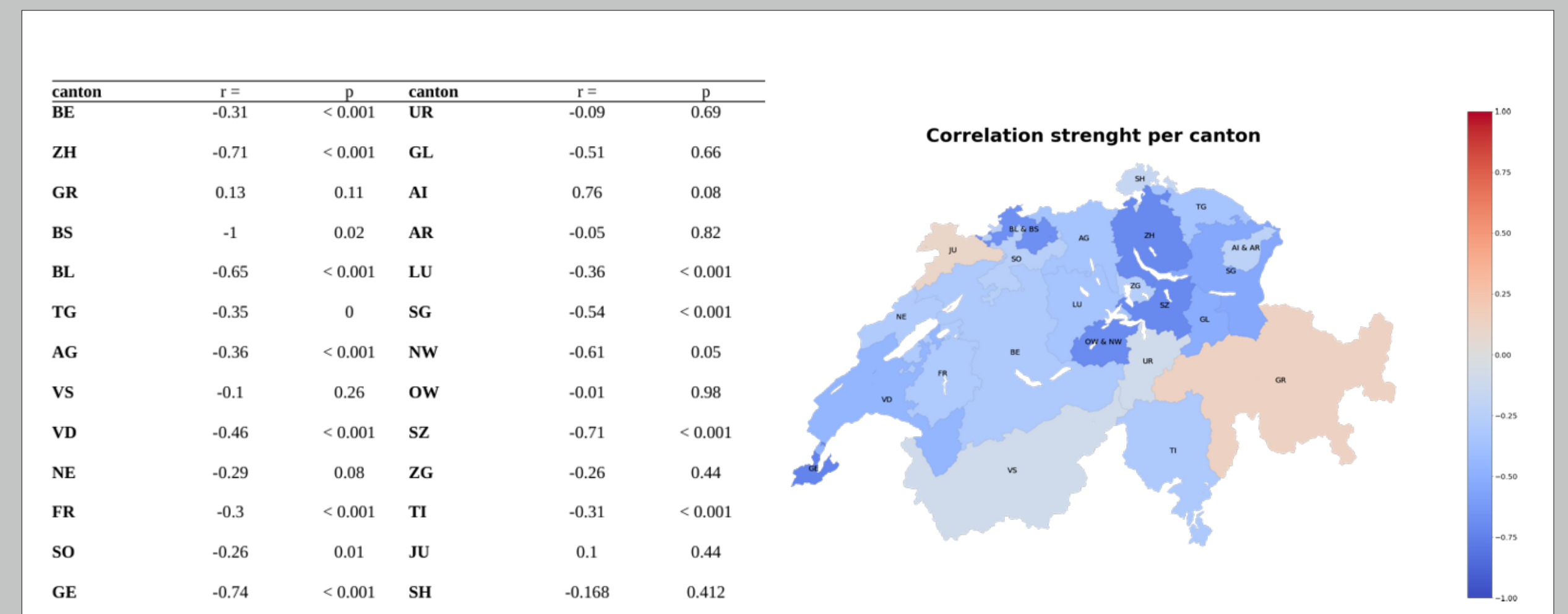| canton | r | p | canton | r | p |
|---|---|---|---|---|---|
| BE | -0.31 | < 0.001 | UR | -0.09 | 0.69 |
| ZH | -0.71 | < 0.001 | GL | -0.51 | 0.66 |
| GR | 0.13 | 0.11 | AI | 0.76 | 0.08 |
| BS | -1 | 0.02 | AR | -0.05 | 0.82 |
| BL | -0.65 | < 0.001 | LU | -0.36 | < 0.001 |
| TG | -0.35 | 0 | SG | -0.54 | < 0.001 |
| AG | -0.36 | < 0.001 | NW | -0.61 | 0.05 |
| VS | -0.1 | 0.26 | OW | -0.01 | 0.98 |
| VD | -0.46 | < 0.001 | SZ | -0.71 | < 0.001 |
| NE | -0.29 | 0.08 | ZG | -0.26 | 0.44 |
| FR | -0.3 | < 0.001 | TI | -0.31 | < 0.001 |
| SO | -0.26 | 0.01 | JU | 0.1 | 0.44 |
| GE | -0.74 | < 0.001 | SH | -0.168 | 0.412 |



Figure: Correlations and regression of median income and percent 'yes' by canton as scatterplots (left) and as geographical map (right).

Although the negative correlation between income and acceptance of the Popular Initiative seems to be an almost nation wide trend, it's strength varies greatly between cantons. "Canton" could thus be considered a **moderator variable**.

## Conclusions

The analysis results indicate that the acceptance of the "1:12" Popular Initiative varies with income but surprisingly not so much with income inequality. Median income per commune seems to be a more reliable indicator of income height per commune than the mean income, most likely because of a small percentage of extremely rich individuals. At least this seems to be the explanation for the extreme values in the commune of Anières in the canton GE, which was in the year 2014 not only the 'richest' but also the most unequal commune in Switzerland (https://www.srf.ch/news/schweiz/120-millionen-zu-viel-im-steuerkaesseli). Although the correlation between median income and vote result is slight at most and moderated by canton, it nonetheless indicates an interesting association. But correlation does not equal causation and no explanation for this relationship can be provided at this point, thus further analyses are needed to investigate the relationship between income and voting behaviour. Other variables that were not included in this analysis should also be taken into consideration, such as political party strength or people's orientation towards political convictions.

## Data Sources

▶ Vote data (Federal Statistical Office FSO): https://www.bfs.admin.ch/bfs/de/home/statistiken/politik/abstimmungen.assetdetail.7646485.html
▶ Tax data (Federal Tax Administration): www.estv2.admin.ch/d/dokumentation/zahlen_fakten/karten/2014/equivalent/Daten.xls
▶ Geographical data (Federal Statistical Office FSO): https://www.bfs.admin.ch/bfs/de/home/dienstleistungen/geostat/geodaten-bundesstatistik/administrative-grenzen/generalisierte-gemeindegrenzen.assetdetail.328824.html

Vote data for various cantons (see "Data Collection") was further obtained from State Chancelleries of the cantons.