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***YOUTH ENFRANCHISEMENT IN
SWITZERLAND***
an analysis from the Swiss Election Studies (SELECTS)

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ABSTRACT

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Increasingly heated debates have led to the discussion of the possibility of extending the right to vote to a wider section of the population. The contrast between those in favor and those against has forced public opinion to evaluate the pros and cons of a more inclusive electoral system. This has been possible because of the many past enfranchisement processes that have occurred around the world and have taken place both at the regional and national levels.

The following work aims to use the pooled cross SELECTS dataset containing information from 1971 to 2019 on the Swiss electorate to better understand the political consequences of extending democratic rights. Specifically, the federal enfranchisement of youth that occurred in 1991 was studied to determine whether it subsequently had consequences for the maturation of political interest and increased voters' participation both in the citizens and in youth.

The difference-in-differences analysis used suggests that on average both those under the 20s and the electorate as a whole have shown greater electoral interest following the national legislative change, this result is statistically significant. Greater interest is also observable when analyzing, over the entire duration of the period, young people who obtained the right to vote relatively early at the cantonal level. As for the electoral participation of the electorate as a whole, turnout has significantly increased over time, but more importantly, it has also increased following the reform in 1991. This effect is only consistent in the "later group". After controlling for individual-level characteristics such as gender, level of education, age, and relative level of income, considerable differences concerning the two variables of interest can be observed.

The results obtained by analyzing the Swiss case show an improvement in democratic health in the Swiss confederation, as they lead the population to take a greater interest and be more active in national decision-making. These results, therefore, disprove most of the concerns raised by those opposed to youth enfranchisement.

The limitations given by the incompleteness of the dataset and the lack of available data force us to interpret the results obtained with caution. However, what was discovered adds to the already dense literature and contributes to the promotion of a more inclusive democracy in Switzerland.

Keywords: youth enfranchisement; policy evaluation; electoral turnout; political interest; Switzerland; electoral rights

The originality of this thesis has been checked using the Turnitin OriginalityCheck service.

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1.INTRODUCTION:

The world we live in is characterized by a multitude of countries that are governed by different political systems, ranging from authoritarian totalitarianisms to more democratic regimes. Different types of government translate both into different forms of representation and different rules within the various countries: this gives citizens specific rights and obligations that can also differ greatly between nations and territorial entities.

This heterogeneity leads us to question the reasons that brought us to the current situation and in particular, for this paper, to analyze in detail the processes and consequences of democratization and extension of electoral rights.

Studies dating back as early as the second half of the last century have been concerned with investigating not only the phenomenon of extending voting rights to a larger portion of the population but especially in determining the possible effects that such a change would have on the political behavior of voters (Beck & Jennings, 1969; Glenn & Grimes, 1968; Niemi, Stanley & Evans, 1984) and on politics in general (Berlinski & Dewan, 2011; Cassan, Iyer & Mirza, 2020). The availability of an increasing amount of data related to voters and their political preferences has made it possible, to carry out the first studies for this purpose, thus contributing to the study of political science. The considerable progress made by scholars over the years has made it possible to identify the main issues related to youth enfranchisement and they, therefore, represent the most debated issues between supporters and opponents of further democratization of voting rights.

One of the main issues that divides public opinion when it comes to franchise extension of younger people concerns the effect such a change would have on policy outcome: this can be traced primarily to the issue of voter turnout. For years now we have been observing a general trend concerning the electorate in the various countries: in Europe but not only, we are witnessing a modest but constant decline in electoral turnout (Fieldhouse, Tranmer, & Russell, 2007).

What was discovered so far is relevant to the discussion in the sense that the enfranchisement of young people legitimizes a larger portion of the population to go to the polls, but on the other hand this is done by guaranteeing democratic rights that are largely

untapped by younger people (Bergh, 2013). Opponents of this extension justify their opinion by stating that such a change would only lead to a further lowering of the electoral turnout and potentially less support for political decisions by the population (Bartolini, 1996). According to them, therefore, it would not make sense to grant such important electoral powers to people who would not use them and who in case of use would even risk worsening the health of democracy already in crisis because of their political immaturity.

Supporters of this proposal on the other hand say that reducing the voting age could have a positive effect on society, as the under-20s are in a favorable context for developing a political consciousness: this because they are probably still living with their parents and taking part in the educational system (Wagner, Johann & Kritzing, 2012).

Another necessary element that has been considered when discussing whether or not to integrate young people into the political debate is to understand if on average the concerns of younger people are different from the rest of the population (Wattenberg, 2015). This element has to be considered simply because different priorities could translate into different policy choices which potentially lead to alternative electoral outputs. Knowing the distribution of cohorts across the political spectrum can be useful in understanding whether certain parties or issues are more important to the younger electorate than the older electorate.

Finally, one of the arguments most frequently used by opponents of further democratization of decision-making power is the lack of political maturity of younger people, especially when discussing the under-20s (Beck & Jennings, 1969; UK Electoral Commission, 2004).

To understand whether the concerns of those opposed to such reform are well-founded, it would therefore be necessary to prove that young people are incapable of using such a democratic tool in a responsible manner. In this regard, it would be essential to scientifically demonstrate that significant cognitive differences between young and old exist and are such as to justify the exclusion of the youngest segments of the population from voting.

If this were not the case it would be necessary to empower and grant the right to vote also to the youngest, to treat them indiscriminately with regard to electoral rights and obligations (Stubbs & Piccolo, 2018).

Some of these aspects will be explored in this work and this will be done by taking into account the Swiss context and its evolution in recent decades.

The focus of this paper will be on the popular decision to lower the minimum age limit for voting: from 20 to 18 years. The transition took place gradually in the different cantons and was then standardized at the national level in 1991. Such a policy will make it possible to test the hypothesis that a lowering of the voting age, and therefore the granting of new democratic rights, actually leads young people to take a greater interest in the decision-making process, resulting in greater political interest and/or an increase in the electoral turnout at the federal level (Andolina, Jenkins, et al., 2003).

Cumulative data from the Swiss Electoral Studies (SELECTS) will be crucial in this respect, as it will allow to make a statistical analysis and understand whether this legislative change has indeed had an impact on the voting behavior of the electorate as a whole.

This paper will be structured to initially give the reader an overview of the topic of extending the right to vote in a democracy and to consequently offer a better understanding of the issue.

The first chapter explores the issue of voting and attempts to explain why the act of voting is a fundamental pillar for the proper functioning of a democratic society. This first chapter will also summarize what has already been studied in papers published in the past, allowing to better define the hypothesis for the empirical part of the work.

The next section will introduce the Swiss case. This part will present the main stages that led to the gradual extension of cantonal and federal youth voting rights in order to understand the political structural reasons that led to heterogeneity in policy change.

The theoretical framework will be followed by the description of the database. In this section, a descriptive analysis will be conducted based on the SELECTS database to understand what kind of information is contained in it.

After studying the characteristics of the sample, an analytical strategy will be defined to delineate the best statistical approach to study the consequences of youth enfranchisement in Switzerland. The fourth part of the paper will therefore be devoted to discussing the methodology and presenting the statistical methods used in the study of post-event consequences.

The empirical part will consequently be the central part of the article and will be based on the statistical methods discussed to test the political and behavioral consequences of people related to the extension of rights to 18- and 19-year-olds in Switzerland. Here, tables and graphs will also be discussed and interpreted.

Finally, a concluding section will be devoted to a discussion of the results. It will serve to relate what was theorized in the initial part, with the results actually obtained in the analysis. The conclusions will then make it possible to assess whether and how the extension of democratic rights to young people has influenced their electoral behavior and their political interest.

2.THE ACT OF VOTING:

2.1. Voting as a rational choice:

The act of voting in a democratic country has been extensively studied by public choice researchers and this has given rise to several theoretical models (Mueller, 2003: Chapter 14). These have been created with the aim of defining the reasons that lead the electorate to "activate" and go to the polls to express their preference for candidates and proposed policies.

The lowest common denominator of the main theories related to voting in a democracy, and thus representing the very foundation on which democratic systems are founded, is the assumption of the voter as a rational individual.

In fact, according to the hypothesis firstly developed by Anthony Downs in 1957 the individual is capable of elaborating and processing information so as to vote for the option that would maximize his or her utility. This would be possible because of the premise that the individual is able to anticipate the consequences arising from the future political outcome, thus enabling him or her to instrumentally design his or her voting decision (Mueller, 2003: p. 304).

The act of voting according to the rational voter's theory should be seen as an act of the citizen who in a completely selfish way expresses himself to draw the greatest possible benefit. The potential marginal benefit is in that way defined as the difference between the utility that results between the best and worst possible outcome for the citizen.

The activity of the voter therefore somewhat coincides with the concept of "homo oeconomicus" well known in the economic and social sciences (Behavioraleconomics.com, n.d.).

There are, however, not only benefits to be gained from the act of voting, but also important costs that must be considered in the cost-benefit analysis.

These costs arise from the hassle that results from: the act of processing information to form one's own opinion, the cost that results from physically going to the voting booth, the opportunity costs that result from the decision to vote,... The totality of these elements is certainly relevant and deserves to be considered in the discussion (Kaniowski, 2019).

Given the importance of these costs and the small magnitude of the benefits derived from the act of voting, scholars have questioned the rationality of the act of voting. From the need to fill the gaps in rationality theory, multiple alternative theories have emerged.

However, these will not be addressed in this work, as it is based on the study of respondents' voting frequency and political interest and not on the analysis of the deep reasons why people actively participate in a democracy.

The assumption behind this research is therefore that individuals are sincerely interested in voting and benefit from expressing their preferences, this is consistent with the idea of the voter as a rational individual.

2.2. The decision of the franchise extension:

While the rational voter theory allows one to understand the motives that move the electorate, the heterogeneity of national and regional electoral rules does not provide clarity on how citizens are integrated into the democratic-electoral process (Freeman & Snidal, 1982).

Although the importance of the participation of the people in decision-making in a democracy is recognized, it is not clear how these rights and duties are to be granted or withdrawn. As evidence of this, one need only look at the countless processes of enfranchisement that have occurred in democracies in the past. These simply occur at a different point in time or involve extensions that affect different parts of the population, differing significantly between regions and nations.

Nonetheless, common trends regarding enfranchisement are observable in the democracies of Western countries and this demonstrates the uniformity of the elites in wanting greater decision-making legitimacy. The inclusion of more people in the decision-making process results in greater popular consensus and support of decisions made by representatives, giving greater legitimacy to political representatives.

The expansion of voting rights to a larger part of the population did not arise solely from an elitist need, but also from the fact that the population over time began to recognize the franchise no longer as a privilege but as a right (Freeman & Snidal, 1982).

The set of changes in electoral rules can be summarized into three macro-categories: enfranchisement regarding gender, ethnic or citizenship motivations, and finally age issues. It is based on the latter category and the consequences that such a process entails, that this paper will focus on.

2.3. Youth enfranchisement and consequences:

To better understand why the extension of voting rights to younger people plays such an important role in our society, it is necessary to first understand what relevance the vote has within a democratic system. Voting is unquestionably one of the most significant legal rights in a democracy, as it allows people to self-determine by making decisions based on a citizen's opinion. On the other hand, the exclusion of a portion of the population from voting must be thoroughly discussed, as it represents a clear violation of the principle of equality in society (Chan & Clayton, 2006).

For this reason, issues related to the minimum voting age and the definition of the voting age limit are of great importance.

Although there has been a gradual reduction in the voting age in the past, setting an age threshold must be justified by studies and supported by facts. In the past, the evolution of the minimum voting age limit has been closely linked to the definition of the age of majority and more importantly to the rules for obtaining specific duties and rights, such as: the right to marry, to obtain a driver's license, to join a political party, to enter into contracts,... (Chan & Clayton, 2006; Stubbs & Piccolo, 2018).

The intensifying debate regarding age issues, however, has led scholars to question the consequences associated with further lowering the voting age. Nevertheless, there is no "right" age threshold at present, as there are no unambiguous answers regarding the definition of optimal minimum voting age.

One of the main arguments of those against enfranchisement is the lack of political maturity in younger people. Extending the right of political expression to younger segments of the population would represent a worsening of the condition of health in democracies (Wagner, Johann & Kritzinger, 2012). This statement implies at least two things: that the difference in political maturity of the younger compared to the older electorate be statistically proven, and above all that an age-based voting limit be established.

The study conducted by Wagner et al. in Austria on the under-18 electorate shows that younger people are not significantly less able or capable of voting than the older electorate. These results contrast with the findings of Chan's youth electorate analysis, which found that English 16- and 17-year-olds were on average less interested in politics and less informed (Chan & Clayton, 2006). Similar statistical differences in younger subjects were found following a 2011 analysis conducted in Norway (Bergh, 2013).

While it is unclear whether significant differences exist in younger people's cognitive abilities and interest in political issues, consistent variations can be observed in electoral participation across cohorts.

The literature shows that there is a positive correlation between age and electoral turnout. Young people are consistently less active at the political level, systematically presenting lower levels of participation than the rest of the electorate (Glenn & Grimes, 1968). This phenomenon is corroborated by the publication of Fieldhouse et al. who observed average levels of electoral turnout in the youth electorate (18-24 years old) that are 21 percent lower than in the rest of the electorate.

As a result, we expect to find a significantly lower turnout in the youth population from the analysis in this paper, with differences expected to persist over the long term.

Individual-level, rather than nation-specific, differences would seem to explain differences in individual turnout (Fieldhouse, Tranmer & Russell, 2007). From the analysis conducted by Fieldhouse and covering 22 countries, the level of education and individual economic situation would appear to be (positively) correlated with the level of electoral participation. A similar relationship can be observed by analyzing education level and political interest.

Schools, together with the family, represent the main places of development for young people and therefore play an important role in the development of tomorrow's citizens (Andolina, Jenkins, et al., 2003). Education therefore could be a good control variable for the analysis, as past studies highlight the positive relationship between the level of education and both the level of political activity and interest (Glenn & Grimes, 1968).

However, it is not clear from the literature why the level of individual income should influence the variables of interest.

Finally, this work will take into account the gender of the individuals in the sample, allowing to control for this variable. Indeed, numerous studies related to political science point out that women are less politically active than men (Niemi, Stanley & Evans, 1984; Neundorf, Smets & García-Albacete, 2013). Similar results are expected following the analysis of the SELECTS database on the Swiss electorate.

Controlling for such a variable would thus allow the identification of any gender differences in political interest and participation, as well as observing whether the 1991 change in federal law resulted in different consequences between women and men under-20.

3.THEORETICAL FRAMEWORK:

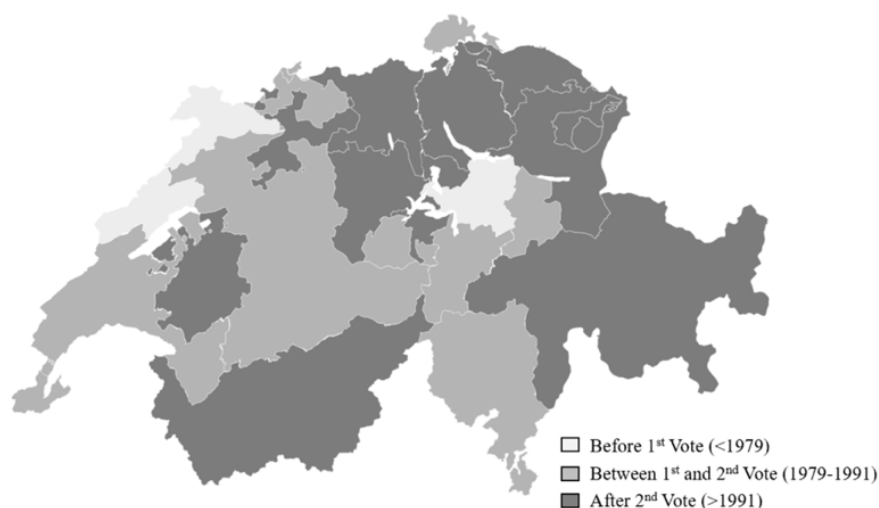
3.1. The Swiss context and its evolution over time:

Over the past two centuries, most democratic societies have gone through a continuous process of extending suffrage, granting the right to vote to those who previously did not have it. It is precisely during this period of time that the lower and middle classes, women, or ethnic minorities such as the African-American community in the United States have acquired these democratic rights (Koukal, Schafer & Eichenberger, 2020: p. 2).

The same is true in the case of Switzerland, where the process of extending the right to vote to younger people, specifically from 20- to 18-year-olds, has taken place gradually.

In this sense, two votes at the federal level have taken place to submit to the people the constitutional law that would have allowed 18- and 19-year-olds to go to the polls. After an initial rejection in 1979 at both the citizen and cantonal levels, the proposed extension of rights received clear double approval in 1991, testifying to the clear desire of Swiss citizens and cantons to integrate even the youngest people into the decision-making process at the federal level.

Figure 1: Chronology of youth enfranchisement at the cantonal level¹



At the cantonal and municipal level, however, things have happened somewhat differently, and this is because the popular majority in the various territorial entities has been obtained

¹ Source : Koukal, Schafer & Eichenberger, 2020.

in different periods. Suffice it to say that the enfranchisement of 18-year-olds took place even before its introduction at the federal level: in fact, 10 cantons out of 26 had already made such concessions in the period between 1979 and 1991 (Koukal, Schafer & Eichenberger, 2020: p. 4). Consider, for example, the singular case of Canton Schwyz, which had already granted cantonal voting to 18-year-olds in 1898, 93 years before voting was extended to the federal level (Federal Statistical Office, 2021: p. 14).

3.2. Swiss Federalism :

To understand the heterogeneity of the youth enfranchisement process, it is necessary to briefly contextualize the Swiss system by introducing the concept of federalism.

Switzerland is a federal state which allocates state competencies and responsibilities on three different levels: Confederation, cantons, and municipalities (ch.ch, n.d.). The executive-legislative powers are divided between the central state, the 26 cantons, and the more than 2300 Swiss municipalities, while the judiciary power is only of federal and cantonal competence (The Swiss Federal Department of Foreign Affairs, 2021).

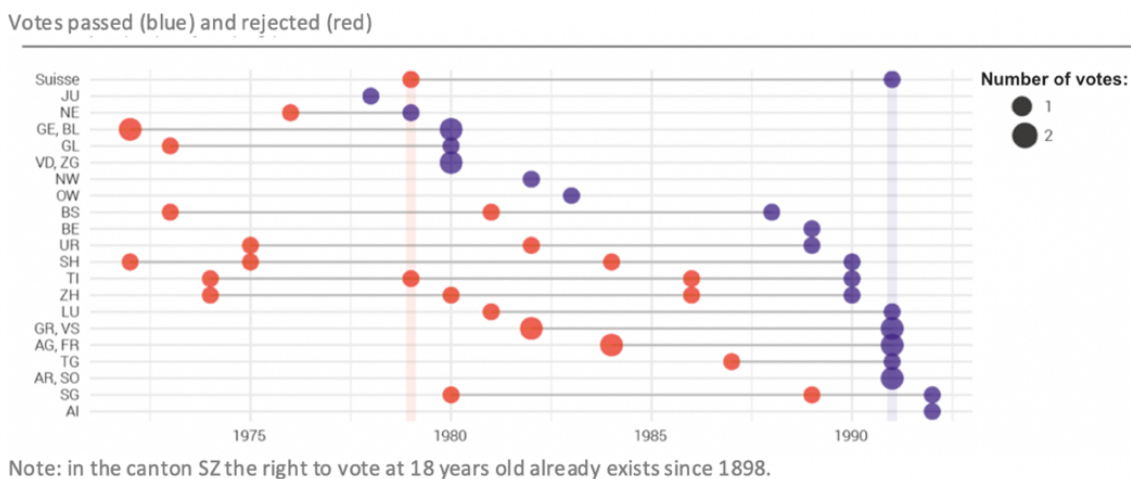
This particular political-administrative set-up allows Switzerland to better distribute tasks, allowing, for example, cantons and municipalities to operate with a certain autonomy, while maintaining a strong national cohesion.

It is precisely based on this federal principle that political decisions are taken at several levels. As proof of this, Article 39 of the Swiss Constitution states that the federal government is responsible for expressing its opinion on the exercise of voting rights with regard to federal matters, while the canton is responsible for expressing its opinion on cantonal and communal matters.

A striking example of the functioning of democracy in a federal system can be observed with regard to the decision to reduce the voting age from 20 to 18 years.

As can be seen from the figure below, the process of enfranchisement of young people has been gradual at the cantonal level, as they can and should legislate independently regarding regional democratic rights.

Figure 2: Federal and cantonal votes on the right to vote at 18²



Crossing the data in Figure 1 with those in Figure 2, it is clear that, starting in the early 1970s, a popular will to lower the voting age emerged in many cantons. This process would seem to have been motivated by the new social ideals that emerged with the 1968 movements (Federal Statistical Office, 2021), which spread nationwide and led to a reassessment of the role of youth in society (Swissinfo.ch, 2018a; Swissinfo.ch, 2018b).

Despite the impossibility of recognizing patterns in the approval of youth enfranchisement in Switzerland, we can see that the territorial entities of central Switzerland have been the main promoters of a more inclusive democracy.

It is not known, however, what deep motivations prompted the cantons to express themselves in a more or less progressive manner regarding the inclusion of 18- and 19-year-olds in the electorate.

The figure just above shows, however, that while the enfranchisement process was temporally brief, it was nevertheless characterized by a multitude of popular votes. A clear result of this is the fact that the lowering of the voting age was rejected and therefore delayed 26 times, taking into account both cantonal and federal results.

Precisely on the basis of the graphical representations proposed so far and through the use of the SELECTS database, this work will explore the issue of youth enfranchisement in Switzerland, a process that ended in 1991 at the federal level.

² Source : Federal Statistical Office, 2021.

4. DATA DESCRIPTION:

4.1. The Swiss Election Study cumulative dataset

Because this work is focused on quantitative analysis and the study of electoral effects following a legislative change, it is necessary to have a reliable database containing multiple observations and variables measured over time.

The Swiss Election Study (SELECTS) is a collective of researchers that has been investigating the electoral behavior of Swiss citizens during national elections since 1995³. This has allowed them to collect an impressive amount of data at the level of individual voters and especially over an extraordinarily long period. This impressive work of SELECTS results in the creation of pooled cross-section dataset that currently contains information on 43669 participants and 347 variables between the period 1971 and 2019. Thus, this database represents an important resource not only for the success of this work but in general for the study of decision-making at the Swiss level.

The database is publicly accessible for research and teaching purposes through the online portal FORSBase⁴: a platform dedicated to contributing to research in the social sciences by making available databases and research information.

The data collection method used to create such a dataset was based on collecting information about the individuals in the statistical sample through the use of a questionnaire. This allows researchers to create sort of a standardized instrument, subjecting respondents to fair and equal treatment. This mechanism is critical because using a single and invariable tool allows limiting the statistical and bias errors that usually characterize data collection. Despite many arrangements made, the design used in the data collection has limitations that will be further discussed below.

In this regard, the documentation made available by SELECT⁵ permits to understand the structure of this questionnaire, so that one can understand what questions were asked of the study participants and the response categories suggested to them.

³ Source : forscenter.ch/projects/selects, consulted on March 23, 2022.

⁴ <https://forsbase.unil.ch/project/study-public-overview/17517/0/>, consulted on January 18, 2022.

⁵ <https://www.swissubase.ch/api/public/catalogue/files/v1/10307/download>, consulted on February 1, 2022.

Among the numerous variables available, those relating to the political behavior of the individuals in the statistical sample will have a significant weight in the analysis. Controlling the values of these variables in the period before and after the enfranchisement of 18-year-olds would enable to understand whether this policy change significantly affects the electoral behavior of citizens.

Of these, it is certainly worth mentioning: the electoral participation of individuals, their positioning on the political spectrum, their possible militancy in political parties, and their trust in public institutions.

However, what makes this data collection functional for this research is the fact that it does not only contain data regarding the electoral participation and political preferences of the individuals in the statistical sample but includes a whole range of socio-demographic information about these individuals. This is of fundamental importance because it makes possible to take into account these variables and to control them at will or, for example, to identify possible relationships between socio-demographic and behavioral variables.

Relevant for the analysis will certainly be the variables related to the year of data collection, the set of "cultural" variables related to individuals, like the cantons of origin of respondents, as well as variables on the age of individuals, the level of education, the standard of living,...

To obtain this valuable database, however, it was necessary to combine multiple surveys, to create a single collection containing information gathered over multiple years. This approach has some non-negligible statistical limitations since although information on the same variables is acquired, the collection process and the design of the studies conducted during the election years might slightly differ.

This aspect is of central importance, since the method of data collection used and the selection criteria adopted by researchers to choose the study participants during the surveys determine their representativeness. A non-random selection method could lead to obtaining a statistical sample that does not reflect the average characteristics of the population at the center of our study. Failure to take this aspect into account would therefore compromise the success of a research project of this kind since it would lead to conclusions that could not be generalized to the Swiss population as a whole.

To overcome this problem, it is necessary to use statistical weightings to correct the issue. Mention should be made in this regard of the work of Georg Lutz who was of fundamental importance in defining the appropriate criteria for weighting observations in surveys (Lutz, 2008, 2012 & 2016).

The weightings suggested in the literature will be applied to the data at disposal: this to be able to carry out an appropriate statistical analysis and thus obtain more reliable conclusions.

The following table comprehensively summarizes the weighting coefficients used in the statistical analysis of this work.

Table 1: Weighting coefficients observations per canton of origin over time⁶

Cantons	Weighting coefficients before 1995	Weighting coefficients 1995	Weighting coefficients 1999	Weighting coefficients 2003	Weighting coefficients 2007	Weighting coefficients 2011	Weighting coefficients 2015
ZH	1.00	1.57	0.90	1.56	1.56	1.14	1.02
BE	1.00	1.39	1.79	1.52	1.52	2.10	1.79
LU	1.00	0.64	1.66	0.48	0.48	2.06	1.96
UR	1.00	6.48	1.48	1.09	1.09	0.25	0.33
SZ	1.00	4.43	1.40	2.87	2.87	1.12	1.23
OW	1.00	9.45	1.00	0.87	0.87	0.28	0.37
NW	1.00	3.24	1.22	1.01	1.01	0.32	0.37
GL	1.00	0.06	1.48	0.92	0.92	0.34	0.43
ZG	1.00	3.17	1.47	2.17	2.17	0.53	0.99
FR	1.00	3.84	1.68	2.23	2.23	1.50	2.36
SO	1.00	4.49	1.50	2.90	2.90	1.43	2.13
BS	1.00	2.98	1.85	2.63	2.63	0.91	1.64
BL	1.00	4.10	1.51	3.11	3.11	1.50	1.90
SH	1.00	0.14	1.63	0.09	0.09	0.58	0.79
AR	1.00	2.52	1.74	1.18	1.18	0.33	0.51
AI	1.00	1.89	1.30	0.32	0.32	0.12	0.18
SG	1.00	3.34	1.68	2.70	2.70	1.99	2.02
GR	1.00	5.52	2.12	4.54	4.54	1.19	1.37
AG	1.00	0.92	1.50	0.69	0.69	2.09	2.08
TG	1.00	3.84	1.88	2.56	2.56	1.26	2.09
TI	1.00	0.51	0.22	0.43	0.43	0.31	0.27
VD	1.00	0.76	1.70	0.72	0.72	1.98	2.18
VS	1.00	0.50	2.21	2.74	2.74	1.66	1.97
NE	1.00	3.48	1.56	2.71	2.71	1.00	1.35
GE	1.00	0.38	0.25	0.44	0.44	0.36	0.24
JU	1.00	3.02	1.71	2.18	2.18	0.44	0.66

4.2. Descriptive statistics

As said before, the cumulative database was obtained by combining data collected through numerous surveys conducted over the years. This process was carried out trying to maintain a standard collection method to avoid collection bias and allow researchers to harmonize the data, thus facilitating comparability over time.

⁶ Source : Lutz, 2008, 2012 & 2016.

The following table aims to provide a summary statistic of the available data, offering an overview of the main variables and their respective characteristics.

Table 2: Descriptive statistics dataset and main variables⁷

Election year	Sample size	Average age of individuals	Percentage of men	Average level of education attained	Individuals from a German-speaking region in percentage	Individuals from a French-speaking region in percentage	Average income situation measured in quintiles	Average individual political interest	Average positioning on the political spectrum	Average federal elections participation in percentage
1971	1'917	45.945	53.312	2.316	75.222	20.188	NA	2.692	5.624	60.752
1975	1'253	45.814	50.120	3.139	73.982	22.346	2.811	2.794	5.385	58.776
1979	1'002	44.617	53.393	4.181	100.000	0.000	2.576	2.323	5.235	73.136
1987	1'001	45.436	49.750	4.088	74.026	20.979	NA	2.579	4.913	64.458
1991	1'002	44.900	49.401	4.335	74.850	21.158	NA	2.544	5.06	63.655
1995	7'561	45.822	54.093	4.995	60.085	31.848	2.867	2.188	5.217	62.101
1999	3'258	48.640	54.911	4.946	52.394	28.607	2.892	2.327	5.105	61.805
2003	5'891	51.230	55.322	5.054	65.031	25.429	2.786	2.182	5.06	68.139
2007	4'392	51.941	55.396	5.192	61.703	26.480	2.869	2.183	5.233	68.922
2011	4'391	50.247	51.697	5.552	61.284	25.279	2.828	2.132	5.115	74.275
2015	5'337	48.670	52.014	5.813	55.125	29.605	2.865	2.186	5.316	70.106
2019	6'664	51.037	51.996	6.201	47.119	40.966	2.902	2.178	5.122	70.287
Total	43'669	47.858	52.617	4.651	66.735	24.407	2.822	2.359	5.199	66.368

Average level of education attained calculated by considering the categorical variable *educ*, which contains values starting from 1 (“primary school”) to 9 (“university”).

Average individual political interest calculated by considering the categorical variable *pi1*, which contains self-assessed values from 1 (“very interested”) to 4 (“not interested at all”).

Average positioning on the political spectrum calculated by considering the variable *lr1*, which contains self-assessed values from 0 (“left”) to 10 (“right”).

The table above summarizes the evolution over time of the size of the statistical sample and the main variables of interest for this work. The cumulative database is composed of an important quantity of observations and important differences can be found at the level of the statistical sample taken into consideration in the various election surveys.

It is easily observable how the size of the statistical sample has undergone important variations over the years: the individuals taken into consideration in the various observations range from a minimum of 1001 to a maximum of 7561 persons.

Part of these important differences can be attributed to the fact that the database is the result of merging multiple surveys that were conducted over time by different research institutions. Some of the data have been lost over time and this justifies, for example, the lack of respondents from Romandie or Ticino in the 1979 sample and, above all, the lack of information for the 1983 survey.

In addition to that, regional boosts have also been applied over time to better represent certain regions.

⁷ Source : Swiss Election Study, results based on own calculation.

Information related to individual age, gender of individuals in the sample, average education level, and standard of living (income) is also represented as they will be used as control variables in the empirical part of this paper. This will allow for the variation in these individual characteristics to be taken into account at the time of the policy evaluation.

These demographic characteristics are crucial to the analysis because, as theorized in the previous studies cited above, they are in turn correlated with the dependent variables: political interest and electoral turnout. As the doctrine suggests, the older, wealthier, and more educated males tend to be more politically interested and active than the median citizen. It is precisely for this reason that variations in the average demographic characteristics of the sample must be considered when analyzing y.

While on the one hand, some variables show certain stability over time: such as the ratio of men to women interviewed or the average financial situation of the interviewees; on the other hand, we note some differences in the various surveys as regards, for example, the region of origin of individuals in the statistical sample, the average individual age or the average level of education. In the most recent surveys, on average, there are older individuals among those surveyed: in fact, the average age goes from around 45 to over 50. An even more important increase can be observed in the length of education of the Swiss interviewed and in their region of origin. Over time they tend to be much better educated and more often to come from the Latin regions of the Swiss Confederation. However, these important differences in study design across surveys and the resulting sampling process can be scaled back if the statistical analysis takes into account appropriate control variables and weighting coefficients.

It is also interesting to observe how the evolution over the years of political interest and the average duration of education of individuals can foreshadow the presence of some significant trends within the reference database.

Based on Figure 2, it would be further possible to divide the database observations into two groups: "early" respondents, which allow one to distinguish between individuals from cantons that granted voting rights to 18-year-olds relatively early (before 1985) and "later" respondents from more conservative cantons (after 1985). This will later allow to test the hypothesis that the timing of enfranchisement at the cantonal level also affects electoral behavior in the sample analyzed.

Table 3: Descriptive statistics dataset and main variables⁸

Election year	Group	Sample size	Average age of individuals	Percentage of men	Average level of education attained	Individuals from a German-speaking region in percentage	Individuals from a French-speaking region in percentage	Average income situation measured in quintiles	Average individual political interest	Average positioning on the political spectrum	Average federal elections participation in percentage
1971	Early	402	48.236	49.005	2.910	32.090	67.910	NA	2.850	5.158	56.122
	Late	1515	46.039	46.073	2.159	86.997	7.855	NA	2.650	5.753	61.965
1975	Early	287	46.589	43.554	3.245	30.662	69.338	2.885	2.933	4.988	50.000
	Late	966	45.584	51.760	3.107	86.853	8.385	2.791	2.753	5.504	61.354
1979	Early	90	44.578	44.444	4.159	100.000	0.000	2.403	2.295	5.043	76.543
	Late	912	44.622	46.820	4.183	100.000	0.000	2.591	2.325	5.256	72.775
1987	Early	309	45.621	48.544	4.184	39.806	60.194	NA	2.507	4.850	61.889
	Late	692	45.424	51.012	4.045	89.451	3.613	NA	2.612	4.942	65.602
1991	Early	285	45.474	51.579	4.296	39.298	60.702	NA	2.592	4.852	54.577
	Late	717	45.136	50.209	4.350	88.982	5.439	NA	2.525	5.142	67.275
1995	Early	2483	46.246	44.825	5.156	29.480	70.520	2.799	2.299	5.107	50.725
	Late	5078	45.662	46.436	4.916	75.049	12.938	2.899	2.133	5.268	67.665
1999	Early	989	47.728	43.680	5.314	18.402	81.598	3.020	2.394	4.911	56.926
	Late	2269	49.037	45.703	4.786	67.210	5.509	2.836	2.298	5.190	63.933
2003	Early	1572	50.943	42.048	5.360	15.776	84.224	2.851	2.287	4.832	66.985
	Late	4319	51.334	45.636	4.943	82.959	4.029	2.761	2.144	5.145	68.559
2007	Early	1507	51.406	43.464	5.407	35.965	64.035	2.953	2.222	5.028	68.659
	Late	2885	52.221	45.199	5.080	75.147	6.863	2.825	2.162	5.340	69.060
2011	Early	1474	50.168	48.100	5.666	35.617	64.383	2.878	2.156	4.967	72.548
	Late	2917	50.287	48.406	5.495	74.254	5.519	2.802	2.119	5.189	75.146
2015	Early	1905	45.687	46.404	5.858	25.197	74.698	2.915	2.276	5.260	62.626
	Late	3432	50.366	48.864	5.789	71.737	4.575	2.840	2.136	5.347	74.243
2019	Early	2993	50.833	46.074	6.378	15.837	84.163	2.935	2.232	4.969	66.588
	Late	3671	51.204	49.578	6.059	72.623	5.748	2.875	2.135	5.244	73.304
Total	Early	14296	47.792	45.977	4.828	34.844	65.147	2.849	2.420	4.997	62.016
	Late	29373	48.076	47.975	4.576	80.939	5.873	2.802	2.333	5.277	68.407

Average level of education attained calculated by considering the categorical variable *educ*, which contains values starting from 1 (“primary school”) to 9 (“university”).

Average individual political interest calculated by considering the categorical variable *pi1*, which contains self-assessed values from 1 (“very interested”) to 4 (“not interested at all”).

Average positioning on the political spectrum calculated by considering the variable *lr1*, which contains self-assessed values from 0 (“left”) to 10 (“right”).

The descriptive table above takes into account the canton of origin of the individuals and some differences are already observable in: the average level of education in the groups, the average positioning on the political spectrum, the average participation in the federal elections,...

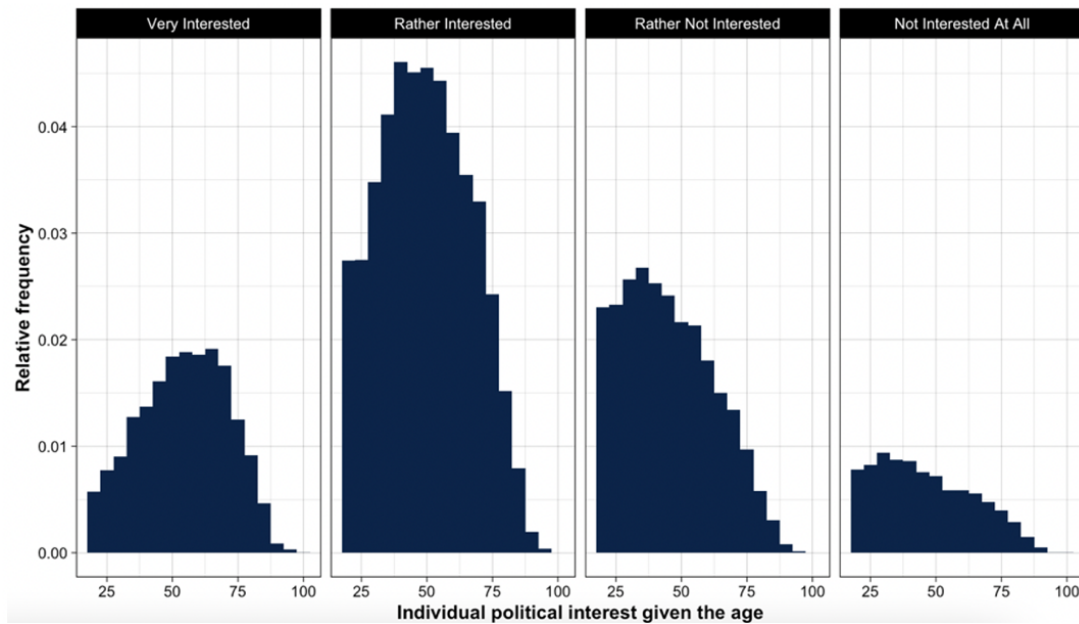
Before running the statistical analysis and the difference-in-differences approach, one could investigate to try to understand if there exists an actual relationship between age and political behavior, as suggested in the literature.

It is supposed that youth and newly enfranchised individuals vote less (Franklin, 2004; Corder & Wolbrecht 2006) because they’re less interested in politics (Chan & Clayton, 2006).

The following figure shows graphically the degree of political interest of the individuals interviewed taking into account their age.

⁸ Source : Swiss Election Study, results based on own calculation.

Figure 3: Individual political interest based on age⁹



“Very interested“: 8054 individuals , “Rather interested“: 20430 individuals, “Rather not interested“: 11198 individuals, “Not interested at all“: 3853 individuals.

From the graph, it is already possible to observe that individuals most interested in politics ($pi1=1$), tend to be older. Graphically, in fact, under the “very interested” facet there is a peak of observations in the 50+ part of the graph, which suggests that the over-50s are more involved.

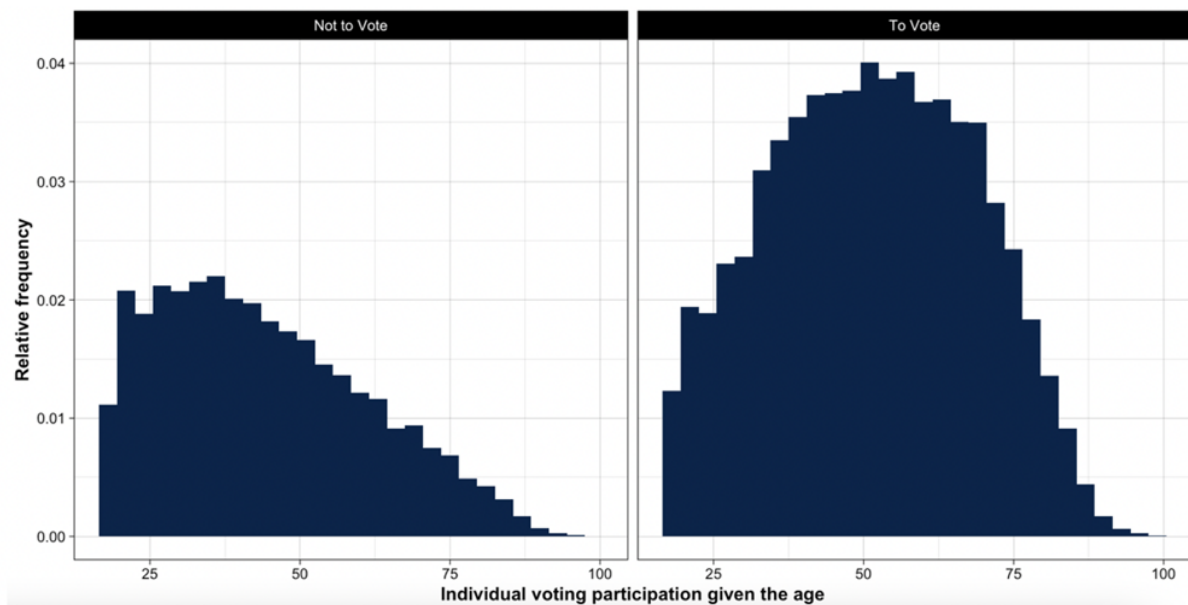
On the other hand, if we look at the part of the population least interested in politics (“Rather not interested” and “Not interested at all”, which correspond respectively to $pi1=3$ and $pi1=4$), we see that the average age goes down. Graphically this translates into left-skewed distributions.

The graph may already indicate a positive relationship between age and interest in politics similar to the one suggested in the literature (Zeglovits, & Zandonella, 2013).

Instead, to observe whether individuals of different ages tend to adopt different electoral behavior during elections, a focus on the binary variable $vp1$ is needed.

⁹ Source : representation based on own calculation.

Figure 4: Individual political participation based on age¹⁰



Non-voting: 14212 individuals, Voting: 29112 individuals.

The graph reveals that the portion of the electorate that decides to vote (also equivalent to $vp1=1$) is primarily made up of individuals around the age of 50.

On the other hand, the individuals who do not vote ($vp1=0$) are on average younger than the actual voters, this is observable by the left-skewed distribution under the “not to vote” facet.

The graph just described considers only post-federal enfranchisement observations of youth (observations after 1991) so as to include the behavior of 18- and 19-year-olds in the graph and thus avoid bias.

To better investigate the above-mentioned relationships different statistical models can be performed to find the best candidates.

¹⁰ Source : representation based on own calculation.

5.METHODOLOGY AND ECONOMETRIC ESTIMATION STRATEGY:

The objective of this work is to determine how the 1991 extension of voting rights to under-20s at the federal level affected the youth approach to politics and the electoral behavior of young Swiss. Indeed, the focus will be to understand what components influence political interest and voter participation, and more importantly to understand how those explanatory variables act on them.

The equation proposed below will serve as a starting model for the event study, taking into account the main components for the analysis of the development over time of the political interest of the young part of the electorate. It will therefore contain: control variables, variables to distinguish between the observation groups, and finally a time variable. Thus, the basic statistical models of reference are as follows:

$$Y_{it} = \alpha + \theta X_i + \beta(\text{youth})_i + \gamma(\text{early})_i + \tau_t(\text{after change})_i + \varepsilon_{it} \quad (5.1)$$

Equation 5.1 summarizes all components of the model for determining political interest, in this case, Y_{it} .

The coefficient α summarizes the intercept of the model and thus describes the average political interest of the reference individual in our sample: the constant.

The X-matrix accounts for the individual characteristics of the respondents encapsulating information about both the education of the individuals and their gender, thereby allowing these factors to be controlled for. Education is a categorical variable with values ranging from 1 (primary school) to 9 (university) and is therefore defined to take into account the level and not the actual years of education of individuals.

The dummy variable female assumes only two values based on the sex of the individuals: 0 for men and 1 for women.

There are at least two good reasons to include control variables in the analysis: to take into account systematic differences between individuals when comparing respondents and to

reduce error variance by including more items in the regression (Wooldridge, 2012: Chapter 13.2).

Including education level and gender in the pre- and post-event analysis allows these factors to be taken into account when analyzing the two groups. In fact, it is possible that in one of the two periods people with a significantly different average level of education were interviewed or that there is a very different gender representation in the two periods. Knowing that women and less educated people tend to be less politically active and less interested in politics, including these variables in the analysis allows for the avoidance of interpretive bias. This makes sense in a work of this type as it improves the precision of the DiD estimate by linking any changes in interest outputs to the 1991 law change. (The mixtape, 2022).

The other reason mentioned is instead related to the accuracy of the estimation and the R-squared coefficient. Since this coefficient is an indication of how much variation in y is explained by X , the inclusion of more terms in the equation allows to better approximate the dependent variable and reduce the error variance. However, R-squared must continue to play a marginal role both because the inclusion of an excessive number of variables leads to an increase in variance in the model (James et al., 2013), and because the statistical sample used is large enough to reduce this problem (Wooldridge, 2012: Chapter 6.3). For the following reasons, the inclusion of control variables makes the common trend hypothesis more plausible for the DiD analysis.

The *youth* and *early* variables are both dummy variables created based on data already present in the SELECTS database and are defined to create groups to respectively categorize observations according to individual age (youth: 18-19 years old, non-youth: >19) and canton of residence.

Specifically, the *early* variable allows to distinguish citizens from cantons that were the first to lower the voting age to 18 years for young people (< 1985) from those that were more conservative, defined in the work as "later", for having maintained the voting age at 20 years longer at the cantonal level. The list of cantons belonging to each of the two groups was derived using Figure 2.

The *AfterChange* variable was created taking into account the time component and takes on the value 0 for observations collected in 1991 or earlier, and the value 1 for observations from 1995 onwards, i.e. those relating to the period after the legislative change.

Finally, the last parameter in the equation takes into account error terms.

The model will be used to test the hypothesis of variation in average political interest across groups, and holding the variables of interest constant, in the two chosen observation periods: before and after reform. This approach will allow for testing the hypothesis that has also emerged repeatedly in the doctrine that extending voting rights to 18- and 19-year-olds affects the political interest of young people.

The equivalent of equation 5.1 will be proposed below but shifted to the study of another variable of interest: political participation of the electorate. Equivalently, the new equation will take into account the new control variables and a time component to study the evolution of the variable *vp1* over time.

The model chosen for determining the electoral turnout in the sample is proposed here below:

$$Y_{it} = \alpha + \theta X_i + \tau_t + \varepsilon_{it} \tag{5.2}$$

Equation 5.2, on the other hand, represents the model used to determine voter participation. It is defined dichotomously: the value 0 represents a decision not to vote and the value 1 means that the individual votes.

Equivalently to the previous model, alpha represents the constant.

The X-matrix this time takes into account more individual characteristics and this is so that the effect of more demographic variables on the voting decision can be considered.

Specifically, it takes into account age, individual education, gender, and income level measured in quintiles (ranging from 1 = “low income” to 5 = “high income”).

The tau coefficient accounts for the time variable in the model to consider how voting decisions evolve over time.

Again, the last term in the equation represents error terms in the model.

5.1. Difference-in-differences:

The main statistical method that will be implemented in this analysis is the Differences-in-Differences (DiD) approach, to determine and analyze the effects caused by a change in the system on citizens' political interests, a federal legislative change in this case. And it is precisely based on the extensive DiD literature concerning political-electoral issues that the empirical part of this paper was defined (Harjunen, Saarimaa & Tukiainen, 2021; Garmann, 2016; Keele, Hasegawa & Small, 2019; Glynn & Kashin, 2017).

The use of this statistical method would be possible because of the use of a rich database containing data over a fairly large time period (1971-2019). This approach is widely used in the field of policy evaluation with regard to panel data and repeated cross-sections, as it analyzes the consequences following a legislative change in the groups¹¹. The following statistical method can be conducted even if one has information regarding the observation of new individuals selected at each survey, as it does not require information concerning the evolution of the same group of individuals over time.

The idea behind DiD is that only a portion of the population studied is affected by the reform (treatment group), while the remainder is not significantly affected by the change (control group). By analyzing the two groups at different time periods, specifically before and after the change, one can determine the effect caused by the enfranchisement of the population in the two groups.

This is possible because it is assumed that both groups share the same time trend concerning the outcome and therefore any after-change output that differs from the expected time trend in the treatment group is attributable to the exogenous change induced in the system (Wooldridge, 2012: Chapter 13).

In other words, the fundamental assumption for this statistical method is that there are no unobservable time-varying effects in individuals. This automatically implies that, in the absence of the law change in 1991, the dependent variables in the two groups would have followed the same trends and been affected by the same changes (Angrist & Pischke, 2014: Chapter 5.1).

¹¹ <https://mixtape.scunning.com/difference-in-differences.html>, consulted on April 7, 2022.

To perform such an analysis, it is necessary to make a further division of the statistical sample to categorize as a treatment group those individuals who are directly affected by this policy: specifically, 18- and 19-year-olds who have become federally eligible to vote since 1991, our time t . These are considered a treatment group because as a result of the reform, they have undergone a change. Specifically, they have been given the right to vote, something that before 1991 was not granted to children under the age of 20. In the used database this group will be formed by individuals who will be 18 or 19 years old in the followings federal votes (from 1995).

The control group, on the other hand, will be made up of all those respondents who will not be directly concerned by the extension of the right to vote to younger people and will therefore be made up of the part of the electorate aged 20 or over following the legislative change. This group is defined as of control because their rights and their behavior should not be affected by the vote, as this does not give them any additional civic rights or duties. The analysis will therefore take into account individuals' characteristics in the statistical sample to define the affiliation of the participants to the two groups as well as the behavior and political interest of the citizens. This particular setup allows one to identify the effect, if any, of a certain type of policy, so that one can understand how it acts on the average political behavior of the people treated.

The models used will take into account, as mentioned before, the weighting coefficients but above all multiple control variables to isolate the effect of the change of law so as to attribute any changes in the behavior of individuals to this policy.

In this empirical part and based on the information in the database, any relationships between variables discussed earlier in the literature will also be tested. Specifically, any possible correlation or causality between demographic age and political behavior (political interest and voting participation) will be explored further.

Categories will be created according to the canton of origin of individuals to account for groups that contain members with certain common characteristics. This setup will then allow for the identification of possible consequences of an extension of voting rights on the average behavior of individuals in the clusters.

$$Y_{it} = \alpha + \beta(\text{youth})_i + \tau_t(\text{after change})_i + \delta(\text{youth} * \text{after change})_i + \varepsilon_{it} \quad (5.3)$$

The basic DiD model in equation 5.3 will only consider the evolution of the average political interest both in the control and treatment group through the two time periods of reference: before and after the legislative change.

The δ coefficient would be defined as the Average Treatment Effect on the Treated (ATET) and it's obtained by accounting for the interaction between young individuals and the post-treatment period. This delta-coefficient makes it possible to derive the average effect that results from the federal policy change on the treatment group. The ATET measures the effect of the federal law reform on the average political interest only considering the treatment group (Woolridge, 2012: Chapter 13).

This basic design makes sense statistically, as legislative change occurs only once during the observation period, and therefore there is no need to consider the set of temporal dummies related to the surveys.

To make our model more comprehensive and isolate the effects of individual characteristics on political interest we need to include control variables in the model.

In addition to that, by including the *early* variable and allowing for interactions it is possible to test whether *early youth* enfranchisement at the cantonal level affects the development of greater civic maturity and consequently greater political interest.

The result of these new arrangements is the model described in equation 5.4.

$$\begin{aligned}
 Y_{it} = & \alpha + \theta X_i + \beta(\text{youth})_i + \gamma(\text{early})_i + \tau_t(\text{after change})_i \\
 & + \delta(\text{youth} * \text{after change})_i + \rho(\text{youth} * \text{early})_i + \eta(\text{after change} * \text{early})_i + \\
 & \lambda(\text{youth} * \text{after change} * \text{early})_i + \varepsilon_{it}
 \end{aligned}
 \tag{5.4}$$

Regarding electoral participation, the before-after situation cannot be taken into account for the under-20s, since they had no voting rights before 1991 and therefore did not vote. The basic assumption on the common trend would therefore be violated since if there had been no federal enfranchisement young people would have continued not to vote. Knowing, however, that the general electoral turnout in Switzerland has been steadily declining for years¹², one cannot adopt a DiD approach with the youth treatment group for the variable *vp1* (voters' participation) similar to that used for the variable *pi1* (political interest) because of different electoral trends.

¹² Source: <https://www.idea.int/data-tools/country-view/76/40>, consulted on April 8, 2022.

5.2. F-Test of overall significance:

The F-Test of overall significance is a statistical method for understanding whether the inclusion of more independent variables in the model, as opposed to a model with fewer predictors, results in a better fit. This specific test is based on testing the following hypotheses:

- Null hypothesis (H0): the model with no or fewer predictor variables fits the data as well as the alternative regression model.
- Alternative hypothesis (H1): getting a p-value with a significant level would mean that the regression model with extra predictors fits the data better than the starting model. One would conclude that the added variable is statistically significant and should therefore be included in the model.

The test will be carried out to verify the relevance of the variable *female* in models with political interest as the dependent variable and to test if indeed gender affects the individual's approach to political issues in Switzerland.

The choice to test the significance of just this variable in the Swiss case studied lies in the fact that the negative correlation between being a woman and interest in politics has been widely debated and addressed in the literature. Results have mostly been collected in different national contexts and they indicate, for example, that in Austria and the United States, women tend to be *ceteris paribus* less interested in politics than men (Bennett & Bennett, 1989; Zeglovits & Zandonella, 2013).

One would therefore expect that gender will also be the Swiss case a significant determinant of the political interest of the electorate, in particular, that women will be less politically interested.

Such an investigation takes on added relevance when one considers that women only gained the right to vote at the federal level in 1971, much later than in neighboring countries (the Swiss parliament, n.d.). The analysis of the impact of gender on political interest thus allows for a deeper understanding of the role of women in the Swiss democratic system.

Demonstrating the statistical significance of the *female* variable would not only further confirm what has already been discussed regarding the gender-political interest relationship,

but would also highlight how gender differences in politics still exist today, that is, 50 years after the introduction of women's suffrage.

5.3. F-Test of overall significance:

A further test that will be used in this work is the z-test two-proportions which will be used to test whether there are significant differences between the average electoral turnout of 20-year-old citizens from *early* cantons and those residing in later cantons.

The Z-Test Two-proportions will be used to compare the average turnout (calculated as a proportion) of respondents aged 20 years in the two groups. By comparing these values during the surveys following the change in federal law, it is possible to understand whether the timing of the cantonal extension of the right to vote may have influenced the behavior of young people.

Intuitively, one might expect that young people from *early* cantons have been politically active for longer at the regional level, and this might lead them over time to develop a greater civic awareness than “later” peers, which would translate into wider use of political rights at the federal level as well.

The following two hypotheses will be tested:

- Null hypothesis (H0): proportions are the same in the two groups, this means that the timing of the cantonal enfranchisement does not significantly affect youths' political behavior.
- Alternative hypothesis (H1): proportions in the two groups are on average not the same, the timing of the cantonal enfranchisement does affect youths' political behavior.

The Z-test is used in place of a normal two-sided t-test given that the variable on voter turnout is a dummy. The average voter turnout is therefore easily obtained by calculating the proportion between actual voters and eligible voters in the age group in question.

5.4. Two-sided t-test:

Finally, the two-sided t-test will be used to determine whether *youth* in the two groups (*early* and later) have on average similar (H0) or different (H1) political interests in the after-1991 period.

This method tests the hypothesis that younger people tend not to be interested in politics because they are often not integrated into the political discourse and therefore extending political rights to younger people would allow them to become more interested.

It is perhaps worth quoting Markus Wagner's words here, which well express why we might expect more interest in young people who have been eligible to vote for longer (early group), than in those who are still maturing a civic sensibility (later group).

“Studying electoral participation for those who do not have the right to vote has a considerable flaw: without the right to cast a ballot, there is no rational incentive for citizens to increase their interest and knowledge in politics. Simply having voting rights may encourage people to gather information and become politically active in other ways” (Wagner, Johann & Kritzing, 2012: p. 375).

6.EMPIRICAL RESULTS:

6.1. Hypothesis 1 – Political interest:

The starting hypothesis is that the granting of new democratic rights gives young people more responsibility and therefore leads them to take a greater interest in political issues. This relationship, as seen above is supported by studies conducted at the national level.

From an initial analysis, it would appear that there could be a relationship between age and political interest (see Figure 3). To quantify the magnitude of this phenomenon and understand whether this is statistically significant, statistical models are required.

Table 4: Estimation relationship age-political interest

	<i>Dependent variable:</i>		
	OLS (1)	pi1 OLS (2)	log (3)
Intercept	2.748*** (0.012)	2.818*** (0.847)	1.243*** (0.355)
Age	-0.008*** (0.0002)	-0.011*** (0.0003)	-0.005*** (0.0001)
Educational level		-0.084*** (0.002)	-0.037*** (0.001)
Female		0.217*** (0.009)	0.096*** (0.004)
Income level		-0.069*** (0.003)	-0.029*** (0.001)
Year of survey		0.0003 (0.0004)	0.00002 (0.0002)
Control Variables:	No	Yes	Yes
Interaction terms:	No	No	No
Observations:	43'500	33'901	33'901
Log Likelihood:	-57'030.990	-41'862.600	-41'861.930
AIC:	114'066.000	83'737.200	83'735.860
Mean Squared Errors:	0.727	0.611	0.610
Levels of significance:		*p<0.1; **p<0.05; ***p<0.01	

Table 4 shows three models that were used to determine the age-interest relationship. They differ from each other in that they take into account a different number of variables and different link-models, allowing for different types of correlation between the explanatory variables and y to be considered. Models 2 and 3 also allow to understand how political interest evolves over time.

It should be mentioned here that the categorical variable related to political interest is defined with values from 1 to 4, representing individuals who are very politically interested and not at all interested, respectively.

In all models it can be observed that individual age is negatively correlated with the dependent variable, thus confirming that *ceteris paribus* older individuals are on average more interested in politics. This relationship is in all models statistically significant at the $\alpha=0.1\%$ level and would confirm what was previously assumed in Figure 3.

The control variables included starting from model 2 are all statistically significant at the $\alpha = 0.1\%$ level, except for the time variable related to surveys. For this reason, a time trend for the variable *pi1* cannot be supported by the statistical output obtained.

Partial results obtained so far suggest that: both education and standard of living positively influence interest, while women tend on average to be less interested in politics than men.

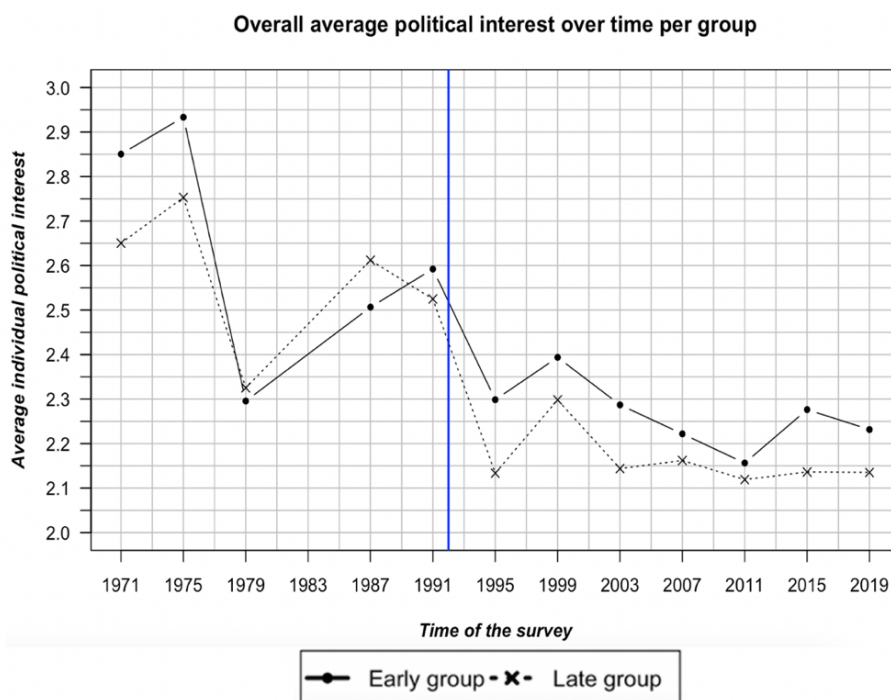
The table also shows that the log-model is the most effective candidate model for describing how the explanatory variables affect the interest. This conclusion can be drawn by looking at the Akaike Information Criterion (AIC), but especially the Mean Squared Error (MSE) which has lower values in the third model.

Therefore, the logarithmic model will be taken as a reference and will be used later to test more efficient and advanced models.

Specifically, the MSE appears to be the favored criterion as it allows to select the best model although comparing candidates having different distributional assumptions or link-model.

Again, before performing the DiD statistical analysis it is helpful to understand through a graphical representation if the evolution of the average interest over time differs between the two groups. This was done simply by calculating the average interest of respondents in the groups and therefore at this time without taking into account the control variables.

Figure 5: Individual political interest over time per group¹³



The points in the graphs represent the average annual interest in the two observation groups. The vertical blue line indicates the point in time when the reform on lowering the voting age takes place at the federal level. This line helps understand at which point in time the reform occurred, but it also might represent a cut-off point in case the legislative change involves a post-event significant change on average political interest.

In the graph is possible to observe a clear negative trend in both sets of observations. This would seem to indicate that there is a decrease in the average values of the observed variable over time, which therefore translates into an increase in average political interest in both "populations".

Some differences in the average interest of the two groups do indeed seem to exist. Throughout almost the entire period analyzed, individuals from cantons that were favoring an earlier lowering of the voting age tended to have higher values than the later group (less political interest than the former). This difference, however, tends to narrow around the time of the federal youth enfranchisement.

¹³ Source : representation based on own calculation.

If on the one hand, we notice clear differences in the average values of the two groups in the period of observation, this type of divergence is not observable with regard to the trend between early and late observations.

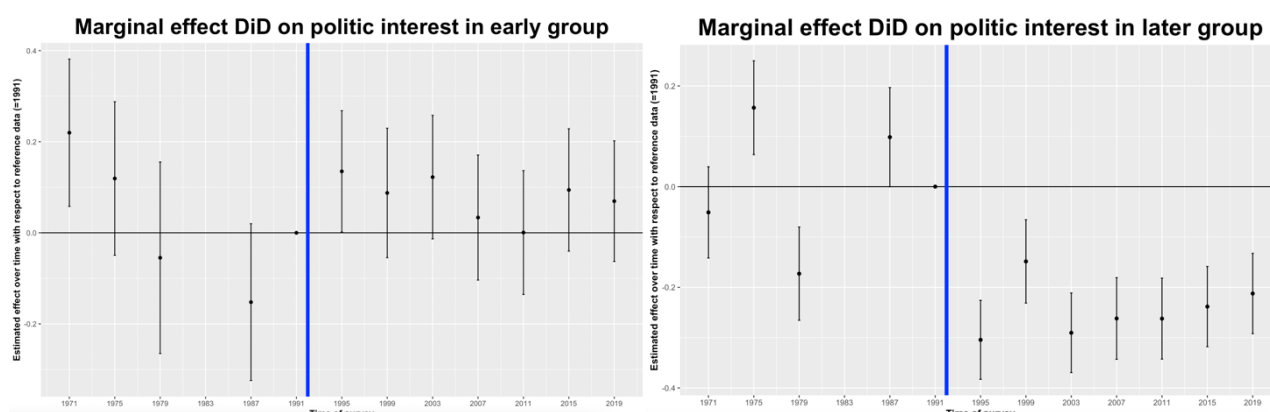
Observing only the period prior to the reform, it can be seen that there are common pre-trends in the two groups and this would already be the first clue to confirm the hypothesis of the common trend. The two sets of observations seem to move in parallel throughout the pre-1991 period.

Regarding the post-reform values, we note an important and lasting lowering of the values of the variable, suggesting a beneficial effect of enfranchisement on the (average) interest of the entire electorate. However, these benefits appear to be important close to the policy change and then cancel out over time.

To determine whether this effect is actually significant, different models will be used to also consider multiple interactions and control variables. Such an approach then allows for an understanding of whether a more inclusive democratic system for young people allows for a greater passion to be sparked in them regarding political issues. If confirmed, this would consequently allow the development of strategies to promote a healthier democracy.

It is worthwhile at this point to graphically represent the change in average interest over time.

Figures 6a & 6b: Reform consequences over individual political interest per group¹⁴



¹⁴ Source : representation based on own calculation.

Graphs 6a and 6b were obtained by taking the average values obtained in the 1991 survey as a reference so as to be able to quantify the variations in interest. This approach was adopted separately for the groups to isolate the marginal effects in the two categories considered.

The dots in the graphs represent the marginal effect compared to the mean values found in 1991, 95%-confidence intervals were also used to illustrate the segments. Points located near the abscissa indicate that there is no change in the reference variable in the year of observation compared to the 1991 period. Values that deviate strongly from the reference value, on the other hand, indicate important marginal effects that would indicate a significant change in that case.

Equivalent to what was done previously, the blue line indicates when youth enfranchisement took place at the federal level.

At first glance, it can be seen that there are changes in political interest as a result of the policy and these are opposite in the two groups.

In the post-1991 period, in fact, an increase in the outcome (less interest) can be observed in the *early* group, while the contrary is true in the later group (increase in interest). In both cases, these effects tend to stabilize over time.

With regard to the pre-treatment period in the *early* group, there is a gradual decrease in the average interest, while for the later group no specific trend is observable.

In the early group, post-reform mean values are almost consistently above baseline, indicating that there would be a negative effect as a result of enfranchisement on the interest of representatives in this category.

By contrast, the effect would seem to be the opposite and much more important in the "later" group: following the reform, the average interest level seems to have risen sharply.

This first graphical analysis would therefore suggest significant differences in the consequences in the two groups. And it is precisely these consequences that will be examined in the next analytical part, to understand whether they are statistically significant or not.

Because we are interested in evaluating the policy and understanding its impact on the electorate, the analysis in this paper must however focus on the changes found in the

temporal period close to the reform. A longer-term approach is meaningless because evaluating the consequences over the entire period (1971 to 2019) does not account for the other changes that have occurred in Switzerland. Since these changes cannot be factored into the analysis and the effects on the electorate cannot be controlled for, it would be erroneous to attribute every change in the interest of the electorate to federal enfranchisement.

A shorter-term analysis would therefore be preferred in that it reduces this interpretative bias, by allowing for a more accurate analysis, as it does not attribute every change in average interest to the federal extension of democratic rights.

Despite these reasons, and aware of the limits of interpretation of long-term variations, it was decided to represent anyway the period from 1971 to 2019 in order to offer an overview of the changes during the time period analyzed.

Now that it is understood that some variables do indeed influence political interest and some before-after trends are observable, a Differences-in-Differences (DiD) approach must be taken so as to quantify the effects of federal youth enfranchisement. This has to be done by focusing on the consequences and the correlations in the two groups of individuals: “early” and “later”.

The DiD models used are multiple and include different explanatory variables allowing for the comparison of different candidates by taking into account different types of interactions. This helps to select the model that most effectively determines *pi1* based on the lowest MSE value rule.

Table 5: Consequences youth enfranchisement on political interest (DiD)

	Dependent variable:		
	DiD (1)	pi1 DiD (2)	DiD (3)
Intercept	2.610*** (0.011)	2.583*** (0.013)	2.760*** (0.014)
Youth	0.152 (0.191)	0.417** (0.212)	0.584*** (0.203)
AfterChange	-0.288*** (0.012)	-0.296*** (0.014)	-0.134*** (0.014)
Early		0.120*** (0.027)	0.147*** (0.026)
Educational Level			-0.090*** (0.002)
Female			0.237*** (0.008)
Youth*AfterChange	0.100 (0.193)	-0.187 (0.214)	-0.494** (0.205)
Youth*Early		-1.370*** (0.485)	-1.452*** (0.464)
AfterChange*Early		-0.022 (0.028)	-0.013 (0.027)
Youth*AfterChange*Early		1.405*** (0.488)	1.481*** (0.467)
Control Variables:	No	No	Yes
Interaction terms:	Yes	Yes	Yes
Observations:	43'535	43'535	43'018
Log Likelihood:	-57'314.210	-57'244.260	-54'670.180
AIC:	114'636.400	114'504.500	109'360.400
Mean Squared Errors:	0.728	0.725	0.665
Levels of significance:		*p<0.1; **p<0.05; ***p<0.01	

AfterChange is a dummy variable that was created to perform the DiD analysis and takes the value of 1 for observations after the lowering of the voting age (after 1991) and the value of 0 for the pre-treatment period. This variable makes it possible to analyze pre- and post-reform effects differently.

The dummy variable *early*, on the other hand, was included to distinguish the differences in interest between individuals coming from cantons that lowered the voting age early at the canton level (*early*=1), from those from cantons that were more conservative in terms of voting rights (*early*=0).

The binary *youth* variable was defined in order to distinguish the part of the electorate that would be affected by the reform (18- and 19-year-olds) from the rest of the respondents: Swiss aged 20 and over.

In the first model, young people appear to have no major differences from the rest of the electorate in terms of political interest. Yet in models 2 and 3 this variable becomes statistically significant, suggesting that young people are on average less interested in decision-making in Switzerland. This finding is consistent with findings in the literature (Chan

& Clayton, 2006) and would seem to legitimize the concerns of those opposed to the extension of rights to younger people being on average less interested in politics.

The *AfterChange* variable indicates that interest in the post-reform period is higher on average; this result is statistically significant.

By introducing control variables and allowing for interactions between regressors, the model becomes more accurate and the delta-coefficient becomes statistically significant. The obtained ATET suggests that young people tend to be more interested in politics as a result of reform, confirming the hypothesis regarding the consequences of youth enfranchisement!

Nonetheless, the significant effect is found only in the model that includes the control variables, which is more accurate because it accounts for individual characteristics when studying political interest.

By doing so, it is possible to isolate the effect of the change in the law on interest, excluding any hypothetical variations resulting from a different demographic representation over time. Indeed, by controlling for variations in respondents' education levels and gender, it is possible to rule out the influence of these significant variables on the delta coefficient.

However, this interest involves only young people belonging to the later group: 18- and 19-year-olds who obtained the right to vote at the cantonal level later. This can be interpreted by the positive coefficient *Youth*AfterChange*Early*.

Nonetheless, when analyzing the entire period (1971-2019), young people who gain early voting rights at the cantonal level exhibit greater interest in politics than peers in later cantons. While this finding could legitimize the extension of voting rights to younger groups as well, it could be partly trivially motivated by simple differences between the interest of citizens in different cantons.

Hereafter, two different versions of the DiD 3 model will also be represented to compare different link-models and thus obtain a model that more effectively allows replication of the dataset.

Table 6: Comparison similar DiD models with different link-functions

	Dependent variable:	
	DiD (1)	DiD log (2)
Intercept	2.760*** (0.014)	1.023*** (0.006)
Educational Level	-0.090*** (0.002)	-0.039*** (0.001)
Female	0.237*** (0.008)	0.100*** (0.003)
Youth	0.584*** (0.203)	0.221*** (0.067)
AfterChange	-0.134*** (0.014)	-0.055*** (0.005)
Early	0.147*** (0.026)	0.053*** (0.010)
Youth*AfterChange	-0.494** (0.205)	-0.186*** (0.069)
Youth*Early	-1.452*** (0.464)	-0.617** (0.247)
AfterChange*Early	-0.013 (0.027)	0.002 (0.010)
Youth*AfterChange*Early	1.481*** (0.467)	0.625** (0.248)
Control Variables:	Yes	Yes
Interaction terms:	Yes	Yes
Observations:	43'018	43'018
Log Likelihood:	-54'670.180	-54'669.760
AIC:	109'360.400	109'359.500
Mean Squared Errors:	0.665	0.665
Levels of significance:		*p<0.1; **p<0.05; ***p<0.01

Although two link-models are proposed, in both cases the coefficient regarding the effect of reform on youth interest (in bold) is statistically significant.

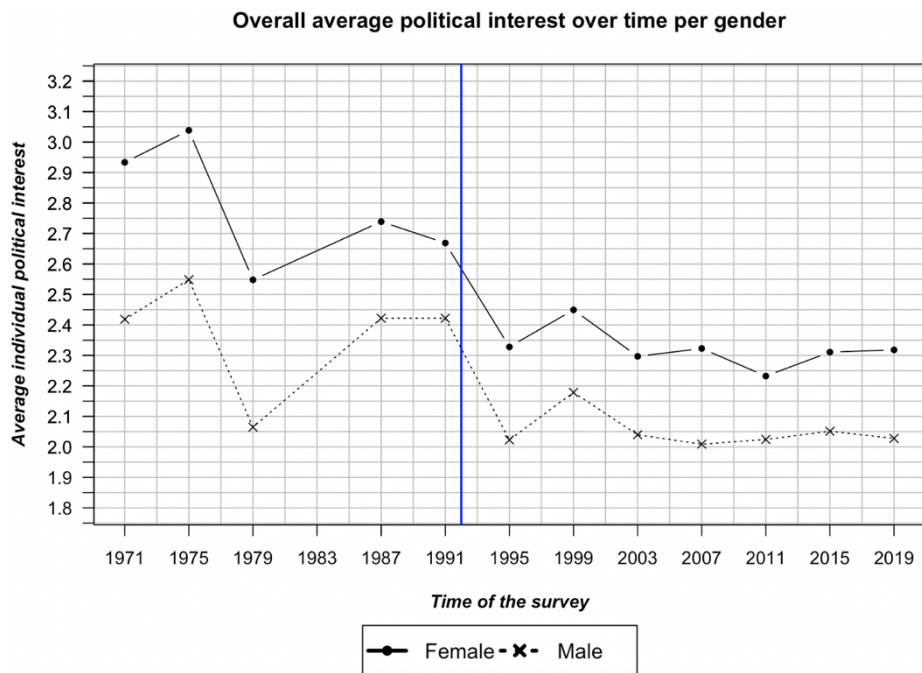
Nevertheless, the DiD log will be the chosen model given the data available. The selection criterion for the models, in this case, is AIC, and the best model will be chosen on the lowest value rule.

As seen so far, some variables exhibited different levels of significance in the models used above, and it is perhaps worth discussing whether the explanatory variables included in the models are determinants of predicting the expected interest of the individuals in the sample. For instance, the literature emphasizes the fact that women would seem to be, on average, less interested in politics than men. This effect has emerged repeatedly in the literature (Bennett & Bennett, 1989; Zeglovits & Zandonella, 2013).

To test this hypothesis also in the Swiss context, it is sufficient to run an F-test using the selected log-model to see if the variable *female* is statistically significant and thus should be

taken into account to determine the political interest. The null hypothesis tested here is that men and women have on average the same political interest. In other words, the aim is to verify whether indeed the variable female has no predictive effect with respect to the dependent variable of interest.

Figure 7: Individual political interest over time per gender¹⁵



The graph depicts the evolution of political interest in the two sexes and from the initial analysis, there is a clear distinction between the two groups. Throughout the period of analysis, the two functions seem to develop in a parallel fashion, with higher mean values in women, thus indicating their lower interest.

In both cases, it is possible to observe a clear downward trend, which becomes more accentuated around the time of the change in reform and then stabilizes in the long term.

From this initial graphical analysis, it is possible to hypothesize that there are significant differences in average interest due to gender. To statistically confirm what has just been said, however, it is necessary to proceed with a test on the significance of the *female*

¹⁵ Source: representation based on own calculation.

variable. The significance of this variable will be tested taking into account the best candidate model found so far: that is model 2 of table 6.

Table 7: F-Test of overall significance variable female¹⁶

F-Test significance variable Female in predicting political interest:

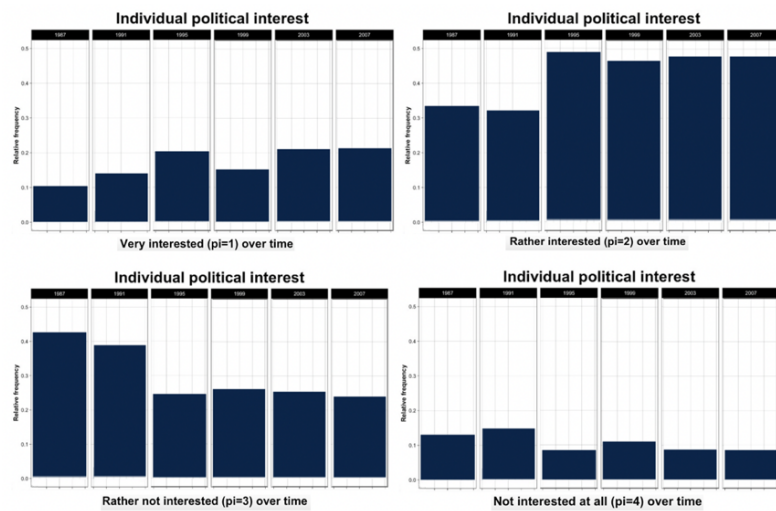
Statistic	Mean	St. Dev.	Min	Max
Resid. Dev	30,168.250	413.314	29,875.990	30,460.510
Deviance	584.514		584.514	584.514
F	841.438		841.438	841.438
Pr(> F)	0.000		0	0

Since the p-value obtained is highly statistically significant at $\alpha = 0.1\%$, the null hypothesis can be rejected and it will be concluded that men and women in the dataset show on average a different interest. Therefore, the *female* variable should be included in the predictive models.

The analysis conducted so far has identified the main regressors of political interest and defined their coefficients. The use of a DiD method has also outlined certain pre-post reform trends, showing how average political interest varied over time and across different groups. Although it is clear how the categorical variable related to the individual interest varies over time, it is not yet known how the distribution of interest in the population changes over time.

¹⁶ Source: representation based on own calculation.

Figure 8: Distribution of interest in the population over time¹⁷

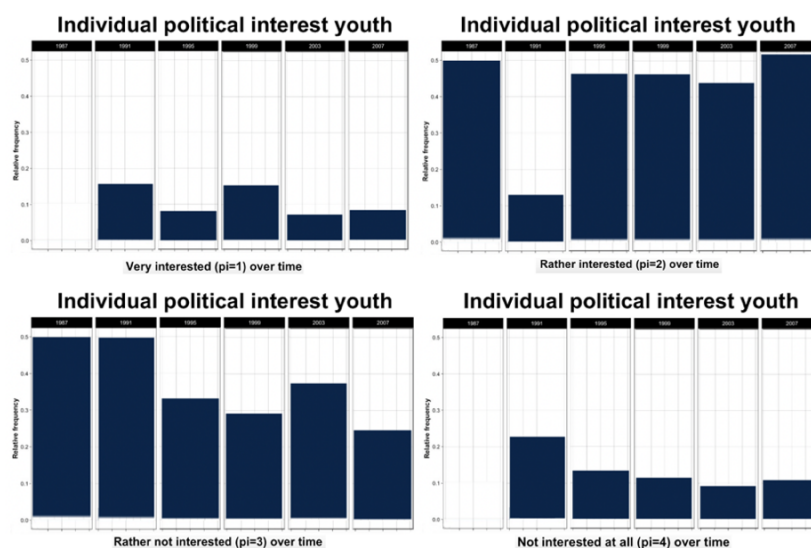


The four graphs above show the evolution from 1987 to 2007 of the four categories related to respondents' political interest.

While some stability can be inferred with regard to the “very interested” and “not at all interested” part of the electorate, most of the changes occur in the intermediate ranges. The increase in the average interest of the population is mainly driven by the fact that a large part of the electorate goes from being "rather not interested" to "rather interested".

Instead, the same graphs will be presented below, this time relating solely to 18- and 19-year-olds.

Figure 9: Distribution of interest in the youth over time¹⁸



¹⁷ Source : representation based on own calculation.

¹⁸ Source : representation based on own calculation.

Also, in this case, the majority of the youth electorate presents average values of interest, which demonstrates that there is no polarization of the youngest towards extreme (dis)interest.

The histograms show once again that there is a certain stability in $pi1=1$, while this time there is a slight decrease in the relative number of young people who are not interested in politics.

As for the electorate as a whole, the most important changes seem to be attributable to 18- and 19-year-olds, who significantly decrease in relative terms moving from category 3 to category 2.

However, it should be noted that the graphs in Figure 9, in contrast to those in Figure 8, were obtained using a relatively small number of observations, as we do not have a large number of youths in the database. Major changes are partly attributable to the high variance caused by the limits of the SELECTS sampling.

6.2. Hypothesis 2 - Voters' participation:

So far, the analysis has focused on determining the factors correlated with political interest and how the latter is affected by the policy reform. However, it is equally interesting to investigate respondents' political participation ($vp1$) to understand what influences the decision to vote and to also understand their effect.

Tables 2, table 3, and figure 4 already provide some interesting insights into electoral turnout over time.

Table 8: Estimation relationship age-voting turnout

	Dependent variable:		
	OLS (1)	vpl Logit (2)	Probit (3)
Intercept	-1.662*** (0.506)	-9.433*** (2.267)	-5.856*** (1.388)
Age	0.008*** (0.0002)	0.034*** (0.001)	0.021*** (0.0004)
Educational level	0.033*** (0.001)	0.149*** (0.006)	0.091*** (0.003)
Female	-0.060*** (0.005)	-0.270*** (0.023)	-0.166*** (0.014)
Income level	0.040*** (0.002)	0.181*** (0.009)	0.111*** (0.005)
Year of survey	0.001*** (0.0003)	0.003*** (0.001)	0.002*** (0.001)
Control Variables:	Yes	Yes	Yes
Interaction terms:	No	No	No
Observations:	33'767	33'767	33'767
Log Likelihood:	-23'921.490	-26'100.100	-26,097.880
AIC:	47'854.990	52'212.200	52'207.770
Mean Squared Errors:	0.222	0.221	0.221
Levels of significance:		*p<0.1; **p<0.05; ***p<0.01	

Age, *educational level*, and *income level* appear to be positively correlated with the voters' decision to participate in federal voting. The variable *female* instead has a negative coefficient, suggesting that on average women vote less frequently at the federal level than men. Once again, gender appears to be a key determinant of the estimation of the electorate's approach to political issues

The identikit of the typical individual who most regularly shows up at the voting booth is therefore: an older man having a high standard of living with a long academic education behind him.

Time trend is observable in the outcome, as electoral turnout appears to increase over time.

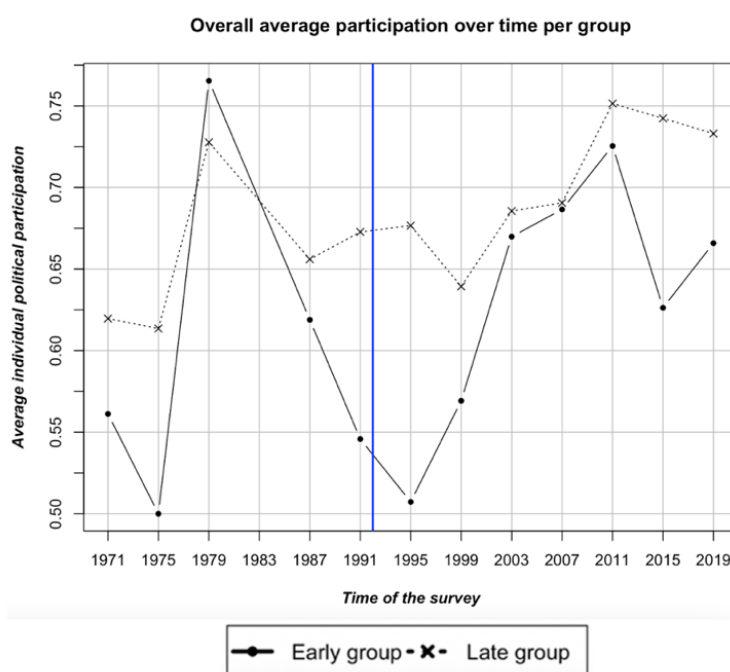
The set of independent variables included in the models is again highly statistically significant, confirming the validity of the choice to include education, gender, and income level as control variables. Such a statistical expedient thus makes it possible to observe changes in turnout while holding these individual characteristics constant.

MSE is the most appropriate selection criteria here, given that not only different link models are being considered, but also models with different distributions. This thumb rule allows defining the Probit model as a candidate to be selected.

The probit categorical data model choice also makes sense given that *vp1* (voting participation) is a binary dependent variable (Wooldridge, 2010).

However, it is perhaps worth looking graphically and in more detail at how the electoral turnout varies over time in the two groups.

Figure 10: Turnout per group over time¹⁹



The graph divides the observations into two groups (*early/late*) and this is based on the respondents' canton of origin. Such an approach allows to observe whether the legislative change has had different significant effects on voter turnout and this by taking into account different effects in the two groups.

A positive trend is clearly detectable and implies that as time goes by individuals become on average more and more active in their voting behavior. This increase in voter participation seems to conflict with the official data on federal voter turnout²⁰, which are signaling the

¹⁹ Source : representation based on own calculation.

²⁰ Source: <https://www.idea.int/data-tools/country-view/76/40>, consulted on April 8, 2022.

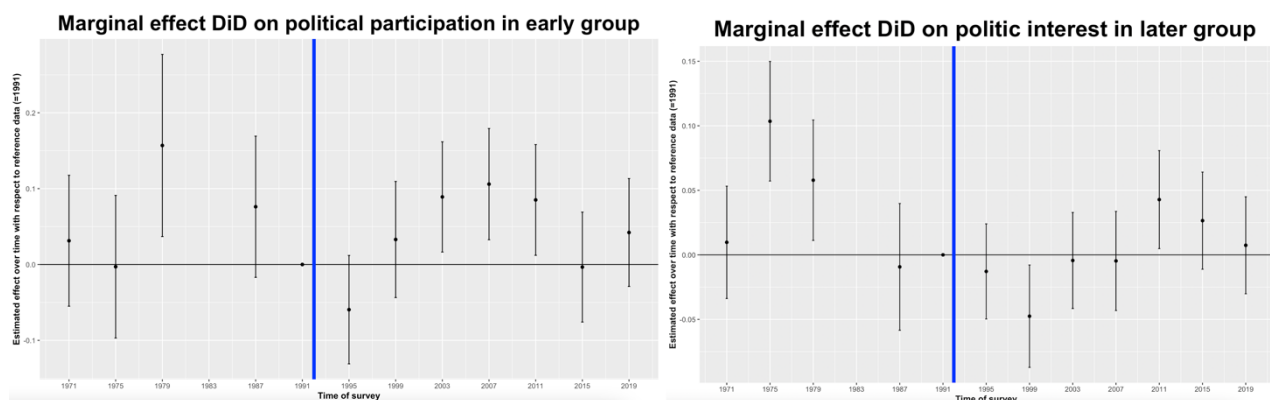
presence of a significant and sustained decline in the percentage of voters. The reasons for such a result could be attributable to the method of information collection used by the researchers. The response variable is, in fact, the result of the aggregation of the information provided by the respondents concerning their intention to vote.

It could, however, be very different from the actual electoral participation in the case in which individuals tend to respond deliberately in a positive way if there is a sort of social pressure to vote. Possible differences could instead be traced back to a sincere desire of citizens to participate in elections, which however does not translate concretely into a vote.

Interestingly, the two groups have different electoral participation rates on average: individuals from cantons who received early electoral enfranchisement for younger people tend to be less active on average than “later” peers.

Moreover, a small cut-off seems observable for the *early* group immediately after federal reform, but it does not appear to be such that it would change the group's average electoral participation in a major way. Further analysis is in any case required to determine marginal changes in surveys.

Figures 11a & 11b: Reform consequences over individual political interest per group²¹



The graphs illustrate changes in average annual electoral turnout relative to the 1991 baseline year, which is the time that should precede any electoral effects of federal enfranchisement. These were calculated by further considering confidence intervals at the standard (95%) level.

²¹ Source : representation based on own calculation.

In the period following the event, it can be seen in both cases that the electoral turnout undergoes an immediate downward trend in the short term. This effect tends, however, in both cases to neutralize itself in the medium-long term, given also the marginal increase of the turnout in the surveys that are temporally more distant.

In the pre-reform period, however, the marginal values are almost exclusively above the 0 axis.

As explained previously, greater importance must be given to the interpretation of the marginal values close to the blue line, since long-term interpretations could be erroneous. Considering a time period of almost 50 years, it would be foolish to attribute the entirety of the marginal change solely to the reform. Although we have a rich database of information, it has limitations in that it does not allow to control for other political, economic, and socio-cultural events that could also influence the turnout. For the following reasons, the analysis will have a temporally narrow focus.

To better investigate the reform-turnout relationship and the aforementioned trends, an additional statistical model would be run to quantify the change in average turnout in the two groups following the legislative change.

Table 9: Before-after change analysis voters' turnout

	<i>Dependent variable:</i>
	vp1
	Probit
Intercept	-0.328** (0.153)
AfterChange	0.486*** (0.159)
Early	-0.408 (0.312)
AfterChange*Early	0.175 (0.319)
Control Variables:	No
Interaction terms:	Yes
Observations:	1'560
Log Likelihood:	-1'067.120
AIC:	2'142.240
Mean Squared Errors:	0.246
Levels of significance:	* p<0.1; ** p<0.05; *** p<0.01

Table 9 was created to determine the change in electoral turnout as a result of federal reform. The addition of the *early* variable in the model and its interaction with the *AfterChange* variable instead shows whether significant differences exist in the two groups over the two periods in question.

The only effect deemed as consistent is the increase in electoral turnout following the reform in the later group. An increase in participation is also found in the *early* group, although it is not significant.

But how did the level of voter participation change after 1991? In order to determine whether the federal vote has affected the rate of voter participation in any way, and more importantly, whether it has affected the two groups differently, we need to graphically represent the situation.

But how does the political behavior of younger people differ instead? And are there substantial differences in the behavior of the younger part of the electorate if we differentiate them by group (*early/late*)?

To answer these questions, one two-proportion z-test will be used to compare the average voting behavior of *early* and later *youth* over the years. Specifically, it was decided to use data on 20-year-olds, as the youngest group already eligible to vote nationally before the legislative change.

The assumption is that the early introduction of youth voting rights at the cantonal level does not cause substantial voting differences in *youth* at the federal level in the post-1991 period. This statistical test will be conducted multiple times, to test in each survey whether the voting behavior of *youth* in the two groups is similar or significantly different.

Table 10: Two-proportions Z-Test voting participation youth over time²²

Two proportion Z-Test - Voting participation 20-year-old voter participation							
	Survey 1995	Survey 1999	Survey 2003	Survey 2007	Survey 2011	Survey 2015	Survey 2019
Early voters in absolute terms	17	13	15	29	57	92	61
Early voters in relative terms	0.207	0.433	0.455	0.558	0.582	0.467	0.545
Late voters in absolute terms	71	28	64	51	102	87	81
Late voters in relative terms	0.507	0.5	0.547	0.573	0.583	0.565	0.628
p-value	0.000	0.716	0.458	0.999	1.000	0.087	0.238

Out of a total of seven surveys over the 24-year time frame, only in one case did the levels of participation differ significantly in the two groups. This only happen in 1995.

Regarding observations in the other surveys, no substantial differences can be identified at the conventional significance levels.

These results seem to disprove the hypothesis that the early extension of rights at the cantonal level may lead to an increase in federal electoral participation in younger people. Therefore, the null hypothesis of similar average turnout in the two groups cannot be rejected.

Finally, it is time to determine whether the average voting behavior and political interest of young people (18-20 y.o.) at the federal level throughout the 1995-2019 period differ significantly between the two groups. This can simply be done by comparing groups' average values through a two-sided t-test.

Table 11: T-test youth average behavior and political interest in the groups²³

Two-sided T-Test - Average voting participation 18- to 20-year-old voters per group after enfranchisement					Two-sided T-Test - Average political interest 18- to 20-year-old voters per group after enfranchisement				
	Average participation	T-value	Degrees of freedom	p-value		Average political interest	T-value	Degrees of freedom	p-value
Early	0.470	-3.5007	1292.8	0.0004798***	Early	2.488	1.5112	1243.1	0.131
Late	0.563				Late	2.423			

In the first case, the zero hypothesis should be rejected if we consider the whole period of interest, given that the p-value is statistically significant at the 0.1% level. A significant difference in voting participation seems to exist between the two groups.

²² Source : representation based on own calculation.
²³ Source : representation based on own calculation.

Regarding average electoral turnout, the initial assumption cannot be rejected given that the p-value is not statistically significant at any conventional level. This means there's no significant difference in youth political interest between the two groups.

7.CONCLUSIONS:

7.1. Results interpretation:

This work led us to study the political effects caused by the decision made in Switzerland in 1991 regarding the lowering of the voting age at the federal level from 20 to 18 years. The Swiss Election Studies database used during our analysis allowed us to determine and quantify the political effects resulting from such a reform through the study of Swiss citizens surveyed.

Our findings show that young people on average tend to be less interested in politics than the older part of the electorate. This finding clearly highlights and legitimizes the concerns of those opposed to extending voting to younger people, as they are both less interested in political issues and not frequent users of electoral rights.

Although young people are on average less interested in political issues, comparing the before-after reform periods, we can see a significant increase in the average interest of 18- and 19-year-olds. This change is a full 3.7 times larger than the increase in average interest experienced in Swiss people aged 20 or older over the same period. The gap between the treatment and control groups is therefore narrowed over time for this variable.

Other significant control variables we used during the empirical part of this work are gender and education level. The models selected are in fact showing that women tend to be less interested in politics than men, while the level of education is positively correlated with interest. This is also consistent with what is suggested in the literature.

As for the consequences of youth enfranchisement on the turnout of the electorate as a whole, we can see that it also increases substantially in the post-1991 period. Such a result is partly to be explained by what is found in Table 8, which indicates a positive trend in voter turnout over time, even when considering the ante-reform period. Therefore, the increase in the *AfterChange* period cannot and should not be solely traced to such a policy.

Regarding this dependent variable, age, level of education, and level of income can be defined as significant regressors. Again, women are found to be less politically active than their male counterparts.

The distinction of the statistical sample into *early* and later groups has allowed us to test whether the moment in which enfranchisement occurs might have caused different consequences in individuals. This is considered in our work even despite the fact that the analysis takes place on distinct territorial levels: that is, through the consideration of the year in which the enfranchisement takes place at a cantonal level and the variation of the federal turnout.

The part of the electorate coming from cantons in which the right to vote was granted before 1985 tends on average to be less interested in political issues. If, on the other hand, only 18- and 19-year-olds are considered, the results are decidedly more interesting.

Young people who were granted voting rights early at the cantonal level show more interest than their later peers. However, the interest in this group decreases considerably if only the period after the reform is taken into account.

These statistical differences in the political approach between the two groups, on the other hand, do not translate into different political participation: the electoral turnout of Swiss citizens does not seem to differ between the early and later electorate. In this case, cantonal enfranchisement and the timing with which it occurs have no statistical significance on federal turnout.

For the totality of the conclusions drawn from the empirical part of this paper, we can say that in the Swiss case the lowering of the voting age did not cause a deterioration in the quality of democracy in the country. In fact, during the observation of the period from 1971 to 2019, there was a considerable increase in the average interest in both young people and the electorate as a whole. The significant increase found in the variable voters' participation (*vp1*) in the post-reform period also indicates a clear improvement in electoral participation in Switzerland. In this regard, past studies suggest that increased interest in political issues may lead citizens to vote more frequently and consequently to be more electorally active members in a democracy.

The combination of these effects, therefore, legitimizes the popular willingness to include younger groups in the voting process, given that the legitimacy of decision-making in the

federal government would not appear to be undermined by such an extension of voting rights.

7.2. Possible future contributions:

This finding, however, does not automatically justify a further lowering of the voting age to 16-year-olds, as the results we found cannot be validated externally to the under-16s.

Nevertheless, such a policy could for example be motivated by further studies concerning the behavior and interest of even younger people in Switzerland and elsewhere. The task of the researchers would therefore be to verify that the behavior and reaction of the target group, when faced with a further lowering of the voting age, is similar to that found in 18- and 19-year-olds.

Controlled experiments could indeed be considered to study such behaviors in a predefined local context. Such an approach would for example be conceivable at the municipal or cantonal level in order to limit the consequences to a smaller scale of observation before an eventual federal generalization.

7.3. Statistical limitations and issues:

Despite the statistical devices and weightings adopted, one cannot fail to recognize the interpretive limitations of this work. These essentially fall into three categories that allow us to distinguish errors caused by the lack of data, errors arising from the information gathering process, and finally, errors related to the design of the empirical part of this work.

Indeed, it is crucial to emphasize the lack of information regarding the sample's electoral participation at the cantonal level. This would have allowed, for example, to directly relate the timing of cantonal enfranchisement to the output of citizens at the cantonal level. This lack has forced us to adopt a less precise analysis, since it is based on multiple geographical levels: cantonal change-federal response.

The availability of this additional data would also have allowed DiD analyses to be performed at the cantonal level.

Another limitation of the database was certainly the lack of a sufficiently large number of young individuals. Although the work aimed to identify the effects in the treatment group, the

scarcity of those under the 20s in the sample does not allow us to give robustness to our conclusions, since the results obtained are very variable.

This problem could have been solved if researchers had represented 18- and 19-year-olds more during the sample selection process in the various surveys.

It is also worth mentioning again the lack of information in the 1983 survey. These data would have been particularly interesting for this paper, the survey being relatively close to the federal reform we studied.

Regarding the limitations related to the data collection process, one cannot avoid to mention the sampling mechanism used by the researchers. Chapter 2 of this paper showed great variability in the statistical samples selected in the various surveys, this is especially true if we look at the region of origin of the respondents.

Although the problem of regional oversampling and over-representation of certain age groups has been partially resolved thanks to the weighting coefficients used, there is an important lack of data concerning the Latin cantons.

One other aspect to consider is that in both cases the values of the dependent variables used in this paper were derived through the answers of the respondents. However, since these are self-reported values, a bias may have led citizens to declare themselves more interested and more electorally active than they actually are. Such a phenomenon could occur if participants feel socially judged and, in that case, the analyses and respective conclusions drawn from this work would be biased. Therefore, the hypothesis we used is that the bias while it may be present, is not significant.

Finally, mention must be made of the problem of standard errors that often characterizes the difference-in-differences approach. In fact, during the empirical part of DiD, it is customary for the researcher to apply clustering at the level of the individual, implying that there are no correlations between individuals belonging to the same age group, the same geographical region, the same sex,... This hypothesis is utopian in reality and therefore risks compromising a correct estimate of standard errors.

If on the one hand, we understand the importance of clustering, it is much more difficult to understand how it should be done. This is because it is not clear at what level the “*common unobserved random shock*” between individuals occurs, and therefore how these correlations between errors occur (Abadie et al., 2017).

Given the difficulty in understanding on what level the relationships between the respondents in the database were, and given in any case the important size of the statistical sample used, in this work it was decided not to apply any clustering so as to avoid defining any clusters improperly.

In any future studies, it will certainly be necessary to have an eye on the correct strategy for aggregating observations.

8. LITERATURE:

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