Disentangling Digital Divide and Trust
Internet Voting Affinity in Switzerland

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Abstract. In Switzerland internet voting is currently being introduced in a piecemeal fashion. Since the first trials in 2003 an increasing number of Swiss cantons is offering the digital voting channel to its citizens either living in Switzerland or abroad. So far the question whether the introduction of internet voting in Switzerland would increase the digital divide, favoring the well educated, economically better off citizens could not be answered in a conclusive way. As yet bi- and multi-variate regression analyses of survey data showed that general trust in the internet and in internet voting in particular outweigh the effect of the typical digital divide variables. There is, however, so far no study trying to disentangle the two types of variables by applying structural equation modeling. In the present study we test whether digital divide variables have a direct effect on general support of internet voting in the Swiss population or whether they should rather be treated as exogenous variables of general trust in the Internet and of internet voting in particular. We therefore put forward a structural equation model which helps us to disentangle direct and indirect effects on internet voting affinity. In order to test our model we are using the first Swiss population survey exclusively conducted on the topic of internet voting in April 2016.

Keywords: Internet voting · e-voting · Digital divide · Online participation · Digital democracy · Trust in technology

1 Introduction

As in other federalist countries such as Australia and Canada internet voting in Switzerland is currently being introduced in a piecemeal fashion. Since the first trial in 2003 an increasing number of cantons is offering the digital voting channel to its citizens either living in Switzerland or abroad. So far the question whether the introduction of internet voting in Switzerland would increase the digital divide, favoring the well educated, economically better off citizens could not be answered in a conclusive way. As yet bi- and multi-variate regression

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analyses of survey data showed that general trust in the internet as well as trust in internet voting in particular outweigh the effect of the typical digital divide variables. However, so far no study has tried to disentangle the two types of variables by applying structural equation modeling (SEM). In the present study we are trying to fill this gap by testing whether digital divide variables have a direct effect on general support of internet voting or whether they should rather be treated as antecedent variables of trust factors.

First, we set up the stage by describing a bit more in detail the context of Swiss internet voting and then review the current state of empirical studies in the next section. In the theoretical part we briefly discuss the issue of digital divide, the calculus of voting and the technology acceptance model (TAM) which we are using to draw up the hypotheses for our structural equation model. In the methodological part we present the survey data from 2016 and the method of partial least squares (PLS) modeling. In the empirical part we are reporting the measurement model and the results from the analysis. We conclude by a discussion of our main findings and suggestions for further research.

2 The Context of Swiss Internet Voting

In Switzerland the implementation of elections and referendums are a subnational matter. It is therefore the cantons and local executives who maintain vote registries, organise elections and determine voting results. Each canton maintains an Electoral Management Board (EMB) in charge of organising and administering elections as well as referendums on all three state levels. Smaller variants of the cantonal EMBs can be found in all of the approximately 2,350 Swiss municipalities. However, it is important to note that the cantonal political rights legislation is subject to federal approval [8] such that only the Federal Council (highest national executive power in Switzerland) has the authority to approve internet voting trials and to formulate the specific conditions under which the new digital channel can be implemented. There are detailed provisions on prerequisites for internet voting trials put forward in a federal ordinance. Cantons are, however, completely free whether they want to offer internet voting or not. As a general principle, and unlike on the local level in Canada, all other voting channels, i.e. ballot box and postal voting, remain open.

Remote voting is already very much the norm in Switzerland. In the bigger cities more than 90% of citizens are postal voters. Given Switzerland's success in establishing postal voting over the past 30 years as a preferred method of voting [11,14,21], there was hope that the internet as a new channel would be quickly adopted by the Swiss electorate in general and in particular by the young voters - a group usually displaying low participation rates. Due to the frequency of voting in Switzerland's referendum democracy [32], further arguments supporting the introduction of internet voting put forward in the debate were that it will speed up the vote counting process and reduce the number of invalid votes. In the early 2000s, with the federal administration providing financial support, the decentralised implementation of internet voting models began first in Geneva

and soon thereafter also in Neuchâtel and Zurich. Three distinct models were developed, with the biggest difference between Zurich and Geneva being that the first is operated by a private company for a very decentralised local government system and the second one for a strongly centralised system developed and maintained mainly by the canton itself. Internet voting in Neuchâtel is different in that it is part of a cantonal e-government portal for which citizens have to register in person and can also be used for various other administrative transactions such as filing tax statements [34].

The first internet voting[1] trial for a binding referendum vote was held in 2003 in the Geneva based municipality of Anières. Zurich and Neuchâtel held their own trials in the following two years. The success of the trials in the three pilot cantons led the Swiss Federal Council to officially give the green light in May 2006 to the step-by-step rollout of internet voting; not only across the whole country, but importantly also for Swiss residents living abroad [8, 23], due in particular to the difficulties that they encounter with postal voting [5, 20]. In 2015, Swiss residents living abroad from roughly half of the 26 cantons were given the option to vote online. Rather than develop their own internet voting systems, the non-pilot cantons have chosen to adopt one of the existing models specifically either that of Zurich or Geneva. Neuchâtels specialised model was originally not easily transferable to other cantons. Trials were then put on hold in Zurich in 2011 [4]. In the meantime, the Canton Aargau took on the role of administrator for the consortium using the Zurich internet voting model. However, in the fall 2015, two months before the national elections this consortium comprising nine cantons did not get permission to use its system due to some flaws discovered on the occasion of an external security audit. Thereafter the Zurich-Aargau consortium dissolved. More recently, the Swiss Post joined forces with the canton of Neuchâtel and so far was able to bring the cantons of Fribourg and Basel City on board. Several other cantons are still in the process of choosing one of the two remaining systems so that the current situation is quite dynamic.

3 Current State of Research

There are several solid empirical studies analysing the socio-demographic profile of internet voters, eg. for Canada [15,16], Estonia [1,37,38], Norway [29] as well as the USA [3,36] just to cite a few of them. They are all documented in a comprehensive meta study [33]. For this paper, however, we limit our discussion to the directly relevant studies drawing on Switzerland.

The pioneer of Swiss internet voting, the Canton of Geneva, was also the first one to commission several studies. Combining online survey data for the municipalities of Carouge and Meyrin with the respective vote registry data [5] found that internet voters tended to be younger and male. 30 to 50 years

[1] It would be more precise to speak of internet or online voting. The term e-voting can also entail, for example touchscreen voting devices, which are used in voting booths. However, in Switzerland the term e-voting is commonly used, also by the authorities as a synonym for internet voting.

old men seemed to be specially prone to this new voting channel. In addition, results from the online survey suggested that a higher degree of education and, not surprisingly, the availability of a computer and internet access are further crucial factors explaining the preference for the online voting channel. Similar conclusions could be drawn from [35] presenting survey data from the Canton of Zurich. On the occasion of the national and cantonal referendum votes in fall 2004 a more thorough telephone survey among 1'014 voters as well as non-voters in four Geneva pilot municipalities showed that young, male voters with high income and educational level are over-represented among internet voters [6]. Nevertheless, the global multivariate model revealed that neither demographic nor political variables are good predictors in order to explain the choice of the voting channel. All these variables turn insignificant in the multivariate ICT model. Regarding the variables included in the ICT model such as IT skills, type of internet connection, trust in the internet and trust in the internet voting mechanism remain significant, the last one being the strongest predictor.

In 2009, when the first Swiss cantons such as Neuchâtel, Geneva and Basle City started to offer internet voting to Swiss citizens living abroad, further studies were conducted. According to an analysis drawing on official vote registry data as well as two online surveys for Swiss abroad internet voters registered in the canton of Geneva, the profile of Swiss abroad internet voters and postal voters were compared [31]. Young (the 30–39 as well as the 40–49 cohort using this channel more often than the 18–29) and male Swiss abroad were the most likely users of the online channel. Thirdly, the more distant the country of residence the more likely the person is to vote online. Further studies based on the 2011 election survey data from SELECTS corroborated these findings. Voters whose country of residence does not boarder Switzerland, with high IT skills and good political knowledge are more likely to use the online channel [12].

The hitherto most comprehensive study on the Geneva based internet voting trials [30] best illustrates the interaction of socio-demographic and ICT-related moderator variables. The authors compared traditional voters (ballot box and mail) with e-voters using survey data of a sample of the whole electorate of Geneva (partly telephone survey, partly online survey) as well as of an online poll of internet voters only. Their findings suggest that although male and young voters with a high level of education, high household income, high political and computing knowledge are indeed overrepresented among e-voters, all these variables turn insignificant in a multivariate model which includes the variables frequency of internet use and trust in internet transactions and communication.

Summing up, after more than a decade of internet voting practice in Switzerland studies seem to suggest that digital divide issues are not related to the new voting channel. However, there remains a puzzle to resolve. It might very well be the case that digital divide variables do not affect internet voting affinity directly but in an indirect way if they were to influence the variables most closely linked to internet voting such as ease of use and trust in the internet. Previous studies did not address this option properly. Simple descriptive statistics, bivariate correlations and even multivariate regression analyses do not provide

enough discretionary power to disentangle the respective effects of digital divide variables, factors of convenience, worries about security issues and trust in the internet. Inspired by more recent studies such as [24,26] we aim at making a further contribution in this respect, in a first instance by testing more elaborate causal modelling on very recent survey data for the Swiss case.

4 Theoretical Considerations

4.1 Digital Divide

Not on internet voting in particular but rather on the access and use of the Internet in general, there is the well-known argument that the new technological options favor the better off and well educated strata of society. This phenomenon is usually described as the digital divide. The digital divide [19] is at the same time technological (lack of access in remote areas, the global South), economic (lack of access to a computer at home) and cognitive (lack of skills to use ICTs)[9]. According to [25] the most worrying characteristic of the digital divide is the fact that it follows existing cleavages in society and might increase inequalities further. Other authors, however, point out that such a socio-economic distortion will most likely fade away over time as mobile ICTs are becoming widely available also in more remote places and equipment is getting more affordable [2].

4.2 Technology Acceptance Model (TAM)

In addition to theoretical arguments along the digital divide track we consider the Technology Acceptance Model (TAM) to be of particular relevance for this study. The TAM [7] posits that user's perceived usefulness and effort are major explanatory factors for the acceptance of a technology. Applications in line with ours but with slightly different foci of research such as [24,26] are demonstrations of the relevance of TAM in the realms of internet voting.

4.3 The Calculus of Voting

According to the calculus of voting [27] one of the major factors affecting an individual voter's decision to turn out for an election is the cost of voting. Many voting reforms hence are trying to facilitate the voting procedure, for example by allowing for remote voting, advance voting periods and finally also by introducing internet voting. Empirical studies showed that convenience reforms of voting can indeed have a tangible effect on participation rates. Postal voting increased participation in Switzerland [21] and the United States [17] by three to four percentage points. Whether internet voting can add to the further reduction of the cost of voting on top of postal voting is still an open debate and might depend on the context. In Switzerland where internet voting is being introduced on top of generalized postal voting, the extra convenience reform does not seem to make a difference [13]. However, irrespective of an eventual effect of internet

voting on aggregate turnout in a constituency it can still have an effect on the perception of potential voters on internet voting and should therefore be taken into account.

4.4 Hypotheses

In this contribution we aim at bringing the debate on the question whether internet voting should be regarded as a digital divide issue to a higher level by trying to disentangle relevant variables and concepts which have proven to be of relevance in previous research. From such previous research on internet voting in Switzerland but also from elsewhere we know that trust in the internet in general as well as trust in internet voting in particular do have a strong effect on the actual use, the intent to use and approval rates for internet voting. However, discarding digital divide factors to be at play because they cancel out in multiple regressions would be premature. In case the very same digital divide variables cancel out as direct causes of internet voting affinity are affecting the respective trust variables, and those in return do load on our dependent variable, we would be back to square one. We argue that such an indirect effect of digital divide via the trust components was not properly tested in empirical studies before. We suggest this task can be achieved by applying better statistical techniques, namely by using structural equation modeling.

As depicted in Fig. 1 further below, our structural path model with internet voting affinity as the dependent variable is defined by a group of exogenous variables such as gender, education, age and income as well as of further endogenous components. In addition to being directly linked with the endogenous components convenience, political integration, use and trust of the internet and safety concerns, the exogenous variables can have both a direct or indirect effect on internet voting affinity.

H1 - Direct Effects of Socio-Economic Variables: In the light of detailed meta studies [33] direct effects of exogenous digital divide variables such as age, gender, income and education on the affinity to internet voting as our dependent variable are unlikely. We therefore expect those variables not to have a significant effect or at best a very minor one. Refuting hypothesis H1 would thus lead us to conclude that there is no major digital divide among the Swiss population regarding support for the new voting channel.

H2 - Direct Effect of Intermediate Variables: Following our discussion of the current state of research and theory we suspect certain intermediate components to affect Swiss citizen's degree of affinity towards internet voting.

The **first component** in our path dependency model summarizes items evaluating the convenience aspect of internet voting (comp1). Do respondents of the survey think that internet voting is more convenient (argu2) and simpler (argu5) to handle than postal voting? Do they think it is about time (argu3) to introduce internet voting because they realize there is a gap between all the

things they do in their daily lives with the help of the Internet such as online-shopping, booking all kinds of leisure activities and using it in their respective work environment but not for voting (egov2).

The **second component** brings together items measuring how strongly a citizen is integrated in political activities(comp2). Foremost we can measure the degree of political involvement by asking about the interest in political matters in general (polint) as well as the frequency of participation in formal political events (part) such as referendum votes and elections.

The **third component** comprises core aspects of TAM, namely internet use and trust (comp3). Survey participants were asked how much they trust transactions over the Internet (trustint) and how often they are using it (useint).

The **fourth component** groups items about security concerns (comp4). Do respondents think that a vote via the Internet is easier to manipulate than a postal vote (argu4)? Do they even think there is a danger of foreign secret services monitoring the vote and thus breaching vote secrecy (argu6)?

H3 - Indirect Effect of Socio-Economic Variables: Previous research suggests that the internet use and trust component is taking out all direct effects of digital divide variables on internet voting affinity. However, an indirect effect could still be at play and been overlooked so far. In case digital divide variables have a direct effect on the internet use and trust component (c3) and if that same component is having a substantial effect on internet affinity we should conclude that digital divide is playing a role. We are thus looking for strong, statistically significant paths leading from socio-economic variables to the dependent variable via c3.

5 Data and Methods

5.1 The Swiss Internet Voting Survey 2016

To test our hypotheses[2] we are drawing on the data of a recently conducted population survey [22] with the exclusive aim to gain more detailed insights to internet voting affinity in Switzerland. The poll was carried out by the agency LINK between the 11th and the 21th April 2016 using computer-assisted telephone interviewing (CATI). The target population is composed by all Swiss citizens eligible to vote between 18 and 79 years of age. The sample consists of 1'228 respondents. Switzerland has three main linguistic regions: Population-wise, the German speaking part is the largest one, comprising 70% of the whole Swiss population. The French speaking part is making up around 20 and the Italian speaking part around 5% of the whole population. Thus, a disproportionated stratified sampling design was chosen in order to over-sample the two linguistic minorities. In turn, specific design weights were used to compensate for this disproportionate stratification.

[2] In a further step the data collected in studies such as [31,35] should be re-analysed in a similar fashion.

All the questions and answer categories used in the analysis are summarized in Table 4 in the Appendix. Most items were measured on a 5-point Likert scale, where "Don't know" answers were included into the middle category. This is certainly true for the arguments which were tested within the survey. These arguments represent statements about internet voting, with which the respondents could agree or disagree with.

We are fully aware of the limitations we are facing with survey data asking about internet voting affinity. Using internet voting affinity as our main dependent variable is one major step away from explaining actual behaviour. Supporting the generalisation of internet voting and actually choosing that particular voting channel are of course two separate matters.

5.2 Partial Least Squares Modelling

We analysed our hypotheses with the help of partial least squares path modelling (PLS-PM). PLS-PM analysis has become an established tool in many fields of research, particularly when there are more than just a few, highly collinear factors explaining the response variable. Generally speaking, PLS-PM belongs to the family of structural equation models (SEM) which in turn, are a blend of different statistical techniques such as confirmatory factor analysis, path analysis, causal modelling with latent variables, and multiple regression. Especially when dealing with latent constructs, SEM is the most preferred methodology of choice. Additionally, our goal is to disentangle factors of internet voting affinity which are situated at different levels of explanation. To estimate such a complex multi-step cause-effect relationship, multiple regression analysis is not a suitable approach. Instead, path modelling in general and PLS-PM in particular are preferable for this sort of research problem.

As we pointed out before, PLS-PM can be thought of a robust structural equation modelling approach. In contrast to covariance-based SEM, the PLS approach does not reproduce a sample covariance matrix, but rather seeks to maximize the explained variance of the endogenous variables by iteratively estimating partial model relationships with OLS regressions [18]. Another distinctive feature of PLS is the fact that in PLS the latent variable scores are estimated and treated as error-free substitutes of the corresponding indicators. In contrast, CBSEM always includes an error term either for the indicators. Additionally, PLS has much less rigid distributional assumptions than covariance-based SEM techniques (CBSEM). For example, it does not require the normality assumption. In contrast, most CBSEM techniques require hard distributional assumptions [23]. Finally, PLS-PM does not have rigid demands on sample size making it suitable for a variety of models and purposes. Because of these advantages, PLS-PM was chosen as method of analysis. PLS analysis was performed with the SmartPLS software [28] using the PLS algorithm [20].

6 Empirical Analysis

6.1 The Measurement Model

In a first step, we tested our measurement model. In Table 1 we present the results of a principal component analysis (PCA) for all latent variables in use.

Table 1. Rotated component matrix of the independent variables (PCA)

Variables	comp1	comp2	comp3	comp4
More comfortable than postal voting	**.40**	−.15	−.23	.24
It is about time to introduce e-voting	**.45**	−.06	−.29	.08
Simpler than postal voting	**.44**	−.04	−.24	−.02
Demand for e-voting	**.43**	.07	−.20	−.02
Political interest	−.01	**.67**	−.15	.15
Participation frequency	−.01	**.68**	−.07	.15
Trust in the Internet	.35	.07	**.56**	−.03
Internet use	.31	.09	**.64**	.18
E-Voting can easily be manipulated	−.05	−.14	.06	**.72**
Secret services might hack the system	−.21	−.12	−.06	**.58**

As we can see, the factor loadings on the second (political integration), third (internet use and trust) and fourth (security concerns) component (comp2–4) are rather strong (above .55), while the loadings on the first component (convenience) are only fairly strong (between .4 and .45). Clearly, the convenience and the trust-usage component have a lot in common. Both indicators of the third component (trust in the Internet and Internet use) load rather strongly on the first component, too. Thus, the discriminant validity of both factors is closer to the lower than to the upper limit of acceptability. This makes also sense from a theoretical point of view. In order to gauge superior convenience of internet voting over postal voting, one has to be familiar with and trustful of the Internet in general. Respondents lacking any experience with the Internet or deeply distrusting it are extremely unlikely to having a preference of internet voting over postal voting. The second factor, however, is overwhelmingly independent of other indicators. In other words, political involvement is indeed independent from internet use, internet trust, internet voting affinity and general safety concerns. The same applies to the fourth component, although to a somewhat lesser degree.

As we can see in Table 2 construct validity is on a fairly good level: The average variance extracted amounts between .56 and .77, the composite reliability between .68 and .87 and Cronbach's alpha between .41 and .79.

Keeping certain limitations of our measurement model such as the border line discriminant power between the convenience and the trust component in mind we have prepared the grounds for the estimation of a PLS model.

Table 2. Construct validity and reliability

Components	AVE	Composite reliability	Cronbach's alpha	R^2
E-voting affinity				.531
Component 1	.613	.864	.790	.071
Component 2	.774	.873	.710	.118
Component 3	.684	.812	.543	.242
Component 4	.563	.682	.411	.017

AVE = Average variance extracted

6.2 Results

Our path model contains four exogenous variables and five endogenous variables (including the main dependent variable internet voting affinity). The model is reflective, i.e. the manifest variables of one block are considered to reflect their corresponding latent variable. For the sake of better visibility Fig. 1 only shows significant paths between latent variables for standardized regression coefficients higher than 0.1. The full results of the model test with bootstrapping are shown in Table 3 further below. Note that regression coefficients in Table 3 differ somewhat from the ones displayed in Fig. 1 since the latter is a representation of a model re-estimating only the paths which proved to be statistically significant in the full model as displayed in Fig. 1. Missing cases were replaced by the mean of the remaining observations.

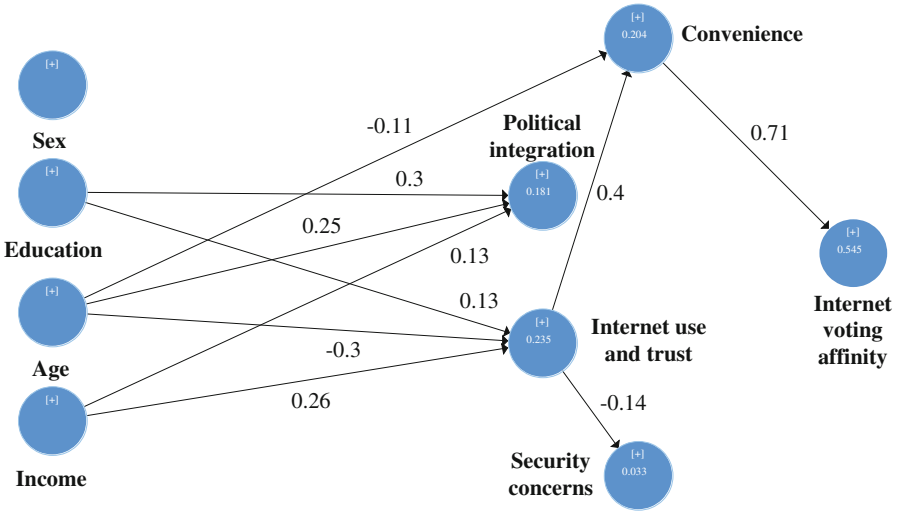

Fig. 1. PLS model estimates for all significant paths greater than .1

The first important point we can notice is the complete absence of direct and statistically significant paths from our exogenous variables to the phenomenon to explain, internet voting affinity. H1 can thus safely be refuted en bloc.

Regarding direct effects between the endogenous components 1–4 we can see that there is only one significant and strong path from the convenience component (c1) to internet voting affinity. All other components link to the dependent variable to such a minor degree that we do not take them into account. With a β of .71 the relationship between a positive evaluation of internet voting as being a convenient channel for voting and internet voting affinity is very strong. While the strength of this relationship is not surprising as such it is rather the absence of any strong connection between the other components and the dependent variable which is surprising.

The relatively strong path between the internet use and trust component (c3) and the convenience component (c1) can make sense intuitively but is probably owed to a large degree to some internal cohesion between the two which already became apparent when testing for discrimination between the components in Table 1. Furthermore, respondents with higher internet use and trust in internet transactions tend to be less concerned about security issues. However, with a β of only −.14 this relation does not seem to be particularly strong.

Looking at each of our exogenous variables in turn, we note that there is no significant partial regression path stemming from gender to any other variable in our model. There is a relatively strong relation between education and the degree of political integration (β = .3 in Fig. 1) and only a minor one towards the internet use and trust component. In that sense our model displays reassuring results. It is common knowledge in political and educational science that a higher degree of political integration corresponds with a better education, a higher economic status as well as higher age. The political integration component is actually not the most relevant for us but it was necessary to have it in the model as a control variable. In order to refute H3 we particularly focus on the internet use and trust component (c3) and check whether strong paths from digital divide variables continue to our dependent variable. However, this is not the case. Although education and income are somewhat or moderately related to the internet use and trust component we do not find the continuation further on to the dependent variable. We find the same pattern with age. The negative link (β = −.3 in Fig. 1) from age to the internet use and trust component is quite strong though.

7 Discussion

The results of the PLS model estimates suggest we can safely disregard a strong direct correlation between digital divide variables such as sex, education, age and income on the affinity to internet voting (H1). From the endogenous components we only find the convenience aspects to having a strong direct effect on internet voting affinity. The fact that the degree of political integration is almost unrelated to our dependent variable is a first hint pointing at the fact that digital

Table 3. Rotated component matrix of the independent variables (PCA)

Path	β	SE	p
age → c1	−.058	.03	.018
age → c2	**.183**	.02	.000
age → c3	**−.320**	.02	.000
age → c4	−.002	.03	.940
sex → c1	.014	.02	.541
sex → c2	−.087	−.03	.000
sex → c3	−.019	−.02	.388
sex → c4	.005	.03	.856
education → c1	.032	.03	.201
education → c2	**.216**	.02	.000
education → c3	**.168**	.02	.000
education → c4	−.064	.03	.001
income → c1	.007	.03	.782
income → c2	**.125**	.03	.000
income → c3	**.226**	.02	.000
income → c4	−.011	.03	.697
c1 → e-voting affinity	**.690**	.02	.000
c2 → c1	**.418**	.03	.000
c2 → c4	**−.166**	.03	.000
c2 → e-voting affinity	.050	.02	.025
c3 → e-voting affinity	.044	.03	.096
c4 → e-voting affinity	−.031	.02	.139
age → e-voting affinity	−.013	.02	.475
sex → e-voting affinity	.024	.02	.193
education → e-voting affinity	.007	.02	.734
income → e-voting affinity	.006	.02	.749

Fit-values: RMSEA = .036, CFI = .98, TLI = .97; SRMR = .027; Estimation: ML; all values are linear regression coefficients. In bold: significant paths higher than .1

divide might not be at play here either. Since a higher degree of education and a higher income do seem to have a moderately positive effect on political participation, a continuation of a strong path from this component to internet voting affinity would have meant that internet voting mostly finds support among the politically active strata of Swiss citizens. But this is not the case. We find the same pattern for the use and trust of the internet component. We would have expected this component to being related to digital divide factors and to also

have an impact on internet voting affinity. This is clearly not the case either. The component that moderated almost all digital divide factors out of the equation in previous regression analyses is largely unrelated to our dependent variable. The security concerns component seems to be largely unrelated to the core concepts in the model either. Except for the strong convenience component effect on internet voting affinity we can thus also refute direct effects of the endogenous part of the model (H2). Regarding potential expected indirect effect of digital divide via one of our four endogenous components - in particular the one via the use and trust in the internet component - we only find one via the convenience component which in return is unrelated to digital divide variables. We should therefore also refute major indirect effects (H3).

The current PLS model, however, shows an aspect we so far have rather neglected. Age seems to exert a stronger influence on endogenous components than expected. Focusing on the main digital divide variables such as sex, education and income in this study we might have neglected another phenomenon. The strongest partial regression coefficient pointing to the internet use and trust component is actually the age. For the moment we can only speculate. However, further studies should eventually focus on the question whether the digital divide is not rather an generational gap rather than one of economic and cognitive resources (see [10,26]).

More geared towards the substantive part of our model a word of caution is at order regarding the quality of some of the endogenous components of our model. In particular, there is a doubt whether the separation of the components convenience and trust in the internet can be upheld. The PCA as well as the relatively strong path link between the two suggests that they might have more in common than what we display in the model. In case the respective endogenous components ought to be regarded as one, and in light of the presence of the very strong link from the convenience component to our dependent variable as well as some of the digital divide variables moderately linking to it, an indirect effect would have to be reconsidered. In a nutshell, in order to gain a clearer insight on potential effects of digital divide variables operating in an indirect way as put forward in H3, there is some further conceptual work at order. In addition, a data set designed for that particular purpose could also help to improve the situation.

Last but not least, we should address some of the further pitfalls we might face with the present study. Firstly, our dependent variable is internet voting affinity and not the use of internet voting per se. Further Swiss data should be re-analysed in order to remedy this shortcoming. Furthermore, the Swiss case might be a peculiar one and not extend easily to other countries. This problem can only be overcome by comparative studies.

Appendix

Table 4. Items used in the analysis

Variable	Label	Wording and answer categories
E-voting affinity	evote	Generally speaking, are you in favour or against the introduction of e-voting? 1: "totally against"; 2:"rather against"; 3: "rather in favor"; 4:"totally in favor"
Participation frequency	part	Usually less than half of the electorate participates in referendums. How is it with you? Lets say there were ten in a given year. In how many would you have participated? Answers from 0–10
Interest in politics	polint	In general, how strongly are you interested in politics? 1: "very much interested"; 2: "rather interested"; 3:"rather not interested"; 4: "not interested at all"
E-voting convenience	argu2	When voting electronically it is possible to vote with a simple mouse click from ones home. This is more comfortable than postal voting. 1: "completely agree"; 2: "rather agree"; 3: "don't know"; 4:"rather disagree"; 5: "completely disagree"
Zeitgeist	argu3	Nowadays nearly everything can be done via the Internet. Hence it is time for e-voting to be universally available. 1: "compl. agree"; 2:"rather agree"; 3:"dont know"; 4: "rather disagree"; 5:"compl. disagree"
Postal voting easier	argu5	The postal vote is so simple, that e-voting is not needed. 1: "completely disagree"; 2: "rather disagree"; 3: "dont know"; 4: "rather agree"; 5: "completely agree"
Trust in the internet	trustint	much do you trust in internet transactions? 1: "not at all"; 2: "rather not"; 3: "depends on the transaction"; 4: "rather"; 5: "completely"
Internet usage	useint	How often do you use the Internet? 1: "never"; 2: "less than several times a month"; 3:"several times a month"; 4: "once per week"; 5: "several times per week"; 6: "once per day"; 7: "several times per day"
Demand for e-voting	egov2	Demand for services by government agencies: the possibility to cast ones ballot online. Scale from 0 (unnecessary) to 10 (very necessary)
Easier to manipulate	argu4	Its easier to manipulate a vote via the Internet than via postal vote. 1: "completely agree"; 2:"rather agree"; 3: "dont know"; 4: "rather disagree"; 5: "completely disagree"
Worries about security	argu6	With e-voting there is a danger of foreign secret services monitoring the vote. 1: "completely agree"; 2: "rather agree"; 3: "dont know"; 4: "rather disagree"; 5: "completely disagree"

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