Who are the Internet Voters?

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Abstract. Assessing the influence that socio-economic characteristics have on the division between traditional voters and those who choose to vote via the internet is crucial to political debate as well as for the future development of democracies. Does the introduction of internet voting technology simply widen the divide between voters and non-voters, further isolating the part of the electorate already underrepresented in the political process? We address these issues by reviewing the current state of research in 22 empirical studies relating internet voting to socio-economic variables. The results are not homogeneous but suggest that although socio-economic factors do play an important role in explaining the choice of voting channel, they are strongly moderated by the general use of and trust in the internet.

Keywords. Digital divide, internet voting, voting technology, socio-demographic variables

1. Introduction

Internet voting (i-voting) has been considered, discussed and implemented in several countries since the late 1990s [26]. The development and success of i-voting in each country differs greatly. For instance, while the experience in the USA has been limited to individual trials in primary elections [30], [38], in Estonia, or 'E-stonia' as it has been named, the entire electorate can vote online in national elections [39]. In Switzerland, pilot projects have been carried out in Cantons Geneva, Zurich and Neuchâtel, beginning in 2003 in the Geneva municipality of Anières. Since then, other cantons have also introduced i-voting [36]. In some countries such as Norway, i-voting projects have been stopped completely after several trials [4].

Although the introduction of this additional voting channel clearly has some advantages, such as reducing costs and simplifying the voting and vote counting processes [22], i-voting undeniably raises various technical, legal and especially political questions. One such question is that of the socio-economic characteristics of i-voters. I-voting is perceived as offering a new way to reach the population and involve those underrepresented in the electorate in the political process. This argument is based primarily on the hope for increased participation of younger voters as they have a higher affinity for the internet compared to other age groups [20], but a generally low turnout rate [22].

Increasingly, there is also a fear that socio-economic groups that are already underrepresented in the electorate would be further disadvantaged in the political process. It is argued that i-voting would predominantly be utilised by those groups who

already exhibit a high participation rate without the introduction of this additional voting method. Well-educated, affluent citizens are more likely to have access to the internet and the knowledge required to navigate it than the less well-educated, low income socio-economic groups [23], a phenomenon often referred to as the *digital divide*. What is pivotal is that according to [28] the digital divide runs alongside existing socio-economic cleavages and can therefore exacerbate existing inequalities. It must be noted that in the long term the existing distortion can be changed or at least softened, and in the best case scenario corrected altogether [6]. Using data from the USA, [1] illustrates that the digital divide tends to diminish over time. Among other things, the data refers to the percentage of households in certain income brackets that own a computer. While in households with an income of under US$25,000 p.a. there was an increase of 80.3 percent between 1977 and 2000, the increase was only 15.7 percent in households with a yearly income of over US$75,000.

Aside from the much discussed and argued *digital divide*, the sociological explanatory model for voting behaviour, developed by researchers at the University of Columbia in the 1940s, remains one of the main theories in this field. It is based on an analysis of interviews of 600 people during the 1940 presidential election campaign by a research team led by Paul F. Lazarsfeld to document the opinion-forming process of the interviewees. The principal argument of their analysis was that a person's vote is highly dependent on their socio-economic characteristics. The ensuing criticism, that the theory lacked a causal connection or had its own social determinism, led to the advancement of the ideas of the Lazarsfeld group in the following decades. For example, [24] developed a macro-sociological approach explaining the party systems as well as the party affiliation of individuals on the basis of four conflict structures in society arising from national revolutions and the industrial revolution: centre and periphery as defined by ethnicity and language; State and church; city and country; and labour and capital. Today the socio-economic composition of the electorate is still considered relevant to the election result [32].

For various reasons the socio-economic profile of i-voters is also of interest. Compared to existing voting channels like ballot or post, are certain population or age groups over or underrepresented among i-voters? Do certain socio-economic characteristics have a detectable influence on the choice of voting channel? I-votes conducted so far in Switzerland and Estonia, but also in the USA, United Kingdom, Norway and Canada, have allowed for these questions to be empirically explored.

This paper summarises the current state of research by analysing and comparing the 22 known studies with reference to underlying methods and results. The focus is on the socio-economic dimensions of age, gender, income and education and how these dimensions influence the choice of voting channel. Though several studies examined a multitude of additional information, these four variables were included in enough of the studies to compile a meaningful comparison.

The fundamental methodology and variables examined vary from analysis to analysis. In most of the studies, i-voters are compared with voters using other channels. Only a few isolated studies limit their analysis to the profile of i-voters without any comparison. Central to the interpretation and structuring of the results is the methodology used in each study. This paper differentiates between bivariate and multivariate analyses, each made up of two categories respectively. Not all studies refer to the models using our terminology, however every analysis can be grouped into one

of the four categories. The bivariate studies are limited to the relationship between a specific socio-economic variable and the choice of voting channel and in most cases also describe the frequency distribution. Rarely, an additional chi-squared test is carried out to test the significance of the differences found. The multivariate models consider multiple independent variables. They therefore answer questions such as: Does age have a significant influence on the choice of voting channel when the influence of gender, income and education is taken into account at the same time? Again, this category of analyses differentiates between socio-economic and global models. In the first, only socio-economic information is included.

Variables such as marital status or social class are also examined in some studies. The global models consider above all variables that relate to politics and IT such as political orientation, computer knowledge or trust in the internet. Although this paper does not focus explicitly on these variables, the corresponding results are included as they can provide indications for further explanatory approaches for the choice of a specific voting channel. Certain coefficients that show significant values in socio-economic models can lose their significance in global models. For example, it is obvious that better computer knowledge and a higher trust in the internet are typical for the younger population. This means that they do not use i-voting because they are young but rather because compared to other age groups they have a higher affinity to the internet. The global models can therefore put the significance of socio-economic dimensions into perspective and provide new explanatory approaches.

2. Switzerland

Who uses i-voting in Switzerland? What are their socio-demographic characteristics? Six studies have been conducted so far for the Swiss case. They give a first indication as to whether the variables age, gender, income and education have an impact on the use of i-voting. Table 1 gives an overview of these studies.

2.1. Age

The studies reveal by and large a uniform picture regarding age. According to bivariate measures, younger voters tend to use i-voting in greater numbers than older voters. Interestingly, it is not the youngest voters (18-29 years) who use i-voting most often but rather voters in the 30-49 years age group [10, 34]. The oldest age group, in turn, only rarely makes use of i-voting. Likewise, a multivariate analysis [34] shows that it is the second youngest electorate group that uses i-voting most frequently. Crucially, age loses its statistical significance when controlling for the frequency of internet usage and trust in the internet. This indicates that younger voters tend to use i-voting more frequently because they currently show a greater affinity for the internet. Consequently, differences between age groups with regard to i-voting usage could fade over time as it depends not on age itself but rather on affinity for the internet.

2.2. Gender

All analyses which are limited to the description of frequencies conclude that men are overrepresented among i-voters [10, 11], [33, 34], [37]. [37] shows that 35.7 percent of

men use i-voting compared to merely 16.4 percent of women, whereas [34] demonstrates with 36.7 percent to 30.2 percent respectively, a less stark contrast between the genders. Performing a chi-squared test, however, [18] finds no statistically significant effect for gender. Similarly, multivariate analyses [11], [33] show no significant effect of gender once the variables computer skills and frequency of internet usage are controlled for.

Table 1. Overview of studies examining socio-demographic characteristics of i-voters in Switzerland.

Study	Results
Christin and Trechsel [10]	Based on *bivariate* analysis **younger** (under 40, although not the youngest), **male** and **higher educated** voters are overrepresented among i-voters.
Christin and Trechsel [11]	Based on *bivariate* analysis i-voting is used more frequently by **younger**, **male** voters with a **high education** level and a relatively **high** household **income**. The *multivariate* model including socio-demographic and ICT variables produces significant results only for the latter variables.
Serdült and Trechsel [37]	The following results are found based on *frequency distributions*: voters aged **40-49** followed by voters aged **18-39** are overrepresented among i-voters. **Men** and voters with a **higher education** and an **above average income** are also overrepresented.
Serdült [34]	Based on *bivariate* analysis, **30-39** year old voters most often choose to use i-voting, followed by the **40-49** year old group. **Men** and the **better educated** are overrepresented among i-voters.
Sciarini et al. [33]	*Frequency distributions* show that voters between **25 and 34** more frequently use i-voting. 7% more **men** than women chose to vote online. **Better educated** (university degree) voters and voters living in **high income households** are overrepresented. *Multivariate* models show significant effects of **age, gender** and **education** on i-voting. However, the model including frequency of **internet use** and **trust in the internet** explains away effects of all socio-demographic variables.
Germann et al. [18]	Based on *chi-squared tests* **age** appears unrelated to i-voting use. **Men** are more likely to vote via the internet. I-voters are significantly more tech-savvy (**IT-skills**).

2.3. Income

Bivariate results show that higher income voters more frequently use the internet to vote [11], [33], [37]. As [37] shows, the share of i-voters grows as income increases, but at the same time the share of voters who use the two established voting channels (postal and ballot voting) decreases. Similarly, [33] observes greater shares of i-voters compared to postal or ballot voters among middle and higher income households. Although [11] finds a general positive association between income and i-voting, no clear impact of income on the use of the traditional voting channels is observed. In a multivariate analysis, income proves to be positively related to the probability to vote via the internet, but loses its significance as soon as IT-variables such as frequency of internet usage or trust in the internet are controlled for.

2.4. Education

Similar to age and income, education is found to be positively related to i-voting in bivariate analyses. Among i-voters, the highly educated are clearly overrepresented.

For instance, [37] found only 2.8 percent of i-voters indicated compulsory education as their highest education level, whereas 29.5 percent indicated they had a higher vocational education and 36.1 percent a university degree. In a comparison of voting channels (internet or postal) used by Swiss living abroad from the cantons Aargau, Basel-City, Graubünden and St. Gallen, a chi-squared test produces no significant results for education [18]. Finally, a multivariate analysis results in a familiar pattern: as soon as the frequency of internet usage and trust in the internet are introduced into the analysis, education loses its effect [11], [33]. When looking at frequency distributions therefore, i-voters display distinct socio-demographic characteristics. They are generally more highly educated, between 30 and 49 years old, male and have an above average income. However, as the multivariate models show, possible effects of socio-demographic variables on i-voting are all explained away by measures of internet usage and attitudes towards the internet.

3. Estonia

Since 2005, i-voting has been available to the entire Estonian electorate, not only at a local level but also for national and European parliamentary elections [26], [39]. Five studies were conducted: [39] and [6] examined data from the 2007 parliamentary election; [8] focused on the 2005 local elections; [2] considered both of the abovementioned elections; [40] relied on data from five different elections: local elections from 2005 and 2009, the 2007 and 2011 national elections and the 2009 European parliamentary election. [2] was limited to bivariate analyses, [6] and [40] to multivariate analyses. [8] and [39] first undertook bivariate analyses, followed by multivariate analyses. Table 2 gives an overview of these studies. The studies all compared i-voters with traditional voters. Only [2], in a section examining electoral roll data, limited the analysis to i-voters.

3.1. Age

The results for age support those produced in the Swiss studies - that it is generally younger voters, though not the youngest, who choose to use i-voting. The bivariate studies, which describe the distribution of this variable, point out that younger voters tend to be overrepresented amongst i-voters. [8] and [2] show that the percentage of i-voters increases from the youngest age category (18-29) to the second youngest (30-39 (25-29 for [2])), and then decreases. [39] also describes the relationship between i-voting and age as a curve. The turning point appears to be the 40-49 age group. Both [8] and [39] show that the distribution of ballot voters is different – here the percentage increases consistently with age.

The multivariate analyses confirm these results for the most part. [6] not only considers age as a variable on its own but uses the square value of the age. The results that support the bivariate reports give a positive coefficient for the single variable and a negative coefficient for the squared one. This means that the relationship between age and i-voting is non-linear. Initially, the probability of using i-voting increases with age. There is then a turning point when the probability reduces as age continues to increase. [8] and [39, 40] all generated a multivariate socio-economic model and a second multivariate global model. In the first model, all results produced a negative

coefficient; that the probability of using i-voting decreases with age. The global models give conflicting results: [8] and [40] found a positive coefficient. [40] deduces for all five models in the global evaluations (one for each election studied), that age, as soon as control variables such as trust in the internet are considered, has no significant influence on the choice of voting channel. The studies conclude that although i-voters are predominantly young, the reason for the increased use of i-voting is not due to age but rather to a greater affinity for the internet that is typical for the younger generation.

3.2. Gender

While the bivariate analyses [2], [8], [39] identify that men are overrepresented (slightly) amongst i-voters, the multivariate study results [6], [8], [39], [40] conclude that gender has no significant influence over the choice of voting method. The results from [8] and [39] show that the percentage of men voting online is significantly greater than those voting by ballot. [2] first limited its study to i-voters and found that 48.24 percent were female and 52.76 percent were male. [2] compares traditional voters with i-voters and confirms that the gender distribution for the two voting channels is identical. Socio-economic and global multivariate analyses [6], [8] and [39] conclude that gender has no statistically significant influence on the choice of voting method. While for [40] gender is insignificant overall, there are some exceptions. The authors apply both a socio-economic and global model for each of the analysed elections. In the first model, two of the five elections show that men tend to use i-voting more. The application of the global model for the 2011 parliamentary election likewise shows that men are overrepresented among i-voters.

In most cases there is therefore either no or very minimal indication of a gender gap. Although the bivariate analyses often determine a varying distribution, the multivariate models (with few exceptions) do not confirm this significance. In those studies where there are slight differences between the genders, it is always men who are overrepresented.

Table 2. Overview of studies examining socio-demographic characteristics of i-voters in Estonia.

Study	Results
Trechsel et al. (2007) [39]	*Bivariate* results show that i-voters are **young** (but not the youngest), **well-educated** and **high earning**. It is the **tech-savvyness** of the **young** that explains their use of i-voting. **Males** are overrepresented but the **gender bias** is not significant. Based on the *multivariate* socio-economic model, **young**, **well-educated**, **high earning** voters are overrepresented among i-voters. **Trust in the internet** increases the likelihood of i-voting. In the *multivariate* global model **income** and **education** cease to be significant. **IT skills**, rather than **age** increase the likelihood of i-voting. **Gender** plays no significant role in either of the multivariate results.
Bochsler (2010) [6]	Based on *multivariate* analysis **middle-aged** (**40-50** years), **well-educated**, **high earning** voters are overrepresented among i-voters. **Gender** is not significant.
Breuer and Trechsel (2006) [8]	*Bivariate* results show that **younger** (**under 40**, although not the youngest), **male**, **well-educated** voters with **very high incomes** are overrepresented among i-voters. It appears to be the **tech-savvyness** of the **young** that explains their use of i-voting. **Trust in the internet voting procedure** has a strongly significant impact in both *bivariate* and *multivariate* results.

	Based on the *multivariate* socio-economic model, i-voters are **younger**, **high earning** and **well-educated**. **Gender** is not significant. Based on the *multivariate* global model **gender**, **education** and **income** lose their significance. **Young** voters are overrepresented due to their **IT skills**.
Alvarez et al. (2009) [2]	Based on *bivariate* analysis **young**, **tech-savvy** voters are overrepresented among i-voters. **Trust in the internet voting procedure** is highly significant. **Gender**, **income** and **education** have little or no significance.
Trechsel and Vassil (2011) [40]	Based on *multivariate* socio-economic analysis, i-voters are **young**, **well-educated** and **high earning**. **Gender** is not significant. Based on *multivariate* global analysis, **age** (as soon as control variables such as **trust in i-voting** are considered), **education** and **gender** have no significant influence on choice of voting channel.

3.3. Income

[2] is the only study to find no difference in the choice of voting method between high and low income earners. The general tone of the other studies is that the probability of using i-voting increases as income increases. [8] and [39] find a similar distribution among ballot voters and i-voters in relation to income, though very high earners are overrepresented among i-voters. Interestingly, [39] finds that voters in the highest income bracket (over 10,000 Estonian crowns) are not overrepresented. The multivariate socio-economic models consistently show a positive correlation between income and i-voting [6], [8], [39, 40]. As shown with the age and gender variables however, this trend changes as soon as political or IT-variables are included. Only in [40] are positive significant coefficients delivered in three of the five models. The remaining two studies do not provide any statistically significant values with regard to income.

3.4. Education

The education variable delivers similar results to income. [2] again finds that there is no difference between i-voters and traditional voters. Bivariate analyses [8], [39] highlight that well-educated voters are overrepresented among i-voters. [8] finds that the most well-educated make up 60 percent of i-voters but only 30 percent of ballot voters. Results from [39] show a somewhat lower percentage for well-educated i-voters (50 percent). The multivariate studies that limit their models to socio-economic variables find a positive correlation between education and i-voting [6], [8], [39, 40]. The multivariate global models give, as in previous cases, less significant results. In [8] and [39] education loses all significance. It is the same for [40] in four of its five models, though in respect of the model based on the 2011 election, there is a negative coefficient for compulsory schooling and i-voting.

4. United States of America

The United States has had limited experience with i-voting. The four studies analysed here relate to two Democratic Party primary elections. One took place in Arizona in 2000 and [3] and [38] based their analysis on data from this election. [30] and [31] examined the profile of voters in the Democratic Party primary in Michigan in 2004.

Table 3 gives an overview of these studies. All four studies incorporate multivariate models. Only [38] also examines bivariate relationships. [3] defines the dependent variables as a percentage of the electronic votes in 15 districts. The remaining studies compare i-voters with traditional voters.

4.1. Age

Age produces significant results in all studies. [3] divides the variable into two categories: under and over 60 years. The results show that the probability of using i-voting decreases in the higher age group. [38] first undertakes a bivariate analysis through a chi-squared test to test the significance of the recognised differences. This shows that the 36-55 age group (68 percent), followed by the 56-65 age group (55 percent), then the 18-35 age group (44 percent) exhibit the highest percentage of i-voters. It is therefore by far not the youngest who use i-voting most. The chi-squared test and the results from the multivariate analyses that were carried out subsequently, produce significant results. The multivariate model from [30] shows a negative correlation between age and i-voting (compared to ballot box voting). [31] created a two-part model, comparing i-voters with postal voters. A negative coefficient is produced for internet and postal voting methods in the first part of the model and solely for internet in the second part of the model. I-voters therefore tend to be younger than postal or ballot voters.

4.2. Gender

All studies except [31] examine gender but only [30] finds significant results. According to [30] men exhibit a higher probability of voting online. [3] finds no statistically significant values. [38] is the same, although bivariate results show that only 42 percent of women, but 51 percent of men who took part in the study use i-voting. However the chi-squared test produces an insignificant result and the multivariate analysis therefore does not include this variable.

Table 3. Overview of studies examining socio-demographic characteristics of i-voters in the United States of America.

Study	Results
Alvarez and Nagler (2001) [3]	Based on *multivariate* analysis, i-voters are **young**. **Gender** has no influence.
Solop (2001) [38]	Based on *bivariate* analysis (chi-squared tests) i-voters are **young** (though not the youngest), **male** and **well-educated** with **high incomes**. Based on *multivariate* analysis, **young**, **well-educated** voters are overrepresented among i-voters. **Income** is not significant.
Prevost and Schaffner (2008) [31]	Based on *multivariate* selection model analysis, i-voters are **young** and **well-educated** with **high incomes**. Based on *multivariate* outcome model analysis, **young** voters are overrepresented among i-voters. **Income** and **education** had minimal effect.
Prevost (2008) [30]	Based on a two-part *multivariate* analysis, **young**, **male** voters with **high incomes** are overrepresented among i-voters. **Education** is not significant.

4.3. Income

Three of the four studies examined income. According to the bivariate analysis [38], in which the chi-squared test also produces significant results, high earners are overrepresented among i-voters. While i-voters make up only 21 percent of voters with the lowest income, the percentage is 69 percent for the top earners. The multivariate logistical regression, that includes age, income and education variables, does not confirm this result however. Only age and education provide significant values. [30] also finds a positive correlation between income and i-voting compared to ballot voters who tend to earn less. [31] finds, in the first part of their model, that i-voters and postal voters have higher incomes than ballot voters. However, a comparison of internet and postal voters produces a negative coefficient for i-voting.

4.4. Education

Three of the four studies examine this variable. According to [30], education has no influence on the choice of voting method, while [31] produces a positive correlation. [38] also confirms the significance of this relationship. According to the bivariate study of [38], well-educated voters are overrepresented among i-voters. While lowest income earners make up 17 percent of i-voters, 69 percent come from the highest income earners. The chi-squared test confirms the significance of this difference. As previously mentioned, the multivariate analysis also produces a significant result. According to [31], a university degree increases the probability of voting via the internet or by post (compared with ballot voting). If postal voting and i-voting are compared with one another, a university degree increases the probability that voting will be online.

5. Canada

In the last decade, i-voting has been offered for local elections in approximately 60 municipalities in the provinces of Ontario and Nova Scotia [29]. Four studies examine the socio-economic composition of i-voters and refer to elections in 2003, 2006 and 2010 in Markham, Ontario [12, 13, 14], [19]. Table 4 gives an overview of these studies. The study analyses are bivariate and limited to providing a description of the distribution of the different variables. The statistical significance of the differences found in the distribution is not provided. Only [12] compares ballot voters with i-voters; the other studies focus exclusively on i-voters.

5.1. Age

Age is examined in all the studies. [12], which provides a comparison between different voting channels, shows that i-voters are slightly younger that ballot voters. The percentage of 18-24, 35-44 and 45-54 year olds is about three percentage points higher among i-voters than traditional voters. In contrast, 19 percent of ballot voters and only 8 percent of i-voters are over 65. Since none of the other studies make comparisons to traditional voters, the results are less meaningful for this report. The general tone, however, is that middle-aged voters use i-voting most frequently.

5.2. Gender

Gender is examined in two of the four studies. [12] observes no significant gender bias when it comes to voting method. 51 percent of i-voters and 52 percent of ballot voters are male. [13] likewise concludes that of the sample voters for the 2006 election, approximately the same number of male (52 percent) and female (48 percent) were i-voters.

Table 4. Overview of studies examining socio-demographic characteristics of i-voters in Canada.

Study	Results
Delvinia Report (2004) [12]	I-voters are **young** and **well-educated** with **high incomes**. No significant **gender** bias amongst i-voters.
Delvinia Report (2007) [13]	**Young**, **well-educated** voters with **high incomes** are overrepresented among i-voters. No significant **gender** bias amongst i-voters.
Delvinia Report (2011) [14]	**Middle-aged**, **well-educated**, **high earning** voters are overrepresented among i-voters. **Gender** not significant.
Goodman (2014) [19]	**Middle-aged** and **older** voters are overrepresented among i-voters. No information regarding significance of other variables provided.

5.3. Income

All three Delvinia Reports deal with income. [13] regards CAD$99,300 as the average yearly income of i-voters. [14] concludes that i-voters typically earn between CAD$55,000 and CAD$84,999 per annum. Only [13] makes a comparison with traditional voters. It concludes that high earners are overrepresented amongst i-voters when compared with traditional voters. The percentage of i-voters is consistently higher than ballot voters in the income categories above CAD$85,000.

5.4. Education

Education is considered in [12] and [13]. In a comparison between i-voters and ballot voters in [12], it is observed that i-voters are slightly better educated than traditional voters. 42 percent of i-voters and only 36 percent of ballots voters have a university degree. 7 percent of ballot voters and 4 percent of i-voters are in the lowest education category. [13] only examines i-voters and finds that the distribution of the education variable is very similar to [12] and there is therefore a high probability that in this case i-voters are also slightly better educated than traditional voters. However, this is an assumption based on a comparison of the two studies and cannot be conclusively confirmed due to a lack of data regarding traditional voters from 2006.

6. Norway

In Norway i-voting trials were conducted during local elections in 10 municipalities in 2011 and during parliamentary elections in 12 municipalities in 2013. Recently the decision was made not to pursue i-voting [4]. For both studies, data on the socio-economic composition of the electorate was compiled and analysed [5] and [7]. The studies examine electoral roll and survey data. Table 5 gives an overview of these studies. Although multivariate analyses are carried out in the studies, their results have

been excluded from this report because they only compare i-voters to non-voters and ballot voters to non-voters, and make no direct comparison between the two voting methods. The following analysis is therefore limited to bivariate results. It must be noted that the bivariate studies not only compared i-voters with traditional voters, but also often included data from non-voters.

6.1. Age

In relation to age, one can say that i-voters are more evenly distributed across the age groups than ballot voters. The percentage of i-voters is relatively constant up to age 60 and then decreases markedly. In contrast, the percentage of traditional voters increases steadily until age 75 before falling away. A comparison of both voting methods determines that i-voters are most strongly represented among the younger age groups. According to [7] the 21-34 year old group has the same percentage of i-voters and ballot voters. In all the other age categories the percentage of ballot voters exceeds that of i-voters. Likewise in [5], the difference between i-voters and ballot voters is smallest among the youngest voters.

6.2. Gender

Both studies conclude that men are slightly overrepresented among i-voters. [5] shows that the percentage of voters who vote online is 26 percent on average; 25 percent female and 28 percent male. Whether this difference can be seen as statistically significant is not tested.

Table 5. Overview of studies examining socio-demographic characteristics of i-voters in Norway.

Study	Results
Bergh and Christensen (2012) [5]	Based on *bivariate* analysis, **younger**, **male**, **well-educated**, **high earning** voters are overrepresented among i-voters. The *multivariate* analysis delivers the same results.
Bock Segaard et al. (2014) [7]	Based on *bivariate* analysis, i-voters are **younger**, **male** and **well-educated** with **high incomes**.

6.3. Income

According to [5], the percentage of i-voters and ballot voters increases as income increases. Compared with non-voters, voters generally have higher incomes. [7] concludes that the percentage of ballot voters up to the third income category (of a total six) increases and thereafter decreases slightly. With i-voters, the percentage decreases from the first to the second income category and then steadily increases. The percentage of non-voters steadily decreases as income increases.

6.4. Education

The results in [5] for education are very similar as for income. While the percentage of voters for both voting methods (ballot and internet) increases as the education level improves, it decreases for non-voters. [7] confirms this, though in the analysis the

increase in the percentage of i-voters is much more prominent than for ballot voters. One can conclude that the well-educated are overrepresented among i-voters.

7. United Kingdom

Initially it seemed that the United Kingdom would be one of the pioneers in the implementation of i-voting. For a number of years pilot projects were carried out at the local level. After a time however, i-voting was no longer pursued [21]. Only one study was carried out that examines the socio-economic composition of i-voters. It relates to local elections in Swindon and in a bivariate analysis compares the profile of ballot voters and i-voters [21]. Of the four variables of interest in this report, [21] only examines age and gender. Table 6 gives an overview of the study.

Table 6. Overview of studies examining socio-demographic characteristics of i-voters in the United Kingdom.

Study	Results
Henry (2003) [21]	Based on *bivariate* analysis i-voters are **young**, **male** and belong to the **upper social classes**.

7.1. Age

According to [21] i-voters are younger than ballot voters. While the over 60 years category has the highest number of ballot voters (42.6 percent), it only accounts for 2.6 percent of i-voters. 35.9 percent of i-voters belong to the 18-24 years category and 48.7 percent (the highest) to the 25-44 years category. Other than for the over 60 years category, the study does not provide any comparative data concerning ballot voters.

7.2. Gender

[21] finds that 43.3 percent of i-voters and 52.3 percent of ballot voters are female. Whether this difference is statistically significant is not tested in the study.

8. Conclusion

The common assumption of the typical i-voter being relatively young, male, well-educated and having a higher than average income can be partly confirmed by the studies reviewed in this article. Overall, the *age* variable is the most significant one. All bivariate analyses and multivariate socio-economic models as well as a high proportion of more global multivariate analyses show the importance of age as an explanatory factor for the selected voting channel. In most studies it is the second youngest age group rather than the youngest that proves to be the most frequent user of i-voting. Certainly, the oldest age groups make use of i-voting the least. As a preliminary first result, after i-voting trials in several countries in the last fifteen years, we should therefore refrain from raising the expectation that the i-voting channel will bring the young, underrepresented voters back to the ballots.

The socio-demographic variable with the least clear effect is *gender*. Although men are overrepresented among i-voters in most cases, the differences are usually not statistically significant. However, it should be noted that in none of the presented studies are women choosing this voting channel more often than men. Regarding *income* and *education* we can observe certain similarities in their effect on the choice of the voting channel. Most bivariate and multivariate socio-demographic models show that voters with a higher education and a high income tend to use i-voting more often. Global models integrating variables other than just socio-economic ones still tend to deliver significant effects for income.

In general, the socio-economic analyses show that the significance of the four variables focussed on tends to decrease as soon as the models include the variables of computer literacy and trust in the internet. The strongest moderating effect can be observed for gender and education. As long as variables outside of the socio-economic ambit are not included, most analysis would report that a higher income and a good education would very likely lead to a higher propensity to use i-voting. According to the more encompassing models, the real cause for the divide between i-voters and traditional voters is their affinity to the internet. With time, i-voters will get older and the age gap will disappear. We should therefore consider that socio-economic factors such as age, gender, income and education are only relevant to a certain degree when explaining the choice to vote online and are rather strongly moderated by knowledge and use of the internet.

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