

The e-voting experience: what have we learned and how to proceed?

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eDemocracy conference 2008, Tallinn
June 5 2008

Two Reports

- 2005 Local Elections
- 2007 Parliamentary Elections

Structure of both reports

1. Introduction
2. Context
3. Goals of the Study
4. Methods
5. The Internet and the campaign (new in 2007!)
6. Participation in the Elections:
General/Demographic Aspects
7. Choosing to e-vote: explanatory models
8. Conclusions
9. Recommendations

Goals of the studies

- Who votes online? Who prefers the traditional channel of participation at the polling place? Do the socio-demographic and socio-economic profiles of Internet voters differ from those voting at the polling station and from those abstaining in the elections?
- How can we explain the choice of the voting channel?
- What are the political effects (if there are any) of electronic voting? Is the introduction of this channel of participation politically neutral with regard to the outcome of the elections or not?
- NEW IN 2007: What role did ICTs play in the campaign preceding the 2007 national elections?
- NEW IN 2007: How do these results compare with the analysis presented in the study of the October 2005 local elections in Estonia?

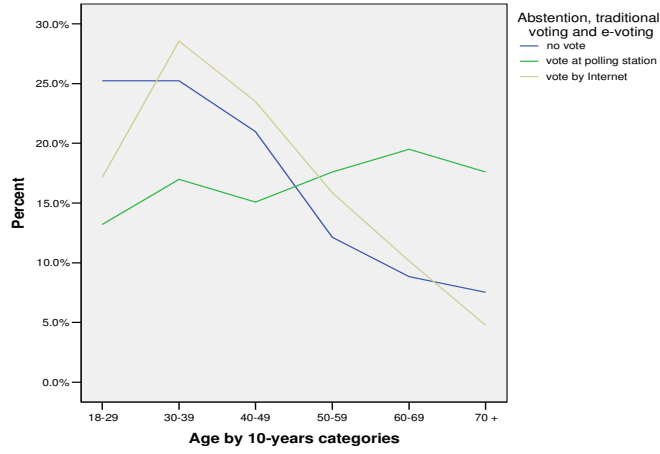
Methods

- Specifically designed surveys containing answers from 939 (2007: 987) respondents who had the right to vote in the local (2007: national) elections
- Samples consisted of
 - 315 (2007: 367) e-voters
 - 319 (2007: 365) 'traditional' voters
 - 305 (2007: 246) non-voters

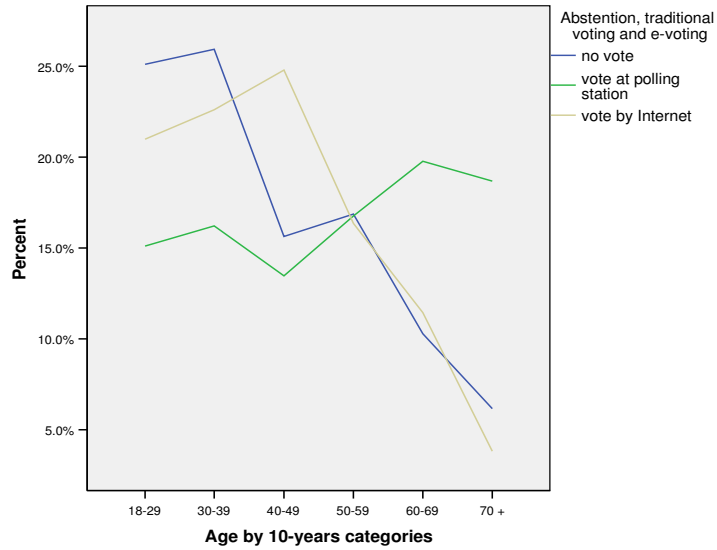
Team

- Prof. Dr. Alexander H. Trechsel (European University Institute, Florence, project leader)
 - Dr. Fabian Breuer (European University Institute, Florence and GPPI Berlin)
- > extension of the team in 2007 to further include:
- Prof. Dr. Michael Alvarez (California Institute of Technology, USA)
 - Prof. Dr. Thad Hall (University of Utah, USA)
 - Dr. Guido Schwerdt (ifo Munich)

Age and mode of participation (2005)



Age and mode of participation (2007)



Gender and mode of participation (2005 and 2007)

Mode of participation	Gender		
	male	female	n
no vote	45.2	54.8	305
vote at the polling station	41.2	58.8	318
e-vote	49.8	50.2	315
Overall n	426	512	938

N=939, valid cases=938, missing cases=1.

Mode of participation	Gender		
	male	female	n
no vote	44.9%	55.1%	243
vote at the polling station	38.5%	61.5%	384
e-vote	48.8%	51.2%	367
Overall n	426	512	938

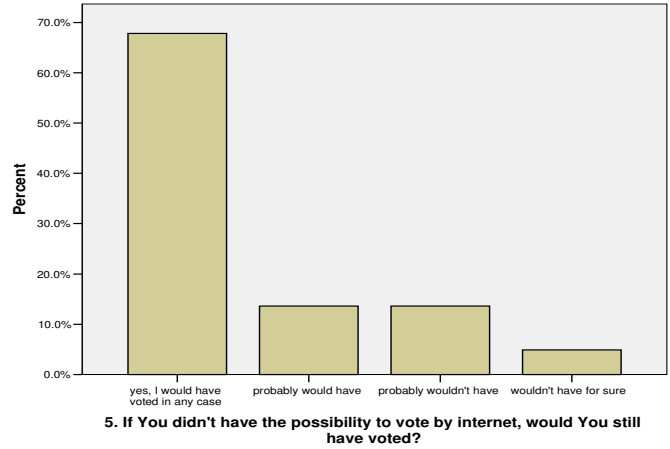
N=982, valid cases=974, missing cases=8.

Frequency of usual political participation and mode of vote (2005 and 2007)

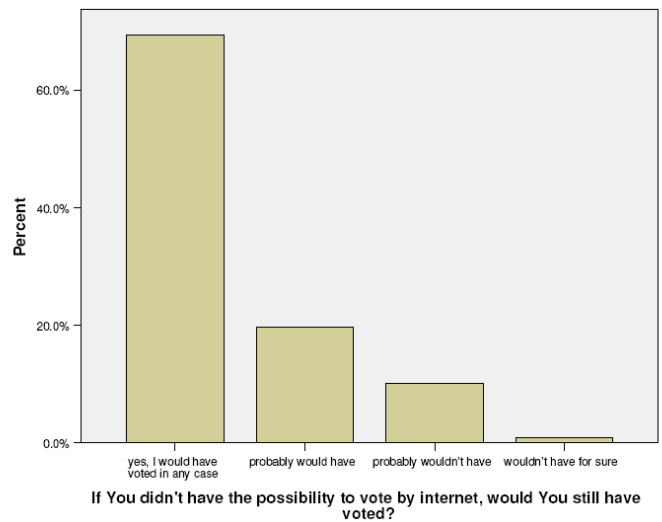
Vote in 2005...	Frequency of usual political participation				
	in all elections	in some elections	from time to time	never	Total (% , n)
at the polling place	77.6	18.0	3.5	0.9	100.0
by internet	70.2	24.4	4.8	0.6	100.0
Total (n)	467	234	26	5	632

Vote in 2007...	Frequency of usual electoral participation				
	in all elections	in some elections	from time to time	never	Total (% , n)
at the polling place	78.8	20.1	0.8	0.3	100.0
by Internet	67.8	29.4	2.5	0.3	100.0
Total (n)	532	180	12	2	726

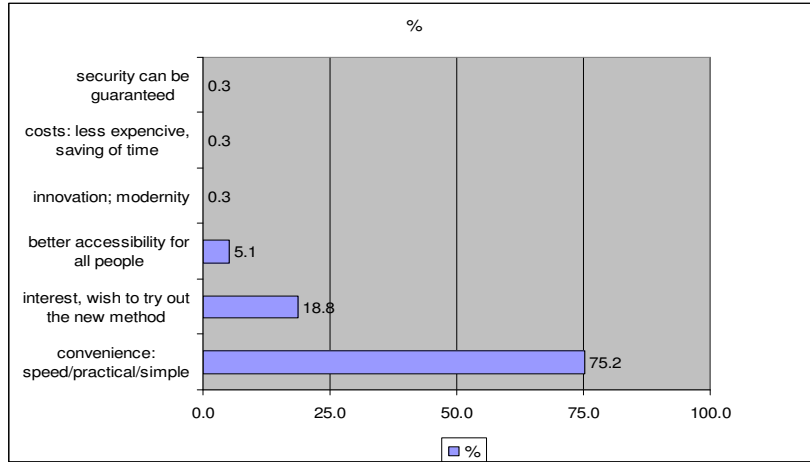
Subjective estimation of participation in the absence of e-voting (2005)



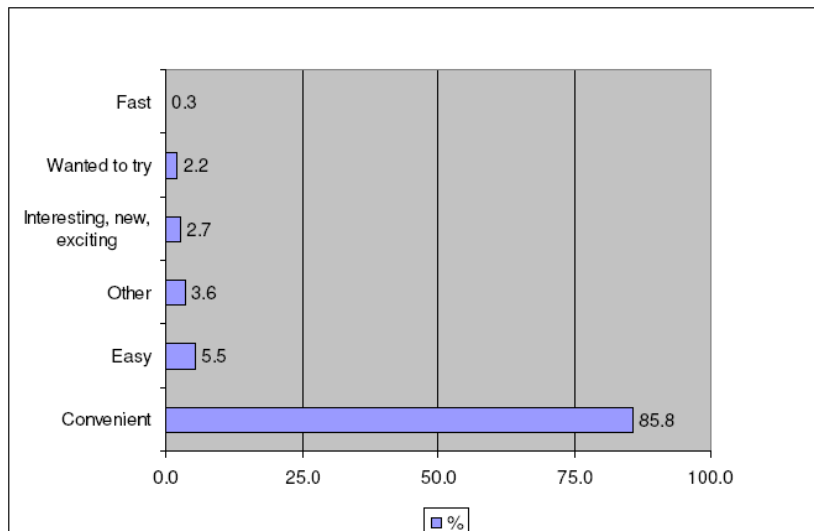
Subjective estimation of participation in the absence of e-voting (2007)



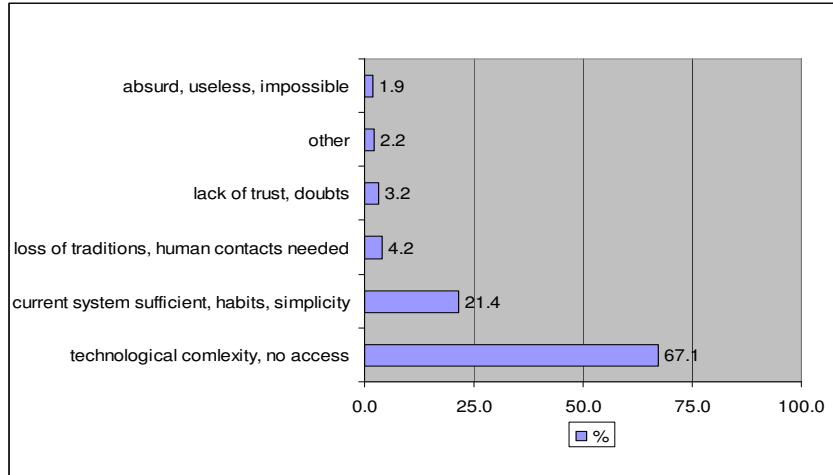
Subjective reasons for choosing e-voting (2005)



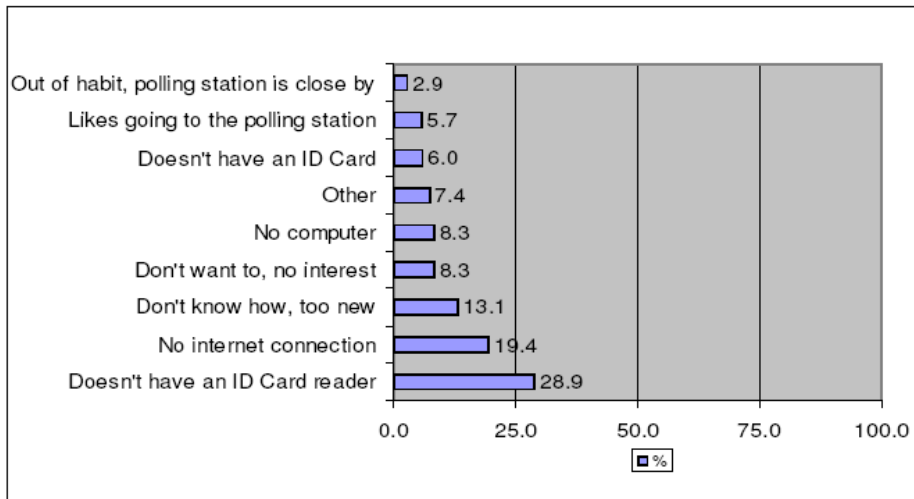
Subjective reasons for choosing e-voting (2007)



Subjective reasons for not using e-voting (2005)



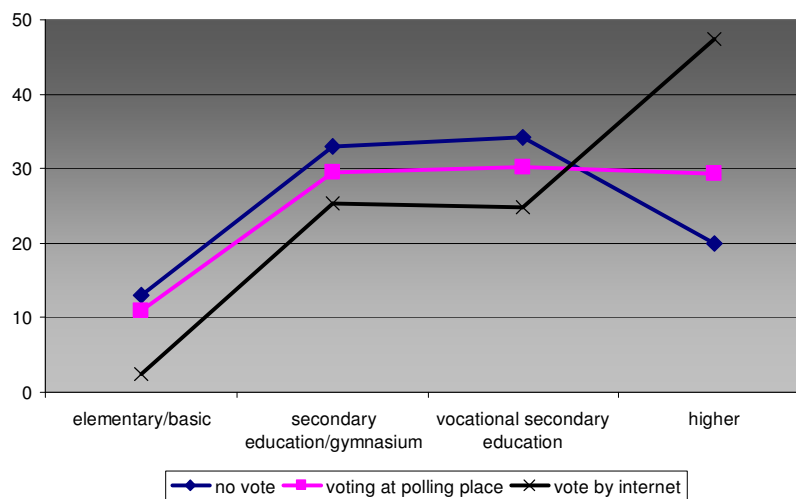
Subjective reasons for not using e-voting (2007)



Some more bi-variate relations

- Education and voting channel
- Occupation and voting channel
- Income and voting channel

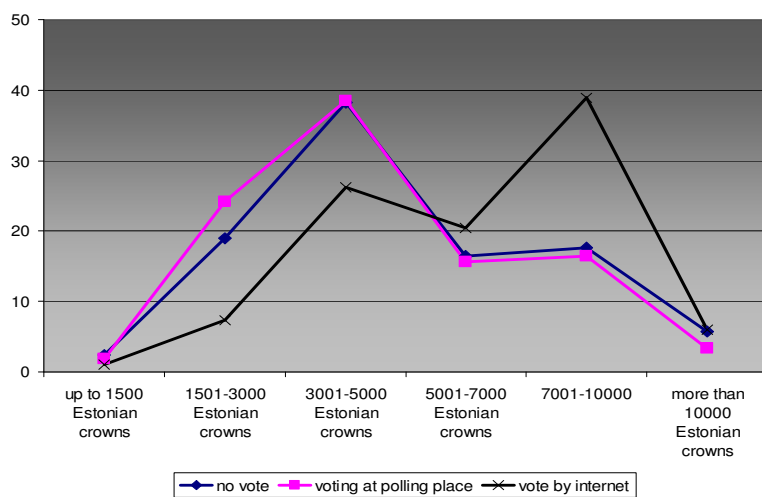
Education



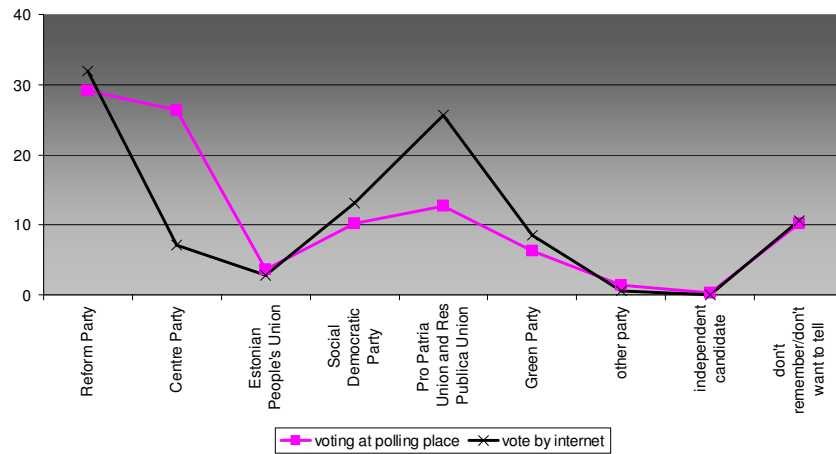
Occupation

Mode of participation	no vote	vote at the polling place	e-vote	n
Occupational status				
entrepreneur, farmer, self-employed	12.4	6.3	10.9	93
freelancer	4.1	1.1	1.1	18
salaried worker in public sector	11.9	18.7	30.5	212
salaried worker in private sector	39.9	32.1	39	359
student	7	5	2.7	46
retired	16.1	31.9	9	190
at home	7.4	4.4	6	56
unemployed	0.8	0.6	0.3	5
other	0.4	0	0.5	3
Total	100	100	100	982

Income



Political Parties?



Motivation

- The bi-variate analysis revealed important correlations between certain factors and the choice of the voting channel.
- However, some of these correlations might be *spurious*. That is, they might be driven by other factors correlated with both variables of interest.
- Therefore, it is mandatory to check the robustness of the bi-variate findings using a multi-variate framework.

Multi-variate Models

- Theoretical considerations lead us to construct 3 distinct models explaining the choice of the voting channel.
 - Socio-demographic and economic model
 - Political model
 - ICT model
 - Global model

Estimation Strategy (1)

- Outcome variable

$evote_i$ is a dummy (binary) variable that takes the value 1 if individual i casts her vote over the internet and 0 if individual i casts her vote at the polling place

Estimation Strategy (2)

- A binary dependent variable demands a non-linear specifications (heteroskedasticity, interpretation as probabilities...)
- We chose a *Logit* specification (assumes a logistic distribution for the probability to e-vote)

Socio-demographic and –economic model

COEFFICIENT	SDE MODEL
Age	-0.21*** -0.05
Gender	-0.23 -0.17
Settlement	-0.18 -0.18
Education	0.30*** -0.09
Income	0.38*** -0.07
Language	-2.28*** -0.42
Constant	1.40* -0.73
Observations	731
Pseudo R2 (McFadden)	0.15

Socio-demographic and –economic model

The SDE model suggests:

- Age, level of education, income and language are highly significant predictors of e-voting,
- while gender and type of settlement have no significant effect on the choice of e-voting over voting at the polling stations.

Global model

COEFFICIENT	SDE MODEL	POLITICAL MODEL	ICT MODEL	GLOBAL MODEL
Age	-0.21***			0.36***
Gender	-0.05			-0.11
Settlement	-0.23			-0.06
Education	-0.17			-0.26
Income	-0.18			-0.01
Language	-0.18			-0.27
Left-right scale	0.30***			0.03
Political discussions	-0.09			-0.15
Trust in Parliament/government	0.38***			0.12
Trust in politicians	-0.07			-0.12
Trust in the State	-2.28***			-2.35***
Computing knowledge	-0.42			-0.65
Frequency of Internet use		0.17***		-0.06
Location of Internet access		-0.05		-0.07
Trust in transactions on the Internet		-0.31***		-0.08
Trust in the procedure of e-voting		-0.12		-0.16
Constant		-0.35		0.21
Observations		-0.26		-0.34
Pseudo R2 (McFadden)		-0.26		-0.85**
		-0.26		-0.34
		-0.07		-0.1
		-0.19		-0.26
			-0.52***	-0.65***
			-0.12	-0.17
			0.15***	0.19***
			-0.05	-0.06
			-0.08	-0.1
			-0.08	-0.1
			-0.14	-0.16
			-0.17	-0.21
			-1.22***	-1.22***
			-0.19	-0.25
Constant	1.40*	1.03	3.17***	6.34***
Observations	731	489	602	425
Pseudo R2 (McFadden)	0.15	0.05	0.24	0.28

rors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Global model (cont.)

COEFFICIENT	GLOBAL MODEL
Age	0.36***
	<i>-0.11</i>
Gender	-0.06
	<i>-0.26</i>
Settlement	-0.01
	<i>-0.27</i>
Education	0.03
	<i>-0.15</i>
Income	0.12
	<i>-0.12</i>
Language	-2.35***
	<i>-0.65</i>

Global model (cont.)

Left-right scale	-0.06
	<i>-0.07</i>
Political discussions	-0.08
	<i>-0.16</i>
Trust in Parliament/government	0.21
	<i>-0.34</i>
Trust in politicians	-0.85**
	<i>-0.34</i>
Trust in the State	-0.1
	<i>-0.26</i>

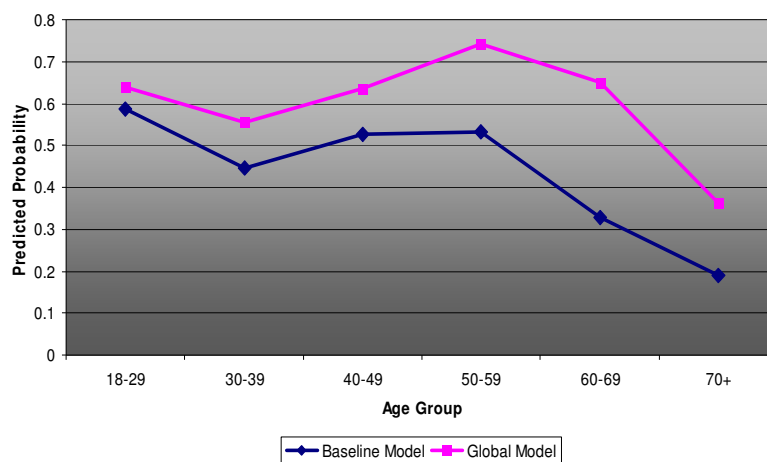
Global model (cont.)

Computing knowledge	-0.65***
	-0.17
Frequency of Internet use	0.19***
	-0.06
Location of Internet access	-0.1
	-0.1
Trust in transactions on the Internet	-0.16
	-0.21
Trust in the procedure of e-voting	-1.22***
	-0.25
Constant	6.34***
	-1.75
<hr/>	
Observations	425
Pseudo R2 (McFadden)	0.28
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The Global model reveals:

- Age and language remain strongly significant
- Left-right auto-positioning and the frequency of political discussions become totally insignificant.
- trust in politicians now appears to be of statistical importance at the 5 percent level
- Computing knowledge, the frequency of Internet use, and, above all, trust in the procedure of Internet voting can maintain their structural impact on the dependent variable and remain strongly significant.

A positive effect of age?



Other E-Elections

Year	Location	Type of Election	Number of I-Votes Cast
2007	Estonia	Parliamentary	31,064
2005	Estonia	Municipal	9317
2000	USA	Presidential	84
2000	USA	Arizona Presidential Primary	35768
2004	USA	Michigan Presidential Primary	46543
2002	UK	Crewe and Nantwich Borough Council	364
2002	UK	Liverpool City Council	1093
2002	UK	St Albans City & District Council	825
2002	UK	Sheffield City Council	2904
2002	UK	Swindon Borough Council	4293
2003	UK	Stroud	2356
2003	UK	Swindon	6895
2003	UK	Kerrier	1665
2003	UK	Vale Royal	4001
2003	UK	Shrewsbury & Atcham	2419
2003	UK	Stratford on Avon	2002
2003	UK	Ipswich	2759
2003	UK	Norwich	1666
2003	UK	South Somerset	5497
2003	UK	St Albans	10124

2003	UK	Chorley	2632
2003	UK	Rushmoor	2760
2003	UK	South Tyneside	3263
2007	UK	Swindon Borough Council	6740
2007	UK	South Bucks District Council	1733
2007	UK	Shrewsbury & Atcham Borough Council	1070
2007	UK	Sheffield City Council	3690
2007	UK	Rushmoor Borough Council	3825
2003	Switzerland	Anieres Commune	323
2003	Switzerland	Cologny Commune	432
2004	Switzerland	Carouge Commune	1024
2004	Switzerland	Meyrin Commune	788
2004	Switzerland	Anieres, Carouge, Cologny, Meyrin Canton/Confederation	2723
2004	Switzerland	Vandoeuvres Commune	1382
2004	Switzerland	Anieres, Carouge, Cologny, Collonge-Bellerive, Meyrin, Onex, Vandoeuvres, Versoix Canton/Confederation	3755
2005	Switzerland	Anieres, Bernex, Carouge, Chene-Bourg, Collonge-Bellerive, Cologny, Grand-Saconnex, Lancy, Meyrin, Onex, thonex, Vandoeuvres, Vernier Versoix Canton	7911
2005	Switzerland	NE: "Guichet Unique", Confederation/Commune	1178
2005	Switzerland	NE: "Guichet Unique", Canton	1194
2005	Switzerland	Bulach Commune	1461
2005	Switzerland	Bertschikon, Bulach, Schlieren Confederation/Canton/Commune	1397
2005	Switzerland	NE: "Guichet Unique", Confederation	1334
2006	Switzerland	Bulach Commune	728
2006	Switzerland	NE: "Guichet Unique", Confederation/Commune	1311
2006	Switzerland	Bertschikon, Bulach, Schlieren Confederation/Commune	1309
2007	Switzerland	NE: "Guichet Unique", Confederation/Commune	1538
2007	Switzerland	NE: "Guichet Unique", Confederation/Canton/Commune	1494
2007	Switzerland	Bertschikon, Bulach, Schlieren Confederation/Commune	932

Comparing Results

- Evidence on awareness and acceptance mixed
- US and UK evidence confirms popularity of internet voting among younger voters (Local elections pilot schemes report – 2007)
- However, micro-evidence from Switzerland confirms importance of overall ICT awareness

Conclusions & Recommendations

1. First, e-voting in Estonia remains a participation channel mainly used by younger generations among the electorate.

=> However, the lack of familiarity with Internet technologies appears to be the key-explanation for the observed age pattern.

Conclusions & Recommendations

2. Second, language remains a problem in a linguistically divided society, such as the Estonian one, unless the authorities offer the e-voting tool in a multi-lingual context.

=> In order to convince larger parts of the already large community of Russian speakers in Estonia to use e-voting, offering this device in Russian becomes indispensable.

Conclusions & Recommendations

3. Third, ICT variables such as computing knowledge and frequency of Internet use constitute a barrier for e-voting.

=> It is not so much the divide between “Internet access haves” and “Internet access have-nots”, but clearly their computing skills and Internet experience that made citizens choose either option of voting.

Conclusions & Recommendations

4. Fourth, independently of all other considerations, the trust of citizens in the mechanism of e-voting remains a central issue.

=> Any successful information policy pointing in the direction of giving voters trust in the mechanism itself will therefore make this means of participation more popular.

Conclusions & Recommendations

5. Fifth, some non-results are of utmost importance.

=> we found that e-voting is completely neutral with respect to such crucial variables as gender, income, education and the type of settlement (!)

Conclusions & Recommendations

6. Sixth, it is the political neutrality of e-voting that is at stake.

=> we can conclude that in the Estonian case the introduction of e-voting can be regarded as politically rather innocent. (!)

Recommendations for Estonia

- Overall strengthening of the information society;
- Maintaining diversity in campaigning channels;
- Maximising openness and transparency in internet voting systems and close technological monitoring;
- Maximising social and cultural inclusion (principle of non-discrimination);
- Guaranteeing a sufficiently long period during which internet voting is open.

General recommendations

- need for diffusion
- usefulness of reversible voting
- usefulness of academic follow-up analyses
- respect of the Council of Europe Recommendation on e-voting