

# Miracle Medicine for Curing Low Turnout? Evaluation of Electronic Voting in Taiwan

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It is argued that turnout is either matter of civic duty or preference. If irreversible shortness of civic duty is responsible for low turnout, what is the remedy for that? Are people more willing to participate in elections if new instrument of voting is introduced? In this study, we try to evaluate the utility of electronic voting regarding voting participation based on a nationwide telephone interview conducted in Taiwan, 2011. The preliminary results show that voters are very satisfied with current system of voting, including the efficiency of vote counting and setup of polling stations. They also show high level of trust in the system. In this case, e-voting looks lackluster. But we argue that e-voting may raise voters' interest in turnout, especially for young voters. Moreover, we explore the extent to which digital divide, generational difference, and partisanship explains the level of support for the current system, e-voting, and internet voting.

Keywords: Turnout, Electronic voting, Political efficacy

## Introduction

In the past several decades, the concept of electronic democracy (e-democracy) has been implemented in many democracies. To define it broadly, it refers to using new information and communication technology to assist the fulfillment of democracy values and mechanism. E-democracy has been enhancing quality of democracy as many new modes of policy-making with development of new electronic equipment.

Taiwan has just undergone the second party turnover and entered the period of democratic consolidation (Huntington 1991). On the one hand, it means that democracy becomes institutionalized, or “the only game in town” (Linz and Stepan 1996), in Taiwan. On the other hand, Taiwanese in general is content with democracy. Most people agree that democracy is a better institution than authoritarian regime. Diamond (2008) calls for improving quality of democracy, including more efficient governance and deepening democratic operation.

Obviously, the question we face is how we should do to improve our quality of democracy. The development of new technology could bring people totally different imagination about future mode of governance and political system. Nevertheless, technology is not penicillin. It is very challenging to take advantage of new technology and to encourage citizens to participate in politics. That could

be very critical to improving quality of democracy (Musso, Weare, and Hale 2000) .

The economic miracle of Taiwan highlights the development of technology industry. In particular, Taiwan is one of the leading countries manufacturing hardware. Moreover, people like to embrace new technology. The penetration rate of internet, computer, and cellular phone is higher than most countries. In 2010, for instance, more than 82.8% of household has internet connection and more than 77.1% has high speed broadband. It shows that most people are able to receive and send messages or even communicate with government through internet. Taiwan's government also has applied information and communication technology to governance and participation, including transparency of government information, government service, and participation platform. In brief, Taiwan is ready for more e-democracy. The progress of electronic voting, however, is very limited. As so far, Taiwan merely utilizes compute systems to tally vote counts. The most crucial part of voting—casting the ballot—is still done by hand.

Many countries, such as the United States, United Kingdom, Germany, France, Sweden, France, and Swiss, have adopted e-voting. They find that e-voting can save cost like ballot print and increase the efficiency of election administration. Asian countries such as Japan, Korea, and Philippine have adopted or tested e-voting. Installing technology into the core of democracy—election—has become a global trend. How much we can save by e-voting remains a question, but this may not be as important as how much participation we could raise by adopting e-voting. In fact, scholars may not always see the bright side of democracy merged with technology. Winkel (2000/2001) has examined many different perspectives, pointing out that people may want to consider social context and relative organizations before introducing new technology to society for lesser negative shock. Barber (2000/2001) also suggests that without institutions and culture matching with new technology we may not see better democracy just because we apply technology to every aspect of politics.

Although Taiwan has been in pair with other countries in terms of level of technology and its penetration rate, it is necessary to consider the extent to which citizens are confident with new technology and our election culture. In other words, we should not copy other countries' models directly. Eventually, the fairness of election is the foundation of democracy and the only way to gain the legitimacy. For example, some countries of large scale are concerned about the speed of ballot counting because it relates to the fairness of election. Therefore, ensuring the fairness of election is critical to whether society can accept e-voting. Moreover, how much people embrace new technology is an important indicator of accepting e-voting.

This study departs from the perspective of the mass public, investigating how much e-voting, if adopted, could promote better democracy. First of all, we attempt to observe how people feel about e-voting, including voting in polling stations with electronic equipment and internet voting. Secondly, we want to

explore why citizens prefer e-voting. Is “digital divide” a significant predictor of people’s attitude? Does the level of confidence on new technology affect attitude toward e-voting? Last, we are interested in how much e-voting, if adopted, would contribute to turnout? To answer these questions, this research uses survey data collected in 2011. Section 2 will examine extant literature, revealing whether e-voting can achieve some policy goals. Section 3 presents the research method and data. Section 4 is data analysis. Section 5 will conclude this research.

## Literature Review

We can investigate the benefits of e-voting from three aspects: economy, technology, and politics.

According to Riera and Brown (2003) and Gerlach and Gasser (2009), the most obvious economic benefit of e-voting is reducing the cost of election administration. The traditional ballot-voting requires high cost of printing, and it takes time to count ballots. Although it is costly to design and manufacture voting machines or internet-voting, but in the long term the cost can be compensated as more and more elections are administered by machines or software. Indeed, e-voting allows citizens to vote anywhere they go, which reduces significantly the transportation cost of going back to vote in their hometowns. Overall, e-voting contributes to economic benefits (Esteve 2006). Certainly, it is never easy to estimate it exactly.

From the perspective of practice, the administration of polling stations is not professional. There are a lot of disputes regarding the invalid ballots, which could get worse when the margin is so small that people may challenge the election result (Luoh 2006). Florida, Kimball and Kropf (2004) examine aggregate-level data and their analysis shows that use of touch-screen voting machines and counting machines in the 2004 presidential election indeed contributes to smaller number and percentage of invalid votes. That proves the assistance of technology to election administration successful.

In addition to economic benefits and practice, participation is another major incentive to promote e-voting, which is also one of major concern of political scientists. In many democratic countries, it is difficult to ignore the declining turnout rate (Green and Gerber 2004). According to the approach of rational choice, voting entails costs. When one calculates his benefits from voting and find that it is smaller than cost, he may choose not to vote (Downs 1957, Tulloch 1968, Riker and Ordeshook 1968). As such, reducing cost of voting could be the most important contribution of e-voting (Dubin and Kalsow 1996). In particular, e-voting is convenient for the handicapped people that could not participate in elections as easy as ordinary people (Esteve 2006). Besides, higher educated people and economically well-off people have better access to resources. Therefore, their cost of voting is relatively lower than others. (Campbell et al. 1960, Wolfinger and Rosenston 1980, Verba et al. 1995). Accordingly, we assume that e-voting not only helps handicapped people

participate in elections but also raise voting intention of ordinary citizens. (Houston et al. 2005).

If we take digital divide into account, however, we should not be too optimistic about the possible positive impact through empirical tests (Norris 2001). First of all, young people or people living in the urban area are more familiar with computers than older people or people living in the rural area. Secondly, using voting machines may commit errors when people vote for too many positions or they want to change their voting choices (Herrnson et al. 2006). The product of voting errors and digital divide is noteworthy. Certainly, we cannot only blame voting machines or relative hardware; software and human factors such as staffs in the polling stations should be considered. Glasser et al. (2007) suggest that the number of staffs who can assist people to vote is critical to reduction of incorrect vote. American experience shows that polling stations without any help of staffs. The HAVA bill in 2002 requires that voting machines should be electronic at least. However, Stewart (2011) finds that there are many controversies due to adopting electronic voting machines and abandoning paper ballots.

All in all, we should not assume a linear relationship between reducing cost of voting and turnout rate. People who tend not to vote may not increase their motivation to vote only because more convenient way to vote is introduced. Absentee voting and mail voting is found to have limited impact on turnout rate because people who use these methods are interested in politics and they would vote anyway (Southwell and Burchett 1997, Kenski 2001, Trechsel 2007). We need to bear in mind that political interest, political efficacy, and civic duty, which represent the interaction between individuals and political environment, are influential (Glenn and Grimes 1968; Verba and Nie 1972).

E-voting includes voting in the polling stations by using voting machines and voting somewhere through internet. Kenski (2005) and Houston et al. (2005) have found that internet voting may increase young people's intention to vote; those people are less willing to vote otherwise. Trechsel et al. (2003) also find that over thirty percent of respondents agree that internet voting will increase their likelihood of voting participation. Despite that, people express their concern over internet voting due to identification problem and security issue (Kenski 2005). Previous examples of internet voting indicate that internet voting does not significantly increase turnout rate. In 1999, for example, Arizona adopted internet voting in the primary election of Democrats. Gibson (2001) cites three days of advertisement for a little higher turnout rate. Lee et al. (2008) look at the internet voting in the student union election of National Chengchi University. In the pre-election poll, most respondents plan to use internet voting. But the election result turns out that fewer people participate in the election through internet than expected.

To summarize, there are three possible incentives of adopting E-voting. First of all, E-voting can reduce measurable cost of election administration. However, there are more important reasons than economic benefits. Secondly, voting machines may reduce the errors of vote counting, such as invalid votes.

Besides, voting machines make absentee voting easier. However, people still need to go to the polling stations to vote, which still needs involvement of election staffs. Last, internet voting may reduce the cost of participation, thereby encouraging political participation and increasing representation of elected officials. It remains an open question, however, regarding the effect of E-voting on political participation, especially for the young generation.

In sum, previous experience of E-voting suggests that reducing errors and encouraging political participation is the major reason of developing E-voting. To some degree, reducing the number of invalid votes or standardizing the definition of invalid votes may contribute to political participation and facilitating representation of elected officials indirectly. These two major concerns construct our interviews.

### Survey Data and Findings

Thanks to the Central Election Committee, we conducted a telephone interview on September 2011, using stratified sampling design. Our target population is people who are more than 20 years old. The number of completions is 1,229. We ask respondents about their attitudes toward both voting by machines and internet voting. To avoid confusion, we explain to them about the difference about two types of E-voting.

Before asking whether people can accept E-voting, we explore the level of satisfaction with current election administration, including casting ballots and manual vote counting. Figure 1 shows that the majority of people, 75.9 percent, are either satisfied or very satisfied with current procedures of voting and vote counting. This result implies that people may not have strong incentives to change the current system, partly because the election result can be tallied four hours after the polling stations are closed. Certainly, relatively small number of eligible population is one of the reasons of fast vote counting.

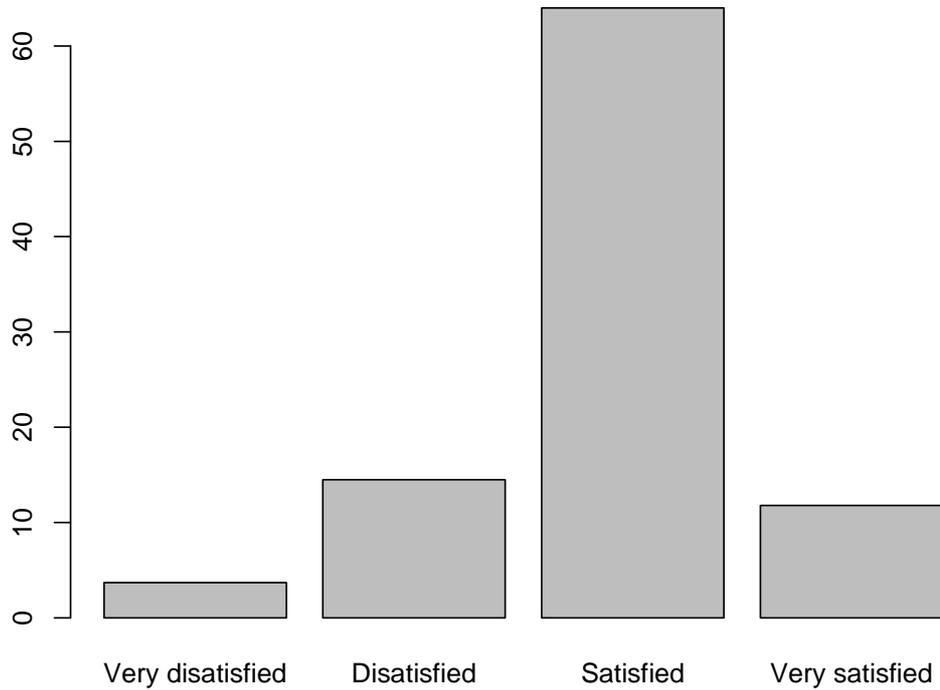


Figure 1. Attitude toward Current Voting System

Furthermore, we intend to know if citizens would prefer either type of E-voting, which are hypothetical for the time being, over the current voting system. We assume that people may choose E-voting if they agree that it is more convenient than casting paper ballots. Figure 2 shows that voting on machines could be as convenient as casting paper ballots and manual vote counting. But internet voting is not considered convenient compared to current voting system.

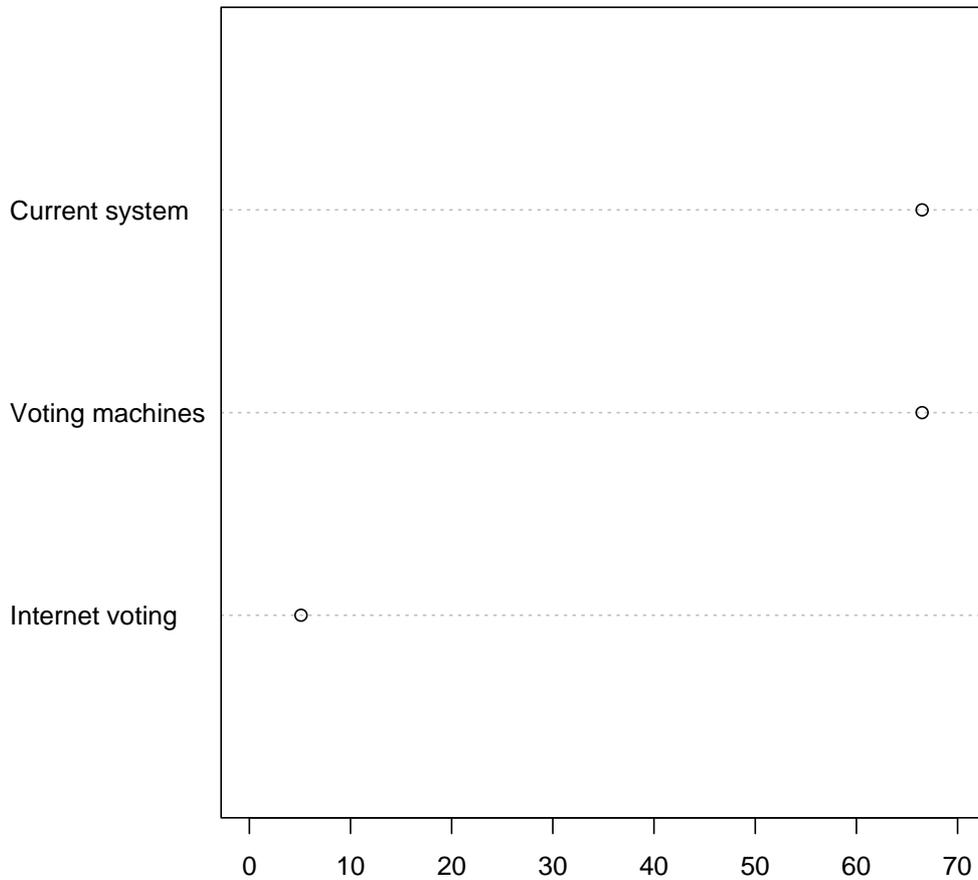


Figure 2. Comparison of Three Voting System

Note: Dots represent the percentages of people who agree that a specific voting system is convenient.

Using cross-tabulation analysis, we are able to observe the bivariate relationship between digital divide and people's support for internet voting. Figure 3 shows that only thirty percent of people who never use computers agree that internet voting is convenient. As for people using computers everyday, about 64 percent of them agree that internet voting is convenient. It is apparent that the more familiar people are with internet and computers, the more convenient they feel about internet voting. Digital divide indeed influences attitude toward internet voting, and perhaps E-voting.

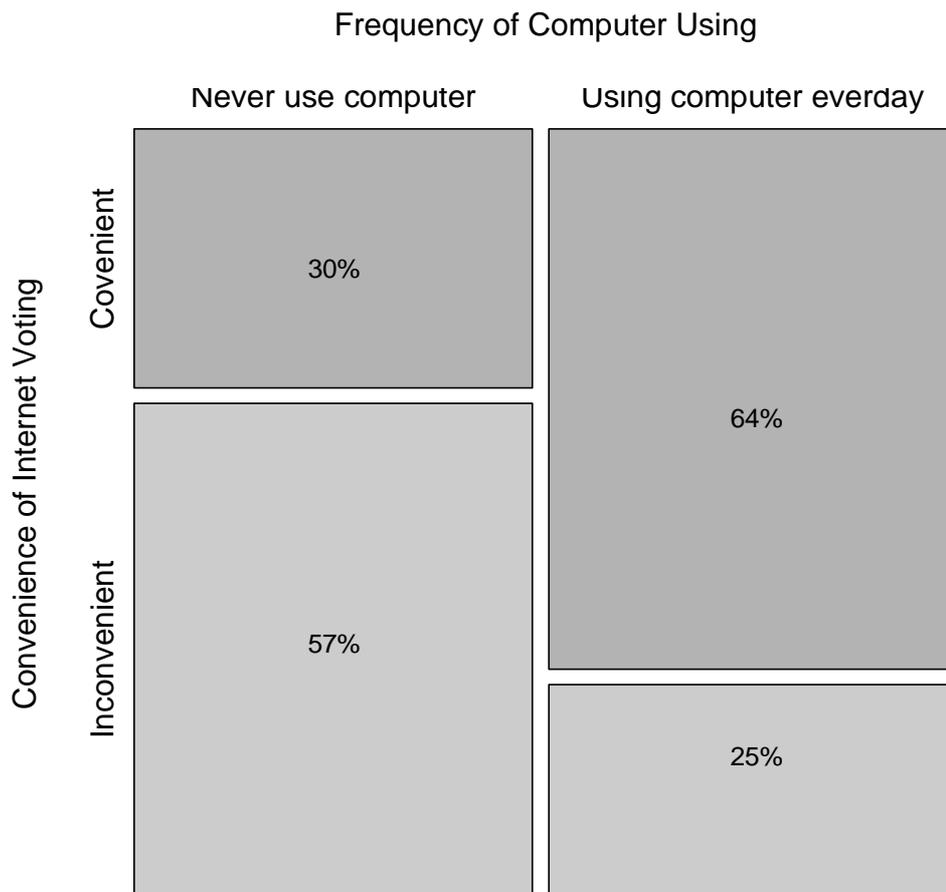


Figure 3. Frequency of Computer Using and Attitude toward Internet Voting

We assume that the perception of counting errors may affect the extent to which people support each type of voting systems. People should support the voting system that commits minimal counting errors, though E-voting has not been put in practice yet. Figure 4 shows the comparison of three voting systems in terms of the likelihood of counting errors perceived by respondents. There are 51 percent of people agree that current voting system is not likely to commit counting errors, but there are 38 percent of people agree that current voting system could commit counting errors. This result is a bit surprising in that only half of people are totally confident with current voting system. In contrast, over 60 percent of people agree that voting machines could avoid counting errors. However, only 35 percent of people agree that internet voting may be able to commit less voting errors than current voting system does; more than 50 percent of people are skeptical about reliability of internet voting.

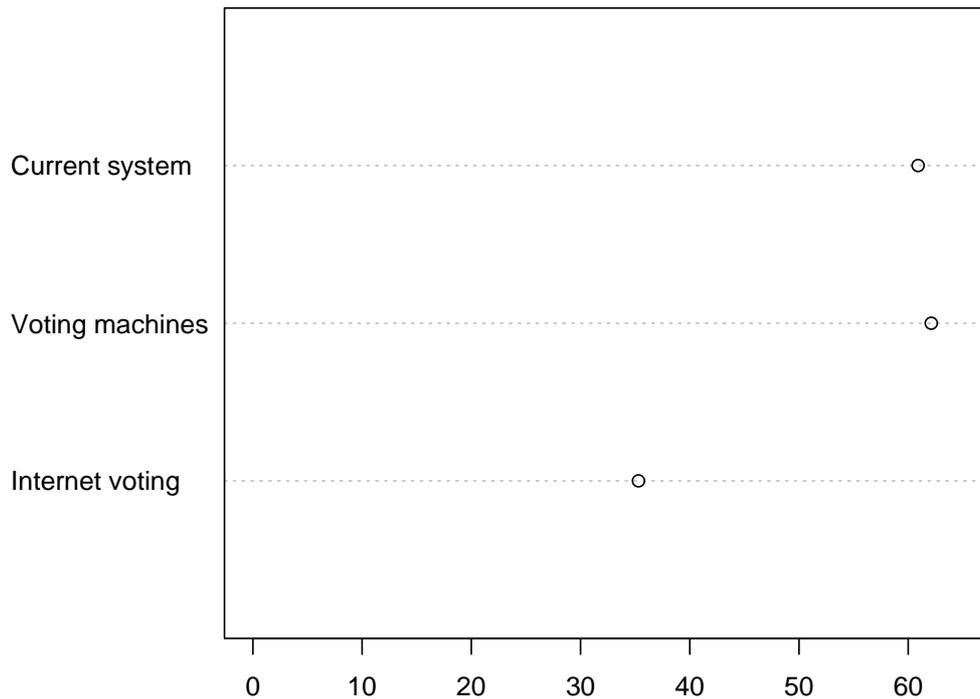


Figure 4. Counting Errors and Types of Voting System

Note: Dots represent the percentages of people who agree that a specific voting system could avoid counting errors.

Cheating and system security is another issue of selecting voting systems. It is very important to assure that neither staffs in the polling stations nor outsiders are able to change the election results before and after the election is finished. In particular, neither current voting system nor E-voting is administered without internet transmission and computer systems, each of which cannot exclude the possibilities of hacking, bugs, and system breakdown. As for traditional ballot counting, switching ballot boxes, intentionally tainting valid ballots, and even hiding part of ballots was common cheating before. Figure 5 shows that about 49 percent of respondents agree that current voting system is free of cheating. Meanwhile, almost 46 percent of people think that current voting system should be secure. It is not a surprise to find that the least secure voting system people perceive is internet voting; only 15 percent of people perceive that internet voting is secure. As for voting machines, only 38.5 percent of people agree that voting machines are secure but over 50 percent of people are skeptical about voting machines.

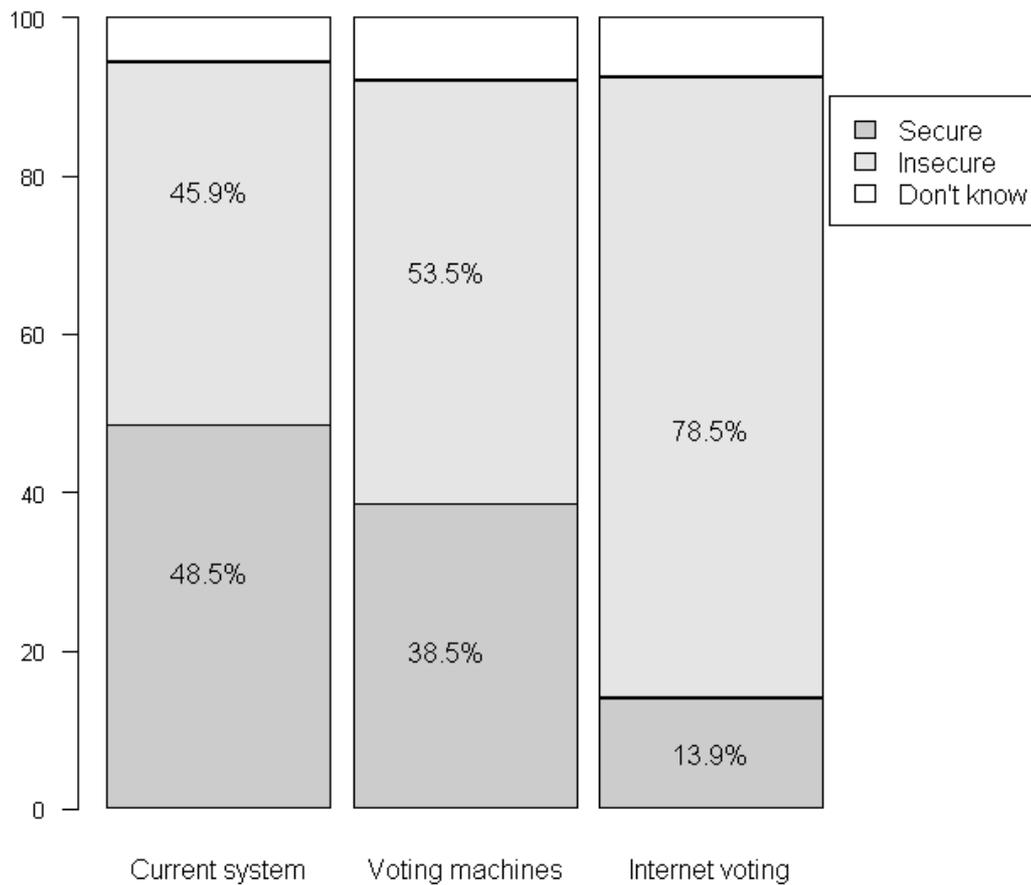


Figure 5. Security and Types of Voting System

Last, we ask respondents whether they could trust each of voting systems. Figure 6 shows that over 60 percent of respondents trust current voting system. As for E-voting, neither voting machines nor Internet voting is trusted by more than 50 percent of people. It implies that most people are not confident with E-voting even though they may agree that voting machines are convenient and error-free. Probably people need more experience of using new technology especially for elections before they find it trustworthy.

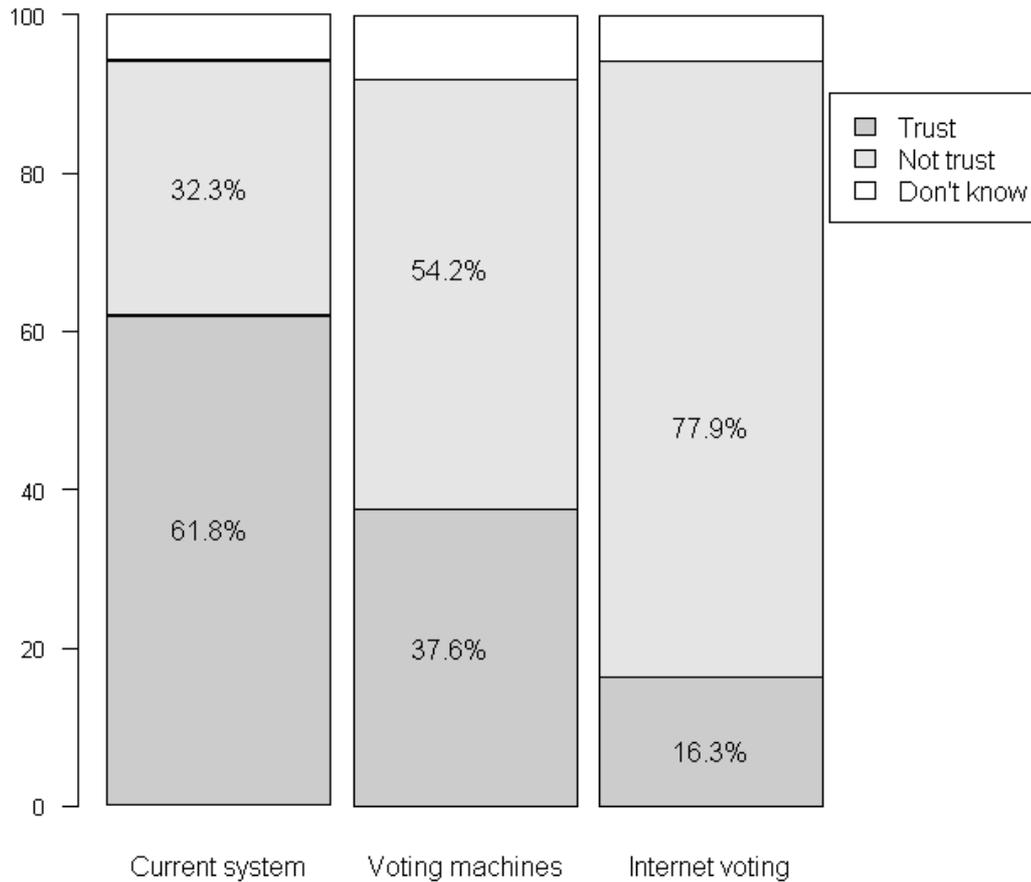


Figure 6. Proportion of Trust on Each Type of Voting Systems

The above empirical findings suggest that, first, people are very satisfied with current voting system, while they believe that technical problems such as counting errors and security concern exist. Our second finding is that most people agree that voting machines can make voting more convenient. However, the security concern remains critical and trust in voting machines is modest. Our third finding is that digital divide influences some people’s assessment of convenience of E-voting. They may refrain from accepting E-voting because they rarely use computers.

After evaluating differing types of voting system, we attempt to assess the number of people who might turn out to vote if E-voting is adopted. Figure 7 shows that most people would remain the same. Only 16 percent and 17 percent of people would increase their voting intention if we use voting machines or internet voting respectively. However, 20 percent of respondents indicate that they would be reducing their intention to vote if voting machines are employed. Internet voting is less welcomed by respondents; 32 percent of people express their unwillingness to participate in elections once Internet voting is adopted. In other words, we are not optimistic about the effect of E-voting on turnout rate.

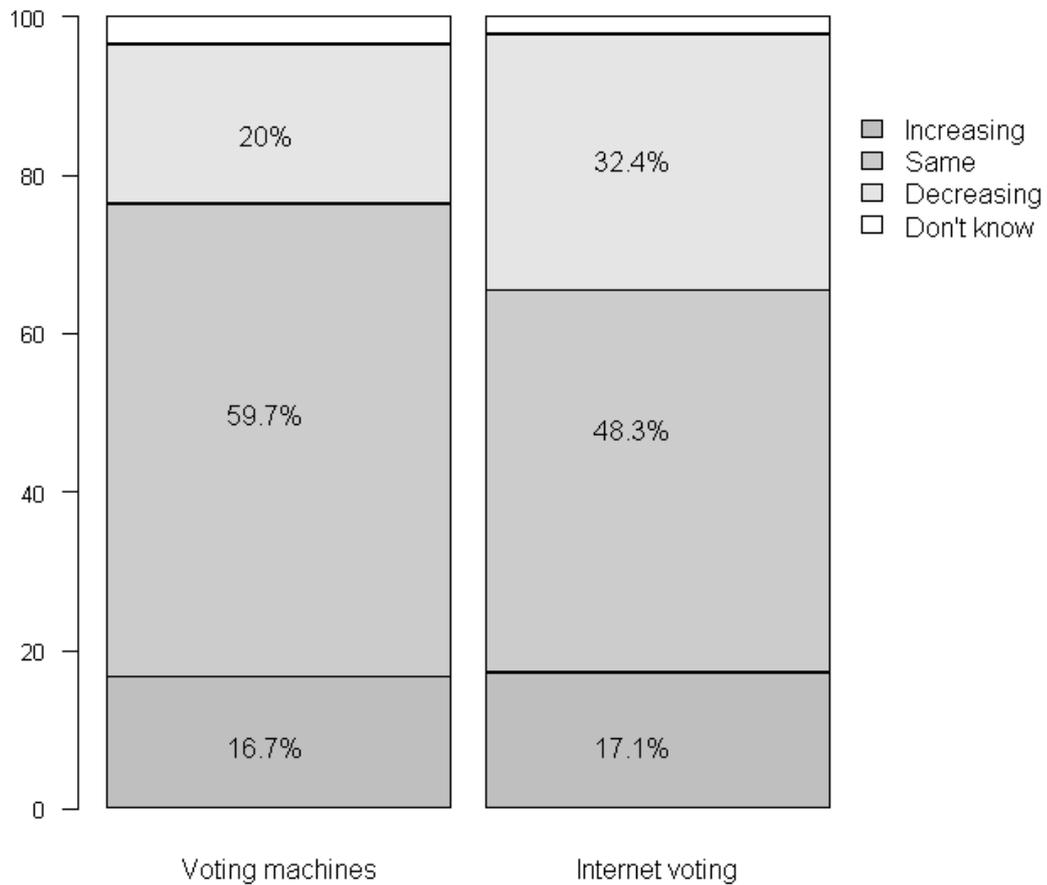


Figure 7. Voting Intention and E-Voting

We run a multivariate analysis to explore the determinants of voting intention due to E-voting? Because the dependent variable, whether people would turn out to vote, abstain, or remain the same, is ordinal-level, we use ordered-logit model to estimate the effects of independent variables. We set up a group of variables for evaluation on voting systems, including level of satisfaction with current voting system, perceived convenience of either voting machines or Internet voting, counting errors about E-voting, security about E-voting, and trust in E-voting. We also set up two dummy variables for frequency of voting. The first one is for people who sometimes turn out, and the second one is for people who never turn out. The third group of variables measures the level of digital divide. The first one of them is the frequency of using computer, and the second one is whether respondents use computers to file tax. In addition, we include some background variables, such as partisanship, gender, age, education, and occupation. In particular, we assume that people who support the opposition party would be less likely to vote than other people because they may not trust any new measures of voting.

Table 1 shows that the more convenient, secure, precise, and trustworthy people feel about E-voting, the higher level of intention of voting they have. If they are satisfied with current voting system, however, they would not be likely to vote for adopting E-voting. The positive finding is that people who never turn out to vote may participate in the election because of new E-voting. Finally, people who have file tax on-line are likely to turn out to vote. In contrast, senior citizens, less educated people, and supporter of the opposition party may decrease their intention to turn out if E-voting is adopted.

**Table 1. Ordered Logit Model of Voting Intention after Adopting E-Voting**

Coefficients	Voting machines (1=decreasing, 2=same, 3=increasing)	Internet voting (1=decreasing, 2=same, 3=increasing)
<b>Evaluation of voting systems</b>		
Satisfaction with current voting system	-.25 (.10)**	-.27 (.10)**
Convenience	.57 (.09)**	.64 (.08)**
Precision	.51 (.11)**	.24 (.09)**
Secure	.0005 (.11)	.21 (.11)*
Trust	.50 (.13)**	.35 (.12)**
<b>Voting participation</b>		
Vote all the time	-----	-----
Vote sometimes	.08 (.15)	.71 (.15)**
Never vote	.81 (.37)**	1.49 (.38)**
<b>Digital divide</b>		
Frequency of using computers	.01 (.08)	.26 (.07)**
Filing tax	.35 (.16)**	.47 (.16)**
<b>Demography</b>		
Female	.20 (.14)	.35 (.13)**

Age	-.22 (.07)**	-.24 (.06)**
Education	.14 (.07)**	.19 (.07)**
Occupation (white collar)	.19 (.16)	-.12 (.16)
<b>Partisanship</b>		
Pan-blue	-----	-----
Independents	-.12 (.16)	-.48 (.16)**
Pan-green	-.49 (.18)**	-.46 (.18)**
Cut point 1	1.60 (.59)	2.08 (.55)
Cut point 2	5.76 (.63)	5.51 (.58)
N	964	975
Pseudo R2	.22	.25

Note: Standard errors are in parentheses. Significance level: \*  $p < 0.1$ , \*\*  $p < 0.05$ , two-tailed test.

## Conclusion

Bushsbaum (2004) suggest that E-voting should be part of e-government structure. He argues that in the future governance should be connected with technology so that government can receive and transmit messages more efficiently. Once E-voting is adopted, the mass public can participate in policy-making more easily. Rupp (2004) also calls for e-government that can deal with people' s demands more effectively and allow people to participate in policy decisions through various channels, including E-voting. Development of democracy should be more successful with E-voting.

Technology must be integrated into humanity when we adopt it. In Taiwan, E-voting probably can bring up economic benefits, such as reducing cost of printing ballots and error of counting. However, trust in new technology is the major concern. We find that most people will not increase their voting intention once E-voting is taken. Our multivariate analysis also shows the existence of digital divide in terms of filing tax on-line and, more broadly, education. The implies that E-voting can take place only when government invites less educated, senior, and less connected people to broader engagement of governance through internet and digital devices.

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