



저작자표시-비영리-변경금지 2.0 대한민국

이용자는 아래의 조건을 따르는 경우에 한하여 자유롭게

- 이 저작물을 복제, 배포, 전송, 전시, 공연 및 방송할 수 있습니다.

다음과 같은 조건을 따라야 합니다:



저작자표시. 귀하는 원저작자를 표시하여야 합니다.



비영리. 귀하는 이 저작물을 영리 목적으로 이용할 수 없습니다.



변경금지. 귀하는 이 저작물을 개작, 변형 또는 가공할 수 없습니다.

- 귀하는, 이 저작물의 재이용이나 배포의 경우, 이 저작물에 적용된 이용허락조건을 명확하게 나타내어야 합니다.
- 저작권자로부터 별도의 허가를 받으면 이러한 조건들은 적용되지 않습니다.

저작권법에 따른 이용자의 권리는 위의 내용에 의하여 영향을 받지 않습니다.

이것은 [이용허락규약\(Legal Code\)](#)을 이해하기 쉽게 요약한 것입니다.

[Disclaimer](#)

경제학석사 학위논문

**The Effects of Mandatory Voting Rule
and Electoral Turnout on Government
Welfare Spending**

의무 투표 제도와 투표율이 정부 복지 재정에
미치는 영향

2017년 2월

서울대학교 대학원

경제학부 경제학 전공

황유선

The Effects of Mandatory Voting Rule and Electoral Turnout on Government Welfare Spending

Yooseon Hwang

Department of Economics

The Graduate School

Seoul National University

Abstract

This paper explores the link between mandatory voting rules and government welfare spending, applying the Median Voter Theorem. In a voluntary voting system, the median voter's income is likely to be higher than the median income of the population because high-income people are more likely to vote than low-income people. However, under a mandatory voting rule which obligates people from every income level to vote by law, the median voter's income would be lower than the median voter's income under a voluntary voting rule. According to the Median Voter Theorem, the preference of the median voter is pivotal in government policies; thus, more low-income voters in a mandatory voting rule would expand government welfare spending. Using Two-Stage Least Squares estimation with cross-country data averaged between 1990 and 1998, I find that mandatory voting increases government welfare spending indirectly via turnout. Furthermore, consistent with previous literatures, findings confirm that turnouts are higher when sanctions on non-voters are harsher in mandatory voting rules.

Keyword: mandatory voting rule, electoral turnout, welfare spending, political institution

Student Number: 2014-22307

Contents

1. Introduction.....	1
2. Literature Reviews	3
2.1. Mandatory Voting Rule and Turnout.....	3
2.2. Electoral Turnout and Welfare Spending	4
2.3. Mandatory Voting Rule, Inequality and Welfare Spending.....	5
2.4. Direction of this paper	6
3. Theory and Hypothesis.....	8
3.1. Median Voter Theorem.....	8
3.2. Median Voter Theorem with Mandatory Voting Rule.....	9
4. Data and Methodology	11
4.1. Data	11
4.2. Variables	11
4.3. Methods.....	12
4.3.1. Ordinary Least Squares	12
4.3.2. Two-Stage Least Squares.....	13
5. Results and Robustness Check	15
5.1. Results	15
5.2. Robustness Check	18
6. Limitations and Policy Implications	20
7. Appendix	21
8. References	29
Abstract in Korean	34

Tables in Appendix

Table 1: Mandatory Voting Countries	21
Table 2: List of Countries	22
Table 3: List of Countries (<i>gastil</i> \leq 3.5)	23
Table 4: Summary Statistics for Voluntary Voting Countries	24
Table 5: Summary Statistics for Mandatory Voting Countries	24
Table 6: Correlation	25
Table 7: OLS Regressions	26
Table 8: 2SLS Regressions	27
Table 9: 2SLS Regressions (Robustness Check)	28

1. Introduction

Nowadays, countries face serious threats of political apathy. According to an article in the Economist (2014), political participation especially from the young people and the minority has never been high throughout history. However, active political participations of all segments of the society is crucial for governments to devise policy measures that can incorporate needs of the population. To tackle political apathy, countries with low turnouts have employed numerous measures such as voter-friendly registration, absentee voting and weekend voting. One of the intriguing policies which Lijphart (1997) phrases as “*the strongest of all the institutional factors*” is Mandatory Voting Rule (MVR) where citizens are obligated to cast ballots by law. Belgium and Argentina are one of the first countries which introduced MVR in 1892 and in 1914 respectively; however, Netherlands and Venezuela abolished MVR in 1963 and in 1994 (IDEA, 2002).

27 countries in the world currently mandate voting by imposing sanctions on non-voters as shown in table 1 (Panagopoulos, 2008). Types of sanctions include explanation, fine, possible imprisonment and disenfranchisement (Pintor and Gratschew, 2002). For example, in Belgium, one’s failure to vote in at least 4 elections within 15 years results in disenfranchisement; in Peru, not carrying a voting card disables one from obtaining goods or services in public offices (Pintor and Gratschew, 2002). Furthermore, Australia imposes penalty fines; and Cyprus and Chile prohibit non-voters from making public transactions, such as banking for three months (The Electoral Commission, 2006). Thus, turnouts in mandatory voting countries are expected to vary depending on types and degrees of sanctions. Belgium and Netherlands which strictly enforce mandatory voting rules have average turnouts well-above 90 percentage points (The Electoral Commission, 2006). Australia also has one of the most-well functioning mandatory voting rule, i.e., 74 percent of Australian adults are in favor of MVR (Australian Electoral Commission, 1996). However, high turnouts in those countries may not be the sole product of MVR; combinations of mobile polling, overseas polling and Saturday voting in Australia may all contribute to its high turnouts (Mackerras and Mcallister, 1999).

President Barack Obama in his recent speech at University of Chicago Law school, has mentioned that if mandatory voting were introduced in United States, it would bring “*transformative*” impacts on turnouts and policies (The Guardian, 2016). However, opinions diverge in discussing merits and ethics of MVR. Advocates contend that an ideal form of democracy should promote greater representation of citizens. Thus, MVR which mobilizes greater number of voters across diverse socioeconomic groups, offers greater legitimacy to the elected body of government. Second, by instilling people with the sense of civic duty, MVR motivates people to educate themselves politically. Third, politicians can make better uses of the monetary resources which would have been spent to promote voting in voluntary voting rules (Pintor and Gratschew, 2002). However, critics argue against MVR for following reasons. First, an act of forcing people to vote is inconsistent with democratic freedom because the right to not vote should also be preserved. Second, MVR may have counterproductive effects such as increase in invalid or blank votes. For instance, in Belgium, the levels of abstention and invalid votes were found to be strongly related to socioeconomic status despite the enforcement of MVR (Power and Roberts, 1995). Therefore, factors such as education and wealth still can be important factors deciding who would vote even in mandatory voting countries. Third, even without mandating people to vote, some of the voluntary voting countries are capable of enjoying high and stable turnouts, e.g. Malta.

Therefore, the discourse of mandatory voting rule depends on its implication on turnouts and policy issues. To add on to current discussions of mandatory voting and its implication on policy issues, this paper intends to inspect welfare consequences of mandatory voting rules.

2. Literature Reviews

2.1. Mandatory Voting Rule and Turnout

A substantial body of research in political science has been devoted to analyze the extent to which mandatory voting rules expand electoral turnouts. Studies utilize binary or categorical variables to indicate the existence of MVR and the level of sanctions on non-voters. When mandatory voting countries are compared to voluntary voting countries, they have about 10-13 percentage points higher turnout rates, *ceteris paribus* (Powell 1980; Jackman 1982); and Franklin (1996) finds a difference between two types of electoral systems to be 7 percentage points. Some cross-national studies have taken a step further by differentiating mandatory voting countries by the enforcement of sanctions. Birch (2009) reports that if MVR is complemented with sanctions, it attributes to turnout by 12 percentage points. On the other hand, Blais (2006) finds that if MVR is only symbolically existent in the constitution, it has no significant impact on turnouts. Furthermore, the strength of sanctions also plays significant role in affecting turnouts. Panagopoulos (2008) categorizes sanctions into four types, i.e., *no/low*, *moderate*, *high* and concludes that harsher punishments are more effective in raising turnouts.

Country-specific and region-specific studies also reveal a positive association between MVR and turnout. Latin American countries which mandate voting have 6.4 and 6.2 percentage points higher turnout rates during legislative elections and presidential elections respectively (Fornos, Power, Garand, 2004). Moreover, Smith (1999) and Franklin (2001) report over 30 percentage points higher turnout rates in mandatory voting countries during European Union parliamentary elections. In Australia which has one of the oldest tradition of mandatory voting, state assembly turnouts are increased by 23 percentage points (McAllister, 2007). It should be noted that the extent to which mandatory voting contributes to turnouts is prone to vary more with country- or region-specific studies than with cross-country studies.

2.2. Electoral Turnout and Welfare Spending

Demographic characteristics of voters are crucial components for government to devise welfare policies. Hence, numerous scholars have explored the dynamics of demographic characteristics of non-voters and voters and their implications on government policies. Hastings (1956) and Schattschneider (1960) point out that one's choice to vote is highly linked to one's socioeconomic status such as wealth, education, marital status and family background. Since socioeconomic status of voters and non-voters are likely to diverge, each group's needs regarding welfare policies are also different (Verba, 1993). In exploring the implication of class-based voting on welfare policies, some studies have used turnout as a proxy variable for measuring the extent to which less-well-to-do citizens vote; in other words, they assume that when turnout are higher, more low-income people have voted. However, other studies which are skeptical of using turnout as an indirect measure for lower-class mobilization instead directly measure the proportion of low-income voters. I elaborate on those two types of studies in following paragraphs.

Rosenstone and Mark (1993) and Lijphart (1997) consider low turnouts to be indicative of the unequal political participation which is skewed toward more privileged members of the society. Hence, declining turnouts throughout history hint at multiplying socioeconomic inequality and systematic policy biases (Lijphart, 1997). By analyzing countries between 1990 and 1998, Fumagalli and Narciso (2012) conclude that improving turnout gives rise to more generous welfare spending because higher turnouts are associated with more low-income voters. Other studies (Husted and Kenny, 1997; Mueller and Strattman, 2003) similarly confirm that lower-class-voting, poll tax and removal of literacy test broaden welfare expenditures.

There are handful of literatures which use the direct measure of lower-class mobilization. Hill and Leighley (1992) cast doubt on the assumption that turnout and class-based voting are necessarily correlated. Thus, they use U.S election data which directly report relative turnout ratio of lower- and upper-income citizens in each state. From the data, Hill and Leighley (1992) conclude that relatively higher representation of lower-income voters to upper-income voters stimulates state

welfare expenditures and benefits. For more comprehensive analysis, Hill, Leighley and Hinton-Andersson (1995) enlarge their database to cover U.S elections during 1978-1990 with which they again confirm that disproportionate representation of higher-class citizens suppresses the level of government redistributive spending. Their study contributes to existing literatures by making two further conclusions. First, the positive effect of mobilizing less well-to-do citizens on welfare generosity has declined since 1980s; and second, such effects are stronger with higher party competition.

2.3. Mandatory Voting Rule, Inequality and Welfare Spending

Despite Lijphart (1997)'s proposition that mandatory voting can be a powerful mechanism through which political and economic equality can be achieved worldwide, studies directly linking mandatory voting rules with policy issues are rather scarce. I introduce some of the existing literatures which explore the implications of mandatory voting on inequality, government spending and government welfare spending in following paragraphs.

Not only are evidences studying the impact of MVR on inequality scant but also the results from empirical studies are rather mixed. Cross-country study indicates that countries with strictly enforced MVR have on average 3.7 points lower Gini indices than those with voluntary voting rule (Chong and Olivera, 2005). Similarly, in Venezuela which had abandoned mandatory voting rule since the mid 1990, income inequality has shrunken (Carey and Horiuchi, 2013). However, the effect of non-monetary penalty on non-voters in Brazil is found to be twice the stronger on educated citizens than on uneducated citizens, suggesting that MVR may have differential effect on one's likelihood of voting by education status (Cepaluni and Hidalgo, 2016).

In linking MVR to government spending, scholars have applied either the Pressure Group Theory or the Median Voter Theorem. Contending that two alternative theories can have opposing effects on central government consumption, Crain and Leonard (1993) empirically shows that MVR slows the growth of

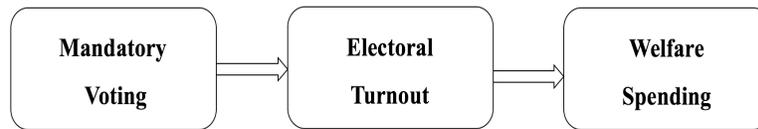
government spending. They also note that the Pressure Group Theory has a stronger impact than the Median Voter Theorem. However, O'Tool and Strobl (1995) claim that the use of Median Voter Theorem and the central government consumption is inappropriate. Instead, they use central government expenditure rather than central government consumption and apply the Pressure Group Theory. Their empirical findings reveal that mandatory voting positively affects Education, Health and Housing&Transfers spending whereas it negatively affects Economic Services spending. Despite their novel approach, applying the Pressure Group Theory may not be enough to explain how MVR affects each component of government expenditure differently.

There are even scantly empirical studies associating mandatory voting and welfare spending. Most of the studies do not employ empirical methodology, except for Fowler (2013) who explores the consequence of mandatory voting on Australian pension spending in comparison to OECD countries. His synthetic control approach supports that MVR is responsible for increasing pension spending by 0.41 percentage point of GDP. In addition, Hill (2000), in her descriptive study, argues against abandoning mandatory system in Australia because '*political shyness*' in voluntary system can jeopardize the welfare of economically vulnerable members. Hill (2002) further suggests that introducing reforms such as excusing genuine conscientious objector and re-conceptualizing fine system to make mandatory voting more feasible.

2.4. Direction of this paper

Although existing body of research focuses mostly on the effects of mandatory voting on turnout, government spending or inequality, an important policy issue pertinent to government welfare policies has largely been neglected. The amount of welfare spending is one of the crucial measures to gauge how governments cope with increasing inequality between the rich and the poor, the old and the young or the majority and the minority. Hence, studying the implication of mandatory voting on welfare spending is a necessary step to analyze whether it can better accommodate to the growing demands of welfare programs. This paper fills the void by connecting mandatory voting with both turnout and welfare spending. I

make two propositions. First, more severe sanctions have greater impacts on turnouts. Second, mandatory voting rule stimulates governments welfare spending through redistribution indirectly via electoral turnout.



3. Theory and Hypothesis

3.1. Median Voter Theorem

Hotelling (1929) argues that policies held by politicians or candidates are likely to converge during elections, which is analogous with businesses in competition producing similar goods. Black (1948) expands on the idea of Hotelling (1928) and formalizes the Median Voter Theorem (MVT). He puts that with majority rules and single-peaked preferences, the preference of median voter is pivotal in policy formulation. Anthony Downs (1957) further elaborates on the idea of Black by showing that with proximity-based preferences and two party structures, competition between parties would lead them to accommodate the preference of the median voter (Downs, 1957). Thus, Downs links Hotelling's theory of candidates' policies with Black's theory of the median voter's preference. By assuming that preferences of individuals are single-peaked and policy options can be represented in a single dimension, Downs shows that the preference of median voter would be pivotal in government policies (Downs, 1957).

Down's celebrated model of the Median Voter Theorem has long been utilized and applied to assess the implication of voting process on income redistribution, e.g., Roberts (1977), Meltzer and Richard (1981) and Lindbeck and Weibull (1987). Their income redistribution model makes few assumptions. First, redistribution and taxation are the only government activities. Second, budget is balanced. Third, voters are fully informed of how governments redistribute. Fourth, benefits are distributed in a lump-sum amount. Fifth, the median voter is decisive in policy formations (Meltzer and Richard, 1981). If n denotes the total population, t , the tax rate and μ , the mean income, the total tax would be $tn\mu$ and the per capital benefit would be tn . Hence, people with income less than the mean would prefer higher tax rate while those with income higher than the mean would prefer lower tax rate (Meltzer and Richard, 1981). It should also be noted that income distributions in almost all countries are skewed to right with the median income lying lower than the mean income. Therefore, if everyone votes, the government would levy a positive tax rate because the median voter in the skewed-to-the-right income distribution earns less than the mean voter.

$t = \textit{tax rate}$	}	$tN\mu = \textit{Total Revenue}$
$N = \textit{number of citizens}$		$t\mu = \textit{Per capita benefit}$
$\mu = \textit{mean income}$		

3.2. Median Voter Theorem with Mandatory Voting Rule

Unlike the highly idealistic society in which everyone votes, electoral turnouts in all countries lag far behind. Electoral studies have consistently confirmed that systematic differences exist between voters and non-voters in regards to wealth, age and education. In a seminal analysis of demographic characteristics of electorates, *Who votes?* (Wolfinger and Rosenstone, 1980), voters and non-voters are distinguished on the basis of education, age, registration laws, personal backgrounds (i.e. marriage, kids) and occupation; voters tend to be wealthier, more educated and older. Beranmany and Anderson (2008) and Solt (2010) add on to the discourse of non-voters and voters by finding that inequality also suppresses political participation especially among under-privileged population.

When voters are different from non-voters, voting population is unlikely to be representative of the entire population. Such electorates are prone to over-represent people with more wealth and better socioeconomic status. Thus, under a voluntary voting rule, the median voter's income is expected to be higher than the median income of the entire population. Therefore, under a voluntary voting system, the tax rate which reflects the preference of the median voter would be lower than the tax rate preferred by the median-income citizen.

I now analyze how mandatory voting changes the composition of electorates which in turn influences government welfare spending. For simplicity, assume that a society consists of 40 percent of the rich and 60 percent of the poor. If everyone votes, the tax rate imposed by the government would be positive. However, if the likelihoods of voting are 0.8 and 0.4 for the rich and the poor

respectively in a voluntary voting rule, the tax rate would be lower. Further assume that, with the introduction of MVR, the likelihoods of voting have risen to 0.9 and 0.7 for the rich and the poor respectively. Then, the pivotal voter under MVR would prefer a higher tax rate than the pivotal voter under a voluntary voting rule. This simple mathematics with the Median Voter Theorem shows that mandatory voting makes electorates more representative of the whole population than voluntary voting. Hence, with more representative electorates, mandatory voting expands government taxation and government welfare spending. With the implications of Downsian Median Voter Theorem and mandatory voting rule, this paper introduces two hypotheses. First, harsher sanctions are more effective in enlarging electorates. Second, MVR expands government welfare spending but only indirectly by enlarging electorates; that is, after controlling for the impact of turnout, mandatory voting does not directly affect government welfare spending.

4. Data and Methodology

4.1. Data

The study limits its empirical analysis to lower house elections. Also, I utilize four different datasets. The first and the second datasets are cross-sectional and panel dataset, both of which are compiled by Persson and Tabellini (2003). Each observation in the cross-sectional data corresponds to an average of yearly values during 1990-1998; and that in panel data corresponds to a yearly value in 1960-1998. The third dataset is imported from International Institute for Democracy and Electoral Assistance (IDEA) and is a panel dataset of yearly turnout rates in each country. The fourth dataset is obtained from Panagopoulos (2008) which describes types and degrees of sanctions imposed on non-voters in 27 mandatory voting countries as shown in Table 1 in Appendix.

I combined these four datasets and averaged them over the period between 1990 and 1998. The final dataset covers 51 countries which consist of 19 mandatory voting countries and 31 voluntary voting countries. Mandatory voting countries are further categorized by the degrees of sanction: *No/Low*, *Moderate* and *High*. For electoral turnouts and government welfare spending, I average the values during 1990-1998 or the sub-periods if necessary.

4.2. Variables

Welfare Spending. The percentage value of consolidated central government expenditure to GDP, which are available in IMF-GFS and IMF-IFS, is indicated as *ssw* (Persson and Tabellini, 2003).

Sanctions in MVR. Mandatory voting rules are divided into 3 categories according to the severities of sanctions as following. If no practical sanctions are enforced, it is coded as 1 (Low/No); if fines are given, it is coded as 2 (Moderate); if penalties such as imprisonment or deprivation of privileges (i.e. employment in public offices) along with fines, it is coded as 3 (High) (Panagopoulos, 2008; IDEA, 2001).

Electoral Turnout. The total number of votes casted (valid or invalid) as a percentage value of total number of registration is denoted by *turnout* during elections to the lower houses (IDEA). Each unit corresponds to an average value for each country during the period 1990-1998 or the sub-period if available.

Forms of Government. A dummy variable *pres* is coded as 1 if ‘*the confidence of the assembly is not necessary for the executive*’ in a country (Persson and Tabellini, 2003). Separation and checks and balances of power both are stronger in presidential regimes than in parliamentary regimes (Persson and Tabellini, 2003).

Electoral Rule. A dummy variable *maj* indicates whether a country uses majority rule to all the lower house elections (Persson and Tabellini, 2003).

Colonial Experience. Dummy variables *col_esp*, *col_uk*, *col_oth* indicate British, Spanish-Portuguese and other colonial origin. (Persson and Tabellini, 2003) The variables *col_espa*, *col_uka* and *col_otha* take into account that the influence of colonial heritage fades with time. For instance, $col_uka = col_uk * (250\text{-years of independence})/250$ (Persson and Tabellini, 2003).

Other Variables. Economic, political and demographic factors that are of relevance to government welfare spending are controlled for. Variables *prop1564* and *prop 65* measure a percentage of population who are aged between 15 and 64, and who are aged over 65 respectively; *gastil* denotes civil liberties and political rights with lower values corresponding to better democracies; *avelf* indicates the lack of ethnic and linguistic cohesion; and *federal* indicates the presence of federalism (Persson and Tabellini, 2003).

4.3. Methods

4.3.1. Ordinary Least Squares

First, I rely on OLS estimations to observe the effects of sanctions in MVR both on electoral turnout and on government welfare spending. Model 1 is to confirm that positive the severity of sanctions is positively related with turnout

rates. Model 2 is to confirm the effect of turnout on welfare spending; and model 3 is to observe the degree of mandatory voting sanctions on welfare spending. In Model 4, both *turnout* and *sanction* variables are included in regression as independent variables to see their impacts on government welfare spending. In all the models, the standard errors reported are robust to heteroscedascity.

Model 1:

$$\begin{aligned} \text{Electoral Turnout}_i = & \beta_0 + \beta_1 \text{No or Low sanction}_i + \beta_2 \text{Moderate sanction}_i \\ & + \beta_3 \text{High sanction}_i + \beta_4 \text{Control Variables}_i + e_i \end{aligned}$$

Model 2:

$$\text{Welfare Spending}_i = \beta_0 + \beta_1 \text{Electoral turnout} + \beta_2 \text{Control Variables}_i + e_i$$

Model 3:

$$\begin{aligned} \text{Welfare Spending}_i = & \beta_0 + \beta_1 \text{No or Low sanction}_i + \beta_2 \text{Moderate sanction}_i \\ & + \beta_3 \text{High sanction}_i + \beta_4 \text{Control Variables}_i + e_i \end{aligned}$$

Model 4:

$$\begin{aligned} \text{Welfare Spending}_i = & \beta_0 + \beta_1 \text{No or Low sanction}_i + \beta_2 \text{Moderate sanction}_i \\ & + \beta_3 \text{High sanction}_i + \beta_4 \text{Turnout}_i \\ & + \beta_5 \text{Control Variables}_i + e_i \end{aligned}$$

4.3.2. Two-Stage Least Squares

Despite the handiness of OLS estimation, it treats turnout as exogenous which is a strong assumption. To overcome such limitations of OLS model and to identify the causal dynamics among degree of sanction, turnout and welfare spending, I rely on Two-Stage Least Squares analysis. Instrumental variables used for *turnout* variable are *degree of sanction* and *presidential regime*¹ variables. I present over-identified models with a single endogenous variable and multiple instruments to test the null hypothesis that MVR affects government welfare

¹ Empirical studies of Fumagalli and Narciso (2011) and Persson and Tabellini (2002) show that presidential elections lower turnout rates in national legislative elections.

spending *only* indirectly through electoral turnout. I also present just-identified models where only the *presidential regime* variable is used as an instrument for turnout to confirm that mandatory voting does not have a direct effect on government welfare spending.

5. Results and Robustness Check

5.1. Results

The sample includes total 51 countries which are listed in Appendix Table 2, consisting of 32 voluntary voting countries and 19 mandatory voting countries. Due to the limited data available on turnout rates and government welfare spending, 19 mandatory voting countries remain out of the total 27 countries. Of the 19 mandatory voting countries, 5 countries enforce *no or low* degree of sanctions, 7 *moderate* degree of sanctions and 7 *high* degree of sanctions.

Table 4 and Table 5 display averages and standard deviations of independent and dependent variable among voluntary voting countries and mandatory voting countries separately. As expected, countries with mandatory voting have 5 percentage points higher turnout rates than those with voluntary voting; standard deviations both in voluntary voting and in mandatory voting are around 12 percentage points. Government welfare spending, however is higher in voluntary voting than in mandatory voting. Note that voluntary voting countries have greater proportion of elderly population, better political and civil rights and more UK colonial experience. Furthermore, comparing table 4 and table 5 shows that voluntary voting countries have higher incidence of majoritarian rules and lesser incidence of presidential regimes. Also, the standard deviation of government welfare spending, *ssw* is quite large, implying that there might be independent shocks affecting it (Persson, Roland and Tabellini, 2007). The implications of table 4 and table 5 can be made clearer by observing correlation coefficients in table 6. Consistent with table 4 and table 5, government welfare spending is highly correlated with the proportion of elderlies, the degree of civil/political rights and the ethno-linguistic cohesion. However, the association between government welfare spending and the degree of sanction is uncertain from the correlation coefficients; only *no/low* sanctions are negatively related to government welfare spending, but only weakly. Hence, to analyze the *ceteris paribus* effect of mandatory voting on welfare spending, possible confounding factors related to politics, history and demography should be controlled for.

Model 1 in table 7 observes the effects of sanctions on turnouts using OLS estimations. Consistent with previous literatures, e.g., Blais (2000) and Panagopoulos (2008), the results show that the degree of sanction is strongly related to the level of turnouts and that only *Moderate* and *High* levels of sanctions raise turnouts. The symbolic existence of MVR in constitution with *No/Low* sanctions has no discernible impacts on turnouts. *Moderate* and *High* level of sanctions are related with 14 and 17 percentage point increases in turnouts respectively. Considering that the average turnout in United States is 62% in the dataset, imposing *Moderate* sanctions on non-voters would increase its turnout to 76%. Moreover, in line with Persson and Tabellini (2002), presidential regime and ethno-linguistic fractionalization have significantly negative impacts on turnout both at 0.05 level while UK and Spanish colonial experiences have significantly positive impacts on turnout both at 0.10 level.

Model 2 in table 7 analyzes how turnouts affect government welfare spending. In this model, variables indicating degree of sanctions are excluded. According to the result, increasing turnout by 10 percentage points boosts government welfare spending by 0.7 percentage points of GDP at 10% significance level. This is consistent with previous findings from Fumagalli and Narciso (2012) and Hill and Leighley (1992). They argue that when more low-income people are mobilized to vote, government is more capable of accommodating to the welfare needs of low-income voters. If results combined from Model 1 and Model 2 are applied to the United States., introduction of MVR coupled with *moderate* sanction can raise welfare spending by 1 percentage point of GDP. However, it should be noted that in model 2, the variable *turnout* is taken as exogenous. Hence, the results from OLS regressions are only tentative until we look at 2SLS estimations where the variable *turnout* is treated as endogenous. The coefficients on *majoritarian rule* and *prop65* are also both significant at 5% and 1% significance level which is consistent with Persson, Tabellini and Roland (2007).

Model 3 in Table 7 looks at how the severity of sanction affects government welfare spending. When the variable *turnout* is excluded from the regression analysis in model 3, the degree of sanction does not have any impact on the level of welfare spending. Meanwhile, higher incidence of majoritarian rule

depresses welfare spending at 0.05 level; this is consistent with Persson, Tabellini and Roland (2007) who report that majoritarian rule decreases welfare spending by inducing lower incidence of coalition government. In model 4, the variable *turnout* is included in the regression analysis along with the variables indicating the severity of sanction. Still, the degree of sanction and the level of turnout do not have any significant implications on government welfare spending while the incidence of majoritarian rule and the proportion of elderlies consistently have significant impacts on government welfare spending. However, the findings that the severity of sanctions are not related to government welfare spending might have resulted from number of limitations of OLS analysis. First, turnout is taken as exogenous. Second, results from OLS can merely be interpreted as correlations, not causal effects. Hence, to obtain a clearer picture of the causal relationship as suggested by the theory, 2SLS estimations can be more insightful.

Model 1 and Model 2 in table 8 illustrates results from 2SLS when the severity of sanction and the incidence of parliamentary regime are used as instruments for the level of turnouts. Model 1 include all 51 countries; however, model 2 includes only 45 countries whose *gastil* index is lower than or equal to 3.5 as shown in Table 3. The specification for the first-stage regression is same as Model 1 in table 4. By using the exclusion restriction that the variables *sanction* and *presidential regime* do not enter the second-stage regression, I identify the causal relationship among three variables: *the degree of sanction*, *turnout* and *government welfare spending*.

2SLS estimation from the model 1 in table 8 suggests that the effect of turnout on welfare spending has been under-estimated in OLS analysis. While the coefficient on turnout is 0.07 according to the OLS estimation, that on turnout is 0.11 according the 2SLS estimation. Considering that 2SLS adjusts for the endogeneity of turnout, 2SLS is a more reliable method. Thus, implementing mandatory voting with *Moderate* degree sanction increases government welfare spending by 1.5 percentage point of GDP, and high-degree sanction by 1.8 percentage point of GDP. If we apply the results to Brazil where government welfare spending is 9.6% of GDP, adopting mandatory voting with high-degree sanction would expand welfare spending to 11.4% of GDP. According to Sargan-

Hansen statistics, we cannot reject the hypothesis that both sanction and presidential regime are exogenous. Hence, *Moderate* and *High* sanctions encourage voting participation, which in turn boost government welfare spending. Also, note that the incidence of majoritarian rule has a significantly negative effect and proportion of elderlies a significantly positive effect on government welfare spending which are consistent with OLS estimations.

The model 2 in Table 8 includes countries only if their civil and political rights index, *gastil* is lower than or equal to 3.5, thus analyzing the effect of mandatory voting only among the well-developed democracies. Such specifications are adopted from Persson, Tabellini and Roland (2007) and Persson and Tabellini (2002) who have found that electoral rules and political institutions perform better with the sound democratic institutions. The coefficient of turnout in model 2 is still significant and even higher than in model 1, confirming that higher turnouts are more effective in raising welfare spending if countries have higher civil and political rights. If one of those countries adopt mandatory voting with *High* degree sanctions, turnouts would increase by 19.7 percentage points which in turn can boost government welfare spending by 3 percentage points of GDP. If the results are applied to the United States where per capita GDP is 53000 dollars as of 2013, a switch to MVR would spurt welfare spending by 1590 US dollars per capita. Furthermore, consistent with model 1, lower incidence of majoritarian rule and higher proportion of elderlies expand the government welfare spending.

5.2. Robustness Check

In previous 2SLS analysis in table 8, presidential regimes and sanctions are used as instruments for turnouts. Hence, using a single endogenous variable with multiple instrumental variables, Table 8 uses over-identified models to test that mandatory voting affects welfare spending *only* indirectly through stimulating electoral turnout. To further confirm that mandatory voting rule does not have a direct effect on government welfare spending, I estimate just-identified models where only presidential regime is used as an instrument for turnout in Table 9; thus, the degrees of sanction are treated exogenous in the second-stage regression. Model 1 includes all 51 countries and Model 2 only includes countries with the

gastil indices less than or equal to 3.5. In both models, the effect of turnout on government welfare spending is positive at 10% and 5% significance model. The results reveal that the severity of sanctions has no significant impact on government welfare spending once the endogeneity of turnout is controlled for. Therefore, just-identified models in Table 9 together with over-identified models in Table 8 strongly suggest that mandatory voting expands welfare spending only through enlarging the size of electorates. Moreover, consistent with over-identified models in table 8, just-identified models in table 9 re-confirm that majoritarian rule and elderly population are significant factors affecting government welfare spending.

6. Limitations and Policy implications

Although results from Sargan-Hansen statistics in Table 8 support the hypothesis that the severity of sanction and the incidences of presidential regime are exogenous, one might suggest that the degree of sanction can be endogenous which might not have been captured in the specifications. For instance, certain shocks or institutional characteristics might be related to how strongly sanctions are enforced or how countries initiated mandatory voting rules in the first place. According to the report from Political Studies Association, colonial ties such as Spanish heritage can be related to the adoption of mandatory voting rules. For example, in Switzerland, many cantons have traditionally forced political participation upon citizens. Hence, studying colonial ties and electoral traditions can be a possible breakthrough for research on mandatory voting rules. Another problem arises from the nature of cross section data. Average cross section data can be inadequate to control for heteroscedasticity even though robust standard errors are reported. A possible solution is to utilize panel data on countries² which had abolished mandatory voting rule and analyze whether the abolition has caused any significant changes in government welfare policies.

Numerous critics argue against mandatory voting, contending that it is inconsistent with democratic freedom. However, as people are fined for not wearing seat-belts, for speeding, or for keeping children away from mandatory education requirement, it's time that voting should be taken as lawfully. Politically practical arrangements such as financial penalty would be an effective start to encourage people to vote. Other possible ways of stimulating political participation can be mandating people to attend political education sessions or to provide valid explanations for not voting. Through such accommodations and requirements, countries can mobilize apathetic individuals to represent themselves in political sphere, thereby promoting basic democratic values and responsibilities.

² Netherlands and Venezuela abolished mandatory voting rule in 1967 and 1993 respectively (IDEA, 2001)

7. Appendix

Table 1: Mandatory Voting Countries

Country	Degree of Sanctions
Argentina	High
Australia	Moderate
Belgium	High
Bolivia	High
Brazil	Moderate
Chile	High
Costa Rica	No/Low
Cyprus	Moderate
Dominican Rep.	No/Low
Ecuador	Moderate
Egypt	High
Fiji	High
Gabon	N/A
Greece	No/Low
Guatemala	No/Low
Honduras	No/Low
Italy	No/Low
Lichenstein	Moderate
Luxembourg	Moderate
Mexico	No/Low
Nauru	Moderate
Paraguay	Moderate
Peru	High
Singapore	High
Thailand	No/Low
Turkey	Moderate
Uruguay	High
N = 27	

Table 2: List of Countries

Voluntary Voting	Mandatory Voting
Austria	Argentina
Bahamas	Australia
Belize	Belgium
Botswana Go to page	Bolivia
Canada	Brazil
Colombia	Chile
Denmark	Costa Rica
El Salvador	Cyprus
Finland	Dominican Rep.
France	Ecuador
Germany	Fiji
Iceland	Greece
Ireland	Luxembourg
Israel	Mexico
Japan	Paraguay
Malaysia	Singapore
Malta	Thailand
Mauritius	Turkey
Nepal	Uruguay
Netherlands	
New Zealand	
Nicaragua	
Norway	
Papua N. Guinea	
Philippines	
Spain	
Sri Lanka	
Sweden	
Switzerland	
Trinidad&Tobago	
USA	
UK	
N=32	N=19

Table 3: List of Countries ($gastil \leq 3.5$)

Voluntary Voting	Mandatory Voting
Austria	Argentina
Bahamas	Australia
Belize	Belgium
Botswana	Bolivia
Canada	Brazil
Colombia	Chile
Denmark	Costa Rica
El Salvador	Cyprus
Finland	Dominican Rep.
France	Ecuador
Germany	Greece
Iceland	Luxembourg
Ireland	Paraguay
Israel	Thailand
Japan	Uruguay
Malta	
Mauritius	
Nepal	
Netherlands	
New Zealand	
Nicaragua	
Norway	
Papua N. Guinea	
Philippines	
Spain	
Sweden	
Switzerland	
Trinidad&Tobago	
USA	
UK	
N=30	N=15

Table 4: Voluntary Voting

Variable	Mean	Std. Dev.
turnout	74.807	11.675
ssw	9.006	6.831
col_uka	0.334	0.403
col_espa	0.041	0.151
col_otha	0.143	0.304
avelf	0.233	0.225
gastil	1.809	1.059
prop1564	63.088	5.031
prop65	9.939	5.027
federal	0.188	0.397
maj	0.469	0.507
pres	0.219	0.42
N = 32		

Table 5: Mandatory Voting

Variable	Mean	Std. Dev.
turnout	79.991	11.886
ssw	6.623	6.781
col_uka	0.168	0.339
col_espa	0.131	0.143
col_otha	0.118	0.231
avelf	0.244	0.206
gastil	2.494	1.149
prop1564	62.816	4.261
prop65	7.648	4.322
federal	0.211	0.419
maj	0.211	0.419
pres	0.579	0.507
N = 19		

Table 6: Correlation

Variables	ssw	sanc.=1	sanc.=2	sanc.=3	turnout	pres	maj	gastil	avelf	federal	prop1564	prop65
ssw	1.000											
sanc.=1	-0.253	1.000										
sanc.=2	-0.043	-0.097	1.000									
sanc.=3	0.022	-0.104	-0.097	1.000								
turnout	0.288	-0.236	0.205	0.297	1.000							
pres	-0.297	0.157	0.113	0.157	-0.343	1.000						
maj	-0.319	-0.174	-0.151	-0.091	0.031	-0.090	1.000					
gastil	-0.672	0.062	-0.041	0.099	-0.188	0.440	0.189	1.000				
avelf	-0.424	-0.155	-0.068	0.080	-0.101	0.165	0.284	0.524	1.000			
federal	0.088	-0.028	0.108	-0.028	-0.136	0.135	0.010	-0.047	-0.063	1.000		
prop1564	0.572	-0.068	0.023	0.035	0.208	-0.481	-0.207	-0.547	-0.543	0.168	1.000	
prop65	0.872	-0.099	-0.039	-0.049	0.196	-0.478	-0.284	-0.657	-0.483	0.105	0.761	1.000

Table 7: OLS Regressions

	(Model 1) TURNOUT	(Model 2) SSW	(Model 3) SSW	(Model 4) SSW
turnout		0.0698* (0.0361)		0.0638 (0.0390)
sanction				
No/Low	1.102 (5.075)		-2.701 (2.845)	-2.772 (2.890)
Moderate	13.79*** (4.209)		-0.0207 (1.819)	-0.900 (1.908)
High	16.96*** (3.865)		1.416 (1.407)	0.334 (1.437)
pres	-13.54** (5.082)	-1.388 (1.388)	-2.325* (1.229)	-1.462 (1.323)
maj	0.421 (3.346)	-2.575** (1.056)	-2.834** (1.108)	-2.861** (1.118)
col_uka	12.06* (7.043)	0.0281 (1.458)	-0.132 (1.850)	-0.901 (1.971)
col.espa	24.55* (13.06)	7.279* (4.009)	7.644* (4.221)	6.078 (4.532)
col.otha	2.006 (4.686)	-2.026 (1.726)	-1.724 (1.818)	-1.852 (1.932)
gastil	-0.401 (1.976)	-0.610 (0.631)	-0.771 (0.664)	-0.746 (0.662)
avelf	-20.77** (8.531)	0.467 (1.984)	-1.498 (2.195)	-0.174 (2.184)
federal	-1.316 (2.953)	0.0427 (1.182)	0.0781 (1.273)	0.162 (1.273)
prop1564	-0.308 (0.529)	-0.0481 (0.116)	-0.00856 (0.152)	0.0110 (0.151)
prop65	0.508 (0.665)	1.124*** (0.261)	1.000*** (0.332)	0.968*** (0.347)
constant	92.41*** (31.45)	-2.110 (6.115)	3.144 (6.602)	-2.748 (6.845)
<i>N</i>	51	51	51	51
<i>R</i> ²	0.526	0.825	0.831	0.837
adjusted <i>R</i> ²	0.360	0.776	0.772	0.774
F-statistics	5.391	28.28	23.75	22.36

Robust standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: 2SLS Regressions

	(Model 1)	(Model 2)
	SSW	SSW
turnout	0.106** (0.0504)	0.154*** (0.0558)
maj	-2.214** (0.896)	-2.397** (1.051)
col_uka	-0.326 (1.511)	-1.236 (2.126)
col_espa	4.528 (3.099)	3.021 (3.099)
col_otha	-1.771 (1.600)	-1.622 (2.042)
gastil	-0.609 (0.567)	-0.517 (1.152)
avelf	1.203 (1.648)	1.640 (2.023)
federal	-0.0467 (1.102)	-0.482 (1.272)
prop1564	-0.0550 (0.103)	0.0197 (0.116)
prop65	1.146*** (0.228)	1.044*** (0.271)
constant	-5.155 (6.130)	-12.31 (9.274)
N	51	45
R^2	0.820	0.798
adjusted R^2	0.775	0.739
First stage F-statistics	8.64	9.26
Sargan-Hansen statistics	0.64	0.63

Robust standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9: 2SLS Regressions: Robustness Check

	(Model 1)	(Model 2)
	SSW	SSW
turnout	0.172* (0.0880)	0.193** (0.0879)
sanction		
No/Low	-2.891 (2.500)	-4.164 (2.829)
Moderate	-2.390 (1.929)	-1.887 (1.939)
High	-1.497 (1.823)	-1.040 (1.866)
maj	-2.906*** (1.012)	-3.022*** (1.049)
col_uka	-2.203 (2.326)	-2.836 (3.040)
col_espa	3.428 (3.960)	1.230 (4.080)
col_otha	-2.069 (1.871)	-1.674 (2.324)
gastil	-0.702 (0.597)	-0.407 (1.118)
avelf	2.069 (2.385)	1.957 (2.725)
federal	0.304 (1.088)	-0.627 (1.250)
prop1564	0.0443 (0.140)	0.172 (0.157)
prop65	0.913*** (0.318)	0.800** (0.367)
constant	-12.73 (9.924)	-21.31* (11.23)
N	51	45
R^2	0.820	0.807
adjusted R^2	0.757	0.726
First stage F-statistics	7.10	8.66

Robust standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

8. References

- Barack Obama praises Australia's mandatory voting rules, 2016. (2016, April 10). *The Guardian*.
- Beramendi, P., & Anderson, C. J. (Eds.). (2008). *Democracy, Inequality, and Representation in Comparative Perspective*. Russell Sage Foundation.
- Birch, S. (2013). *Full participation: A comparative study of compulsory voting*. Manchester University Press.
- Black, D. (1948). On the rationale of group decision-making. *The Journal of Political Economy*, 23-34.
- Blais, A. (2006). What affects voter turnout?. *Annual Review of Political Science*, 9, 111-125.
- Carey, J., & Horiuchi, Y. (2016). Compulsory voting and income inequality. Available at SSRN 2374092.
- Cepaluni, G., & Hidalgo, F. D. (2016). Compulsory voting can increase political inequality: Evidence from Brazil. *Political Analysis*, mpw004.
- Chong, A., & Olivera, M. (2005). On Compulsory Voting and Income Inequality in a Cross-Section of Countries.
- Compulsory Voting, 2011. (2011, May 18). *Australian Electoral Commission*.
- Crain, W., & Leonard, M. L. (1993). The Right Versus The Obligation To Vote: Effects On Cross-Country Government Growth. *Economics & Politics*, 5(1), 43-51.
- Downs, A. (1957). An economic theory of political action in a democracy. *The Journal of political economy*, 135-150.

Electoral Commission. (2006). Compulsory voting around the world. *London: The Electoral Commission.*

Fornos, C. A., Power, T. J., & Garand, J. C. (2004). Explaining voter turnout in Latin America, 1980 to 2000. *Comparative Political Studies*, 37(8), 909-940.

Fowler, A. (2013). Electoral and policy consequences of voter turnout: Evidence from compulsory voting in Australia. *Quarterly Journal of Political Science*, 8(2), 159-182.

Franklin, M. N. (2001). Electoral participation.

Franklin, M. N. (2001). How structural factors cause turnout variations at European Parliament elections. *European Union Politics*, 2(3), 309-328.

Fumagalli, E., & Narciso, G. (2012). Political institutions, voter turnout, and policy outcomes. *European Journal of Political Economy*, 28(2), 162-173.

Hastings, P. K. (1956). The voter and the non-voter. *American Journal of Sociology*, 302-307.

Hill, K. Q., & Leighley, J. E. (1992). The policy consequences of class bias in state electorates. *American Journal of Political Science*, 351-365.

Hill, L. (2000). Compulsory voting, political shyness and welfare outcomes. *Journal of Sociology*, 36(1), 30-49.

Hill, L. (2002). Compulsory voting: Residual problems and potential solutions. *Australian Journal of Political Science*, 37(3), 437-455.

Hotelling, H. (1990). Stability in competition. In *The Collected Economics Articles of Harold Hotelling* (pp. 50-63). Springer New York.

Husted, T. A., & Kenny, L. W. (1997). The Effect of the Expansion of the Voting

Franchise on the Size of Government. *Journal of Political Economy*, 54-82.

Compulsory voting, 2016. (2016, Feb 26). *International Institute for Democracy and Electoral Assistance*.

Jackman, R. W. (1987). Political Institutions and Voter Turnout in the industrial democracies. *American Political Science Review*, 81(02), 405-423.

Kenworthy, L., & Pontusson, J. (2005). Rising inequality and the politics of redistribution in affluent countries. *Perspectives on Politics*, 3(03), 449-471.

Larcinese, V. (2007). Voting over redistribution and the size of the welfare state: The role of turnout. *Political Studies*, 55(3), 568-585.

Lindbeck, A., & Weibull, J. W. (1987). Balanced-budget redistribution as the outcome of political competition. *Public choice*, 52(3), 273-297.

Lijphart, A. (1997). Unequal participation: Democracy's unresolved dilemma presidential address, American Political Science Association, 1996. *American political science review*, 91(01), 1-14.

Meltzer, A. H., & Richard, S. F. (1981). A rational theory of the size of government. *The Journal of Political Economy*, 914-927.

Mueller, D. C., & Stratmann, T. (2003). The economic effects of democratic participation. *Journal of public Economics*, 87(9), 2129-2155.

O'Toole, F., & Strobl, E. (1995). Compulsory voting and government spending. *Economics & Politics*, 7(3), 271-280.

Panagopoulos, C. (2008). The calculus of voting in compulsory voting systems. *Political Behavior*, 30(4), 455-467.

Persson, T., & Tabellini, G. E. (2005). *The economic effects of constitutions*. MIT

press.

Persson, T., Roland, G., & Tabellini, G. (2007). Electoral rules and government spending in parliamentary democracies. *Quarterly Journal of Political Science*, 2(2), 155-188.

Franklin, M. N. (2004). *Voter turnout and the dynamics of electoral competition in established democracies since 1945*. Cambridge University Press.

Power, T. J., & Roberts, J. T. (1995). Compulsory voting, invalid ballots, and abstention in Brazil. *Political Research Quarterly*, 48(4), 795-826.

Powell Jr, G. B. (1980). Voting turnout in thirty democracies: Partisan, legal, and socio-economic influences. *Electoral participation: A comparative analysis*, 534.

Roberts, K. W. (1977). Voting over income tax schedules. *Journal of public Economics*, 8(3), 329-340.

Schattschneider, E. E. (1975). *The Semi-Sovereign People: A Realist's View of Democracy in America*.

Smith, J. (1999). *Europe's elected parliament* (Vol. 5). A&C Black.

Solt, F. (2010). Does economic inequality depress electoral participation? Testing the Schattschneider hypothesis. *Political Behavior*, 32(2), 285-301.

Rosenstone, S. J. H., Rosenstone, J. M. J., & Hansen, J. M. (1993). *Mobilization, participation, and democracy in America*. Macmillan Publishing Company,.

Verba, S., Schlozman, K. L., Brady, H., & Nie, N. H. (1993). Citizen activity: Who participates? What do they say?. *American Political Science Review*, 303-318.

Why young people don't vote, 2014. (2014, Oct 29). *The Economist*.

Wolfinger, R. E., & Rosenstone, S. J. (1980). *Who votes?* (Vol. 22). Yale University Press.

의무 투표 제도와 투표율이 정부 복지 재정에 미치는 영향

황유선

사회과학대학 경제학부

서울대학교 대학원

이 논문은 중위자 정립을 사용하여 의무 투표 제도와 정부 복지 재정에 관하여 연구한다. 자유 투표 제도 아래에서의 중위자 투표자 소득은 전체 인구 소득의 중앙값보다 낮곤 한다. 이는 부유층의 투표율이 빈곤층의 투표율보다 더 높기 때문이다. 하지만 모든 시민들에게 투표를 의무화하는 제도에서의 중위자 투표자 소득은 자유 투표 제도 아래에서의 중위자 투표자 소득보다 낮다. 중위자 투표 정리에 따르면, 정부는 정책을 택할 시, 중위 투표자가 선호하는 입장을 취한다. 따라서, 의무 투표 제도는 빈곤한 사람들을 보다 더 많이 투표하게 만듦으로써 정부 복지 재정을 늘리게 된다. 2단계 최소 자승 (Two-Stage Least Squares) 과 나라들의 1990-1998년의 평균값을 사용하여 위와 같은 이론을 분석하였다. 본 연구를 통해, 강제 투표 제도는 투표율을 높임으로서 간접적으로 복지 복지 재정을 확장시킨다는 것을 볼 수 있었다. 또한 의무 투표 제도의 벌칙 제도가 강할수록 투표율이 더 높다는 기존 논문들의 가설을 재확인 할 수 있었다.

주요어: 의무 투표 제도, 투표율, 정부 복지 재정, 정치 제도

학 번: 2014-22307