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Author(s): Costas Panagopoulos

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The Calculus of Voting in Compulsory Voting Systems

Costas Panagopoulos

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Abstract Compulsory voting laws have consistently been demonstrated to boost electoral participation. Despite the widespread presence of compulsory voting and the significant impact these laws appear to have on voting behavior, surprisingly little effort has been devoted to analyzing how mandatory voting alters the decision-making calculus of individual voters in these systems. Moreover, studies that investigate the influence of compulsory voting laws on electoral participation generally treat these policies monolithically, with scant attention to the nuances that differentiate mandatory voting laws across systems and to their consequences for voting rates. Analyses that explicitly and empirically examine the effects of penalties and enforcement are surprisingly rare. This study aims to fill that void by adapting rational choice models of participation in elections for compulsory voting systems. I find that the level of penalties countries impose for non-compliance and the degree of penalty enforcement impact turnout rates. Voters in mandatory voting systems abstain least when both the penalties and the likelihood of enforcement are high, and abstain most when both meaningless.

Keywords Compulsory voting · Voting behavior · Voting costs and benefits · Voter turnout · Comparative elections

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C. Panagopoulos (✉)
Department of Political Science, Fordham University,
441 E. Fordham Rd.
Faber 667, Bronx, NY 10458, USA
e-mail: costas@post.harvard.edu

Introduction and Theory

Rational choice theories of electoral turnout assume that voters, like consumers, are rational and self-interested. Observing that the act of voting is costly, such theories suggest that voters, as rational actors, will weigh the costs of voting (C) against the benefits (B) in their decision-making calculus and, accordingly, rational voters will vote in elections only if the benefits exceed the costs of participation (Downs 1957; Tullock 1967; Riker and Ordeshook 1968).

A corollary assumption often associated with this calculus is that benefit is determined by the probability that one's vote is decisive (p) and by the increase in utility to the voter when he or she casts a decisive vote. If p is low and the costs of voting are reasonably high, rational citizens have incentives to abstain even if they have strong preferences between the two alternatives (Palfrey and Rosenthal 1983). Decision theory models predict rational voters will vote if $pB > C$ and abstain if $pB < C$. In large electorates, the likelihood that an individual voter will cast a pivotal vote is, under most voting rules, effectively zero, suggesting that costs will always outweigh the benefits and predicting zero turnout (Ferejohn and Fiorina 1974). Yet non-zero turnout in elections is routinely observed, and scholars have reconciled this paradox by proposing that voters derive benefits from voting (D) regardless of the outcome. If this direct benefit exceeds the cost, then voting is not irrational (Palfrey and Rosenthal 1983; Ferejohn and Fiorina 1974). These elements yield the standard voting calculus equation: $R = pB - C + D$, and rational voters should vote when R is positive.

Empirical tests of the Downsian model provide extensive evidence to confirm several of the theoretical hypotheses developed above. Riker and Ordeshook (1968) and Frohlich et al. (1978) find that higher probabilities of casting a pivotal vote boost turnout; over 17 studies provide additional evidence, consistent with the rational voter hypothesis, that turnout increases when the perceived closeness of the race is higher (Mueller 2003). Riker and Ordeshook (1968) and Ashenfelter and Kelley (1975) show that turnout increases when citizens perceive greater differences between the alternatives. And Ashenfelter and Kelly (1975) and Silver (1973) show that higher costs of voting depress turnout. Despite considerable empirical support for elements and extensions of the Downsian turnout model, critics have vociferously emphasized its failure to accurately predict behavior (Ferejohn and Fiorina 1974; Mueller 2003). Perhaps the most damaging critique is the consistent evidence of electoral participation when the model predicts rational voters should abstain. Scholars have devoted attention to, “rescuing rational choice theorists from this embarrassing predicament” and have offered modifications to reconcile inconsistencies between the model and individual-level behavior (Ferejohn and Fiorina 1974, p 525) (see Mueller 2003). Despite its shortcomings, the Downsian model is a useful tool, and it remains relevant to explaining variation in turnout. Its basic argument—that turnout decisions will be determined by calculations of costs versus benefits of participation—remains a powerful heuristic that can, at the very least, shed light on political behavior. Moreover, the assertion that voting decisions will be best explained *primarily* by calculations in the C and D terms in R (Downs 1957; Tullock

1967; Mueller 2003) render the model especially useful in analyzing behavior in polities that mandate voting.

For the most part, turnout theory has been developed and tested with voluntary voting systems in mind. The implicit assumption in the theory, and in the extensive empirical literature that has grown from the theory, is that the act of voting is voluntary. Given this assumption, the theory and the key empirical findings make sense. In this framework, citizens need only consider costs and benefits of participation, and the cost of abstention is assumed to be zero. In many countries, however, voting is non-voluntary. Citizens are required to vote, and abstention is punishable by law. Thus, abstention is costly, and, in many cases, the cost of abstention can exceed the nominal cost of participation.

This article investigates voters' strategic calculations about turnout in compulsory voting systems. I proceed as follows. In the next section, I review the institutional landscape that characterizes compulsory voting systems, focusing on the cross-national variation in mandatory voting codes and implementation that exists. Next, I adapt the decision-theoretic calculus of voting to apply to compulsory voting systems and I develop hypotheses that emerge from the new theoretical construct. In the following sections, I advance a series of empirical analyses to test the hypotheses presented. In the final section, I reflect further upon the findings and offer some concluding remarks.

Compulsory Voting Systems

Participation in elections is considered a political right by most democratic governments, but others view voting as a duty and regulate participation through electoral laws. These countries mandate voting as a safeguard from anemic electoral participation (Blais 2000). Compulsory voting laws legally oblige eligible voters to participate in elections or be liable to sanction (Massicottee et al. 2004). Declining turnout in most democracies in the 1990s rekindled scholars' attention to compulsory voting as an institutional remedy for low turnout (Lijphart 1997; Blais 2000).

Constitutionally mandated voting is not a wholly new phenomenon. It originated in the Swiss canton of St. Gallen in 1835 (Gosnell 1935) and currently exists in over two-dozen countries worldwide (see Table 1). But compulsory voting laws are not uniform, and there exists widespread variation in the severity of sanctions countries impose for non-compliance. In some nations, including Greece and Mexico, voting is constitutionally required as a civic duty, but this requirement is largely symbolic and there are no formal sanctions imposed on defectors. Non-voters face a fine sanction in other societies. Fines vary across countries and can range, for example, from 200 pounds in Cyprus to 20 dollars in Australia to 10–20 pesos in Argentina. Laws in some compulsory voting states threaten non-voters with possible imprisonment. In others, defectors' may face civil rights infringements or disenfranchisement. In Belgium, for example, citizens lose their right to vote after they abstain in four elections within a 15-year period. In Peru, proof of electoral participation is required to obtain certain public services; and in Argentina, offenders cannot work in public service for 3 years following an abstention (Massicottee et al. 2004).

Table 1 Compulsory voting in comparative perspective: severity of sanctions and degree of enforcement

Country	Sanctions	Enforcement
Argentina	High	Weak
Australia	Moderate	Strict
Belgium	High	Strict
Bolivia	High	N/A
Brazil	Moderate	Weak
Chile	High	Weak
Costa Rica	No/low	No/low
Cyprus	Moderate	Strict
Dominican Republic	No/low	No/low
Ecuador	Moderate	Weak
Egypt	High	N/A
Fiji	High	Strict
Gabon	N/A	N/A
Greece	No/low	No/low
Guatemala	No/low	No/low
Honduras	No/low	No/low
Italy	No/low	No/low
Lichtenstein	Moderate	Weak
Luxembourg	Moderate	Strict
Mexico	No/low	No/low
Nauru	Moderate	Strict
Paraguay	Moderate	N/A
Peru	High	Weak
Singapore	High	High
Thailand	No/low	No/low
Turkey	Moderate	Strict
Uruguay	High	Strict

Notes: Sanctions: Adapted by author from IDEA (2001) as follows: No/low, no formal sanction; Moderate, fine only; High, fine and additional sanction including possible imprisonment, civil rights infringements, or disenfranchisement.

Enforcement: Source: IDEA 2001. Excludes states in which mandatory voting laws apply only in certain regions or for certain offices (Switzerland, Austria, France) and states where compulsory voting laws were not in place in the 1990s or later (Philippines, Switzerland)

Besides the variation in the nature of sanctions imposed for nonvoting across countries, there are also disparities in the degree to which penalties are enforced. The complexities and resources required for enforcement are often daunting for many countries, and non-compliance with compulsory voting laws routinely goes unpunished. Others governments enforce legal voting requirements strictly. Table 1 summarizes enforcement patterns across states with mandatory voting requirements.¹

Studies consistently demonstrate that compulsory voting raises turnout. Tingsten (1937, p 205) concludes that, “[t]he introduction of compulsory voting everywhere has been accompanied by a remarkable rise in participation.” In fact, compulsory voting seems to stimulate turnout more than any other institutional factor, boosting participation rates by anywhere from 7 to 16 percentage points on average (Lijphart 1997; Powell 1980; Jackman 1987; Franklin 2001).

¹ Assessments of the degree of enforcement are obtained for International Institute for Democracy and Electoral Assistance (IDEA) (2001). See details below.

Despite the widespread presence of compulsory voting and the significant impact these laws appear to have on voting behavior, surprisingly little effort has been devoted to analyzing how mandatory voting alters the decision-making calculus of individual voters in these systems. Moreover, studies that investigate the influence of compulsory voting laws on electoral participation generally treat these policies monolithically, with scant attention to the nuances that differentiate mandatory voting laws across systems and to their consequences for voting rates. Analyses that explicitly and empirically examine the effects of penalties and enforcement are surprisingly rare. This study aims to fill that void by adapting rational choice models of participation in elections for compulsory voting systems.

Theoretical Expectations and Hypotheses

Strategic calculations about voting in compulsory voting systems must incorporate not only the costs of voting (C) but also any costs associated with abstention (C_{NV}). I adapt the standard expected utility model of turnout to consider the non-zero cost of abstention in compulsory voting systems by conceiving of the cost of voting (C) as consisting of two parts—the cost of voting (C_V) and the cost of abstention (C_{NV}). This modification suggests voters' utility from voting equals $pB - C_V$, while the utility for abstention equals $-C_{NV}$. In compulsory voting systems where there are no formal sanctions for non-voting, the cost of abstention is effectively zero, and the decision-theoretic calculus of voting is unaffected. Rational voters are expected to abstain. Few differences in turnout should emerge between these systems and voluntary voting systems.

In compulsory voting systems that impose non-trivial formal penalties for non-voters, the costs of abstention will, for the most part, outweigh the costs of voting ($C_{NV} > C_V$).² A voter's utility from abstaining will always be lower than the utility a voter receives from voting, and we should observe full voting participation. Yet empirical evidence provides little support for this expectation. In many compulsory voting systems, a sizeable portion of the electorate abstains, creating a *paradox of non-voting* in such systems. In fact, the data I present below reveal that, on average, majorities of eligible voters in compulsory voting systems that levy penalties for non-participation abstain.

Why would rational citizens abstain in compulsory voting systems that impose non-trivial penalties for non-voting? To account for this apparent paradox and for the variation in rates of abstention we observe across these compulsory voting systems, it is necessary to consider both the *severity of the sanction* and the *degree of enforcement*. Scholars that have evaluated empirically the impact of compulsory voting on turnout erroneously presume uniform costs of abstention across countries. Costs of abstention are neither fixed nor uniform across cases. Penalties in some compulsory voting systems are considerably more severe than in others. In addition,

² For simplicity, I assume the costs of abstention (C_{NV}) always exceeds the costs of voting (C_V) ($C_{NV} > C_V$) in all compulsory voting systems that impose formal sanction for non-voters. Clearly, there may be instances in which this assumption may be an oversimplification, but these are assumed to be rare.

there is uncertainty about whether or not non-compliant citizens will be penalized. In many systems, compulsory voting requirements exist but are rarely enforced (see above and Table 1). This suggests that voters can expect to pay the cost for noncompliance only with some probability (q). An additional modification to the Downsian turnout model to incorporate the likelihood of enforcement alters the decision-making calculus for voters in compulsory voting systems as follows: the expected utility from abstention becomes,

$$E[U(\text{Abstain})] = -qC_{NV} - (1 - q)(0) = -qC_{NV}. \quad (1)$$

Thus, rational voters should vote if $qC_{NV} > C_V$.

Equation 1 above suggests we may expect to find a trade-off between the severity of sanctions and the strictness of enforcement. As the penalty for nonvoting increases, the strictness of enforcement can be decreased while still keeping the probability of voting constant (assuming the costs of voting are fixed) and vice versa. More generally, eq. 1 also suggests the impact of penalties and enforcement on turnout in compulsory voting systems may be conditional. That is to say, the marginal impact of the penalty on turnout may depend on the degree of enforcement and vice versa.

I argue mainly that sanctions and sanction enforcement in compulsory voting systems affect the C term in the standard expected utility model of turnout. An alternative possibility is that these factors affect the D term described above. That is to say, even sanctions that lack teeth send a clear signal from the government that “good” (i.e., law-abiding) citizens should vote. Such signals could strengthen citizens’ sense of civic duty or of the intrinsic value of voting.

More generally, I argue that penalty and enforcement levels will impact electoral participation in countries that mandate voting. Accordingly, the following three hypotheses are extensions of the discussion presented in this section and will be empirically evaluated in this article.

Hypothesis 1 Turnout in compulsory systems without meaningful penalties and enforcement should equal turnout in voluntary systems.

Hypothesis 2 Penalties and enforcement each increase turnout.

Hypothesis 3 Penalties and enforcement together increase turnout above and beyond the effect of each individually (e.g., there is an interactive effect).

Methods and Data

To test the propositions that emerge from the theory as developed above, I use voter turnout data from elections in democratic countries³ (as classified by Cheibub and Gandhi 2004) that occurred in the 1990s.⁴ Turnout data was obtained from

³ The analyses that follow are restricted to countries classified as democracies for the period of the study by Cheibub and Gandhi (2004). Compulsory voting countries excluded: Egypt, Fiji, Gabon, Paraguay, Peru, and Singapore. Mexico classified as democracy since 2000.

⁴ The period of the 1990s is utilized in the study because details about compulsory voting practices, with respect to levels of sanctions and enforcement, were consistently available for this period.

Vanhanen (2000) and indicates the proportion of the voting age population that participated in elections in each country for each year included in the analysis.⁵ Consistent with the findings of previous studies (Blais 2000; Franklin 2001), the mean level of turnout overall in compulsory voting systems in this cross-section is modestly higher on average than in voluntary voting systems: 44.4% of the voting age population ($N = 60$; standard error = 2.1) compared to 42.9% ($N = 278$; standard error = 0.8), respectively. Turnout ranges from 10.2 to 70.2% in systems with voluntary voting, and from 12 to 67.5% in compulsory voting systems during the period of the study.

I argue that turnout in compulsory voting systems will be responsive to both the severity of the penalty and the degree of penalty enforcement. Thus, the main variables of interest in my analyses are *penalty* and *enforcement*. To advance the empirical analyses that follow, *penalty* is categorized as follows, from low to high. Countries that technically have compulsory voting requirements on record but which impose no formal penalties for abstention are coded as “–1” (Low/No). In such systems, governments officially designate their systems as compulsory but typically only recommend that citizens vote as part of their “civic duty.” Other nations impose fines for noncompliance with compulsory voting requirements. These have been coded as “0” (Moderate) with respect to the penalty level. Countries that impose fines in addition to other severe penalties (including imprisonment or loss of civic privileges) as a result of defection are coded as “1” (High). Countries coded as “high” impose the most severe punishments for abstention.

My expectation is that a positive relationship between the severity of the abstention penalty and average turnout is consistent with the rational voter hypothesis developed above for voters in compulsory voting systems.

I rely on data compiled by the IDEA to evaluate the likelihood of sanction enforcement in compulsory voting systems. I have coded this variable, *enforcement*, as follows. Countries that routinely fail to enforce sanctions for abstention in compulsory voting systems are categorized as “–1” (No/Low). Systems that tend to enforce penalties, but only weakly, are coded as “0” (Weak). Countries that monitor compliance and enforce sanctions for abstention strictly are coded as “1” (Strict). The likelihood of enforcement rises as we move from category “no/low” to category “strict”. I expect that a positive relationship exists between *enforcement* and turnout rates in compulsory voting democracies.

Table 1 summarizes sanction severity and enforcement patterns across states with mandatory voting requirements and showcases the considerable variation that exists.

Consistent with the discussion above, I also expect that the interaction between severity of the sanction and the likelihood of enforcement will be related to the rate of electoral participation. I hypothesize that turnout will be highest in systems in which sanctions are most severe and the likelihood of enforcement is strongest. The analyses that follow incorporate an interaction term to examine such a relationship.

⁵ Vanhanen (2000) provides data through 1998. The supplemental data (through 1999) used in this study were compiled and made available by Vanhanen online at <http://new.prio.no/CSCW-Datasets/Data-on-Governance/The-Polyarchy-dataset/>. (Accessed 1 February 2007).

Empirical Results

Table 2 presents average turnout rates in voluntary voting systems and in compulsory voting systems, categorized by the severity of the penalties (No/Low, Moderate, High). The data presented in Table 2 reveal support for several hypotheses developed above. First, I find that turnout in compulsory voting systems that impose no formal sanctions for non-compliance is lower on average than in other compulsory voting systems. It is also virtually indistinguishable, statistically, from average turnout rates in voluntary voting systems (the difference of means tests is not significant at conventional levels). The finding lends support for Hypothesis 1 described above and suggests that voters in compulsory voting systems that do not impose formal penalties for non-voting behave similarly to voters in voluntary voting systems with respect to turnout.

The empirical evidence presented in Table 2 also demonstrates that turnout increases as the severity of the penalty increases. Turnout in compulsory voting systems that impose the most severe penalties for abstention is 6.0 percentage points higher, on average, than average turnout in systems that impose lower penalties for non-compliance. A difference of means tests reveals this difference is significant at the $p < .05$ level.

The data in Table 2 also provides empirical evidence about the relationship between the degree of enforcement of compulsory voting sanctions and turnout. Table 2 reports average turnout rates in voluntary voting systems and in compulsory voting systems, categorized by the degree of enforcement (No/Low, Weak, Strict). The findings reveal support for several of the propositions developed above. First, turnout is lowest amongst compulsory voting systems that routinely fail to prosecute

Table 2 Mean levels of turnout (1990s) by severity of abstention penalty and degree of enforcement for compulsory and voluntary voting democracies^a

	Mean Turnout (1990s)	<i>N</i>
Voluntary systems	42.9	278
Compulsory systems		
<i>Severity of penalty</i>		
No/Low	39.0	24
Moderate	45.5*	20
High	51.5**	15
<i>Degree of enforcement</i>		
No/low	39.0	24
Weak	43.2	15
Strict	56.3***	17

Notes: *** Indicates difference of means (turnout) between this and the preceding category is significant at the $p < .01$ level, ** difference of means is significant at the $p < .05$ level, * difference of means is significant at the $p < .10$ level. *N* indicates number of elections included in the corresponding category. Mean turnout data obtained from Vanhanen (2000) and supplemental data made available by Vanhanen online

^a As classified by Cheibub and Gandhi (2004)

defections. In these systems, mean levels of turnout in elections is virtually indistinguishable from turnout in voluntary systems (the difference of means tests is not significant at conventional levels). Second, the data reveal support for the expectation that turnout rises as the likelihood of sanction enforcement rises. Mean turnout in compulsory voting systems that enforce sanctions for nonvoting strictly is 13.1 percentage points higher on average than in compulsory voting systems that punish defectors less routinely, a difference that is significant at the $p < .01$ level. The patterns also suggest mean turnout in countries with No/Low enforcement is higher than in systems with weak enforcement, but this difference is not significant at conventional levels.

When compulsory voting systems impose no formal penalties for abstention or when defection is not prosecuted ($q = 0$), the strategic decision-making calculus of participation in elections is effectively unaltered. The empirical evidence presented above supports this contention. I observe no differences in turnout between voluntary systems and systems with only token sanctions for abstention or no real enforcement mechanisms. I conclude from this finding that sanctions and enforcement affect primarily the C term (costs of voting) in the strategic calculus of voting and not the D term that is meant to capture the intrinsic value of the benefit of voting (civic duty, etc.).

Given this argument, I conduct a secondary analysis that excludes those cases where no formal penalties exist or where defections are unpunished. Table 3 displays average turnout rates by severity of penalty and degree of enforcement when the sample is limited to these cases. The data presented in Table 3 reveal that average turnout is highest (62.5%) in compulsory voting systems that strictly enforce severe penalties for abstention and lowest (39.1%) in systems that impose moderate penalties and tend to enforce these weakly. The evidence presented in Table 3 supports the contention that a trade-off may exist between the severity of the sanctions and the strictness of enforcement. A difference of means test reveals average turnout rates in high penalty/weak enforcement countries is statistically indistinguishable from turnout rates in moderate penalty/strict enforcement countries. The evidence presented in Table 3 also suggests the impact of the severity of penalties on turnout may be conditional on the degree of enforcement and vice versa. The analyses that follow investigate this conditional relationship more systematically.

Multivariate Analyses

In order to estimate the effects of penalty severity and enforcement on turnout in compulsory voting systems more systematically, I apply linear regression to three nested models described below. The dependent variable in the analysis is the turnout rate for country j in year t . I report panel-corrected standard errors to take into account the pooled cross-sectional nature of the data (Beck and Katz 1995; Golder 2006). The naïve model includes only the two, main regressors: penalty and enforcement.

Table 3 Average turnout (1990s) by levels of penalty and enforcement in democracies with compulsory voting

Enforcement	Penalty	
	Moderate	High
Weak	39.1 (1.9) <i>N</i> = 10	51.6 (0.6) <i>N</i> = 5
Strict	51.9 (2.1) <i>N</i> = 10	62.5 (0.7) <i>N</i> = 7

Notes: Standard errors in parentheses. *N* indicates number of elections included in the corresponding category. Difference of means tests significant at $p < .01$ levels between all categories with the exception of the difference between the means of the high penalties/weak enforcement and the moderate penalties/strict enforcement categories which is not significant at conventional levels

$$\text{Turnout}_{j,t} = \beta_0 + \beta_1 \text{Penalty}_{j,t} + \beta_2 \text{Enforcement}_{j,t} + u \quad (\text{Model 1})$$

The second specification incorporates the interaction term:

$$\text{Turnout}_{j,t} = \beta_0 + \beta_1 \text{Penalty}_{j,t} + \beta_2 \text{Enforcement}_{j,t} + \beta_3 \text{Penalty} \times \text{Enforcement}_{j,t} + u \quad (\text{Model 2})$$

The full specification includes additional covariates as controls as described below:

$$\text{Turnout}_{j,t} = \beta_0 + \beta_1 \text{Penalty}_{j,t} + \beta_2 \text{Enforcement}_{j,t} + \beta_3 \text{Penalty} \times \text{Enforcement}_{j,t} + \beta_4 \text{GDPGrowth}_{j,t} + \beta_5 \text{ElecSystem}_{j,t} + \beta_6 \text{Parliamentary}_{j,t} + u \quad (\text{Model 3})$$

The results of the three models I estimate are reported in Table 4. The coefficients estimated in the linear-additive model (model 1) suggest turnout will increase as the severity of the penalty rises, even after controlling for the degree of enforcement. Similarly, the degree of enforcement exerts a positive and independent effect on electoral participation. Coefficients for both variables are statistically significant at conventional levels. Given the conditional hypothesis developed above, it is more appropriate to estimate and interpret the results of the multiplicative interaction model (Brambor et al. 2006).

The estimates provided by interaction model (model 2) indicate support for the conditional hypothesis that suggests electoral participation will be responsive to the interaction between the severity of the penalty and the degree of enforcement in compulsory voting systems. The coefficients on the constituent term in the interactive model cannot be interpreted in the same way as in the linear-additive model above (model 1) (Brambor et al. 2006). The results suggest that sanctions will exert a significant, positive effect on turnout in the specific case of weak enforcement ($\text{enforcement} = 0$), and that enforcement will exert a significant, positive effect of on turnout when moderate sanctions ($\text{sanctions} = 0$) are in place. The positive coefficient on the interaction term implies the effect of penalties *increases* as enforcement rises, *ceteris paribus*; similarly, the effect of enforcement

Table 4 Explaining turnout in compulsory voting systems (democracies), 1990s dependent variable: electoral turnout (Vanhanen 2000)

Independent variables	Model 1	Model 2	Model 3
Penalty (−1 = No/low, 0 = moderate, 1 = high)	4.68*** (1.66)	5.19*** (1.48)	7.72*** (1.81)
Enforcement (−1 = No/low, 0 = weak, 1 = strict)	4.99*** (1.08)	7.40*** (1.35)	4.62*** (1.64)
Penalty × enforcement		8.53*** (1.49)	7.48*** (2.15)
GDP Growth (annual %, World Bank)			−1.05** (0.48)
Electoral system (1 = majoritarian, 2 = combined, 3 = proportional)			−1.67 (2.17)
Parliamentary system (parliamentary = 1, presidential = 0)			10.84*** (3.52)
Constant	47.02*** (0.73)	42.71*** (0.80)	44.52*** (6.23)
<i>N</i>	56	56	56
Adj. <i>R</i> ²	0.22	0.27	0.41

Notes: Linear regression with panel-corrected standard errors in parentheses

*** Estimated effect is $p < .01$, ** $p < .05$, two-tailed tests

increases as the severity of the penalty rises (Brambor et al. 2006). Thus, the marginal effect of the severity of the sanctions changes with the degree of enforcement and vice versa.

To examine the impact of sanctions and enforcement on voter turnout in compulsory voting systems further, model 3 is expanded to include controls for additional variables expected to impact electoral participation. In addition to the main variables of interest (*penalties*, *enforcement*, and the interaction term), I include controls for: *electoral system* type (coded “1” if the system is majoritarian, “2” if it is a mixed system, and “3” if the electoral system is proportional), whether the system is a *parliamentary* system (coded “1” if parliamentary, “0” if presidential; there are no mixed systems in the sample) (see Norris 2004; Franklin 2001), and, to capture the impact of changes in the economy, I include a variable that measures annual *GDP growth* (%) available from the World Bank.

The results of the estimation of model 3 reveal few substantive changes in the impact of the main explanatory variables on the level of voter turnout, even after controlling for the additional institutional and political characteristics. Based on the coefficients reported in model 3, a 1-unit increase in the penalty level will increase the turnout rate modestly (by .24 percentage points on average) ($\beta_1 + \beta_3 \text{Enforcement} = 7.72 + 7.48 \times (-1)$) when there is virtually no enforcement (*enforcement* = −1), by 7.72 percentage points when there is a weak enforcement (*enforcement* = 0) and by 15.20 percentage points when enforcement is at its maximum (*enforcement* = 1). Similarly, the marginal impact of *enforcement* on voter turnout is 12.10 percentage

Table 5 Predicted turnout by penalty and enforcement levels in democracies with compulsory voting

Enforcement	Penalty		
	No/low	Moderate	High
No/low	43.12 (3.07)	43.36 (4.01)	43.61 (5.78)
Weak	40.27 (3.72)	47.99 (3.28)	55.71 (3.78)
Strict	37.41 (5.91)	52.61 (3.28)	67.81 (2.78)

Notes: For typical parliamentary system with proportional electoral system, values of other variables held at mean levels. Standard error of predictions in parentheses

points when penalties are highest ($penalty = 1$) ($\beta_2 + \beta_3 Penalty = 4.62 + 7.48 \times 1$), compared to 4.62 percentage points when penalties are moderate ($penalty = 0$). The marginal effect of enforcement is actually reductive when penalties are largely perfunctory ($penalty = -1$). For the most part, these findings suggest support for the hypotheses that penalties and enforcement each increase turnout and that there is an interactive effect between the two factors.

To illustrate the substantive impact of penalty and enforcement levels, Table 5 presents predicted turnout rates (with the corresponding standard errors of the predictions) for combinations of penalty severity and enforcement levels (for a typical parliamentary, proportional system; other variables held at mean levels), based on the estimates obtained in model 3. The results corroborate the overall findings discussed above. All else equal, the expected voting rate with maximum penalties and enforcement is estimated to be nearly 25 percentage points higher than turnout given the scenario of only token penalties and enforcement (67.81% compared to 43.12%, respectively).

Discussion

A reasonable explanation for non-voting in compulsory systems where abstention is more costly than participation is that voters calculate the probability of sanction enforcement to be low. This suggests abstention may be a rational decision in these systems, and this study provides some evidence that voters behave as such in countries that mandate voting. Voters in these systems abstain least when both the penalties and the likelihood of enforcement are high, and abstain most when neither penalties nor enforcement levels are meaningful.

From a public policy point of view, this study suggests that compulsory voting countries that seriously wish to deter abstention should impose high sanctions for non-compliance and enforce these sanctions strictly. Sanctions that are largely symbolic and enforcement that is effectively non-existent are unlikely to yield enhanced turnout.

From a scholarly perspective, it is useful to adapt standard voting models to incorporate features unique to compulsory voting systems. This study provides evidence that strategic calculations about voting in compulsory voting systems are more accurately characterized and analyzed by including elements to capture how

voters assess both the severity of the sanctions for abstention and the likelihood of enforcement.

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