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I should like to reserve the term "democracy" for a political system one of the characteristics of which is the quality of being completely, or almost completely, responsive to all its citizens.

- Robert A. Dahl

Abstract

This paper documents the impact of voter turnout on top marginal tax rates in the 34 OECD countries for the period between 1974 and 2014. Across a number of specifications, I find that increases in voter turnout have a positive and statistically significant effect on top tax rates. This finding is broadly consistent with the median voter theorem that posits government redistribution to be a function of the income of the median voter. Because turnout has fallen drastically in the decades leading to 2014, and because the decrease is strongly correlated with income, the pivotal voter is no longer the one whose income lies near the median of the overall income distribution but instead the one whose income is at the median of a much richer subset of the distribution. Using ordinary least squares estimation as well as panel data methods, I find that increases in turnout are associated with higher rates of income tax for top earners. An instrumental variables approach confirms my hypothesis, though the estimates are less precisely estimated.

JEL Codes: H24, I38, P16

Keywords: voter turnout, income tax, redistribution, government policy

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I. Introduction

On a single day in May 2012, some 100,000 people gathered in New York City[1] to protest the exorbitant rise in the share of incomes accruing to the top 1 percent of the income distribution in the United States. In that country, the pre-tax income share of the wealthiest 1 percent has increased from 9.1 percent in 1974 to some 23.5 percent in 2007 while the share going to the top 0.1 percent has grown from 2.7 percent to 12.3 percent in the same time period (Piketty, 2014). Around the world, trends are similar. As of 2014, the richest percentile of the global population claimed 48 percent of the world's wealth (Oxfam, 2015). As such, the 'May Day' protest in New York City was organised as part of the larger *Occupy* movement which "aims to fight back against the richest 1 percent of people that are writing the rules of an unfair global economy."[2] The movement spanned some 100 cities in the United States and approximately 1,500 others across the globe. And yet, in November of that same year, just 53.5 percent of the total voting age population turned out to vote in America's presidential election. Ironically, individuals with incomes over US$100,000 comprised more than 25 percent of the vote. More generally, across all OECD countries, those that held elections between 2010 and 2014 experienced an average turnout of 66 percent, 12 percentage points lower than the 1974–1979 average of 78 percent[3]. Although this evidence need not be contradictory—it could be, for example, that the protesters were mostly well educated and better off whereas low income individuals neither voted nor protested—the contrasts are stark and they stimulate questions worthy study: for instance, if so many are concerned about the distribution of wealth and if so many are committed to taking action for the cause, then why do so few people vote? And what are the economic consequences of such low rates of turnout? Are they, in any way, responsible for the growing concentration of wealth among the top percentile?

In this paper, I analyse the latter two of these questions. I examine the impact of voter turnout on top marginal tax rates in the Organisation for Economic Cooperation and Development (OECD) countries. Empirical studies have shown that those who vote are systematically different in their social and economic characteristics—and hence their policy preferences—to those who do not vote. A large literature, reviewed later in the paper, indicates that, among other things, those who vote tend to be richer, better educated and older than those who do not. Falling rates of voter turnout, therefore, imply that the preferences of wealthy individuals are over-represented in relation to those of the population in general which, I expect, will place less pressure on public policy for redistribution. Accordingly, I anticipate top marginal tax rates to rise and fall with turnout.

To test this hypothesis, I assemble a panel of data for the OECD countries for the period between 1974 and 2014 to assess the impact of voter turnout in national elections on top marginal tax rates. I find a positive and statistically significant relationship between the two. Results across a number of specifications indicate that a ten percentage point increase in voter turnout leads to approximately 2.5 percentage point increase in

[1]Estimates taken from the David Graeber's 7 May 2012 article in the Guardian: $https : //www.theguardian.com/commentisfree/cifamerica/2012/may/07/occupy - liberation - from - liberalism?CMP = share_btn_link$. Accessed September 2016.

[2]Taken from the Website of the Occupy Wall Street: http://occupywallst.org/about/. Accessed September 2016.

[3]Turnout expressed as a fraction of the total voting age population (VAP). The difference between turnout and VAP turnout will be discussed later in the paper.

the top marginal tax rate. If the correlations uncovered in this paper are causal, then the 12 percentage point decrease in voter turnout in the 40 years to 2014 can explain some 13 percent of the 23 percentage point decline in tax rates over the same period. Because both variables are downward-sloping time series, I undertake a number of empirical strategies to regress them against each other in order to determine whether their relationship is, in fact, causal.

As a first step, I control for a number of observable social and economic characteristics of the countries in question, including per capita gross domestic product, annual growth in GDP, educational attainment, whether the election is presidential or parliamentary and the population size of a given country in a given year. To address concerns that deeper, underlying characteristics such as political freedoms are driving the results, I include an index from Freedom House that measures the degree of political rights. Controlling for these observable characteristics does little to diminish the effect of voter turnout on top marginal tax rates. The results remain positive and statistically significant at conventional levels.

As a second strategy, I exploit the panel structure of the data by including year dummies and country fixed effects. This is a crucial step as it enables me to (a) study the within-country variation of the variables of interest and (b) account for all unobservable, time-invariant country heterogeneity. It also allows me to control for any additional unobservable effects that vary over time but that remain constant across countries such as shocks to the global economy. Encouragingly, I find that my results remain robust to the inclusion of both time and country fixed effects.

To increase confidence in the OLS estimates both with and without fixed effects, I re-run the regressions on various subsamples. First, I regress the top marginal tax rate in years $t + 1$, $t + 2$, and $t + 3$ as well as over the election cycle on voter turnout for elections in year t and I find significant results, implying that turnout has an impact not just in the election year but throughout the entire term of a given government. Second, I carry out a placebo test by regressing tax rates in years $t - 1$, $t - 2$, and $t - 3$ on voter turnout for elections in year t. If turnout is what causes changes in tax rates, then we would not expect to see significant effects of turnout in year t on tax rates in years $t - n$. Consistent with this thinking, I find that turnout has little to no explanatory power over top marginal tax rates in the years leading up to an election.

As a final step, I employ an instrumental variables approach to exploit only the exogenous variation of voter turnout in a regression of top marginal tax rates on turnout. The instrument I use is a dummy variable that indicates whether a country has compulsory voting laws. The first stage of a two stage least squares regression shows that, within countries, compulsory voting laws have a large, positive and statistically significant effect on turnout, implying that the instrument is strong and relevant. Later in the paper I address issues concerning the exclusion restriction of the instrument. To the extent that this restriction is satisfied, I find that the instrumental variables results produce estimates with coefficients of similar magnitude (and sign) to OLS estimates both with and without fixed effects. However, because of the relative imprecision of 2SLS analysis as compared with OLS, the results are not significant at conventional levels and as such are taken as suggestive.

Finally, if turnout does have a significant effect on tax policy, one might wonder what the causal channels are through which it exerts its influence. A likely candidate is party ideology. To test this, I add to the dataset an index that measures the ideological complexion of government. OLS estimation confirms the intuition that higher rates of

voter turnout push party ideology further left on the political spectrum.

The rest of this paper is organised as follows. Section II discusses the median voter theorem and addresses the dual questions of who votes and why. It also places this study in the context of existing literature on voter turnout and explains the paper's main contributions. Section III describes the data and provides an overview of the trends in voter turnout and top marginal tax rates in the OECD countries. It also details the empirical specifications employed to generate the results. Section IV discusses the results and Section V concludes.

II. Background

A. Voter Preferences and the Median Voter Theorem

A tenet of the political science of elections is the median voter theorem. The theorem maintains that politicians have but one objective: to win office. Accordingly, politicians have powerful incentives to align their policy platforms to suit the interests of the majority of their respective electorates. Consequently, the policy platforms of competing parties on a left-right policy spectrum gradually converge toward centre ground so as to maximize the number of votes won and to minimize the number of votes lost. As early as 1929, Harold Hotelling, observing the competition between the Republican and Democratic parties in the United States, noted that in order to avoid losing votes, "each party strives to make its platform as much like the other as possible" (Hotelling, 1929).

Elaborating the idea, Downs (1957) suggested that politicians "act solely in order to attain the income, prestige and power which come from being in office..." and that "parties formulate policies in order to win elections, rather than win elections in order to formulate policies". To win office, therefore, politicians offer policy platforms that increasingly draw nearer to the preferences of the voter whose preferences are located in the median of the *preference distribution* (i.e. the median voter). Put more precisely, the Downsian model of electoral competition states that, given a one dimensional policy space and single-peaked voter preferences, the policy preferences of the median voter act as a sort of centripetal force, drawing the policy platforms of various parties towards it.

Meltzer & Richard (1981) build on the Downsian model of electoral competition to fashion a model of how governments set tax rates and allocate social spending in response to the preferences of the median—or in their terminology, the decisive—voter. Their model, which builds on previous work from Roberts (1977) and Romer (1975), provides two crucial insights: first, it indicates that the decisive voter is not necessarily the one with preferences located in the median of the preference distribution but the one whose *income* lies in the median of the *income distribution*. Second, it demonstrates that voters' preferences for tax rates rise and fall with individual productivity endowments. Accordingly, the size of government, taken to be the share of income redistributed by the government in welfare payments and in social services, depends on the relative distance between median and mean income. The lower median income is with respect to mean income, the greater are the preferences of median-income receiving voters for redistribution. Politicians respond to the median voter to maximize the chances of winning and so they offer tax policies with more redistribution. As median income approaches mean income, the preferences of voters for a high tax rate declines. The insights of their model are captured in Figure 1, taken from Meltzer & Richard (1981).

In their model, individual income, y, is a function of individual productivity, x. Tax

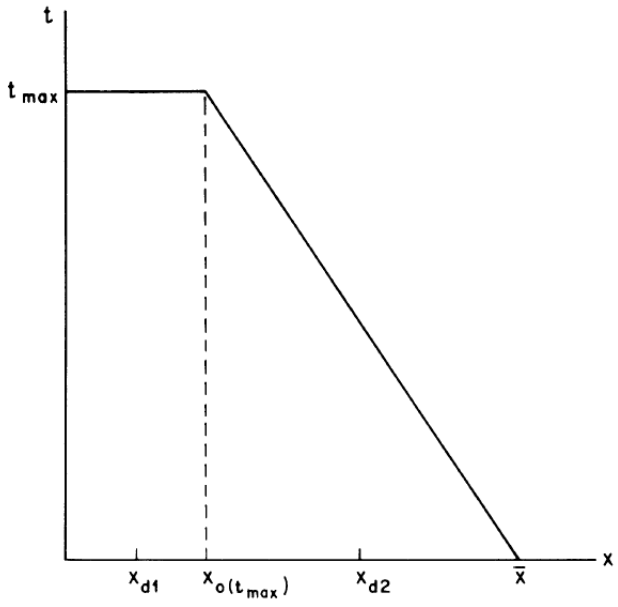


Figure 1: Tax rates and individual productivity

rates are denoted by t. Utility is a function of consumption and leisure and consumption, in turn, is a function of net income plus a government benefit, r, as shown in equation 1.

$$c(x) = (1-t)xn + r \tag{1}$$

Where n is time allocated to work and $1-n$ is time allocated for leisure. An individual in a Meltzer & Richard economic environment thus tries to choose n so as to solve the following utility maximization problem:

$$\max_{n\epsilon[0,1]} \quad u(c,l) = u[r + nx(1-t), 1-n] \tag{2}$$

Without specifying a functional form for $u(c,l)$, Meltzer & Richard derive the following first order condition, comprised of utility from consumption and utility from leisure.

$$\frac{\partial u}{\partial n} = u_c[r + nx(1-t), 1-n]x(1-t) - u_l[r + nx(1-t), 1-n] \tag{3}$$

The model suggests that there exists a certain level of productivity, denoted x_0, at which individuals subsist solely on government transfers and choose not to work. Setting $n = 0$ and solving for x in equation 3, we derive the threshold level of productivity below which individuals subsist on government benefits:

$$x_0 = \frac{u_c[r,1]}{u_l[r,1](1-t)} \tag{4}$$

Note that x_0 is maximized as t increases. Consequently, individuals endowed with productivity $x \leq x_0$, prefer rates of taxation that maximize government transfers and, hence, individual utility (since utility is a function of government transfers, r, and productivity, x). If the median voter is endowed with x_0, tax rates are set at a maximum, noted t_{max} in Figure 1. The maximum tax rate has an upper bound, beyond which overall output and, hence, government revenues decline. As the median income receiver increases

in productivity, his or her preference for government transfers decreases as does his or her preference for a high tax rate. When the productivity of the decisive voter approaches average levels of productivity, $\bar{x}$, his or her preference for taxation go to zero as he or she derives full utility from income generated through work and time dedicated to leisure. Because utility is a function of both earned income *and* government benefits, votes for the tax rate are implicit votes for utility: people less reliant on the benefit prefer lower taxes whereas those more reliant on the benefit prefer higher taxes. In a majority rule voting system, therefore, the pivotal voter is the one located at the median of the income distribution.

It is important to remember that politicians in the Meltzer & Richard environment still respond to the preferences of the median voter. Their model simply specifies more precisely who the median voter is. A more general conclusion thus derived from the model is that the more widely political franchise is extended, the poorer is the decisive, or median, voter in relation to the population in general and the greater are his or her demands for redistribution. The model thus has trouble explaining rising inequality, especially of the sort generated by the hyper concentration of wealth by the top percentiles. After all, such concentration creates median voters with incomes far below the average and with preferences for greater redistribution. Politicians, in response to such preferences, ought to raise taxes so as to stem the growing concentration of wealth. Indeed, if the model holds true, then we would not expect tax rates to decline as wealth becomes increasingly concentrated as it has been in the OECD countries in the decades leading to 2014.

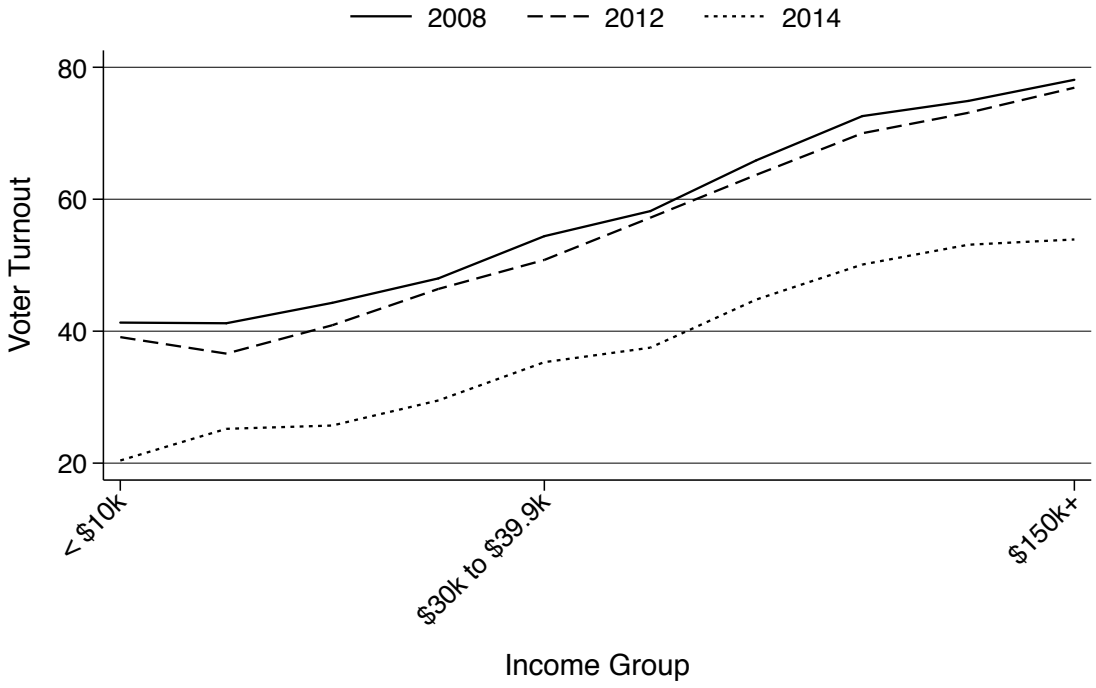
B. Who votes?

The shortcomings of the median voter theorem have been well documented and it is not the objective of this article to summarize them (for useful summary see chapter 2 in Hindmor (2006)). Here, I focus on the role of turnout. The theorem assumes that everyone in a population votes in which case the decisive voter is the voter with median level income as suggested by Meltzer & Richard. But what happens when not everyone votes? If voters and non-voters are randomly distributed, then it would be difficult to identify significant consequences of falling rates of turnout. As it happens, however, those who vote are typically better educated, wealthier and more informed politically than those who abstain. From an empirical point of view, then, the 'median voter' is not the one who lies at the median of the income distribution of the population but rather at the median of a much richer subset of the income distribution. Although there is some research that challenges the conventional view that voter turnout—and in particular the decline of it—is marked along class lines (Leighley & Nagler, 1992), the majority of studies consistently show that factors such as age, income, education as well as being better informed are strong predictors of individual turnout (Lassen 2005; Smets & van Ham 2013; Gallego 2010). Larcinese (2007) describes the phenomenon aptly:

> Downsian models normally assume that everybody votes...It is, however, clear from available data that non-voters are not randomly distributed across the total population: a substantial body of empirical research has documented that voters and non-voters systematically differ in their socio-economic and demographic background and, therefore, in their needs and policy preferences...In different countries and elections, empirical research consistently shows that the likelihood of voting is positively correlated with income, age and education

level, as well as with being a male citizen. It is quite likely that such characteristics are correlated with policy preference, especially over redistributive issues.

A cursory search of readily available evidence confirms this view. Figure 2 shows voter turnout by household income for the last three presidential elections in the United States. As shown, there is a clear association between income and turnout. Figure 3 shows the same data, this time for the 2014 presidential election and broken down by age. Data for the 2008 and 2012 elections are similar: all show a positive correlation between age, income and voting. And such relationships are not just observed in the United States. Table 1 shows that voter turnout in France is also marked along income groups, with wealthier segments of the population displaying greater rates of electoral participation (Abrial *et al.* , 2003).

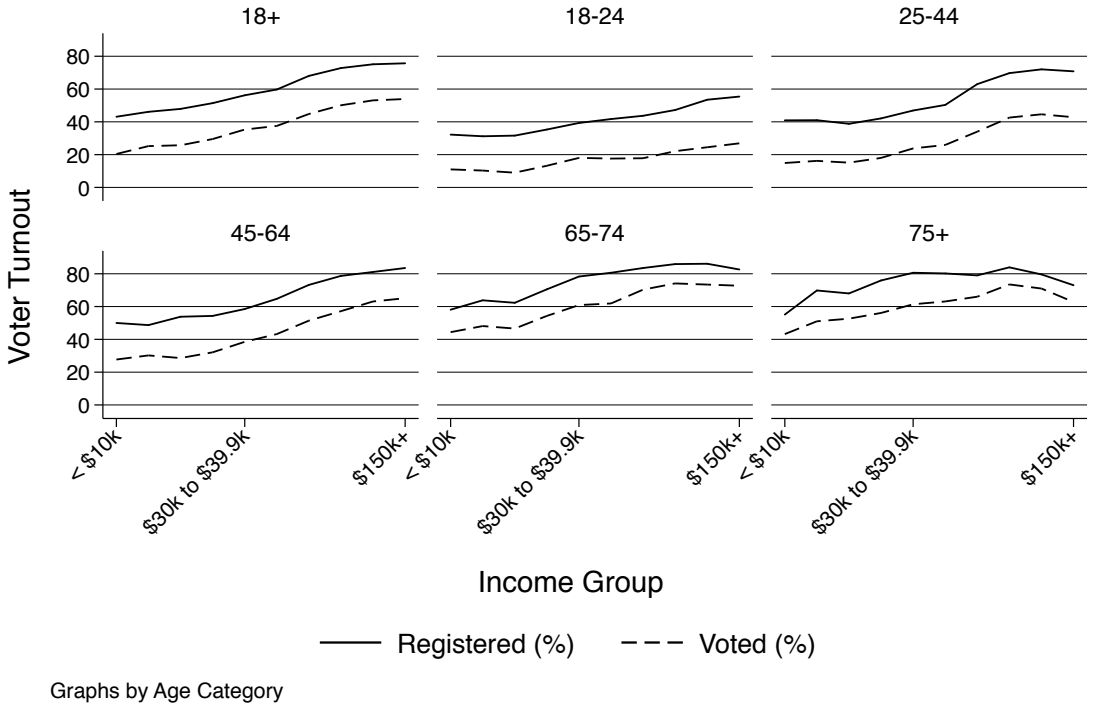


Source: US Census Bureau Current Population Survey's (Tables 7 for 2012 and 2014 and Table 8 for 2008)

Figure 2: Turnout by household income in US presidential elections

Table 1: Turnout by income group in 1995 French presidential elections

	Turnout (%) by Income Group						
	Lowest	Low	Middle	High	Highest	Total	N
Did not vote	47.6	16.3	9.6	8.4	7.9	11.1	101
Voted	82.4	83.7	90.4	91.6	92.4	88.9	81



Source: US Census Bureau, Table 7 of the November 2014 Current Population Survey

Figure 3: Turnout by household income and age in the 2014 US presidential election

C. Why do people vote?

How do we know that the direction of causation is from turnout to redistributive policy and not the other way around? That is to say, how do we know that more inequality and less redistributive policy themselves do not cause lower levels of turnout? Whilst there may be a possibility of reverse causation, such a hypothesis has received little intellectual support. For one, all the theoretical implications of the median voter theorem suggest that the direction of causation is from voters to government. For another, the reasons why people vote are many but income distribution and taxation policy do not appear to be among them. Instead, theoretical and empirical work tends to point to such factors as the costs of registration (things like voter registration laws, information acquisition and time); demographic factors (including education, income, age, gender and race as discussed in the previous subsection); social and psychological factors (the like of which include habit, marital status, civic duty and social image); and the particular characteristics of a given election (how close a given political race is) (Harder & Krosnick 2008; Stefano DellaVigna 2014).

Elections Canada commissioned a survey following its 2 May 2011 General Election in order to better understand the reasons why eligible voters did not cast their ballots. As shown in Figure 4, inequality, taxation policy or government redistribution do not appear as reasons for abstaining. Whilst these figures cannot conclusively rule out the possibility of reverse causality, the weight of evidence available seems to support the hypothesis put forward in this paper.

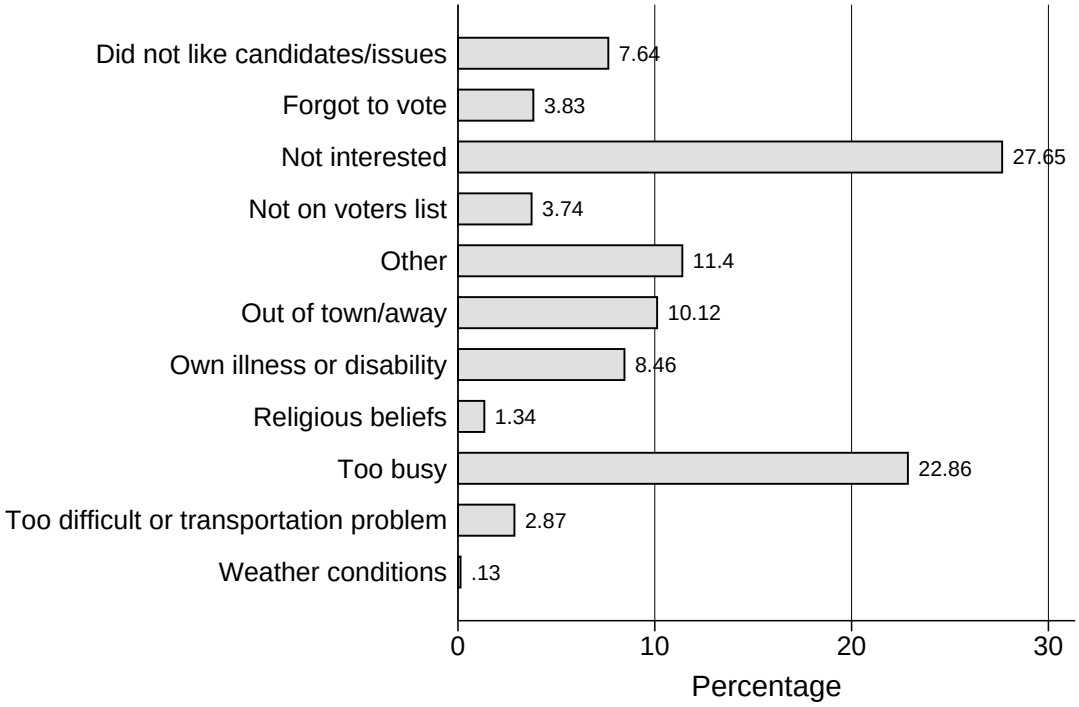


Figure 4: Why voters did not vote in Canada's 2011 General Election

Source: Labour Force Survey commissioned by Elections Canada, May 2011

D. Related Literature

This study contributes to a rich literature that documents the effect of voter turnout on economic outcomes. The most well documented relationship between turnout and redistribution concerns the effect of voter participation on government expenditures as a share of GDP. Hicks & Swank (1992) examine the political determinants of social spending in 18 industrialised democracies during the period between 1960 and 1982 and find that higher rates of voter turnout, "as well as left and center governments" augment welfare spending. In a similar vein, Lindert (1996) analyses the factors that determine social spending in a panel of data for 19 OECD countries between 1960 and 1981. His dependent variables include six measures of government expenditure: pensions, welfare, unemployment compensation, education, health and non-social spending. His results indicate that higher levels of voter turnout are associated with higher levels of social spending in almost all categories. Examining similar questions with another panel of 19 OECD countries, Franzese (2002) finds that both income skew and voter participation affect government transfers. Interestingly, his study also finds that the interaction of these two variables has a positive and significant effect on taxes and transfers, suggesting that the marginal effect of either variable becomes greater when the other variable is larger. Intuitively, his findings suggest that voter turnout matters more for government redistribution when income distribution is more unequal. More recently, Mahler *et al.* (2014) assess the impact of voter turnout across 14 advanced democracies. In contrast to other studies, the authors use a measure for turnout inequality rather than rates of turnout as the main explanatory variable and find that greater inequality of voting is associated with less social benefits. Larcinese (2007) carries out a cross-country panel analysis of 41

countries between 1972 and 1998 and finds similar relationship between voter turnout and social and welfare spending. His contribution shows that the results derived in previous studies holds even when considering countries that are not "developed democracies"; in so doing he expands the sample and extends previously documented results to a much wider range of countries. Finally, Fujiwara (2015) examines the introduction of electronic voting technology in Brasil. He finds that such technology led to a large increase in voting among lesser educated citizens, thereby causing a shift in government spending towards health care aimed at lower income groups.

The study adds to this literature, and advances it, in two ways. First, it adds to studies like Lindert (1996), Franzese (2002) and Larcinese (2007) by analysing recent data for the OECD nations over a 40 year period. In this respect, Lindert (1996) explains that "post-1981 data are not available in the abundance and quality of this special OECD study". The dataset compiled for this study does not suffer from this difficulty. The number of countries in the OECD has also grown to 34 since Lindert's study which expands the sample considerably. Additionally, because of the panel structure of my data, I am able to utilise both year and country fixed effects. I also examine the effects of turnout on tax rates not just in the year of the election but in subsequent years and over the electoral cycle and I employ and instrumental variables strategy in an effort to isolate the exogenous variation in turnout in order to better understand its effects on redistributive policy.

Second, by investigating the effects of voter turnout on top marginal tax rates, the study is, to my knowledge, the first of its kind to measure the effects of voter participation on policies that *directly* affect the distribution of income. Thus, while it is related to the literature that examines the relationship between turnout and redistribution as measured by the amount of government social spending, the study poses a slightly different question, asking instead what the direct effects of voter turnout are on the tax rates of the wealthiest segments of the population. In so doing, the study also relates to the literature that studies the determinants of wealth concentration. This literature has focused mostly on market forces as the primary cause of wealth concentration, the like of which include the difference between the interest rate and growth rate (Piketty, 2014), the supply and demand of skills and the overall returns to education (Autor, 2014), and institutional and technological factors (Acemoglu & Robinson, 2015). Although political accounts of inequality do exist, including a number that focus on the hyper concentration of wealth by the top percentiles, these studies focus mostly on the power and resources of the wealthy in shaping market outcomes (Hacker & Pierson 2010; Winters 2011). Accordingly, to my knowledge, this is the first study that relates political participation of citizens in elections with the rising levels of wealth concentration now being observed in many economically advanced and democratically stable nations.

III. Empirical Methodology

A. Data

The analysis is based on measures of voter turnout and top marginal tax rates in the 34 nations that comprise the Organisation for Economic Cooperation and Development (OECD) for the period between 1974 and 2014. The OECD countries were chosen for two reasons. First, by and large, the OECD Member States represent the advanced democracies of the world and it is the economic impact of voter turnout in such countries

that we are interested to study. Second, and relatedly, data are much more readily available for the variables of interest within the universe of OECD nations. In this respect, a new dataset was compiled from a number of sources described in this section.

Data for voter turnout comes from the International Institute for Democratic and Electoral Assistance (IDEA). IDEA maintains a database that records voter participation in national presidential and parliamentary elections of more than 170 nations since 1945. The database maintains two records for voter turnout: one, *turnout*, that measures voter participation as a percentage of registered voters and a second, *VAP turnout*, that measures voter participation as a fraction of the total voting age population. Because *turnout* measures participation only from among those who registered to vote, the study uses *VAP turnout* to avoid potential endogeneity issues associated with voter registration (which is likely correlated with other determinants of turnout). There are practical issues, too, with regard to voter registration laws in various countries. For example, some nations may not use voter registers (although this is not the case in the OECD countries) and voter registration figures, according to IDEA, can be inaccurate or unavailable. *VAP turnout* may also provide a clearer picture of turnout by bringing to light challenges with the voter registration process, in the event that the two figures are disparate. In practice, however, the two measures are very similar for the sample of OECD countries and the results of the study are robust to both. The IDEA database also includes a number of other variables that act as valuable controls for the study in question. These include whether the election was presidential or parliamentary[4], a Freedom House score that measures political rights, and the number of registered voters. Lastly, the database maintains a dummy variable for whether a nation has compulsory voting laws. I use this variable as an instrument in the latter parts of my empirical analysis.

Information regarding the top marginal tax rates comes from the OECD, but are compiled, for the years between 1974 to 2013, by the World Tax Database and The Tax Policy Center. Tax rates for 2014 are readily available from the website of the OECD. I also obtain unemployment and population figures for each country in each year of the sample from the OECD.

I used the World Bank Open Data to obtain data on GDP per capita as well as annual growth in GDP. These are important control variables as they may have a direct bearing both on voter turnout as well as on government tax policy decisions. In addition, the World Bank data include figures for tertiary education enrolment rates of each country for each year of the study. Including this variable allows me to control for any education-related effects that may confound the analysis.

Tables 2 and 3 provide descriptive statistics of the variables in the data set while Table A.1 in the Appendix describes the variables in more detail and provides their sources.

[4]11 countries in the sample have presidential and parliamentary elections in the same year. To address this, I conduct the analysis using only the presidential election data of these nations and then again using only their parliamentary election data. Next, I re-run the analysis choosing, to my best judgement, the most sensible election for each country. Results insensitive to such choices and I report which elections from which country I use in Table A.2.

Table 2: Summary Statistics: Entire Sample

	Mean	SD	Min	Max	Observations
Turnout (%)	77.0	12.4	42	96	356
VAP Turnout (%)	73.5	12.5	35	95	357
Top Tax Rate (%)	49.1	14.1	12	91	1,159
GDP Per Capita (USD 1,000s)	20.9	18.3	.59	117	1,331
Annual GDP Growth Rate (%)	2.8	3.1	-15	13	1,268
Unemployment Rate (%)	7.0	4.1	.0068	27	1,210
Population (millions)	32.2	50.4	.22	319	1,383
Registered Voters (millions)	20.5	30.0	.13	194	356
Tertiary Education Enrollment Rate (%)	42.0	23.3	1.1	110	1,219
Ideological Complexion of Government	2.9	0.8	1	4	1,109
Freedom House - Political Rights	1.2	0.6	1	5	349
Turnout - VAPturnout	3.5	8.2	-14	38	356

B. Trends in Voter Turnout and the Top Marginal Tax Rate

Figure 5 shows a steady downward trend in both voter turnout and the top marginal tax rates in 34 countries of the sample. Figure A.1 in the Appendix shows that similar trends exist within each individual country. For the OECD as a whole, Table 3 shows that rates of VAP turnout (henceforth referred to as turnout) between 1974 and 1979 were 78.5 percent. For the period between 2010 and 2014, rates of turnout dropped to 66.6 as indicated in Table 3. Top marginal tax rates followed similar trends, falling from 65.8 percent in the mid to late 1970s to 42.5 percent in the mid 2010s. Figure 6 plots top marginal tax rates against turnout and provides further evidence of a positive association between the two variables. However, because not every country has elections in the same year, the simple scatter shown in Figure 6 likely suffers from compositional issues. To address this, I retain the residuals from a regression of top marginal tax rates on only country and year dummies and plot them against the residuals from a regression of voter turnout on country and year fixed effects. Doing so enables me to observe variation in the two variables when all country and time heterogeneity have been accounted for, thereby alleviating concerns of compositional effects that may arise in a straightforward scatter. Results are shown in Figure 7. As illustrated, the relationship between the predicted residuals, whilst still positive, is much less pronounced than in Figure 6 and may be more indicative of the true relationship between the two variables.

The last row of the summary tables show that the difference between *turnout* and *VAP turnout* are not large. For the entire sample, the mean difference between the variables is 3.5 percentage points. The difference has a relatively high standard deviation, with a minimum value of -14 percentage points (meaning that VAP turnout was in fact larger than turnout) and a maximum of 38 percentage points. A closer examination of the data, however, reveals that the large disparities between *turnout* and *VAP turnout* are driven by four countries. On the one hand, the United States and Luxembourg exhibit large differences (in the order of 30 percentage points or more) between turnout and VAP turnout, suggesting that the voter registration laws in these countries make it hard for people of voting age to register or that there are a large number of people

Table 3: Summary Statistics for the First and Last 5 Years of the Sample

	Mean	SD	Min	Max	Observations
Panel A: 1974 to 1979					
Turnout (%)	82.0	11.3	48	95	47
VAP Turnout (%)	78.5	11.7	41	95	47
Top Tax Rate (%)	65.8	11.0	40	91	136
GDP Per Capita (USD 1,000s)	6.1	3.5	.59	16	168
Annual GDP Growth Rate (%)	3.5	3.3	-11	13	158
Unemployment Rate (%)	4.3	2.7	.0068	9.9	140
Population (millions)	27.5	41.8	.22	225	204
Registered Voters (millions)	16.0	22.3	.13	98	47
Tertiary Education Enrollment Rate (%)	19.7	10.0	1.1	55	169
Ideological Complexion of Government	3.0	0.9	1	4	134
Freedom House - Political Rights	1.4	0.6	1	4	46
Turnout - VAPturnout	3.5	7.3	-8.9	32	47
Panel B: 2010 to 2014					
Turnout (%)	70.1	13.0	42	93	49
VAP Turnout (%)	66.6	11.3	40	87	49
Top Tax Rate (%)	42.5	10.9	15	60	136
GDP Per Capita (USD 1,000s)	40.9	23.6	8.9	117	170
Annual GDP Growth Rate (%)	1.7	2.5	-9.1	9.2	170
Unemployment Rate (%)	8.6	4.7	3.1	27	166
Population (millions)	37.9	59.7	.32	319	159
Registered Voters (millions)	23.1	35.5	.24	194	49
Tertiary Education Enrollment Rate (%)	71.3	16.7	18	110	126
Ideological Complexion of Government	2.7	0.8	2	4	124
Freedom House - Political Rights	1.1	0.5	1	3	48
Turnout - VAPturnout	3.5	7.7	-6.9	36	49

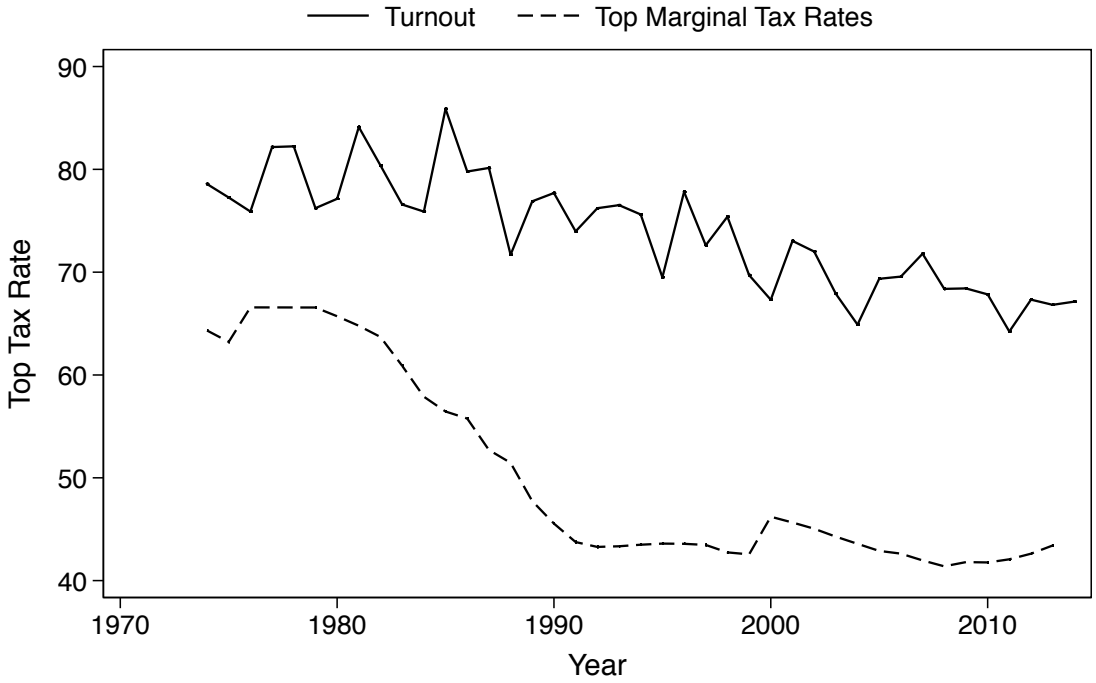


Figure 5: Top marginal tax rates and voter turnout in OECD Countries: 1974 to 2014

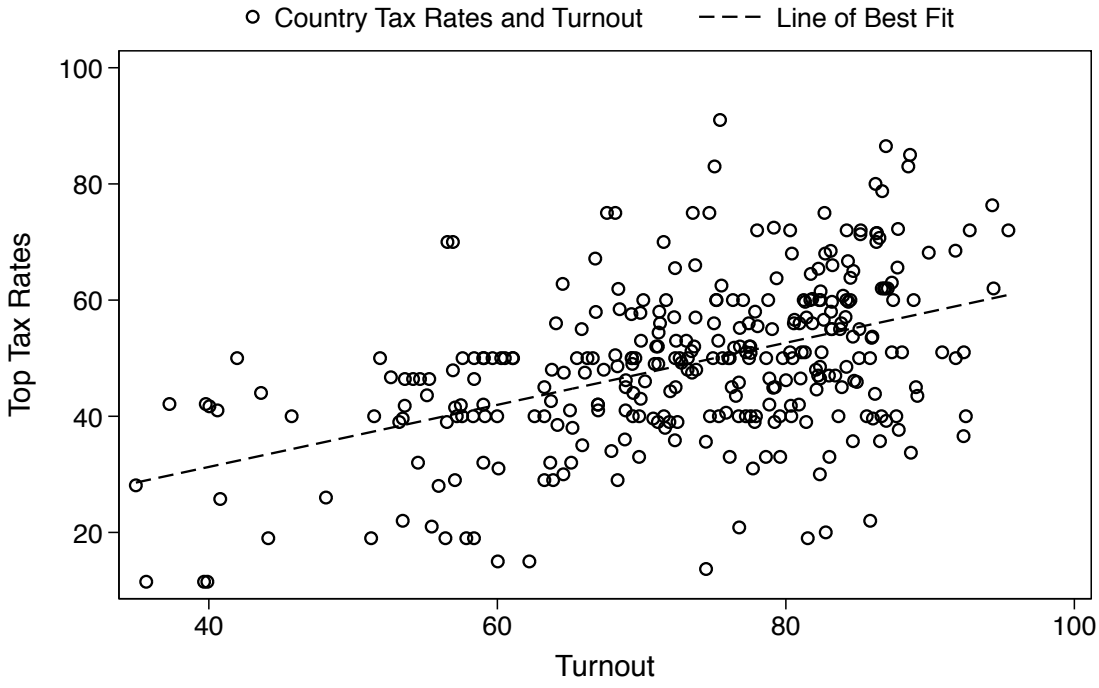


Figure 6: Scatter plot of top tax rates and turnout in OECD countries: 1974 to 2014

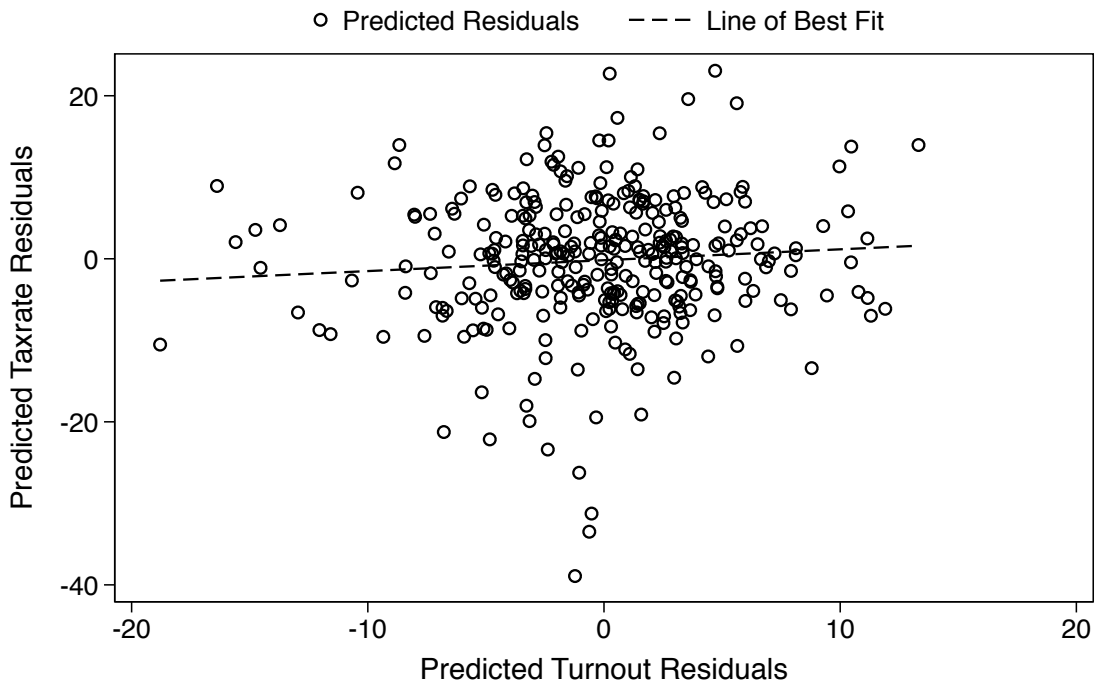


Figure 7: Scatter plot of predicted residuals of tax rates and turnout in OECD countries: 1974 to 2014

This figure plots the residuals of a regression of top marginal tax rates on year and country fixed effects against the residuals from a regression of voter turnout on year and country fixed effects.

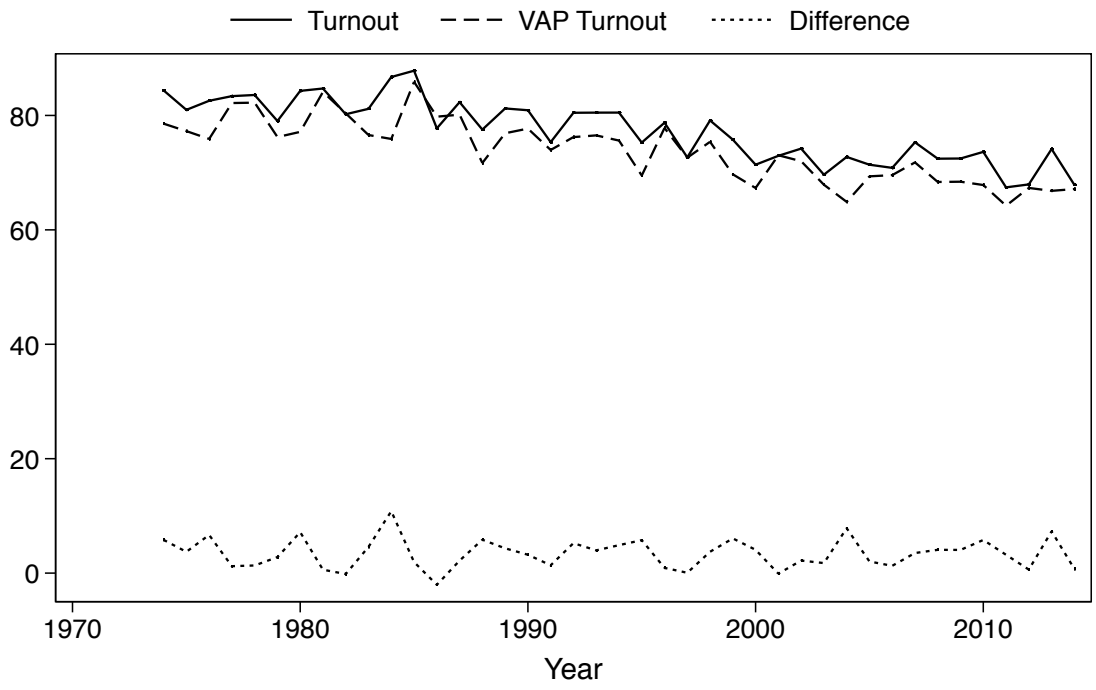


Figure 8: Mean values for Turnout and VAPTurnout in OECD countries: 1974 to 2014

(like expats) who are ineligible to vote. The fact that VAP turnout captures turnout as a fraction of the voting age population and not the *eligible* voting age population does raise some concerns. On the other hand, however, Greece and Portugal have, on three occasions (Greece in 2000 and 2004 and Portugal in 1995) experienced a 10 percentage point difference between VAP turnout and turnout, suggesting that voter registration laws may not be strictly enforced or that records are not well kept. Moreover—and perhaps more importantly—because registering to vote is likely correlated with other determinants of turnout, using *turnout* raises additional concerns related to endogeneity. These considerations lead me to choose VAP turnout as they key explanatory variable in the study. As mentioned earlier, however, the results of the analysis are robust to both measures (in fact, while the coefficients remain nearly identical across all specifications, they are estimated more precisely in a few instances with *turnout*) and, with the exception of a few isolated cases, the mean difference between the two variables is not substantial. This is made evident in Figure 8 which shows the pooled means for turnout, VAP turnout and the difference between the two for each year of the analysis. As shown, the difference variable is small and much more stable.

C. OLS Estimates

To gain insight into the relationship between voter turnout and the top rate of marginal tax, I begin by estimating the parameters of the following specification:

$$TaxRate_{i,t+n} = \beta_0 + \beta_1 \cdot VAPTurnout_{it} + \mathbf{\Gamma} \cdot \mathbf{X_{it}} + u_{it} \tag{5}$$

Table 4: OLS and Fixed Effects Regressions

	Dependent Variable: Top Tax Rates (%) in Year t			
	(1)	(2)	(3)	(4)
VAP Turnout (%)	0.534***	0.585***	0.439***	0.262**
	(0.0852)	(0.106)	(0.104)	(0.124)
Full Set of Controls	No	Yes	Yes	Yes
Year Fixed Effects	No	No	Yes	Yes
Country Fixed Effects	No	No	No	Yes
Observations	319	281	281	281
R^2	0.218	0.332	0.626	0.569
Number of Countries	34	34	34	34

Notes: Standard errors (in parentheses) are clustered at the country level. The dependent variable is top marginal tax rates in the 34 OECD countries. Control variables include: the number of registered voters, country population, whether the election was presidential or parliamentary, GDP per capita, GDP growth, a Freedom House score for political rights, tertiary education enrolment rate, and the unemployment rate. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Where i is an index for country, t indicates the year, u_i is an idiosyncratic disturbance term and X_{it} contains a vector of country-specific controls as discussed in the preceding subsection. Our variable of interest is β_1, which can be interpreted as the effect, in terms of percentage points, of a one percentage point increase in VAP turnout on top marginal tax rates across the OECD. The results is shown in Column 2 of Table 4 and it indicates that, accounting for a number of potentially confounding variables, β_1 is significant and positive, suggesting that a one unit increase in voter participation is associated with an increase in the top rate of marginal tax by more than 0.5 percentage points.

To investigate the relationship further, I include year and country fixed effects in equation 5 in order to obtain equation 6. Year dummies take into account any unobserved effects that are constant across countries but that may fluctuate over time, such as busts and booms in the global economy. Country fixed effects, indicated by δ_i, capture time-invariant, unobserved country heterogeneity and allow us to understand the within-country variation between the variables of interest.

$$TaxRate_{i,t+n} = \delta_i + \zeta_t + \beta_1 \cdot VAPTurnout_{it} + \mathbf{\Gamma} \cdot \mathbf{X_{it}} + u_{it} \tag{6}$$

Results are shown in Table 4 and are similar to the baseline estimates. Column 3 shows the specification with year fixed effects whilst Column 4 shows the specification with both year and country fixed effects. Column 4, the preferred specification, shows that, while the coefficient of interest does decrease from baseline OLS estimates, it remains positive, economically relevant and significantly different to zero. Of course, a more efficient approach to controlling for unobserved country heterogeneity is to use a random effects model. Doing so produces coefficients slightly larger than those shown in Columns 3 and 4 of Table 4 but with much greater precision. However, the key identifying assumption of random effects is that the unobserved effects must be uncorrelated with the key explanatory variable of interest, in this case voter turnout. In practice this

assumption seems implausible and a Hausman test of the fixed effects and random effects estimators leads us to reject the hypothesis that the unobserved country heterogeneity is orthogonal with the other regressors of the model. This is consistent with results derived in Larcinese (2007).

The within country results confirm the intuition behind the theory. Recall, Figure 1 which illustrates that when median income falls below mean income, the pivotal voter within a country will choose higher tax rates. The analysis, in some ways therefore, confirms the predictions of the model. It shows that, as participation approaches universal levels, tax rates will rise, presumably in response to the preferences of the median voter who lies in median of the income distribution. When turnout is not universal, tax policy may still respond to the median voter but it is important to note who the median voter is in these cases: in the limit, he or (in some cases) she is often richer, better educated and older than the median citizen. Taking into consideration actual turnout rates in median voter models is thus important to better understand how governments react to the preferences of their citizens as expressed in the ballot box.

Thus far, I have shown that voter turnout in year t has a contemporaneous effect on top marginal tax rates. Is this plausible? That is to say, if we believe the relationship is causal, do (or better yet, can) governments react that quickly to voter preferences? Examining dates for each election and marking dates for corresponding changes in tax rates for every country of the sample are beyond the scope of this study. However, to increase confidence in the reliability of the estimates thus far obtained, I regress top marginal tax rates in years $t+1$, $t+2$ and $t+3$ on turnout. I also regress the average value of the top marginal tax rate over the entire election cycle for each election in each country on turnout[5]. Results are shown in Table 5 which shows that the relationship remains significant at conventional levels for all specifications. The coefficient on turnout in Column 4 of Table 5 is significant and similar in magnitude to that of Column 4 in Table 4. If turnout does have a causal relation with tax policy, it makes sense that it does so over the entire election cycle.

Table 5: Fixed Effects Regression with Time Leads

	Dependent Variable: Top Tax Rates (%) with Time Leads			
	(1) Year *t+1*	(2) Year *t+2*	(3) Year *t+3*	(4) Election Cycle Avg.
VAP Turnout (%)	0.218*	0.144*	0.196**	0.226**
	(0.113)	(0.0841)	(0.0845)	(0.105)
Full Set of Controls	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Observations	280	273	269	288
Number of Countries	34	34	34	34
Within-country R-Squared	0.579	0.575	0.547	0.567

Standard errors (in parentheses) clustered at the country level. See notes of Table 4 for control variables.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

[5]The total number of elections and the average length of the electoral cycle in each OECD country for the period of the sample are shown in Figures A.2 and A.3 in the Appendix.

To further increase confidence that the relationship observed is not spurious, I carry out a placebo test by regressing tax rates in years $t-1$, $t-2$ and $t-3$ on turnout in year t. The idea is that voter turnout provides a mandate for the tax policies of the *incoming* government; accordingly, we cannot expect elections in period t to have an effect on government policies that precede it, that is to say, in period $t-n$. Results are shown in Table 6 and show that, as expected, turnout has no explanatory power over tax rates in the years prior to an election. The coefficients are much smaller and, with the exception of Column 2, are not significantly different than zero.

Table 6: Fixed Effects Regression with Time Lags

	Dependent Variable: Top Tax Rates (%) with Time Lags		
	(1) Year *t–1*	(2) Year *t–2*	(3) Year *t–3*
VAP Turnout (%)	0.0150	0.161*	0.0956
	(0.117)	(0.0897)	(0.0947)
Full Set of Controls	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes
Observations	272	267	266
Number of Countries	34	34	34
Within-country R-Squared	0.427	0.446	0.475

Standard errors (in parentheses) clustered at the country level. See notes of Table 4 for control variables.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

D. Instrumental Variables

Thus far, the analysis has shown a statistically significant relationship between voter participation and the top marginal tax rate. Naturally, the correlation uncovered does not necessarily imply that the relationship is causal. Nonetheless, the correlation is robust to a range of controls related to the social and political characteristics of the countries in our sample. Moreover, the inclusion of year and country fixed effects implies that our results are robust to unobserved time and country heterogeneity, respectively. Results also hold when tax rates at various points in the future are regressed on turnout in time period t, suggesting that turnout is a factor in the redistributive policy of incoming governments. Still, one may be concerned about the existence of variables that are both correlated with turnout and determinants of tax rates, variables which would ultimately confound the analysis.

In this section, an instrumental variables strategy is undertaken to further test the robustness of the results thus far obtained. Specifically, I use an indicator variable for whether or not a country has compulsory voting laws as an instrument for voter turnout. The intuition is that compulsory voting laws have no effect on tax rates except through voter turnout. The instrument is valid to the extent that it is (a) relevant to turnout and (b) orthogonal to the disturbance term of equation 5. Between 1974 and 2014, 10 of the OECD countries had, or continue to have, compulsory voting laws. Table 7 illustrates the various experiences of the OECD countries with compulsory voting laws and makes clear that such laws do not change frequently.

Table 7: OECD Countries and Compulsory Voting

OECD Countries with Compulsory Voting Laws		
Country	**Year Introduced**	**Enforced?**
Australia	1924	Yes. Non-voter faces a fine.
Austria	1929 to 1982 (all states)	Yes. Non-voters faced a fine
Austria (Tyrol)	1929 to 2002	Yes. Non-voter faced a fine.
Austria (Vorarlberg)	1929 to 2004	Yes. Non-voter faced a fine.
Austria (Styria)	1929 to 1993	Yes
Austria (Carinthia)	1986 to 1993	Yes
Belgium	1893 (men) 1949 (women)	Yes. Possible imprisonment. Non-participation in 4 or more elections over 15 years leads to disenfranchisement.
Chile	1925 to 2012	Yes. Non-voter faced a fine and possible imprisonment.
France (Senate)	1950s or 60s	No
Greece	1926	No
Italy	1946 to 1993	No
Luxembourg	1919	Yes. Non-voter faces a fine but voting is compulsory only for those who are registered to vote and registering is not mandatory. Voting is voluntary for citizens over 70.
Mexico	Prior to 1946	No
The Netherlands	1917 to 1967	No
Spain	1907 to 1923	No
Switzerland (Schaffhausen)	1904	Yes. Non-voter faces a fine.
Turkey	1982	Yes. Non-voter faces a fine.
United States (Georgia)	1777	No
OECD Countries without Compulsory Voting Laws		
Canada, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Israel, Italy, Japan, Republic of Korea, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Sweden, Switzerland, United Kingdom		

Source: International Institute for Democratic and Electoral Assistance (IDEA). Taken from its Compulsory Voting web page.

In the first stage of the instrumental variables analysis, I regress turnout on compulsory voting as expressed in equation 7. The coefficient is positive and statistically significant. However, I do not report the first stage results; instead I report the first-stage *F-statistic*, shown in the penultimate row of Table 8. As shown, the within-country model (Column 2) indicates that the instrument is not only relevant but strong. This result consistent with other studies that document the effect of compulsory voting on turnout. Quintelier *et al.* (2011), for example, study 36 countries and find that compulsory voting is positively and significantly associated with higher rates of turnout. Such laws do not perfectly predict voter turnout because ultimately what is compulsory is not actual voting but attendance (Quintelier *et al.* , 2011). Nonetheless, the laws do appear to have considerable impact on voting. Quintelier *et al.* (2011) show that when Australia introduced compulsory voting in 1924, voter participation in subsequent elections increased by 23.2 percent. By contrast, when the Netherlands abolished the law in 1967,

turnout levels in its 1970 election (and beyond) declined by more than 10 percent.

$$VAPTurnout_{it} = \delta_i + \zeta_t + \gamma_1 \cdot CompulsoryVoting_{it} + \mathbf{\Theta} \cdot \mathbf{X_{it}} + u_{it} \tag{7}$$

Interestingly, when year dummies are included in the model (Columns 1 and 3), the first stage *F-statistic* drops to below 10, signaling a weak instrument. For this reason, I choose the results from Column 2 as the preferred results because it is here that the instrument is strongly relevant.

We now re-estimate equation 5, using only the exogenous variation in VAP turnout generated from the first stage in place of the regular VAP turnout variable. As shown in Table 8, the coefficient on turnout is comparable to those generated using OLS. However, because instrumental variables are less precisely estimated, the results obtained are not significant at conventional levels. As such, these results should be taken as suggestive. Nonetheless, given the relatively demanding nature of the specifications, it is encouraging that the results of all three are comparable, both in terms of magnitude and sign, to those of earlier specifications. The reader will also notice that I use only the tax rates averaged over the electoral cycle as the dependent variable. Using other outcome variables (i.e. tax rates in years t or $t + n$) yields similar results both in terms of the magnitude of the coefficient and their precision; I use the average outcome variable because it provides an indication of the effect of turnout over the entire electoral cycle.

Table 8: Instrumental Variables Regression with Various Controls

	Dependent Variable: Tax Rates Over the Electoral Cycle (%)		
	(1) Year FE	(2) Country FE	(3) Year & Country FE
VAP Turnout (%)	0.483	0.377	0.274
	(0.648)	(0.722)	(0.484)
Control Variables	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes
Country Fixed Effects	No	Yes	Yes
Observations	270	270	271
First Stage F–Statistic	1.13	11.03	6.76
Number of Countries	34.00	34.00	34.00

Standard errors (in parentheses) clustered at the country level. See notes of Table 4 for control variables.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

A limitation of instrumental variable approaches is that the results rely, in part, on the exclusion restriction of the instrument which cannot be tested. In this particular context, the exclusion restriction implies that compulsory voting laws effect top marginal tax rates *only* through voter turnout. Although this claim cannot be empirically verified, I undertake a simple check to increase confidence that the exclusion restriction is satisfied. I run a reduced form regression on a sub-sample of the data, restricted to non-election years. The intuition is simple: if compulsory voting laws only exert influence on tax rates through voter turnout, then we expect to see no relationship between compulsory voting laws and tax rates in years for which there is no voting (i.e. non-election years). Table 9 shows the results and we see that, as expected, the coefficient on compulsory voting is not significantly different to zero.

Table 9: Reduced Form in Non-Election Years

	Top Marginal Tax Rate
Compulsory voting indicator	-5.828
	(4.682)
Control Variables	Yes
Observations	744

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A better understanding of the nature of compulsory voting laws can also provide evidence in support of the claim that the instrument satisfies the exclusion restriction. In this respect, two ideas stand out.

First, although compulsory voting laws are enacted and repealed within some countries, such changes do not occur often. For instance, just four of the countries in the sample (Turkey, Italy, Chile, and three states in Austria) changed their compulsory voting laws in the period between 1974 and 2014 (Turkey enacted the law in 1983 while the other three repealed it at various times in the past 25 years)[6]. Thus, while there is variation across the countries in the sample with respect to having compulsory voting laws, the low rate at which such laws are altered within countries make it difficult to understand how such laws could have a direct impact on tax rates which have changed so much over the 40 years of the sample.

Austria is an interesting country to study with respect to compulsory voting laws because three of its nine states have enacted and repealed compulsory voting laws at different periods of time. Tyrol, Vorarlberg and Styria all established compulsory voting laws in 1929. Tyrol repealed the law in 2004 while Vorarlberg and Styria both repealed it in 1992. In a working paper, Hoffman *et al.* (2015) use state-level voting records from Austria for the period between 1949 and 2010 to study the effects of compulsory voting laws. They find that enacting the laws increased turnout from some 80 percent to 90 percent but that changes to the laws had "no impact on election outcomes or state-level spending". They also use compulsory voting as an instrument which further supports the claim that such laws have no direct impact on policy outcomes. Interestingly, their results suggest that turnout, even when instrumented by compulsory voting, has no impact on social spending, a result which even the authors find surprising.

A second, and related, point to bear in mind is *why* such laws were introduced in the first place. The precise reasons vary but in nearly all the cases of the OECD the laws were introduced to accompany such changes to the political system as expansion of suffrage or protection to civil rights[7]. In Belgium, for example, compulsory voting was first introduced in 1893 (for men) when franchise became universal. In Italy, compulsory voting was put in place in 1945/6 at the end of the facist regime in order to preserve and protect citizens' sense of 'civil duty' and to accompany the change to a new system of proportional representation. Australia, to take yet another example, introduced the law in 1924 in order to address declining rates of turnout, which decreased from more than 70

[6]This presents certain challenges with regard to the precision of the 2SLS estimates and I will have more to say about this in the discussion.

[7]The examples cited in this paragraph are taken from a Research Report prepared by the Electoral Commission of the United Kingdom in June 2006.

percent in 1919 to less than 60 percent by the subsequent election in 1922. As such, the *Commonwealth Electoral Act* of 1918 states that "[i]t shall be the duty of every elector to vote at each election"[8]. What these examples illustrate is that compulsory voting laws are not introduced—at least not explicitly—to serve economic purposes. Instead, they have been introduced to accompany other changes to the political system and as such they seem to have little direct bearing on redistributive policy, be it past or present.

In light of the the rationale pointed out in the preceding paragraphs and in light of the strong relationship of the instrument with voter turnout, it seems plausible that the only mechanism through which compulsory voting laws affect tax rates is through their effect on voter turnout. To the extent that this rationale holds true, the validity of our instrumental variables result confirms the analysis of this paper that voter turnout does indeed have an impact on top marginal tax rates.

E. Channels

If turnout does have a causal relationship with tax rates, one may wonder about potential mechanisms. A leading candidate is party ideology, which is to say that turnout exerts its influence on redistributive policy by having an impact on the ideological complexion of the parties that are elected to form government. Literature in political science has documented a correlation between turnout and party ideology (see, for example, Bohrer *et al.* 2000) and I test the turnout-ideology nexus in this paper. To do so, I add to the dataset a measure of the ideological complexion of the government elected, taken from Seki & Williams (2014). The index does not include Chile, Mexico and South Korea and I therefore drop these countries from the analysis for this part. The index, which ranges from 1 to 5, is defined as follows:

1. Right-wing dominance (share of seats in government and supporting parties in parliament held by right parties is larger than 66.6%).

2. Right-center complexion (share of right and center parties in government and supporting parties is between 33.3% and 66.6%).

3. Balanced situation (share of center larger than 50% in government and in parliament; or if left and right form a government together not dominated by one side or the other).

4. Left-center complexion (share of seats of left and center parties in government and supporting parties in parliament between 33.3% and 66.6% each).

5. Left-wing dominance (share of seats in government and supporting parties in parliament larger than 66.6%).

I regress the turnout variable on two measures of ideology to generate the results shown in Table 10. First, in Column 1, I regress turnout on the index itself. As expected, I obtain a positive and statistically significant result. Second, in Column 2, I regress turnout on a "left-wing government" dummy variable that I generated. This variable is equal to 1 if the ideology index is greater than three and zero otherwise. As shown, the coefficient on this variable is nearly the same as that of the index itself but with the added benefit of it being estimated much more precisely. Taken together, these suggestive results

[8]Taken from the website of the Australian Government: www.aec.gov.au. Accessed July 2016.

indicate that increased turnout might affect taxation policy by bringing more left-wing parties into government.

Table 10: The Impact of Turnout on Ideology

	(1) Ideology Index	(2) Left-wing Government
VAP Turnout (%)	0.00663*	0.00582***
	(0.00379)	(0.00221)
Control Variables	Yes	Yes
Observations	267	282
Countries in Sample	31.00	31.00

Standard errors in parentheses

See notes of Table 4 for control variables.

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

IV. Discussion

Across a number of specifications, the results derived in this paper suggest that a one percentage point increase in voter turnout leads to an increase in the top marginal tax rate in the order of 0.25 percentage points. In this section, I explore how large this effect is by carrying out some tax rate accounting. I also discuss the strengths and limitations of the paper and point out areas for future research.

If the correlations uncovered are indeed causal, then the 12 percentage point decrease in VAP turnout in the OECD countries between the late 1970s and early 2010s is associated with a 3 percentage point decrease in top marginal tax rates. Given that the average tax rate across the OECD has dropped by 23 percentage points, from 65 percent to 42 percent over the same time period, the fall in voter turnout explains some 13 percent of the fall in tax rates. Conversely, let us imagine a hypothetical situation in which voter turnout increased by 12 percentage points from the 1974–1975 average. This would imply participation of 90 percent of the total voting age population. A 12 percentage point increase in turnout would lead to a 3 percentage point increase in the top marginal tax rate to 69.6 percent. Interestingly enough, this number resembles tax rate figures of several advanced industrial nations in the not-so-distant past. Germany, for example, experienced top marginal tax rates as high as 75 percent in the early 1950s and a 90 percent rate in the late 1940s (Piketty, 2014). The United Kingdom set top income tax rates as high as 98 percent in the 1950s, 1960s and 1970s while the United States levied a 91 percent tax on top incomes in the 1950s and 1960s and then relaxed the rate to 70 percent or more throughout the 1970s Piketty (2014). A tax rate of some 70 percent on top incomes is also in line with estimates carried out by (Piketty *et al.* , 2011) who suggest that the top marginal tax rate could be over 80 percent. Of course, the purpose of this section is not to argue a certain tax rate or even to suggest that the super-rich ought to pay more to the public purse. Instead it is intended to illustrate the degree to which ordinary citizens could exert influence on public policy were they to be mobilised in greater numbers on election day.

***

Are the results derived in this paper causal? It is difficult to say. On the one hand, a limitation of large, cross-sectional studies like this one is that sharp identification, from which causal inference can be made with greater confidence, is hard to come by. As mentioned in the subsection on instrumental variables, only four countries in my sample experience variation in the variable that serves as instrument. This means that I rely on the variation of the instrument in four countries to predict the exogenous variation of turnout in a sample of 34 nations which may be one of the reasons why 2SLS results are estimated imprecisely. On the other hand, the results of the paper seem to suggest more than just a spurious correlation: estimates derived using OLS, time and country fixed effects and with contemporaneous outcomes as well as outcomes in periods $t+n$ and over the election cycle all point to the same direction: greater turnout has a significant effect on government redistributive policy. Given that this is, to my knowledge, the first study that investigates the relationship between turnout and tax rates, the results of this study, far from casting doubt on the nature of the relationship, call out for further research, perhaps using micro-level or sub-national data in order to benefit from sharper identification strategies.

V. Conclusion

This paper adds to the literature that aims at better understanding the economic consequences of voter turnout. For the most part, this literature has focused on the relationship between voter turnout and government redistribution, as measured by how much governments allocate to spending on social ends such as health, education and pensions. These empirical studies confirm the results of the median voter theorem which asserts that, as voting approaches universal levels, the preferences of the median voter tend more towards redistributive policies.

In this paper, I have built on these studies by exploring the relationship between voter turnout and a more direct measure of redistribution, namely, the top marginal tax rate. The theory motivating this study is similar to those of previous ones: If governments are intended to respond to the preferences of the median voter, a question arises as to what the economic consequences are when voter turnout declines and when that decline is marked along class lines. I have shown that increased participation in elections is associated with a positive and statistically significant impact on top marginal tax rates.

To determine whether the correlation between these two variables is causal, I undertook three empirical strategies. First, I included for a range of social and economic characteristics that may confound the analysis. I then exploited the panel nature of my dataset by including year and country fixed effects to take into consideration any unobserved country or time heterogeneity. As a final step, I employed an instrumental variables strategy to exploit only the exogenous variation in rates of voter turnout. Crucially, I also take into account that governments may take time to respond to the mandate given them by voters. As such, I modified my baseline specification in order to estimate the impact of turnout on tax rates in periods $t + n$ as well as over the entire electoral cycle. Across all specifications, results confirm my hypothesis that more turnout demands more redistribution.

On the whole, the results of this paper underscore what may seem to be a self-evident truth: voting matters. Yet, in spite of the veracity of such a seemingly simple claim, fewer and fewer people are turning out to vote. This study shows that doing so is not without consequences.

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A. Appendix

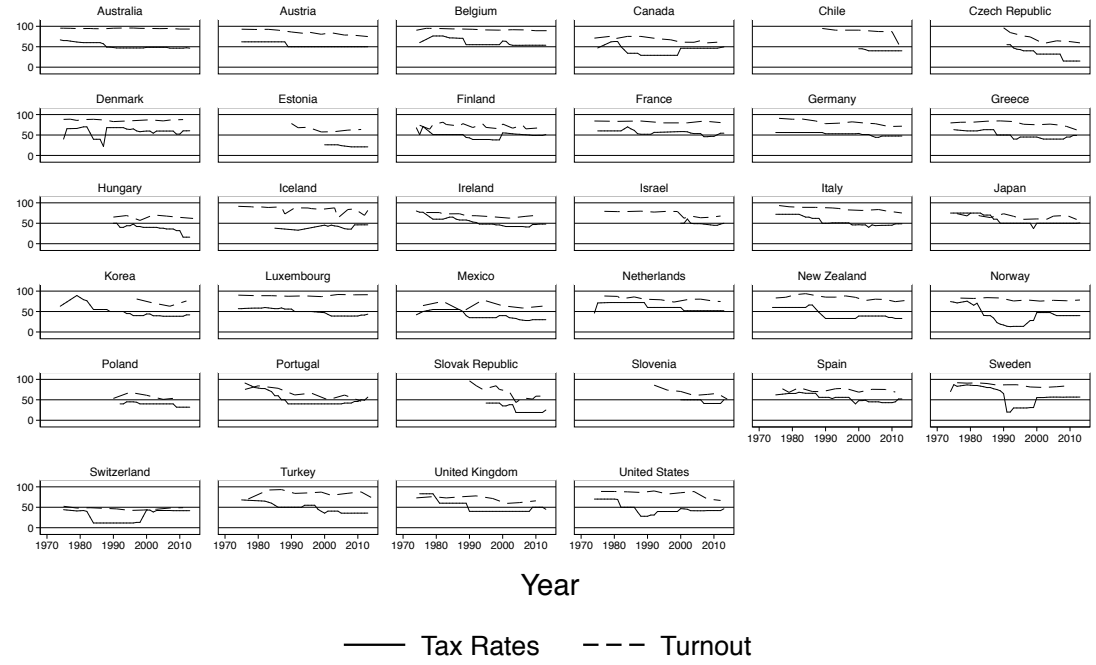

Figure A.1: Trends in Top Marginal Tax Rates and Voter Turnout in each OECD Country

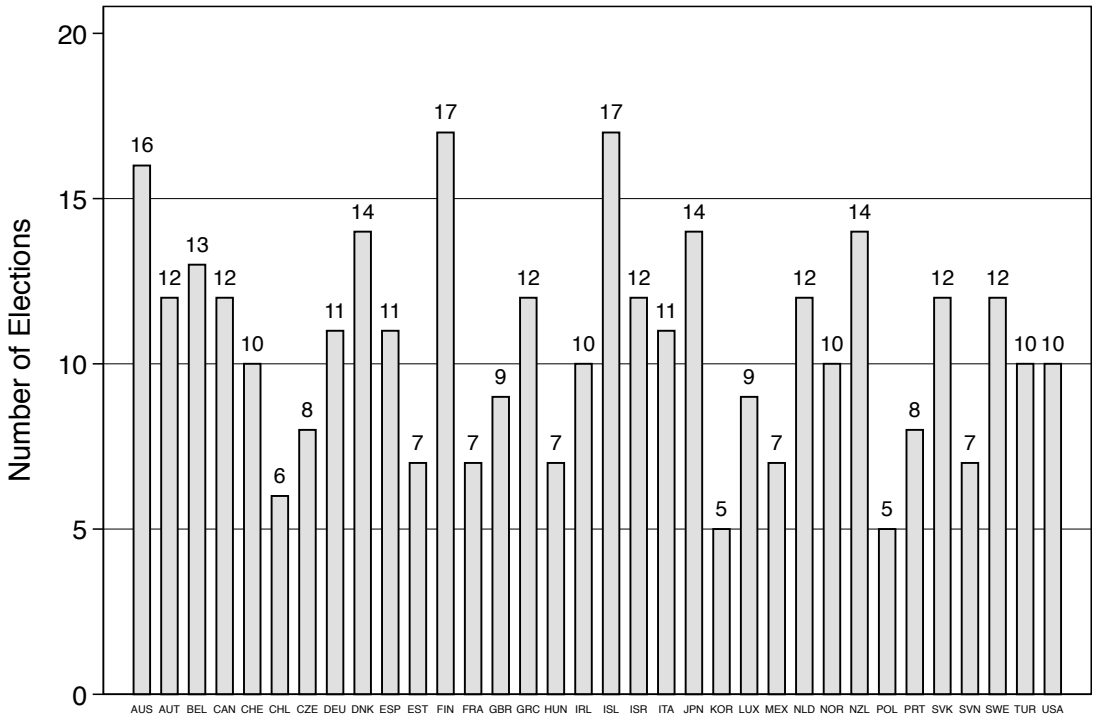

Figure A.2: Total number of elections over the period of the sample in each country

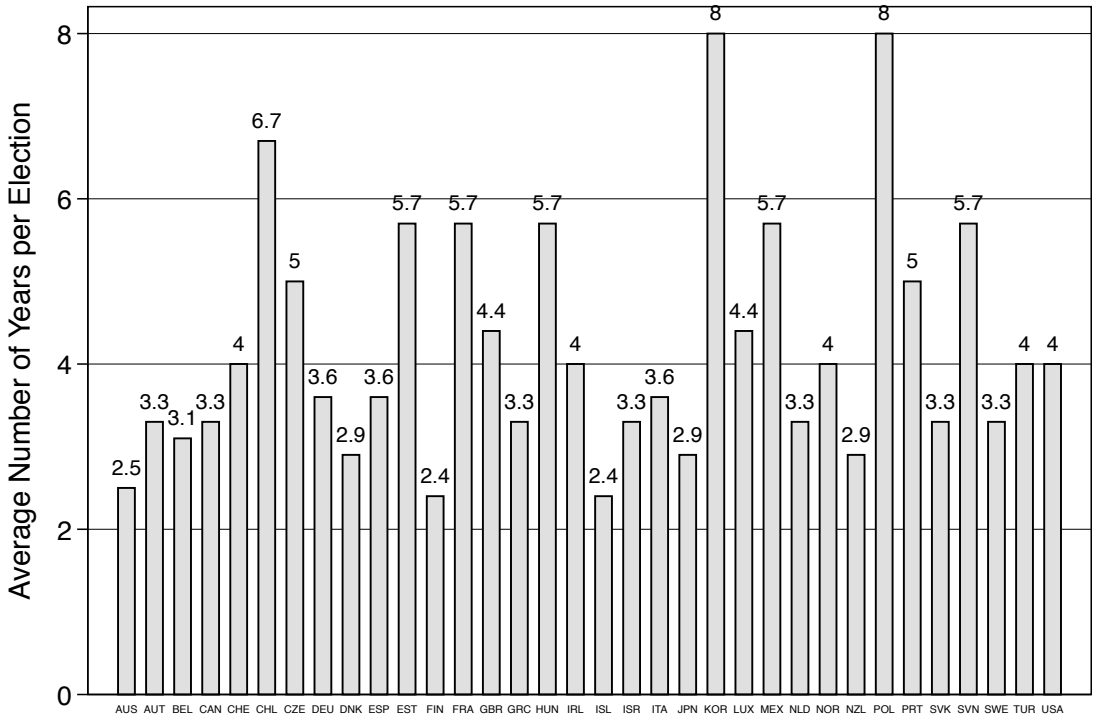

Figure A.3: Average number of years per election cycle in each OECD country

Table A.1: Description of Variables Used in the Dataset

Variable	Description	Source
Turnout	Calculated by dividing the number of people who voted by the total number of people who were registered for elections.	IDEA
VAP Turnout	Calculated by dividing the number of people who voted by the total voting age population.	IDEA
Tax Rate	Top marginal tax rate, expressed as a percentage.	OECD, World Tax Databse, Tax Policy Centre
GDP Growth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2005 U.S. dollars.	World Bank OpenData
GDPPC	GDP per capita: gross domestic product divided by midyear population. Data in current USD.	World Bank OpenData
Population	Total population in a country.	OECD
Unemployment	Total number of unemployed people aged 15 and over	OECD
Tertiary Education Enrolment	Total enrolment in tertiary education, regardless of age, expressed as a percentage of the total population of the five-year age group following on from secondary school leaving.	World Bank OpenData
Freedom House - Political Rights	Freedom House index of political rights: index ranges from 1 (free) to 7 (not free).	IDEA (taken from Freedom House)
Ideology	An index from 1 to 5 that measures the ideological complexion of government as described in the text.	Seki & Williams (2014)

Table A.2: Elections chosen for countries with Presidential and Parliamentary Elections in the same year

Presidential Elections	Parliamentary Elections
United States	Republic of Ireland
France	Austria
Chile	Czech Republic
Mexico	Slovenia
South Korea	
Portugal	
Poland	