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Full Length Research Paper

Political competition and electoral participation: Is there any linkage?

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This paper analyzed empirically, in the case of 40 countries, the biunivoque relationship between political competition and electoral participation. The analysis was based on the construction of an unrestricted Vector Autoregressive Model (unrestricted VAR). The validity of the model was checked by using a series of tests, such as: Panel Unit Root Test (in order to verify the stationarity of the series), Pairwise Granger Causality Test, VAR Lag Order Selection Criteria, VAR Residual Portmanteau Test, VAR Residual Serial Correlation LM Test, and VAR Residual Normality Test. The results revealed an interesting fact: voters are discouraged from exercising their fundamental right, the right to vote, as political competition becomes more pronounced, while political competition is stimulated as electoral participation becomes more consistent.

Key words: Political competition, electoral participation, vector autoregressive model (VAR), Granger causality, normality test, impulse function.

INTRODUCTION

One of the most used propositions in economics is that, by and large, monopoly is bad and market competition between firms raises the welfare of consumers (Alam, 2009). Whether competition between political parties has similarly virtuous consequences on electoral participation, is far less discussed, despite the long-term monopoly on power by a dominant party observed in a number of existing democracies (Besley et al., 2005).[1] In this paper, we argue that political competition may be an inhibiting factor for voter turnout, while a higher electoral participation encourages competition between political parties. For a better understanding of how these two variables interact, we conducted a brief conceptual presentation.

Electoral participation is the percentage of eligible voters who cast a ballot in an election. After increasing for many decades, there has been a trend of decreasing electoral participation in most established democracies since the 1960s (Niemi and Weisberg, 2001). In general, low turnout may be due to disenchantment, indifference, or contentment. Low turnout is often considered to be undesirable, and there is much debate over the factors that affect turnout and how to increase it. In spite of significant study into the issue, scholars are divided on reasons for the decline. Its cause has been attributed to a wide array of economic, demographic, cultural, technological, and institutional factors. There have been many efforts to increase turnout and encourage voting.

Different countries have very different average electoral participations. For example, in the United States 2008 presidential election, turnout was 63% (Center for the Study of the American Electorate, 2008) and 68% among African Americans. In Australia, which has compulsory voting, participation reaches 95%. These differences are caused by a mix of cultural and institutional factors (Evans, 2006).

In large populations, the probability that a single vote will change the outcome of an election is miniscule (Gelman et al., 1998), meaning that, even very small costs to the individual, typically outweighs the expected

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[1] A large literature in political science discusses the dominant-party systems in countries such as Japan (the LDP), Malaysia (the UMNO), Mexico (the IRP), Paraguay (the Colorado Party), and South Africa (the ANC), and their political effects (see the contributions in Pempel, 1990).

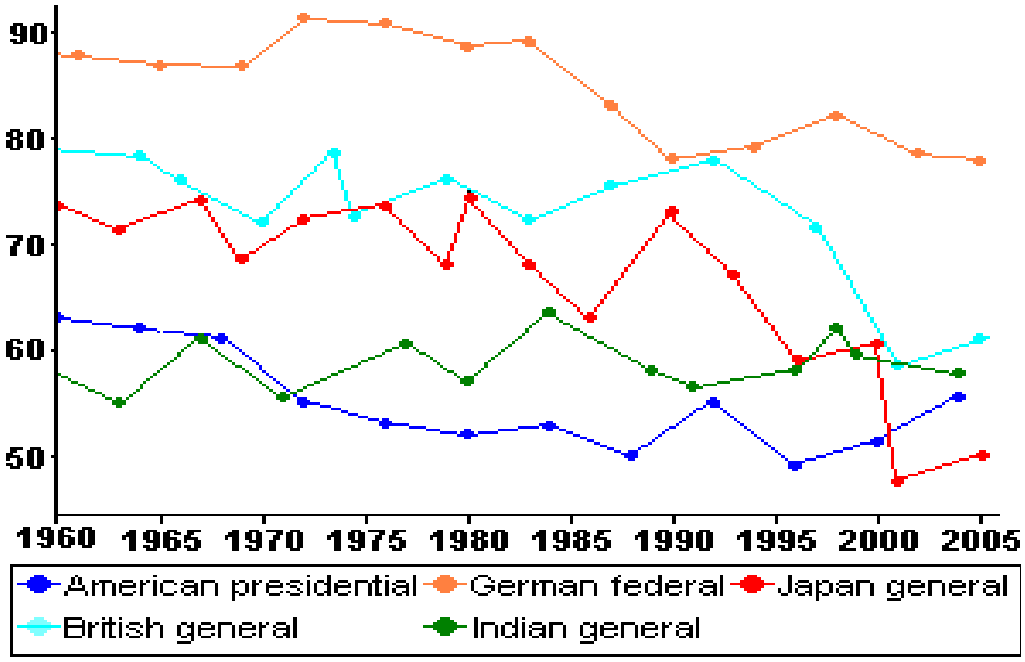

Figure 1. The evolution of electoral participation worldwide (1960-2005). (Source: http://en.wikipedia.org/wiki/Voter_turnout#cite_note-2).

benefits he or she would receive from voting. Some studies show that a single vote in a voting scheme such as the Electoral College in the United States has an even lower chance of determining the outcome. (Satoshi, 1998) Other studies claim that the Electoral College actually increases voting power. (Gelman et al., 2002) This causes a difficulty for rational choice theory: it seems that a rational individual should not vote Studies using game theory, which takes into account the ability of voters to interact, have also found that the expected turnout for any large election should be zero (Satoshi, 1998).

Over the last 40 years, electoral participation has been steadily declining in the established democracies (Niemi and Weisberg, 2001). This trend has been significant in the United States, Western Europe, Japan and Latin America. The decline in voting has also accompanied a general decline in civic participation, such as church attendance, membership in professional, fraternal, and student societies, youth groups, and parent-teacher associations. (Putnam, 1995) At the same time, some forms of participation have increased. People have become far more likely to participate in boycotts, demonstrations, and to donate to political campaigns. (Niemi and Weisberg, 2001).

Before the late 20th century, suffrage - the right to vote - was so limited in most nations that turnout figures have little relevance today. One exception was the United States, which had near universal white male suffrage by 1840. The U.S. saw a steady rise in electoral participation during the century, reaching its peak in the years after the Civil War. Turnout declined from the 1890s until the 1930s, then increased again until 1960 before beginning its current long decline (Burnham, 1982). Globally, electoral participation has decreased by about five percentage points over the last four decades, as shown in Figure 1.

Many causes have been proposed for this decline; a combination of factors is most likely. When asked why they do not vote, many people report that they have too little free time. There are often barriers to voting in a district where one is a recent arrival, and a new arrival is likely to know little about the local candidate and local issues (Hashim et al., 2010). Some blame the welfare state, arguing that the decrease in turnout has come shortly after the government became far more involved in people's lives. Sclove (1995) argues that technological developments in society such as "automobilization," suburban living, and "an explosive proliferation of home entertainment devices" have contributed to a loss of community, which in turn has weakened participation in civic life.

Trust in government and in politicians has decreased in many nations. However, the first signs of decreasing voter turnout occurred in the early 1960s, which was before the major upheavals of the late 1960s and 1970s. Putnam (1995) argues that the collapse in civil engagement is due to the introduction of television. In the 1950s and 1960s, television quickly became the main leisure activity in developed nations. It replaced earlier more social entertainments such as bridge clubs, church groups, and bowling leagues. Putnam argues that as people retreated within their homes and general social participation

declined so did voting too.

Another interesting fact is that before the introduction of television, almost all of a party's resources would be directed towards intensive local campaigning and get-out the vote initiatives. In the modern era, these resources have been redirected to expensive media campaigns in which the potential voter is a passive participant (Rosenstone and Hansen, 2001). During the same period, negative campaigning has become ubiquitous in the United States and elsewhere. Attack ads and smear campaigns give voters a negative impression of the entire political process.

Geys (2005) analyses many factors that affect voter turnout: firstly, population size and electoral closeness - both related to the probability of affecting the outcome of the election - more often than not, have a statistically significant effect on turnout in the predicted direction. Turnout is higher when the population is smaller and the election closer. Secondly, whereas a more stable population appears to positively affect turnout rates (due to higher social pressure and lower information costs), no relation appears to exist between turnout and population concentration and homogeneity. Thirdly, he finds that campaign expenditures are positively related to turnout rates, conform theoretical expectations, while the level of political fragmentation appears to have no unambiguous effect. Finally, the institutional procedures governing the course of the elections strongly affect turnout. Compulsory voting, easier registration procedures, concurrent elections and the use of proportional representation all significantly stimulate turnout.

According to Jackman (1987), political institutions shape the distribution of incentives for political actors, whether they are candidates for office or simply citizens contemplating whether to vote. His working assumptions are as follows: When there are incentives for candidates and parties to mobilize more voters, they will do so, and this will increase turnout. At the same time, he assumes that institutional arrangements influence the degree to which potential voters think their vote will make a difference both to the election outcome itself and to the subsequent formation of a government.

Voters in multiparty systems that produce coalitions face a fundamental problem; they do not directly select the government that will govern them. Instead, they vote for parties that select a government in the legislature, so that "ambiguity and compromise are introduced on a secondary level whenever coalitions are formed" (Downs, 1957). Downs's argument implies that elections play a less decisive role in government formation within multiparty systems. Where elections are less important, citizens have less incentive to vote. Multipartyism should therefore depress turnout.

According to Vanhanen (1990, 1997, 1998) political competition represents the percentage share of the smaller parties and independents of the votes cast in parliamentary elections, or of the seats in parliament. Competition among political parties or candidates for office maximizes voters' welfare inasmuch as it reduces political rents, for example, the tax price at which government services are supplied, and works as an information revealing-mechanism that improves the efficiency of the principal-agent relationship between voters and elected representatives (Padovano and Ricciuti, 2008). The literature that developed these early contributions focused on imperfections of the political market, through notions such as rational ignorance, efficiency losses of representation, voting and decision making procedures, bundling in political decisions, problems of time inconsistency in politicians' incentives, as well as how alternative institutional frameworks affect the efficiency properties of political market equilibria.

However, all these inquiries shared the paradigmatic conviction that more political competition enhances citizens' welfare (Wittman, 1989, 1995; Stigler, 1972; Barro, 1973). Even when severe inefficiencies taint the electoral processes and institutions, competition among interest groups shares many of the welfare properties of market competition (McCormick and Tollison, 1981; Becker, 1983). To further strengthen the argument, political economics models have shown that lopsided political competition engenders welfare losses, due to excessive rent seeking (Polo, 1998) and inefficiencies in the provision of government services (Svensson, 1998). Figure 2 gives the summary statistics of the political competition before and after 1989.

According to the concept of political competition used in Figure 2, any government level is characterized by two parties that select candidates for the elections of the president of the national government and of the sub-national ones (Padovano and Ricciuti, 2008). Both national and sub-national elections are held according to the same institutional procedures. The population is composed of two groups of citizens, one that work in a traditional sector, the other that draws income only from a technologically advanced sector with no differences of composition between the various sub-national units.

The elected President decides the policies and re-distributes resources among the two sectors to maximize his/her political returns. Those who work in the traditional sector protect their quasi-rents by lobbying. They are more successful at capturing the government. The more uneven a political competition, the lower is the 'quality' of the President and the greater the set of policies that the President controls. The constitution divides the political competencies of the national and the sub-national governments, avoiding overlaps.

METHODS AND RESULTS

In order to verify whether there are any linkages between political competition (PC) and electoral participation (EP), we will use a VAR model, with the following hypothesis:

H_1: PC = f(EP) (1)
H_2: EP = f(PC) (2)

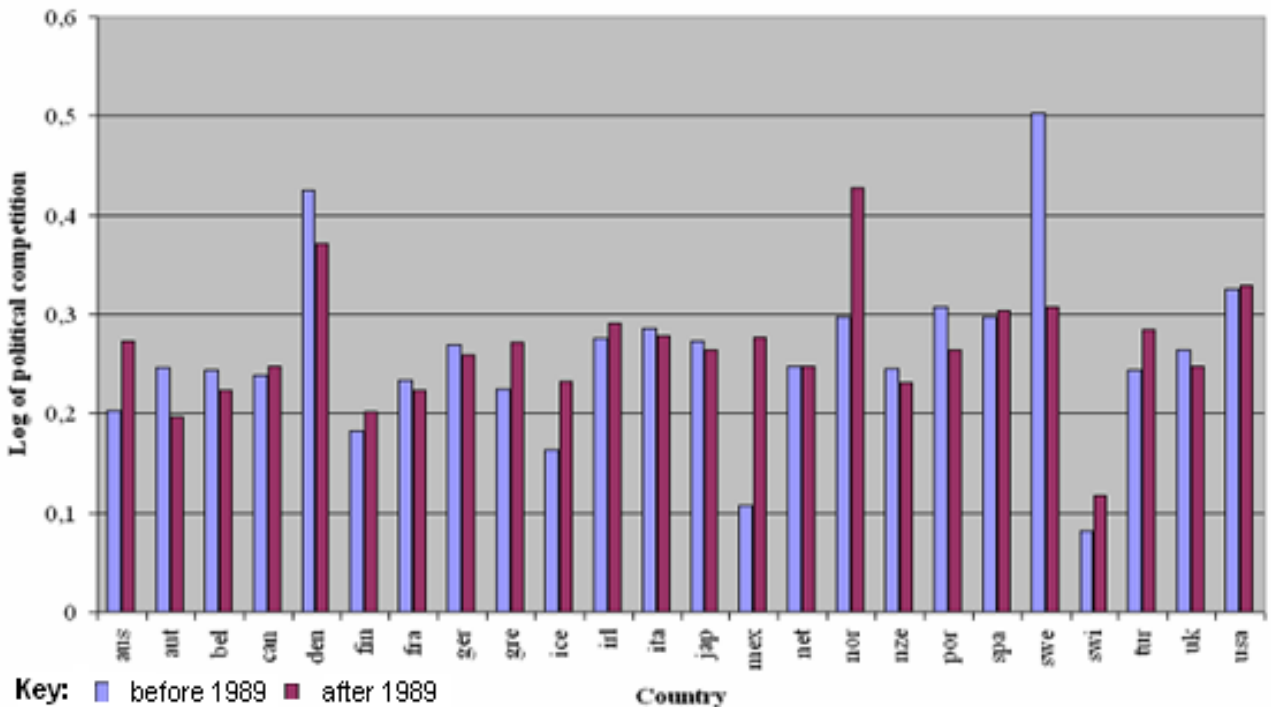

Figure 2. Political competition before and after 1989.
(Source: Fabio Padovano and Roberto Ricciuti, 2008, p. 13).

The vector auto regression (VAR) is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system of variables.[1] The VAR approach sidesteps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged values of all of the endogenous variables in the system. The mathematical representation of a VAR is:

$$Y_t = A_1 y_{t-1} + \ldots + A_p y_{t-p} + Bx_t + \varepsilon_t \quad (3)$$

Where, y_t is a k vector of endogenous variables, x_t is a d vector of endogenous variables, A_1, …, A_p and B are matrices of coefficients to be estimated, and ε_t is a vector of innovations that may be contemporaneously correlated but are uncorrelated with their own lagged values and uncorrelated with all of the right-hand side variables. Our VAR model contains two equations:

$$PC_t = \alpha_1 + \sum_{j=1}^{k} \beta_j * PC_{t-j} + \sum_{j=1}^{k} \chi_j * EP_{t-j} + \varepsilon_{1t} \quad (4)$$

$$EP_t = \alpha_2 + \sum_{j=1}^{k} \delta_j * EP_{t-j} + \sum_{j=1}^{k} \phi_j * PC_{t-j} + \varepsilon_{2t} \quad (5)$$

where α_1, α_2 are the intercept terms; $\beta, \chi, \delta, \phi$ are the coefficients of the endogen variables, and the ε are the stochastic error terms.

We have chosen a VAR model because it is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system of variables. Moreover, according to Gujarati (2004), in vector auto regression models, some variables are treated as endogenous and some as exogenous or predetermined (exogenous plus lagged endogenous).

In this case, the two considered variables – PC and EP - are treated as endogenous variables.

The database that we used represents a form of democracy measurement and it provides comparable data on the degree of democratization in all independent countries of the world since 1810. The Polyarchy dataset is compiled by Tatu Vanhanen, emeritus professor at the University of Tampere and at the University of Helsinki, and covers 187 countries over the period 1810 to 2000.[2]

Vanhanen means, by democracy, a political system in which ideologically and socially different groups are legally entitled to compete for political power and in which institutional power holders are elected by the people and are responsible to the people. In his opinion, we should apply the same criteria of democracy to all countries because it is reasonable to assume that human nature is more or less similar across all human populations.

The problem is to establish the criteria of democracy, to measure the degree of democratization, and to separate democracies from non-democracies. Various operational measures of democracy have been formulated and used in empirical studies. Vanhanen formulated two political variables to measure the distribution of power; (1) the percentage share of the smaller parties and independents of the votes cast in parliamentary elections, or of the seats in parliament, and (2) the percentage of the adult population that voted in elections. The smaller parties' share was calculated by subtracting the largest party's share from 100%. The two variables were combined into an index of power distribution by multiplying the two percentages and by dividing the result by 100. His second basic indicator of democratization - the degree of electoral participation - originates from this 1971 study as well as the later index of democratization.

[2] The data can be downloaded at the following address: http://www.prio.no/CSCW/Datasets/Governance/Vanhanens-index-of-democracy/

Table 1. Checking the stationarity of the EP series (Panel Unit Root Test).

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin and Chu t*	-2.48958	0.0064	39	3744
Breitung t-stat	1.74227	0.9593	39	3705
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.13201	0.4475	39	3744
ADF - Fisher Chi-square	76.6617	0.5216	39	3744
PP - Fisher Chi-square	89.2273	0.1809	39	3900
Null: No unit root (assumes common unit root process)				
Hadri Z-stat	31.7328	0.0000	40	4040

Source: data processed using Eviews 5.0.

The smaller party's share of the votes cast in parliamentary or presidential elections, or both, was used to measure the degree of competition (Competition), and the percentage of the population who actually voted in these elections was used to indicate the degree of participation (Participation). The index of power distribution was renamed to an index of democratization (ID) (Vanhanen 1990, 1997, 1998). Competition is calculated by subtracting the percentage of votes won by the largest party from 100. If the largest party gets, for example, 40% of the votes, the share of the smaller parties is 60%. If data on the distribution of votes are not available, the value of this variable is calculated on the basis of the distribution of seats in parliament.

The percentage of the population which actually voted in the same elections is used to measure the degree of participation (Participation). This percentage is calculated from the total population, not from the adult or enfranchised population. Vanhanen selected the total population as the basis of calculation because more statistical data are available on total populations than on age structures of electorates. In principle, these two empirical variables are very simple and easy to use.

For our case study, we selected 40 countries for which we took into account, data provided by Vanhanen on political competition and electoral participation, during 1900 to 2000. The concerned countries are: Argentina, Austria, Belgium, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Denmark, Dominica, Ecuador, El Salvador, Ethiopia, France, Germany, Greece, Guatemala, Honduras, Hungary, Iran, Italy, Japan, Luxembourg, Mexico, Netherlands, Norway, Paraguay, Peru, Portugal, Romania, Russia, Spain, Sweden, Switzerland, Turkey, United Kingdom, USA and Uruguay.

The reason for choosing the 40 countries is that, we wanted to apply the econometric testing, using a longer period of time, in order to increase the statistical relevance of the results. In Vanhanen's database, some countries present data back from 1810, while other countries' recorded data beginning from 1991, for example, Azerbaidjan. Thus, in order to obtain appropriate data to work with, we have chosen a period of 100 years, during which data was available only for the above mentioned 40 countries.

Next, we tried to identify and quantify any mutual relationship that exists between political competition (PC) and electoral participation (EP); for this purpose we took the following steps:

a) We checked the stationarity of the EP and PC series: We first tested the level stationarity of the EP series and as can be seen in Table 1, the probabilities associated with the six statistical tests indicate that the EP series shows a unit root, which means that the series is not stationary. Therefore, we proceeded to the first differentiation of the series. The probabilities listed in Table 2 indicate that the first order integrated series is stationary (there is no unit root) that is, the EP series is I (1).

Similarly, we tested the stationarity of the PC series and the results are listed in Table 3. It is noted that the PC series is level stationary (the probabilities indicate that there is no unit root), that is, the PC series is I (0).

b) Further, we tested the Granger causality between PC and DEP series; we have chosen these two series because, strictly speaking, in an m-variable VAR model, all the m variables should be (jointly) stationary. Since that wasn't the case for EP and PC series, we had to transform the data appropriately (by first-differencing) (Gujarati, 2004).

The Granger (1969) approach to the question of whether *x* causes *y* is to see how much of the current *y* can be explained by past values of *y* and then to see whether adding lagged values of *x* can improve the explanation. *y* is said to be Granger-caused by *x* if *x* helps in the prediction of *y*, or equivalently, if the coefficients on the lagged *x*'s are statistically significant. A two-way causation is frequently the case: *x* Granger causes *y* and *y* Granger causes *x*.

After applying the Pairwise Granger Causality test, for a lag equal to 4, it is noted that both null hypotheses are rejected, which means that electoral participation Granger causes political competition and vice versa, thus, the series can be considered endogenous.

c) For the selection of the joint lags, we considered the VAR Lag Order Selection Criteria (Table 5); "*" indicates lag order selected by the criterion: analyzing the table data, we can conclude that the appropriate lag for our model is 7.

d) Next, we estimated the VAR model; in order to condense the presentation of VAR results table, we reported the estimated coefficient and the standard error by using two equations:

$$DEP = -0.07501351866*DEP(-1) - 0.04123287125*DEP(-2) - 0.1229596333*DEP(-3) - 0.02845754188*DEP(-4) - 0.038217765*DEP(-5) - 0.03742053859*DEP(-6) - 0.0350360125*DEP(-7) - 0.02666464279*PC(-1) + 0.02168433641*PC(-2) - 0.00757807458*PC(-3) + 0.01019825182*PC(-4) - 0.01845314868*PC(-5) + 0.001009751765*PC(-6) + 0.0004504132966*PC(-7) + 1.21569969 \quad (6)$$

Table 2. Checking the stationarity of the DEP series (Panel Unit Root Test).

Method	Statistic	Prob.**	Cross-sections	Obs.
Null: Unit root (assumes common unit root process)				
Levin, Lin and Chu t*	-12.7201	0.0000	39	3705
Breitung t-stat	-25.0848	0.0000	39	3666
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-23.7749	0.0000	39	3705
ADF - Fisher Chi-square	714.084	0.0000	39	3705
PP - Fisher Chi-square	1137.12	0.0000	39	3861
Null: No unit root (assumes common unit root process)				
Hadri Z-stat	-3.11762	0.9991	40	4000

Source: data processed using Eviews 5.0.

Table 3. Checking the stationarity of the PC series (Panel Unit Root Test).

Method	Statistic	Prob.**	Cross- sections	Obs.
Null: Unit root (assumes common unit root process)				
Levin, Lin and Chu t*	-0.45333	0.3252	40	3840
Breitung t-stat	-5.50050	0.0000	40	3800
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.21254	0.0000	40	3840
ADF - Fisher Chi-square	215.859	0.0000	40	3840
PP - Fisher Chi-square	311.275	0.0000	40	4000
Null: No unit root (assumes common unit root process)				
Hadri Z-stat	15.9228	0.0000	40	4040

Source: Data processed using Eviews 5.0.

Table 4. Pairwise Granger causality test (4 lags).

Null hypothesis	Obs	F-Statistic	Probability
PC does not Granger Cause DEP	3840	6.93237	1.5E-05
DEP does not Granger Cause PC		3.43909	0.00819

Source: Data processed using Eviews 5.0.

PC = 0.01176569294*DEP(-1) - 0.009899870581*DEP(-2) - 0.1115969214*DEP(-3) + 0.07815185603*DEP(-4) + 0.02565467533*DEP(-5) + 0.03479746927*DEP(-6) - 0.03753027085*DEP(-7) + 0.8470452759*PC(-1) + 0.04950124225*PC(-2) + 0.01061154283*PC(-3) - 0.08282791449*PC(-4) + 0.03370220965*PC(-5) + 0.01244030615*PC(-6) + 0.07356544799*PC(-7) + 2.347499643 (7)

Table 6 presents additional information; the first part of the additional output presents standard OLS regression statistics for each equation. The results are computed separately for each equation using the appropriate residuals and are displayed in the corresponding column. The numbers at the very bottom of the table are the summary statistics for the VAR system as a whole.

e) To validate the VAR model, we first verified the stability condition; after checking the condition of stability of the VAR model, we concluded that VAR satisfies this condition.

Next, we tested the residual error correlation. In this regard, we applied the following tests: VAR Residual Portmanteau Tests for Autocorrelations, VAR Residual Serial Correlation LM Tests and VAR Residual Normality Tests. Portmanteau Autocorrelation Test computes the multivariate Box-Pierce/Ljung-Box Q-statistics for residual serial correlation up to the specified order. We report both the Q-statistics and the adjusted Q-statistics (with a small sample correction). Under the null hypothesis of no serial correlation up to lag *h*, both statistics are approximately distributed χ^2 with degrees of freedom $k^2 (h-p)$ where *p* is the VAR lag order.

Autocorrelation LM Test reports the multivariate LM test statistics for residual serial correlation up to the specified order. The test

Table 5. VAR Lag order selection criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-29574.60	NA	27602.07	15.90140	15.90475	15.90259
1	-25316.55	8509.234	2803.214	13.61428	13.62431*	13.61785
2	-25310.57	11.95374	2800.224	13.61321	13.62993	13.61916
3	-25285.05	50.94651	2768.011	13.60164	13.62505	13.60997
4	-25283.84	2.409367	2772.170	13.60314	13.63324	13.61385
5	-25251.74	64.01367	2730.601	13.58803	13.62482	13.60112
6	-25238.70	25.99164	2717.360	13.58317	13.62665	13.59864
7	-25226.14	25.01537*	2704.886*	13.57857*	13.62874	13.59642*

Source: Data processed using Eviews 5.0.

Table 6. Vector autoregressive forecasts for a lag = 7.

Variable	DEP	PC
R^2	0.033505	0.848777
Adj. R^2	0.029853	0.848206
Sum sq. resids	144360.3	393098.5
S.E. equation	6.242087	10.30046
F-statistic	9.174261	1485.376
Log likelihood	-12083.43	-13946.68
Akaike AIC	6.504530	7.506278
Schwarz SC	6.529617	7.531365
Mean dependent	0.408019	34.40551
S.D. dependent	6.337399	26.43802
Determinant resid covariance (dof adj.)		2683.203
Determinant resid covariance		2661.608
Log likelihood		-25226.14
Akaike information criterion		13.57857
Schwarz criterion		13.62874

Source: Data processed using Eviews 5.0.

statistic for lag order h is computed by running an auxiliary regression of the residuals u_t on the original right-hand regressors and the lagged residual u_{t-h}, where the missing first h values of u_{t-h} are filled with zeros. Under the null hypothesis of no serial correlation of order h, the LM statistic is asymptotically distributed χ^2 with k^2 degrees of freedom.

Both tests indicate that the null hypothesis can not be rejected, so we can argue that, for a LM-stat = 3.891450 and a p = 0.4209, there aren't autocorrelations between the residual errors.

Normality Test reports the multivariate extensions of the Jarque-Bera residual normality test, which compares the third and fourth moments of the residuals to those from the normal distribution.

In principle, rejection of normal distribution invalidates the test statistics. But measures of skewness are found to be not informative in small samples (Bai and Ng, 2001). In conclusion, the "Unrestricted Vector Auto regression DEP and PC" model may be considered representative and stable to describe, for the 40 countries, the autoregressive connection between electoral participation and political competition and vice-versa.

f) Finally, we can identify a series of impulse response functions. An impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables EP and PC. In this case, the accumulated responses of EP and PC to Generalized One S.D. Innovations ± 2 S.E., for 10 years, are illustrated in Figures 3 and4.

Figure 3 indicates that a positive impulse in PC determines a decrease of EP's level over the entire period. Opposed to the previous case, Figure 4 indicates that a positive impulse in EP determines an increase of PC's level over the entire period.

Conclusions

Our analysis demonstrates the empirical relevance of the connection between political competition and electoral participation. The main contribution of this paper lies in using a VAR model to establish a very robust set of relationships between political competition and electoral participation. Based on the VAR model estimations, the following conclusions can be drawn:

1) In the long run, it is likely that electoral participation to

Table 7. VAR Residual Portmanteau test for autocorrelations.

Lag	Q-Stat	Prob.	Adj. Q-Stat	Prob.	df
1	0.018981	NA*	0.018986	NA*	NA*
2	0.102406	NA*	0.102456	NA*	NA*
3	0.288226	NA*	0.288426	NA*	NA*
4	0.510856	NA*	0.511296	NA*	NA*
5	0.935711	NA*	0.936722	NA*	NA*
6	1.311738	NA*	1.313357	NA*	NA*
7	1.633067	NA*	1.635292	NA*	NA*
8	18.90002	0.0008	18.93946	0.0008	4
9	25.02226	0.0015	25.07654	0.0015	8
10	25.91820	0.0110	25.97490	0.0108	12

Source: Data processed using Eviews 5.0.

H_0: No residual autocorrelations up to lag h.

*The test is valid only for lags larger than the VAR lag order.
df is degrees of freedom for (approximate) chi-square distribution.

Table 8. VAR residual serial correlation LM test.

Lag	LM-Stat	Prob
1	7.710054	0.1028
2	11.70215	0.0197
3	9.551403	0.0487
4	8.507714	0.0747
5	13.11851	0.0107
6	13.44990	0.0093
7	3.891450	0.4209
8	20.53519	0.0004
9	6.794660	0.1471
10	0.973257	0.9138

Source: Data processed using the program Eviews 5.0.
H_0: No serial correlation at lag order h.

be deterred by stronger political competition. This is probably due to rational ignorance that characterizes the individual; a person will vote only if the benefits related to the vote outweigh the costs incurred by the candidate's selection process (the cost is expressed in time spent to collect relevant information). So, if political competition gets tighter, the costs of correct information become higher because individuals are faced with multiple options. Under these conditions, in most cases, the expected benefit is outweighed by the option cost and the choice of the individual can be expressed as: "I choose not to choose".

These findings go against some previous research. Jackman (1987) argues that differences in voter turnout among industrial democracies are a function of political institutions and electoral law. Specifically, the presence of nationally competitive electoral districts provides incentives for parties and candidates to mobilize voters everywhere, thereby, increasing turnout. Also, multipartyism assigns elections a less decisive role in government formation, depressing turnout. These results are based on empirical analyses of average voter-turnout levels in the 1970s and 1960s across 19 industrial democracies.

The differences between our results and Jackman's can be explained starting from the following considerations: i) the period of time differs significantly: we have a period of 100 years, while Jackman uses a 20 years period; ii) Jackman takes into account only industrial democracies, while we take into account a more diverse sample of countries, from USA, Denmark and Germany to Ethiopia, China and Guatemala; iii) the quantification of the links between electoral participation and other and other explanatory variables was performed differently

Table 9. VAR residual normality test.

Variable		Chi-sq	df	Prob.
Component	Skewness			
1	1.100540	750.9371	1	0.0000
2	0.100744	6.292629	1	0.0121
Joint		757.2298	2	0.0000
Component	Kurtosis			
1	41.85200	233969.1	1	0.0000
2	20.02656	44935.10	1	0.0000
Joint		278904.2	2	0.0000
Component	Jarque-Bera			
1	234720.1		2	0.0000
2	44941.39		2	0.0000
Joint	279661.5		4	0.0000

(Source: data processed using the program Eviews 5.0).
H0: residuals are multivariate normal.

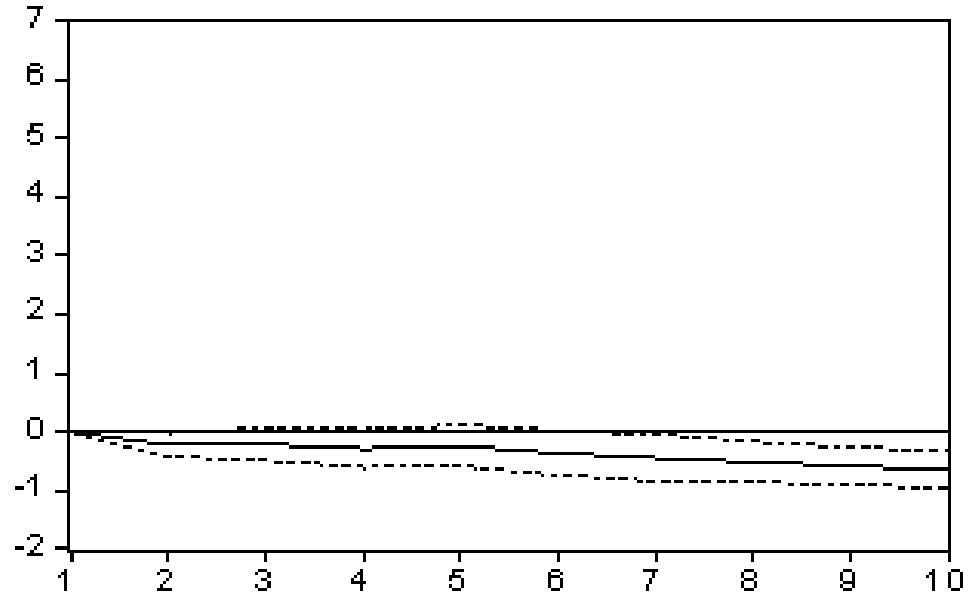

Figure 3. Accumulated response of DEP to PC.

from one study to another: while Jackman uses a set of regressions, we used a VAR model and so the results are, naturally, different.

Also, Geys (2005) argues that from a theoretical point of view, there is no consensus whether political compe-ition (in other words, fragmentation) can be expected to increase or decrease turnout.

A positive effect can be expected on the basis of two arguments. Firstly, a larger number of parties enrich the choice offered to the electorate, increasing the probability that voters can identify with some parties (Seidle and Miller, 1976; Blais and Carty, 1990; Hansen, 1994). This can be expected to enlarge the benefits of voting to the individual. Secondly, Dittrich and Johansen (1983) argue that more parties increase the competitiveness of the party system and thereby the potential benefits from selecting 'good policy.'

A negative effect can be expected as an increase in the number of parties is likely to enlarge the need for coalition formation under given electoral rules (Jackman, 1987; Blais and Carty, 1990; Ackaert et al., 1992). This decreases the direct influence of the electorate in the

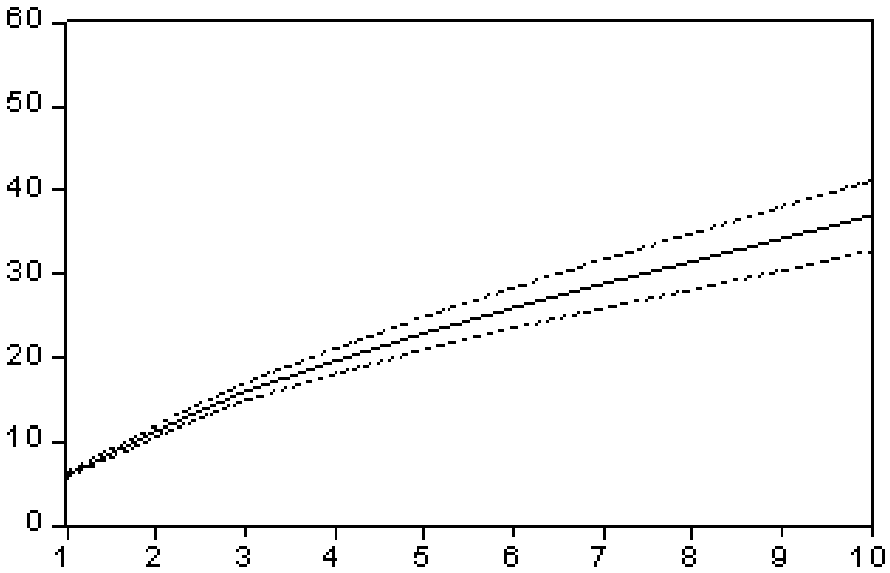

Figure 4. Accumulated response of PC to DEP.

contend also that more parties might increase the complexity of the political system and make it harder for the voter to make up his mind. This increases the information costs of the voter and reduces his likelihood of heading to the polls (Hoffman-Martinot, 1994).

2) On the other hand, if citizens participate in larger numbers to vote, then the political competition intensifies. The explanation might lie in the fact that, ultimately, we are dealing with a political market, where consumers are voters; under a large "demand" (massive electoral participation), the "supply" reacts by diversifying, that is, by enhancing political competition (thus, we are dealing with a strong causal link from electoral participation towards political competition).

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