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# TAXATION AND DEMOCRACY

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## **Abstract**

*In this study we are examining the validity of relationship between level of taxation and democracy, using a panel-model approach. The data-set covers the period 2002-2008, including 51 states. The main finding stresses that the assumed function are nonlinear, and has a quadratic U-shape.*

**Key words:** Taxation, Democracy, Nonlinearity, Dynamic Panel

**JEL classification:** D70, H20, C33

## **Introduction**

From fiscal point of view, the state collects the taxes and allocates them in order to fulfil the three musgravians' functions in economy: allocation, distribution, and economic stabilization. In this context, the power to tax is a very important thing in a democracy. Farmer and Lyal (1994) consider power to tax as one of the most basic and jealously guarded prerogative of the state, in order to assure the state revenues, and to be an instrument of economic management. For Brennan and Buchanan (2006), practically, the power to tax is the power to take. Based on the social contract, the government may use the tax revenues for financing the public goods or different transfers that citizen-taxpayers desire. Political regime - democratic or autocratic - has, in this case, an important implication on taxation, especially regarding the level of tax revenue as a percentage of Gross Domestic Product (GDP).

Democracy has a lot of definitions. In a simplistic way, according to Vanhanen (2003), democracy means free popular elections to fill positions of power, while Welzel (2007) defines democracy by constitutional constraints on the power of the state, and by popular control over it. The autocracy is the opposite concept of democracy: the government in which one person has uncontrolled or unlimited authority over others. It's important to note that in many situations, as Tullock (1987) shows, the autocracy can become electoral.

This paper studies the impact of democracy on the level of taxation, using a panel-model approach. The data-set covers the period 2002-2008, including 51 states. On the one hand, the main finding stresses that the assumed function are nonlinear, and has a quadratic U-shape. On the other hand, the analysis covers the "gap" in the literature in the field.

Even if the literature is relatively poor, there are three main different directions regarding the results of the connection between the level of taxation and the intensity of democratization: (a) the strong democracy determines a high level of taxation (De Schweinitz, 1964; Cheibub, 1998; and Boix, 2001); (b) the strong autocracy has a high level of taxation (Downs, 1960; Olson and McGuire, 1996; Niskanen, 2003; and Tonizzo, 2008); and (c) there is no any significant relationship between taxation and democracy (Meltzer and Richard, 1981; and Profeta et al., 2009).

The rest of the paper is organized as follows: Section 2 contains the literature review. Section 3 presents the methodology, and the empirical results. Section 4 concludes.

## **Literature review**

The relationship between the level of taxation and the intensity of democratization was less investigated in the literature. However, there are authors that claim the existence of this connection, but with different directions, while others stress that there is no any significant correlation.

De Schweinitz (1964) promotes the idea that the taxation and democratization's level are strong connected, and have the same direction. He considers democracy inevitable associated with a high level of taxation, because the democracy must satisfy pressure for immediate consumption, which are stronger than in autocracy. Cheibub (1998) performed a cross-country regression. Regarding taxation, its results illustrate that the autocracy has no any advantage compared with democracy. In this case, the autocracy is not associated with high level of taxation. In the same way, Boix (2001) finds a relationship between the government size and the type of political regime. He argues that government budgets (tax collected, and allocations) under democracy tend to grow faster than under autocracy.

Other authors defend the existence of the connection, but with a contrary sign. Downs (1960) shows that under democracy the budget tends to be systematically lower, because the government allocates the resources in a suboptimal way. McGuire and Olson (1996) reveal that higher level of taxation can be observed in autocracy. In such a situation, the resources are used for private consumption, and not to provide quality public goods. Niskanen (2003) finds that autocracy are more likely to rise the tax, but spending the resources in a discretionary way, while Tonizzo (2008) illustrates that strong democratic countries have a low size of government, and consequently low tax burden.

Finally, the last opinions promote the idea that there is no any evidence regarding the relationship between taxation and democracy. For Meltzer and Richard (1981) it is impossible to predict if democracy or autocracy will lead to a bigger government size, and more progressive form of distribution. Similarly, Profeta et al. (2009) do not find any significant within-country effect of democracy and civil liberties on corporate taxes, indirect taxes, and social security contributions.

In this context, we find some new evidence regarding the relationship between the level of taxation and the intensity of democratization, using a panel-model approach, with 51 states, for the period 2002-2008.

## Methodology and results

In order to investigate the relationship between taxation and democracy, we consider three variables: the level of taxation, as dependent variable, the Combined Polity Score, and the GDP per capita, as independent variables. The data-set includes 51 countries, covering the period 2002-2008 (Table 1, in Appendix). The countries were selected using a several criteria such as: level of economic development, form of socioeconomic system, culture, and type of political regime.

(a) The level of taxation ( ${}^t l$ ) illustrates the amount of tax revenues as percentage of GDP. This indicator measures how much of GDP is collected by government for its functions. Low level of indicator shows a reduced intervention of government in economy through taxation. The data has taken from World Bank online data-base.

(b) The Combined Polity Score ( $d$ ) measures the intensity of democratization, as a result of unified polity scale ranges. The maximum level is +10 (strongly democratic), and minimum level is -10 (strongly autocratic). The data has taken from Marshall et al. (2010).

(c) The GDP per capita ( ${}^c g$ ) was introduced as a control variable, and represents the GDP in US\$ divided by midyear population. The source of the data is World Bank online data-base.

The main hypothesis of this analysis is that the level of democratization determines the level of taxation, based on a function with this shape:

$${}^t l = f(d), \quad (1)$$

where  ${}^t l$  - the amount of tax revenues as percentage of GDP, and  $d$  - the Combined Polity Score.

In order to study this function, we consider a panel-data model, using several scenarios (Table 2, in Appendix).

The basic OLS naive model is as follows:

$${}^t l_{it} = \alpha + \beta d_{it} + \varepsilon_{it}, \quad (2)$$

where  $\alpha$  - intercept,  $\beta$  - slope,  $i$  - country,  $t$  - time and remainder, and  $\varepsilon_{it}$  - the error term, which varies over both country, and time.

In the case of model 1, the results of Ramsey's Reset Tests, assuming square and cube, cube only, and square only, suggest a nonlinear relationship between the level of taxation and the level of democratization, by square type. More, we introduced a control variable -  ${}^c g$  (GDP per capita), according to Berch (1995), Lowery (1987), and Dennis et al. (2009). The authors consider that the voters with high incomes are willing to accept high level of taxation. Based on this correction, the model becomes:

$${}^t l_{it} = \alpha + \beta_1 d_{it} + \beta_2 d_{it}^2 + \beta_3 {}^c g + \varepsilon_{it}. \quad (3)$$

In relation (3), the error term  $\varepsilon_{it}$  can be written:

$$\varepsilon_{it} = \lambda_i + \mu_{it}, \quad (4)$$

where  $\lambda_i$ - constant across individuals, and  $\mu_{it}$ - normally distributed error, or in other words  $\mu_{it} \approx N(0, \sigma_\mu^2)$ .

We can consider two types of panel model in this case:

(a) Fixed-effects model, with this shape:

$${}^i l_{it} = (\alpha + \lambda_i) + \beta_1 d_{it} + \beta_2 d_{it}^2 + \beta_3^c g + \mu_{it}, \quad (5)$$

where  $\lambda_i$  - part of constant, but varies by individual, and

(b) Random-effects model, which can be specified as follows:

$${}^i l_{it} = \alpha + \beta_1 d_{it} + \beta_2 d_{it}^2 + \beta_3^c g + (\lambda_i + \mu_{it}), \quad (6)$$

where  $\lambda_i$  - part of error term (error variances varying across groups and/or times).

As the panel-data model may have heterogeneity in data, we analyzed this propriety in both cases of fixed, and random effects panel-models' types. First, we performed the hypothesis tests to choose between pooled model and fixed-effects models (cross-section and period), respectively random-effects models. Second, we study the hypothesis tests to choose between fixed-effect models and random-effect models.

The null hypothesis of no cross-sectional heterogeneity is rejected with F-statistic  $F(50,303)=78.15$  (p-value=0.00), while the null hypothesis of no time-dimension heterogeneity is not rejected for all significance levels (F-statistic  $F(6,347)=0.21$ , and p-value=0.97). F-tests allow that cross-sectional fixed model 3 is preferred to the pooled model 2, while this last model is better then the period fixed-effects model 4.

The Breusch-Pagan test for the random-effects has the Chi-square=889.09, with p-value=0.00, so the null hypothesis of no cross-sectional heterogeneity is rejected. The random model 5 is preferred to the pooled model 2.

Finally, for the random-effects models 5, and 6, in both cases, the Hausman tests, with a Chi-square=3.607928 (p-value=0.307), respectively 1.237621(p-value=0.7440), suggest that these models are preferred to fixed-effects models 3, and 4.

In consequence, a residual test for AR(1) serial autocorrelation is performed for the models 5, and 6. The null hypothesis test that idiosyncratic errors are serially uncorrelated is rejected in both cases, with a Chi-square=13808.63 (p-value=0.00), respectively 12138.43 (p-value=0.00). The autocorrelation coefficient should be -0.5<sup>1</sup>. Based on these results, the estimations must be performed with the presence of a lagged dependent variable among the regressors.

Arellano and Bond (1991) suggest, in this context, an estimation using generalized method of moments (GMM), with Arellano-Bond 1-step estimator, lagged endogenous variables, and white standard errors and covariance.

The estimation of the new model 7 can be written as:

$$\Delta^i l_{it} = \beta_1 \Delta d_{it} + \beta_2 \Delta d_{it}^2 + \beta_3 \Delta^i l_{i,t-1} + \beta_4 \Delta^c g_{it} + \Delta \mu_{it}. \quad (7)$$

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<sup>1</sup> According to EViews 7 Users Guide II, p.661.

Attached J-statistic test of the model shows that de null hypothesis that the model is valid cannot be rejected. The instrument rank of 32 is greater than the number of estimated coefficients 4. Therefore, the last model can be considered representative and stable to describe the relationship between the level of taxation and the level of democratization.

The empirical results, in the case of 51 investigated countries, allow that all considered determinants have significant, and positive impact on taxation. Moreover, the second derivative of the function  $f(\Delta d_{it})$ , in respect to the level of democratization, is positive:

$$f''(\Delta d_{it}) = (\Delta l_{it})'' = 2\beta_2 > 0 \quad (8)$$

Thus, there is a minimum level of considered function, with a quadratic U-shape, in respect to the level of democratization. This means that, in dynamic approach, the level of taxation depends by its historical values, and GDP per capita levels, having the same signs. A high increase of taxation's level can be obtained only in a strong democratic or autocratic regime. Also, the empirical results reveal that there is a minimal level of taxation's dynamic, which corresponds to a given democratic trend.

## Conclusions

In dynamic, democratization's level has a significant impact on the amount of taxation, which can depend by its historical values, and GDP per capita levels. Having a quadratic U-shape, the function between taxation and democracy allows that only a strong democratic or autocratic country is compatible with high increase in the level of taxation.

A strong democracy is a political regime in which the voters realize the importance of social contract, the political participation and competition are high, and the public institutions have a good quality. In these states, the voters agree to pay high taxes because the public goods received have best quality. Even if the level of taxation is growing, the payment of taxes is the result of voters' respect for the public institution.

Similarly, the same effect can be obtained in a strong autocracy. In this political regime, the payment of taxes is not a result of the "acceptance" of social contract, but the results of voters' constrain. The collected resources do not have any correspondent in the public goods, more of them following a private destination. To cling to power, the autocrat political regime needs higher financial inputs, while the taxpayers tend to avoid taxation.

In the context of tax policy implications, the study suggests that a significant increase of taxes, without a major negative reaction of taxpayers, can be facile obtained if the political regime is strong democratic or, per a contrario, strong autocratic.

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\* \* \* (2009) EViews 7 Users Guide II.

\* \* \* (2011) World Bank online data-base.

## Appendix

Table 1: List of analyzed countries

No.	States	26	Italy
1	Australia	27	Kazakhstan
2	Austria	28	Kenya
3	Bangladesh	29	Kuwait
4	Belarus	30	Latvia
5	Belgium	31	Lebanon
6	Bhutan	32	Mauritius
7	Bulgaria	33	Morocco
8	Canada	34	Nepal
9	Chile	35	Netherlands
10	Croatia	36	Norway
11	Czech Republic	37	Peru
12	Denmark	38	Philippines
13	Egypt	39	Poland
14	El Salvador	40	Portugal
15	Estonia	41	Romania
16	Finland	42	Seychelles
17	France	43	South Africa
18	Georgia	44	Spain
19	Germany	45	Sri Lanka
20	Ghana	46	Sweden
21	Greece	47	Uganda
22	Guatemala	48	Ukraine
23	Hungary	49	United Kingdom
24	Iceland	50	United States
25	Israel	51	Uruguay

Table 2: Regression results regarding the impact of democracy on taxation

Dependent variable: $t$ (tax as % in GDP)							
Independent variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	OLS naïve	OLS	FE:CS	FE:PE	RE:CS	RE:PE	GMM - Dynamic
Constant $\alpha$	16.48491*** [40.94631] (0.0000)	13.81915*** [25.34893] (0.0000)	16.16501*** [26.15379] (0.0000)	13.85551*** [25.19381] (0.0000)	15.64798*** [15.94673] (0.0000)	13.81915*** [25.17920] (0.0000)	
$d$	0.203776*** [5.321473] (0.0000)	0.352926*** [6.048616] (0.0000)	0.095251 [1.407963] (0.1602)	0.356183*** [6.049645] (0.0000)	0.147868** [2.412050] (0.0164)	0.352926*** [6.008115] (0.0000)	1.284540*** [8.158341] (0.0000)
$d^2$		0.005641*** [4.595459] (0.0000)	0.001677 [1.413889] (0.1584)	0.005786*** [4.655202] (0.0000)	0.002565** [2.373533] (0.0182)	0.005641*** [4.564688] (0.0000)	0.031424*** [11.01584] (0.0000)
$t(-1)$							0.697729*** [32.44917] (0.000000)
$c_g$		6.74E-05*** [3.549925] (0.0004)	4.67E-05*** [2.766866] (0.0060)	6.32E-05*** [3.226422] (0.0014)	5.27E-05*** [3.304600] (0.0010)	6.74E-05*** [3.526156] (0.0005)	3.01E-05** [2.229741] (0.0266)
Model summary							
R-squared	0.073876	0.184304	0.941302	0.187322	0.04742	0.184304	
F-statistic	28.31688 (0.000000)	26.58642 (0.000000)	91.67886 (0.000000)	8.887029 (0.000000)	5.857566 (0.000651)	26.58642 (0.000000)	
Akaike criterion	6.500648	6.384883	4.033366	6.41479			
Schwarz criterion	6.522372	6.428331	4.619914	6.52341			
Hannan-Quinn	6.509289	6.402164	4.266662	6.457993			
Ramsey RESET Test: (1) F-statistic (square and cube)	21.710660 (0.00000)						
(2) F-statistic (cube only)	34.071292 (0.00000)						
(3) F-statistic (square only)	35.135932 (0.00000)						

Cross-section F			78.152124 (0.000000)				
Cross-section Chi-square			939.491589 (0.000000)				
Period F				0.214756 (0.9720)			
Period Chi-square				1.323216 (0.9704)			
Breusch-Pagan test					889.09 (0.000000)		
Hausman - test					3.607928 (0.3070)	1.237621 (0.7440)	
Idiosyncratic random					0.0789	1	
Residual test for AR(1): Chi-square					13808.63 (0.000000)	12138.43 (0.000000)	
J-statistic							36.667640
Instrumental rank							32

(a) [...] denotes the t-stat, while (...) shows the attached probability;

(b) FE:CS, FE:PE, RE:CS, and RE:PE denote cross-section fixed-effects, period fixed-effects, cross-section random-effects, respectively period random-effects.

(c) \*\*\*, \*\*, and \* denote significance at 1, 5 and 10 % level of significance, respectively.