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TAXATION AND POLITICAL STABILITY

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Abstract
The present study is, in particular, an attempt to test the relationship between tax level and political stability by using some economic control variables and to see the relationship among government effectiveness, corruption, and GDP. For the purpose, we used the GMM (1991) and GMM system (1998), using a country-level panel data from 112 countries for the period 1997 to 2010. The main results show that political stability is not the key for the tax policy, under the control of political regime durability the taxes as percent in GDP having consistent sinusoidal tendency, by cubic type.

Key words: Taxation, Political Stability, Connection, Effects, GMM and GMM system

JEL classification: H20, D70, C23

1. Introduction

There is no doubt that any change in political area has strong implications in the socio-economical systems. Bussiere and Multer (2000) see the political instability trough some factors, such as: the political polarization in the parliament; the coalition governments; the undecided voters and fickleness of the voters; and the control and timing of the elections. As Hendry (2001) notes, the changes in legislation, with sudden modify of economic policy and severe political turmoil, cause large "shocks or\breaks" in the economy.

Both the stability and instability can have different manifestations of civil wars or violent conflicts, democratic setbacks, few guarantees for human rights groups, violation of trade unions, massacres, forced displacement, violent little state presence in regional geography. Reports of Freedon House (1972 to 2011) show that these are factors that have greater relevance to the future. Even in the wide area of Eastern Europe, some Latin American countries, regimes are semi-consolidated authoritarian.

According to Weingast (2009), changes in these old regimes are transformations that affect the political institutions, involving sudden changes in the central, replacement and emergency powers of local governments, in some cases radical authoritarian and undemocratic. A majority of adverse changes in these regimes tend to favour some democracies and, conversely, promote authoritarianism. The scale of transformation in the countries that were under the government of the Soviet Union is an example of this. The same happens in other regions when the central authority collapsed state, as in the cases of Somalia and the Democratic Republic of Congo during the 1990s, the overthrow of the radical revolution in Cuba in 1959 in Iran in 1979, the dissolution of the Confederate States, or demands for secession of the state by extrajudicial means, as happened in the USSR and Yugoslavia in 1991, Pakistan in 1972. Venezuela is a case of unstable political system, whose systems of government evolved from a political party system with an excessive concentration of power to an authoritarian government run by one person.

Kalyvas (2006) considers that the political instability may relate to violent conflicts of low intensity. Types of government coalitions with paramilitary groups in rural areas, displacing people and expropriate land from its owners. For Estrada (2010) levels of violence vary from massacres against the opposition political groups to assassinations of presidential candidates as in Colombia during the late 90s. No need to use extreme violence, a political regime can sacrifice union leaders or opposition parties. In paramilitary massacres objectives can be derived from regional struggles over land, in other cases by animosities against opportunism and conflicts within a community. Colombia and Rwanda, in opinion of Kalyvas (2006), are an appropriate example of these manifestations of political instability, military regimes in Latin America during the 80 years separating the enemies of the opposition, condemning their people and their households. In Central America the violent conflict committed against the civilian population became an authoritarian regime by a revolutionary government, but its development was a continuation of extreme violence by paramilitary groups against specific groups of civilians.

Social movements can lead to revolutionary changes such as Egypt, bloodless extraordinary. The transition does not mean a leap toward democracy but toward hybrid forms of government. However, massacres, assassinations and forced displacement almost always directly affect the political stability of a country. Furthermore, political instability promotes a fragmented image of internal conflicts, separate different actions of organized violence, insurgent struggle, forced displacement and violence. The challenge is to unify these manifestations of civil violence in the formation of a complex domain of political instability. When many events overlap as in the case

of countries in Africa and Latin America, we detect relationships among the first acts of violence and the terminal stage of it.

There are some researches that see the political factors in significant connection with the tax level. Melo (2011), for example, identifies many taxation determinants: the levels of economic development and GDP per capita, the tax handles, the tax morale, and the political regimes.

Even if the literature is relatively poor regarding the relationship between tax level and political stability, there are two main different directions regarding the results of this connection: (a) the level of taxation determines the political stability (Feng, 1997; Devereux and Wen, 1998; Bell, 2001; Palan, 2002; Carmignani, 2003; Collier, 2009a, 2009b; Ghura and Mercereau, 2004; Nkurunziza, 2005; Elgin, 2010; and Estrada, 2011); and b) the political stability determines the level of taxation (Cukierman et al., 1992; Volkerink and De Haan, 1999; Bohn, 2002; Aizenmana and Jinjarak, 2008; Azzimonti, 2010; Melo, 2011; and Rieth, 2011).

In this paper we use the GMM estimates (1991) and GMM system estimates (1998) in order to avoid the endogenity issue associated with tax. We consider a country panel-data from 112 countries (Table A1, in Appendix), for the period 1997 to 2010, to study the dynamic relationship between taxes as percent in GDP (Tax) and political stability (PS). Our main interest is to study whether the dynamics of tax revenue are different across countries with different levels of political stability. Further, to analyse the issue in a comprehensive manner we analysed non-linearity associated with political stability. Finally, we analysed the relationship between Tax and PS by using some economic control variables (as Table A2 in Appendix shows, the variables used are Government effectiveness, hereafter GE; Freedom of corruption, hereafter FC; Gross Domestic Product, hereafter GDP).

The rest of the paper is as follows: Section 2 presents a brief review of literature; Section 3 presents the empirical specification and the data description; Section 4 provides the results of our work; and Section 5 presents our conclusions.

2. Literature review

The literature in the field of the relationship between tax level and political stability are relatively poor. On the one hand, there are authors who claim that the level of taxation determines the political stability, but on the other hand, others researchers state that the political stability determines the level of taxation.

The level of taxation determines the political stability. For Feng (1997) and Bell (2001) the political stability is the consequence of a strong taxation power that cares about the quality of life of people. Devereux and Wen (1998) start their research based on the connection between economic growth and size of government, and political instability respectively. Some of the results allow that the high tax of capital is associated with political instability. Analysing the issue of tax heaven, Palan (2002) find that the most successful tax havens have political and economic stability.

One year after, Carmignani (2003) explores the models in which the political instability affects several economic variables, such are: economic growth, budget formation, inflation, and monetary policy. He does not forget the taxation issue. His main results show that an increase in capital taxation for redistributive purposes reduces the investments in the legal system, determines policy myopia induced by political instability and uncertainty.

Ghura and Mercereau (2004) focus the study on Central African Republic. They analyse the relationship between trade and taxation, on the one hand, and political climate, on the other hand.

Using an econometrical investigation instrument, they find that the turbulences in the level of trade and low tax revenues could generate chances of political environment; more precisely these factors can propagate political instability.

Nkurunziza (2005) treats both high tax rates and political instability. The main results of his investigation stress that during a period of economic meltdown high tax rates and political instability force the taxpayers to go in underground economy or to leave the government taxation system. Collier (2009a, 2009b) provides quantitative arguments to assess the causes of political instability. His hypothesis is that economic opportunities are the main causes of civil wars. In some cases, as Estrada (2011) shows that the political instability depends on a weak state presence in the territories and the power of guerrilla insurgents. In most countries depend mainly on the fiscal challenges of hybrid between the stability conditions and political instability.

Finally, Elgin (2010) demonstrates the hypothesis that confirms the connection between tax level and political stability. The author's model involves that countries in which the political turnover is high, the level of tax burden is low.

The political stability determines the level of taxation. Cukierman et al. (1992) study the issue of tax reform. The tested model used cross-sectional data for 79 countries. Based on the main results, the authors consider that countries with a more unstable and polizared political system have an inefficient tax structure. Moreover, the political instability is positively connected with the seigniorage.

Volkerink and De-Haan (1999), applying panel data analysis on a large sample of OECD countries for the period 1965-1995, investigate the relationship between tax structure and political climate. He found that the political and institutional variables do not have any significant impact on the shape of the tax structure. The other part of analysis shows that an unstable regime has a higher tax burden. For Bohn (2002), the political instability causes myopic government behaviour and high debt levels, but it does not lead to an increase in inflation taxation, as in Cukierman, et al. (1992) has sustained.

Aizenmana and Jinjarak (2008) focused on the efficiency of tax collection in their study and found that the efficiency of tax collection is affected by the greater polarization and political instability. More precisely, the reduced political stability determines a low efficiency of tax collection. Azzimonti (2010) explored the effect of political instability. The author emphasised that a rise in the level of political instability generate an decrease of the level of resources (i.e., taxes) available to next period's policymaker, restricting in this way the spending of local public good. Melo (2011) studied the connection "tax level - political stability" in the case of Argentina, using "transaction cost politics" and Brasilia for comparison. He concludes that an explaining for low taxation in Argentina is political instability. In this case, the systemic political instability affects the tax behaviour of governments.

Rieth (2011) considers the hypothesis that higher political instability leads to an increase of the tax rate on capital income. The author tested this idea using a panel approach, with annual observations for 13 OECDies, for the period 1964-1983. The main finding shows that an increase of the index of political instability determines an increase of the tax rate on capital.

A simplified Figure 1 can show the variation between taxation and political stability. The full table identifies four types of political stability related to four types of taxation. This likewise reduces the space of four types of analysis to political stability: without political stability but low tax (for example Somalia and Congo-Kinshasa), without stability but high tax (Kazakhstan, Iran, and Colombia), with political stability and high tax (Norway, Japan), and with political stability but low tax (Jamaica, Belgium).

Figure 1: The variation between taxation and political stability

Tax	Without PS and high Tax	With PS and high Tax
	Without PS and low Tax	With PS and low Tax
Variables	Political Stability	

The location in any of the four quadrants makes a powerful difference to the character of the prosecutor and the public policy of a political regime. The conditions correspond to forms of taxation prevailing in each quadrant: (1) *Without stability with high taxation* - with conditioning of civil liberties, public opinion subordinate large budget for state military forces, the regime changes depend on conflicts between élite or a rebellion from below; (2) *Without stability, low taxation* - the state has no presence throughout the country, paramilitary groups occupy peripheral areas of the country, fighting between insurgent groups and displacement of civilians, many paramilitaries organizations are vying for political power in the localities; (3) *With stability and high taxation* - the civil liberties permanent social mobility, the difference between political parties, respect union rights, democratic opposition and competitive elections, control of private expressions of violence, low levels of political violence; and (4) *With stability and low taxation* - similar to regimes with high capacity and stability of taxation, social movements, frequent mobilization of political parties, formal consultations (including elections), but low effectiveness of tax control and greater involvement of actors in public policy illegal, deadly violence selective and high crimes.

The literature regarding the connection between tax level and political stability allows that there are two directions of the relationship: “tax level first and political stability second” (the level of taxation determines the political stability), and “the political stability first and tax level second” (the political stability determines the level of taxation). Whatever is the direction of these connections; the considered variables can have the same sign or a different one. Moreover, even if operate such investigations, there are few of them that treat this connection under some economic or non-economic factors.

3. Methodology

The usual way of analysis in panel data models is use of static panel data models in the framework of either one way fixed/random effect models or two way fixed/random effects model. However, it is important to mention that static panel (with or without fixed and random

effects) models do not allow us to analyze the possible dynamism existing in country tax determinants. Most of the tax regression studies assume that tax is an exogenous variable, even though tax is expected to be endogenous in tax regressions. In addition to that, tax may present issues of reverse causality for example, if PS depends on the level of taxation, it will necessarily depend on tax, and if this kind of reverse causality is not taken into account, it can lead to serious inaccuracies in research results. In such a situation, it is not only that the parameter estimates will be inconsistent (because error term of the tax equation may include factors that both affect tax and are correlated with PS) but also the magnitude and the meaning of the PS parameter will be altered as well. Therefore, we employed dynamic panel data estimation techniques to deal with the issue of endogenity in the context of panel data models. For such analysis, we relied on Arellano and Bond's Generalized Method of Moments (GMM) - type estimator (1991) in our analysis. In the dynamic framework, we can specify our equation as follows:

$$Tax_{it} = \beta_0 + \beta_1(Y_{it}) + \beta_2(PS_{it}) + \beta_3(FC_{it}) + \beta_4(GE_{it}) + \rho(Tax_{i,t-1}) + w_{it}, \quad (1)$$

with $w_{it} = \mu_i + \varepsilon_{it}$, where $\beta_{0,1,2\ldots}$ the regression coefficients, i indexes countries, t indexes time, w_{it} represents both country effects (μ_i) and the remainder error term which varies over both country and time (ε_{it}). The GMM-type estimator proposed by Arellano and Bond (1991) is also known as two-step estimation process and are constructed in two phases. Firstly, first differences from the dynamic panel data model are calculated; then, lagged levels of right-hand side variables are used as their instruments. With a lagged dependent variable and other endogenous regressors, the lagged levels are dated *t-2* and earlier (*t* indexes time). If there are predetermined regressors, all their lagged levels are used as instruments. Evaluation of the equation (1) in first differences allows us to eliminate unobservable individual effects, eliminating in this way the correlation between μ_i and $Tax_{i,\,t-1}$. The use of lags of the tax and its determinants as instruments allows for the creation of orthogonal conditions between ε_{it} and $\text{Tax}_{i,\,t-1}$ i.e., eliminating correlation between ε_{it} and $\text{Tax}_{i,\,t-1}$.

However, Blundell and Bond (1998) concluded[1] that when the dependent variable is persistent i.e., there being a high correlation between its values in the current period and in the previous period, and the number of periods is not very high, the GMM (1991) estimator is inefficient. For this kind of situations Blundell and Bond (1998) have extend the GMM (1991) estimator by considering a system with variables at level and first differences. For the variables at level in equation (1), the instruments are the variables lagged in first differences. In the case of

[1] Arellano and Bond (1991) have derived a consistent generalized method-of-moments (GMM) estimator for the model in which the unobserved panel-level effects are correlated with the lagged dependent variables and making standard estimators inconsistent. However, the Arellano and Bond estimator can perform poorly if the autoregressive parameters are too large or the ratio of the variance of the panel-level effect to the variance of idiosyncratic error is too large. Building on the work of Arellano and Bover (1995), Blundell and Bond (1998) developed a system estimator that uses additional moment conditions. This estimator is designed for datasets with many panels and few periods. This method assumes that there is no autocorrelation in the idiosyncratic errors and requires the initial condition that the panel-level effects be uncorrelated with the first difference of the first observation of the dependent variable.

the variables in first differences in equation (1), the instruments are those lagged variables at level. However, the GMM (1991) and GMM system (1998) dynamic estimators can only be considered robust if, firstly the restrictions created as a consequence of using GMM (1991) and GMM (1998) are valid and secondly, there is no evidence of second order autocorrelation. To test the validity of the restrictions we use the Sargan test in the case of the GMM (1991) and GMM (1998) estimator. In both cases, the null hypothesis is the restrictions imposed by use of the instruments are valid against the alternative hypothesis that the restrictions are not valid. If the null hypothesis is rejected, we can infer that the estimators are not robust since restrictions imposed by use of instrument are not valid. Moreover, to test for the existence of first and second order autocorrelation we use Arellano and Bond (1991) test. The null hypothesis is that there is no autocorrelation of first and second order against the alternative hypothesis being the existence of autocorrelation. And if the null hypothesis of non-existence of second order autocorrelation is rejected we conclude that the estimators are not robust.

Further, unlike other studies, the empirical model, which we have estimated, is of the following form:

$$Tax_{it} = \beta_0 + \beta_1(Y_{it}) + \beta_2(PS_{it}) + \beta_3(PS_{it}^2) + \beta_4(PS_{it}^3) + \beta_5(FC_{it}) + \beta_6(GE_{it}) + \rho(Tax_{i,t-1}) + w_{it} \ . \qquad (2)$$

This is to incorporate nonlinearities in tax - political stability relationship.

4. Estimation and Empirical Results

Before conducting regression analysis, correlation analysis was carried out in order to find out whether there is any evidence of severe multicollinearity among the test variables, as in the presence of severe multicollinearity the analysis may provide misleading conclusions (Table A3 in Appendix). Since we do not find evidence of severe multicollinearity, regression analysis has been carried out with incorporation of all variables simultaneously (Tables A4 in Appendix).

We present the results of the GMM (1991) and GMM system (1998) dynamic estimators for different alternative models in Table 1.

Table 1: Results of Dynamic panel data analysis

Panel data Models: Dependent variable is Tax; standard error in parenthesis						
Independent variables	Model 1: GMM (1991)	Model 1: GMM (1998)	Model 2: GMM (1991)	Model 2: GMM (1998)	Model 3: GMM (1991)	Model 3: GMM (1998)
Tax (-1)	.4992216 [a] (.0001156)	.3243175 [a] (.0000733)	.498954 [a] (.0001244)	.325414 [a] (.000065)	.4989525 [a] (.0001271)	.3291352 [a] (.0001126)
GDP	4.59e-08 [a] (4.57e-09)	-3.99e-08 [a] (2.76e-09)	3.43e-08 [a] (6.71e-09)	-1.65e-08 [a] (4.23e-09)	3.86e-08 [a] (8.71e-09)	1.77e-07 [a] (7.55e-09)
PS	-.0021769 [a] (.0000514)	-.0011506 [a] (.0000242)	-.0044604 [a] (.0001507)	.0041391 [a] (.0001299)	-.0050773 [a] (.0002558)	-.0204022 [a] (.0004208)
(PS)×(PS)	---	---	.0000326 [a] (3.57e-06)	-.0000718 [a] (3.69e-06)	.0000555 [a] (8.22e-06)	.0006167 [a] (.0000155)
(PS)×(PS) ×(PS)	---	---	----	---	-1.61e-07 [b] (5.52e-08)	-3.97e-06 [a] (1.56e-07)

FC	.0083895 [a] (.0000162)	.0071822 [a] (8.73e-06)	.0084384 [a] (.0000153)	.0074015 [a] (9.35e-06)	.0084545 [a] (.0000156)	.0087408 [a] (.0000115)
GE	.0118038 [a] (.0004304)	-.0832372 [a] (.0002067)	.0135756 [a] (.0004237)	-.0647443 [a] (.0001812)	.0139 [a] (.0004345)	-.0903397 [a] (.0002986)
Constant	-.1726804 [a] (.0064904)	-.0369847 [a] (.0004197)	-.1699871 [a] (.0095052)	-.0757084 [a] (.0013674)	-.1668547 [a] (.0094277)	-.0185289 [a] (.0038473)
Model summary						
Abond test	Z1= -1.0054 Z2= -.21261	Z1= -1.0059 Z2= -.20837	Z1= -1.0055 Z2= -.18572	Z1=-1.0058 Z2=-.26396	Z1= -1.0055 Z2= -.19049	Z1=-1.003 Z2=.63707
Sargan test	$chi^2_{(90)}$= 99.477	$chi^2_{(103)}$= 105.68	$chi^2_{(90)}$= 98.4789	$chi^2_{(103)}$= 105.6927	$chi^2_{(90)}$= 98.1957	$chi^2_{(103)}$= 101.8818
Wald chi^2	2.29e+07[a]	3.73e+07[a]	1.96e+07[a]	3.86e+07[a]	2.02e+07[a]	1.62e+07[a]
Country included	112	112	112	112	112	112
Total observations	1568	1568	1568	1568	1568	1568

Note: 1. The Wald test has $\chi 2$ distribution and tests the null hypothesis of overall non-significance of the parameters of the explanatory variables, against the alternative hypothesis of overall significance of the parameters of the explanatory variables.
2. The Sargan test has $\chi 2$ distribution and tests the null hypothesis of significance of the validity of the instruments used, against the alternative hypothesis of non-validity of the instruments used.
3. The Z1 test has normal distribution N(0,1) and tests the null hypothesis of absence of first order autocorrelation, against the alternative hypothesis of existence of first order autocorrelation.
4. The Z2 test has normal distribution N(0,1) and tests the null hypothesis of absence of second order autocorrelation against the alternative hypothesis of existence of second order autocorrelation.
5. [a] and [b] denote significance at 1 and 5 % level of significance.

Source: Author's calculation

We analyzed three models. In the model our regression equation includes Tax(-1), GDP, PS, FC and GE as independent variables. However, in the second and third model respectively square of PS cube of PS is included as additional variables. The results of the Wald test in all the three models for GMM (1991) and GMM (1998) cases show that the determinants used in this study can be considered, as a whole, explanatory of the economic growth, as Wald test is significant at 1% level of significance. Further, as the Sargan test is not significant in all models therefore, we can conclude that data do not provide evidence to reject the null hypothesis of instrument validity and consequent restrictions generated from use of the GMM (1991) and GMM system (1998) dynamic estimators respectively. This implies that the instruments and restrictions generated from the use of GMM (1991) and GMM (1998) are valid. Arellano and Bond (1991) (indicated by Abond test) test of autocorrelation shows that in all models data do not provide evidence to reject the null hypothesis of the absence of first and second order autocorrelation. Therefore, given the validity of the instruments and restriction imposed by GMM (1991) and GMM (1998) and absence of first and second order autocorrelation, we can conclude that the GMM (1991) and GMM system (1998) dynamic estimators are efficient and robust.

The presence of a lagged dependent variable among the regressors is a major drawback when using least squares, because it renders the OLS estimator biased and inconsistent. Even so, this estimation method proceeds by essentially treating the variables included in the regression as exogenous and the country-specific effects as homogeneous among different individuals. If these assumptions do hold, there should be no substantial differences between the OLS and the GMM results. However, we find this is not so when we applied OLS model by including lagged dependent variables with other regressors. When OLS is applied only lagged tax variable is

significant in all the three models and all other variables are insignificant. Further, we also find insignificance of the all variables when OLS model with fixed and random effect (results are not reported but results are accessible from authors) is used implying presence of sever issue of endogenity.

It is evident from Table 1 that lagged tax is significant with positive sign in all models either we apply GMM (1991) and GMM system (1998). In case of model 1, GMM (1991) provide evidence of GDP being positively significance however, GMM system (1998) show that GDP is negatively significance. Similar, holds for model 2 however, in case of model 3 both GMM (1991) and GMM system (1998) provide evidence that GDP is positive and statistically significant, which corresponds to the theory. Therefore, we can rely on model 3. Further, PS is negatively significant in all three models with the use of both estimators (except in model 2 with the use of GMM system (1998) estimators). Square of PS is significant with positive sign in model 3 with both estimators. It also holds for model 2 with the application of GMM (1991) estimators, whereas when GMM system (1998) is applied square of PS become significant with negative sign. Interestingly, cube of PS is negatively significant with the application both estimators that GMM (1991) and GMM system (1998). Further, our evidence shows that FC is positively significant in all models with the application of both estimators. Finally, we find surprising results for GE. That is when GMM (1991) estimator is used in the all three model GF is positive and significant however, when GMM system (1998) is used we find that GE is still significant in all the three models but with negative sign. Constant term in all cases is also found to significant but with negative sign.

Based on the coefficients of model 3, Tax function in respect to PS has a trend as Figure 2 illustrates. We note that:

$$Tax : (0,+\infty) \rightarrow (0,+\infty) \tag{3}$$

In this case, the cubic Tax function in respect to PS has fluctuated tendency, with two critical points: one minimum ($PS_{min.}$) and another maximum ($PS_{max.}$). PS_{1a} and PS_{1b} are the roots of first derivative cubic function Tax in respect to PS, and PS_2 is the root for the second derivative of the same function.

Figure 2: The tendency of cubic Tax function in respect to PS

PS	0		PS_{1a}		PS_2		PS_{1b}		$+\infty$
f'(PS)	----------		0	++++++++++++++++++			0		----------
f''(PS)	++++++++++++++++++++			0		----------			
Trend of f(PS)	Decrease		$PS_{min.}$	Increase			$PS_{max.}$		Decrease
Form of function				$PS_{inf.}$					

On the function's definition interval (0, +∞), Tax cubic function in respect to PS decreases to PS_{1a}, increases between two critical points (PS_{1a}, PS_{1b}), and decreases from PS_{1b}. More, there is an inflection point $PS_{inf.}$ in which accelerated increasing trend becomes slowed.

5. Conclusions

The present study is, in particular, an attempt to test the relationship between Tax and PS by using some economic control variables and to see the relationship among the GE, FC and GDP. For the purpose, we used the GMM (1991) and GMM system (1998) in order to avoid the endogenity issue associated with tax. For analysis, we used country-level panel-data from 112 countries for the period 1997 to 2010.

The salient features of the model are: (a) simplicity, even if there are complex nonlinear interactions effects by cubic type; (b) accuracy and low level of errors, because the model achieves a high percentage of accuracy in distinguishing countries with inclination to political instability, compared to countries with political stability; (c) generality, because there is a extended panel-data with 112 countries, and (d) novelty, because the model incorporates a nonlinear tool and generates new results that helps and extend the conventional literature.

Study finds that significant positive response of tax to tax in all cases. Response of tax to GDP is varies with the estimators we use however, for our preferred model GDP shows positive impact on tax. The very interesting findings of our study is that low level of PS and very high level of PS (indicated by cube of PS) show negative impact on tax whereas medium level of PS (square of PS) show positive impact on tax. Effect of FC (freedom from corruption) is positive on tax revenue as we expected and as far as effect of government effectiveness is concerned we are unable to draw a solid conclusion. This is because sign of the coefficient associated with GE is changing as we change the use of estimators.

A long period of political stability determines a decrease of taxes as percent in GDP in the first years. This could be the results of expansionary tax policy as political voters “reward” in the first years of governance. After that, comes a long political contractionary period, characterised by high taxes and high level of taxation in GDP. This is for political power a political “permissive” period, based on government democratic credibility or autocratic abuse. Finally, as the period of political stability increases continuously, the level of taxation decreases. This last period is related to “populism” period, with low taxes and high government financial transfers.

Regarding policy implication, as the results shows, the political stability is not the key for the tax policy, under the control of political regime durability the taxes as percent in GDP having consistent sinusoidal tendency, by cubic type. In respect to political regime durability, a low level of taxation as percent in GDP could be applied only on short and long term. Otherwise, high taxation level is equivalent to medium political regime durability.

References

Aizenmana, J., Jinjarak, Y. (2008). The Collection Efficiency of The Value Added Tax: Theory and International Evidence. The Journal of International Trade & Economic Development, 17(3): 391- 410.

Arellano, M., Bond, O. (1991). Some Tests of Specification for Panel Data: Monte Carlo evidence and an application to employment equations, Review of Economic Studies, 58: 277-297.

Azzimonti, M. (2010). Barriers to Investment in Polarized Societies. MPRA Paper No. 25936, Online at http://mpra.ub.uni-muenchen.de/25936.

Bell S. (2001). The rol of State and hierarchy of money, Cambridge Journal of Economic, 25: 149-163.

Blundell, R.W., Bond, S.R. (1998), Initial conditions and moment restrictions in dynamic panel data models, Journal of Econometrics, 87: 115-143.

Bohn, F. (2002). Public Finance under Political Instability and Debt Conditionality. Economics Discussion Papers from University of Essex, Department of Economics, No. 540.

Bussiere, M, Multer, B. (2000). Political Instability and Economic Vulnerability. International Journal of Finance & Economics, 5(4): 309-330.

Carmignani, F. (2003). Political Instability, Uncertainty and Economics. Journal of Economic Surveys, 17(1): 1-54.

Cukierman, A., Edwards, S. Tabellini, G. (1992). Seigniorage and Political Instability. The American Economic Review, 82(3): 537-555.

Collier, P. (2009a). Wars, Guns and Votes, Democracy in Dangerous Places, Harper Collins Books.

Collier, P. (2009b). The political economy of state failure": Oxford Review of Economic Policy, 25: 219–240.

Devereux, M., Wen, J.F. (1998). Political instability, capital taxation, and growth. European Economic Review, 42: 1635-1651.

Elgin, C. (2010). Political Turnover, Taxes and the Shadow Economy. Working Papers, Bogazici University, Department of Economics, No 2010/08.

Estrada, F. (2010). Devouring the Leviathan: fiscal policy and public expenditure in Colombia", RePEc / EconPapers / Munich Personal Archive, MPRA No. 21981.

Feng, Y. (1997). Democracy, Political Stability and Economic Growth; British Journal of Political Science. 27: 391- 418.

Ghura, D., Mercereau, B. (2004). Political Instability and Growth: The Central African Republic. IMF Working Paper/04/80, African and Asia and Pacific Department.

Hendry, D. (2001). How Economists Forecast. Understanding Economic Forecasts, ed. by D. Hendry and N. Ericsson. Cambridge, MA: The MIT Press, 15-41.

Kalyvas S. (2006). The logic of violence in the civil war, Cambridge University Press.

Melo, M. (2011). Institutional Weakness and the Puzzle of Argentina's Low Taxation. Latin American Politics and Society, 49(4): 115-148.

Nkurunziza, J. (2005). Political Instability, Inflation Tax and Asset Substitution in Burundi. Journal of African Development. 7(1): 42-72.

Palan, R. (2002). Tax Havens and the Commercialization of State Sovereignty, International Organization, 56(1): 155-156.

Rieth, M. (2011). Essays on Dynamic Macroeconomics: Debt, Taxation, and Policy Interaction. Dissertation zur Erlangung des akademischen Grades, Doktor rerum politicarum der Technischen Universität Dortmund.

Volkerink, B., De Haan, J. (1999). Political and institutional determinants of the tax mix: an empirical investigation for OECD countries. Research Report, from University of Groningen, Research Institute SOM (Systems, Organisations and Management), No. 99E05.

Weingast B. (2009). Second generation fiscal federalism: The implications of fiscal incentives, Journal of Urban Economics, 6: 279–293.

*** Freedom House, 1972–2011 Freedom in the World, Lanham, MD: Rowman & Littlefield.

*** World Bank online data-set, World Development Indicators (WDI) from 1960 to 2010.

*** Polity™ IV Project Political Regime Characteristics and Transitions, 1800-2009 Dataset.

Appendix

Table A1: Variables and their sources

Variable	Source
Tax - Taxes in GDP (%)	World Bank online data-set, World Development Indicators (WDI) from 1960 to 2010
PS - Political stability (years)	Polity™ IV Project Political Regime Characteristics and Transitions, 1800-2009 Dataset
GE - Government effectiveness (2.5 maxim quality points)	World Bank online data-set, Aggregate Governance Indicators, 1996-2009
FC - Freedom of corruption (100 - no corruption)	The Heritage Foundation
GDP - Gross Domestic Product in US Dollars	World Bank online data-set, World Development Indicators (WDI) from 1960 to 2010

Table A2: List of analyzed countries

Countries				
Albania	Costa Rica	Indonesia	Mongolia	Slovenia
Algeria	Croatia	Iran, I.R. of	Morocco	South Africa
Angola	Cyprus	Iraq	Mozambique	Spain
Argentina	Czech Republic	Ireland	Namibia	Sri Lanka
Armenia	Denmark	Israel	Nepal	Sudan
Australia	Djibouti	Italy	Netherlands	Swaziland
Austria	Dominican Republic	Jamaica	New Zealand	Sweden
Azerbaijan, Rep. of	Ecuador	Japan	Nicaragua	Switzerland
Bahrain, Kingdom of	Egypt	Jordan	Niger	Syrian Arab Republic
Bangladesh	El Salvador	Kazakhstan	Nigeria	Taiwan Prov.of China
Belarus	Equatorial Guinea	Kenya	Norway	Tajikistan
Belgium	Estonia	Korea, Republic of	Oman	Tanzania
Benin	Ethiopia	Kuwait	Pakistan	Thailand
Bolivia	Fiji	Kyrgyz Republic	Panama	Togo
Bosnia & Herzegovina	Finland	Lao People's Dem.Rep	Papua New Guinea	Trinidad and Tobago
Botswana	France	Latvia	Paraguay	Tunisia
Brazil	Gabon	Lebanon	Peru	Turkey
Bulgaria	Georgia	Lesotho	Philippines	Turkmenistan
Burkina Faso	Germany	Libya	Poland	Uganda
Burundi	Ghana	Lithuania	Portugal	Ukraine
Cambodia	Greece	Macedonia, FYR	Qatar	United Arab Emirates
Cameroon	Guatemala	Madagascar	Romania	United Kingdom
Canada	Guinea	Malawi	Russian Federation	United States
Cape Verde	Guinea-Bissau	Malaysia	Rwanda	Uruguay
Central African Rep.	Guyana	Mali	Saudi Arabia	Uzbekistan
Chad	Haiti	Mauritania	Senegal	Venezuela, Rep. Bol.
Chile	Honduras	Mauritius	Sierra Leone	Vietnam
China,P.R.: Mainland	Hungary	Mexico	Singapore	Yemen, Republic of
Colombia	India	Moldova	Slovak Republic	Zambia

Table A3: Correlation analysis

	FC	GDP	GE	PD	TAX
FC	1				
GDP	0.25823237979	1			
GE	0.89530503541	0.29655180742	1		
PD	0.59016373889	0.53725908999	0.56156040816	1	
TAX	0.07520797802	0.00104191103	0.07096433014	0.02193290756	1

Table A4: OLS estimates

Panel data Models: Dependent variable - Tax; standard error in parenthesis			
Variable	Coefficient	Coefficient	Coefficient
TAX(-1)	0.503539a (0.013546)	0.503475a (0.013549)	0.503356a (0.013559)
FC	0.002096 (0.001407)	0.002060 (0.001409)	0.002076 (0.001410)
GDP	-1.84E-09 (1.26E-08)	3.66E-09 (1.51E-08)	3.50E-12 (1.91E-08)
GE	-0.015356 (0.032915)	-0.017430 (0.033068)	-0.016844 (0.033131)
PS	-4.96E-05 (0.000596)	0.000648 (0.001205)	0.001250 (0.002270)
PS*PS	----	-5.61E-06 (8.43E-06)	-1.75E-05 (3.89E-05)
PS*PS*PS	----	----	5.32E-08 (1.70E-07)
C	0.065789 (0.055333)	0.056457 (0.057091)	0.051721 (0.059079)
R-squared	0.492671	0.492826	0.492861
Adjusted R-squared	0.490922	0.490726	0.490409
S.E. of regression	0.520858	0.520958	0.521120
Sum squared resid	393.3752	393.2549	393.2283
Log likelihood	-1113.252	-1113.030	-1112.980
F-statistic	281.6213	234.6682	201.0330
Prob(F-statistic)	0.000000	0.000000	0.000000
Akaike info criterion	1.537435	1.538502	1.539808
Schwarz criterion	1.559207	1.563903	1.568838
Hannan-Quinn criter.	1.545558	1.547979	1.550639
Durbin-Watson stat	2.673429	2.674161	2.674083
Note: [a] and [b] denote significance at 1 and 5 % level of significance.			
Source: Authors' calculation			