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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 Vector Autoregression (VAR) approach in the panel framework, using a country-level panel data from 59 countries for the period 2002 to 2008.
The salient features of this model are: (a) simplicity is based on a limited number of variables (five) are categorical or continuous and not dependent on complex interactions or nonlinear effects. (b) accuracy: a low level of errors, the model achieves a high percentage of accuracy in distinguishing countries with inclination to political instability, compared to countries with political stability, (c) generality: the model allows to distinguish types of political instability, both resulting from acts of violence and failure of democracies to show, and (d) novelty: the model incorporates a tool that helps evaluate and exclude many variables used by the conventional literature. This approach is mainly based on the recognition of state structures and the relations between elites and parties.

Key words: Taxation, Political Stability, Connection, Effects, Panel VAR analysis

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 Vector Autoregression (VAR) approach in the panel framework (i.e., we used Panel Vector Autoregression, hereafter PVAR) to investigate the biunivoque relationship between tax level (Tax) and Political Stability (PS). This choice overcomes and isolates the response of Tax to PS and fundamental factors. Use of PVAR approach has advantages in that it assumes all variables as endogenous and hence, contrary to the previous studies makes us to overcome the defining the dependent variable for which there is there is no consensus among researchers. Further, in this connection we focus on the orthogonalized impulse-response functions, which show the response of one variable of interest (i.e., Tax) to an orthogonal shock in another variable of interest (i.e., PS and other economic variables used in analysis as control variables). By orthogonalizing the response, we are able to identify the effect of one shock at a time, while holding other shocks constant.
We use country-level panel data from 59 countries for the period 2002 to 2008 to study the dynamic relationship between Tax and PS. Our main interest is to study whether the dynamics of tax revenue are different across countries with different levels of political stability.

We argue that the level of PS in a country can be used as an indication of the different degrees of economic constraints faced by a country either due to economic or non-economic reasons. After controlling for the shocks to 'fundamental' factors, we interpret the response of 'Tax' to 'PS' as evidence of economic constraints and we expect this response to be larger in countries with lower levels of PS. We believe that our paper contributes to a number of strands in the recent fiscal economics literature. First, by using vector autoregressions on panel data we are able to consider the complex relationship between Tax and the PS of countries, while allowing for a country-specific unobserved heterogeneity in the levels of the variables (i.e., fixed effects). Second, by analyzing orthogonalized impulse-response functions we are able to separate the response of Tax (tax burden) to shocks coming from fundamental or economic and non-economic factors. Third, use of PVAR approach makes us free to determine the dependent variable for which there is no consensus is reached until date. Fourth, we analysed the relationship between Tax and PS by using some economic control variables (variables used are Government effectiveness, hereafter

GE; Freedom of corruption, hereafter FC; Gross Domestic Product, hereafter GDP) and finally we tested the relationship between behaviour of GE, FC and 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) started 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. Carmignani (2003) explored 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. One year after, analysing the issue of tax heaven, Palan (2002) found that the most successful tax havens have political and economic stability.

Ghura and Mercereau (2004) focused 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 found 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 allow 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, 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.

Several years after, Elgin (2010) demonstrated 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 OECD ies, 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 Graphic 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).

Graphic 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. Empirical methodology

We use a panel-data vector autoregression methodology. This technique combines the traditional VAR approach, which treats all the variables in the system as endogenous, with the panel-data approach, which allows for unobserved individual heterogeneity. We specify a first order VAR model as follows:

$$Z_{it} = \Gamma_0 + \Gamma_1 Z_{it-1} + \mu_i + d_{c,t} + \varepsilon_t \qquad (1)$$

where z_t is either a two variable vector (Tax and PS or FC and PS or GDP and PS) or five-variable vector (Tax, PS, GE, FC and GDP) or four- variable vector (GE, FC and GDP) and the variables are as defined previously (Appendix, Table I). We use i to index countries (Appendix, Table II) and t to index time, τ are the parameters and ε is white noise the error term. Further to calculate the impulse-response functions which describe the reaction of one variable to the innovations in another variable in the system, while holding all other shocks equal to zero we need to decompose the residuals in a such a way that they become orthogonal as the actual variance–covariance matrix of the errors is unlikely to be diagonal. The usual convention is to adopt a particular ordering and allocate any correlation between the residuals of any two elements to the variable that comes first in the ordering.[1] The identifying assumption is that the variables that come earlier in the ordering affect the following variables contemporaneously, as well as with a lag, while the variables that come later affect the previous variables only with a lag. In

[1] The procedure is known as Choleski decomposition of variance-covariance matrix of residuals and is equivalent to transforming the system in a "recursive" VAR for identification purposes. See Hamilton (1994) for the derivations and discussion of impulse-response functions.

other words, the variables that appear earlier in the systems are more exogenous and the ones that appear later are more endogenous.[2]

In our specification, we assume that current shocks to the PS have an effect on the contemporaneous value of tax revenue, while tax revenue has an effect on the PS with a lag. We believe this assumption is plausible for two reasons.

First, the tax level is a direct result of political vector action and depends only by the flexibility of tax system and legislative timing. In this case, the elector's votes have an indirect effect on taxation. Second, the political environment is controlled with lag by tax level, which is one of most important info-economical factor in the collective choice. In this last situation, we note that the electoral tax feedback is strongly connected with the timing of electoral cycle.

We set three objectives particularly in our study. First, we attempted to compare the response of tax burden to PS of bivariate to case when model includes five variables. Second analyze and compare the response of GDP to PS (i.e., bivariate case) and response of GDP to PS, tax burden, GE and FC (a case when model includes five variable). Third, we also analyzed the behaviour of response of GE, FC and GDP model which do not includes Tax and PS.

In applying the VAR procedure to panel data, we need to impose the restriction that the underlying structure is the same for each cross-sectional unit. Since this constraint is likely to be violated in practice, one way to overcome the restriction on parameters is to allow for "individual heterogeneity" in the levels of the variables by introducing fixed effects, denoted by μ_i in the model (Love and Zicchino, 2006). Since the fixed effects are correlated with the regressors due to lags of the dependent variables, the mean-differencing procedure commonly used to eliminate fixed effects would create biased coefficients. To avoid this problem we use forward mean-differencing, also referred to as the 'Helmert procedure' (see Arellano and Bover, 1995). This procedure removes only the forward mean, i.e., the mean of all the future observations available for each country-year. This transformation preserves the orthogonality between transformed variables and lagged regressors, so we can use lagged regressors as instruments and estimate the coefficients by system GMM.[3] Further, our model also allows for country-specific time dummies, $d_{c,t}$ which are added to model (1) to capture aggregate, country-specific macro shocks that may affect all countries in the same way. We eliminate these dummies by subtracting the means of each variable calculated for each country-year. Further, to analyze the impulse-response functions we need an estimate of their confidence intervals. Since the matrix of impulse-response functions is constructed from the estimated VAR coefficients, their standard errors need to be taken into account. We calculate standard errors of the impulse response functions and generate confidence intervals with 500 Monte Carlo simulations.[4] Finally, we also present variance decompositions, which show the percent of the variation in one variable that is explained by the shock to another

[2] More formally, if a variable *x* appears earlier in the system than a variable *y,* then *x* is weakly exogenous with respect to *y* in the short run.

[3] In our case the model is "just identified", i.e. the number of regressors equals the number of instruments, therefore system GMM is numerically equivalent to equation-by-equation 2SLS.

[4] In practice, we randomly generate a draw of coefficients of model (1) using the estimated coefficients and their variance covariance matrix and re-calculate the impulse-responses. We repeat this procedure 1000 times (we experimented with a larger number of repetitions and obtained similar results). We generate 5th and 95th percentiles of this distribution which we use as a confidence interval for the impulse-responses.

variable, accumulated over time. The variance decompositions show the magnitude of the total effect. We report the total effect accumulated over the 10, 20 and 30 years.

4. Results

We estimate the coefficients of the system given in (1) after the fixed effects and the country time dummy variables have been removed. In Table 1, we report the results of the model with two-variable vector (Tax and PS, FC and PS and GDP and PS). In panel 1 of Table 2, we report the model of five-variable vector (GDP Tax, PS, GE, FC and GDP) and in panel 2 of table we report the results of the three-variables vector (GE, FC and GDP). Finally, Table 3 and Table 4 report the results of variance decomposition. Further, we present graphs of the impulse-response functions and the 5% error bands generated by Monte Carlo simulation. Fig. 1, 2 and 3 reports graphs of impulse responses for the model with two variables, while Fig. 4 reports impulse-response functions of five variables and the 5% error bands generated by Monte Carlo simulation. In order to see sensitivity of the results we excluded the tax and PS variables and plots of impulse-response functions with of three variables case and the 5% error bands generated by Monte Carlo simulation are presented in Fig. 5.

Table 1: Results of a two-variable VAR model

Response of	Response to	
	$Tax_{(t-1)}$	$PS_{(t-1)}$
Model 1: Tax and PS		
$Tax_{(t)}$	0.65927699 (3.592873)***	0.01776941 (0.23756994)
$PS_{(t)}$	-0.01802554 (-0.05706872)	0.7265211 (3.0192047)***
Model 2: FC and PS		
	$FC_{(t-1)}$	$PS_{(t-1)}$
$FC_{(t)}$	0.8186223 (3.3256258)***	0.05595704 (0.65369876)
$PS_{(t)}$	0.01965007 (0.0541893)	0.73079369 (20.410429)***
Model 3: GDP and PS		
	$GDP_{(t)}$	$PS_{(t)}$
$GDP_{(t)}$	0.69183174 (9.3432619)***	4.395e+09 (0.65729474)
$PS_{(t)}$	-1.105e-13 (-0.15751507)	0.74070339 (2.7464966)*
Two variable VAR model is estimated by GMM, country-time and fixed effects are removed prior to estimation. Reported numbers show the coefficients of regressing the row variables on laggs of the column variables. Heteroskedasticity adjusted *t*-statistics are in parentheses. *** , ** and * indicates significance at 1%, 5% and 10% level, respectively.		
Source: Authors' calculation		

It is evident from the model 1 of Table 1 that response of tax to PS is positive but insignificant in terms of estimated coefficient however, response of PS to tax is negative but this is also insignificant in terms of estimated coefficient. Response of tax and PS to themselves is positive and significant. Similarly, response of FC and PS to themselves is positive and significant in terms of estimated coefficient however, response of FC to PS and PS to FC is positive but insignificant (and negligible in case of PS to FC) in terms of estimated coefficients in both cases.

Model 3 show that response of GDP to GDP is positive but insignificant in terms of estimated coefficients and response of PS to PS is positive and significant in terms of estimated coefficient. Response of GDP to PS is positive while response of PS to GDP is negative however; estimated coefficients of both cases are insignificant.

Next, we present results of the relationship among five variables of our interest in panel 1 of Table 2 and their sensitivity of dynamic relationship among FC, GE and GDP is presented in panel 2 of Table 2.

Table 2: Results of a Five-variable and Three-variable VAR model

Response of	Response to				
	$Tax_{(t-1)}$	$PS_{(t-1)}$	$GE_{(t-1)}$	$FC_{(t-1)}$	$GDP_{(t-1)}$
Panel 1: Tax, PS, FC, GE, and GDP					
$Tax_{(t)}$	0.6886671*** (5.2738666)	0.00387733 (0.07739613)	0.0550709 (0.03186126)	-0.02411885 (-0.401493)	-2.766e-14 (-0.1072374)
$PS_{(t)}$	-0.05051866 (-0.15964162)	0.74966387*** (3.8510976)	-0.38436068 (-0.05906699)	-0.00742575 (-0.051763)	-1.750e-13 (-0.4606695)
$GE_{(t)}$	-0.00456843 (-0.55303369)	0.00206191 (0.32549224)	0.89030224*** (3.9261383)	0.00261014 (0.69725982)	1.645e-14 (0.38352893)
$FC_{(t)}$	-0.06066337 (-0.255812)	0.09097436 (0.65771337)	2.5051433 (0.48151517)	0.70338689*** (5.1800124)	1.031e-13 (0.16376026)
$GDP_{(t)}$	1.070e+09 (0.24405784)	-5.121e+08 (-0.10957263)	-8.748e+10 (-0.55690429)	-2.246e+09 (-1.144209)	0.69328497*** (9.4382726)
Panel 2: FC, GE, and GDP					
	$GE_{(t)}$	$FC_{(t)}$	$GDP_{(t)}$		
$GE_{(t)}$	0.82543233*** (3.9169541)	0.0056157 (0.60381247)	1.423e-14 (0.3080674)		
$FC_{(t)}$	-1.0655629 (-0.27895739)	0.61516889* (2.0404792)	-1.337e-13 (-0.22457988)		
$GDP_{(t)}$	-7.104e+10 (-0.40651321)	-2.891e+09 (-0.41960763)	0.69390085*** (8.5114831)		
Five and three variable VAR model is estimated by GMM, country-time and fixed effects are removed prior to estimation. Reported numbers show the coefficients of regressing the row variables on laggs of the column variables. Heteroskedasticity adjusted *t*-statistics are in parentheses. *** , ** and * indicates significance at 1%, 5% and 10% level, respectively.					
Source: Authors' calculation					

It is evident from the both panels of Table 2 that response of Tax, PS, FC, GE, and GDP to only them is positively significant in terms of estimated coefficient. It is evident from panel 1 that response of Tax to PS and GE is positive but insignificant in terms of estimated coefficient and response of Tax to FC and GDP is negative and insignificant in terms of estimated coefficient. Response of PS to all other three variables is negative but insignificant in terms of estimated coefficient. Response of GE to every variable is positive except for Tax however, it is significant in terms of estimated coefficient for all variables except for itself. Results of FC are very similar

to the GE. Response of GDP is positive for itself and Tax while negative for PS, GE, and FC and significant only for itself in terms of estimated coefficient.

If we see Panel 2 of Table 2 we find that response of GE to GE, FC and GDP is positive but significant in terms of estimated coefficient only for GE and hence this finding is similar to the findings of five-variable case. Further, response of FC is positive to itself and negative to GE and GDP but significant in terms of estimated coefficient in case of itself and hence in this case also our findings of five variable model is not sensitive to the exclusion of the Tax and PS variables. Finally, we have similar results of the relationship among GDP, GE and FC in case of three variable model and five variable model.

The variance decompositions for the different models, presented in Table 3, are in line with these results.

Table 3: Variance decomposition of a two-variable VAR model

Model	Tax	PS
Model 1: Tax and PS		
Tax	0.98911587	0.01088413
PS	0.00042509	0.99957491
Model 2: FC and PS		
	FC	PS
FC	0.98542776	0.01457224
PS	0.00765671	0.99234329
Model 3: GDP and PS		
	GDP	PS
GDP	0.76359804	0.23640196
PS	0.0047603	0.9952397
Percent of variation in the row variable (10 periods ahead) explained by column variable.		
Source: Authors' calculation		

Tax explains, in model 1, about 99% of variation 10 periods ahead in itself while only 1% is explained by PS while PS explains about 100% of variation 10 periods ahead in itself. In model 2, FC explains about 99% of variation 10 periods ahead in itself while only 1% is explained by PS while PS explains about 100% of variation 10 periods ahead in itself. Model 3, show that about 76% of variation 10 periods ahead is explained by GDP in itself and 24% is explained by PS while PS explains about 100% of variation 10 periods ahead in itself.

Next in Table 4 we present the variance decomposition of model contains all five variables and sensitivity of the results to the exclusion of Tax and PS.

Table 4: Variance decomposition a Five-variable and Three-variable VAR model

Variable	Tax	PS	GE	FC	GDP
Panel 1: Tax, PS, FC, GE, and GDP					
Tax	0.96965472	0.00069825	0.00240558	0.02722765	0.0000138
PS	0.00076803	0.99443189	0.0042787	0.00044334	0.00007804

GE	0.03919617	0.06048736	0.86374144	0.03626451	0.00031053
FC	0.02521807	0.06072712	0.12400332	0.79000777	0.00004372
GDP	0.04545642	0.05061542	0.38459291	0.10074347	0.41859177
Panel 2: FC, GE, and GDP					
	GE	FC	GDP		
GE	0.89417083	0.10562547	0.0002037		
FC	0.00881963	0.99114438	0.00003599		
GDP	0.19299306	0.14606802	0.66093893		
Percent of variation in the row variable (10 periods ahead) explained by column variable.					
Source: Authors' calculation					

Its is evident from panel 1 of Table 1 that Tax explains, in this case also a very high percentage of variation (i.e., 97%) 10 periods ahead in itself while FC explains more than 2% and rest is explained by PS, GE and GDP. Interestingly, PS explains about 99% of variation 10 periods ahead in itself and rest 1% is explained by other four variables. Further, GE explains 86% of variation 10 periods ahead in GE, PS explains 6%, and Tax and FC each of them explains 3% of variation. In case of FC, 79% of variation is explained by FC itself and 12% is explained by GF, 2.5% and 6% is explained by tax and PS. Finally, in case of GDP, GDP explains around 41%, 10% is explained by FC, GE explains 38%, Tax and PS explains 4.5% and 5% variation 10 periods ahead.

Now if we look panel 2 of the table we will find that GDP explains 66%, GE explains 19 and FC around 15% of variation in GDP. Further, in case of FC around 100% of variation is explained by FC only. Finally, in case of GE, 10 periods ahead 89% of variation is explained by GE itself and 11% is explained by FC. Hence, we find almost same results on the relationship among GE, FC and GDP even after excluding Tax and PS from the system.

Next, we present the IRFs of our bivariate models analyzed above. Figure, 1 shows that response of tax to tax though positive but declining over period and tax to PS is almost zero through the period. Similarly, response of PS to tax is marginally negative while response of PS to PS is positive but declining throughout the period.

Figure 1: Tax and PS

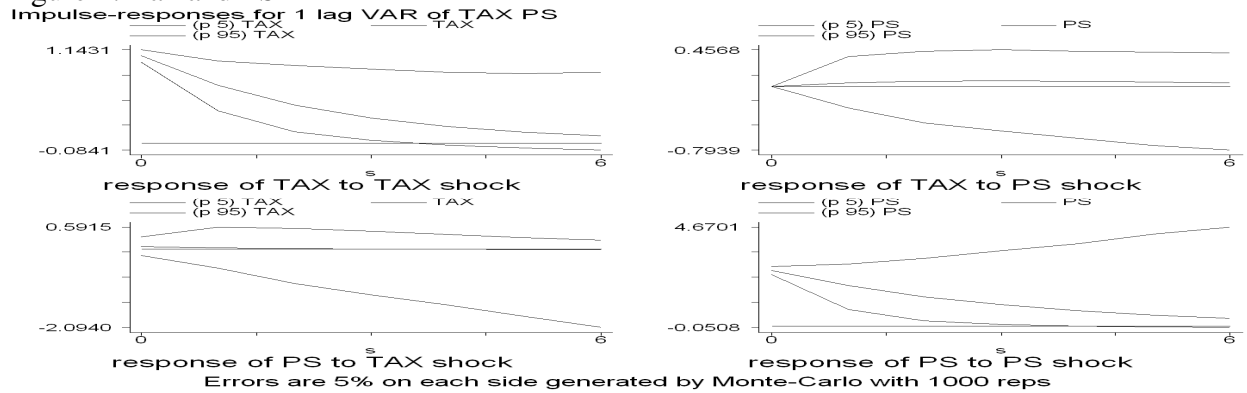


Figure 2 shows that response of FC to FC and to PS is positive but it is declining over period in case of FC only. Response of PS to FC is almost zero while response of PS to PS is positive but declining throughout the period.

Figure 2: FC and PS

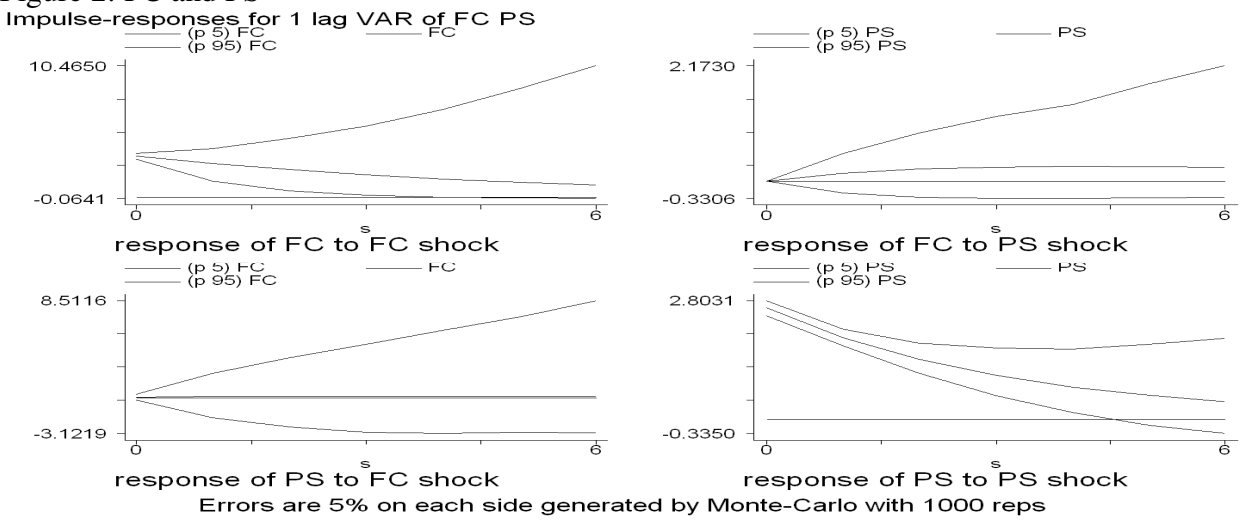


Figure 3 show that response of GDP to GDP and to PS is positive but it is declining over period in both cases. Similar holds for response of PS to GDP and to PS.

Figure 3: GDP and PS

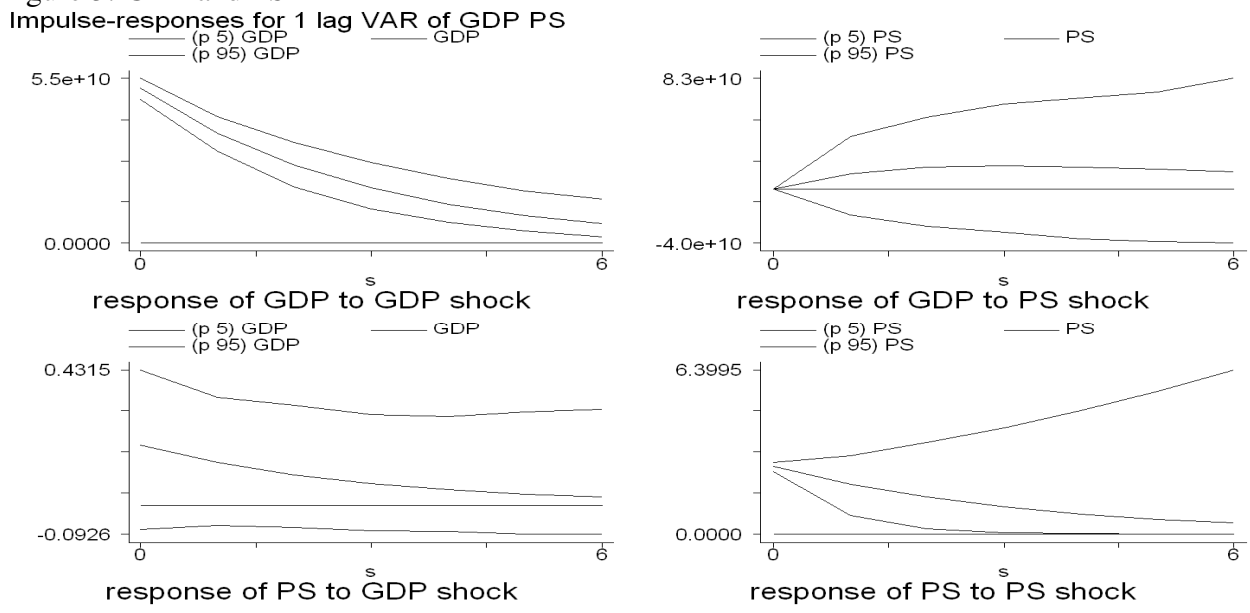
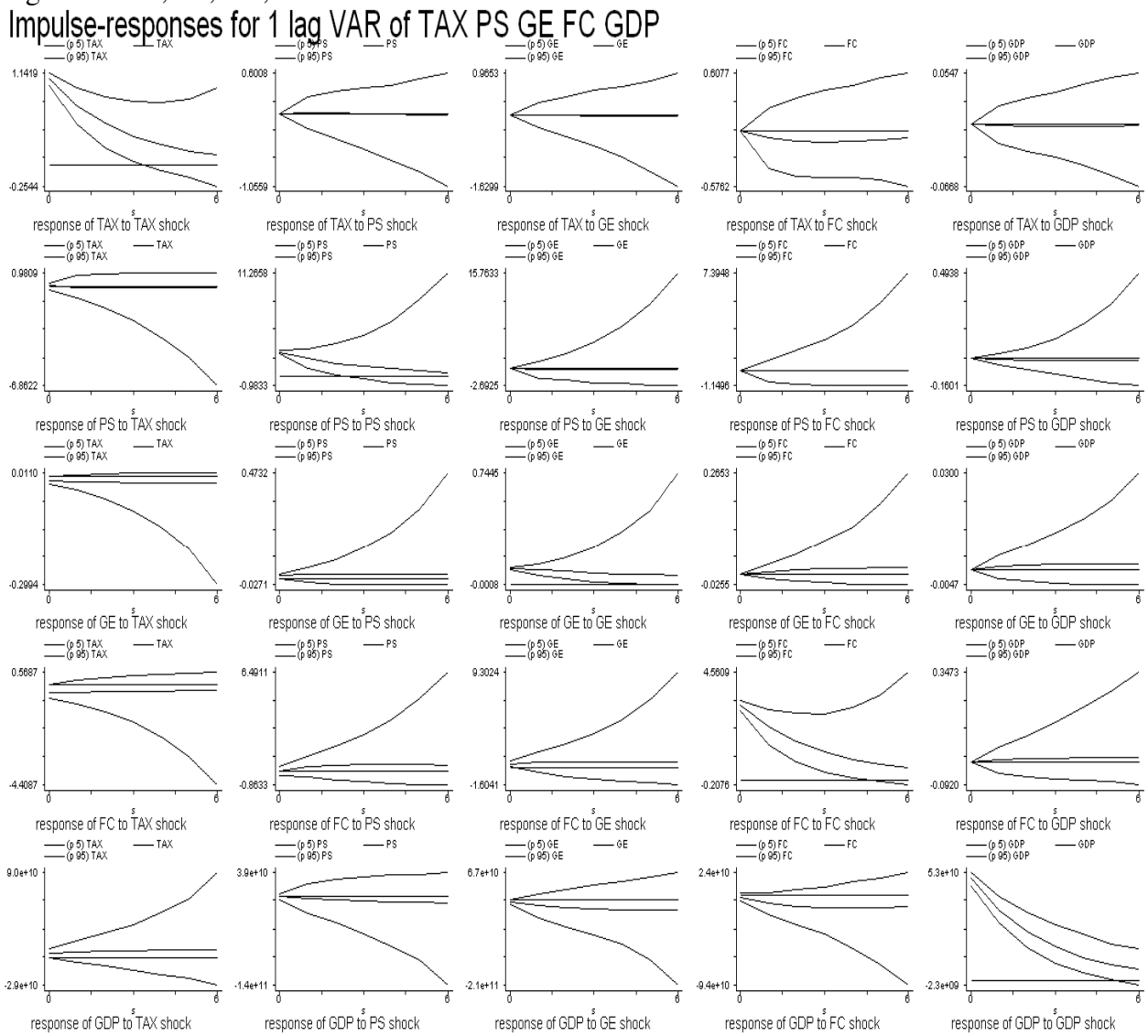


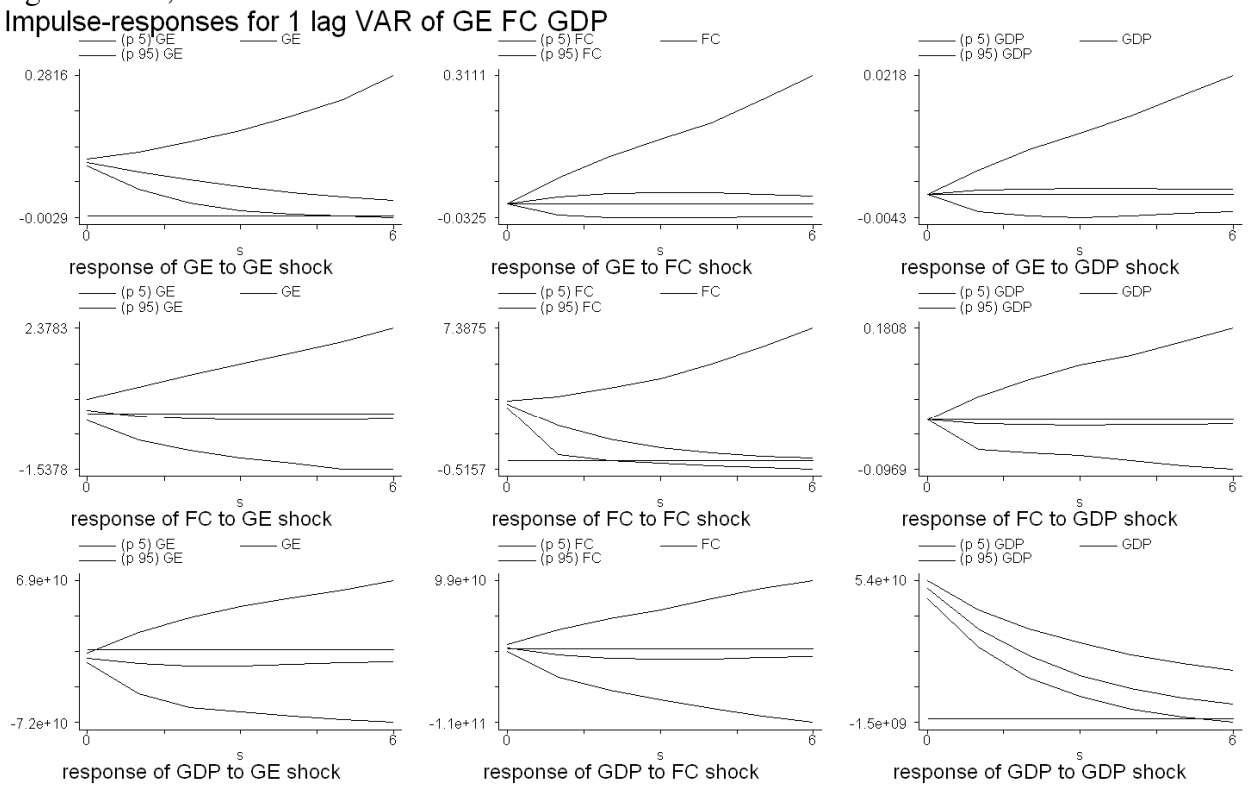
Figure 4 show that response of tax to tax though positive but declining over period and tax to PS and GDP is almost zero through the period while response of Tax to FC is negative. Response of PS to tax is marginally negative while response of PS to PS is positive but declining throughout the period. Response of PS to FC and GDP is almost zero while response of PS to PS is positive but declining throughout the period.

Figure 4: Tax, PS, GE, FC and GDP



Response of GE to PS, GE, FC and GDP is positive while it is negative for Tax. Response of FC to Tax is negative while it is positive for other variables. Response of GDP to PS, GE and FC is negative but marginally positive in case of tax and highly positive in case of GDP.
It is evident from figure 5 that response of GE to GE is positive but over period it is declining. Response of GE to FC and to GDP though positive but not very high and it is close to zero.

Figure 5: GE, FC and GDP



Response of FC to GE and GDP is close to zero while to FC though positive but decline over period. Response of GDP to GE and FC is marginally and constantly positive through the 10 years while response of GDP to itself is though positive but declining over period.

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 Vector Autoregression (VAR) approach in the panel framework because of its advantages in that it assumes all variables as endogenous contrary to the previous studies. For analysis, we used country-level panel data from 59 countries for the period 2002 to 2008.

Study finds that response of tax to tax is positive but to PS and GDP is almost zero throughout the period while tax to FC is negative. However, response of PS to tax is marginally negative but response of PS to PS is positive throughout the period. Response of PS to FC and GDP is almost

zero while response of PS to PS is positive throughout the period. Response of GE to PS, GE, FC and GDP is positive while it is negative for Tax. Response of FC to Tax is negative while it is positive for other variables. Further, we find that response of FC to FC and to PS is positive and response of PS to FC is almost zero. Response of GDP to PS, GE and FC is negative but marginally positive in case of tax and highly positive in case of GDP.

The proposed analysis helping to make distinctions between the political instability experienced but maintained high taxation, and those states with political stability but with a low taxation. The few variables that are used in the model and its reduction to a two-way relationship are one of its merits, when compared with other models used in similar studies. The model also contains a simple explanation for a complex problem: measuring the taxation power and its relations with political stability, and vice versa, to measure political stability based on taxation (Estrada, 2010) notes. The model results are not linear, but rather their function within the system variables with a relative strength (Tax, PS, GE, FC and GDP). Political stability can be a good predictor of tax stability, although not the only key factor. It is possible to suggest on the basis of these results that the political and institutional stability determines the conditions of economic risk and civil war, divisions between parties and violent conflict, so typical in countries with political instability.

Based on this approach, the model helps to explain the causes of political instability. The salient features of this model are: (a) simplicity is based on a limited number of variables (five) are categorical or continuous and not dependent on complex interactions or nonlinear effects. (b) accuracy: a low level of errors, the model achieves a high percentage of accuracy in distinguishing countries with inclination to political instability, compared to countries with political stability, (c) generality: the model allows to distinguish types of political instability, both resulting from acts of violence and failure of democracies to show, and (d) novelty: the model incorporates a tool that helps evaluate and exclude many variables used by the conventional literature. This approach is mainly based on the recognition of state structures and the relations between elites and parties.

It is possible that during the first manifestations of political instability has no explicit relationship with taxation. However, the model presented in this paper allows us to observe their occurrence within more or less irregular intervals. Most variables and suggested conditions observed in other models such as taxation affects the stability, but do so less able to predict the onset of political instability and its impact on institutions. While the effects of massacres, assassinations and forced displacement are important to detect instability, taken as a categorical measure of political institutions, it is by far the most powerful factor distinguishing the time fiscal stability and tax time political instability. Indeed, once we can take into account the characteristics of the political regime studied, a majority of economic, political and social countries in the sample taken, they have a significant impact on the relative instability in the short term. In our view, this conclusion moves our study focusing on this field, with the goal of attention from problems of tax and fiscal power to the institutional foundations of political instability (Buchanan and Brennan, 1990; and Snyder and Mahoney, 1999). From the political point of view, these results suggest a return to the Leviathan (Brennan and Buchanan, 1990). Many of the factors that other studies have found related to taxation and the fiscal power to the civil wars and violent conflicts, the per capita income, physical geography, population size, longevity and the provision of basic resources.

Aspects that are outside of timing term public policy. The most influential factor in this model, however, is the institutional nature of tax systems and the susceptibility of reform policies.

At the same time, the model also suggests that the tax reform process can often contain political instability. Previous research has shown that transitions to democracy often go through intermediate regimes. This work has shown that there is a variety of political instability, partial democracies with tax systems of low or high income (Hammar et al., 2008). In a majority of the unstable political regimes of low tax risk is evident. Taxation, as noted, may have indirect relationships with political instability in complex regimens (Bischoff and Gohout, 2010). In any case, when institutions are subordinated to radical struggles between factions or political parties, the tax is at risk of being godless by taxpayers or the sensors are installed in revenue, ready to devour the budget (Blomquist and Micheletto, 2006). Then, the corrections made to the fiscal policy effects are not always assertive on the general policies of public spending.

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Appendix

Table I: Variables and their sources

Variable	Source
Tax - Tax 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 II: List of analyzed countries

Countries	Latvia	Estonia	Portugal
Australia	Lebanon	Finland	Romania
Austria	Lesotho	France	Russia
Bangladesh	Lithuania	Georgia	Singapore
Belarus	Mali	Germany	Slovenia
Belgium	Mauritius	Ghana	South Africa
Bulgaria	Moldova	Greece	Spain
Canada	Mongolia	Guatemala	Sri Lanka
Chile	Morocco	Hungary	Sweden
Croatia	Nepal	Indonesia	Trinidad Tobago
Cyprus	Netherlands	Israel	Uganda
Czech Republic	Norway	Italy	Ukraine
Denmark	Peru	Kazakhstan	United Kingdom
Egypt	Philippines	Kenya	United States
El Salvador	Poland	Kuwait	Uruguay