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Income Inequality and Rule of Law in Bulgaria

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Abstract

This study presents evidence about the relationship between income inequality and the quality of rule of law Bulgaria. Rule of law in Bulgaria has been in negative index for the past two decades. This study uses an autoregressive distributed lag (ARDL) model to test the co-integration and long-run relationships between these two variables, with rule of law as the dependent variable. The results of the co-integration bounds test showed that the variables are co-integrated, but the findings on the long-run coefficients showed no expressive relationship between income inequality and rule of law even in the short-run, as for the case in Bulgaria.

Keywords: Rule of law, inequality, Bulgaria, ARDL

1. INTRODUCTION

A good quality of rule of law guarantees sustainable growth and stabilizes the economy; this is because it ensures the protection of lives and properties. Countries that possess this quality usually experience improvements in their economic and social activities. A feasibly planned constriction that outlines the interaction between people according to North (1990) is good governance. It explains the manner to which government manages public resources and affairs (The United Nations Economic and Social Commission for Asia and Pacific (UNESCAP 2009)). Therefore, good governance broadly captures law and individual right besides, protection of investors, good quality of contract enforcement, commitment to economic development among others. North (1990) stressed that good governance is an instrument that distinguishes between successful and unsuccessful countries. On the view of the classical economists, institutional situation changes in the institutional quality is among the factors that influence the developmental pattern of any economy. This means that beside interaction of resources, technology and comparative advantage, the quality of institutions is equally needed for developmental process of an economy.

The range of indices used, in measuring institutional quality (rule of law) by the World Governance Indicators (WGI) are 2.5, as the highest range, which means the rule of law is excellent, and 0.0 as having the weakest rule of law. Countries with negative index are considered as having poor quality of rule of law. The quality of rule of law or its effectiveness has a significant effect on protection of property rights, well-being and development of an economy. Low quality of rule of law has a tendency to shrink the trust of the people on the government, it affects the poor who rely more on government services and supports (Harrison and Rodriguez, 2009). In 2013, the average quality of rule of law index in Southeast Europe stood at 0.1, Bulgaria, one of the countries in Southeast Europe has been recording a negative index of rule of law for over two decades, (WGI, World Bank report, 2015). The average quality of rule of law in Bulgaria between 1996 and 2015 was -0.16872; this explained how poor the quality of rule of law in Bulgaria. A question may be asked; what is the underlying principle behind the poor quality of rule of law in Bulgaria? Alonso and Garcimartin (2013) revealed that a situation of high social inequality leads to bad institutions.

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In Bulgaria, the level of income inequality is relatively high compared to other countries of Europe. Income inequality as defined by the United Nation Human Development (UNHD) is an unequal distribution of household or individual income across the various participants in an economy. It is often presented as the percentage of income to a percentage of population. For instance, a statistic may indicate that 70 per cent of a country's income is controlled by 20 per cent of that country's population. Though, there are other methods of measuring income inequality, this study uses the Gini index; it is measured from 0 - 1, with 0 having perfect equality, while a Gini coefficient of 1 enunciates highest inequality. As of 2012 Bulgaria has the highest income disparity in Europe. The Eurostat (2013) revealed that the richest 10 percent in Bulgaria earn about 13.69 times more than the poorest 10 percent. Between 1994 and 2013, the Gini index in Bulgaria has increased by 45.68 percent from 0.243 in 1994 to 0.354 in 2013, (WDI, World Bank, 2015). Is the rising income inequality among citizens of Bulgaria over the last two decades behind the poor quality of rule of law in the country? This study is conducted to observe this relationship. Therefore, the objective of this study is to examine the effect of income inequality on rule of law in Bulgaria. The study is important as to authors' knowledge, no study has been conducted so far that uses rule of law and income inequality, especially, in this area of study. The remnants of this paper are arranged as follows: section 2 reviewed related literature; section 3 explains the method used in this study, section 4 discusses the results and findings of the study, and finally section 5 concludes the study.

2.   LITERATURE REVIEW

Most of the early works on institutional quality are done by North D. According to North (1990) institutions provide the incentives needed to develop, stagnate or even decline an economy. Here, we review findings on the relationship between income inequality and institutional quality. Dobson and Dobson (2010) have found the existence of trade-off between corruption and inequality using ordinary least squares estimates. This means that an increase in the improvement of institutional quality will worsen inequality in the case of informal sectors in Latin America. This could be explained to the fact that reforms have to do with changes in the redistributive measures, this helps aggravate inequality. Chong and Gradstein (2007) use OLS, instrumental variable approach to analyse the dynamic relationship between inequality and institutions; they found that institutions (governance) is negatively related to inequality (Gini index). This means that higher quality of institutions enhances better distribution of income. Levy and Temin (2007) argue that the United States' policies of 1970's and 1980's basically led to wide income disparity currently prevailing among citizens of the country; and not the variables they considered in their study.

Chong and Calderon (2000) have found that institutional quality raises inequality in the beginning; however, subsequent improvement in institutions lowers inequality just as in Kuznets's curve. The study applies GMM estimators, the institutional quality is measured by the composite index as corruption of government, quality of bureaucracy, risk of rejection of contract, risk of taking privately own property by the government and law and order tradition. The relationship according to their findings revealed a negative relationship when institutional quality is squared in the regression and positive when on linear institutions. On the other hand, Krieger and Meierrieks (2016) quoted Jong-Sun and Khagram (2005) that income inequality undermines rule of law, this is because the rich are more likely to bribe for a favourable legislations and court decisions.

A study undertaken by Alonso and Garcimartin (2013) has considered variables such as level of development, income distribution, tax system and level of education to examine how they determine the quality of institutions in various countries across the world. The empirical findings of the study suggest that the determinants of institutional quality are within the reach of the government; level of development is positively associated with institutional quality, income distribution determines institutional quality. A sound tax system is also correlated positively with institutional quality. Lastly, level of education is also an important determinant of institutional quality. Levchenko (2007) in a study institutional quality and international trade has uncovered using an empirical analysis, that variations in the quality of institutions significantly determine trade flows between countries. Torgler and Schneider (2009) have examined the relationship between tax morale & institutional quality and the shadow economy using multivariate analysis. The authors found, after controlling for possible factors that higher tax morale and a higher institutional quality lead to a reduction of shadow economy.

3.   METHODOLOGY

This paper examines the impact of income inequality on rule of law in Bulgaria. The study considers other variables like unemployment and trade openness as control variables and uses semi-annual data that covered a period of 20 years (1996-2015) with 40 numbers of observations. The data for rule of law were taken from the World Bank's World Governance Indicator (WGI), while data for inequality, trade openness and unemployment

were taken from the World Bank's World Development Indicator (WDI). The WGI and the WDI provides only annual data on the variables of interest, data for rule of law available from the period 1996. In order to have larger number of observations that suit the method of estimation of this study, the data were resized/resampled to semi-annual so as to have more number of observation; hence the relevance of semi-annual data. The authors employ an ARDL bound testing approach developed by Pesaran, et al. (2001) for this study. The ARDL can be applied whether the variables are I(0) or I(1), endogeneity is less of a problem, small sample is convenient, (Pesaran and Pesaran, 1997). The ARDL comprises the co-integration test, long run and error correction (short run) models. It is estimated after conducting a unit root test of stationary.

3.1 Unit Root Test

The unit root test assumes time series to be tested remained written as follows:
$$y_t = D_t + z_t + \varepsilon_t \qquad (1)$$

where,
- D_t denotes the deterministic component
- z_t denotes the stochastic component
- ε_t stands for the stationary error process

The test is charged with determining whether stochastic component has a unit root or is stationary. The frequently used tests are augmented Dickey-Fuller (ADF) and Phillips Perron (PP) tests.

3.2 Co-integration Bounds Test

The co-integration relationship verifies the long run relationship among the variables of interest using F-statistics. The ARDL co-integration test is performed by transforming the model into unrestricted error correction model (UECM). In the following co-integration model, income inequality (as in the work of Alonso and Garcimartin, 2013), trade openness and unemployment are considered as the explanatory, while rule of law is the dependent variable.

$$\Delta Rol_t = \alpha_0 + \sum_{i=1}^{m} \partial_i Rol_{t-1} + \sum_{i=0}^{m} \theta_i Ine_{t-i} + \sum_{i=0}^{m} \varphi_i X_{t-i} + \beta_1 Rol_{t-1} + \beta_2 Ine_{t-1} + \beta_3 X_{t-1} + \mu_t \qquad (2)$$

where X_t denotes the control variables of trade openness and unemployment, β_1, β_2, β_3 are parameters to be estimated, m is the number of observation and μ_t is the error term.
The H$_o$: $\beta_1 = \beta_2 = \beta_3 = 0$ (no cointegration)
The H$_a$: $\beta_1 \neq \beta_2 \neq \beta_3 \neq 0$ (cointegration exists)

3.3 Long-run Model

$$Rol_t = \propto_t + \sum_{i=1}^{m} \partial_{1i} Rol_{t-i} + \sum_{i=0}^{m} \theta_{1i} Ine_{t-i} + \sum_{i=0}^{m} \varphi_{1i} \ln X_{t-i} + e_t \qquad (3)$$

We use Wald coefficient test to calculate the long run coefficients. Each variable is expected to have single long run coefficient only.

3.4 Short-run Model

$$\Delta \ln Cr_t = \propto_2 + \sum_{i=1}^{m} \partial_{2i} \ln Cr_{t-i} + \sum_{i=0}^{m} \theta_{2i} \ln Ine_{t-i} + \sum_{i=0}^{m} \varphi_{2i} \ln X_{t-i} + \aleph ECM_{t-1} + \varepsilon_t \qquad (4)$$
Where: $\aleph$ is the coefficient of ECM_{t-1}
ECM is the error correction term. It represents the potential effects of departures from the long run equilibrium (Baharumshah et. al, 2009). $\aleph$ is the adjustment coefficient. The ECM coefficient should be negative and significant in order to conform to the co-integration relationship.

4. RESULTS AND DISSCUSSIONS

This section begins with explanation of the results of the unit root test. The results showed that all the variables are stationary at first difference I(0), as indicated in Table 4.1 below. This rendered the use of ARDL model developed by Pesaran, et al. (2001) feasible. The co-integration bounds test of the ARDL is conducted to determine the existence of long run relationship between the variables of interest.

Table 1. Unit Root Test

Variable	Statistic Values		Significance	Conclusion
Ineq	Augmented Dickey-Fuller	-12.03096	0.0000	I(1)
	Phillips Peron	-25.56405	0.0001	I(1)
ROL	Augmented Dickey-Fuller	-6.913405	0.0000	I(1)
	Phillips Peron	-33.49495	0.0001	I(1)
Open	Augmented Dickey-Fuller	-7.110582	0.0000	I(1)
	Phillips Peron	-31.26749	0.0001	I(1)
Unem	Augmented Dickey-Fuller	-6.292108	0.0000	I(1)
	Phillips Peron	-40.90416	0.0001	I(1)

Table 1 above contained results of the unit root test. We ran unit root test before the regression analysis. The unit root is applied to check the stationary of the data. This is because stationary is important in data to avoid spurious results which will be harmful to interpretation. The results of the unit root indicate that all variables are stationary at first difference; for this reason the null hypothesis is rejected and the alternative hypothesis is hereby accepted. We now move further to test the relationship between rule of law and income inequality in Bulgaria.

4.1 Cointegration Bounds Test

In testing for the co-integration relationship between rule of law and income inequality, an ARDL bounds test for co-integration is used. The co-integration bound test is done to ensure the existence of long run relationship among the variables of interest. The maximum lag specification is 2 for half yearly data, (Pesaran, et al. 2001). The results revealed that the variables are co-integrated at 1% significance level which means that long run relationship exists between rule of law and the independent variables. This relationship can be explained to the fact that the F-statistics (7.8503) being greater than the values of both the lower I (0) and the upper I (1) bounds of the Narayan (2005) table at 1% critical values; these values are 4.983 and 6.423 respectively. Since the variables are co-integrated it means that long-run relationship exists between rule of law (dependent variables) and the independent (income inequality, trade openness and unemployment).

Table 2. Co-integration Bounds Test

			Critical Bound		
Model	*F-stat*	*Sig*	*Lower*	*Upper*	*Decision*
F_{ROL} (*ROL/LIneq,LOpen, LUnem*)	7.85***	1%	4.98	6.42	Co-integration

Note: The critical values are from Table III Unrestricted Intercept with no Trend in Narayan (2005), *** Denotes 1% significance level.

Having confirmed the existence of co-integration relationship among our variables of interest, we move further to explain the results of the long-run coefficients and short-run effects of the independent variables on rule of law. However, before the long-run and short-run results are explained, the study conducted the diagnostic test to check whether or not serial correlation, heteroskedasticity problem among the variables exist. Below is the result of the diagnostic checks presented in Table 3. The maximum lag is set at 2 (Pesaran et al. 2001).

Table 3. Diagnostic Test Results

Test Statistics	LM Version	F Version
Serial Correlation	CHSQ(2)= 1.2647[.531]	F(2, 37)= .56061[.576]
Functional Form	CHSQ(1)= .098915[.753]	F(1, 38)= .087614[.769]
Heteroscedasticity	CHSQ(1)= .0044284[.947]	F(1, 41)= .0042228[.949]

The diagnostic test results above revealed that the variables under study are free from serial correlation, functional form misspecification and Heteroskedasticity in the error term. It is indicated by the probability values in [ ] having more than 0.05. Serial correlation is the relationships between a given variable and itself over various time intervals. They are frequently found in repeating form when the level of a variable affects its future level. It is the similarity between observations as a function of the time lag; the main problem with serial correlation is that it may make a model look better than it actually is. However, the coefficients are still remained unbiased, it make

variance of a parameter increased. Data smoothing or manipulations and misspecification are among the causes of serial correlation. The existence of Heteroskedasticity invalidates statistical significance.

4.2   Long-run and Short-run Results

The results of both the long-run and the short-run of this study did not show any meaningful relationship between rule of law and income inequality. Therefore, an inference is drawn by this study that based on the existence of non-meaningful relationship between rule of law and income inequality and other control variable (openness and unemployment), the current poor quality of rule of law in Bulgaria does not in any way exacerbated by the level of income inequality, trade openness and unemployment in the country. In order to confirm this insignificant relationship between rule of law and income inequality, this study conducted a robustness test using dynamic ordinary least squares (DOLS) and compared the results with that of the ARDL approach in terms of the long-run coefficients' signs and level of significance. We found that the result of the DOLS is in line with the ARDL estimates.

Furthermore, a one on one relationship between rule of law and income inequality has also been conducted using scatter plots to further confirm the findings of the ARDL on the long-run impact of income inequality on rule of law. The scatter plots showed that the negative effect of income inequality on rule of law was not significant. These scatter plots are presented below as Figure 1.

Figure 1. Scatter Plots of Rule of Law and Income Inequality
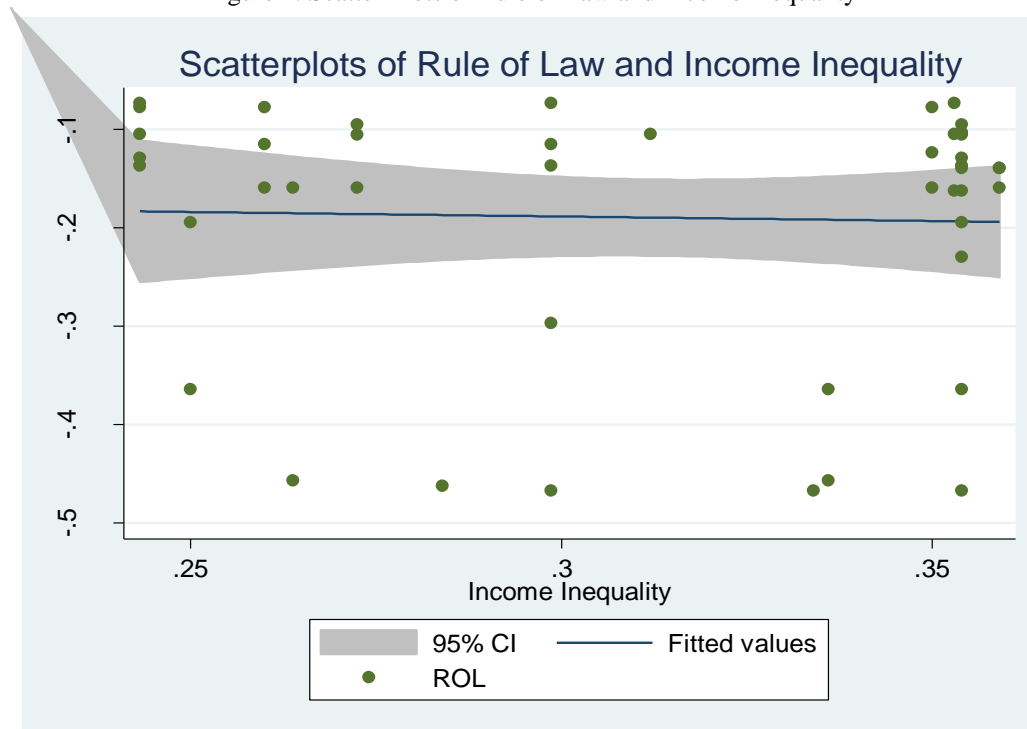
5.   CONCLUSION

This paper has examined the impact of income inequality on rule of law in Bulgaria, the paper employed ARDL approach developed by Pesaran, et al. (2001) in achieving this objective. Firstly, the study conducted the unit root test in order to see whether the data is stationary or not. After confirming that the data is stationary, the study went ahead to estimate co-integration relationship among the variables of interest using ARDL co-integration approach; we found that the variables are co-integrated, meaning that long-run relationship exists between the dependent variable (rule of law) and the independent variables (income inequality, trade openness and unemployment) in Bulgaria. But the results of the short-run and long-run coefficients of the effects of the independent variables on rule of law did not show a meaningful results. Moreover, the robustness checks conducted by this study using DOLS have also established that the long-run effects of the independent variables on rule of law were not meaningful. One important contribution of this study is its ability reveal that the current poor quality of rule of law that has been prevailing in Bulgaria over the last two decades does not in any way undermined by the level of income inequality in the country. Therefore, in the case of Bulgaria, income inequality did not weaken the

quality of rule of law. This study therefore, suggests the use of more numbers of countries and variables in future research.

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