



# Relationship between rule of law and tax revenues: dynamic panel data analysis

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Article\*\*

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## Abstract

*Tax revenue has been declining in most countries recently. Therefore, to better understand the reasons behind this, some studies focus on supply factors, while few studies focus on demand factors. In this context, this study aims to analyse the impact of rule of law on tax revenues in 59 countries by using the panel data method over the period 2002-2018 considering the level of economic development. This study is different from previous studies in several respects. Firstly, it uses a different and more comprehensive index to measure rule of law. Secondly, we focus on the economic level of countries, which is a crucial factor for measuring efficiency of the rule of law. The results show that the effect of rule of law on tax revenues varies based on the level of economic development of the countries.*

*Keywords: rule of law, tax revenues, economic development, dynamic panel data analysis*

## 1 INTRODUCTION

Tax revenues account for the biggest share in public revenues in many countries with different levels of development. Taxes, which were first collected for fiscal purposes, are used for economic, social, cultural, and political purposes due to developing and changing conditions and reached an average of 50-70% of public revenues in the budgets of many states. As stated by Syadullah (2015), tax revenue depends on many factors, such as political stability, corruption, GDP per capita and market openness. Rule of law is another important factor that affects tax revenue since it has a significant role in providing tax compliance. Moreover, it also meets the need for states with various institutional and structural characteristics to create more transparent, open, specific, fair, and equal regulations in this area.

Taxes are commonly considered to be an efficient public revenue to meet public expenditures. Failure in the optimal provision of public goods and services prevents Pareto-efficient resource allocation (Rosen and Gayer, 2010). Therefore, it is critical to collect sufficient tax income to support public expenditure. However, the quantity and level of tax revenue have been declining in most countries. To better understand the reasons for this decline, most studies focus on supply factors that affect tax revenue rather than demand factors. Few studies focus on demand factors in terms of governance factors, such as corruption, democracy, and political stability. More importantly, the interaction effect of governance and economic development on tax revenue has not been adequately investigated. Therefore, this study aims to fill this gap by investigating the interaction effect of governance factors and economic development on tax revenue in 59 countries using the panel data method. Namely, this study contributes to the literature by investigating whether the effect of the rule of law on tax revenue changes depending on the economic development of a country.

This study is organized as follows. Section 2 explains the theoretical relationship between tax revenue and rule of law. Section 3 reviews the literature. Section 4

provides detailed information, such as descriptive and summary statistics of the variables and explains the methodology of the study. Section 5 presents the results obtained from dynamic panel data estimation. Section 6 summarizes the conclusion and discusses the results obtained.

## **2 THE RELATIONSHIP BETWEEN TAX REVENUES, RULE OF LAW AND THE LEVEL OF ECONOMIC DEVELOPMENT**

The actual and legal power of the states in the field of taxation based on the sovereign right is called the taxation power (LLI, 2022). “Magna Carta Libertatum”, which is one of the first constitutional arrangements in the legal field, aimed to restrict the powers of the king in the field of taxation and was an important step towards the idea of “No taxation without representation” (Passant, 2017). The developments in the democratization process resulted in more detailed regulations in the field of taxation as well when the states, especially developed ones, started to take active roles in issues such as political rights, citizenship awareness, balancing income distribution, employment problem, ensuring horizontal and vertical equality, and economic development (Esping- Andersen, 2013).

Regulations in the field of taxation expanded the scope of the purposes and principles of taxation. The principle of taxation is related to the rule-of-law principle. Bingham (2007) associates the rule of law with eight basic principles: accessibility, predictability, the application of laws, the equality of laws, protection of human rights, adjudicative procedures in legal disputes, limitations of the power exercised by rulers, the justice of judicial procedures provided by the state and compliance with the obligations under international law. The definition of rule of law in the “Rule of Law Index” created by The World Justice Project focuses on accountable government, good laws, good process, and achieving justice issues (Botero and Ponce, 2010).

Considering the rule of law as an ideal of modern political ethics, it is also important in determining the principles of the market economy as well as democracy and human rights (Waldron, 2008). It is possible for the political decision-making mechanism to use its sovereign power in the field of economy through its institutions and to shape the economy. Looking from a wider perspective, it is clear that law, economy, and politics are interrelated concepts. The popularization of the rule of law concept and the fact that the rules of law became valid for both the rulers and the ruled resulted in the states intervening in the market not only in the financial field but also in the social and economic fields.

Although the states in need of more revenues to meet the increasing public goods and services have historically turned to generate revenues from various sources, the fact that taxes, the most important public financing source, are based on laws is a requirement of the rule-of-law principle. Within this context, the effect of the rule of law concept on tax revenues is considered to be an area to be focused on. The taxable economic potential in a country is called tax capacity, and the tax capacity varies from country to country (Boukbech, Bousselhamia and Ezzahid,

2018). The aim of the states is to collect tax revenues as close to/equal to their tax capacity as possible. Various economic, political, socio-psychological, demographic, structural, and institutional factors affect the tax capacities of countries, such as income per capita, income distribution, confidence in public administration, income, tax rate, source of tax, the structure of tax systems, tax ethics, the composition of public expenditures, level of economic development, tax awareness, etc. (Arbex and Mattos, 2020). The examination of the aforementioned factors shows that taxes, which are one of the instruments of fiscal policy, are also intertwined with economic policy.

Research shows that levels of development have an especially significant effect on the tax structure of countries (Luong, Nguyen and Nguyen, 2020). In welfare states, which rank higher in terms of economic development, tax revenues have a larger share in the gross domestic product (GDP) compared to less developed countries. In other words, since the countries with a high level of economic development are able to develop and change their governance structures to fit the changing conditions, they can finance most of their public expenditures with tax revenues (Bird and Zolt, 2008). On the other hand, the ineffectiveness of the tax administration and the inability to implement tax reforms, corruption (Brondolo et al., 2008), and politically motivated institutional factors (Ajaz and Ahmad, 2010) in developing countries are the main reasons for their inability to collect sufficient tax revenues. Within this context, tax policies, together with the economic development and growth targets of the countries, shape the economic structure, and the economic structure shapes the tax policies. Including the differences in the level of economic development into the analyses in the studies conducted in the relevant field will contribute to reaching more accurate results (Stoilova, 2017).

### 3 LITERATURE REVIEW

The increasing difference between the total tax revenues expected to be collected in line with the regulations on tax liabilities and the actual tax revenues led societies to reconsider their public policies in line with the welfare targets they want to reach (Weber, Fookan and Benedikt, 2014). Within this context, since taxation has many social, economic, administrative, financial, political, and legal dimensions, multidimensional research is required in the field.

When analysing economic, administrative, structural, institutional, etc. factors that have an effect on the collection of tax revenues, the point of focus is generally the share of tax revenues in GDP (Tanzi, 1992; Teera and Hudson, 2004; Gupta, 2007; Profeta and Scabrosetti, 2010).

Studies emphasizing the economic and administrative factors that have an effect on collecting tax revenues generally focus on income, tax rate, tax control, tax penalties, tax administration, and the structure of tax systems (Clotfelter, 1983; Alm and Torgler, 2006; Durham, Manly and Ritsema, 2014; Kogler, Mittone and

Kirchler, 2016). However, recent studies also include structural and institutional factors in taxation-related analyses as well as economic and managerial factors. Using theoretical analysis, Dell'Anno (2009) has revealed how citizens are affected by political factors while fulfilling their tax liabilities. Garcia and von Haldenwang (2016) attributed value to the relationship between political regimes and tax revenues, while Baskaran and Bigsten (2013) attributed value to the relationship between democracy and tax revenues. The examination of the studies in the field reveals that the studies that analyse institutional and political factors generally focus on issues such as corruption, political stability, and democracy, while the rule of law issue has been examined in a limited number of studies. However, since the rule of law is the principle on which many political and institutional factors are based, it is important to analyse its relationship with tax revenues.

Bird, Martínez-Vásquez and Torgler (2004) found a positive relationship between the rule of law and tax revenues using data from 1990-1999 from 110 developing countries. Similarly, Simbachawene (2018) focused on the determinants of tax revenues in Tanzania using data from the 1999-2015 period and concluded that the rule of law positively affected tax revenues. Syadullah (2015) analysed the effects of administrative factors, such as political stability, the efficiency of the government, the quality of regulations, the power of law on tax revenues in Southeast Asian Nations (ASEAN – Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam) and showed that there was a positive relationship between the rule of law and tax revenues. The study conducted by Torgler (2003) and based on the “World Values Survey (WVS)” data suggested that if the perception of the citizens regarding the functioning of the political process was based on facts such as confidence, justice and equality, this would increase the willingness of the citizens to pay taxes as well as increase tax revenues. Frey and Torgler (2007) and Schneider (2011) both observed that confidence in the legal order would have a positive effect on the collection of tax revenues.

There are also studies in the literature that show a negative relationship between tax revenues and the rule of law. The study conducted by Nyanzi, Babyenda and Bale (2016) analysing the 1980-2014 period in East Africa and the study conducted by Ashraf and Sarwar (2016) using the data from 50 developing countries in the period 1996-2013 determined a negative relationship between the rule of law and tax revenues.

Since there is no generally accepted opinion in the literature about the relationship between the rule of law and tax revenues, various factors need to be included in the analysis. Within this context, it is generally accepted that the levels of development of analysed countries may cause the analysis results to differ. Tanzi (1992) and Von Haldenwang and Ivanyina (2012) emphasized the importance of economic development in collecting tax revenues. Luong, Nguyen and Nguyen (2020) examined the relationship between the rule of law, economic growth, and informality in 18 transition economy countries between 2002-2015. Using the data of the International Monetary Fund (IMF), they revealed that the rule of law reduced informality, that if

the rules of law are prepared with due care, this may control the informal economy, and that the effectiveness of the rule of law encourages economic growth.

#### 4 DATA SET AND ECONOMETRIC METHOD

##### 4.1 DATA SET

The analysis in this study has been carried out using annual data for the 2002-2018 period from 59 countries<sup>1</sup> with different levels of democracy and economic development. The rule of law and other economic indicators have been obtained from the World Bank database. General information regarding the data is provided in table 1. The dependent variable is tax revenue percentage of GDP while the key independent variable is the Rule of Law Index. It is used as an indicator of confidence in the rules applied in the country and the perception of the extent of compliance with these rules. The index takes values between 0 and 100, and within this context, when the index value approaches 0 in a country, this means that such a country does not apply the rule of law, that there is no confidence in the law and no compliance with the rules of law; when the index value approaches 100, this means that the confidence in the legal rules and the perception of the implementation of legal rules is increased.

The control variables of the study are other variables that affect tax revenues, such as the shares of imports and the three main sectors of the economy (agriculture, industry, and service) in GDP. GDP Per Capita Income is another crucial variable in terms of examining the differences in the levels of economic development of countries.

**TABLE 1**

*Descriptive definition of variables*

Variables	Symbol
Tax Revenue (GDP %)	TR
Rule of Law	RL
Import (GDP %)	ImGDP
GDP Per Capita	GDPPC
Agriculture Sector (GDP %)	Agri
Industry (GDP %)	Ind
Service (GDP %)	Ser

*Note: All with annual frequency, in 2002-2018 period, source World Bank.*

*Source: Authors' preparation.*

Table 2 presents the summary statistics of variables. The mean shows the central tendency, while the standard deviation and the minimum and maximum values are used as the measures of central distribution. The observed sample consists of a total of 1,003 observations.

<sup>1</sup> Australia, Austria, Belgium, Cyprus, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxemburg, Netherlands, Norway, Portugal, Singapore, Slovenia, Spain, Sweden, Switzerland, United Kingdom, Argentina, Belarus, Bhutan, Brazil, Bulgaria, Burkina, Cambodia, Costa Rica, Cote d'Ivoire, El Salvador, Estonia, Georgia, Guatemala, Jamaica, Jordan, Latvia, Lebanon, Lithuania, Croatia, Mauritius, Moldova, Morocco, Nicaragua, Peru, Philippines, Poland, Romania, Russia, Slovakia, South Africa, Sri Lanka, Thailand, Ukraine, Zambia.

TABLE 2

Summary statistics for 1,003 observations

Variables	Mean	Std. deviation	Minimum	Maximum
Tax Revenue (GDP %)	18.67	5.75	7.03	48.56
Rule of Law	64.50	26.81	4	100
Import (GDP %)	50.90	27.81	11.25	208.33
GDP Per Capita	22,675.04	23,677.72	474.94	111,968.3
Agriculture Sector (GDP %)	5.90	6.24	0.0284	34.55
Industry (GDP %)	25.23	5.93	9.88	45.09
Service (GDP %)	59.02	8.25	35.02	79.33

Source: Authors' calculation.

#### 4.2 ECONOMETRIC METHOD

Before conducting the econometric analysis of the study, we performed a cross-sectional dependency analysis by employing Breusch-Pagan's (1980) LM and Pesaran CD tests. The null hypothesis of the tests suggests that there is no cross-section dependence. Breusch-Pagan (1980) LM test statistics have been calculated as shown in equation (1).

$$\lambda_{LM} = \sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{p}_{ij}^2 \quad (1)$$

$\hat{p}_{ij}^2$  refers to the number of correlations between the residues of  $i$  and  $j$  units and is calculated by using the formula in equation 2,

$$\hat{p}_{ij} = \hat{p}_{ji} = \frac{\sum_{t=1}^T \hat{\varepsilon}_{it} \hat{\varepsilon}_{jt}}{\left(\sum_{t=1}^T \hat{\varepsilon}_{it}^2\right)^{1/2} \left(\sum_{t=1}^T \hat{\varepsilon}_{jt}^2\right)^{1/2}} \quad (2)$$

where  $\varepsilon$  shows the ordinary least squares (OLS) estimate of  $u_{it}$ . The LM test statistic is distributed with  $d=(N(N-1)/2)$  degrees of freedom  $\chi^2$ .

Breusch-Pagan LM test can be applied in cases where  $N$  is lower. However, when  $N$  is higher, consistent results may not be obtained. Therefore, Pesaran CD test was developed as an alternative to Breusch-Pagan (1980) LM test to obtain consistent results in cases where  $N$  is higher. The Pesaran CD test statistic is calculated by using the formula  $CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{p}_{ij}\right)$ .

## 5 EMPIRICAL FINDINGS

The results of Breusch-Pagan's (1980) LM and Pesaran CD tests are provided in table 3. Based on the probability values of the tests, the null hypothesis claiming that "there is no cross-sectional dependency between variables" is rejected.

**TABLE 3**  
*Cross-sectional dependency test results*

Variables/tests	Breusch-Pagan LM	Pesaran CD
TR	5711.564 (0.000)	14.786 (0.000)
RL	5557.867 (0.000)	3.59 (0.0003)
ImGDP	9028.183 (0.000)	44.392 (0.000)
GDPPC	17723.44 (0.000)	110.6822 (0.000)
Agri	9371.135 (0.000)	63.469 (0.000)
Service	9979.556 (0.000)	51.36084 (0.000)
Indp	9439.447 (0.000)	42.49648 (0.000)

Source: Authors' calculation.

Since there is cross-sectional dependency between the units as presented in table 3, the Im-Pesaran-Shin unit root test, which takes the cross-sectional dependency into account, was used in the stationarity analysis of the variables. The results of the test are provided in table 4. Based on the probability values, the null hypothesis of a unit root is rejected. In other words, the variables were found to be stationary in their level.

**TABLE 4**  
*The results of the Im-Pesaran-Shin unit root test with probability zero*

Variables	Test statistic value
TR	-4.11287
RL	-5.38299
ImGDP	-8.42850
GDPPC	-5.28732
Agri	-10.3820
Service	-5.27322
Indp	-5.82446

Source: Authors' calculation.

The model shown in equation (3) is used to estimate the relationship between tax revenues and the rule of law. Since the model shown in equation (3) contains one lagged dependent variable, using the static panel data analysis method in such models causes inconsistent results and may lead to endogeneity problems. Considering this, Arellano Bond GMM dynamic panel data analysis, which gives consistent and unbiased results even in case of an endogeneity problem, was preferred.

$$Y_{it} = +Y_{it-1} + \theta X_{it} + \beta RL_{it} + \varepsilon_{it} \quad (3)$$



In equation (3),  $Y_{it}$  shows the tax revenues,  $Y_{it-1}$  shows the lagged value of the tax revenues, RL is the Rule of Law Index,  $X_{it}$  denotes the control variables affecting the tax revenues, and  $\varepsilon_{it}$  is the error term.

The results of the basic model provided in equation (3) are shown in the first column of table 5. All of the variables of interest and control variables in the column were found to be statistically significant at the 1% level. However, although the Rule of Law Index (RL), which is the main variable of interest, was found to be 1% significant, contrary to the theoretical expectation, it was found to be negative.

**TABLE 5**  
*Dynamic panel data estimation results*

<b>Dependent variable: <math>TR_{it}</math></b>			
<b>Independent variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
$TR_{it-1}$	0.4472*** (0.004713)	0.4083*** (0.003110)	0.4273*** (0.003154)
$RL_{it}$	-0.0409*** (0.006580)	-0.0786*** (0.005999)	-0.076729*** (0.007228)
$ImGDP_{it}$	0.0672*** (0.002716)	0.0650*** (0.002504)	0.0666*** (0.001732)
$Agri_{it}$	-0.296*** (0.017728)	-0.3291*** (0.019130)	-0.3376*** (0.013551)
$Service_{it}$	-0.4495*** (0.013394)	-0.4807*** (0.02472)	-0.4505 (0.021178)
$Indp_{it}$	-0.3197*** (0.011396)	-0.3538*** (0.01706)	-0.3311*** (0.015736)
$RL_{it} \times KUK_{it}$		0.2133*** (0.014250)	
$RL_{it} \times GDPPC_{it}$			3.84E-06*** (3.97E-07)
$GDPPC_{it}$			-0.000374*** (3.44E-05)
Sargan Test	53.23329 (0.42)	54.3208 (0.38)	54.30157 (1.000)
AR(1)	(0.044)	(0.045)	(0.0038)
AR (2)	(0.777)	(0.842)	0.2255

*Note: \*\*\* shows that the variables are statistically significant at the 1% significance level. The instrumental variables used in the model based on the probability values of the Sargan Test are valid. Furthermore, contrary to the expectations, there is no autocorrelation problem in the model according to the AR (2) probability value.*

*Source: Authors' calculation.*

Considering the variables in the analysis, the reason for this may be the fact that countries have different structural, socio-cultural, institutional, political, and economic characteristics, considering that it may be caused by the different economic development levels of countries. Therefore, after adding the dummy variable into

the basic model in equation (3) to control for the economic development of the countries, we get the model shown in equation (4).

$$Y_{it} = \emptyset X_{it} + \beta_1 Y_{it-1} + \beta_2 RL_{it} + \beta_3 (RL_{it} \times Z_{it}) + Z_{it} + \varepsilon_{it} \quad (4)$$

Equation (4) shows the interaction of the levels of economic development of the countries with the Rule of Law Index by adding an independent variable in the equation, which was obtained by multiplying  $RL_{it}$  and  $Z_{it}$  variables.  $Z_{it}$  represents the variable that reflects the rule of law and levels of economic development. Within this context, the coefficient  $\beta_2$  in equation (4) shows the effect of the Rule of Law Index on tax revenues of individual countries and the coefficient  $\beta_3$  shows the effect of the rule of law and levels of development of the countries on tax revenues. The statistically significant coefficient  $\beta_3$  means that the effect of the Rule of Law Index on tax revenues differs based on the levels of economic development of the countries.

Within this context, a dummy variable was created by attributing 1 to countries with per capita income over \$20,000 and 0 to other countries for the variable  $Z_{it}$ , and the estimation was performed by including it in the model with  $RL_{it}$  expressing the Rule of Law Index ( $RL_{it} \times KUK_{it}$ ). The results of the estimation are provided in the second column of table 5. The column shows that the value obtained by multiplying the two variables was found to be 1% statistically significant. In other words, the effect of the rule of law on tax revenues differs based on the level of economic development of the countries. Since it is thought that the effect of the rule of law on tax revenues differs based on the level of economic development of the countries, equation (4) was re-modelled and equation (5) was created by including the GDP per capita income level, which is one of the important macro-economic indicators in examining the interaction between the level of economic development and rule of law, expressed in the analysis as the  $Z_{it}$  variable above.

$$Y_{it} = \emptyset X_{it} + \beta_1 Y_{it-1} + \beta_2 RL_{it} + \beta_3 (RL_{it} \times GDPPC_{it}) + \beta_4 GDPPC_{it} + \varepsilon_{it} \quad (5)$$

As presented in the third column of table 5, the coefficient estimations in  $RL_{it}$  and  $RL_{it} \times GDPPC_{it}$  rows ( $\hat{\beta}_2 = -0.076729$  and  $\hat{\beta}_3 = 3.84E-06$ ) are found to be 1% statistically significant. This result confirms the finding obtained in Equation 4, suggesting that the effect of the rule of law on tax revenues varies based on the levels of economic development of the countries. Within this context, the total derivative representation of the rule of law effect on tax revenues that takes the level of economic development into account is expressed in equation (6).

$$\partial Y_{it} / \partial RL_{it} = -0.076729 + (3.84E-06)GDPPC_{it} \quad (6)$$

When equation (6) is equated to zero, the average threshold value of real GDP per capita – which determines the direction of the relationship between the rule of law and tax revenues – was found to be  $GDPPC_{it}^* \approx \$20,000$ . In other words, while the

rule of law increases tax revenues in countries with a real GDP per capita higher than approximately \$20,000, tax revenues decrease as the rule of law increases in countries with lower income levels. The classification of countries based on this threshold value is provided in table 6.

**TABLE 6**

*Classification of countries according to threshold value*

<b>Countries =&gt;20,000 \$</b>	Australia, Austria, Belgium, Cyprus, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxemburg, Netherlands, Norway, Portugal, Singapore, Slovenia, Spain, Sweden, Switzerland, United Kingdom
<b>Countries &lt; 20,000 \$</b>	Argentina, Belarus, Bhutan, Brazil, Bulgaria, Burkina, Cambodia, Costa Rica, Cote d'Ivoire, El Salvador, Estonia, Georgia, Guatemala, Jamaica, Jordan, Latvia, Lebanon, Lithuania, Croatia, Mauritius, Moldova, Morocco, Nicaragua, Peru, Philippines, Poland, Romania, Russia, Slovakia, South Africa, Sri Lanka, Thailand, Ukraine, Zambia

*Source: Authors' preparation.*

With the threshold value expressed in equation (4) being approximately \$20,000, the countries that constitute the sample of the study are classified into two groups in table 6: the ones whose real GDP per capita is higher than \$20,000 and the ones whose real GDP per capita is below this threshold. The relationship between the rule of law and tax revenues is positive in countries with a per capita income of \$20,000 or higher. In other words, as the level of economic development of the countries increases, so does the effect of the rule of law on tax revenues. In countries with a GDP per capita income lower than \$20,000, this effect is mitigating.

## 6 CONCLUSION AND DISCUSSION

The examination of the basic economic approaches shows that tax regulations with varying and diversifying amounts, purpose, and application methods from Mercantilism to today's modern approaches, are among the issues that many countries at different welfare levels especially focus on. Within the framework of the modern fiscal approach, taxes rank first among public finance sources when they are proportioned to GDP. In this sense, the collection of taxes in full is important for the efficient execution of public services.

The regulations on taxes, which are one of the most important fiscal policy instruments used by states to intervene with the market, must be determined on the basis of laws and the rule-of-law principle must also be adopted in the field of taxation. The rule of law, which is a multilateral concept, emphasizes democracy, legality, and human rights and requires the rules of law to apply to both the public and private fields.

Within this context, the study investigates the effect of the rule of law on tax revenues using dynamic panel data analysis based on the data from a sample of

59 countries during the 2002-2018 period. The first findings in the study show a negative effect of the rule-of-law principle on tax revenues. However, this result is not compatible with theoretical expectations since the economic condition of countries, such as their economic development level, plays a crucial role in collecting tax revenues. Therefore, the effect of the rule of law on tax revenues was tested by adding the differences in the level of economic development to the model as a dummy variable. The value obtained by multiplying the dummy variable and the rule-of-law principle was found to be statistically significant. In other words, the effect of the rule of law on tax revenues varies based on the levels of economic development of the countries. In the next step, the dummy variable was replaced with the multiplicative variable of real income per capita and the Rule of Law Index as a real macroeconomic variable, and the estimation was performed. The results obtained showed that the rule of law positively affects tax revenues in developed economies with a per capita income of over \$20,000, and has a negative effect in countries with per capita income below \$20,000. This result is consistent with the argument linking the level of taxation with democracy. The degree of distribution of income shapes the preferences of democracy; therefore, level of income promotes democracy and rule of law. Rule of law and democracy are closely related as rule of law is possible only in democratic countries. This leads to an increase in tax revenues. In other words, the effect of rule of law on tax revenue depends on the economic condition of countries' income inequality. Therefore, countries which have high per capita income are more likely to increase their tax revenue. As stated by Jin Yi (2012), higher economic development has a positive impact on the probability of democratic survival. Furthermore, it prevents democratic regimes from reverting to partial democracies or autocratic regimes.

Within this context, the level of economic development of the countries as well as the rule of law both play an important role in increasing the share of tax revenues in national income. For example, in developing countries, corruption, tax evasion (Worlu and Nkoru, 2012), avoidance of taxes, fairness problems in the legal system, lack of confidence in the state, and lack of transparent and accountable tax systems prevent the expansion of the tax base and leads to collecting insufficient tax revenues. On the other hand, in welfare states, the achievement of political stability, the effectiveness of governments, the adoption of transparent, fair, and equitable management systems that are based on laws enable the development of tax policies and collecting sufficient tax revenues.

The findings of the study in general show that the inclusion of the levels of development of the countries in the analysis within the scope of the relationship between tax revenues and the rule-of-law principle has significant effects on the analysis results. The results of the study support the findings reported by Bird, Martínez-Vásquez and Torgler (2004), Syadullah (2015), and Nnyanzi, Babyenda and Bale (2016). For example, Nnyanzi, Babyenda and Bale (2016) investigated the relationship between economic integration and tax revenue in an East Africa community. They focused on the effect of some economic and governance factors

on tax revenue, and they found a negative relationship between rule of law and tax revenue. This result confirms our findings since GDP per capita in the observed East Africa community is under the threshold value that we found (\$20,000). As stated earlier, our findings suggest that below this threshold value, the coefficient of rule of law turns out to be negative. On the other hand, our findings do not support the results obtained by Ashraf and Sarwar (2016) since they use income tax and sales taxes as dependent variable; but when they use overall revenue as a dependent variable, their results confirm our findings.

Our findings also support two important statements that explain why rule of law affects tax revenue positively in developed countries, as argued by Bergman (2010) and Butkiewicz and Yanikkaya (2006). Bergman (2010) stated that countries with rule of law have higher level of tax compliance since norms and rules are widely embraced in these countries. Butkiewicz and Yanikkaya (2006) claimed that developed countries have two characteristics: democracy and maintenance of the rule of law.

Our research has two limitations. Firstly, this study focuses on the 2002-2018 period due to lack of available data. A greater sample could lead to higher generalization of our results. Secondly, we use only GDP per capita as an indicator of economic development. Other economic factors, such as savings, GDP growth, and capacity use rate may be used as an indicator of economic development.

Future research may focus on the static relationship between rule of law and tax revenue. For example, they may use the static panel threshold method to estimate this relationship. Moreover, future research should study the interaction between economic development and other governance factors such as corruption, democracy, and political stability.

### **Disclosure statement**

No potential conflict of interest was reported by the authors.

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