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Institutionalist impact upon the efficiency of public finance policy. A theoretical approach

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Abstract

In the recent years, there have been significant changes in the fiscal and monetary policy of the United States and the Eurozone. The main objective of these policies was to achieve macroeconomic stability and sustainable economic growth while reducing income inequality. The purpose of this research is to examine which policies and measures do implement better an effective fiscal policy, in order to understand the impact of institutions at a global level. The analysis of institutions can contribute to understand the effectiveness of fiscal policy to achieve social prosperity and to limit the impact of economic fluctuations.

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1. Introduction

Over the last decades, a growing number of theoretical and empirical studies is devoted to the interaction between the quality of institutions and economic policy. Hence, North (1990: 112) asserts that "the polity and the economy are inextricably interlinked in any understanding of the performance of an economy". In that sense formal institutional constraints -like fiscal rules- "specify and enforce property rights that shape the basic incentive structure of an economy" but also impose the rules that are most favorable to economic growth. Furubotn and Richter (1998: 293-5) define the constitutional and operational rules of an efficient private ownership economy. In the former rules they comprise the principles of private property, of freedom of contract and that of individual liability to fulfil its respective obligations. Among the operational rules they include appropriate legal rules and specific regulations for conducting and enforcing contracts. Furthermore, North (2005: 159) holds that sustained growth is not a simple function of knowledge and technology; "the key is the incentive structure … for productivity-improving activities" provided by the institutional matrix. Efficient government is an essential part of the institutional matrix as it embraces both the creation of rules and their enforcement within an order of law. As he explained, for market institutions to work the state should respect the property and personal rights of its citizens through an efficient fiscal system; only then, "all members of society have an incentive to obey and enforce the rules" (North, 2005: 107-8). Additionally, a crucial element for economic performance and sustainable growth is the quality of informal rules and social norms exemplified by the level of social capital and the variations of trustworthiness in the state: where social norms prescribing cooperation and trustworthiness prevail, corruption is weaker and governmental efficiency is stronger (cf. Keefer and Shirley 2000; Keefer and Knack 2005, 709).

Economic policy aims to have a significant impact on various macroeconomic variables, such as inflation, unemployment, Gross Domestic Product and investment. With regard to the Eurozone, the Stability and Growth Pact (SGP) signed by the member states, dictates how economic policy should be applied. The main intention of the SGP is to coordinate fiscal policy in the Eurozone to reduce the ability of developed countries to increase their spending, while other countries pursue restrictive fiscal policies.

Several surveys have been conducted in recent years to determine the exact role of fiscal policy, such as Dixit and Lambertini (2001) and Uhlig (2002). The main motivation for the above researches was the fact that the monetary policy, pursued by the European Central Bank in the case of the Eurozone, cannot be used as a tool to achieve macroeconomic stability everywhere due to the different institutional settings that each country faces. Therefore, the most effective tool that the Eurozone countries have now - after monetary unification - to deal with crises, political investment and economic growth is fiscal policy. This does not mean that monetary policy cannot affect the macroeconomic figures of an economy, especially price fluctuations.

The purpose of this study is to examine how the quality of institutions marks fiscal policy. Institutions need to be quantified to find out how they affect public spending or revenue. Institutional variables included here are, the rule of law, the control of corruption, the effectiveness of government.

2. Literature Review

In the present study we examine how institutional quality indicators affect public debt in various countries worldwide, both developed and developing, following the theoretical background of new institutional analysis**.** The research question that arises is which independent variables affect the quality of fiscal policy. Fiscal policy is considered to be successful when additional debt does create more GDP.

Next, we present a recent literature review organised around six subjects following the World Bank's six "Worldwide Governance Indicators" (WGI): 1) Regulatory Quality, 2) Political Stability, 3) Rule of Law, 4) Voice and Accountability, 5) Government Effectiveness, 6) Control of Corruption.

Starting from Regulatory Quality, Woo (2006) examines which variables are important for interpreting differences between countries in public sector deficits. He studies a set of economic, socio-political and institutional variables in 57 developing and developed countries during the period 1970-1990, through a panel methodology. He uses econometric tools to hypothesize that social polarization is important in explaining differences in fiscal results by country, based on the data provided by the World Bank. The dependent variable in his regression is the average of the public sector surplus (as a percentage of GDP). In addition, some of the independent variables are the average growth rate of real GDP and the average decade rate of inflation of consumer price indices. Other independent variables are: the logarithm of real GDP per capita and some dummy-variables. He notes that income inequality, political assassinations, the size of the cabinet and the concentration of power in fiscal decisions are important and powerful determinants of public deficits. The impact on public deficits of socio-political variables tends to be smaller in countries with better institutions. Conversely, socio-political polarization has a very strong impact on deficits due to the presence of bad institutions.

In his turn, Gani (2007), uses Panel-data methodology to estimate the relationship between governance ratios and foreign direct investment, using a sample of countries from Asia and Latin America. In his model the dependent variable is the ratio of foreign direct investment to gross domestic product and independent variables are economic growth, market share, freedom of trade and the six indicators of institutional quality. Empirical results provide evidence that the rule of law, the control of corruption, the regulatory quality, government effectiveness and political stability are positively related to foreign direct investment.

Jadhav and Katti (2012), explore the role of institutional and political factors in attracting foreign direct investment in the economies of the BRICS countries. They use panel data for the period 2000-2010, which were obtained from the World Bank. In their model the dependent variable is direct foreign investment and independent variables are the six indicators of institutional quality. The results show that government effectiveness and the regulatory quality are positively related to the inflow of foreign direct investment in the BRICS countries. Three variables in the model, political stability, voice and accountability and the control of corruption have a negative impact on the inflow of foreign direct capital into the BRICS countries.

Zaman (2015), explored the possible links between governance indicators and educational reforms in important regions of the world during the period 1996-2012 using the Panel Fixed Effects method. The results show that the six indicators of institutional quality have a significant impact on the formulation of policies regarding the internationalization of universities.

Nguyen et al. (2017) examine the impact of the quality of institutions on fiscal policy in 28 Asian countries from 2002 to 2013, by using two models with different dependent variable. In the first model, the used the rate of increase in tax revenue as a dependent variable, whilst in the second one, they used the rate of increase in government spending. Independent variables in both models were the debt with one lag, the GDP with one lag and 5 of the indicators of institutional quality, which were: (i) the control of corruption; (ii) the political stability; (iii) the regulatory quality; (iv) the government effectiveness; and (v) the rule of law. Data were obtained from World Bank Worldwide Governance Indicators and Asia Development Bank. They conclude that better institutional quality tends to reduce government spending and

increase government tax revenues. Countries with better institutional quality pursue their fiscal policies more targeted and support better their economic growth.

Tarek and Ahmed (2017), examine how governance affects the accumulation of public debt in the MENA countries (MENA - Middle East / North Africa), during the period 1996-2015. The six indicators of global governance (voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption) were used to measure the quality of governance in these countries. Data were obtained from World Bank, IMF and Worldwide Governance Indicators. In their study the dependent variable is the ratio of public debt to GDP and independent variables are fixed per capita income, government spending as a percentage of GDP, unemployment rate, inflation, GDP growth percentage, the dependent variable with one lag and all six indicators of global governance. The econometric results partially confirm the basic assumption that the higher the bad governance in a country, the higher the ratio of public debt to GDP. Indeed, only three governance indicators support this hypothesis well. These variables are the indicator of political stability and the absence of violence, the indicator of the regulatory quality and the indicator of the rule of law.

Hayat (2019), explores the role of institutional quality in economic development and more specifically the role it plays through foreign direct investment. It uses data from 104 countries, drawn from the World Bank (World Databank) and applies the GMM estimation method. The dependent variable is the annual real growth rate of GDP per capita and independent variables are the dependent one lag, foreign direct investment, macroeconomic variables, the rule of law, control of corruption, political stability and absence of violence, the regulatory quality and government effectiveness. He finds that better institutional quality leads to stronger economic growth. The study concludes that control of corruption, the rule of law and government effectiveness have a positive and direct impact on the country's economic development. On the other hand, the regulatory quality has a negative direct effect on economic growth.

Tsegaw, (2020), examines the relationship between good governance indicators and the human development index in Africa. It uses Panel data for 49 African countries from 2000 to 2018. In his model the dependent variable is the logarithm of the human development index and the independent variables are the logarithms of the six institutional quality indicators. The econometric analysis showed that the three indicators of governance, the rule of law, the regulatory quality and political stability and the absence of violence are directly related to the human development index. The finding showed that government effectiveness and control of corruption are inversely related to human development. Voice and accountability are not significantly related to human development. This result suggests that countries should consider putting a relatively better emphasis on the three governance indicators that have a positive and direct relationship to human development.

Focusing on Political Stability, Hallerberg et.al. (2007), examine the impact of fiscal rules and budgetary procedures on the public finances of European countries. Their analysis concerns 15 European countries in the period 1985-2004 using “Dynamic Panel Estimation and OLS models”. The model they process consists of the following variables: the change in gross public debt (dependent variable) and independent variables are the dependent on lag, the real GDP growth, the increase in the unemployment rate, the debt with one lag, the cost of service debt, political variables (election year and the variable related to the ideological dispersion of the parties required for the approval of the budget), the population, the variable related to the exposure of economic sectors to external competitiveness, the variability of production and institutional variables such as fiscal convergence and lending constraints. They note that the assignment of a fiscal decision to the Minister of Finance effectively improves fiscal discipline where the ideological dispersion of the government is zero or quite small. The opposite is true for the rigor of fiscal targets, which are effective in states with different

ideological views in government. These results confirm that the choice of institutions to strengthen fiscal discipline depends on the type of government and, therefore, on the political environment and constitutional features, such as the electoral system.

On their side, Bergman et.al. (2016), investigate whether national fiscal rules alone contribute to the promotion of sustainable public finances in the European Union, or whether they need to be supported by good governance in order to be effective. They use an econometric panel model for 27 European countries from 1990-2012. Their regression has as a dependent variable the cyclically-adjusted primary balance, while the dependent lag (t-1), the numerical index of the national fiscal rule, the numerical index of government efficiency and a vector of control variables serve as independent variables. Bergman et al conclude that fiscal rules are effective in reducing structural primary deficits at all levels of government efficiency. They also note that multiple fiscal rules improve fiscal solvency. Other institutional features that enhance the effectiveness of fiscal rules are policy transparency and commitment to the implementation of fiscal programs.

Yildirim and Gökalp (2016), examine the relationship between institutions and macroeconomic performance in 38 developing countries. They study the period covering the years 2000 to 2011 through the use of 23 variables of institutional structure, following the "Panel Data Analysis" method. The results of their research show on the one hand, that indicators of institutional structures, such as the integrity of the legal system, rules on trade restrictions, restrictions on foreign investment, the share of the private sector in the banking system and employment-dismissal variables, have a positive effect on macroeconomic performance of developing countries. On the other hand, variables such as judicial independence, subsidies, military guardianship (political stability) and government spending, have a negative impact on the macroeconomic performance of developing countries.

Awan, R. U et al. (2018), examine the relationship between governance, corruption, and economic growth in five selected South Asian Association for Regional Cooperation (SAARC) countries, using panel data for the period 1996-2014. The dependent variable is GDP per capita and as independent variables they use corruption, education index, government effectiveness and political stability. The findings reveal that two institutional indicators of governance, namely government effectiveness and political stability, have a positive and significant impact on economic growth. Corruption adversely affects economic growth, according to the theory. In addition, the results show that among the governance indicators, government effectiveness has a greater impact on GDP growth.

Tsegaw, (2020), also dealt with Political Stability, while Mitsi (2021), examines the role of good governance in economic development in the group of countries labelled as PIIGS (Portugal, Italy, Ireland, Greece, Spain). The data cover the period 2002-2018 and were drawn from many sources such as World Bank's Worldwide Governance Indicators, World Bank's Worldwide Development Indicators, United Nations Conference on Trade and Development, European Commission Database and International Monetary Fund. The dependent variable is the logarithm of GDP per capita and the independent variables are open trade, foreign direct investment, government spending, inflation and the six indicators of institutional quality. She finds that trade openness, gross capital formation, inflation, political stability, rule of law, debt rule, budget balanced rule, and the combination between debt rule/budget balanced rule with political stability and combination between debt rule/budget balanced rule with rule of law are significant drivers of economic growth in PIIGS countries while foreign direct investments, government effectiveness, voice and accountability, regulatory quality, fiscal rule index and expenditure rule are insignificant.

Many writers dealt with the third institutional indicator, which is the Rule of Law. Gani (2007), as well as Von Hagen (2010), examine the relationship between real GDP growth and general government balances (revenue and expenditure). For forecast errors and discrepancies,

he uses descriptive statistics as well as Panel models. The data are taken from the annual stability and development programs and the convergence programs in 15 European countries, for the period of December 1998 to December 2004. Von Hagen concludes that the budget forecasts for the Convergence, Stability and Development programs are not very informative as indicators. The institutions that follow the tax framework of Economic and Monetary Union rely heavily on the development of the medium-term tax plans of the governments of the European Union. There are many discrepancies in the annual Convergence and Stability programs in terms of forecasts for real GDP growth, revenues, public administration and expenditures over different time horizons. These discrepancies are explained by institutional factors such as the type of tax governance and the strictness of tax rules.
Yildirim and Gökalp (2016), Tsegaw (2020), and Mitsi (2021) mentioned above, also study the impact of the Rule of Law. Moreover, Zhuo et al., (2020), use panel data from 31 developed countries for the period 2002-2018, applying various methods such as (GMM), (Sys GMM), pooled OLS, fixed effect, and random effect to investigate the impact of the six governance indicators on economic growth. The data come from World Bank and World development indicators. The dependent variable is GDP per capita and the independent variables are the six indicators of institutional quality, inflation, GDP growth, the real interest rate and the total share of government spending on education. Their study concludes that the rule of law, the control of corruption and voice and accountability have a direct and significant impact on the economic development of developed countries, which shows that the economy in developed countries is growing due to the increase of the rule of law or of the control of corruption or of the voice and accountability. The study also finds an indirect significant impact of government effectiveness, political stability and the regulatory quality on economic growth, which means that the economies of developed countries shrink due to a 1% increase in government effectiveness, political stability and the regulatory quality.

Next, we present studies who dealt with the fourth institutional indicator, which is Voice and Accountability. Marino et al. (2016), explore the relationship between the World Bank governance indicators and the BRICS countries' socio-economic development indicators (BRICS - Brazil, Russia, India, China, South Africa). The data refer to the period 2005-2012. They use as a dependent variable the GDP growth that measures the annual fluctuation of GDP and the human development index that measures the development of an area based on education, income and life expectancy. Independent variables are the six institutional quality indicators and other explanatory variables. The results show a positive relationship between the indicators of human development and the indicators of government effectiveness and the control of corruption and between the GDP index and the index of the control of corruption. On the contrary, they portray a negative relationship between the GDP index and the indicators of Voice and Accountability and Political Stability. Similarly, Zhuo et al. (2020), dealt with Voice and Accountability.

Concerning, the fifth institutional indicator, which is Government Effectiveness, Gani (2007), dealt not only with Regulatory Quality, Political Stability, Rule of Law but also with this indicator, just as Jadhav and Katti (2012), Tarek and Ahmed., (2017) and Awan, R.U et al. (2018). In their turn, Keser and Gömen (2017), investigate the relationship between governance indicators and the level of human development with the Panel methodology for 33 countries, the period 2002-2012. The dependent variable is the logarithm of the human development index and independent variables are the logarithms of the six institutional quality indicators. Their analysis concluded that at least three of the governance indicators such as government effectiveness, the regulatory quality and the rule of law have positive contributions to the Panel model. This means better governance for each country that provides better human development efficiency.

Finally, many writers explored the sixth institutional indicator, which is Control of Corruption. Beyond Gani (2007), also Ali and Yahya (2019), examine how governance affects the accumulation of public debt in the Gulf countries between 1996 and 2015. They use the panel and GLS methodology. The dependent variable in this study is the ratio of public debt to GDP. This study is based on the six institutional quality measures given by the global governance indicators. These variables are voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, the rule of law and the control of corruption. Additional control variables have also been used such as inflation rate, per capita income, government spending as a percentage of GDP, consumer spending as a percentage of GDP, unemployment rate and GDP growth. Data were obtained from the sources: International Financial Statistics (IMF), World Bank (World Databank) and Worldwide Governance Indicators (WGI). According to the authors, an increase in any governance index other than the control of corruption leads to a reduction in public debt.
Montes et.al. (2019), investigate whether countries make efforts to improve fiscal transparency and whether fiscal transparency affects government efficiency and the efficiency of government spending. A sample of countries (68 developing and 16 developed) for the period 2006-2014 is examined with the panel methodology. The data were taken from the World Bank. The variables used are government efficiency (dependent) and as independent are debt, inflation, GDP, trade, corruption and transparency. The results show that fiscal transparency is important for reducing government debt and improving government efficiency and the efficiency of government spending.

Furthermore, Mehmood et al. (2021), dealt with all six institutional indicators. They investigate the relationship between institutional quality and public debt in Pakistan for the period 1996-2018. Data were obtained from the sources: International Financial Statistics (IMF), World Bank (World Databank) and Worldwide Governance Indicators (WGI). In their regression the dependent variable is public debt and independent variables are the indicators of institutional quality (voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and corruption control). The results of this study show that the factors of voice and accountability, the regulatory quality and the control of corruption have a positive relationship with public debt, while political stability, government efficiency and the rule of law have a negative impact on public debt.

Taking into account the above studies, we conclude to the following table which presents the most relevant econometric studies with our subject of interest. Those studies will be used in the next chapter to carry out our own econometric analysis. Their data consists of panel data, and they mostly use the standard method of Fixed Effects in order to end up with robust results.

Authors	Dependent Variable	Independent Variables
Gani (2007)	FDI to GDP	• Economic growth and market share indices • Trade openness • The six indicators of institutional quality
Jadhav and Katti (2012)	FDI	• The six indicators of institutional quality
Marino et al. (2016)	GDP growth	• The six indicators of institutional quality • Other explanatory variables
Tarek and Ahmed (2017)	Debt to GDP	• Fixed per capita income • Government expenditure to GDP • Unemployment rate • Inflation • GDP Growth • Debt to GDP lagged • The six indicators of institutional quality
Awan, R. U et al. (2018)	GDP per capita	• Control of Corruption • Education index • Government Effectiveness • Political Stability and Absence of Violence
Ali and Yahya (2019)	Debt to GDP	• The six indicators of institutional quality
Hayat (2019)	Real growth rate of GDP per capita	• Real growth rate of GDP per capita lagged • FDI • Other macroeconomic variables • Rule of Law • Control of Corruption • Political Stability and Absence of Violence • Regulatory Quality • Government Effectiveness
Zhuo et al., (2020)	GDP per capita	• The six indicators of institutional quality • Inflation • GDP Growth • Real interest rate • Total share of government spending on education
Mehmood et al. (2021)	Debt	• The six indicators of institutional quality
Mitsi (2021)	Logarithm of GDP per capita	• The six indicators of institutional quality • Trade openness • FDI • Government expenditure • Inflation

As a conclusion, the above studies demonstrate that institutional factors positively affect the reduction of public debt and the economic growth of individual countries. The gap in the

literature we aim to fill, is to cover all countries of the world, both chronologically and cross-sectionally.

3. Methodology

To examine the importance of institutional factors, we collected data from 178 countries for the period 2002-2019. We gathered data on the six institutional quality indicators and on the income level of each country (based on the scale used by the World Bank).
The data were collected based on previous studies that mentioned them as important factors for measuring fiscal efficiency and at the same time, we considered it important to examine the impact of the data by income level.
Compared to previous research we present a much larger sample of data, both chronologically and cross-sectionally. Also, previous studies that made a distinction between the countries in question used as a criterion whether a country is developed or developing, but in our analysis, we will try to examine the effectiveness of fiscal policy for each of the World Bank's four basic income levels (level 1: low income, level 2: lower - middle income, level 3: upper-middle income, level 4: high income).

As dependent variables we use the variables of debt to GDP, GDP growth and foreign direct investment to GDP. After the stationarity tests have been done, we will consider the simplest form of the models. In our first group of models, we regress the three dependent variables with the six institutional indicators and four additional independent variables (inflation, population, government expenditures to GDP, trade openness). In our second group of models, we regress the same variables, but we separated the sample based on the income level of each country.

Our regressions are based on an unbalanced panel dataset and we conduct our analysis in a similar fashion with the presented literature review. We use the fixed effects model on every occasion -our final models were based on the results of the Redundant Fixed Effects test and the Hausman test- and we present the final estimations where all the variables are statistically significant.

3.1 Regressions using the full sample

We begin our regressions with the debt to GDP variable

$$\boldsymbol{debt_{i,t} = 52.31 + 14.55law_{i,t} - 13.73polstab_{i,t} - 24.08regq_{i,t} + 0.0028inflation_{i,t} + u_{i,t}} \quad (1)$$

After removing the insignificant variables, we observe that the debt-to-GDP variable is affected by the Rule of Law, the Political Stability, the Regulatory Quality, and the Inflation, by using a fixed effects model.

Table 1 - Debt-to-GDP regression (full sample)

Variable	Coefficient	Standard Error	t-statistic	P-Value
constant	52.31	0.5158065	101.41	0.000
law	14.55	5.744636	2.53	0.012
polstab	-13.73	5.495787	-2.50	0.013
regq	-24.08	7.248267	-3.32	0.001
inflation	0.0028	0.0001481	18.62	0.000

$$fdi_{i,t} = 5.82 - 0.001114trade_{i,t} + u_{i,t} \quad (2)$$

From the results of the regressions we conducted with dependent Foreign Direct Investments to GDP we see that the indicators of institutional quality do not affect the intention of foreign investors to inflow capital into the respective country. On the contrary, the only variable that is said to influence is Trade Openness, which is expected to influence based on economic theory.

Table 2 - FDI-to-GDP regression (full sample)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	5.82	0.0001872	31,089.74	0.000
trade	-0.001114	0.0001272	-8.76	0.000

$$gdpgr_{i,t} = 6.55 - 2.35law_{i,t} + 1.43regq_{i,t} + 3.35voice_{i,t} - 0.14govex_{i,t} - 0.00036inflation_{i,t} + 0.0028trade_{i,t} + u_{i,t} \quad (3)$$

We notice that the variables Rule of Law, Regulatory Quality, Voice and Accountability, Government Expenditure, Inflation and Trade Openess affect the GDP Growth.

Table 3 - GDP Growth regression (full sample)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	6.55	1.295041	5.06	0.000
law	-2.35	0.7034145	-3.35	0.001
regq	1.43	0.5911634	2.42	0.017
voice	3.35	1.292324	2.59	0.010
govex	-0.14	0.0656289	-2.13	0.034
inflation	-0.00036	0.0000185	-19.29	0.000
trade	0.0028	0.0003117	8.87	0.000

3.2 Regressions by income category

Below we present the final regression for the determinants of debt-to-GDP for low-income countries

Low income countries

$$debt_{i,t} = 117.11 + 0.46inflation_{i,t} - 110.58trade_{i,t} + u_{i,t} \quad (4)$$

We can observe that for low-income countries the factors affecting debt-to-GDP are inflation and trade openness.

Table 4 - Debt-to-GDP regression (Low income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	117.1092	26.73883	4.38	0.000
inflation	0.4574213	0.2165097	2.11	0.044
trade	-110.5783	50.99705	-2.17	0.039

We therefore continue our analysis with low- to middle-income countries.

Low- to -middle income countries

$$\boldsymbol{debt_{i,t} = 43.81 - 20.52 corrupt_{i,t} + 18.97 voice_{i,t} + 0.21 inflation_{i,t} + u_{i,t}} \quad (5)$$

The debt to GDP for these countries is said to be negatively affected by Control of Corruption, positively by Voice and Accountability and positively by Inflation.

Table 5 - Debt-to-GDP regression (Low-to-middle income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	43.80811	4.514924	9.70	0.000
corrupt	-20.51602	10.16732	-2.02	0.049
voice	18.97433	7.406907	2.56	0.014
inflation	0.2132275	0.054009	3.95	0.000

In the continuation of our analysis, we will look at middle to high income countries.

Middle - to high- income countries

$$\boldsymbol{debt_{i,t} = 45.39 - 10.71 law_{i,t} + 0.003 inflation_{i,t} + u_{i,t}} \quad (6)$$

Middle to high income countries are negatively affected by the Rule of Law, i.e. as this variable increases, the debt to GDP decreases and inflation has a positive effect, i.e. as inflation increases, so does the debt to GDP.

Table 6 - Debt-to-GDP regression (Middle-to-high income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	45.39057	0.8442179	53.77	0.000
law	-10.70986	4.397655	-2.44	0.019
inflation	0.029669	0.0000119	248.41	0.000

For Debt to GDP as a dependent variable we will also consider the last level of income, i.e. high income countries.

High income countries

$$\boldsymbol{debt_{i,t} = 35.26 - 29.71 regq_{i,t} + 1.13 govex_{i,t} + 0.0000015 population_{i,t} + u_{i,t}} \quad (7)$$

From the above regression we observe that the debt to GDP is negatively affected by the Regulatory Quality, positively by Government Expenditures and positively by the Population.

Table 7 - Debt-to-GDP regression (High income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	35.26427	19.95256	1.77	0.083
regq	-29.70719	9.578769	-3.10	0.003
govex	1.129039	0.5192417	2.17	0.034
population	0.00000150	0.000000576	2.61	0.012

We continue our analysis by estimating regressions, for four income levels, with Foreign Direct Investment to GDP as the dependent variable.

Low income countries

$$\boldsymbol{fdi_{i,t} = 1.55 + 3.78regq_{i,t} + 11.004trade_{i,t} + u_{i,t}} \quad (8)$$

From the above regression we see that, for low-income countries, Foreign Direct Investment to GDP is positively affected by the Regulatory Quality and by Trade Openness.

Table 8 - FDI regression (Low income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	1.549523	2.821944	0.55	0.587
regq	3.776826	1.932562	1.95	0.061
trade	11.00433	5.327731	2.07	0.048

Our analysis is followed by the estimate for low- to middle-income countries.

Low- to - middle income countries

$$\boldsymbol{fdi_{i,t} = 4.002 + 2.07law_{i,t} - 2.56voice_{i,t} + u_{i,t}} \quad (9)$$

As we can observe, FDI to GDP is positively affected by Rule of Law and negatively by Voice and Accountability, for this income level.

Table 9 - FDI regression (Low-to-middle income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	4.001984	0.3753021	10.66	0.000
law	2.07066	0.881887	2.35	0.023
voice	-2.561408	0.7531181	-3.40	0.001

Here's our analysis of middle-to-high-income countries.

Middle- to - high income countries

$$\boldsymbol{fdi_{i,t} = 7.003 - 0.03govex_{i,t} - 0.0000000318populaton_{i,t} + u_{i,t}} \quad (10)$$

As we can see, Foreign Direct Investment to GDP is negatively affected by Government Expenditure and Population growth, for that income level.

Finally, for Foreign Direct Investment to GDP, we will look at high-income countries.

Table 10 - FDI regression (Middle-to-high income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	7.003439	0.533882	11.99	0.000
govex	-0.0289458	0.0126689	-2.28	0.027
population	-0.0000000318	0.0000000116	-2.75	0.008

Finally, for Foreign Direct Investment to GDP, we will look at high-income countries.

High income countries

$$\boldsymbol{fdi_{i,t} = 9.17 - 0.0012 trade_{i,t} + u_{i,t}} \quad (11)$$

We see that for high-income countries, only Trade Openness affects (negatively) FDI to GDP.

Table 11 - FDI regression (High income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	9.168912	0.0004942	18,553.04	0.000
trade	-0.0012427	0.0001743	-7.13	0.000

We continue our analysis by estimating regressions, for four income levels, with GDP Growth as the dependent variable. For low-income countries, these indicators do not affect GDP Growth. We continue by estimating the equation for low- to middle-income countries.

Low- to -middle income countries

$$\boldsymbol{gdpgr_{i,t} = 3.69 - 1.98 law_{i,t} + 1.91 polstab_{i,t} + 0.06 trade_{i,t} + u_{i,t}} \quad (12)$$

GDP growth is reported to be negatively affected by the Rule of Law, positively by Political Stability and Absence of Violence, and positively by Trade Openness, for the given income level.

Table 12 - GDPGrowth regression (Low-to-middle income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	3.691396	0.570773	6.47	0.000
law	-1.98415	1.063206	-1.87	0.068
polstab	1.908162	0.6233906	3.06	0.004
trade	0.0586304	0.0272523	2.15	0.037

Next, we estimate the sample for middle- to high-income countries.

Middle - to high- income countries

$$gdpgr_{i,t} = 11.58 - 0.22govex_{i,t} - 0.00037inflation_{i,t} - 0.0000000674population_{i,t} + u_{i,t} \quad (13)$$

So we observe that, at this level of income, GDP Growth is negatively affected by the variables of Government Expenditure, Inflation and Population, respectively.

Table 13 - GDPGrowth regression (Middle-to-high income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	11.57679	1.54494	7.49	0.000
govex	-0.2229026	0.0627814	-3.55	0.001
inflation	-0.0003742	0.000000825	-45.37	0.000
population	-0.0000000674	0.0000000236	-2,85	0.006

Finally, we estimate the equation for high-income countries as well.

High income countries

$$gdpgr_{i,t} = 15.55 - 3.19law_{i,t} + 1.93polstab_{i,t} + 3.19regq_{i,t} - 0.74govex_{i,t} + u_{i,t} \quad (14)$$

As we see, GDP Growth, for high-income countries, is negatively affected by the Rule of Law, positively by Political Stability and Absence of Violence, positively by the Regulatory Quality and negatively by Government Expenditures.

Table 14 - GDPGrowth regression (High income countries)				
Variable	**Coefficient**	**Standard Error**	**t-statistic**	**P-Value**
constant	15.55452	2.182361	7.13	0.000
law	-3.188192	1.169922	-2.73	0.009
polstab	1.929742	0.8263795	2.34	0.023
regq	3.191278	1.150749	2.77	0.008
govex	-0.7432037	0.0925135	-8.03	0.000

4. Results and discussion

The graph below (Figure *1*: Countries based on Income LevelFigure 1) portrays the world map showing the countries based on their income level. The darker the color of the country, the higher its income. We observe that countries such as those in North America, Australia, European countries, Japan and Saudi Arabia are among the high-income countries for the period 2002-2019, while many countries, mainly in Africa, belong to the other extreme, i.e. low-income countries.

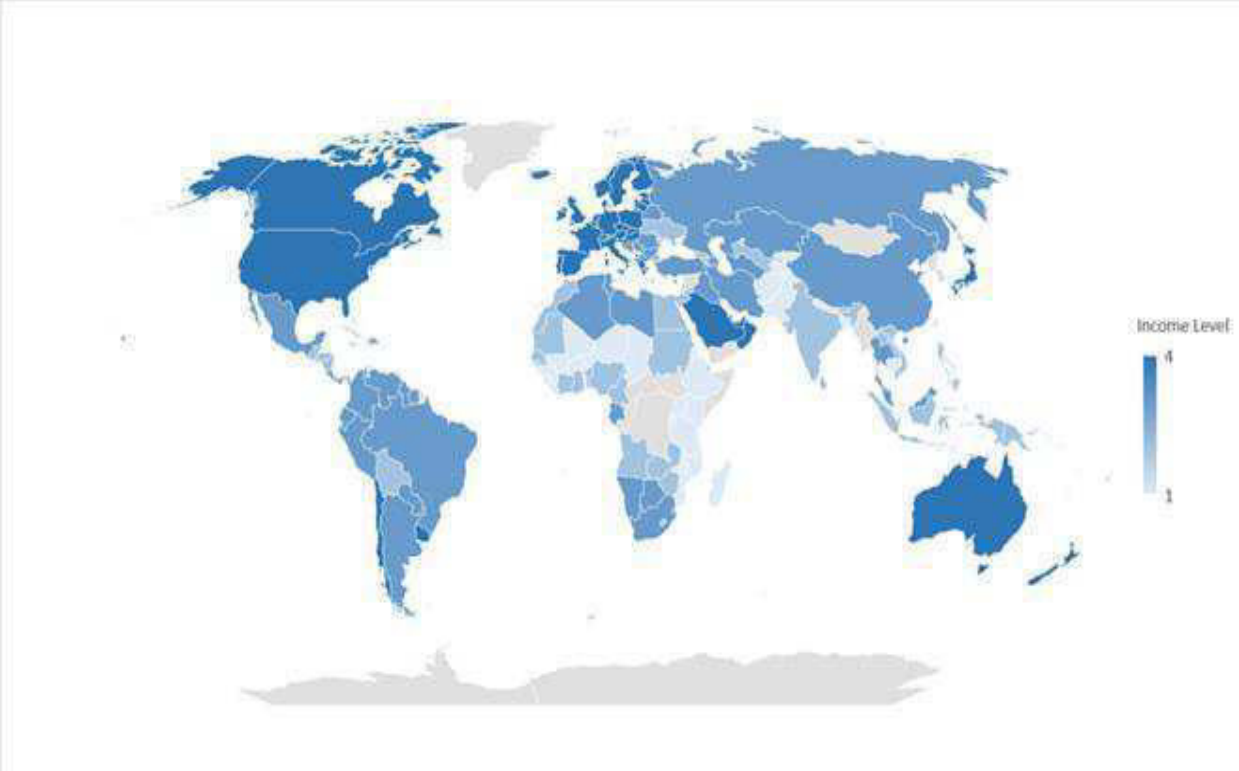

Figure 1: Countries based on Income Level. Data from the World Bank. Our map

Additionally, we examine the differentiation between some key macroeconomic variables and countries' income level. Firstly, we observe the debt to GDP ratio where the low- and high-income countries are the ones that show the highest percentage for this index. The middle-income countries demonstrate more modest rates (Figure 2).

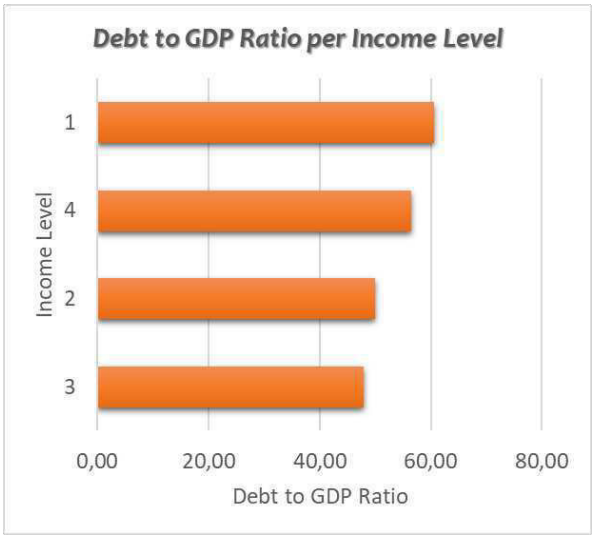

Figure 2: Debt to GDP Ration per Income Level. Data from the World Bank. Our chart.

In Figure 3, below we present the levels of foreign direct investment inflows to GDP by income level. High-income countries have significantly higher inflows than other countries. Furthermore, the countries in the other three income levels show similar levels of foreign direct investment inflows, with small differences between them.

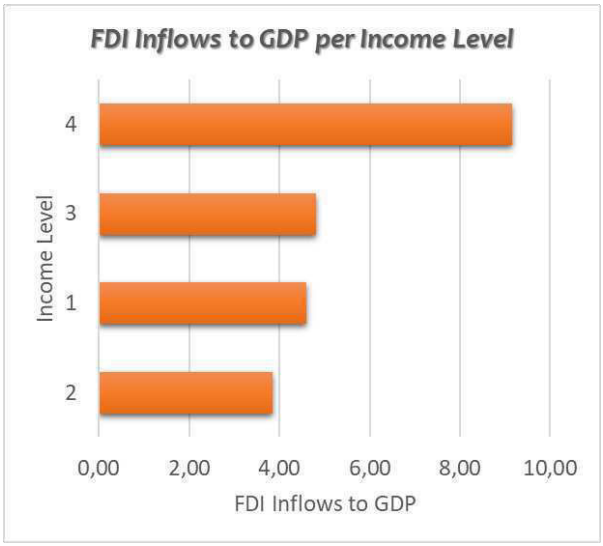

Figure 3: FDI Inflows to GDP per Income Level. Data from the World Bank. Our chart

The last macroeconomic indicator we will examine is GDP growth. In this case (Figure 4), the low- to middle-income and middle- to high-income countries are the ones showing the highest growth rates, while the low- and high-income countries are showing the opposite results.

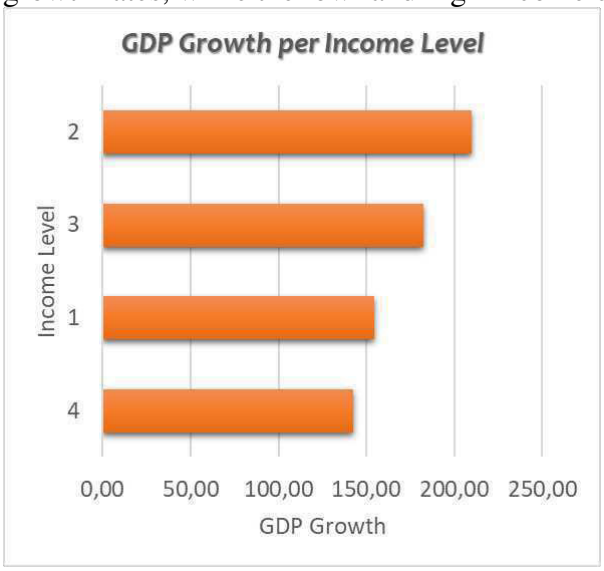

Figure 4: GDP Growth per Income Level. Data from the World Bank. Our chart

Figure 5 below shows the behavior of institutional quality indicators by income level. The indicators Control of Corruption, Government Effectiveness, Regulatory Quality and Rule of Law demonstrate an increasing trend from low-income countries to high-income countries. The Voice and Accountability variable has low values for low-income countries; low to middle income countries and middle to high income countries show a greater dispersion than the previous variables, while high income countries have slightly higher values for this indicator. Finally, the Index of Political Stability and Absence of Violence has low values for low-income countries and a large dispersion of values for the other three income levels.

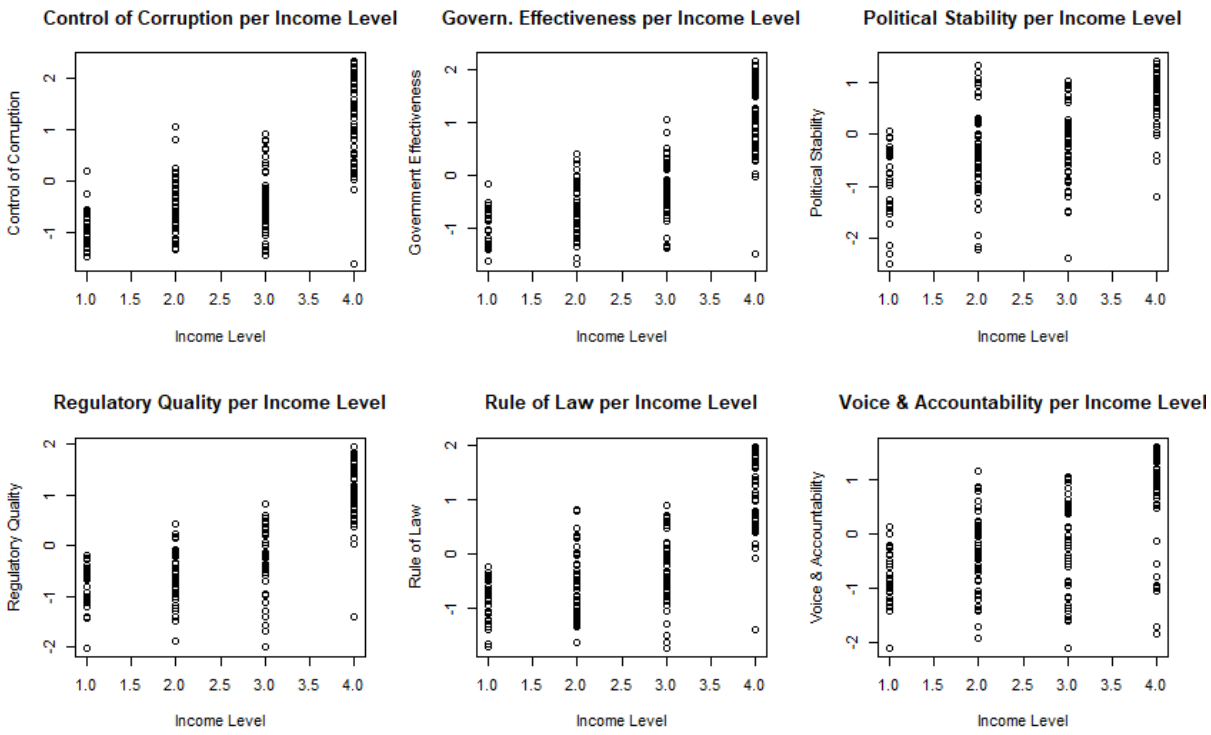

Figure 5: Behavior of Institutional Quality Indicators by Income Level. Data from the World Bank. Our charts.

5. Conclusions

The purpose of this research was to examine which policies and measures are susceptible to implement effective fiscal policy, in order to understand the impact of institutions at a global level. The analysis of institutions can contribute to understand the effectiveness of fiscal policy, in achieving social prosperity and limiting the impact of economic fluctuations.

During the course of this research, we examined the importance of institutions, how they are intertwined with fiscal policies and factors that affect their effectiveness.

Institutions are written and unwritten rules that people have invented to reduce uncertainty. The quality of institutions relates to the economic policy of a country as it affects various aspects of the economy, such as the tax system and other socio-political indicators.

In order to carry out a more in-depth analysis of the connection between institutions and fiscal policy, it is necessary to quantify the meaning of institutions. This can be achieved by using the World Bank's six institutional quality indicators, which reflect various aspects of the social, economic, and political situation in a country.

As discussed above, there is a relationship between macroeconomic indicators, institutional quality indicators and the level of income of each country. Prospectively, these relationships should be thoroughly investigated using further econometric modeling techniques, making these models more useful to economic policy makers, government agencies and other institutions.

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