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The Impact of Institutional Quality on Fiscal Discipline: An Analysis of OECD Countries

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Kurumsal Kalitenin Mali Disiplin Üzerindeki Etkisi: OECD Ülkeleri Örneği

Abstract

Indicators of institutional quality are based on six different indices published by the World Bank in 1996 within the framework of Universal Governance Indicators. These indicators have significant effects on many financial variables. Fiscal discipline can also be affected by indicators of institutional quality. Based on this, the study investigated the impact of "government effectiveness" on fiscal discipline in OECD countries using autoregressive panel data analysis estimation methods with 2009-2021 period data. According to the analysis results, the increase in the value of government effectiveness affects fiscal discipline negatively and significantly. This result shows that as government effectiveness increases, the share of public debt stock in gross domestic product, an indicator of fiscal discipline, will decrease. A definite conclusion could not be reached regarding the non-linear relationship between the two variables.

Keywords : Fiscal Discipline, Institutional Quality, Government Effectiveness, Autoregressive Panel Data Model, OECD Countries.

JEL Classification Codes : E61, H60, H62, G30, G34.

Öz

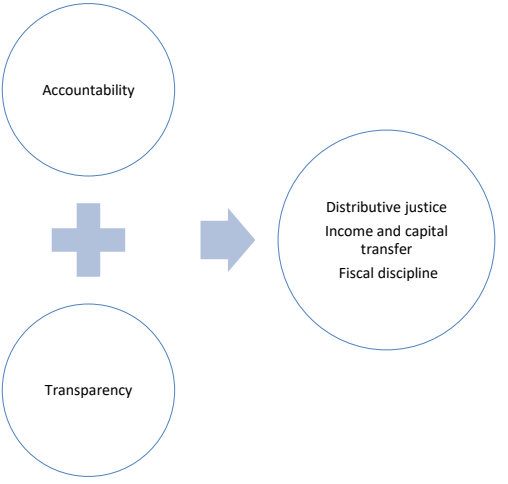
Kurumsal kaliteye ilişkin göstergeler Dünya Bankası tarafından 1996 yılında Evrensel Yönetişim Göstergeleri çerçevesinde yayınlanan altı farklı endekse dayanmaktadır. Bu göstergelerin birçok mali değişken üzerinde önemli etkileri bulunmaktadır. Mali disiplin de kurumsal kaliteye ilişkin göstergelerden etkilenebilmektedir. Buradan hareketle çalışmada, 2009-2021 dönemi verileri ile otoregresif panel veri analizi tahmin yöntemleri kullanılarak OECD ülkelerinde "hükümet etkinliği"nin mali disiplin üzerindeki etkisi araştırılmıştır. Analiz sonuçlara göre, hükümet etkinliği değerindeki artış, mali disiplini negatif ve anlamlı bir şekilde etkilemektedir. Bu sonuç hükümet etkinliği arttıkça mali disiplinin bir göstergesi olan kamu borç stokunun gayri safi yurtiçi hasıladaki payının azalacağını göstermektedir. İki değişken arasındaki doğrusal olmayan ilişkiye yönelik ise kesin bir sonuca ulaşılamamıştır.

Anahtar Sözcükler : Mali Disiplin, Kurumsal Kalite, Hükümet Etkinliği, Otoregresif Panel Veri Analizi, OECD Ülkeleri.

1. Introduction

Even though each country has its own distinct set of ideologies and value systems, they all share a dedication to providing products and services effectively and efficiently to improve social welfare. Such differences shape governments' financial policies regarding optimally employing scarce resources. Indeed, the individuals involved, the available resources, and the policies implemented to promote their welfare impact the conditions that give rise to economic activity. The management of public finances is also at the core of the socioeconomic systems developed by the countries. The primary objectives of public financial management are to ensure the effective administration of public resources and the provision of services; in contrast, the private sector focuses primarily on ensuring the profit of investors and business owners. In this sense, public financial management addresses distributive justice, income and capital transfer, and fiscal discipline within the framework of accountability and transparency.

Graphics: 1
Basic Elements of Public Financial Management



Fiscal discipline, or the ability of governments to maintain appropriate financial functioning and fiscal position - that is, the long-term sustainable balancing of public expenditures with public revenues-is one of the most extensive theoretical domains of study in political science and political economy (Franchino, 2023: 1). Governments must maintain budgetary stances commensurate with macroeconomic stability and long-term economic growth to provide fiscal discipline. In light of this, care should be taken to avoid too much debt and borrowing. The policies to be put into place should also be the most effective in reaching the objectives of resource allocation and distribution and in minimising output variations. Currently, it is seen as a smart strategy to develop budget buffers to handle impending budgetary constraints and react to unfavourable shocks (Kumar & Ter-

Minassian, 2007: 2). The management of public finances is essential for emerging, transitioning, and less developed nations. Financing growth, physical infrastructure, social and other public services in such countries require additional financial resources. Due to limited resources, the public financial management system must inevitably be effective, disciplined, transparent, and accountable. A potential system failure could lead to social unrest and tension because it would impact the overall success of the public finance system, which unites the entire system of public institutions with its objectives and purposes associated with the country's economic growth strategy. Thus, improving fiscal discipline is one of the endeavours that may be accomplished by boosting other aspects of public finance management.

Fiscal discipline limits the quantity, nature, and maturity of debts in the short and long term to prevent passing on a large debt load to future generations through debt sustainability and profitability evaluations. Basic fiscal discipline concepts (Otinche, 2016: 563) may be listed in the following manner:

- A sound budget system,
- Projection of income and expenses,
- Compilation and acceptance of a budget based on the needs of the society,
- Evaluation of the financial consequences of budgeting decisions,
- A structural balance between current revenues and current expenditures,
- Adoption of the budget before or at the start of the next fiscal year,
- Responsible budget execution within the context of countercyclical measures,
- Debt profiling as part of debt management and sustainability. These factors are a foundation for a country's public sector governance, budget mechanisms, and fiscal discipline.

Fiscal indiscipline, defined as the inability to attain the optimal balance of public revenue and expenditure, which results in fiscal dominance in the economy, may erode public efficiency. In such a case, governments may be forced to borrow money from the central bank or suffer a financial deficit. Currency devaluation and inflation are unavoidable at the current time. As a result, fiscal discipline should be maintained by meeting annual or medium-term fiscal outcome objectives. Fiscal discipline may encourage long-term growth by improving the fiscal sustainability of budgetary procedures and increasing solvency, resulting in national savings through budget surpluses. Institutional systems actively preserve fiscal discipline, ranging from legally obligatory fiscal norms to robust accountability procedures and administratively backed public assurances (Debrun, 2007: 2). Recent studies have highlighted the significance of institutional quality in fostering budgetary discipline. Institutional quality and government effectiveness profoundly affect public financial management operations' ultimate objectives. Additionally, productive public involvement in governance, excellent management of the public structure, and, ultimately, citizen-centred service delivery are all facilitated by sound governance.

Governments are urged to strengthen their control over state infrastructure by enhancing institutional quality and promoting transparency in the budget approval process.

Since 1996, the World Bank's Worldwide Governance Indicators (WGI) have been the framework for formulating governance indices for countries in six categories. As of 2021, 214 countries are included in the index. The indices are Voice/Accountability, Political Stability/Absence of Violence, Terrorism, Government Effectiveness, Regulatory Quality, Supremacy of Law, and Control of Corruption (The World Bank, 2023b).

Voice/Accountability includes views on a country's citizens' ability to vote in national elections and their freedom of expression, association, and press. Factors contributing to *Political Stability and the Absence of Violence/ Terrorism* comprise perceptions of the possibility that the government will be overthrown or destabilised through illegal or violent means, such as politically motivated terrorism and violence, and the government's ability to formulate and implement sound policies successfully.

Regulatory Quality analyses how the public views the government's capacity to generate and carry out sensible laws and policies that enable and encourage the growth of the private sector and show respect for the institutions that control the social and economic relations between the people and the government. The objective of the *Rule of Law* is to ascertain how the representatives perceive social norms, namely the degree to which property rights, law enforcement, courts, and agreements are upheld, as well as their assessment of the potential for crime and violence. Perceptions of the extent to which public authority serves for private benefit, encompassing both small-scale and large-scale corruption and state takeover by elites and private interests, are summed up by the concept of *Control of Corruption*. *Government effectiveness* is determined by determining the perception of public actors' competency, the standard of public services and their level of resistance to political pressure, the calibre of policymaking and execution, and the legitimacy of the government's pledge to uphold these standards (Kraay & Mastruzzi, 2010: 3, The World Bank, 2023b). Stated differently, government effectiveness aims to provide better public sector accountability by bringing governments closer to the people they are supposed to serve and matching services more closely to citizens' preferences (Huther & Shah, 1998: 1-2). According to UAE The Government Summit (2013), there are four systematic significant government factors in performance;

- *Innovation*: It suggests that a dynamic innovation process should exist. In this instance, it is important to recognise, modify, and implement ground-breaking approaches.
- *Scale:* This pertains to the capacity to offer advice or direction to expand innovations. This criterion states that creative and pioneering methods require a management structure that is receptive to them for good ideas to make an impact.
- *Measurement*: An unambiguous focus on measurement and analysis is necessary. Analytical proficiency increases the likelihood that practices will scale optimally and allows for the implementation of effective policies.

- *Incentives*: Tighter sanctions and more transparent incentives are required to maximise government effectiveness.

Government effectiveness is directly related to a country's economic and social progress, and it indicates that actions and processes related to the obligations of public organisations and people are carried out in a way that is consistent with social welfare. In actuality, if public services are geared toward helping citizens, bureaucracy and corruption will be kept to a minimum, and the judiciary will increase government effectiveness even further by making accurate choices in executing the rule of law. The more aware the government is of the choices of its citizens, the more its policies will represent their requirements. Citizens' joint accountability and government authority can lead to better governance and more successful programs. This is because accountability may improve efficiency by impacting government behaviour.

Fiscal policy (the debt-to-GDP ratio) is another performance indicator for assessing the effectiveness of government (Huther & Shah, 1998: 5). Governments, through their exclusive responsibility for fiscal policy, put together institutional structure and organisation, finance public activities, employment, fiscal rules, incentives, and so forth. Ultimately, they decide how public finances will evolve going forward (Sanchez et al., 2013: 569). At this point, it would be reasonable to claim that competent debt management, and hence an appropriate fiscal discipline, may be employed to assess government performance. Therefore, fiscal discipline (i.e., the ratio of public debt stock to GDP) is the dependent variable of the research. In addition, as already stated, areas with strong social cohesion tend to have lower levels of political polarisation, facilitating government adoption of citizen-approved policies. Low social segregation reduces the disparity between taxation preferences and expenditure demands of different interest groups, suggesting that a more homogeneous citizenry will reinforce budgetary restraint.

In this regard, the study's hypothesis has been formed as 'the more government effectiveness, the better the fiscal discipline'. Given the importance of the topic and the crucial role of government effectiveness in economics, this study used panel data analysis to investigate the relationship between government effectiveness, one of the indicators of institutional governance, and fiscal discipline in OECD nations. This is because policy analyses and discussions on the function, extent, and effectiveness of government have been conducted due to a lack of empirical research on the quality of governance. This study offers an empirical assessment that will enable the discussion of theoretical research and policy concerns within a tangible definition framework. The article starts with theoretical justifications for the subject matter. Following a review of the studies in the literature, an explanation of the model and data set used for the study is provided. The test findings of the analysis are shown in the last section. The relationship between budgetary discipline and the effectiveness of government is assessed based on the empirical data.

2. Conceptual Framework and Literature Review

Institutional quality and governance emerged internationally in the context of significant financial misconduct and malfeasance in industrialised countries like the USA, the UK, and Italy. National governments and other authorities have responded to such activities by tightening regulations about quality and governance and by imposing penalties for the sake of adopting ethical and transparent policies. The ultimate objective is to deter fraud and other financial misconduct while ensuring a fair and equitable power distribution among directors, shareholders, and senior management. "The way that an organisation (public or private) is managed, supervised, and used to achieve performance, fulfil its responsibilities, and add value" is the definition of institutional quality and governance. Hence, all parties concerned (shareholders and investors, the board of directors, managers, staff members, the government, and others with a direct stake) have their rights and responsibilities respected while employing financial, human, and information resources efficiently (Matei & Drumasu, 2015: 496-497).

Transparency, accountability, and fiscal discipline are essential in discussions on institutional quality and governance. Government corruption thrives without transparency and minimises the public sector's effectiveness. Accountability, associated with transparency, is predicated on formulating criteria by which public institutions undergo assessment. These standards encompass resource efficiency, expenditure control, and internal and external audits. Accountability boosts a government's credibility. The application of fiscal responsibility and fiscal discipline is predicated on the importance placed on accountability and openness. In transition economies, political and legal frameworks based on fiscal prudence and discipline are the foundation for economic growth, sustainable development, nation-state structure, and democracy (United Nations, 2007: 7; Otinche, 2016: 561). This makes it possible to argue that the cornerstones of economic progress are sound institutional design and restrained spending. It is suggested that poor institutional quality and mishandled state resource allocation have led to the current state of affairs in many developing nations (Dhikru & Adeoye, 2019: 1). Effectiveness plays a significant role in analysing government expenditures and taxation. These activities should maximise the potential advantages for each person. According to Webster, comparing input and output or costs and benefits is what efficiency is all about. Effective prioritisation of public services to address individual needs is another efficiency aspect. A just and uniform legal framework combined with an economically effective production and distribution system can accomplish this (Afonso et al., 2006: 8-9). An effective government that delivers high-quality public services in line with residents' desires is essential to responsibly using financial resources. Fiscal policy initiatives are among the most critical tools governments employ to achieve their financial objectives. Government effectiveness may be qualitatively appraised regarding the relationship between administrative efficiency and bureaucratic structure. Since the government controls a substantial portion of public employment and may influence competitiveness and growth through revenue generation and expenditure policies (such as those related to infrastructure, education, and research and development), it is also primarily accountable for the efficiency of the public sector. The more accountable

and effective the government in any country, the greater its political stability and the lower the additional rules and expenditures. The government's effectiveness also impacts corruption and the rule of law. As a result, governments and governing bodies must emphasise accountability, rule compliance, and administrative excellence.

Studies on the relationship between government effectiveness and fiscal discipline in the literature have centred primarily on economic development, which is one of the objectives of macroeconomics and the contributing variables of government effectiveness. Few studies have looked indirectly at the impact of governmental indices like corruption, administrative excellence, and political stability on fiscal rule or fiscal discipline. The same is true for the government effectiveness index. In their study in 152 countries, La Porta et al. (1999) concluded that while larger governments typically function better, a government that engages in a broader range of goods and services will incur higher public debt due to the increased costs associated with management and sustainability. Acosta and Coppedge (2001) discovered that governments usually incur budget deficits during election years after analysing data from seven Latin American nations (Argentina, Brazil, Chile, Ecuador, Mexico, Venezuela, and Uruguay) in their model for measuring fiscal performance. The effectiveness of political institutions on economic performance is also figured out. Annett (2002) studied 19 countries with advanced economies between 1980 and 2000. Regression analyses indicate a significant relationship between government effectiveness and budgetary policy. It is reported that during times of high debt and growth, there is a greater likelihood of reducing transfer expenditures and moving the tax burden from labour to consumer taxes, particularly in countries threatened by political instability. In 57 developed countries and developing ones between 1970 and 1990, Woo (2003) examined the relationships between a wide range of economic, socio-political, and institutional variables, including income inequality, financial depth, cabinet size, and central budget decisions. The study also examined the variables to which these countries' budget deficits are related. In countries with ineffective governments, budget deficits have been shown to rise. Using panel data analysis for 61 industrialised and developing nations from 1990-2002, Lavigne (2006) reveals that political economy determinants support the upkeep of sound fiscal policies. Sturdy democratic institutions play an essential role in developed countries, while robust economic institutions are important in establishing fiscal balance in developing countries. According to Glennerster and Shin's (2008) analysis, governments that consistently apply fiscal accountability reforms observe a structural reduction in borrowing costs. They also find that increased transparency benefits smaller and less liquid debt markets. This is evidenced by their examination of government bond markets in 23 emerging economies between 1999 and 2002.

Peat et al. (2015) revealed a positive and non-linear relationship between credit spreads and well-executed transparency regulations using an analysis of the open budget and credit default swap (CDS) index for 2004-2010 in 45 industrialised and developing countries. Economic development and educational attainment are the primary predictors of government effectiveness, according to Sanchez et al.'s (2013) study on the indicators of government effectiveness using the generalised technique of moments in 202 countries

between 2002 and 2008. Furthermore, depending on the distribution of money between countries, some organisational traits like gender diversity, political restraints, and government size may enhance the quality of governance. For 1995-2012, Montes and Paschoal (2016) employed the least squares method to determine the drivers of government effectiveness for a set of 130 countries (30 developed and 100 developing). As a consequence of the study, data indicates that countries with low government effectiveness have the most significant percentage of public debt. Montes et al. (2019) examined fiscal transparency, government effectiveness, and the efficacy of public expenditure in 14 industrialised and 68 developing countries. The study demonstrated that fiscal transparency is a key indicator in minimising public debt and enhancing government effectiveness, using panel data analysis from 2006 to 2014.

Imaginário and Guedes (2020) used panel data analysis for 164 countries between 2002 and 2015 to analyse the relationship between public debt and governance quality. The study demonstrates that public debt and governance quality correlate statistically and adversely. According to some research, improved governance practices reduce public debt in countries with low incomes while boosting it in countries with high incomes. Using least squares, random effects, and the two-stage generalised technique of moments, Nguyen and Luong (2021) discovered that institutional quality may impact public debt in 27 transition countries between 2000 and 2018. Public debt increases directly from ineffective and poor governance, particularly when preventing corruption. Furthermore, public debt is increased by initiatives to enhance the institutional quality of government effectiveness, administrative quality, and the rule of law following regime transitions. Eneji et al. (2022) adopted an autoregressive model in the context of time series analysis using data from 1990 to 2018 to examine how governance impacts fiscal restraint and illicit money flows in Nigeria. The findings indicate a favourable correlation between illegal money circulation, budgetary discipline, and governance. In this context, to ensure transparency and accountability in Nigeria's public sector, it was suggested that the rule of law, participation, and accountability mechanisms, including public intervention, public service accessibility, and anti-corruption policy changes, be fortified.

The study should consider various criteria because there is no widely recognised perspective in the literature about the relationship between fiscal discipline and government effectiveness. One of the most pressing issues in the state's economic growth and development objectives is fiscal discipline, which calls for adopting the concept of government effectiveness to ensure optimal budget balance in regulations. Therefore, this study seeks to close the current gap by examining the relationship between government effectiveness and fiscal discipline. This study is the first to give empirical data and add to the body of literature based on the literature review findings.

3. Data Set, Empirical Model and Methodology

For 35 OECD countries[1], this research section empirically analyses the relationship between government effectiveness and fiscal discipline. The data set spans the years 2009-2021 and is annualised. The primary rationale behind selecting this timeframe is due to incomplete data sets for several countries up to 2009.

Table 1 includes information on the variables. As shown in Table 1, the variables used in the study are the ratio of public debt stock to GDP (debt) as an indicator of fiscal discipline, the government effectiveness index (eff), the government effectiveness index developed with the logarithm of GDP per capita or briefly interaction term (lny*eff), the square of the government effectiveness index (eff^2), the logarithm of GDP per capita in dollars at current prices. The consumer price index (inf) variable indicates national price stability. The World Bank's "World Development Indicators" and "Worldwide Governance Indicators" databases, as well as the OECD database, are the sources of the variables. The values of the government effectiveness index are intended to represent opinions about the standard of public services and their level of autonomy from political influences, as well as the standard of policy formulation and implementation and the dependability of the government's adherence to such policies (World Bank, 2023a).

Table: 1
Study-Related Variables

Variable	Variable Class	Clarification	Database
debt	Dependant Variables	Public Debt Stock to Gross Domestic Product Ratio	OECD (2023b)
eff	Independent Variables	Government Effectiveness Index	The World Bank (2023a), Worldwide Governance Indicators
lny*eff		Government Effectiveness Index (Interaction Term) Improved by the Logarithm of Gross Domestic Product per Capita	
eff^2		Square of Government Effectiveness Index	
lny	Control Variables	The logarithm of gross domestic product per capita in dollars at current prices	The World Bank (2023c), World Development Indicators
inf		Consumer Price Index (2010=100)	The World Bank 2023d), World Development Indicators

The values of the government effectiveness index range from -2.5 to +2.5. Government effectiveness declines as the score gets closer to -2.5 and rises as it gets closer to +2.5. The following equations demonstrate the models that address the empirical link between these variables.

$$debt_{it} = \alpha_1 + \alpha_2 eff_{it} + \alpha_3 lny_{it} + \alpha_4 inf_{it} + e_{it} \quad (1)$$

$$debt_{it} = \alpha_1 + \alpha_2 lny*eff_{it} + \alpha_3 lny_{it} + \alpha_4 inf_{it} + e_{it} \quad (2)$$

[1] *OECD member countries: Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, South Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom, USA (OECD, 2023a). Costa Rica, Colombia and Iceland were not included in the study due to lack of data.*

$$debt_{it} = \alpha_1 + \alpha_2 eff_{it} + \alpha_3 eff^2_{it} + \alpha_4 lny_{it} + \alpha_5 inf_{it} + e_{it} \quad (3)$$

$debt_{it}$ is the dependent variable in all equations, while eff_{it}, $lny*eff_{it}$ and eff^2_{it} are the independent variables; lny_{it} and inf_{it} are the independent control variables. In addition to these variables, α_1 is the constant term, α_2-α_5 are the independent variable parameters, and eit is the error term. In contrast, the model in Equation 2 attempts to quantify the linear and indirect effects of government effectiveness and the logarithmic value of gross domestic product per capita on fiscal discipline, and the model in Equation 1 attempts to quantify the linear and direct effects of government effectiveness and other independent variables on fiscal discipline. The non-linear impacts of government effectiveness are examined in Equation 3. The models were estimated using the Stata 14 package program.

Table: 2
The Expected Effects on Coefficients

Equation 1	Equation 2	Equation 3	Expected Effect
eff		eff	-
	lny*eff		-
		eff^2	- / +
lny	lny	lny	- / +
inf	inf	inf	- / +

The expected coefficient signs for each equation's variables are listed in Table 2. Fiscal discipline is expected to be negatively affected by the primary variable eff. Therefore, fiscal discipline is guaranteed by government effectiveness. The lny*eff interaction terms' coefficient is also expected to have a negative sign. On the other hand, the variables eff^2, lny, and inf may have positive or negative coefficients.

Owing to the substantial dimensions of time (13 years) and unit (35 countries), panel data analysis will be employed to estimate the models above. Preferred in this situation are autoregressive panel data models and estimators that incorporate the impact of fiscal discipline data from the prior quarter. The lagged value of the dependent variable is included as an independent variable in the autoregressive panel data model, a kind of dynamic panel data model. Equation 5 illustrates a dynamic (autoregressive) panel data model; in contrast, Equation 4 depicts a static panel data model (Hsiao, 2003: 69).

$$Y_{it} = \beta X_{it} + \alpha_i + \lambda_t + u_{it} \qquad i=1,\ldots,N \qquad t=1,\ldots T \quad (4)$$

$$Y_{it} = \gamma Y_{i,t-1} + \beta X_{it} + \alpha_i + \lambda_t + u_{it} \qquad i=1,\ldots,N \qquad t=1,\ldots T \quad (5)$$

In both equations, the dependent variable vector is Y_{it}, the independent variable matrix is X_{it}, the lag dependent variable vector is designated as $Y_{i,t-1}$, the unit effect is termed α_i, the time effect is defined as λ_t, and the error term is called u_{it}.

Different estimators based on fixed effects and first differences models perform better in estimating autoregressive panel data models. Among these estimators are Anderson and

Hsiao (1982), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998).

The "endogeneity" problem is the most significant in dynamic panel data models. In autoregressive models, the endogeneity problem occurs when the variable $Y_{i,t-1}$ is associated with the error term u_{it}. In such cases, the Pooled Least Squares (HEKK) approach produces skewed and inconsistent findings (Baltagi, 2005: 136; Yerdelen-Tatoğlu, 2012: 66). The relationship between the unit effect α_i and the error term u_{it} also deviates from the random effects of the estimator. To avoid skewed and inconsistent estimations, it is of the utmost importance to develop bias-free and consistent estimates using a variety of approaches.

To tackle the endogeneity problem, Anderson and Hsiao (1982) devised the "instrumental variables" method. Firstly, the unit effects in the model have been removed using the initial differences of the variables in the model, according to this method. Instrumental variables such as $y_{i,t-2}$ or $y_{i,t-2}$ can be employed instead of the variable producing the endogeneity problem (Baltagi, 2005: 136). Although this estimator produces precise findings, it is not useful when autocorrelation is possible (Yerdelen-Tatoğlu, 2012: 76). In this case; it makes more sense to use the Generalised Method of Moments (GMM), which Arellano and Bond (1991) developed. Nonetheless, this method could lead to biased findings for small sample sizes (Arellano & Bond, 1991: 293).

Another estimate developed the "orthogonal deviations" approach, the Arellano and Bover (1995) estimator, for situations where the small sample size in the models results in a weak initial distinction transformation. With the orthogonal deviations method, the difference is calculated from the average of all potential subsequent values of the variable rather than comparing the value of the variable in the present time frame to the value in the previous period (Yerdelen-Tatoğlu, 2012: 85-86; Arellano & Bover, 1995: 31-33). The Arellano and Bover (1995) estimator develops a two-system equation, which is then estimated as a single system. The Arellano and Bover (1995) estimation model is often referred to as the System Generalised Moments (GMM) estimator (Yerdelen-Tatoğlu, 2012: 87). Finally, Blundell and Bond's (1998) research provides a unique understanding of the technique of the GMM system. Blundell and Bond (1998) drew attention to the "extra moment" criterion, which generates an effective estimator in autoregressive panel data models with a limited temporal dimension. This requirement significantly boosts the Blundell and Bond (1998) System GMM estimator's efficiency over the initial difference GMM estimator (Hsiao, 2003: 148).

4. Empirical Findings

The estimation results, empirical discoveries, and model evaluations of equations 1, 2, and 3 are the focus of this section of the study. The Arellano and Bond Generalised Method of Moments (AB GMM), Arellano and Bond Two-Stage Generalised Method of Moments (AB 2SGMM), Arellano and Bover/Blundell and Bond System Generalised Method of Moments (AB-BB SGMM), and Arellano and Bover/Blundell and Bond Two-

Stage System Generalised Method of Moments (AB-BB 2SGMM) are the frameworks in which the estimation results are obtained. Moreover, the Arellano and Bond System Generalised Method of Moments Robust Estimation Results (AB-BB SGMM Robust) and the Arellano and Bond Two-Stage Generalised Method of Moments Sturdy Estimation Results (AB 2SGMM Robust) are also provided.

Tables 3, 4, and 5 summarise the estimation findings. Each table also contains the number of observations, instrumental variables, and additional diagnostic tests, allowing for an examination of both the relevance of the parameters and the validity of the instrumental variables employed in the models.

Table 3 shows the estimated findings for the relationship described in Equation 1. Firstly, the Durbin Score and Wu-Hausman tests in the diagnostic tests section examine for endogeneity issues in the AH method models. Probability (prob.) values < 0.05 suggest endogeneity issues in the models. The validity of the instrumental variables in the models is tested by the Sargan test under the AB GMM and AB-BB SGMM test findings; however, it is discovered that the instrumental variables employed in the said models are invalid upon analysis of the probability (prob.) values.

All models provide second-order autocorrelation results except AH and AB-BB SGMM. Second-order autocorrelation mustn't be present for the models to be viable. When it comes to the relationship between government effectiveness and fiscal discipline, the results for the AB 2SGMM, AB 2SGMM Resilient, AB-BU SGMM Resilient, and AB-BU 2SSGMM estimators without endogeneity issue and second-order autocorrelation are efficient and consistent.

First, the lag value of the dependent variable is positive and significant based on the AB 2SGMM results. This is true for different estimators as well. The result thus indicates that the ratio of public debt stock to gross domestic product in the subsequent year is positively impacted by the value of the ratio in the preceding year. In summary, a mutually beneficial process involves fiscal discipline and fiscal indiscipline. On the other hand, fiscal discipline is positively impacted by positive outcomes and perceptions of government effectiveness, according to estimation results both with and without control variables. The parameters are negative and significant. This suggests that the proportion of the public debt stock in the GDP will decline as government effectiveness rises. This is a highly significant result. Theoretically, it aligns with Table 2's assumptions and demonstrates that OECD nations' fiscal discipline depends critically on increased government effectiveness. Once more, price stability negatively impacts fiscal discipline, but increases in per capita income have a beneficial effect.

The robust estimate results of the AB 2SGMM indicate no findings significantly different from the AB 2SGMM outcomes. Only the criterion for price stability is of little importance. A significant improvement in government effectiveness has a beneficial impact on budgetary restraint.

Table: 3
Estimated Results for the Relationship between Government Effectiveness and Fiscal Discipline (Equation 1)

debt	**AH**		**AB GMM**		**AB 2SGMM**		**AB 2SGMM Robust**		**AB-BB SGMM**		**AB-BB SGMM Robust**		**AB-BB 2SSGMM**	
$debt_{it-1}$	0,611* (0,000)	0,815* (0,000)	0,668* (0,000)	0,606* (0,000)	0,667* (0,000)	0,606* (0,000)	0,667* (0,000)	0,606* (0,000)	0,925* (0,000)	0,813* (0,000)	0,925* (0,000)	0,813* (0,000)	0,926* (0,000)	0,810* (0,000)
eff	- 9.584 (0.092)	-12,566** (0,038)	-15,450* (0,001)	-15,102* (0,001)	-15,020* (0,000)	-14,920* (0,000)	-15,020* (0,002)	-14,920* (0,006)	5,732* (0,001)	-14,941* (0,000)	5,732 (0,087)	-14,941 (0,068)	5,682* (0,000)	-14,530* (0,000)
lny		-98,085* (0,000)		-55,032* (0,000)		-54,164* (0,000)		-54,164* (0,002)		9,359* (0,000)		9,359* (0,001)		9,633* (0,000)
inf		-0,028 (0,821)		0,136* (0,005)		0,130* (0,000)		0,130 (0,307)		-0,050 (0,285)		-0,050 (0,390)		-0,064* (0,000)
Number of Observations	385	385	385	385	385	385	385	385	420	420	420	420	420	420
Instrumental variables	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$
Durbin Score Prob.	0,000	0,000												
Wu-Hausman Prob.	0,000	0,000												
AR(2) prob.			0,9715	0,3327	0,9557	0,1462	0,9561	0,1615			0,8834	0,7585	0,8810	0,7646
Sargan			258,111 (0,000)	267,171 (0,000)	33,969 (0,9935)	34,806 (0,9992)			326,616 (0,000)	326,959 (0,000)			34,220 (1,000)	31,179 (1,000)

*Note: * denotes significance at 1%; ** 5%.*

It is necessary to assess the outcomes of the last two estimators- the AB-BB 2SGMM estimator and the AB-BB SGMM robust estimator- in two distinct ways. The first estimator's results without control variables demonstrate that the government effectiveness parameter is positive but not statistically significant. For the second estimator, it has been found that the same parameter is significant and positive. The robust estimation findings of the AB 2SGMM and AB 2SGMM are comparable to the estimated results of the control variables. Government effectiveness is assessed through a negative and substantial parameter. Therefore, favourable breakthroughs in the efficacy of government also have a positive impact on budgetary discipline. On the other hand, fiscal discipline suffers when per capita income increases. Compared to the different estimators, this finding is noteworthy. For the AB-BU 2SGMM, the price stability variable is negative and substantial, which is inconsequential for the robust AB-BU SGMM estimator. However, it has minimal impact on financial restraint. Finally, six of the eight outcomes obtained, in line with the diagnostic tests, indicate a favourable relationship between government effectiveness and budgetary discipline.

Table: 4
Estimation Outcomes for the Relationship between Government Effectiveness and Fiscal Discipline (Equation 2)

debt	**AH**	**AB GMM**	**AB 2SGMM**	**AB 2SGMM (Robust)**	**AB-BB SGMM**	**AB-BB SGMM (Robust)**	**AB-BB 2SSGMM**
$debt_{it-1}$	0,816* (0,000)	0,604* (0,000)	0,605* (0,000)	0,605* (0,000)	0,802* (0,000)	0,802* (0,000)	0,803* (0,000)
lny*eff	-2,643** (0,048)	-3,378* (0,001)	-3,356* (0,000)	-3,356* (0,006)	-3,997* (0,000)	-3,997** (0,020)	-3,994* (0,000)
lny	-94,961* (0,000)	-51,435* (0,000)	-50,500* (0,000)	-50,500* (0,003)	10,611* (0,000)	10,611* (0,000)	10,970* (0,000)
inf	- 0,025 (0,835)	0,138* (0,004)	0,131* (0,000)	0,131 (0,309)	-0,054 (0,240)	-0,054 (0,341)	-0,074* (0,000)
Number of Observations	385	385	385	385	420	420	420
Instrumental Variables	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$
Durbin Score Prob.	0,0000						
Wu-Hausman Prob.	0,0000						
AR(2) prob.		0,3331	0,1512	0,1657		0,8434	0,8477
Sargan		267,169 (0,000)	34,804 (0,999)		324,726 (0,000)		30,911 (1,000)

*Note: * denotes significance at 1%, ** 5%.*

Table 4 further shows the estimation results for the indirect relationship in Equation 2. First, the AH test results suggest the model has an endogeneity issue since the probability (prob.) values of the Durbin Score and Wu-Hausman tests are less than 0.05. It is also noted that all models except AH, AB GMM, and AB-BU SGMM lack second-order autocorrelation. The findings point out that the government effectiveness index, or more specifically, the interaction term (lny*eff), which is generated using the logarithm of gross domestic product per capita, has a negative and significant impact on fiscal discipline for the AB 2SGMM, AB 2SGMM Robust, AB-UK SGMM Robust, and AB-UK 2SSGMM estimators. This is consistent with the results in the equation in Table 3; however, the interaction term has a lesser impact. The impact of government effectiveness on fiscal discipline is more significant on its own. On the other hand, the interaction term analyses a

more minor indirect influence. This implies that the results of the AB-BU 2SGMM estimation and the robust AB-BU SGMM estimation, previously interpreted in Table 3, are more reliable. Accordingly, fiscal discipline is positively impacted by the effectiveness of government, yet increases in per capita income negatively impact it. This conclusion is also reflected in the indirect results for the interaction term.

In all instances, the public debt stock to gross domestic product (GDP) ratio from the preceding period positively impacts the public debt stock to GDP ratio from the subsequent period. The conclusion that fiscal discipline and indiscipline have complementary processes is also seen here. Once more, the robust estimate findings of the AB 2SGMM and AB 2SGMM suggest that an increase in per capita income benefits fiscal discipline. However, the AB 2SGMM estimation results show that, albeit to a lesser extent, the price stability variable has a negative impact on fiscal discipline. Yet, the AB 2SGMM robust estimate results reveal no meaningful correlation between fiscal discipline and price stability.

The price stability variable is significant only for the AB-SS 2SGMM estimator, and its impact on fiscal discipline is negligible, based on the results for the final two estimators, the AB-SS SGMM robust estimator and the AB-BB 2SGMM estimator. An increase in per capita income has a negative impact on fiscal discipline. Upon examining the general outcomes of Equations 1 and 2, it is evident that government effectiveness plays a significant role in determining fiscal discipline. Government effectiveness increases aligned with predictions in all equations and for most estimators. The literature will also benefit greatly from these empirical findings because institutional factors significantly impact public financial variables in the same way they may influence economic aspects. It has been shown that attaining successful outcomes and implementing public financial policies depends heavily on institutional underpinnings.

Finally, Table 5 shows the estimation results for the nonlinear relationship in Equation 3. The endogeneity issue is shown by the probability (prob.) values of the Durbin Score and Wu-Hausman tests being less than 0.05 for these models, as per the results of the AH test. On the other hand, the findings of the Sargan test under the AB GMM and AB-BB SGMM tests show that the models' instrumental variables are invalid.

It is also noted that all models except AH, AB GMM, and AB-BB SGMM lack second-order autocorrelation. The model includes the square of the government effectiveness indicator (eff^2) to analyse the nonlinear link. For a non-linear relationship to be identified, the eff and eff^2 variables' parameters need to be significant. Depending on the findings, it is possible to determine if the connection is U-shaped or inverted.

Table: 5
Estimation Results for the Relationship between Government Effectiveness and Fiscal Discipline (Equation 3)

debt	**AH**		**AB GMM**		**AB 2SGMM**		**AB 2SGMM (Robust)**		**AB-BB SGMM**		**AB-BB SGMM (Robust)**		**AB-BB 2SSGMM**	
$debt_{it-1}$	0,612* (0,000)	0,820* (0,000)	0,668* (0,000)	0,599* (0,000)	0,666* (0,000)	0,601* (0.000)	0,666* (0,000)	0,601* (0,000)	0,890* (0,000)	0,814* (0,000)	0,890* (0,000)	0,814* (0,000)	0,891* (0,000)	0,810* (0,000)
eff	-18,128 (0,200)	-20,096 (0,187)	-21,404 (0,060)	-0,058 (0,996)	-22,238* (0,000)	5,078 (0.217)	-22,238 (0.157)	5,078 (0,678)	25,506* (0,000)	-23,173** (0,039)	25,506* (0,000)	-23,173 (0,121)	25,498* (0,000)	-24,798* (0,002)
eff^2	3,514 (0,505)	3,065 (0,581)	2,642 (0,560)	-6,304 (0,153)	3,205* (0,001)	-8,292* (0,000)	3,205 (0,608)	-8,292 (0,092)	-12,065* (0,002)	3,727 (0,434)	-12,065* (0,003)	3,727 (0,477)	-12,184* (0,000)	4,105* (0,002)
lny		-97,702* (0,000)		-58,203* (0,000)		-54,941* (0,000)		-54,941* (0,001)		10,450* (0,000)		10,450* (0,002)		10,984* (0,000)
inf		-0,037 (0,766)		0,156* (0,002)		0,146* (0,000)		0,146 (0,229)		-0,062 (0,204)		-0,062 (0,315)		-0,071* (0,000)
Number of Observations	385	385	385	385	385	385	385	385	420	420	420	420	420	420
Instrumental Variables	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$	$\Delta debt_{it-1}$ / $debt_{it-2}$
Durbin Score Prob.	0,000	0,000												
Wu-Hausman Prob.	0,000	0,000												
AR(2) prob.			0,9625	0,3167	0,9377	0,1661	0,9383	0,1773			0,8535	0,7037	0,856	0,7075
Sargan			257,630 (0,000)	265,460 (0,000)	34,015 (0,999)	32,911 (0,999)			325,734 (0,000)	325,285 (0,000)			34,580 (1,000)	32,424 (1,000)

*Note: * denotes significance at 1%; ** 5%.*

Table 5 exhibits the robust estimate findings of AB 2SGMM about the non-linear relationship between fiscal discipline and government effectiveness. The results seem to suggest that the parameters of the *eff* and eff^2 variables in the models are not significant. The robust estimator of the AB-UNSGMM is likewise applicable to the model with control variables. The eff variable's parameter is insignificant in the model containing control variables, according to the AB 2SGMM estimate findings.

Within this context, the AB 2SGMM estimator, the AB-BB- SGMM robust estimator, and the AB-BB- 2SGMM estimator may all be used to study the non-linear relationship between fiscal discipline and government effectiveness. The parameters of *eff* and eff^2 are significant in both cases, according to the AB 2SGMM and AB-BB SGMM robust estimate findings. However, the AB-BB 2SGMM estimation results imply a need for more control factors.

When the estimators' results are examined, the parameters of the *eff* variable are found to be significant and negative, and the parameters of the eff^2 variable are found to be significant and positive in both the AB-BU 2SGMM estimator's model with control variables and the AB 2SGMM estimator's model without them as well. On the other hand, in the models in which the control variables of the AB-BB 2SGMM estimator and SGMM robust estimator are not used, the *eff* parameter is negative and significant, but the eff^2 parameter is positive and significant.

On the other hand, in all cases, the public debt stock to GDP ratio from the preceding period increases with the subsequent period. Concerning equation 3, it is also demonstrated that fiscal discipline- or lack thereof- is a self-reinforcing process. Again, while the AB-BB 2SGMM estimate findings show that a rise in per capita income has a negative effect on fiscal discipline, the price stability variable also negatively influences fiscal discipline, albeit to a lesser extent.

5. Conclusion

Significant information on national institutional quality levels and the evolution of institutional quality levels may be found in the global governance indicators that the World Bank has released since 1996. Numerous studies in the international literature reveal that many variables, including budget balance, fiscal discipline, economic growth, price stability, and employment growth which are among the fiscal and economic objectives of the countries -are closely correlated with institutional quality levels. The primary focus of this study is the relationship between fiscal discipline and government effectiveness, one of the global governance indicators as a measure of institutional quality.

Fiscal discipline is an essential objective in public finance. Lack of fiscal discipline might result in a cash crisis for the government, causing depreciation in the currency and inflation. Additionally, the effectiveness of the government may suffer. On the other hand, recent study data has highlighted the relevance of institutional quality and government

effectiveness in encouraging fiscal discipline. Fiscal discipline should be considered as a need rather than a choice. First, optimal results may be obtained by defining fiscal discipline or becoming acquainted with finding bottlenecks in the budget-planning process. Governments must, therefore, be explicit about their commitment to and accountability for implementing and overseeing the budgeting procedure and their comprehensive grasp of how it operates.

Public financial management is responsible for establishing fiscal discipline in a transparent and accountable manner. Recognising how these activities fit into the more extensive system of rules and regulations controlling resource allocation is essential. and what these efforts ultimately aim to achieve. Government accountability is a key component of fiscal performance. The participation of the majority of the public in political matters and the provision of public goods and services is critical for holding politicians and bureaucrats accountable. Countries prioritising government accountability have significantly lower debt ratios, demonstrating how accountability supports fiscal discipline. Therefore, it can be inferred that fiscal discipline is bolstered by accountability. Holistic financial practices are essential for promoting public sector reforms, integrating policy areas and actors involved in revenue and budget management, and linking the core strategic roles of public institutions with more comprehensive accountability elements.

This study addresses the relationship between fiscal discipline and government effectiveness for 35 OECD member countries from 2009 to 2021 from an empirical perspective. Among the autoregressive panel data model estimators used in this framework are the Anderson and Hsiao Method, the Arellano and Bond Generalised Method of Moments, the Arellano and Bond Two-Stage Generalised Method of Moments, the Arellano and Bover/Blundell and Bond System Generalised Method of Moments, and the Arellano and Bover/Blundell and Bond Two-Stage System Generalised Method of Moments. The first model (equation 1) highlights the linear and direct relationship between the two variables. It examines the relationship between fiscal discipline and government effectiveness as measured by the proportion of public debt stock in gross domestic product (GDP). To begin with, the findings of the Arellano and Bond Two-Stage Generalised Method of Moments demonstrate that developments and perceptions of government effectiveness positively impact budgetary discipline. Based on these findings, it can be inferred that as government effectiveness increases, the percentage of public debt stock to gross domestic product (GDP), a measure of fiscal discipline, will decrease.

The robust estimation results from the Arellano and Bond Two-Stage Generalised Method of Moments, as well as the estimation results from the Arellano and Bover/Blundell and Bond Two-Stage System Generalised Method of Moments, back up the Arellano and Bond Two-Stage Generalised Method of Moments.

The second model (Equation 2) provides a framework for analysing the indirect relationship between the variables. The impact of the interaction term on fiscal discipline is negative and significant, based on the robust estimation results of the Arellano and Bond

Two-Stage Generalised Method of Moments, Arellano and Bover/Blundell and Bond Two-Stage System Generalised Method of Moments, Arellano and Bond Two-Stage Generalised Method of Moments, and Arellano and Bover/Blundell and Bond System Generalised Method of Moments. On the other hand, the interaction term has a lesser influence than what equation 1 implies. In this case, fiscal discipline is positively impacted by the effectiveness of government.

In the final model (Equation 3), examining the non-linear relationship between government effectiveness and fiscal discipline, the estimation results indicate that there may be a non-linear relationship between government effectiveness and fiscal discipline in OECD countries. Still, they do not allow us to reach a firm conclusion on the nature of this relationship. More research in this area, conducted in multiple countries/country groups or over extended periods, will yield more definitive results.

As an indicator that aims to demonstrate perceptions of the quality of public facilities, as well as the level of independence from political pressures, the quality of policy development and execution, and the dependability of the government's commitment to such policies, one of the most significant findings of this study, is the critical role that government effectiveness index values play in achieving fiscal discipline. The outcomes of this study are in line with the conclusions of Montes et al. (2006-2014) for 82 countries, Imaginário and Guedes (2002-2015) for 164 countries, and the empirical data of Montes and Paschoal (2016). On the other hand, this study differs from the findings of Nguyen and Luong's (2021) study, which found that attempts to strengthen the institutional quality of government effectiveness, administrative quality, and the rule of law following system-wise changes in 27 transitional countries for the period of 2000-2018 increased the amount of public debt. Specifically, transition countries' efforts to achieve institutional quality throughout the adaptation of the market economy place a significant financial strain on them, which is assumed to be the reason for the difference in findings between the two studies.

This study is expected to offer a unique viewpoint to this field and significantly close a knowledge gap because few studies examine the relationship between institutional quality indicators and financial indicators, particularly in the local literature. The core elements of fiscal discipline are the OECD member countries' efforts to improve the quality of institutional services, particularly within the framework of government effectiveness, produce more appropriate and feasible policies, and take positive steps toward governments' commitment to the policies addressed. They can be recognised once it is acknowledged that institutional quality indicators, which highlight the primary drivers of economic growth and development, also determine fiscal discipline.

This research also examined the problem from a one-way causality relationship between fiscal discipline and government effectiveness. On the other hand, the problem may also be investigated from several angles when considered in the context of circular causality. This research found that government effectiveness promotes fiscal discipline in the case of OECD nations that have comparatively developed beyond a certain point. According to

specific research on underdeveloped countries, institutional elements could be more effective. Therefore, a country's institutional development may also help its economic growth, and a country's institutional development can broadly support its economic development. Research on this topic must include the development-underdevelopment cycle.

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