



Hacettepe University Graduate School of Social Sciences

Department of Economics

DETERMINANTS OF FISCAL SPACE: AN EMPIRICAL ANALYSIS FOR OECD COUNTRIES

Okan ASLAN

Master's Thesis

Ankara, 2022

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ACCEPTANCE AND APPROVAL

The jury finds that Okan ASLAN has on the date of 08.04.2022 successfully passed the defense examination and approves his Master's Thesis titled "Determinants of Fiscal Space: An Empirical Analysis for OECD Countries".

Prof. Dr. Ayşen SİVRİKAYA (Jury President)

Asst. Prof. Dr. Zühal KURUL (Main Adviser)

Asst. Prof. Dr. Alperen AĞCA (Member)

I agree that the signatures above belong to the faculty members listed.

Prof. Dr. Uğur ÖMÜRGÖNÜLŞEN

Graduate School Director

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18/04/2022

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ETİK BEYAN

Bu çalışmadaki bütün bilgi ve belgeleri akademik kurallar çerçevesinde elde ettiğimi, görsel, işitsel ve yazılı tüm bilgi ve sonuçları bilimsel ahlak kurallarına uygun olarak sunduğumu, kullandığım verilerde herhangi bir tahrifat yapmadığımı, yararlandığım kaynaklara bilimsel normlara uygun olarak atıfta bulunduğumu, tezimin kaynak gösterilen durumlar dışında özgün olduğunu, **Dr. Öğr. Üyesi Zühal KURUL** danışmanlığında tarafımdan üretildiğini ve Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Yazım Yönergesine göre yazıldığını beyan ederim.

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ABSTRACT

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The concept of fiscal space, which has gained importance especially after the 2008 global crisis, can be broadly defined as a budgetary possibility that provides resources to a government for a targeted purpose without negatively affecting the sustainable financial position of the government. Fiscal space is mostly associated with the concepts of fiscal sustainability and debt sustainability in the literature and generally discussed in terms of creation methods, measurement methods, and its relationship with other policies. The main objective of this study is to empirically reveal the impacts of the determinants of fiscal space and to present policy recommendations within this framework. For the empirical analysis, two different fiscal space indicators are calculated within the de facto fiscal space approach put forward by Aizenman and Jinjara (2010) and the debt limit-based approach of Ostry et al. (2010). Accordingly, this study analyzes the impacts of selected macroeconomic, institutional, political and global variables (determinants of fiscal space) on the calculated fiscal space indicators by using panel data techniques for 27 OECD countries in between 1999 and 2020. Our findings suggest that in addition to macroeconomic variables, institutional and political variables also have significant impact on fiscal space. On the other hand, global variables do not have direct impact on fiscal space but have an indirect impact by characterizing the global environment in terms of global liquidity.

Keywords

Fiscal Space, De Facto Fiscal Space, Debt Limit, Fiscal Sustainability, Fiscal Risk.

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ABBREVIATIONS

BFS	: Broad Fiscal Space
CDS	: Credit Default Swap
DSF	: Debt Sustainability Framework
EMU	: European Monetary Union
EU	: European Union
FS	: Fiscal Space
G7	: Group of Seven
GDP	: Gross Domestic Product
IMF	: International Monetary Fund
LICs	: Low Income Countries
MDGs	: Millennium Development Goals
MTEF	: Medium-term Expenditure Framework
NFS	: Narrow Fiscal Space
NGOs	: Non-governmental Organizations
OECD	: Organisation for Economic Co-operation and Development
PPP	: Public Private Partnership
SWEAP	: South-Western Euro Area Peripheral Countries
SWF	: Sovereign Wealth Fund
US	: United States
UK	: United Kingdom
UNDP	: United Nations Development Programme

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INTRODUCTION

The concept of fiscal space, which has been used frequently in the international literature in recent years, has gained importance during the 2008 crisis and in the post-crisis period in terms of stabilizing public finance and giving confidence to financial markets. After the global crisis, many countries followed expansionary budgetary policies that violated their budget and borrowing targets in the face of increasing unemployment and decreasing GDP. Indeed, according to OECD data, while the average general government debt to GDP ratio of OECD countries was around 57% in 2008, this ratio increased gradually in the following years and reached 95% by 2020. Likewise, the fiscal deficits of countries also increased in this period. This situation has brought along hesitations about the sustainability of fiscal policies and rising public debt ratios. In this framework, availability of fiscal space has been considered as a factor that supports fiscal sustainability.

Fiscal space provides a room for governments to maneuver in the face of unexpected fiscal shocks or cyclical events. In this sense, it can be seen as a tool that can be used against fiscal risks in the economy. Financing need that emerged on a global scale with the Covid-19 pandemic reminded us once again this function of the fiscal space. In addition, the concept of fiscal space comes to the fore in the implementation of different policy goals of countries and the financing of their economic development. All these gains that come with the concept of fiscal space have brought about the desire to have information about the level of fiscal space that countries have or may have, both in countries and in international organizations. Existence of fiscal space has also been at the center of recent debates about steering fiscal policy to accelerate growth in advanced and developing economies (Kose et al., 2017: 2).

In the literature, the concept of fiscal space is discussed in various aspects, both theoretically and empirically. The concept is mostly associated with the fiscal sustainability and debt sustainability. Although there is no consensus in the literature on the definition of the concept of fiscal space, it can be said that the most common definition is *“the availability of ‘budgetary room’ that allows a*

government to provide resources for a desired purpose without any prejudice to the sustainability of a government's financial position" (Heller, 2005a). Fiscal space creation methods also take various forms. It is seen that some of the methods in the literature are related to fiscal policy and some are related to monetary policy. In the empirical literature, approaches regarding the measurement of the fiscal space come to the fore. Fiscal space measurement methods are generally explained with concepts such as tax years required to repay public debt (Aizenman and Jinjarak, 2010), debt limit (Ostry et al., 2010) and Laffer curve (Park, 2012). In addition, there are also some other studies in the literature that examine the factors affecting the fiscal space based on these measurement methods. In this context, the general point of view in the recent literature is primarily to determine the level of fiscal space of countries.

The main objective of this study is to empirically reveal the impacts of the determinants of fiscal space and to present policy recommendations within this framework. To this end, we analyze the impacts of selected macroeconomic, institutional, political and global variables (determinants of fiscal space) on the calculated fiscal space indicators by using panel data techniques for 27 OECD countries in between 1999 and 2020.

The contributions of this thesis are expected to be manifold. First, the number of studies examining the determinants of fiscal space is limited in the literature and there are also very few studies dealing with OECD countries in particular. So, this study extends the literature in this direction. Second, two different fiscal space indicators are used in the analysis. In addition to de facto fiscal space indicator put forward by Aizenman and Jinjarak (2010), we interpreted the Ostry et al. (2010) approach in a different way and obtained another fiscal space indicator based on debt limits. Differently, we calculated the debt limits of the countries on the basis of the risk premiums measured by the difference between long term interest rate and risk-free interest rate. To the best of our knowledge, this is the first study that examines the determinants of the OECD countries' fiscal space with the Ostry et al. (2010) approach. Third, apart from the existing studies in the literature, this analysis also includes global variables (global liquidity and global

risk) among the determinants of the fiscal space to quantify the impacts of global conditions on fiscal space. Last but not least, this study argues how policies to amplify the fiscal space can be improved. In order to give a policy recommendation, we examined the impact of tax reforms on the fiscal space as a revenue increasing policy. Also, we analyzed whether this effect varies depending on the institutional quality of the countries.

The organization of the study is as follows: Chapter 1 deals with the theoretical background of the concept of fiscal space and focuses on the fiscal space definitions and creation methods. Chapter 2 explains the various approaches regarding the measurement of the fiscal space. Chapter 3 reviews the studies on the measurement of fiscal space in the literature and evaluates determinants of fiscal space and its possible effects based on these studies. Chapter 4 presents the empirical analysis about the effects of selected macroeconomic, institutional, political and global variables on the calculated fiscal space indicators. Finally, the concluding section evaluates the results of the study and discusses the policy implications.

CHAPTER 1

THEORETICAL BACKGROUND OF FISCAL SPACE

1.1. EMERGENCE AND IMPORTANCE OF FISCAL SPACE

Today, in order to fulfill the requirements of being a "social state", governments have to deal with many policies related to economic development, elimination of unemployment and poverty, ensuring equality in income distribution, preventing crises, ensuring economic stability, as well as producing public goods and services. The feasibility of such policies is closely related to the resources owned by the governments (Karaca, 2012: 417). With the increasing role of the government in terms of economic and social policies over time, policies that will provide additional resources to meet the increasing expenditures have become increasingly important. At this point, the concept of fiscal space, which aims to create additional resources to meet the increasing expenditures without harming the fiscal sustainability of the countries, appears as a popular research topic.

The fiscal space provides required resources to the government without distorting its financial position, in other words, it creates a fiscal maneuvering area for the governments. This situation has brought about the desire of both developed and developing countries to have information about the level of fiscal space to use for unforeseen situations (Akbayır & Yereli, 2018: 254).

Principally, the concept of fiscal space emerged as part of the wide-ranging debate between countries and international financial institutions about the capacity to increase public expenditure in the late 1990s, after the Asian crisis (Eroğlu & Maraş, 2019: 174; Marcel, 2014: 2). Heller (2005a) states that the concept of fiscal space emerged when governments (especially Latin American and European governments) argued that fiscal constraints should be relaxed to accommodate additional borrowing to fund infrastructure projects which create productive assets that pay for themselves over the long term, thus creating the fiscal space. To generate fiscal space for such investments these countries

proposed to exclude them from macroeconomic fiscal targets (Marcel, 2014: 2). The term has also been used by advocates of higher health and education-oriented outlays who have argued that these expenditures will eventually pay for themselves through higher returns to human capital (Heller, 2005b: 1-5). In line with this idea, the discussion of fiscal space has subsequently been broadened in the World Bank, bilateral donor community, and NGOs. These authorities argued that current spending for health and education, which adds to human rather than physical capital, also has a valid claim on any available fiscal space because such outlays can pay for themselves over the long term (Heller, 2005a: 2)

From the perspective of development economics, fiscal space is a tool that can be used to finance economic development process and in particular, to achieve the Millennium Development Goals (MDGs)¹. Roy et al. (2007: 2) and Brun et al. (2006: 8) argue to fund internationally agreed development goals, it is necessary to make use of all available resources within country's fiscal space.

The importance of the fiscal concept varies for countries at different development level. Although the term was initially devised for the countries have low-income level, it has useful application in developed and developing countries as well (Schick, 2009: 2; Doherty & Yeaman, 2008: 80).

For less developed and developing countries, the issue of fiscal space arises in the immediate term. There is an urgent need for today's expenditures, and the challenge is how to find the resources for their financing (Heller, 2005a: 5). These countries are trying to overcome the lack of resources, which is the biggest

¹ The Millennium Development Goals (MDGs) were eight international development goals for the year 2015 that had been established following the Millennium Summit of the United Nations in 2000, following the adoption of the United Nations Millennium Declaration. These goals are; i) eradicate extreme poverty and hunger, ii) achieve universal primary education, iii) promote gender equality and empower women, iv) reduce child mortality, v) improve maternal health, vi) combat HIV/AIDS, malaria, and other diseases, vii) ensure environmental sustainability, viii) develop a global partnership for development (<https://www.un.org/millenniumgoals/>).

obstacle to their potential growth, by arranging policies that will ensure the formation of fiscal space (Karaca, 2012: 417).

In developed countries, the expected goal from the fiscal space is to allocate resources effectively in accordance with macroeconomic targets with annual and medium-term budgeting decisions (Ünsal & Durucan, 2014: 280-281). For developed countries, an important issue is that if much of the resources of a government's budget are tied up in nondiscretionary spending categories such as social security expenditures, which is possible due to the aging population, it means that there is obviously not much fiscal space for discretionary programs. This situation may imply the creation of "negative" fiscal space on future budgets and may weaken the hand of the government against unexpected economic developments. Fiscal space should thus be ensured so that a government can meet unanticipated challenges (Heller, 2005a: 5).

Regardless of a country's level of economic development, fiscal space contributes to improved economic stability, competitiveness and living standards (Doherty & Yeaman, 2008: 80). The importance of the fiscal space is common for each country groups in terms of facilitating resources for the realization of national policy priorities and reaching certain targets, providing an opportunity for governments to take an action against events that may create crisis and similar financial risks, increasing the credibility of the government in the market by supporting its solvency.

Last but not least, in addition to the ever-increasing financing needs for the provision of public functions, the search for resources that governments can use to eliminate the negative effects of the crises, has increased the importance of the concept of fiscal space. After the global crisis, many countries followed expansionary budget policies that violated their budget and borrowing targets in the face of increasing unemployment and decreasing GDP. While these expansionary fiscal policies led to an increase in expenditures, there were decreases in revenues due to the decrease in investments. This situation caused significant deterioration in the fiscal balance. On the other hand, financial instability and increasing debt burden during the crisis increased the need for

fiscal consolidation (Ulusoy et al., 2013: 247). In that period, countries with relatively large fiscal space felt the effects of the crisis less and had more freedom to implement expansionary fiscal policies. On the other hand, countries with low fiscal space were caught unprepared for the crisis. Policies against the crisis increased the budget deficits and debt stock, and in a sense, the financial crisis turned into a debt crisis. To conclude, in the context of the high levels of public debt in most countries due to the 2008 Crisis and the expansionary reaction it triggered, it was considered important to evaluate the scope of the fiscal space of the countries (Botev et al., 2016: 5-7). After this point, the concept of fiscal space, which has been associated with the concept of "fiscal sustainability" since it began to be discussed in the literature, has begun to be more closely associated with "sustainability of debts" specifically (Bastos & Pineda, 2013: 3).

1.2. DEFINITION OF FISCAL SPACE

There are various definitions in the literature about the concept of fiscal space. The term is generally associated with the concept of fiscal sustainability², and more specifically, debt sustainability³. Therefore, definitions are often closely related with these concepts as well.

In the literature, the most commonly used and systematic definition was put forward by Heller (2005a). Heller (2005a: 3) defines fiscal space as follows:

“the availability of ‘budgetary room’ that allows a government to provide resources for a desired purpose without any prejudice to the sustainability of a government’s financial position.”

² Fiscal sustainability is the ability of a government to maintain public finances at a credible and serviceable position over the long term (OECD, 2013: 50). In other words, it refers to the ability of government to sustain spending on a desired purpose for its planned duration, and to meet the cost of borrowing without compromising the government's financial position (Hay & Williams, 2005: 4).

³ In general terms, debt sustainability means that a government should be able to service its debt at any point in time. This implies that a government must be both solvent and liquid (Alcidi & Gros, 2018: 5).

As it can be interpreted from aforementioned definition, "budgetary room" refers to the fiscal resources in the public budget, and the expression "sustainability of government's financial position" refers to its fiscal (debt) sustainability. Heller (2005a) established a relationship between fiscal space and fiscal sustainability and also denoted that this connection is about the capacity of the government to finance its expenditure program, to service debt payment obligations and to ensure its solvency (Heller, 2005a: 3).

The Development Committee stated that in order to ensure the solvency of the government, the primary surplus and seigniorage income in general should be at least as large as its debts. In this direction, Development Committee explained fiscal space as "the gap" between the current expenditure level and the maximum expenditure level that government can undertake without weakening its solvency (Development Committee, 2006: 14).

United Nations Development Programme (UNDP) interpreted the concept of fiscal space more broadly and made a definition within the framework of development economics. Accordingly, Roy et al. (2007) criticized the conceptualization of fiscal space term as a residual concept such as "gap" or "room" and explained fiscal space in terms of development objectives such as financing of MDGs. In this context, it is stated that the fiscal space is:

"the financing that is available to government as a result of concrete policy actions for enhancing resource mobilization, and the reforms necessary to secure the enabling governance, institutional and economic environment for these policy actions to be effective, for a specified set of development objectives."

Heller's (2005a) and Development Committee's (2006) definitions deal primarily with the short-term consequences of an increase in public spending and mainly with its potential negative effects. However, Roy et al. (2007) attempts to assess how concrete policy actions can support trend shifts in the potential for local resource mobilization for pro-poor public investment (Roy et al., 2007: 1-3). While macroeconomic stability, financial solvency and sustainability stand out in the

definitions of Heller (2005a) and the Development Committee (2006); in UNDP's definition, development objectives come to the forefront and the fluidity of resources has a critical importance (Ulusoy et al., 2013: 252).

Brun et al. (2006) defined fiscal space as narrow fiscal space (NFS) and broad fiscal space (BFS). According to this two-armed approach, while NFS encompasses government revenues (tax and non-tax revenues) and internal financial resources (domestic borrowing and seigniorage); BFS consists of NFS along with external resources (grants, external borrowing) and domestic resources created by rationalization of expenditures (Brun et al., 2006: 9).

Ostry et al. (2010), Aizenman and Jinjark (2010) and Park (2012) made definitions within the scope of the fiscal space measurement methods they put forward. Ostry et al. (2010) associated the concept with the “debt limit” and defined it as the difference between the debt limit and current level of public debt (Ostry et al., 2010: 3-6). Aizenman and Jinjark (2010) added the phrase “de facto” to the concept and defined as the inverse of the tax years it would take to repay the public debt (Aizenman & Jinjark, 2010: 1), in other words, “resources used in the payment of public debt in periods of low tax collection” (Akbayır & Yereli, 2018: 261). Park (2012) focused on the effect of aging trends on the revenue generating capacity and stated that if the aging population works less, the tax base and income will decrease, and hence fiscal space. In Park (2012: 3)'s definition fiscal space is the distance between the current tax revenue level and the peak of the Laffer Curve⁴ or maximum tax revenue. The aforementioned measurement methods and the details about these approaches will be explained in Chapter 2.

Schick (2009) establishes a relationship between budgeting and fiscal space and argues how budgeting can be transformed into a process to allocate scarce fiscal

⁴ The Laffer Curve is a tax theory suggesting an inverted-U shaped relationship between tax rates and the amount of tax revenue collected by governments. According to the Laffer Curve; as the tax rate increases, the tax revenue also increases up to a certain point (up to the optimal tax rate); if the tax rate continues to increase after this point, the tax revenue will not increase, on the contrary, it will begin to decrease (Şen & Sağbaş, 2020: 177 – 179).

space. In this context, as a definition related to budgeting, Schick (2009) defined fiscal space as the financial resources that a government can use for policy priorities through the budget and related decisions. Accordingly, the term of fiscal space does not include money allocated in the previous budget and continuing in the next budget. However, it includes funds raised through reallocation, increased resources created by economic growth, borrowed funds in excess of current revenues and additional income from tax increases (Schick, 2009: 2-3).

Eller et al. (2011) argues that the concept of fiscal space gains importance in terms of crisis mitigation capacity and crisis resilience of countries. In this context, Eller et al. (2011) explains fiscal space as “the capability of fiscal policy makers to properly respond to a business cycle shock” (Eller et al., 2011: 8).

In line with Heller (2005a)’s definition, IMF describes fiscal space as a room for discretionary fiscal policy to be undertaken according to existing plans without jeopardizing fiscal sustainability. In this sense, fiscal space exists if a government can increase spending or lower taxes without jeopardizing market access and compromising debt sustainability (IMF, 2016: 6; IMF, 2018: 1).

Botev et al. (2016) also put forward a definition for the fiscal space by considering it in terms of market access. Accordingly, Botev et al. (2016) defines fiscal space as “a measure of how much governments can borrow without losing market access or facing sustainability challenges” (Botev et al., 2016: 6-7). This definition expresses a trade-off between borrowing and sustainability concerns.

Recently, Kose et al. (2017) broadly defined fiscal space as “the availability of budgetary resources for a government to service its financial obligations” (Kose et al., 2017: 1). Besides market access, Kose et al. (2017) also evaluates the fiscal space in terms of balance sheet vulnerability, external and private sector risks, debt sustainability issues.

As can be seen, different features are highlighted in the definitions of the fiscal space, and while some of the definitions are restrictive, in others the concept is handled in a broader framework. The concept of fiscal space is used in different ways and therefore a precise definition of the concept remains unclear. In the

beginning, it seems that the fiscal space was likened to a budgetary room or expenditure gap. It is also mentioned that it can be a tool for countries to achieve their targeted policy goals or to cope with unexpected economic situations. Later on, fiscal space has been considered as a measurable concept and some definitions have been put forward in this framework. These perspectives have enabled the concept of fiscal space to be handled empirically in the literature. In addition, fiscal space is also explained with topics such as budgeting, borrowing, market access, business cycles etc. However, in general, the clear link between fiscal space and fiscal (or debt) sustainability stands out.

The definitions in the literature regarding the concept of fiscal space are summarized in Table 1.

Table 1: Definitions of Fiscal Space

SOURCE	DEFINITION
Heller (2005a)	The availability of "budgetary room" that allows a government to provide resources for a desired purpose without any prejudice to the sustainability of a government's financial position.
Development Committee (2006)	The "gap" between the current expenditure level and the maximum expenditure level that government can undertake without weakening its solvency.
Brun et al. (2006)	Narrow Fiscal Space (NFS) encompasses government revenues (tax and non-tax revenues) and internal financial resources (domestic borrowing and seignorage). Broad Fiscal Space (BFS) consists of NFS along with external resources (grants, external borrowing) and domestic resources created by rationalization of expenditures.
Roy et al. (2007)	The financing that is available to government as a result of concrete policy actions for enhancing resource mobilization, and the reforms necessary to secure the enabling governance, institutional and economic environment for these policy actions to be effective, for a specified set of development objectives.
Schick (2009)	The financial resources that a government can use for policy priorities through the budget and related decisions.
Ostry et al. (2010)	The difference between the debt limit and current level of public debt.
Aizenman and Jinjark (2010)	Tax years it would take to repay the public debt. In general terms, resources used in the payment of public debt in periods of low tax collection.
Eller et al. (2011)	The capability of fiscal policy makers to properly respond to a business cycle shock.
Park (2012)	The distance between the current tax revenue level and the peak of the Laffer Curve or maximum tax revenue.
IMF (2016; 2018)	Room for undertaking discretionary fiscal policy relative to existing plans without endangering market access and debt sustainability.
Botev et al. (2016)	A measure of how much governments can borrow without losing market access or facing sustainability challenges.
Kose et al. (2017)	The availability of budgetary resources for a government to service its financial obligations.

Source: Author.

1.3. CREATING FISCAL SPACE

Fiscal space creation methods can take various forms. It is seen that some of the methods in the literature are related to fiscal policy and some are related to monetary policy.

Policies for the creation and expansion of the fiscal space can be successful as a result of the mutually supportive implementation of fiscal policy and monetary policy and the support of these policies by national and international financial circles. It is emphasized that the fiscal space can be created by stable and effective fiscal and monetary policies (Heller, 2006: 78). However, due to the different characteristics and economic conditions of the countries, the methods of creating fiscal space should be evaluated on a country-specific basis.

Fiscal space creation methods can be listed as follows: reprioritization of expenditure, raising revenues, borrowing, foreign aid (external grant), economic growth, Public – Private Partnerships (PPPs), privatization, seigniorage, wealth and stabilization funds, fiscal decentralization and some institutional arrangements and reforms.

The methods used in creating fiscal space can be applied individually or designed as a combination of methods compatible with each other. In other words, methods can be complementary and substitutable among themselves. While methods that are substitutes for each other cannot be used together, methods that are complementary to each other can be used at the same time and by supporting each other (Çelen & Yavuz, 2014: 32). For example, while it is seen that the reprioritization of public expenditures has a complementary feature with borrowing, foreign aid, economic growth and raising revenues; it is assumed that the level of its interaction with Public Private Partnerships (PPPs) and seigniorage income generation is low.

The substitution and complementarity of some fiscal space creation methods with each other are shown in Table 2.

Table 2: Substitution and Complementary Status of Some Creation Methods

METHODS	Economic Growth	Reprioritization of Expenditures	Raising Revenues	Seigniorage	Public - Private Partnerships	Borrowing and Foreign Aid
Economic Growth		Complementary	Complementary	Complementary	Complementary	Complementary
Reprioritization of Expenditures	Complementary		Complementary	No Effect	No Effect	Complementary
Raising Revenues	Complementary	Complementary		Substitution	Complementary	No Effect
Seigniorage	No Effect	No Effect	Substitution		No Effect	Substitution
Public - Private Partnerships	Complementary	No Effect	Complementary	No Effect		Complementary
Borrowing and Foreign Aid	Complementary	Complementary	Complementary	No Effect	Complementary	

Source: Çelen and Yavuz (2014)

1.3.1. Reprioritization of Expenditures

Reprioritizing and rationalizing public expenditures by changing their composition is one of the important tools that countries can use to create fiscal space. Reprioritization and rationalization of expenditures creates fiscal space by generating additional resources for new expenditures in the budget by ensuring the efficiency of existing expenditures without increasing the total budget appropriations for public expenditures (Ulusoy et al., 2013: 256).

In this context, governments should review outdated and unproductive public expenditures, which are recurrent in particular. For this purpose, it is necessary to limit or revise applied subsidy policies, defense and internal security expenditures, foreign visits and diplomacy expenses; reduce wage and salary in the non-key sectors and rationalize the quality and quantity of inefficient public employees, in other words “ghost workers” (Heller, 2005a: 7). Elimination of these wasteful expenditures from government’s budget directly frees up resources that can be channeled to productive expenditures and also indirectly increase

government's credibility and its borrowing ability (Development Committee, 2006: 14).

However, it should be noted that the productive expenditures must be protected because not spending enough for critical sectors (such as education, health, R&D) may have negative social effects and this would be costly and time consuming to rebuild these sectors over time (Heller 2005b: 2). At the same time, too much spending on certain sectors can also create a crowding out effect on other sectors (Heller, 2005a: 5). As a result, the expansion of the fiscal space that will emerge in the short term may reverse in the long term, bringing along the possibility of serious contraction. In other words, the consequences of intertemporal choices should be taken into account in the creation of fiscal space (Çelen & Yavuz, 2014: 32).

Effective resource allocation of the government can indirectly affect private sector by increasing the efficiency of private sector expenditures. For example, if the government improves the quality of its own healthcare, households may reduce spending on inefficient private sector healthcare providers, even if they have to pay user fees. In a similar vein, if the government provides infrastructure services properly, it may increase the returns of the private investment as well (Heller, 2006: 76).

1.3.2. Raising Revenues

Governments can create fiscal space through using tax and non-tax instruments for raising their revenues (Development Committee, 2006: 15). However, tax revenues are more sustainable and predictable, and also constitute the highest share in public revenues. For this reason, it is stated that public revenues should be increased by tax instruments rather than non-tax instruments (Çelen & Yavuz, 2014: 32).

Raising revenue is closely related to tax capacity⁵ ve tax effort⁶. In other words, in order to create fiscal space by increasing tax revenues, there must be the potential to be taxed, the ability and willingness to pay (Çelen & Yavuz, 2014: 40). When the tax capacity is greater than the tax effort there is always an opportunity to increase public revenues. In this sense, while the positive tax effort shows that the revenue potential is fully mobilized in an economy; a negative tax effort indicates that there is space in the income side and that it is not used enough (Brun et al., 2006: 3). Therefore, creating fiscal space by increasing revenues is an important option especially for the countries with low tax share in their national income (Heller, 2005a: 6-7).

Heller (2005a, 2005b, 2006) emphasize that the tax revenue as a share of GDP should be at least 15 percent as a minimum objective for low-income countries. On the other hand, since the ratio of tax shares to national income in developed countries approach to optimal tax revenue, it is economically and politically difficult to increase this ratio further.

Generally, fiscal space can be expanded by creating additional income through the introduction of new taxes, expanding the existing tax base with tariff changes, taxing previously idle income sources, and improvements in tax administration to prevent tax avoidance and tax evasion (Tan, 2014: 193; Ter-Minassian, 2008: 21). The implementation of a comprehensive tax reform that will include all these and the reduction of the share of taxes that have a distorting effect on the economy contribute to the creation of fiscal space by increasing income (Development Committee, 2006: 15). In cases where it is not possible to increase tax rates, reviewing and reducing tax expenditures⁷ may also have an income-increasing effect (Ulusoy et al., 2013: 257). Furthermore, public revenues can be

⁵ Tax capacity can be defined as the sum of all taxpayers' ability to pay taxes (Akdoğan, 2013: 185).

⁶ Tax effort is the proportional relationship between tax capacity and actual tax revenue in a country (Akdoğan, 2013: 186).

⁷ Tax expenditures are generally defined as those government expenditures carried out through tax legislation, regulations, and practices that reduce or defer taxes for some taxpayers (Villela, 2010: 4). Tax expenditures can be counted as: exceptions, discounts and exemptions.

increased without increasing the tax burden on the formal sector by taxing the informal economy. For this, institutional improvements such as effective criminal and judicial system and extensive and tight tax audit network are considered necessary (Çelen & Yavuz, 2014: 41-42).

1.3.3. Borrowing

Another tool to be used in creating financial space is to increase the amount of borrowing obtained from the domestic and foreign markets. Governments generally pursue policies to benefit from unused borrowing capacity⁸ through increasing public sector fiscal credibility, strengthening the growth of the revenue base and locking up future financial resources (Development Committee, 2006: 15). Strength of credibility depends on the government's financial transparency and adoption of fiscal rules that ensure its ability to repay its debts. Increase in the credibility of the government provides access to resources under more favorable conditions and at lower costs. This situation may facilitate the debt service easier, as well as reduce the share of debt interest payments in the budget, thus enabling the creation of additional resources (Ulusoy et al., 2013: 258). In addition, the government can increase its borrowing capacity and hence fiscal space by increasing its income base by giving a larger primary surplus and by locking up some resources that it can mobilize in the future to pay off debt (Development Committee, 2006: 15-16).

There are some important points to be considered in creating a fiscal space through borrowing. The cost incurred by borrowing should be evaluated by considering the return on the expenditures. The question of whether the return on expenditure covers the cost of borrowing gains importance in terms of providing a justification for borrowing (Karaca, 2012: 423, Heller, 2005: 9). If the borrowed funds are used to finance current expenditures instead of investment

⁸ Development Committee defined "borrowing capacity" as the difference between the maximum level of net debt that it can sustain (on the basis of the maximum present and future primary surpluses it can generate) and its current level of net debt (Development Committee, 2006: 15).

expenditures, problems may arise in fulfilling the obligation to pay debt. In addition, debts used in financing investment expenditures have a growth-enhancing effect up to a certain point, and debt service payments may exceed the return from borrowing after a certain point. Therefore, the self-financing of debt must be taken into account in borrowed funds (Ulusoy et al., 2013: 258). In this context, it is critical to direct the resources provided by borrowing to productive and growth-enhancing expenditures in the long run. Consequently, debt-financed spending must be evaluated in terms of its impact on the growth rate or on a country's capacity to generate the income needed to repay that debt (Heller, 2005a: 4). The crowding out effect of borrowing on private sector investments should also be taken into account and evaluated well. Borrowing more to create fiscal space may crowd out private investment, either by reducing the amount of resources available to the private sector or by raising the cost of those resources (Ulusoy et al, 2013: 260-261). In a sense, the increase in the fiscal space of the government by borrowing may lead to a decrease in the financing opportunities of the private sector. Therefore, attention should be paid to whether there is sufficient capacity in the economy in terms of resources used by the private and public sectors (Hay & Williams, 2005: 27).

In creating a fiscal space through borrowing, it is important to note that the public debt management should be carried out in a way that will meet the financing need at the lowest possible cost in the medium and long term, taking into account the developments in the domestic and foreign markets (Karaca, 2012: 424). Within the scope of debt management, it should be aimed to minimize the interest, maturity and exchange rate risks, and to reduce the amount of debt by taking advantage of cyclical movements and market movements (Çelen & Yavuz, 2014: 49). In order to control the size of the public debt and reduce the debt stock to GDP ratio, changes in the maturity, currency, composition of debt should be monitored. Reducing the debt stock contributes to the fiscal space by reducing the share spent on interest payments (Çelen & Yavuz, 2014: 49-50).

Finally, it should not be forgotten that in order to use borrowing successfully as a method of creating fiscal space, the country should have a developed banking

and financial system, have a market depth, and use modern techniques in debt management (Çelen & Yavuz, 2014:49-50). Diversity of debt instruments that can be used against risks such as interest rates, exchange rates and inflation allow debt management to be carried out more prudently. An example would be the use of market-based hedging instruments such as financial derivative instruments. In addition, the wide investor portfolio in the domestic and foreign markets will increase the financing opportunities of the government. In this respect, the fiscal space will also be positively affected by an active debt management that takes into account risk and return mechanisms.

1.3.4. Foreign Aid

Foreign aid (or external grant) is the support provided to less developed and developing countries by developed countries for humanitarian, political and economic reasons. Foreign aid with economic content is the most common type of foreign aids, which generally includes development aid (so it is related with MDGs) given to less developed countries from developed countries and international organizations (Çelen & Yavuz, 2014:51). As a matter of fact, foreign aid is a method of creating a fiscal space that can be used especially by less developed and developing countries with insufficient resources.

Foreign aids should be “sustainable” and “predictable” in order to fulfill the function of creating fiscal space properly. Only a sustainable and predictable flow of aids can create the potential to raise up sustainable spending and reduce uncertainty about whether a grant is one-off only or not (Heller, 2005b: 3). On the other hand, it is important to use foreign aids to solve structural problems (lack of infrastructure, capital accumulation, technical inadequacies in production process etc.) in less developed countries and to finance long-term productive investment and MDGs.

Foreign aids have more obvious effects on creating fiscal space than borrowing. Since foreign aids are outright in nature, unlike borrowing, they do not bring any extra cost to the public budget. However, foreign aids may harm a country's

macroeconomic situation for some reasons. The large amount of resource flow to the countries receiving foreign aid, may increase the real exchange rate in those countries and reduce their competitiveness. Another negative situation is that the incentives of the administrations in the countries receiving foreign aid to establish an effective production and public financial structure may blunt and make them dependent on aid. This situation, which can also be called the Dutch disease⁹, may reduce productivity in these countries. Managing foreign aids effectively requires productivity gains to offset pressures on non-tradable assets, however it is a challenge in practice (Development Committee, 2006: 20; Heller, 2005a: 11). Foreign aids may also increase rent-seeking activities within state bureaucracies and may be misused (Heller, 2005a: 11). For this reason, sometimes it may be necessary to limit the use of foreign aids as a method of creating fiscal space, because these adverse effects may cause contractionary effects.

1.3.5. Economic Growth

Expanding the fiscal space is closely related to economic growth opportunities. Governments can increase economic growth and indirectly the fiscal space by various channels: eliminating the problems based on factor supply and organizational deficiencies in the economy, using idle production factors in production, increasing factor productivity with technological developments, making investments to increase the quality and quantity of physical and human capital, increasing the institutional quality etc. (Schick, 2009: 8-9; Çelen & Yavuz, 2014: 33-37). At the same time, economic growth seems to be complementary to all other fiscal space creation methods, as can be seen in Table 2.

⁹ The term "Dutch Disease" was introduced to describe the situation experienced in the Netherlands in the 1960s after the discovery of gas deposits in the North Sea. The discovery of natural resources was followed by an appreciation of the real exchange rate and a crowding out of the manufacturing exports. More recently, the term is also used to describe the negative effects on exports induced by foreign aid, remittances, capital inflows or an improvement in the terms of trade (Faltermeier et al., 2017: 3)

The most obvious effect of growth on the fiscal space appears in terms of public revenues. Economic growth, which means an increase in national income, also increases the revenue generation capacity (i.e., tax base) of the countries. Accordingly, it is stated that with high growth performance, public revenues generally increase faster than GDP due to tax elasticities (Schick, 2009: 8).

Increasing the growth rate will not only increase the budgetary and future revenue potential of public authorities, but will also create the possibility of a decrease in the public debt stock and debt service. In this direction, the decrease in the public debt stock will not only expand the fiscal space, but also allow private sector investments to be funded under more favorable terms (Çelen & Yavuz, 2014: 37).

1.3.6. Public Private Partnerships

Public Private Partnerships (PPPs) are a contractual model of cooperation between public administration and private enterprises to fund, build, renovate, manage and maintain a service (Çelen & Yavuz, 2014: 46). Essentially, with the PPPs, the investment expenditures which are normally covered from the central budget are financed by the private sector. To this end, PPPs can be used to apart public investment expenditures from the budget and to reduce the need for borrowing to finance public expenditures (Karaca, 2012: 425). In this way, it is possible to expand the fiscal space and to evaluate financial resources in different areas (Çelen & Yavuz, 2014: 46). It is seen that PPPs is a method used especially in less developed and developing countries that have a shortage of resources in the financing of infrastructure investments.

Governments should prefer PPP models to the extent that private enterprise can operate more efficiently and effectively than public institutions in constructing and managing large infrastructure projects and performing related public services (Kesik & Telli, 2014: 87-88). At this point, the scale advantage of the public sector and the efficiency advantage of the private sector can be used for a common purpose. With PPP agreements, the investment costs, benefits and risks related to infrastructure projects are shared between the public and private sectors, and

it becomes possible to fund investment expenditures by the private sector in case the central government budget is insufficient (Çelen & Yavuz, 2014: 46). In this way, PPP models can both create a risk sharing mechanism and provide more effective and better-quality public services with existing resources. Therefore, it can provide a more rational use of fiscal space (Şahin, 2014: 183).

In addition to the benefits they provide, PPPs also bring some financial risks. Considering the potential effects of PPPs, the government's implicit costs and fiscal responsibilities may increase in some cases. In this sense, the effects of creating fiscal space in the long run seem to be indirect and controversial (Şahin, 2014: 183). Accordingly, efficiency gains obtained by the PPP method may be reversed in the medium and long term as a result of the private enterprise reflecting all of its investment costs to rent and operating service fees. In this case, public services may become more costly (Kesik & Telli, 2014: 87 - 88). Additionally, irrational guarantees given by the government to private enterprises may exceed the social benefit expected from PPPs, and ultimately the costs that service consumers have to bear may be reflected to the entire society or taxpayers (Çelen & Yavuz, 2014: 46). In other words, the fiscal space produced by the PPP method in the short term may shrink in the medium and long term, and on the contrary, it may turn into an additional cost (Kesik & Telli, 2014: 87 - 88). Therefore, all costs and benefits of PPPs must be taken into account and cooperation agreements must be carefully drawn up so that these risks do not impose additional financial obligations on the public (Doherty & Yeaman, 2008: 81).

1.3.7. Privatization

Privatization is one of the methods of creating fiscal space. Privatization practices can create fiscal space by preventing waste of resources in the public sector, increasing production and national income by ensuring the rational use of resources transferred to the private sector, and contributing to additional efficient expenditures by reducing budget deficits (Karaca, 2012: 426).

Privatization can be effective in three different areas, such as generating sales revenue, getting rid of the debt burden of economic enterprises, and taxation on the increased output and consumption created by efficient production methods. Privatization practices provide direct benefits to the government, such as reducing the pressure on public expenditures on the one hand and increasing tax revenues on the other (Karaca, 2012: 426).

1.3.8. Seigniorage

The seigniorage is a type of public revenue that is based on the sovereignty of the state, which is mostly encountered in fiat money regimes. The seigniorage income consists of the difference between the value written on the money and the cost of production (Çelen & Yavuz, 2014:42). The size of the seigniorage income depends on the monetization level of the economy. While the income that can be obtained in this way is limited in the economies with low monetization, seigniorage is an important source of income in the economies with high monetization (Ulusoy et al., 2013: 258).

It is argued that creating a fiscal space by creating seigniorage revenue is not a very desirable method, as it brings with it the inflation phenomenon, but it can contribute to the formation of fiscal space if the necessary conditions are met. When it comes to seigniorage, the monetary policy should not go beyond the provision of sufficient liquidity to support the real growth in the economy (Heller, 2005a: 9).

In order to create a fiscal space with the help of seigniorage income, it is necessary to increase the emission volume in a controlled manner that does not disturb the macroeconomic balances, and to adhere to certain limits. Only in this way, while production and income are increasing, the real costs of the increase in emissions can be eliminated (Çelen & Yavuz, 2014:45).

1.3.9. Wealth and Stabilization Funds

Although it is not a very common view, there are opinions that fiscal space can be created through wealth and stabilization funds.

In some countries, especially in resource-rich countries and export-oriented economies (such as Norway, Saudi Arabia, United Arab Emirates, Russia, China, South Korea, etc.), temporary revenue surpluses are gathered in sovereign wealth funds (SWFs), thereby expanding fiscal space, investing in future generations, and balancing future liabilities. Revenues saved during periods of prosperity are used to smooth potential future income gaps and mitigate the impact of the adverse shocks to government spending (Kose et al., 2018: 4). In this way, SWFs provides governments a more stable and predictable macroeconomic environment. Large current account surpluses among the export-oriented economies of East Asia are also contributing to the rise of SWFs (Doherty & Yeaman, 2008: 85).

SWFs can be established for stabilization and savings purposes or both. Without considering its purpose, establishing appropriate governance mechanisms that support SWFs' operations are crucial. SWFs should be transparent and stay away from political inference while operating. There must be also clear and comprehensive goals, asset management strategies for SWFs. SWFs should be part of the government's medium to long-term strategies (Doherty & Yeaman, 2008: 85). SWFs can also be integrated with the budget by establishing clear rules for the accumulation and withdrawal of resources (Kose et al., 2018: 4). If all these governance conditions are met, the role of wealth funds in creating fiscal space can be mentioned.

1.3.10. Fiscal Decentralization

Another option in creating fiscal space is fiscal decentralization. The advocates of fiscal decentralization state that the provision of public services through local governments will ensure efficiency in public expenditures by realizing the

allocation of resources in accordance with the preferences of the people. Moreover, decentralization can provide efficiency in service delivery by encouraging inter-governmental competition, and efficiency in resource use can be increased since the emergence of a market-like competitive structure will limit the excessive interventions and ineffective behaviors of the central government in the economy (Ulusoy et al., 2013: 259). Briefly, in an optimal institutional framework, resources can be freed up and fiscal space can be created by decentralizing the management of public expenditures, which increases the efficiency of public expenditure (Brun et al., 2006: 6).

There is no general opinion about the ideal level or form of decentralization. However, there is a prevailing view in the literature that well-designed regulations that support close links between expenditure decisions and the preferences of the local population can improve fiscal space by increasing the efficiency of government expenditures (Doherty & Yeaman, 2008: 85).

Potential risks should also be considered in creating a fiscal space through fiscal decentralization. In order to gain efficiency through fiscal decentralization, intergovernmental coordination should be well designed, and revenue and expenditure allocation should be considered together (Ulusoy et al., 2013: 259).

1.3.11. Institutional and Fiscal Arrangements and Reforms

Institutional and financial arrangements and reforms can be addressed in a wide range. Issues such as budgeting and spending techniques, fiscal rules, control of corruption, tax reforms, etc. may have some positive effects in terms of creating fiscal space.

Output and performance-based budgeting, expenditure reviews and medium-term expenditure frameworks (MTEFs) are seen as systems that complement each other and contribute to the fiscal space by contributing to transparency and accountability, increasing trust in the government, and ensuring efficiency and productivity in public financial management (Nangir & Kiral, 2014: 323).

By means of performance-based budgeting, public resources can be redistributed through expenditure reviews and ineffective activities can be stopped. By measuring the performance of public activities, efficiency and effectiveness in public financial management can be increased. As a result, it is possible to contribute to the creation of fiscal space by increasing the savings in the public sector (Nangir & Kiral, 2014: 325). The preparation of medium-term projections beyond annual budgeting with MTEF will make it possible to take into account the economic developments that may occur, thus providing governments with more maneuvering opportunities in the budget, or in other words, fiscal space (Nangir & Kiral, 2014: 328). In this direction, we can say that any consideration of fiscal space must be made in the context of at least a medium-term expenditure framework that has a comprehensive perspective on the government's expenditure priorities.

As an institutional arrangement, fiscal rules, which impose legal restrictions on policy instruments, are one of the most important tools to ensure economic stability and debt sustainability under fiscal sustainability. These rules are aimed at ensuring fiscal discipline and sustainability by introducing regulations and restrictions on the budget balance and budget deficit, borrowing and debt stock, expenditures and revenues (Yılmaz, 2014: 323). In this context, the effective implementation of well-designed fiscal rules can increase the financial credibility and market access of countries and thus contribute to the formation of fiscal space (IMF, 2016: 2).

Policies aimed at preventing corruption and increasing governance in countries can also be counted as supporting factors for the formation of fiscal space (Heller, 2005a: 8). In addition to this, reforms that will increase the efficiency of the budget, expenditure and taxation processes are also one of the important factors that will accelerate the creation of fiscal space in a country. For example, it may be possible to use public resources more effectively by reducing corruption or to increase public revenues with comprehensive tax reforms. These actions can contribute to the creation of fiscal space.

CHAPTER 2

MEASUREMENT OF FISCAL SPACE

Many different methods have been proposed in the literature regarding the measurement of the concept of fiscal space, for which there is no consensus on its definition yet. Since it is generally associated with financial sustainability and more specifically debt sustainability, studies on measurement methods that emphasize primary balance come to the fore. However, in the literature, there are various measurement methods explained with concepts such as fiscal space creation methods, tax years required to repay public debt or to fund fiscal deficit, debt limit and Laffer curve.

2.1. IMF's APPROACH

IMF's approach (Heller, 2005a; 2005b; 2006) to measuring fiscal space is in line with efforts to create additional fiscal space. Accordingly, the fiscal space of a country can be estimated based on how much it can apply to public revenues, expenditures, foreign aid and borrowing policies, which are among the methods of creating fiscal space (Akbayır & Yereli, 2018: 257).

Based on this method, Heller (2005a, 2005b, 2006) comparatively evaluated the fiscal space of Malawi, Zambia and Tanzania. It is analyzed which policy could provide fiscal space for additional expenditures, taking into account the share of the tax revenue, expenditure, borrowing and foreign aid indicators of these countries in GDP between 1990-2002. The approach is explained through these country examples:

Increasing the revenue share in GDP is an apparent option for countries with a low tax burden (Heller, 2006: 75). As mentioned in Chapter 1, raising the tax share to at least 15% of GDP should be seen as the minimum target for LICs. In this context, while Malawi and Zambia (about 21% and 17%, respectively), which have relatively high Tax/GDP ratios, have limited opportunities to create

additional fiscal space by increasing taxes; it is possible for Tanzania, which has a lower Tax/GDP ratio (below 13%) than them, to gain additional fiscal space by increasing taxes (Heller, 2006: 75). Therefore, it can be said that Tanzania, whose Tax/GDP ratio is approximately 13%, has a fiscal space as much as the source provided by raising this ratio to 15% or perhaps raising it to 20% (Akbayır & Yerehi, 2018: 257). In short, on the tax side, only Tanzania can find room for higher taxes, because Tax/GDP ratios in Malawi and Zambia are already high by regional standards (Heller, 2005b: 3). However, it should be noted that due to some political and economic rigidities, it might not be possible to increase tax revenue by increasing tax rates. Therefore, broadening the tax base through modernizing tax management and customs procedures and mobilization of revenues for earmarked purposes may be seen as important vehicles for expanding fiscal space (Heller, 2005a: 16; Heller, 2006: 75).

Reprioritizing expenditures¹⁰ by reducing inefficient spendings (unproductive subsidy programs, defense expenditures, foreign travel and embassy expenses etc.) is seen as a proper option for countries with already high spending rates (Heller, 2006: 75-76). Malawi and Zambia have already quite high Total Spending/GDP ratios (above 40% and 30% respectively) than Tanzania (below 25%). From this perspective, reprioritizing expenditures can be seen as an option for Malawi and Zambia. However, non-discretionary expenditures (such as interest payments and wages) in total expenditures appear as a factor that makes it difficult to create fiscal space through re-prioritization of expenditures (Heller, 2006: 75-76). Non-discretionary expenditures are absorbing large amounts of resources in both Malawi and Zambia. On the other hand, Tanzania's relatively low overall expenditure level and low share of non-discretionary expenditures provide greater flexibility in re-prioritizing expenditures (Heller, 2005a: 16). In this context, Tanzania has an opportunity to obtain additional fiscal space as much as the remaining resource from interest and wage payments in total expenditures (Akbayır & Yerehi, 2018: 257). Malawi and Zambia, which have high interest and

¹⁰ Termination or reduction of unproductive budget expenditures to make room for more productive expenditures (Karaca, 2012: 422).

wage payments in total expenditures, have limited opportunities to have an additional fiscal space in this respect (Heller, 2005b: 3).

On the borrowing side, Malawi and Zambia have higher Domestic Debt/GDP ratios (around 20-25%) than Tanzania (about 15%). In Malawi and Zambia, interest rates reached high levels with the effect of high domestic borrowing and limited monetization (Heller, 2006: 76-77). Additionally, external borrowing opportunities are also limited for both countries (Heller, 2005b: 3). For these reasons, it is observed that Malawi and Zambia do not have an additional fiscal space based on borrowing. On the other hand, it can be said that Tanzania, which has a relatively low domestic debt ratio, has the opportunity to borrow from local markets up to a certain limit and has a significant fiscal space in this direction (Heller, 2005a: 16).

Lastly, foreign aids (or external grants) seem to be the best option for creating fiscal space for all three countries (Heller, 2005b: 3). As mentioned before, foreign aid must be sustainable and predictable to create fiscal space. In other words, fluctuations in foreign aid negatively affect the fiscal space to be created. Foreign Aids/GDP ratios are at significant levels in all three countries, but it shows a fluctuating course. However, the volatility of aids is relatively higher in Malawi and Zambia than in Tanzania (Heller, 2005a: 17). This reflects that Tanzania is more successful in acquiring foreign aid than Malawi and Zambia as a result of successful macroeconomic stabilization and reform efforts (Heller, 2005a: 17). Accordingly, it can be said that Tanzania has a relatively higher fiscal space in terms of foreign aid.

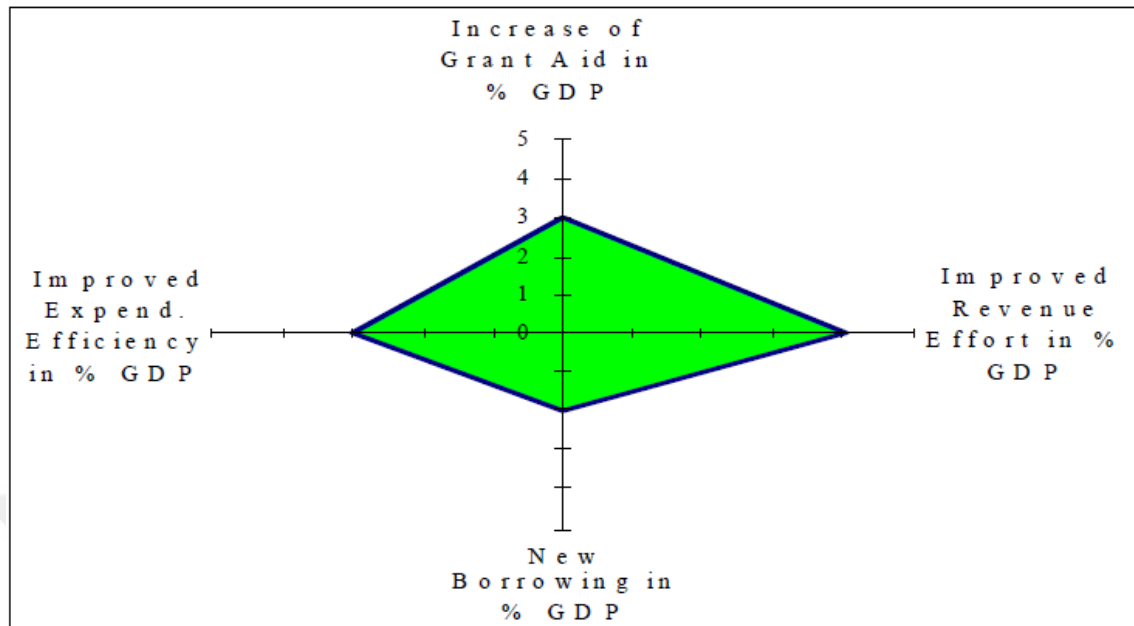
The IMF approach has a relatively simple structure. However, this simplicity is not the advantage but the disadvantage of the approach. Because, this approach stands out as a proportional method and is far from the deep analytical analysis. For example, this approach does not allow for intertemporal evaluation and excludes important government financial indicators (subsidies, public assets etc.) from the analysis (Akbayır & Yereli, 2018: 258). However, it is important in terms of being the first study on fiscal space measurement in the literature and laying the groundwork for other fiscal space measurement methods.

2.2. FISCAL SPACE DIAMOND APPROACH

Development Committee (2006), which considers the efforts to create fiscal space as fundamentally a requirement to achieve the MDGs, has put forward the fiscal space diamond approach. The fiscal space diamond is a visual representation of the different fiscal space creating methods. These fiscal space creation options, which form the four axes of the fiscal space diamond are as follows: raising revenue, increasing borrowing, accessing foreign aid (i.e., external grant aid) and generating fiscal saving through improved expenditure efficiency (Development Committee, 2006: 17). The diamond is created by combining these four methods (as % of GDP) in Cartesian space, and the area of the diamond represents the total fiscal space available in the country (Roy et al., 2007: 6). Different diamond shapes can be formed depending on the size and composition of these tools (Şahin & Akar, 2014: 301). In general, the fiscal space diamond provides a holistic view of the macro-fiscal possibilities to create fiscal space for achieving the intended goals of the countries (Roy et al., 2007: 6).

Figure 1 represents the fiscal space diamond of a hypothetical country. Accordingly, public revenues (% GDP) are located in the right corner of the diamond, public expenditures (% GDP) in the left corner, foreign aid (% GDP) in the upper corner and new borrowing (% GDP) in the lower corner. We can assume that when this country is planning its annual or 3-year budget, it makes an analysis using the fiscal space diamond to determine the potential for additional resources. With the analysis of the country; it can be concluded that by expanding the tax base and making improvements in tax management public revenues can be increased by 4%, foreign aid can be increased by 3% as a result of bilateral negotiations with the countries providing foreign aid, 3% savings can be achieved by reviewing and rationalizing expenditures, and new borrowing opportunities can also be created around 2%. In this case, the country's fiscal space diamond will be formed as in Figure 1 (Development Committee, 2006: 17).

Figure 1: Fiscal Space Diamond



Source: Development Committee (2006)

According to Roy et al. (2007), the fiscal space diamond approach consists of five steps in general: (1) identifying macroeconomic context and human development issues, (2) determining short and long-term fiscal challenges, (3) clarifying whether challenges are exogenous or endogenous in short-term, (4) building the diamond and (5) presenting overall analytical framework (Roy et al., 2007: 6).

A detailed analysis is also required to determine the additional fundraising capacity of the tools in the four axes of the fiscal space diamond. In this context, UNDP (2007) suggested that the following questions should be considered in the analysis to be made.

First, the questions to be considered regarding external support (includes foreign aid and debt relief) are (UNDP, 2007: 1):

- “What is the medium and long term debt sustainability? Is the country benefiting from a debt relief program? At what point does the country qualify for debt relief?”
- What have been the patterns (level, nature –project vs program, origin, predictability) of aid and what can it be like in the foreseeable future?”

Second, the questions to be considered regarding domestic resource mobilization (includes privatization receipts, tax and non-tax revenue collection) are (UNDP, 2007: 1):

- *“Should/can tax/GDP ratio be increased? If so, how can this be done while ensuring that the burden on the poor is minimized?”*
- *Should VAT be introduced if absent?*
- *To what extent is the privatization of public assets feasible without undermining MDG achievement?”*

Third, the questions to be considered regarding deficit financing (includes net domestic financing, net foreign financing) are (UNDP, 2007: 1):

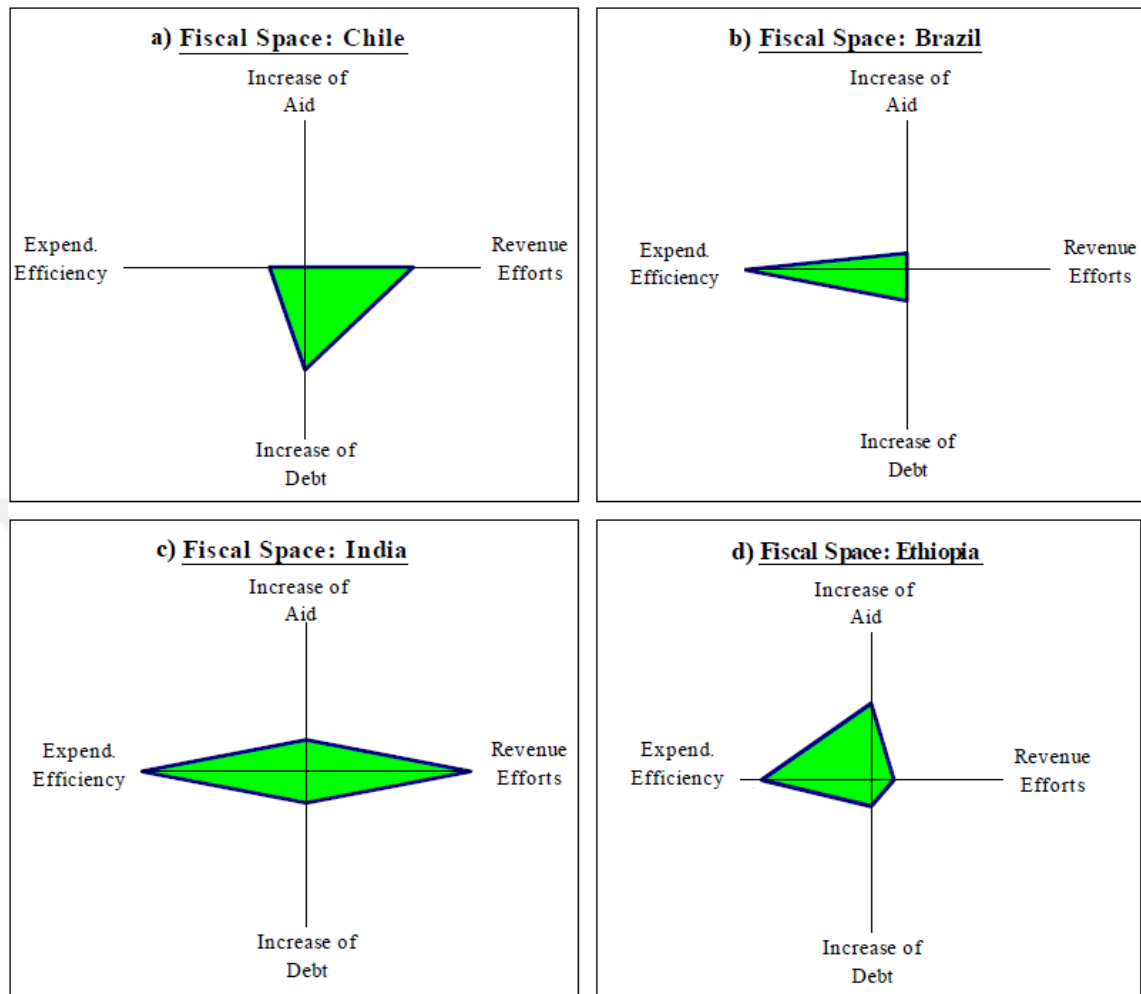
- *“What are the needs for public investment? What is the case/room for additional borrowing concerning external support? What is the level of internal and external debt? Access to the international capital market?”*
- *What is the level of investments and savings? To what extent do the savings contribute to investments?*
- *If savings are low, why? How to reduce obstacles to savings? How to improve the channelling of savings for public investment?”*

Last, the questions to be considered regarding reprioritization and efficiency (includes reprioritization based on the extent the expenditures contribute to MDGs; and value-for-money considerations) are (UNDP, 2007: 1):

- *“What is the ratio of current/capital expenditures?”*
- *What is the share of expenditures that can be classified as pro-poor?*
- *To what extent can the government enhance the value for money for goods and services it provides?”*

Development Committee (2006) measured the fiscal space of Chile, Brazil, India and Ethiopia with the fiscal space diamond approach, as shown in Figure 2. As can be seen, the shape of the fiscal space diamond differs according to the different characteristics of the countries.

Figure 2: Fiscal Space Diamond of Chile, Brazil, India and Ethiopia



Source: Development Committee (2006)

Figure 2-a shows the fiscal space diamond of Chile. Chile reduced its debt level with primary surpluses throughout the 1990s. In addition, since 2001, Chile has also made progress in ensuring fiscal discipline with the implementation of fiscal rules. These developments both increased the country's borrowing capacity and provided flexibility in fiscal terms. Chile has an average revenue level and a relatively low level of borrowing. Since Chile is not a country receiving foreign aid, foreign aid is almost at zero level. Additionally, considering the relatively high efficiency in resource allocation and technical capacity, it is stated that the fiscal space that can be obtained through the prioritization of expenditures is also limited. As a result, Chile has the potential to create fiscal space with options to raise revenue and borrow (Development Committee, 2006: 21).

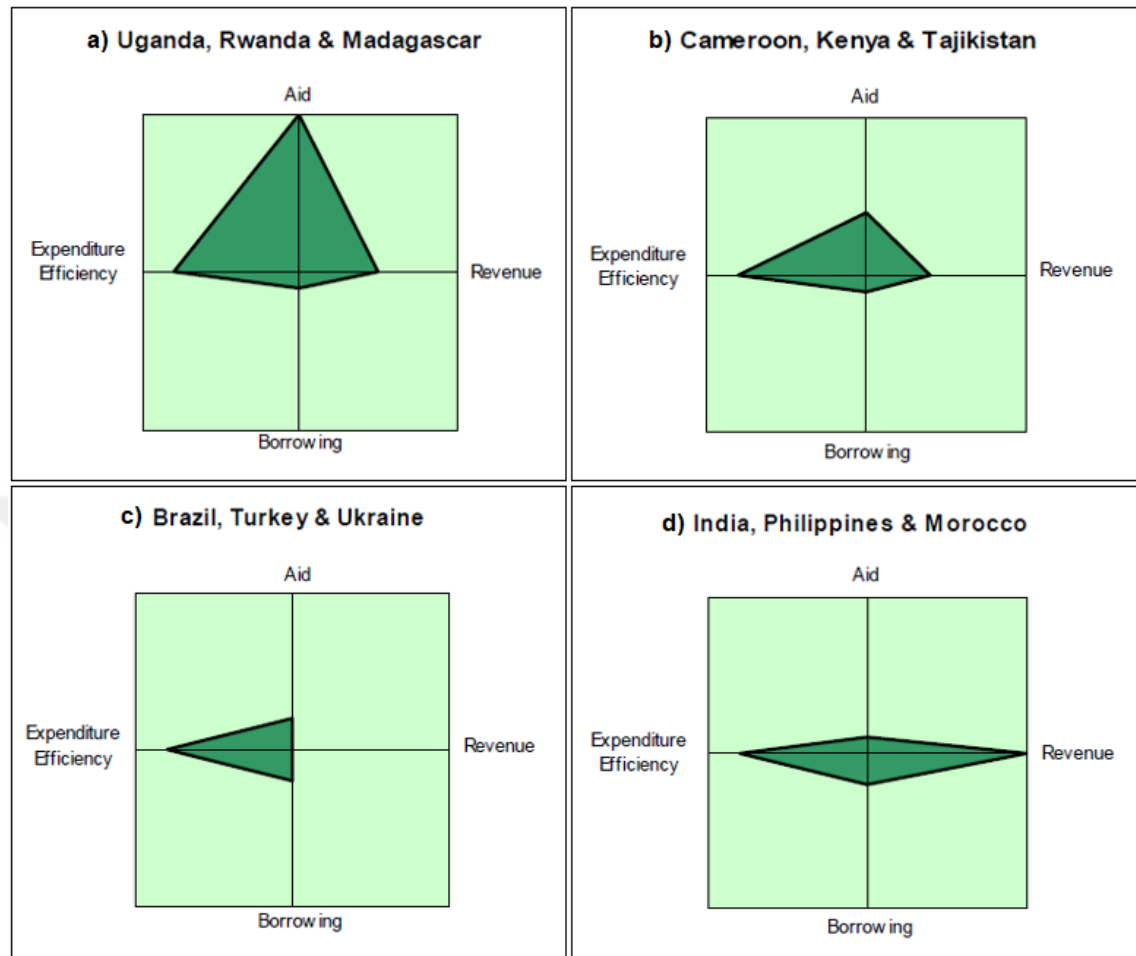
Figure 2-b presents Brazil's fiscal space diamond. Brazil's history of debt and fiscal crisis limits its access to borrowing, thus reducing the possibility of fiscal space to be obtained in this way. Considering the country's relatively high revenue share, efforts to generate more revenue through taxation improvements could reduce investment and production incentives. Foreign aid is also at very low levels. Therefore, the option to create fiscal space largely depends on increasing expenditure efficiency (Development Committee, 2006: 24).

Figure 2-c describes the fiscal space diamond of India. India can easily expand its borrowing opportunities due to the positive perception in the market about paying its debts on time. However, the main problem in India is inefficient public expenditures. Unproductive subsidies and low technical efficiency not only prevent the efficient use of the resources to be obtained from borrowing but also reduce the high-yield return on expenditures necessary for creating fiscal space in the long run. Foreign aid in India is also small. Thus, India needs to reprioritize its spendings and increase its low level of public revenues to create fiscal space in the first stage (Development Committee, 2006: 24).

Finally, Figure 2-d shows the fiscal space diamond of Ethiopia. In Ethiopia, where the revenue level is already high, foreign aid and improving expenditure efficiency have an important role in creating fiscal space. Being a country that receives foreign aid makes it possible to create fiscal space especially in this way. Despite the low share of debt service in expenditures, Ethiopia's past bad reputation for paying debts limits its borrowing opportunities. In this framework, Ethiopia's fiscal space diamond is expanding in the direction of foreign aid and expenditure efficiency (Development Committee, 2006: 26-27).

In a different study, Development Committee (2007) drew together the fiscal space diamonds of countries with similar economic characteristics. In the study, countries were classified as aid access countries with high aid inflows, aid access countries with low aid inflows, market access countries with a relatively high level of public expenditure, market access countries with a relatively low level of public expenditure.

Figure 3: Fiscal Space Diamond of the Countries with Similar Characteristics



Source: Development Committee (2007)

Figure 3-a shows the fiscal space diamonds of Uganda, Rwanda and Madagascar which are classified as aid access countries with high aid inflows. Accordingly, considering the high development needs (MDGs) of these countries that receive high levels of foreign aid, it is stated that there are still opportunities to increase foreign aid they can receive (Development Committee, 2007: 12). In these countries, the inability of private sector investments due to insufficient infrastructure and the necessity of channeling the current scarce resources to the right investments point to the creation of fiscal space by increasing the composition and efficiency of expenditures. On the other hand, although borrowing opportunities are limited for these countries, the fiscal space can be

supported by policies aimed at increasing the low level of revenue (Development Committee, 2007: 15-19).

Figure 3-b presents the fiscal space diamonds of Cameroon, Kenya and Tajikistan which are classified as aid access countries with low aid inflows. Foreign aid flows are generally low and volatile due to donor countries' concerns about their public expenditure management (Development Committee, 2007: 19). Therefore, with institutional and administrative reforms, these countries will be able to create fiscal space by both increasing the flow of foreign aid and turning it into a more stable course. Moreover, these countries also have the opportunity to create additional savings by ensuring efficiency in resource allocation and technical infrastructure and by making efforts to generate revenue (Development Committee, 2007: 12-13).

Figure 3-c describes the fiscal space diamonds of Brazil, Turkey and Ukraine which are classified as market access countries with a relatively high level of public expenditure. These can be classified as countries with high borrowing possibilities. The current high level of revenue and borrowing makes it difficult to apply these instruments more. Foreign aid is also not seen as an option to be considered. The common feature that characterizes all three countries is high and inefficient public expenditures (Development Committee, 2007: 13). Non-discretionary public expenditures (such as wages, social security, transfers and subsidies, etc.) both increase total public expenditures and disrupt the growth-oriented structure of the expenditure composition (Development Committee, 2007: 22-23). In this framework, the fiscal space diamond for these countries is expanding in the direction of ensuring expenditure efficiency.

Lastly, Figure 3-d shows the fiscal space diamonds of India, Philippines and Morocco which are classified as market access countries with a relatively low level of public expenditure. Despite being a market access country, the fiscal space options that come to the fore for the development needs of these countries seem to both increase revenues and ensure expenditure efficiency (Development Committee, 2007: 13). Although these countries have high taxation potential, they cannot increase their incomes due to structural problems related to the tax

system. In this framework, a tax reform that will encompass broadening the tax base, reviewing tax expenditures and simplifying the tax system is deemed necessary. On the other hand, low-level and inefficient public expenditures need to be redesigned to accommodate productive expenditures. In this direction, productive expenditures (such as infrastructure expenditures) that can both support the private sector and contribute positively to growth, should be prioritized (Development Committee, 2007: 27).

It can be said that the fiscal space diamond approach is an advanced version of the IMF's efforts to measure the fiscal space. In other words, in the IMF approach, while measuring the fiscal space of countries, evaluations are made one by one over public revenues, public expenditures, foreign aid and borrowing policy instruments. However, the "fiscal space diamond" approach takes IMF's method one-step further and performs a holistic analysis based on the aforementioned tools. This fact also reveals the fundamental difference between the two approaches (Akbayır & Yereli, 2018: 261).

The fiscal space diamond approach is a particularly useful tool in presenting the outlook for fiscal space potential. Nevertheless, achieving more realistic results necessarily requires a deeper analysis. Countries may differ in terms of policy objectives and constraints, demographic characteristics, demand for public services, macroeconomic situation, financial management, etc. It is obvious that a more detailed analysis based on their specific situations would be more beneficial for countries with different economic characteristics (Development Committee, 2007: 13-14). The nature of this approach, which does not take into account the different economic characteristics of the countries, also eliminates the possibility of making a comparison between countries (Akbayır & Yereli, 2018: 261). However, it is still considered important because it explains the fiscal space analytically.

2.3. DE FACTO FISCAL SPACE APPROACH

Aizenman and Jinjark (2010) considered the “de facto fiscal space” concept as a measurable indicator and defined as the tax years required to repay the current public debt or to close the fiscal deficit (Aizenman and Jinjark, 2010: 1-2). Accordingly, the “de facto fiscal space” of the concerned country is calculated as the ratio of the current public debt or the fiscal deficit to the de facto tax base:

$$\text{De Facto Fiscal Space} = \text{Public Debt (\% GDP)} / \text{De Facto Tax Base (\% GDP)}$$

or alternatively

$$\text{De Facto Fiscal Space} = \text{Fiscal Deficit (\% GDP)} / \text{De Facto Tax Base (\% GDP)}$$

While a decrease in this ratio indicates that there is more fiscal space in the country; higher values of the indicator imply that the fiscal space is limited, in other words, this country may have difficulties in meeting its debt obligations, because it will take many years to repay its current public debt (Gnangnon and Brun, 2019: 241-242). This ratio allows us to make inferences about the fiscal tightness of the countries (Aizenman and Jinjark, 2010: 1).

At this point, it is necessary to explain the concept of “de facto tax base”. De facto tax base represents the realized tax collections and reflects a country's ability and willingness to finance its public expenditures and transfer payments. In a sense, this term provides information about the availability of tax revenue to support fiscal policy (Gnangnon and Brun, 2019: 241-242). In practice, de facto tax base is calculated as the average tax revenues over several years (generally 4 or 5 years) to eliminate business cycle fluctuations (Aizenman and Jinjark, 2010: 1). To put it more explicitly, the de facto fiscal space indicator for a given country in a given year is calculated as the ratio of the total public debt (% GDP) in year t to the average of total public revenues (% GDP) from year $t-4$ to year t (Gnangnon and Brun, 2019: 241-242).

Aizenman and Jinjark (2010) introduced the concept of “de facto fiscal space” in a study explaining the cross-country variation in fiscal stimulus applied during the global crisis using this concept. According to this study, lower public debt

relative to the tax base, i.e. greater de facto fiscal space, means more fiscal capacity to finance fiscal stimulus under the current tax capacity (Botev et al., 2016: 24). In the same study, Aizenman and Jinyarak (2010) also calculated the de facto fiscal space of many countries with both methods using the data between 2000 and 2006.

Table 3 shows the measures of de facto fiscal space for 81 countries based on 2000 to 2006 data. For example; if we interpret Turkey's fiscal space, we can say that Turkey needs almost 2.4 years of tax revenue to repay its current public debt as of 2006. For most countries, the tax years required to repay the public debt in 2006 are under 4 years.

As it can be seen from Table 3; countries such as Congo, Estonia, Luxembourg, Belarus, Kazakhstan, Russia, Denmark, Latvia, Iceland, Australia, Ireland and Slovenia have relatively high fiscal space for FS 1 calculation (public debt as of 2006/average tax revenue from 2000 to 2006). In addition, countries such as Georgia, Belgium, Spain, Netherlands, Lithuania, Switzerland, Portugal, South Africa, United Kingdom, Germany, Ukraine and Austria are also among countries with the relatively high level of fiscal space for FS 2 calculation (average fiscal deficit from 2000 to 2006/average tax revenue from 2000 to 2006, and negative values indicate surplus). On the other hand, while Brazil, Uganda, Nepal, Sri Lanka, Singapore, Bahrain, Bhutan, Ivory Coast, Kyrgyz Republic, India, Tajikistan, Madagascar have the least fiscal space for FS 1 calculation; countries such as Czech Republic, Poland, China, Hungary, Philippines, Afghanistan, El Salvador, Slovak Republic, Greece, Oman, Maldives and Colombia also have very limited fiscal space for FS 2 calculation.

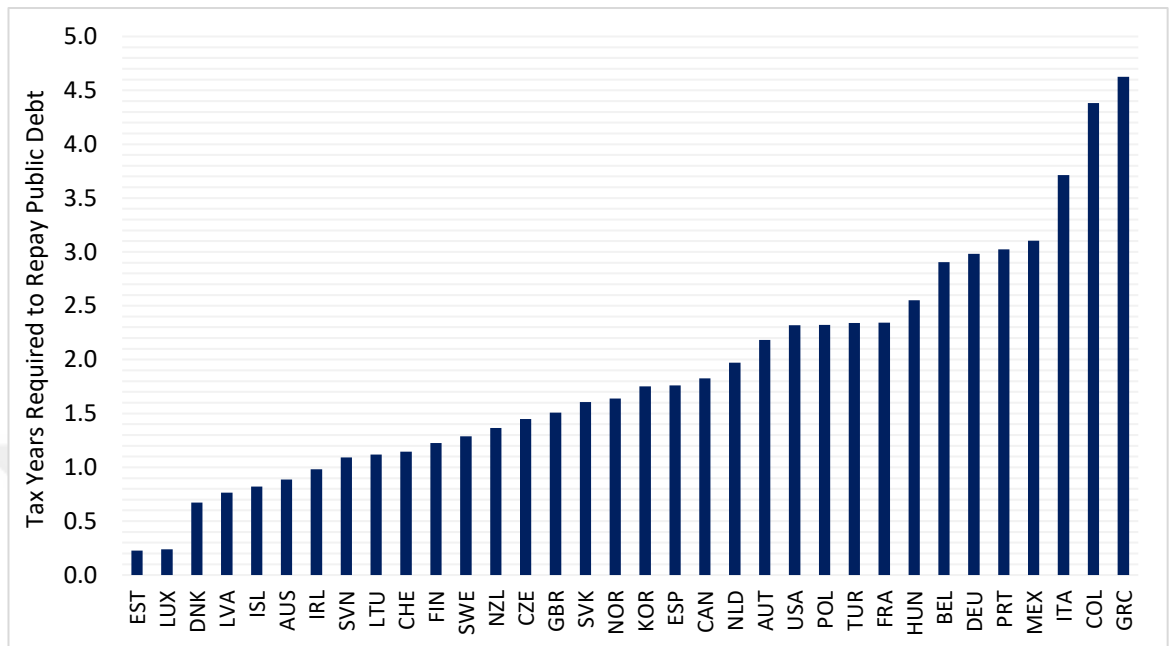
In the light of Table 3, Figure 4 and Figure 5 show the de facto fiscal space of some OECD countries (member as of 2021) as bar graphs for both methods.

Table 3: De Facto Fiscal Space of the Country Groups

Income Group	Country	abbr	FS 1	FS 2	Income Group	Country	abbr	FS 1	FS 2
Low Income	Afghanistan	AFG	1.61	0.29	High Income (Non OECD)	Bahamas, The	BHS	2.36	0.10
	Bangladesh	BGD	4.46	0.09		Bahrain	BHR	6.89	-1.31
	Kyrgyz Republic	KGZ	8.61	0.12		Croatia	HRV	1.69	0.09
	Madagascar	MDG	10.24	0.34		Cyprus	CYP	2.10	0.00
	Nepal	NPL	5.76	0.13		Estonia	EST	0.23	-0.05
	Tajikistan	TJK	10.12	0.38		Latvia	LVA	0.76	0.06
	Uganda	UGA	5.34	0.17		Malta	MLT	2.44	0.07
Lower Middle Income	Bhutan	BTN	6.90	0.51	High Income (OECD)	Oman	OMN	2.69	0.38
	China	CHN	1.95	0.24		San Marino	SMR	2.87	-0.22
	Congo, Rep.	COG	0.03	-0.15		Singapore	SGP	6.60	-0.45
	Ivory Coast	CIV	6.91	0.22		Australia	AUS	0.89	-0.04
	El Salvador	SLV	3.70	0.31		Austria	AUT	2.18	0.07
	Georgia	GEO	2.99	0.01		Belgium	BEL	2.90	0.02
	Guatemala	GTM	1.92	0.15		Canada	CAN	1.82	-0.03
	India	IND	8.62	0.38		Czech Republic	CZE	1.45	0.21
	Indonesia	IDN	3.38	0.10		Denmark	DNK	0.67	-0.04
	Maldives	MDV	2.51	0.38		Finland	FIN	1.23	-0.02
	Moldova	MDA	1.86	-0.04		France	FRA	2.34	0.10
	Mongolia	MNG	2.85	-0.04		Germany	DEU	2.98	0.06
	Morocco	MAR	2.74	0.09		Greece	GRC	4.63	0.33
	Papua New Guinea	PNG	3.03	0.08		Hungary	HUN	2.55	0.25
	Philippines	PHL	4.95	0.26		Iceland	ISL	0.82	-0.04
	Senegal	SEN	4.42	0.09		Ireland	IRL	0.98	-0.06
	Sri Lanka	LKA	6.43	0.55		Italy	ITA	3.71	0.10
	Thailand	THA	2.54	-0.11		Korea, Rep.	KOR	1.75	-0.02
	Tunisia	TUN	2.60	0.12		Luembourg	LUX	0.24	0.00
	Ukraine	UKR	3.66	0.07		Netherlands	NLD	1.97	0.03
Upper Middle Income	Algeria	DZA	1.70	-0.43		New Zealand	NZL	1.36	-0.12
	Belarus	BLR	0.27	0.00		Norway	NOR	1.64	-0.39
	Brazil	BRA	5.00	0.15		Poland	POL	2.32	0.21
	Bulgaria	BGR	1.15	-0.16		Portugal	PRT	3.02	0.05
	Colombia	COL	4.38	0.39		Slovak Republic	SVK	1.61	0.32
	Jamaica	JAM	4.41	0.07		Slovenia	SVN	1.09	0.10
	Kazakhstan	KAZ	0.46	-0.05		Spain	ESP	1.76	0.02
	Lithuania	LTU	1.12	0.04		Sweden	SWE	1.29	-0.03
	Mauritius	MUS	2.56	0.17		Switzerland	CHE	1.15	0.04
	Mexico	MEX	3.10	0.10		United Kingdom	GBR	1.51	0.06
	Peru	PER	2.39	0.08		United States	USA	2.32	0.09
	Russian Federation	RUS	0.63	-0.40	FS 1 = [2006 Debt/GDP] ÷ [2000-06 Average Tax Revenue/GDP] FS 2 = [2000-06 Average Fiscal Deficit/GDP] ÷ [2000-06 Average Tax Revenue/GDP]				
	South Africa	ZAF	1.79	0.05					
	St. Kitts and Nevis	KNA	4.29	0.05					
	Turkey	TUR	2.34	-0.22					
	Uruguay	URY	3.93	0.18					

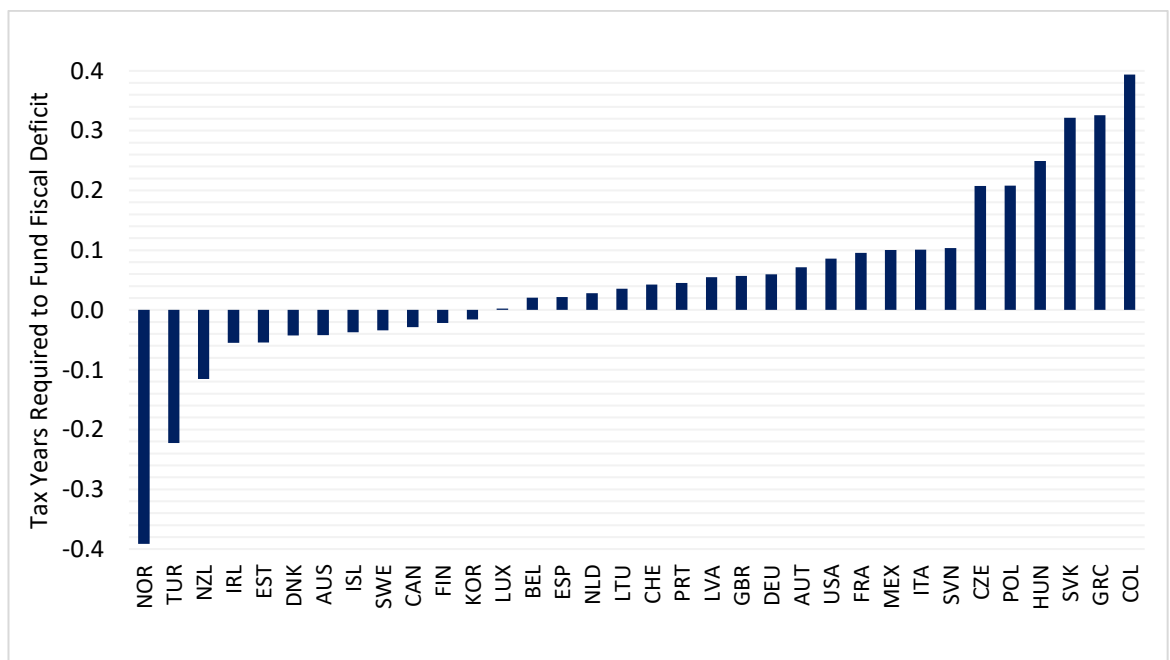
Source: Aizenman and Jinjark (2010)

Figure 4: De Facto Fiscal Space Measures of Some OECD Countries Based on Public Debt and Tax Revenue



Source: Aizenman and Jinjark (2010)

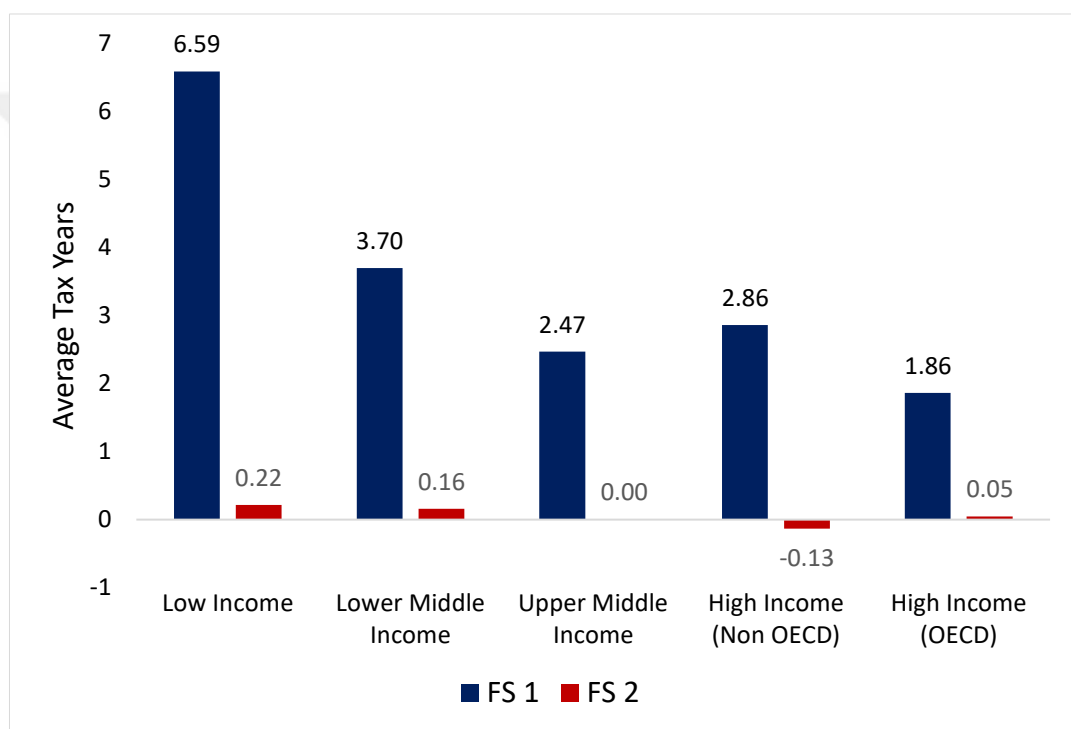
Figure 5: De Facto Fiscal Space Measures of Some OECD Countries Based on Fiscal Deficit and Tax Revenue



Source: Aizenman and Jinjark (2010)

Figure 6 shows the average de facto fiscal space measures of countries for low, lower-middle, upper-middle, and high-income groups. As can be seen, high-income and upper-middle-income countries have a high level of fiscal space at the end of 2006 for both fiscal space calculations. Also, as a note, since there are some countries with fiscal surpluses among high-income non-OECD countries, these countries have high level of de facto fiscal space according to FS 2 calculation.

Figure 6: De Facto Fiscal Space by Income Classification



Source: Aizenman and Jinjark (2010)

The de facto fiscal space method has some advantages and disadvantages. This approach is relatively easy to implement and offers a very transparent framework for comparing countries with each other (Botev et al., 2016: 24). However, since the fiscal space is calculated over accumulated debt and realized tax revenues, this method has a more backward-looking perspective. In this respect, it is difficult to make forward-looking inferences with this method (Cheng and Pitterle, 2018: 9). At this point, it may be better to make an analysis on estimated future tax revenues instead of realized tax revenues. The analysis also leaves out many

important economic factors related to the fiscal space. In other words, only debt (or fiscal deficit) and revenue variables are taken into account when measuring the fiscal space of countries, and many other factors (level of interest rates, maturity structure of the public debt, the impact of the aging population on pension and health expenditures, open and closed economy assumptions, etc.) that may affect the country's fiscal space are excluded (Botev et al., 2016: 24; Gnangnon and Brun, 2019: 241-242; Akbayır & Yereli, 2018: 261). In a sense, this method provides a stylized representation of a very complex problem (Gnangnon and Brun, 2019: 241). On the other hand, measuring the fiscal space of countries can be a much more complex process. In this direction, a detailed analysis that takes into account many country-based factors may be required to reach more accurate results.

2.4. OSTRY et al. (2010) APPROACH

Ostry et al. (2010) has associated the concept of fiscal space with the concept of debt sustainability. Accordingly, Ostry et al. (2010) defines fiscal space as the difference between the current level of public debt and the debt limit implied by the country's historical record of fiscal adjustment (Ostry et al., 2010: 6). More clearly, fiscal space can be defined as the difference between a nation's debt to GDP ratio and the limit beyond which the nation will default unless policymakers take fiscal steps that are outside of anything they have done historically. In this sense, the concept of fiscal space can be used to emphasize how close a government is to defaulting on its debts (Zandi et al., 2011: 2).

Within the framework of this approach, to measure the fiscal space, the debt limit must be calculated at first. For this, it is necessary to calculate the primary balance reaction function, which reflects the reaction of the primary balance to many economic and non-economic variables, especially debt. In addition, the interest rate - growth rate differential, which significantly affects the debt stock, is also included in the calculations. Finally, by combining these two important factors (reaction function and differential) into a standard budget constraint

equation, a country's debt limit will be found. The distance between the calculated debt limit and the current debt level of the countries reveals the fiscal space (Akbayır & Yereli, 2018: 263).

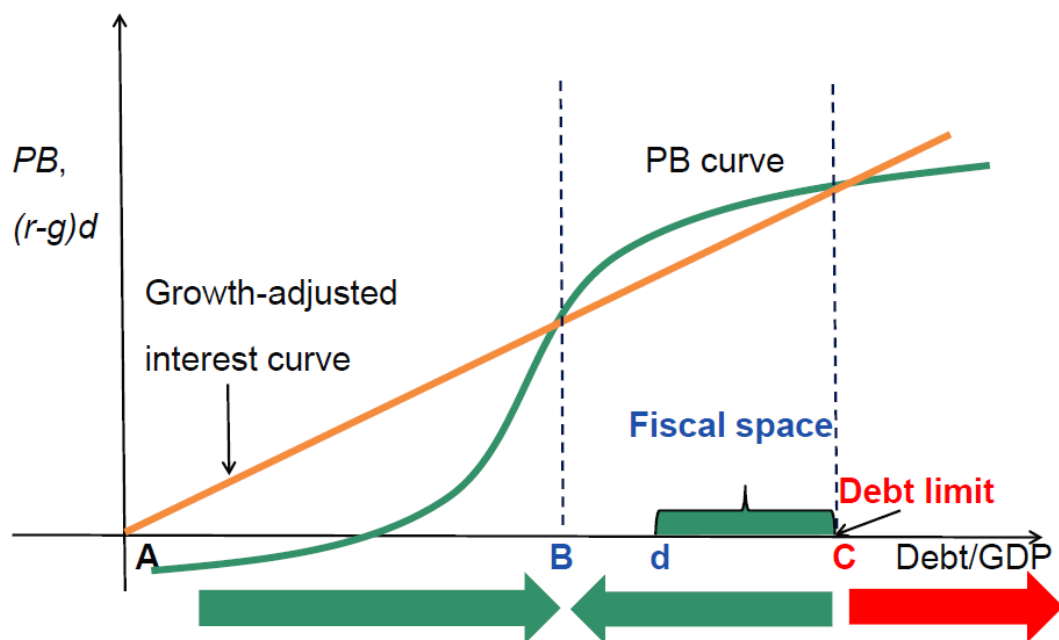
In theory, it is expected that governments use their primary surplus for debt service to keep the debt ratio at a reasonable level. As long as the primary balance is sufficient to offset the higher interest payments, the public debt ratio will eventually return to its long-term value. However, the primary balance may not always increase enough to cover rising interest payments. Tax increases or spending cuts may not be politically feasible while policies are pursued to increase the level of borrowing or large shocks and risks may occur that affect the primary balance in the economy. The debt level that emerges when the primary surplus does not cover the effective interest payments (equal to interest rate – growth rate differential multiplied by the debt ratio) can be called the debt limit. At this point, governments either meet their obligations with extraordinary fiscal adjustments (like austerity policies) or face default (Ostry et al., 2010: 6; Zandi et al., 2011: 3-4). For this reason, in the measurement of fiscal space according to the Ostry et al. (2010) approach, it is stated that a reaction function should be calculated that reflects the response of the primary balance to some important variables (such as output gap, government expenditure gap, trade openness, inflation, oil price, commodity price, political stability, IMF arrangements, fiscal rules), especially debt to GDP ratio (Ostry et al., 2010: 21). The strength of this reaction indicates that one of the first tools used against debt service is the primary surplus (Akbayır & Yereli, 2018: 263-264).

Economic growth rate and the interest rate paid on government debt significantly affect the debt limit, hence the fiscal space. Strong economic growth increases tax revenues and low interest rates reduce financing costs. Therefore, it can be said that countries with strong growth rates and low interest rates have more fiscal space (Zandi et al., 2011: 2). Additionally, if the growth rate is sufficiently high to offset the impact of high interest payments for a given primary balance, this will also increase the fiscal space. In order to see the evolution of the fiscal space over time, it may be useful to examine the interest rate – growth rate

differential (Botev et al., 2016: 23). It is simply calculated by subtracting the growth rate from the interest rate. Multiplying the differential by the ratio of debt to GDP yields effective interest payments (Ostry et al., 2010: 6). While the positive value of the differential affects the fiscal space negatively in parallel with an increase in the debt stock; on the contrary, if it is negative, it will positively affect the fiscal space (Akbayır & Yereli, 2018: 263-264).

Determining the debt limit is important for both market and policymakers. As the debt to GDP ratio approaches the debt limit, interest rates will rise because of the negative perception of the creditors about the potential default risk of the government. The increased risk premium, on the other hand, requires more primary surpluses to balance debt service (Ostry et al., 2010: 6). If this is not achieved, the government is likely to enter a debt load spiral. Therefore, it is stated that the debt limit does not imply the optimal debt level of the government, and the debt burden of the government should be below this level (Zandi et al., 2011: 2).

Figure 7: Illustration of the Fiscal Space with Ostry et al. (2010) Approach



Source: Zandi et al. (2011)

Figure 7 graphically shows Ostry et al. (2010) approach. The linear line represents the growth-adjusted interest curve (or effective interest payments) which is denoted as $(r-g)d$ on the Y-axis where r is the nominal interest rate, g is the nominal growth rate and d is the current debt to GDP ratio. Along the line, the interest rate increases due to the increased risk premium. Green curve line also shows the primary balance reaction curve which is denoted as PB . As can be seen, as debt level increases, primary balance responds greatly up to a certain point at which adjustment efforts such as raising taxes and cutting primary expenditures become more difficult (Ostry et al., 2010: 7). These two curves determine the country's debt limit (point C) together. Assuming that a country's current debt to GDP ratio lies between B and C (at point d specifically), the primary balance remains greater than the interest payments (where the PB curve lies above the growth-adjusted interest curve). At that point, policymakers may also worry about the high level of debt burden and may respond by increasing taxes or imposing some austerity measures. However, the primary surplus can be used to offset interest payments and reduce debt. As long as a country's debt-to-GDP ratio stays between A and C, the government will become solvent and the debt-to-GDP ratio will fall back to point B which is the steady-state debt to GDP ratio (Zandi et al., 2011: 4). Therefore, the lower intersection between the PB curve and interest payments curve defines the long-term public debt ratio which economy converges normally (Ostry et al., 2010: 7).

On the other hand, if the debt to GDP ratio reaches beyond the debt limit (right of the C point) the government may face with insolvency situation. When debt exceeds this point, the primary surplus will no longer be sufficient to cover the debt service (the primary balance curve is permanently below the interest payment curve) and debt becomes unsustainable. The government may find itself in a vicious debt financing cycle: Required interest payments are higher than the primary balance and will rise if new debt is issued. Besides, the market charges a risk premium against the rising default risk of the government and this makes borrowing more costly due to the rising interest rates. In this case, increasing the primary balance may also not be possible due to public resistance against

austerity policies or fiscal fatigue¹¹, and even a downward trend may occur. To avoid sudden default, the government must borrow more to meet debt service. However, this only delays the inevitable, because it increases the future gap between the required interest payments and the primary balance. As a result, the debt to GDP ratio moves along the red arrow (after the upper intersection) in Figure 7 and grows without bound. In other words, interest rates become infinite and the government loses market access and cannot roll over its debt (Zandi et al., 2011: 4; Ostry et al., 2010: 7). Given these considerations, the fiscal space of the government will be the distance between point d (current debt to GDP ratio) and point C (debt limit) in Figure 7.

Ostry et al. (2010) measured the fiscal space of 23 developed countries with this approach. In this study, firstly, two different primary balance reaction functions were calculated for the 1970-2007 and 1985-2007 sample periods; afterwards, the interest rate - growth rate differential was determined by using the ten-year average data. Finally, these two steps were brought together to measure the fiscal space for all these countries (Akbaýır & Yereli, 2018: 264). Accordingly, Greece, Italy, Japan and Portugal are the countries with the least fiscal space. In other words, those countries have the least space scope for increasing public debt without a fundamental shift in the behavior of the primary balance. In addition, Iceland, Ireland, Spain, the United Kingdom and the United States also have very limited fiscal room for maneuver due to rising public debt, demographic pressures and contingent liabilities. On the other hand, the remaining countries (including Austria, Belgium, Canada, Finland, France, Germany, Israel, Netherlands, Sweden), especially Australia, Denmark, Korea, New Zealand and Norway, have a much wider fiscal space. However, these countries also seem to need medium-term fiscal adjustments as a result of the demographic pressures and contingent liabilities that they may encounter in the future (Ostry et al., 2010: 3-5).

¹¹ Ghosh et al. (2013) defines fiscal fatigue as the inability of governments to increase their primary balance - due to some economic and political reasons - as much as the increase in debt service.

The general opinion is that the approach to be used for fiscal space measurement should be the one that most comprehensively takes into account macroeconomic variables and fiscal pressures that may be caused by shocks (IMF, 2016: 10). In this context, Ostry et al. (2010) approach stands out as the method that most considers the general equilibrium state in the measurement of fiscal space. Because, in this approach, a reaction function that includes the effects of many macroeconomic variables and two important factors affecting debts such as interest rate and economic growth rate is used to measure the fiscal space (Akbayır & Yereli, 2018: 264). Since the reaction function contains the effects of many economic and non-economic variables, it can be said that the debt limit calculated from this tool reflects the economic characteristics of the relevant country. In addition, by including the differential in the calculations, the effects of volatility in interest rates and growth rates on the fiscal space can be perceived. Therefore, including these factors in the calculations reduces the doubts about the size of the fiscal space that can be reached for a country (Akbayır & Yereli, 2018: 264).

There are also some points where this approach is criticized. First of all, it is claimed that the approach narrows the scope of the concept of fiscal space. Although it takes into account many economic and non-economic variables, the issue of fiscal space is approached only from the perspective of debt sustainability. Another criticism is related to the claim that the approach mostly reflects the approach of creditor nations and institutions (Akbayır & Yereli, 2018: 264). Accordingly, efforts to create and increase fiscal space are reduced to the concept of debt sustainability only by the imposition of creditor international financial institutions, under the narrow perspective of states and in the world order where global financial markets dominate. In this case, the incentive to create and increase fiscal space for social benefit-oriented activities, which countries will determine according to their own dynamic and strategic priorities, disappears (Çaşkur, 2011: 40). However, just like the criticisms raised against de facto fiscal space approach, it is stated that this measurement method is also a stylized representation of a very complex problem and leaves out some factors such as the maturity structure of public debt (Gnangnon and Brun, 2019: 240-241).

Today, especially in times of crisis, when the mobility of policy makers in the economy is eliminated or restricted, governments primarily resort to budget and borrowing opportunities. Generally, the fact that annual budgets are balanced or have a deficit results in borrowing opportunities to come to the fore in the fight against the crisis (Çelen & Yavuz, 2014: 27-28). From this perspective, it is considered that it becomes quite natural to evaluate the fiscal space from a borrowing perspective, in other words, to describe it as the difference between the current debt level and the debt limit. In addition, it should be also noted that this approach is very open to development, especially in terms of measuring the fiscal space (Akbayır & Yereli, 2018: 265).

2.5. PARK (2012) APPROACH

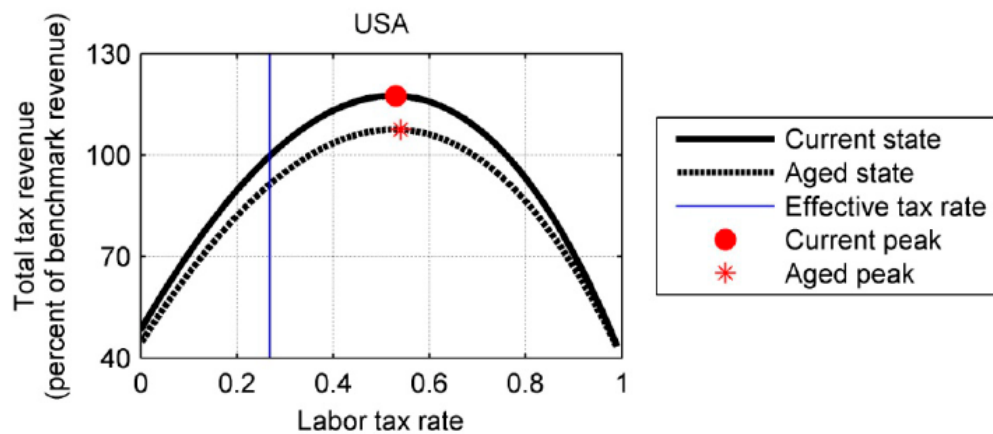
Today, in many countries, it is seen that the population has entered an aging trend as a result of decreasing birth rates and increasing life expectancy. The rising population dependency ratio¹² causes effects such as a decrease in labor supply and an increase in expenditures for the aging population. This situation adversely affects growth and thus causes deterioration in macroeconomic performance. From the perspective of fiscal sustainability, it is considered that the aging population, which is a serious problem especially for developed countries, may also adversely affect the fiscal space (Park, 2012: 3).

The aging population affects the primary balance, and thus the fiscal space, from both income and expenditure aspects. On the income side; as the aging population works less, the tax base may narrow and cause a decrease in total income. On the expenditure side, the aging population may cause pressure to increase expenditures (such as pensions, social transfer expenditures for the ages) for this age group (Park, 2012: 3). In both cases, a distorting effect may occur on the primary balance and the fiscal space may be adversely affected.

¹² Proportion of aged population to working population.

Park (2012) has concerned with the income dimension of the aging trend and put forward a definition of fiscal space through the Laffer Curve. Accordingly, fiscal space is defined as the difference between the current tax revenue level and the maximum tax revenue level or in other words, the peak of the Laffer Curve (Park, 2012: 3). The fact that the current tax rates in a country are lower or higher than the tax rates that yield the highest revenue (i.e., optimal tax rate), which is revealed as a result of the analysis based on the Laffer curve, shows that the tax regime in that country does not bring the highest revenue. In this case, there is a revenue share that cannot be obtained in the economy. This revenue share represents the fiscal space (Akbayır & Yereli, 2018: 265). Within this framework, Park (2012) measures fiscal space as the unused revenue-generating capacity resulting from an aging population.

Figure 8: Illustration of the Fiscal Space by the Laffer Curve



Source: Park (2012)

Figure 8 illustrates the fiscal space of the USA by the Laffer Curves in terms of the current situation and the expected situation in 2050. Y-axis shows total tax revenue, X-axis shows labor tax rate and the blue line shows the effective tax rate in the current state. As can be seen, due to the nature of the Laffer curve, there is a trade-off between the labor tax rate and the total tax revenue, and therefore the Laffer curves are formed in an inverted U shape. According to the results of Park's (2012) detailed analysis, while the USA's total tax revenue could reach 117,5 percent by increasing the labor tax rate to 54 percent in the current

state, the aging effect shifts the Laffer Curve downwards and results in lower tax revenue with the same labor tax rate. This also means that the fiscal deficit will be higher at any tax rate due to aging. Accordingly, the distance between the current peak and the aged peak of the Laffer Curves in the Figure 8 indicates the fiscal space.

Park (2012) calculated the fiscal space of the G-7 countries (USA, Germany, United Kingdom, France, Italy, Japan and Canada) based on this approach. In addition, after this calculation, the effect of the aging population in these countries on the fiscal space measured with this approach has been tried to be revealed. In the analysis for the years 1995-2009, a comparison is made for the G-7 countries (Akbaýır & Yereli, 2018: 265).

Accordingly, a contraction in the fiscal space has been detected in these countries due to the aging of the population. While this contraction effect in the fiscal space was the lowest in the USA with 2.7% of its GDP; most observed in Italy with 7.1% of its GDP. Fiscal space shrinkage due to the aging of the population is greater in France, Germany and Italy than in Canada, Japan and the USA. This contraction arises from the increase in public expenditures due to the aging population and the decrease in public revenues brought about by the decreasing working hours in parallel with the decrease in the working population (Park, 2012: 4).

According to Park (2012), measures such as a reform in the pension system and a flexible spending policy are needed to reduce the negative impact of population aging on the fiscal space in these countries (Park, 2012: 14). With the implementation of such a reform, lost working hours can be compensated. In addition, with flexible spending policies, new positions can be taken in terms of expenditures in the face of negative situations in growth and other macro variables (Akbaýır & Yereli, 2018: 265).

Although this approach has a distinctive method, it is seen that just like the Aizenman and Jinjara (2010) approach, it deals with the measurement of fiscal space from a relatively narrow framework. For example, while the approach

measures by focusing on the public revenue structure, it does not take into account public expenditures. Therefore, it is stated that the reliability of the results to be obtained from this approach is controversial (Akbaýır & Yereli, 2018: 266).

Additionally, the analysis with the Laffer curve does not take into account the social and political tolerance of countries for taxation. With the change in the demographic structure of the countries over time, the attitude towards taxation may also change. In addition, policies such as pension reform, which will eliminate the distorting effects of the aging trend, are ignored. Also, the method does not take into account some other factors (immigration, delay in the retirement age, etc.) that may affect the labor supply (Park, 2012: 4). Although these issues seem to be the weaknesses of the method, it is considered important that an original approach has been introduced for the measurement of fiscal space.

CHAPTER 3

LITERATURE REVIEW

There are various studies on the measurement of fiscal space in the literature. In empirical studies, the fiscal space of countries are generally calculated within the framework of the Ostry et al. (2010) approach or the de facto fiscal space approach put forward by Aizenman and Jinjark (2010), and the effects of various variables on fiscal space are tested.

On the other hand, in addition to the studies on the measurement of fiscal space, there are also some other studies that examine the fiscal space on a sectoral basis or associate it with other fields in the economy.¹³

However, in this chapter, some studies in the literature measuring the fiscal space will be examined and the possible effects of the variables discussed in these studies will be evaluated in order to guide our empirical analysis.

3.1. STUDIES ON THE MEASUREMENT OF FISCAL SPACE

Botev et al. (2016) listed the determinants of the fiscal space that affect the main parameters such as the debt limit, current debt level, public revenues and expenditures used in the measurement of the fiscal space as follows: interest rates (risk free and market), potential output growth, fiscal track record and reaction to debt, macro shocks, spending projections and structural reforms (Botev et al., 2016: 10). In this framework, Botev et al. (2016) evaluated the changes in the fiscal space between 2007 and 2015 for selected OECD countries, EU countries and G7 economies, both within the framework of the de facto fiscal

¹³ In such studies in the literature, it is seen that the concept of fiscal space is generally associated with health, education, poverty, development, social security, political choice, happiness economy, common goods, budgeting, infrastructure, public-private partnerships, privatizations and economic crises.

space approach and interest-growth rate differential which is a part of the Ostry et al. (2010) approach.

Botev et al. (2016) states that in order to see the evolution of the fiscal space over time, it may be useful to examine the interest rate - growth rate differential of the countries. If, in a given primary balance, nominal growth rates are high enough to offset the effect of nominal interest rates, this may lead to an improvement in the fiscal space in terms of debt payments. Accordingly, between 2007 and 2015, the value of the change in differential took positive values in almost all countries, in other words, the fiscal space was negatively affected during this period. On the other hand, the increase in the differential in the G7 countries (Germany, USA, UK, France, Italy, Japan and Canada) was more limited than in Southern and Eastern European countries, that is, there was less contraction in the fiscal space compared to countries in these regions. In addition, Botev et al. (2016) also stated that the differential is expected to decrease in most of the OECD countries and G7 economies (excluding Germany and Japan) in the future (Botev et al., 2016: 24). Botev et al. (2016) also made an assessment of the fiscal space of the OECD and G7 countries and the Euro area as of 2015, using the de facto fiscal space approach and revealed how the de facto fiscal space of these countries and regions changed in the 2007 - 2015 period. Accordingly, as of 2015, the tax year required to repay the total public debt (de facto fiscal space indicator) calculated as 3.1 on average for OECD countries. This measure is 6.3 years for the same year in G7 countries. The reason for the difference is that the year required to repay the total public debt in Japan, a G7 country with a very high debt ratio, is 15.1 years, which increases the average for G7 countries. In the study, it was also stated that the number of years calculated for the Eurozone is higher than the OECD average, but on a lower scale in terms of debt repayment (Botev et al., 2016: 24).

Within the framework of the de facto fiscal space approach, Ulusoy et al. (2013) measured the size of the fiscal space of the European Union (EU) member countries, especially in the years of the global crisis (2008-2011), based on the tax year required to repay public debt and to fund the budget deficit. Accordingly,

in countries such as Greece, Belgium, and Italy, the tax year required to repay public debt is quite high compared to other countries. In other words, the fiscal space in these countries is limited compared to other countries of the EU. Although Ireland, Portugal and Hungary are in better condition compared to the countries listed in the first group, there is also a significant contraction in the fiscal space in these countries due to the policies implemented in 2008-2011 which increased the budget deficit and public debt stock to GDP ratio. Change in the debt stock in the member countries of the EU shows that there was a significant contraction in the fiscal space of the countries with increased debt stock during the crisis (Ulusoy et al., 2013: 274). According to Ulusoy et al. (2013), this deterioration in the fiscal space does not mean that the aforementioned countries cannot achieve a solid financial structure, but it requires policy makers in these countries to take extraordinary steps regarding the current financial structure in the economy at that time (Ulusoy et al., 2013: 274). It can be said that in other countries that were caught in the crisis with a low debt stock to GDP ratio, despite the increasing debt stock during the crisis, fiscal sustainability does not pose a threat, and therefore the fiscal space opportunities are relatively high (Ulusoy et al., 2013: 275).

Zandi et al. (2011), measured the fiscal space of 30 developed countries with panel regression analysis, using the data for the 1985-2007 period, with the Ostry et al. (2010) approach. Zandi et al. (2011) found that the variables that best explain the changes in the primary balance reaction function (hence the fiscal space) calculated to determine the debt limit are; output gap, government expenditure gap, trade openness, age dependency ratio, real oil price (for oil-exporting countries only) and the other national features affecting fiscal prudence like political structure of the country (Zandi et al., 2011: 5). According to the analysis, the direction and reasons for the relationship between these variables and the primary balance are as follows (Zandi et al., 2011: 6):

- Positive relationship between the output gap and the primary balance: During boom periods when the output gap is positive (when the economy is operating at or above its potential), tax revenues will increase,

government spending on unemployment insurance and other countercyclical programs will decrease, thereby improving the primary balance. In recession periods, when the output gap is negative, the primary balance will be deteriorated.

- Negative relationship between the expenditure gap and the primary balance: Financing temporary expenditures (such as wars, natural disasters) will increase the expenditure gap and reduce the primary balance.
- Positive relationship between the trade openness and the primary balance: Openness to the global economy contributes to the country's fiscal discipline and primary balance. Because policy makers in open economies are aware of their dependence on global investors and trade, and they want to have a stronger balance sheet structure.
- Negative relationship between the age dependency ratio and the primary balance: Developed countries with an elderly population structure must allocate their resources more to health and social security expenditures. On the other hand, developing countries, which have a younger population structure, allocate their resources to education-oriented expenditures. Ultimately, a higher age dependency ratio has a reducing effect on primary balance.
- Positive relationship between the real oil price and the primary balance: In countries whose economies are based on oil exporting, higher oil prices improve the primary balance and increase the country's financing opportunities.
- Positive relationship between the fiscal prudence and the primary balance: It is considered that the establishment of a more prudent political and financial structure has a positive effect on the primary balance. It has been observed that countries with less prudent structures are generally the ones most affected by the debt crisis (such as Japan, Ireland, Greece, Portugal, Spain, Italy).

According to results, countries such as Greece, Ireland, Portugal, Italy and Japan, whose debt burdens exceeded their debt limits, experienced a serious erosion in

the fiscal space and these countries have already exhausted their fiscal space. As a matter of fact, Greece, the EU country where the debt crisis was the most severe and the debt/GDP ratio was the highest, could not pay its debts in this period and the risk of not paying the debt dropped the value of the Greek companies. Ireland and Portugal, which do not have fiscal space, also borrowed from the European Financial Stability Fund in order to get rid of the crisis in the same period. Although Italy does not face insolvency or need financial bailout, Italian politicians have turned to fiscal austerity policies that will relieve the economy. Zandi et al. (2011) also states that there are serious financial problems in many European countries. It is argued that in countries such as Spain and Belgium, which have high debt/GDP ratios, large budget deficits and low growth rates, the fiscal space is at a critical threshold and even minor disruptions in the economy may cause serious contractions in the fiscal space in these countries. Similarly, although France and the United Kingdom relatively have fiscal space, it is stated that policy makers must follow prudent policies, otherwise situations may arise that will require them to take extraordinary steps against the risk of default (Zandi et al., 2011: 10-11). In general, it is seen that Asian economies (South Korea, Taiwan, Hong Kong) and Scandinavian countries (Sweden, Norway, Denmark) have the most fiscal space. Among all these countries, South Korea has the most fiscal space. In general, it is stated that these countries are countries with a strong growth potential where fiscal discipline is at the forefront. It can be said that Germany and the USA are among the countries that are in a relatively good position in terms of fiscal space with a strong growth performance despite their high debt burden (Zandi et al., 2011: 11).

Zandi et al. (2011) also associates the calculated fiscal space measures with the interest rates called survival interest rates¹⁴ and the country credit ratings

¹⁴ Zandi et al. (2011) defined survival interest rate as the highest nominal long-term sovereign interest rate (upper limit on 10-yr bonds) a country can survive without getting trapped in a vicious cycle in which its raising interest payment outstrip its ability to service its debt, ultimately resulting in a default without extraordinary fiscal policy action. In other words, above this rate a nation's debt load spirals out of control as the cost of servicing its debt increases more quickly than its debt. Zandi et al. (2011) assumed that the interest rate that the market will perceive negatively and that will make borrowing costs unsustainable is above 10%.

announced by Moody's, which also takes into account the debt default (CDS premiums). As expected, while the survival interest rate is high in countries where the fiscal space is large; in countries with narrow fiscal space, this ratio is at low levels. Similarly, it is seen that the fiscal space has a high correlation with the credit ratings of the countries. The credit ratings of the countries with the most fiscal space are also at the best levels and vice versa (Zandi et al., 2011: 11).

Gnangnon and Brun (2019) examined the relationship between the fiscal space and tax reforms and focused on how tax reforms could affect the fiscal space in less developed and developing countries. Gnangnon and Brun (2019) measured the fiscal space of 99 countries (62 developing and 37 less developed), within the framework of the de facto fiscal space approach for the period 1980-2015 and empirically tested the impact of "tax reforms¹⁵" on the fiscal space with panel data analysis. In addition to tax reform, many other variables such as trade openness, growth, real per capita income, institutional quality, inflation and age dependency ratio are also included in the analysis.

In the study, the expected possible effects of these variables on the fiscal space listed as follows (Gnangnon and Brun, 2019: 247-249):

- Trade openness may help to reduce the public debt burden and increase public revenues by positively affecting growth. Increasing domestic revenues can broaden the tax base. On the other hand, since it will make it easier for countries to be exposed to external shocks, it may increase public debt and decrease public revenues. A decrease in tax revenue from trade can also be observed. For this reason, trade-openness may have both positive and negative effects on the de facto fiscal space.
- High growth rates in the economy may also positively affect the de facto fiscal space with effects that increase public revenues and reduce public

¹⁵ Gnangnon and Brun (2019) measures the extent of tax reform by the indicator describing the degree of convergence of developing countries' tax structure towards the tax structure of developed countries (qualified as "old industrialized countries"). Gnangnon and Brun (2019) considered direct tax revenue share of GDP, indirect tax revenue share of GDP and international tax revenue share of GDP as tax structure components.

debt. In other words, the de facto fiscal space indicator will take lower values.

- Real income per capita can be described as a measure of the economic development of countries. Accordingly, a high level of real income per capita may positively affect the fiscal space.
- It is assumed that institutional quality will have a positive effect on the fiscal space by reducing public debt and increasing public revenues. In the literature, it is seen that institutions such as political stability, quality of governance, democratization of political regime positively affect fiscal policy and generally associated with less public debt. In addition, it is argued that direct democracy, local autonomy and people's trust in the government, court and judicial system increase tax compliance and tax morale, thus facilitating the increase of public revenues.
- Considering the effects of inflation in the economy, it is difficult to reveal the net effect on the fiscal space and on the de facto fiscal space indicator. Increase in inflation may adversely affect public revenues. Especially in cases where the tax system is not designed to take precautions to collect taxes in inflationary periods (such as temporary taxes for certain periods), delay in tax payments/collection will reduce real tax revenues¹⁶. On the other hand, if domestic borrowing was indexed to inflation, debt service would negatively affected due to increases in inflation. However, rising inflation may also lead to a decrease in the real value of public debt, thereby the share of the public debt in GDP may decline. Therefore, the net effect of inflation on debt remains uncertain.
- Although the effect of age dependency ratio on the fiscal space is ambiguous, similar to trade-openness, it is generally accepted that it has a reducing effect on the fiscal space. If this ratio is high, it may positively affect public revenues by increasing the tax revenue to be obtained in

¹⁶ This situation is explained by the “Tanzi effect” in the literature. Tanzi deals with the negative aspect of the inflationary financing process in terms of real tax revenue. Accordingly, it is argued that in a tax system with low income elasticity, a long time until the collection of taxes will reduce the real tax revenue in inflationary periods (Çavuşoğlu, 2005: 38).

terms of creating more demand for expenditures such as education and health. However, the overriding effect on the fiscal space is that it reduces the impact of the workforce on growth, creates age-related solid and costly expenditures, and erodes tax revenues.

Gnangnon and Brun (2019) revealed that tax reforms have a positive effect on the fiscal space, and this positive effect is particularly high in less developed countries. Also, specifically, the fiscal space is positively and significantly affected by higher real per capita income, higher economic growth, better institutional quality, lower inflation rates and lower age dependency ratio (Gnangnon, 2019: 256). On the other hand, it is stated that the positive effect of tax reforms on the fiscal space emerges at higher levels in economies that are more open to trade (Gnangnon, 2019: 238). In this direction, Gnangnon (2019) states that in order to strengthen the fiscal space for financing development needs, policy makers in countries should continue their tax reforms within the framework of an economy model that is more open to foreign trade, especially with the help of both bilateral partners (developed countries) and relevant international institutions (Gnangnon, 2019: 259).

Grauwe and Ji (2013) tested the hypothesis whether the government bond market of Eurozone countries is more fragile and sensitive to liquidity crises compared to 14 developed countries¹⁷ that are not in a monetary union (countries which are not using Euro) and can borrow in their own currencies. In this analysis, Grauwe and Ji (2013) take into account the debt to GDP ratio and the public debt/tax revenue ratio which is the de facto fiscal space calculation method. In the analysis, there is evidence that the main reason for the increases in the borrowing costs of the countries in the euro area during the 2010-2011 period is not due to the increases in the debt/GDP and fiscal space variables of the countries, but rather the negative expectations of the investors in the market over time, especially since the end of 2010. It has been observed that investors who were ignoring the high public debt (debt to GDP ratio) in the Eurozone for many

¹⁷ Australia, Canada, Czech Republic, Denmark, Hungary, Japan, South Korea, Norway, Poland, Singapore, Sweden, Switzerland, the UK and the US.

years, started to worry more about this issue and reflected their risks by increasing the borrowing costs. On the other hand, although there is an increase in debt to GDP ratios and a contraction in fiscal space in developed countries that are not geographically or financially included in the euro area, it is observed that investors do not have similar concerns for these countries (Grauwe and Ji, 2013: 33). It is emphasized that one of the main reasons for this situation is that the countries in the second group can issue their own money and they can give a guarantee to the bond holders that the cash will always be available at maturity, however the member countries of the monetary union cannot provide such a guarantee (Grauwe and Ji, 2013: 32). As a result, the study of Grauwe and Ji (2013) shows that financial markets punish Eurozone countries more than other countries against the same disruptions. In other words, empirical results support the hypothesis that Eurozone countries are more vulnerable to liquidity crises than other countries (Grauwe and Ji, 2013: 33).

Peat et al. (2015) measures the effect of fiscal opacity¹⁸ on government credit markets for 45 developed and developing countries, and in the same study also investigates the relationship between countries' fiscal space measures and CDS premiums. Accordingly, a strong relationship was found between the CDS premiums and country's fiscal space which were determined in parallel with the two fiscal space calculation methods, deficit/tax and debt/tax, in the context of de facto fiscal space approach. In other words, it was concluded that the fiscal space is one of the many factors affecting CDS. Additionally, it appears that "deficit/tax" calculation is more strongly associated with CDS spreads than "debt/tax" calculation (Peat et al., 2015: 40).

Didier et al. (2012) analyzed the impact of the global crisis on developing countries and the way the countries in this group responded to the crisis. Didier et al. (2012) stated that there has been a structural change in the behavior of developing countries during the response to the crisis and the post-crisis recovery process, and that these countries are more resilient than previous crises (Didier et al., 2012: 2052). Accordingly, these countries converged to the pre-crisis

¹⁸ It can be thought as the opposite of fiscal transparency.

growth trend earlier than developed countries. It has been stated that behind this success of developing countries lies the wide fiscal space provided by the high growth rates they achieved in the pre-crisis period. Didier et al. (2012), using the de facto fiscal space measure in the analysis, showed that developing countries had a wider fiscal space than developed economies in 2007 (Didier et al., 2012: 2054). In this way, during the global crisis, developing countries were able to implement counter-cyclical policies and their economies were less affected than developed countries, and they converged a little more to developed economies (Didier et al., 2012: 2070).

Cheng and Pitterle (2018) calculated the fiscal space of 27 selected countries as of 2014 using the de facto fiscal space method. In general, countries such as Denmark, Hong Kong, Sweden, New Zealand, Australia and South Korea stand out as the countries with the highest fiscal space; and the countries such as Japan, Greece, Italy and Portugal appear to have the least fiscal space in 2014. Countries with the least fiscal space are usually those with the highest debt ratios. Among the countries with the highest fiscal space, Hong Kong has a very low level of general government debt. In terms of revenue; it can be said that Nordic countries with a large tax base such as Denmark, Sweden and Finland have a high fiscal space due to their high revenue collection capacity (Cheng and Pitterle, 2018: 14-15). Cheng and Pitterle (2018) suggest to use “fiscal multipliers” in studies on fiscal space measurement. It has been stated that the fiscal policy effectiveness, measured by the size of the fiscal multiplier, can add an important dimension to the fiscal space analysis, since the fiscal space is in a strong relationship with the economic growth target, which is one of the most fundamental fiscal space creation methods (Cheng and Pitterle, 2018: 16). In the study, it was also stated that variables that determine the fiscal space such as debt structure (currency denomination, maturity, domestic or international creditors, and contingent assets), economic outlook, current and future age dependency, institutional stability should be taken into consideration (Cheng and Pitterle, 2018: 17).

Aizenman and Jinjark (2011), who introduced the de facto fiscal space method to the literature, calculated the fiscal space of 123 countries for the period before the global crisis (as of 2006) in another study. In the study, countries are also grouped as low income, middle income, SWEAP countries¹⁹, OECD countries and non-SWEAP Euro countries. On a country basis, it is stated that the average number of tax years required to repay the debt varies according to the indebtedness rate, tax base and fiscal deficits of the countries, but for most countries, it was less than 5 years at that time. The moderate economic climate experienced all over the world in the years just before the crisis (between 2000-2006), with its positive effect on taxation capacity, brought about an increase in revenues and, accordingly, a decrease in both fiscal deficits and debt levels of countries (Aizenman & Jinjark, 2010: 1-2). However, in terms of country groups, it is seen that the countries with the lowest fiscal space for the pre-crisis period are generally low and middle-income countries. This is because these countries are among the countries with the highest public debt/average tax base (Aizenman & Jinyarak, 2011: 7). Although SWEAP countries have relatively higher fiscal space compared to low and middle-income countries, the high indebtedness levels of the countries in this group (high debt/GDP ratios) cause their fiscal space levels to be much more limited compared to high income OECD and non-SWEAP Euro countries. On a group basis, non-SWEAP Euro countries also seem to have a higher fiscal space than OECD countries (Aizenman & Jinyarak, 2011: 7-8).

Aizenman et al. (2011) examined the relationship between the fiscal space and risk pricing in the countries. Aizenman et al. (2011), empirically estimated the risk pricing of 60 countries determined in the market during the crisis period, using dynamic panel regression analysis based on two de facto fiscal space calculation methods (debt/tax and deficit/tax) for the period 2005-2010. The empirical results indicate that the fiscal space plays an important role in risk pricing. In the analysis made in the light of the data for the 2005-2010 period, it has been revealed that the fiscal space variables (debt/tax and deficit/tax) are economically and

¹⁹ South-Western Euro Area Peripheral countries: Greece, Ireland, Italy, Portugal, and Spain.

statistically significant determinants of CDS spreads (Aizenman et al., 2011: 24-26).

Aizenman et al. (2019) examines the cyclical character (fiscal cyclicity) of public expenditures and tax policies and the factors explaining the cyclicity, for the period 1960-2016 on the basis of country groups and regions, using the concept of fiscal space. It is seen that the majority of the countries in the sample are characterized by a limited fiscal space, but differ in terms of whether their fiscal policies are procyclical or acyclical. Accordingly, more limited fiscal capacity (measured by fiscal space indicator) is positively associated with fiscal cyclicity. Aizenman et al (2019) state that the public debt/tax base ratio is a more explanatory than the public debt/GDP ratio in terms of the cyclicity of government expenditures, but the opposite is true when capital investments are also taken into account. On average, more indebted countries spend more during recovery periods (more pro-cyclical) than countries with lower debt ratios; in terms of spending cuts during contraction periods, it does not differ from countries with low debt ratios. On the other hand, the analysis shows a significant economic impact of a persistent interest rate increase on the fiscal space, and that a 10% increase in the public debt/tax base ratio is associated with a 5.9% increase in the procyclicality of government spending (Aizenman et al., 2019: 250).

Yohou (2020), similar to the study of Gnanon and Brun (2019), examined the relationship between fiscal space and tax reforms, but differently evaluated this relationship over the "level of corruption" in the country. In this framework, for the period 1990-2016, Yohou (2020) calculated the fiscal space of 64 developing and developed countries with the de facto fiscal space method, created tax reform and corruption indexes²⁰ and tested the relationship with panel data techniques.

²⁰ Yohou (2020), calculated the tax reform index, based on the method of Gnanon and Brun (2019), as composite index of the structure of non-resource tax revenue and measures the degree by which developing countries' tax structure is similar to that of the advanced economies (Yohou, 2020: 11). As the corruption index, it used the index published by the International Country Risk Guide (ICRG). Corruption index contains: demands for special payments and bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans, excessive patronage, nepotism, job reservations, 'favor-for-favors', secret party funding, and suspiciously close ties between politics and business etc. (Yohou, 2020: 12).

Corruption, as an institutional factor affecting the fiscal space, is one of the variables that most negatively affect public finance. In a recent IMF study, it is stated that among countries with similar incomes, countries with lower levels of corruption collect 4% (as a share of GDP) more tax revenue than countries with higher levels of corruption (IMF, 2019). Tax reforms have positive effects on the fiscal space in terms of increasing the efficiency of public revenues, expanding the tax base and supporting the financing of development goals. However, the phenomenon of corruption prevents or reduces the positive effects of tax reform on the fiscal space through various channels. Accordingly, the effectiveness of tax reforms will decrease as the decisions taken regarding tax reform are guided by the reflections of corruption such as nepotism and bribery. In addition, corruption reduces the efficiency of public expenditures, undermines trust in the government, and can cause a narrowing of the tax base by disrupting taxpayers' compliance with taxes (Yohou, 2020: 2). All these effects of corruption pave the way for Yohou (2020)'s research. In this context, Yohou (2020) argues that corruption distorts the potential positive effects of tax reforms on the fiscal space (Yohou, 2020: 3).

Yohou (2020) used the “debt service/total government revenue excluding grants” ratio as a dependent variable, based on the de facto fiscal space indicator. In addition, “total tax revenues as a share of GDP” is also included in the analysis as another dependent variable. As independent variables, along with tax reform and corruption indexes, institutional quality, economic growth, trade-openness, population growth, inflation, real GDP per capita and government consumption were also taken into account as other variables that may affect the fiscal space (Yohou, 2020: 11).

In the study, the expected possible effects of these variables on the fiscal space and tax/GDP indicators are listed as follows before the analysis (Yohou, 2020: 13-15):

- Institutional quality²¹ encourages tax compliance and can increase tax collections. With the financing opportunity that higher tax revenue will provide, it may be possible to reduce borrowing. In this framework, it is expected that the institutional quality will have a positive effect on the fiscal space (lower de facto fiscal space indicator value) and tax/GDP.
- Economic growth can enable higher public revenues to be obtained and thus reduce dependency on borrowing. Thus, a higher fiscal space is likely to emerge. As a result, it is expected that there will be a positive relationship between tax/GDP and economic growth variables.
- Trade-openness might have positive or negative effects on the fiscal space. On the one hand, it can increase public revenues and reduce the debt burden by stimulating growth. On the other hand, customs tax revenue to be obtained may decrease due to the reduced customs tariffs in order to establish a more trade open structure. In addition, financial pressures arising from increasing globalization may also cause economic disruptions. Despite these different effects, it is assumed that the positive effects of trade-openness on the economy will outweigh.
- Population growth reflects the role of the country's demographics. Accordingly, the increasing labor supply along with the growing population may indicate the expansion of the tax base and thus an increase in tax revenues and fiscal space. However, high age dependency ratio may increase the demand for expenditures that will require more resources such as education, health and social security. In this aspect, positive or negative effects may occur on the fiscal space and tax revenues.
- It is accepted that inflation has a decreasing effect on the real value of public revenues (Tanzi effect). In addition, public debt service may be adversely affected by increasing inflation. Since the effects of inflation on the economy can be very diverse, it is considered that its relationship with

²¹ The institutional quality contains government stability, socioeconomic conditions, investment profile, internal and external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, and democratic accountability, bureaucracy quality etc. (Yohou, 2020: 8).

the fiscal space and tax revenues may change in different ways through different channels.

- Real GDP per capita, as mentioned earlier, is an indicator of development and national welfare. As the increase in per capita income may mean the expansion of the tax base, it also increases the financing capacity of the country. The high level of development and tax effort are also associated with each other. The increase in the demand for public goods and services with high-income elasticity may also increase the tax payment and collection capacity. Considering all these effects, real GDP per capita may have a positive effect on both tax revenue and fiscal space.
- General government final consumption represents the government size in the economy. In the measurements related to the tax effort in the literature, it is stated that the income level needed by the country is also related to the socially desired public expenditures. In this direction, public expenditures are expected to have a positive impact on the fiscal space and tax revenues.

According to Yohou (2020)'s research, tax reforms have a positive effect on the fiscal space and tax revenue. In addition, this effect is higher in countries where corruption is less (or controlled). Empirical results show that the effect of other variables is in line with expectations to a large extent. Accordingly; economic growth, institutional quality, population growth and real GDP per capita have a positive effect on fiscal space and tax revenues. In addition, trade-openness generally has a negative effect on the fiscal space indicator, while it has a positive effect on tax revenues. On the other hand, inflation and government consumption variables do not have a statistically significant effect on fiscal space and tax revenues (Yohou, 2020: 17-18).

Nerlich and Reuter (2015), following the Ostry et al. (2010) approach, calculated the fiscal space of 27 EU member countries for the period 1990 – 2015 and analyzed empirically the relationship between the fiscal space and the fiscal rules (expenditure rule, balanced budget rule, debt rule). In general, empirical results

show that the fiscal space of the EU countries has started to decline since the global financial crisis, especially after 2007 (Nerlich and Reuter, 2015: 5-6).

In the study of Nerlich and Reuter (2015), there is evidence that fiscal rules can contribute to obtaining higher fiscal space. In this respect, it is stated that there is a significant relationship between fiscal rules and fiscal space. As a result of the analysis, it has been revealed that the average level of fiscal space in a country that has adopted a fiscal rule in public financial management for the last 10 years is 22% higher (as a share of GDP) in this period (Nerlich and Reuter, 2015: 8). However, it is stated that the type of fiscal rule applied also affects the relationship between the fiscal rule and the fiscal space. Accordingly, there is a stronger relationship between expenditure rules or balanced budget rules and fiscal space, while there is a lower relationship between debt rules and fiscal space. The positive effect of the expenditure rules on the fiscal space emerges in the direction of increasing the credibility of the government. This is especially about keeping the primary balance under control. In other words, keeping the primary balance under control increases the fiscal space by increasing the credibility (debt limit) of the governments. Expenditure rules are associated with a higher primary balance, a lower debt level, and a lower interest-growth differential. The effect of the balanced budget rule on the fiscal space emerges in terms of increasing fiscal discipline and thus improving the primary balance, as can be expected (Nerlich and Reuter, 2015: 9-11). In the analysis, it is also stated that the high level of fiscal space is associated with increased discretionary spending. However, it is stated that this positive relationship decreases significantly if fiscal rules are adopted. The rationale behind this is that although the fiscal space has an increasing effect on procyclical policies, fiscal rules create more counter-cyclical effects (Nerlich and Reuter, 2015: 9-11).

Nerlich and Reuter (2015) examined some other variables that may affect the fiscal space together with fiscal rules. Accordingly, other variables included in the analysis are as follows (Nerlich and Reuter, 2015: 7-8):

- Economic variables: GDP per capita, financial openness, and trade openness.

- Political variables: Fragmentation of government, election year, the ideological position of the government, the ideological range of government.
- Demographic variables: Population, current age dependency and future age dependency.
- Other variables: EU membership, EMU membership and IMF arrangements.

In general, the effect of these variables on the fiscal space is in line with the expectations in the literature. Specifically, countries that are more open to trade, more conservative, have a less fragmented political structure and are more politically stable seem to have higher levels of fiscal space. Another result of the analysis is that financial openness is associated with a lower level of fiscal space. It is considered that the main reason for this may be due to the fact that governments can use financial repression tools less in a more financially open structure (Nerlich and Reuter, 2015: 8).

Bastos and Pineda (2013) measured the fiscal space of Brazil's Federal District and 26 states for the period 2000-2011 using the Ostry et al. (2010) approach. In the study, it is stated that after the fiscal consolidation process in the country, many states have a certain level of fiscal space. However, it is seen that the levels of fiscal space differ among the states, and in general, the states in the North and Northeast have a higher level of fiscal space than the states in the South and Southeast (Bastos & Pineda, 2013: 15). Bastos and Pineda (2013) also emphasize that the level of fiscal space can be supported by market incentives and fiscal rules on debt to be applied at the state level (Bastos & Pineda, 2013: 16). This study differs from other studies in the literature in that it examines the level of fiscal space on the basis of sub-states of a particular country.

Kim (2015) analyzed the effect of the maturity structure of the debt on the fiscal space. Kim (2015) tested the effect of the maturity structure of the debt on the debt limit calculated within the framework of the Ostry et al. (2010) approach. In the study, it has been revealed that the maturity structure of the debt has a significant effect on the fiscal space. Accordingly, the longer-term debt of the

states expands their debt limit and thus their fiscal space (Kim, 2015: 21). It is considered that the main reason for this situation is that the financial resource provided by long-term debt contributes to the sustainability of the debt with the positive effect it creates on current fiscal output.

Adedeji et al. (2016) calculated the fiscal space of 58 low-income countries for the period 1990-2014 based on the Ostry et al. (2010) approach but made some changes in the method due to the lack of data on these countries. In determining the debt limit, instead of calculating the primary balance reaction function, the "prudent debt level" was calculated with a probabilistic approach by using the debt thresholds and indicators related to fiscal rules determined for each country within the debt sustainability framework (DSF) by the IMF and the World Bank. The difference between this prudent debt level and current debt is taken as the fiscal space. Accordingly, it has been found that approximately 60% of these countries have a certain fiscal space, in other words, their debt ratios are below the determined debt limit. Another result of the study is that countries with stronger institutional quality have higher fiscal space than others.

Hajnovic and Zeman (2013) calculated the debt limit and the fiscal space of the EU countries for the pre-crisis period between 1995 and 2008, using the Ostry et al. (2010) approach. Accordingly, when the general appearance of the EU is considered, it is seen that it has sufficient fiscal space. Especially in some countries with strong fiscal discipline (such as Finland), the fiscal space is at relatively higher levels (Hajnovic & Zeman, 2013: 25). It is stated that many member countries (such as Greece and Italy) which could not benefit from the periods of recovery in the global economy have no sufficient fiscal space. In addition, it has been observed that some countries reduce their debts by improving the primary balance, while others are reducing with rapid GDP growth. In some countries (for example Slovakia), debt management was supported by one-off resources such as privatization. On the other hand, it was noted that almost all countries acted less cautiously in debt management due to the low interest rate environment. It has been also mentioned that some countries may be under pressure due to tax competition. In this context, it is underlined that the

countries should make structural changes in their budget policies in the face of increasing debt (Hajnovic & Zeman, 2013: 25 - 26).

Ko (2020) calculated the fiscal space of 17 welfare states for the period 1986-2013 using the Ostry et al. (2010) approach. In this framework, the debt limit and fiscal space of the countries were determined by calculating the primary balance reaction function and the interest-growth rate differential. In the study, an evaluation was made in terms of the financial sustainability of the welfare states.

In Ko (2020)'s study, in which the primary balance reaction function is considered as the dependent variable, various financial, structural, economic, political and fiscal variables are taken into account as independent variables. Accordingly, the variables included in the analysis and the expectations for some variables are as follows (Ko, 2020: 538-542):

- Financial variables: output gap, welfare expenditure, inflation.
- Economic structure variables: unemployment, part-time employment, self-employment, share of service industry, capital openness, age dependency, future dependency.

Unemployment can reduce financial resources by causing an increase in public expenditures for the unemployed people and narrowing of the tax base. Precarious employment or part-time employment may create similar challenges. The expansion of self-employment can often increase tax evasion and reduce government revenue opportunities. The aging population may put pressure on the welfare system by increasing both current and future expenditures for social security. In addition, since the service sector is assumed to be less productive than the manufacturing sector, it is stated that the expansion of this sector may cause some negative effects on the economy. It is considered that the openness of financial markets (capital openness) can also facilitate capital gains of the state (Ko, 2020: 541).

- Political and institutional variables: election, political stability, majority system (pluralist system), centralization, fiscal rule.

Generally, it is seen that politicians tend to increase public expenditures during election times and this situation leads to an increase in government expenditures and debt. In terms of political stability, the low probability of re-election of the current government or ideological differences between parties may also have increasing effects on public expenditures and public debt. For example, it can be assumed that left-wing parties are generally more generous in terms of public expenditures and borrowing than other parties, and therefore financial conditions might be more difficult while these parties are in charge. In addition, the majority system, centralization and fiscal rules also affect financial performance due to their effects on political or economic decision-making processes (Ko, 2020: 541-542).

Result of Ko's (2020) study shows that all countries except Greece, Spain, Italy and Portugal (SWEAP countries) have a certain fiscal space to ensure fiscal sustainability, although they have some fiscal risk. SWEAP countries could not fully ensure their financial sustainability in the post-crisis period due to low growth, high interest burden on public debt and lack of an adequate governance understanding to solve their financial problems. On the other hand, when evaluated in terms of financial management capacities, it is seen that there is a contraction in the fiscal space of the UK, US and France. It can be said that, unlike SWEAP countries, these countries have the opportunity to solve their financial problems by taking advantage of the low interest rate environment, but there may be uncertainties in the future in terms of fiscal sustainability. Scandinavian countries (Norway, Denmark, Sweden) stand out as welfare states that have been able to maintain their fiscal sustainability despite the global crisis (Ko, 2020: 546).

Ko (2020) argues that contrary to the traditional view, it cannot be concluded that fiscal sustainability can be achieved with low public social expenditures. Ko (2020) points out that the fiscal space of countries with relatively low welfare expenditures such as the UK and the US have decreased recently, while the fiscal space of Scandinavian countries with high welfare expenditures have expanded steadily. In addition, Ko (2020) states that in the evaluations of the financial

sustainability of welfare states, it is necessary to focus on the general income and expenditure structures in addition to the total social expenditures and tax burdens of the countries (Ko, 2020: 546).

Ghosh et al. (2013) calculated the fiscal space of 23 developed countries for the period 1970-2007 with the Ostry et al. (2010) approach. According to Ghosh et al. (2013)'s analysis, there is a dangerous financial situation for the Eurozone periphery countries. In particular, along with Ireland and Spain, Greece, Italy and Portugal are among the countries with the least fiscal space. At the same time, Japan seems to have exhausted its entire fiscal space. Additionally, Iceland, USA and UK appear to have limited fiscal room for maneuver. On the other hand, Australia, Korea, New Zealand and Nordic countries seem to have a sufficient level of fiscal space to cope with unexpected shocks (Ghosh et al., 2013: F7).

According to Ghosh et al. (2013), there is a strong relationship between the primary balance and public debt, which is non-linear and exhibits a "fiscal fatigue" character. Accordingly, a relationship cannot be observed at low levels of debt, or there is a very weak negative relationship, while when debt increases, the primary balance begins to increase. However, this sensitivity eventually weakens and decreases at very high debt levels (Ghosh et al., 2013: F6-F7).

Ghosh et al. (2013) also analyzed various factors that could affect the primary balance (hence the fiscal space) just as in the study of Ostry et al. (2010). These variables are; output gap, government expenditure gap, trade-openness, inflation, oil price, age dependency, future age dependency, non-fuel commodity price, political stability, IMF arrangements, fiscal rules (Ghosh et al., 2013: F15). It is stated that the effects of these variables on the primary balance reaction function are generally in line with the results of other studies in the literature. For example, while the output gap affects the primary balance positively; the expenditure gap creates a negative effect. It is observed that countries with a more open trade structure and countries with a stronger institutional structure (politically stable) have higher financial performances. In addition, high oil prices naturally affect the primary balance of oil-exporting countries positively (Ghosh et al., 2013: F16).

Details of the studies on the measurement of the fiscal space in the literature are summarized in Table 4.

Table 4: Studies in the Literature on the Measurement of Fiscal Space

STUDY	METHOD	YEAR/PERIOD	COUNTRY/REGION/GROUP
Aizenman and Jinjarak (2011)	De Facto Fiscal Space	2006	123 Countries (OECD, Eurozone, SWEAP and Others)
Aizenman et al. (2011)	De Facto Fiscal Space	2005 - 2010	60 Countries (OECD, Eurozone, SWEAP and Others)
Zandi et al. (2011)	Ostry et al. (2010)	1985 - 2007	30 Developed Countries
Didier et al. (2012)	De Facto Fiscal Space	2008 - 2009	183 Developed and Developing Countries
Ulusoy et al. (2013)	De Facto Fiscal Space	1995 - 2011	EU Member Countries
Ghosh et al. (2013)	Ostry et al. (2010)	1970 - 2007	23 Developed Countries
Grauwe and Ji (2013)	De Facto Fiscal Space	2010 - 2011	14 Developed Countries
Bastos and Pineda (2013)	Ostry et al. (2010)	2000 - 2011	Brazil's Federal District and 26 states
Hajnovic and Zeman (2013)	Ostry et al. (2010)	1995 - 2008	EU Member Countries
Peat et al. (2015)	De Facto Fiscal Space	2004 - 2010	45 Developed and Developing Countries
Nerlich and Reuter (2015)	Ostry et al. (2010)	1990 - 2015	27 EU Member Countries
Kim (2015)	Ostry et al. (2010)	2008 - 2012	Advanced Economies
Botev et al. (2016)	De Facto Fiscal Space	2007 - 2015	OECD, EU, G7
Botev et al. (2016)	Interest-Growth Rate Differential	2007 - 2015	OECD, EU, G7
Adedeji et al. (2016)	Ostry et al. (2010)	1990 - 2014	58 Low Income Countries
Cheng and Pitterle (2018)	De Facto Fiscal Space	2014	27 Selected Countries
Gnangnon and Brun (2019)	De Facto Fiscal Space	1980 - 2015	62 Developing and 37 Less Developed Countries
Aizenman et al. (2019)	De Facto Fiscal Space	1960 - 2016	OECD and Non-OECD Countries
Yohou (2020)	De Facto Fiscal Space	1990 - 2016	64 Developing and Developed Countries
Ko (2020)	Ostry et al. (2010)	1986 - 2013	17 Welfare States

Source: Author.

3.2. DETERMINANTS OF FISCAL SPACE

Fiscal space levels of countries can be directly or indirectly affected by many factors in the economy. In general, many variables that can affect the debt structure, income opportunities and public expenditures of countries may have a positive or negative effect on the fiscal space. In this context, the effects of some macroeconomic, institutional and political variables on the fiscal space have been investigated in the literature, and in a sense, it has been desired to clarify what are the determinants of the fiscal space.

In this context, starting from the studies in the literature, the expected possible effects of some variables that can be considered as the determinants of the fiscal space are listed in Table 5. In addition to economic, institutional and political variables, "global variables" are also counted among the determinants of fiscal space, assuming that the level of fiscal space of countries may also be related to the global economic conditions. In Chapter 4, with an empirical analysis, it will be tried to clarify the direction of the relationship between some of these variables and the levels of fiscal space and whether this relationship is statistically significant or not.

Table 5: Determinants of Fiscal Space and Its Possible Effects

MACROECONOMIC VARIABLES	
GDP Growth	Economic growth can enable higher public revenues to be obtained and thus reduce dependency on borrowing (reduce public debt). Thus, a higher fiscal space is likely to emerge.
GDP Per Capita	It is an indicator of development and national welfare. Since the increase in per capita income may mean the expansion of the tax base, it also increases the financing capacity of the country. Accordingly, a high level of real income per capita will positively affect the fiscal space.
Trade-openness	Trade-openness might have positive or negative effects on the fiscal space. On the one hand, it can increase public revenues by broadening tax base and reduce the debt burden by stimulating growth. On the other hand, customs tax revenue to be obtained may decrease due to the reduced customs tariffs to establish a more trade open structure. In addition, financial pressures arising from increasing globalization may also cause economic disruptions.
Inflation	Inflation has a decreasing effect on the real value of public revenues (Tanzi effect). In addition, public debt service may be adversely affected by increasing inflation. However, rising inflation may also lead to a decrease in the real value of public debt, thereby the share of the public debt in GDP may decline. Since the effects of inflation on the economy can be very diverse, it is considered that its relationship with the fiscal space may change in different ways through different channels.
Age Dependency	If this ratio is high, it may positively affect public revenues by increasing the tax revenue to be obtained in terms of creating more demand for expenditures such as education and health. However, the overriding effect on the fiscal space is that it reduces the impact of the workforce on growth, creates age-related solid and costly expenditures, and erodes tax revenues.
Commodity Prices (Oil Price)	In countries whose economies are mainly based on valuable commodities (e.g., oil exporting countries), higher commodity prices may improve the primary balance and increase the country's financing opportunities.
Output Gap	During boom periods when the output gap is positive (when the economy is operating at or above its potential), tax revenues will increase, government spending on unemployment insurance and other countercyclical programs will decrease, thereby improving the primary balance, hence fiscal space. In recession periods, when the output gap is negative, the primary balance will be deteriorated.
Government Expenditure Gap	Financing temporary expenditures (such as wars, natural disasters, etc.) will increase the expenditure gap and reduce the primary balance, hence fiscal space.
Population Growth	Increasing labor supply along with the growing population may indicate the expansion of the tax base and thus an increase in tax revenues and fiscal space. However, high age dependency ratio may increase the demand for expenditures that will require more resources such as education, health and social security. In this aspect, positive or negative effects may occur on the fiscal space.
Unemployment	Unemployment can reduce financial resources by causing an increase in public expenditures for the unemployed people and narrowing of the tax base.
INSTITUTIONAL AND POLITICAL VARIABLES	
Institutional Quality	Institutional quality will have a positive effect on the fiscal space by reducing public debt and increasing public revenues. Institutions such as quality of governance, democratization of political regime positively affect fiscal policy and are associated with less public debt. In addition, direct democracy, local autonomy and people's trust in the government, court and judicial system increase tax compliance and tax morale, thus facilitating the increase of public revenues. With the financing opportunity that higher tax revenue will provide,

	it may be possible to reduce borrowing. In this framework, it is expected that the institutional quality will have a positive effect on the fiscal space. In addition, the majority system and centralization also affect financial performance due to their effects on political or economic decision-making processes.
Political Stability	Generally, it is seen that politicians tend to increase public expenditures during election times and this situation leads to an increase in government expenditures and debt. Also, the low probability of re-election of the current government or ideological differences between parties may also have increasing effects on public expenditures and public debt.
Corruption	Corruption reduces the efficiency of public expenditures, undermines trust in the government, and can cause a narrowing of the tax base by disrupting taxpayers' compliance with taxes. According to some studies in the literature corruption also prevents or reduces the positive effects of tax reform on the fiscal space through various channels. Accordingly, the effectiveness of tax reforms will decrease as the decisions taken regarding tax reform are guided by the reflections of corruption such as nepotism and bribery.
Tax Reforms	Tax reforms have positive effects on the fiscal space in terms of increasing the efficiency of public revenues, expanding the tax base and supporting the financing of development goals.
Fiscal Rules	The positive effect of the expenditure rules on the fiscal space emerges in the direction of increasing the credibility of the government. This is especially about keeping the primary balance under control. In other words, keeping the primary balance under control increases the fiscal space by increasing the credibility (debt limit) of the governments. Expenditure and debt rules are also associated with a higher primary balance, a lower debt level, and a lower interest-growth rate differential. The effect of the balanced budget rule on the fiscal space emerges in terms of increasing fiscal discipline and thus improving the primary balance.
GLOBAL VARIABLES	
Global Liquidity	Fiscal space of countries may also be related to the global economy. Financing conditions and debt management of countries can be affected by global economic conditions. For example, when global liquidity increases, borrowing will become easier and public debt may increase and the fiscal space may narrow. On the other hand, in a low interest environment, borrowing may be possible under favorable conditions and the fiscal space can be positively affected. Also, when the global risk increases, the creditors may be willing to lend less, the borrowing opportunities of the countries may become limited and the fiscal space may be positively affected in terms of not increasing public debt level. In this framework, a relationship can be found between the global liquidity and global risk variables, which represent global conditions, and the fiscal space.
Global Risk	

Source: Author.

CHAPTER 4

EMPIRICAL ANALYSIS

In this chapter, we analyze the impacts of macroeconomic, institutional, political and global variables on the fiscal space indicators by using panel data techniques for 27 OECD countries²² in between 1999 and 2020.

4.1. DATA AND METHODOLOGY

In the analysis, first of all, fiscal space indicators, which are dependent variables, were calculated within the framework of “de facto fiscal space” approach put forward by Aizenman and Jinjark (2010) and debt limit-based approach of Ostry et al. (2010). Then, selected macroeconomic, institutional, political and global variables were taken as independent variables and the baseline model was established. The baseline model was estimated by fixed effect panel regression techniques. In the sub-analyses, the model was converted to a nonlinear form and estimated through panel threshold regression methods and interaction term approaches.

4.1.1. Data

Regarding the studies in the previous literature, a broad set of macroeconomic, institutional and political variables are included in the analysis as determinants of the fiscal space. Apart from existing studies in the literature, this analysis includes global variables (global liquidity and global risk) to quantify the impacts of global environment on fiscal space.

²² Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, United States.

The macroeconomic variables in our empirical analysis are GDP growth rate (GRW), trade-openness (TRD), annual inflation rate (INF) and age dependency ratio (ADR). Data of these variables were obtained from the World Bank's World Development Indicators (WDI) database. The institutional and political variables are institutional quality (INST) and tax reform (TAXREF). For INST variable, the simple average of the indices in the World Bank's Worldwide Governance Indicators (WGI) dataset, which includes six broad dimensions of governance, is taken²³. The TAXREF is measured with an index based on the degree of convergence of the Tax/GDP ratios of the countries in the sample to the average Tax/GDP ratios of the G7 countries, using OECD data²⁴.

Global variables are global liquidity (G_LIQ) and global risk (G_RISK). G_LIQ variable is measured as the weighted average of broad money supply (M3) growth of USA, Japan and Eurozone (EA19) countries using OECD and World Bank data. G_RISK is the CBOE Volatility Index (VIX)²⁵ and the data is obtained from the FRED St. Louis Fed database.

In this study, we use two different fiscal space indicators based on two of the fiscal space measurement methods in the literature explained in Chapter 2. First, we calculate de facto fiscal space indicator (DFFS) with the “de facto fiscal space” approach proposed by Aizenman and Jinjark (2010). Second, we rely on the Ostry et al. (2010) approach, and calculate another fiscal space indicator FS_RISK, which is based on the debt limit of countries. The data for DFFS and FS_RISK variables are obtained from OECD database.

²³ This six broad dimension of governance are “voice and accountability”, “political stability and absence of violence/terrorism”, “government effectiveness”, “regulatory quality”, “rule of law” and “control of corruption”. Each indicator takes values between -2.5 (weak) and 2.5 (strong). High values of the indicator imply high institutional quality, and vice versa.

²⁴ As mentioned before, Gnanon and Brun (2019) measures the extent of tax reform by the indicator describing the degree of convergence of developing countries’ tax structure towards the tax structure of developed countries considering direct, indirect and international tax revenues as a share of GDP. We created an index with a simpler version of this approach, based on total Tax/GDP ratios.

²⁵ Volatility Index (VIX) is also called as the “Fear Index” in the literature. VIX is a measure of expected price fluctuations in the S&P 500 Index options (Münyas and Bektur, 2021: 556).

De facto fiscal space indicator (DFFS) of the countries is calculated by dividing the current year general government debt (GDP %) to the “de facto tax base”. The de facto tax base corresponds to the average tax revenue (GDP %) of the countries for the past 5 years. In this framework, the DFFS variable is shown as follows:

$$DFFS_t = \text{General Government Debt (GDP \%)}_t \div \text{De Facto Tax Base (GDP \%)}_t$$

where

$$\text{De Facto Tax Base (GDP \%)}_t = \text{Average Tax Revenues (GDP \%)}_{t-4 \text{ to } t}$$

As mentioned in the Chapter 2, the DFFS indicator implies that how many years of average tax revenues is needed to repay public debt in the current year. Accordingly, while the low values of the indicator mean that the fiscal space is ample; high values mean that the fiscal space is relatively narrow.

To measure the FS_RISK variable, we follow Ostry et al. (2010)’s fiscal space definition of “the difference between the debt limit and current level of public debt”. First, we calculate the debt limits of the countries on the basis of the risk premiums measured by the difference between long term interest rate and risk-free interest rate. Afterwards, we subtract the current debt levels from the debt limits and determine the fiscal space of the countries.

To estimate the debt limits of the countries in our sample, we consider the link between sovereign risk and indebtedness. According to the market discipline hypothesis (Bishop et al., 1989 and Bayoumi et al., 1995), higher levels of debt lead to higher risk premium. However, this positive relationship may be nonlinear suggesting that once a country surpasses a certain debt level, the risk premium also reaches a level that makes the country unable to access new loans (Campos & Cysne, 2021). That is, beyond a critical debt threshold, the country increasingly approaches a default and maintaining the fiscal sustainability becomes substantially difficult. In this approach, critical debt thresholds can be assessed as debt limits mentioned in Ostry et al. (2010).

In the estimation of thresholds, we apply Hansen's (2000) sample splitting and threshold estimation methodology that is based on change-point literature and allows exploring the endogenously determined thresholds. The baseline model that shows the link between risk premium and debt levels is given as follows:

$$y_t = \varphi'_1 x_t + \varepsilon_{1t} \quad \text{if } q_t \leq \gamma$$

$$y_t = \varphi'_2 x_t + \varepsilon_{2t} \quad \text{if } q_t > \gamma$$

In this model, q_t shows the threshold variable that splits the overall sample into two regimes, γ is endogenously determined threshold parameter and φ'_1 and φ'_2 denote the vectors of coefficients under two regimes. The dependent variable (y_t) is the risk premium measured as the difference between long term interest rate of a country and the risk-free interest rate. Following the previous studies, we choose Germany's long term interest rate as risk free rate implying the lowest probability of default. The single explanatory variable (x_t) is the debt to GDP ratio. The threshold variable is again the debt to GDP ratio and estimated parameter q_t shows the unknown debt threshold that can be called as debt limit.

Using the model above, we first estimate debt limits²⁶ and then calculate the fiscal space by subtracting current debt to GDP of countries from the debt limit as argued in Ostry et al. (2010). Our fiscal space indicator based on the estimation of debt limits can be shown as:

$$FS_RISK_t = debt\ limit_t - current\ debt_t$$

In this study, creating a new fiscal space indicator that is derived from debt limit approach serves as an important way to provide robust results in the empirical analysis.

²⁶ Estimated debt limits and confidence intervals are given in Appendix B. Debt limit of Estonia could not be calculated due to lack of data. Since Germany's long-term interest rate is taken as the risk-free interest rate in the calculation of the risk premium, debt limit of Germany is also not included.

Recently, Kose et al. (2017) has argued that fiscal space indicators can be grouped under four aspects such as “government debt sustainability”, “balance sheet composition”, “external and private sector debt” and “market perception”. In this context, our dependent variables DFFS and FS_RISK are related to “government debt sustainability”. To expand our analysis, we additionally select four different fiscal space indicators that are included in the remaining three groups from the Kose et al. (2017) dataset. Then we estimate baseline model by using these additional fiscal space indicators. In this direction, “debt securities held by nonresidents (DSNR)” from balance sheet composition; “total external debt stocks (EXT_DS)” and “private external debt stocks (EXT_PRV)” from external and private sector; “foreign currency long-term sovereign debt ratings (FCDR)” from market perception are taken as additional fiscal space indicators.

Detailed explanations of the dependent and independent variables, which are outlined above, can be found in Appendix A. The summary statistics of these variables are given in Table 6²⁷.

Table 6: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
DFFS	594	2.228	1.503	0.206	8.471
FS_RISK	550	4.449	29.154	-99.751	120.154
DSNR	532	3.771	3.565	0	23.804
EXT_DS	486	322.444	910.971	29.967	6753.440
EXT_PRV	486	279.996	899.150	23.541	6537.671
FCDR	594	18.094	3.449	2.842	21
GRW	594	1.926	3.288	-14.838	11.965
TRD	594	97.364	57.628	18.125	380.104
INF	594	2.135	1.951	-1.736	15.402
ADR	594	50.21	4.896	38.457	69.049
INST	540	1.215	0.428	0.147	1.969
TAXREF	594	93.069	4.619	81.612	99.988
G_LIQ	594	5.697	2.225	1.166	13.878
G_RISK	594	20.152	6.275	11.090	32.695

²⁷ Observations for some variables may vary due to data constraints.

4.1.2. Methodology

In this study, we employ panel data techniques to quantify the impacts of several macroeconomic, institutional and global variables on fiscal space. The baseline model is given as follows:

$$y_{it} = \alpha + X_{it}\beta_1 + \omega_t + \varepsilon_{it} \quad (1)$$

In this model, dependent variable y_{it} denotes “fiscal space” indicators (DFFS and FS_RISK) measured by de facto and debt-limit approaches, respectively. α represents the constant term in the model and X_{it} is the full set of explanatory variables. As mentioned earlier, X_{it} includes macroeconomic (GRW, TRD, INF, ADR), institutional and political (INST and TAXREF) and global (G_LIQ and G_RISK) indicators. ω_t and ε_{it} represent year fixed effects and error term, respectively.

In the analysis, we also consider the interactions between institutional quality and tax reform. The improvements in institutional quality may fuel the impact of tax reforms which is a revenue-raising policy instrument and help to increase the tax revenues by reducing corruption, increasing transparency and accountability, decreasing the bureaucratic inefficiencies. To test this hypothesis, we first add an interaction term to the baseline model. In this sense, the model is built as follows:

$$y_{it} = \alpha + \beta_1 TAXREF + \beta_2 INST + \beta_3 X_{it} + \beta_4 TAX_INST + \omega_t + \varepsilon_{it} \quad (2)$$

In this version of the model, $TAXREF$ and $INST$ are singular variables representing tax reform and institutional quality with coefficients β_1 and β_2 . X_{it} represents the other explanatory variables that are assumed not to be affected by institutional quality. TAX_INST is the interaction term which is simply calculated by multiplying $TAXREF$ and $INST$ and β_4 is the coefficient of the interaction term.

To provide robustness, we also control the indirect impact of institutional quality on tax reform by performing a panel threshold regression. We apply Hansen's (1999) threshold estimation methodology for static panels. In this framework, the threshold model is shown as follows:

$$y_{it} = \alpha + X_{it}(q_{it} < \gamma)\beta_1 + X_{it}(q_{it} \geq \gamma)\beta_2 + \omega_t + \varepsilon_{it} \quad (3)$$

where q_{it} is the threshold variable, and γ is the threshold parameter that divides the equation into two regimes as upper regime and lower regime with coefficients β_1 and β_2 . ω_t and ε_{it} are the individual year effects and the error term, respectively. In this model one or more explanatory variable can be regime dependent. If a variable is selected as regime independent, it means that the impact of that variable is fully independent from upper and lower regimes.

We can also write this equation as:

$$y_{it} = \alpha + X_{it}(q_{it}, \gamma)\beta + \omega_t + \varepsilon_{it}$$

where

$$X_{it}(q_{it}, \gamma) = \begin{cases} X_{it}I(q_{it} < \gamma) \\ X_{it}I(q_{it} \geq \gamma) \end{cases}$$

In our analysis, one of the threshold variables is institutional quality (INST) and the regime dependent variable is tax reform (TAXREF). The remaining explanatory variables are considered to be regime independent variables. That is, institutional quality divides overall sample into high institutional quality and low institutional quality regimes. By constructing such a model, we take into account that the impact of tax reforms, which is a revenue-raising policy instrument, on the fiscal space may be related to the institutional quality (INST) of that country and may change under high and low institutional quality regimes. We also take global liquidity (G_LIQ) and global risk (G_RISK) variables as other threshold variables. For these thresholds, all other explanatory variables are considered to be regime dependent because we assume that global conditions might have an

effect on all these explanatory variables. In this way, we tried to analyze how fiscal space determinants will be affected by low or high global liquidity/risk conditions.

4.2. EMPIRICAL RESULTS

In our analysis, we first estimate Equation (1) to reveal the impact of macroeconomic, institutional, political and global variables on the fiscal space. The estimation results, which also include the impact of the 2008 Global Crisis on the fiscal space with the dummy variable, are given in Table 7. Columns (1) and (2) shows the results for de facto fiscal space and columns (3) and (4), reports the results for debt limit based fiscal space.

Table 7: Estimation Results of the Baseline Model

Variables	(1) DFFS	(2) DFFS	(3) FS_RISK	(4) FS_RISK
GRW	-0.040*** (0.010)	-0.040*** (0.011)	1.347*** (0.384)	1.306*** (0.411)
TRD	0.006*** (0.002)	0.007*** (0.002)	-0.233*** (0.071)	-0.246*** (0.080)
INF	-0.054*** (0.018)	-0.051** (0.019)	1.927** (0.678)	1.809** (0.739)
ADR	0.073*** (0.014)	0.073*** (0.014)	-3.268*** (0.487)	-3.259*** (0.486)
INST	-0.901*** (0.174)	-0.911*** (0.172)	31.877*** (6.152)	32.478*** (5.890)
TAXREF	-0.055*** (0.008)	-0.055*** (0.008)	1.566*** (0.311)	1.567*** (0.309)
G_LIQ	-0.006 (0.019)	-0.006 (0.018)	0.093 (0.629)	0.090 (0.606)
G_RISK	-0.008 (0.007)	-0.007 (0.009)	0.236 (0.258)	0.175 (0.298)
DUMMY_2008		-0.071 (0.101)		3.176 (3.093)
_cons	4.573*** (1.345)	4.573*** (1.345)	-3.871 (50.646)	-3.871 (50.646)

# Countries	27	27	25	25
# Observations	540	540	500	500
R-squared	0.514	0.514	0.601	0.601

*Note: *, **, *** represent the significance levels of 10%, 5% and 1% respectively. The standard errors are given in parenthesis.*

As a reminder, the de facto fiscal space indicator (DFFS), expresses the average tax years it would take to repay public debt and the debt limit based fiscal space indicator (FS_RISK), shows the difference between the debt limits determined by considering the risk premiums of the countries and the current debt levels. Besides, macroeconomic variables are GDP growth (GRW), trade openness (TRD), inflation (INF) and age dependency ratio (ADR); institutional and political variables are institutional quality (INST) and tax reform (TAXREF) and global variables are global liquidity (G_LIQ) and global risk (G_RISK).

Since the DFFS indicator implies how many years of tax revenue is required to repay the current public debt, low values of the indicator indicate higher fiscal space. On the other hand, since the FS RISK indicator shows the difference between the debt limit and the current debt, high values of this indicator imply that the fiscal space is high. Therefore, when interpreting the effects of the determinants of fiscal space on DFFS and FS_RISK, the signs of the coefficients are formed in the opposite direction, but the same meaning emerges in terms of their increasing/decreasing effects on the fiscal space. Considering the results in Table 7, it is striking that the coefficients of the variables and their significance levels obtained for both dependent variables are quite parallel to each other. This indicates the consistency of the results.

Contrary to the literature and our expectations, the DUMMY_2008 variable which represents the impact of the 2008 global crisis, is statistically insignificant for both fiscal space indicators. However, it is thought that this situation can be explained by the fact that the distorting effects of public debt, which increased with the 2008 global crisis, on the fiscal space are felt more in the following years.

The results show that the GDP growth (GRW) and inflation (INF) have a negative and significant relationship with the de facto fiscal space indicator (DFFS), and a positive and significant relationship with the FS_RISK indicator. A unit increase in GRW and INF decreases the DFFS indicator by 0.04% and 0.05%; while increases the FS_RISK indicator by 1.34% and 1.92%, respectively. In both cases, the increase in these variables increases the level of fiscal space. This relationship between the GDP growth and the fiscal space is consistent with the results of studies in the literature (Botev et al., 2016; Gnangnon & Brun, 2019; Yohou, 2020). As argued in the literature, economic growth helps to raise public revenues by broadening tax base and reduce dependency on borrowing. The impact of inflation on fiscal space remains ambiguous in the literature. Yohou (2020) finds that there is no significant relationship between inflation and fiscal space, while Gnangnon and Brun (2019), show that inflation reduces fiscal space due to a decrease in the real value of public revenues (Tanzi effect). It is also emphasized in the literature that if a country follows an inflation-indexed debt management, increase in inflation can deteriorate the debt service. However, rising inflation may also lead to a decrease in the real value of public debt, thereby the share of the public debt in GDP may decline. Our evidence on inflation confirms the latter and suggest that an increase in inflation leads to a decrease in the real value of public debt.

Trade openness (TRD) and age dependency ratio (ADR) have a positive and significant relationship with the de facto fiscal space indicator (DFFS), and a negative and significant relationship with the FS_RISK indicator. A unit increase in TRD and ADR increases the DFFS indicator by about 0.01% and 0.07%, respectively. Again, a unit increase in TRD and ADR results in a decrease in the FS_RISK indicator by 0.23% and 3.26%, respectively. It is seen that the relationship between trade openness and fiscal space is not compatible with the results of other studies in the literature (Zandi et al., 2011; Ghosh et al., 2013; Nerlich & Reuter, 2015; Gnangnon & Brun, 2019) except for the study of Yohou (2020). As mentioned earlier, the possible impact of trade openness is twofold. First, trade openness can increase public revenues and reduces debt burden

through promoting growth. Second, it can decrease tax revenues by reducing the customs tax revenues.

According to the results of our analysis, the limiting effect of trade openness on customs revenues (i.e., public revenues) outweighs other positive effects. Age dependency ratio (ADR), which is a variable related to the population structure, also affects the fiscal space negatively. A unit increase in ADR increases the DFFS indicator by 0.07% and decreases the FS_RISK indicator by 3.26%. This result is also consistent with the literature (Zandi et al., 2011; Gnangnon & Brun, 2019). The most obvious effect of high age dependency ratio on the fiscal space is that it reduces the impact of the workforce on growth, creates age-related solid and costly expenditures, and erodes tax revenues.

In consistent with the expectations in the literature, institutional quality (INST) and tax reform (TAXREF) have a negative and significant relationship with the de facto fiscal space indicator (DFFS), and a positive and significant relationship with the FS_RISK indicator. A unit increase in INST and TAXREF decreases the DFFS indicator by 0.90% and 0.05%; while increases the FS_RISK indicator by 31.87% and 1.56%, respectively. It seems that the impact of institutional quality on fiscal space is substantially larger than the impacts of other determinants. Institutional quality can be described in many ways, such as the level of democratization, political stability, quality of the governance, regulatory capacity, accountability and transparency, people's trust in the government, court and judicial system, control of corruption, etc. It is generally accepted that high institutional quality contributes to the increase of public revenues by facilitating tax compliance and increases the effectiveness of fiscal policy by ensuring efficiency in resource allocation. In this context, the positive relationship between institutional quality and fiscal space is in line with the literature (Ghosh et al., 2013; Nerlich and Reuter, 2015; Gnangnon & Brun, 2019; Yohou, 2020; Ko, 2020) and our expectations. The result for TAXREF also consistent with the findings of the previous research (Gnangnon & Brun, 2019; Yohou, 2020) suggesting that tax reforms enhance the fiscal space by increasing the efficiency

of public revenues, expanding the tax base and supporting the financing possibilities of the governments.

As mentioned in Chapter 3, we assume that the level of fiscal space of countries may also be related to the global economy. Namely, financing conditions and debt management of countries can be affected by global conditions. For example, when global liquidity increases, borrowing will become easier and public debt may increase and the fiscal space may narrow. On the other hand, in a low interest environment, borrowing may be possible under favorable conditions and the fiscal space can be positively affected. Also, when the global risk increases, the creditors may be willing to lend less, the borrowing opportunities of the countries may become limited and the fiscal space may be positively affected in terms of non-increasing public debt level. However, our results show that there is no significant relationship between global liquidity and global risk variables and the fiscal space indicators.

At this point, we assert that global variables can indirectly affect the fiscal space. G_LIQ and G_RISK may not directly affect the fiscal space, but they can characterize the “global environment”. For instance, at the upper or lower values of a certain threshold, the fiscal space can be significantly and indirectly affected by these variables. Accordingly, we take the variables G_LIQ and G_RISK as threshold variables and convert the model into a nonlinear form. The estimation results of the nonlinear model in Equation (3) are shown in Table 8.

Table 8: Estimation Results of Panel Threshold Regression for G_LIQ and G_RISK

Variables	(1) DFFS	(2) FS_RISK	Variables	(3) DFFS	(4) FS_RISK
Threshold (G_LIQ)	4.561***	4.561*	Threshold (G_RISK)	24.202	16.674
GRW_lower	0.002 (0.017)	-0.284 (0.614)	GRW_lower	-0.040*** (0.009)	1.607*** (0.587)
GRW_upper	-0.045*** (0.006)	1.533*** (0.251)	GRW_upper	-0.041*** (0.009)	1.242*** (0.237)
TRD_lower	0.003**	-0.157***	TRD_lower	0.005***	-0.209***

TRD_upper	(0.001) 0.006*** (0.001)	(0.049) -0.211*** (0.047)	TRD_upper	(0.001) 0.004*** (0.001)	(0.045) -0.263*** (0.051)
INF_lower	-0.096*** (0.032)	3.480*** (1.147)	INF_lower	-0.072*** (0.013)	4.078*** (0.770)
INF_upper	-0.048*** (0.011)	1.652*** (0.401)	INF_upper	-0.030* (0.017)	1.136*** (0.438)
ADR_lower	0.057*** (0.008)	-2.877*** (0.299)	ADR_lower	0.068*** (0.006)	-3.055*** (0.237)
ADR_upper	0.070*** (0.006)	-3.221*** (0.219)	ADR_upper	0.054*** (0.010)	-3.087*** (0.281)
INST_lower	-0.770*** (0.182)	28.711*** (6.356)	INST_lower	-0.825*** (0.170)	33.822*** (6.029)
INST_upper	-0.877*** (0.168)	31.574*** (5.897)	INST_upper	-0.736*** (0.201)	27.813*** (6.017)
G_RISK_lower	-0.005 (0.009)	0.138 (0.325)	G_LIQ_lower	-0.037** (0.015)	0.061 (1.357)
G_RISK_upper	-0.010*** (0.003)	0.282** (0.123)	G_LIQ_upper	0.054*** (0.016)	0.063 (0.319)
TAXREF_lower	-0.040*** (0.010)	1.139*** (0.355)	TAXREF_lower	-0.054*** (0.009)	1.250*** (0.332)
TAXREF_upper	-0.050*** (0.009)	1.375*** (0.319)	TAXREF_upper	-0.057*** (0.009)	1.495*** (0.321)
_cons	4.181*** (0.855)	9.486 (29.218)	_cons	4.851*** (0.867)	8.233 (29.657)
# Countries	27	25	# Countries	27	25
# Observations	540	500	# Observations	540	500
R-squared	0.549	0.623	R-squared	0.534	0.624

*Note: *, **, *** represent the significance levels of 10%, 5% and 1% respectively. The standard errors are given in parenthesis.*

In columns 1 and 2, the threshold variable is global liquidity (G_LIQ) and in columns 3 and 4, the threshold variable is the global risk (G_RISK). The results are shown separately for the DFFS and FS_RISK indicators in the lower and upper regimes. Here, we also assume that global conditions influence all other variables. Therefore, all variables are considered as "regime dependent" variables.

The results indicate that G_LIQ divides the threshold regression into two as high liquidity (upper) and low liquidity environment (lower). As seen in the Table 8,

estimated value of the threshold variable (G_LIQ) is 4.56 and it is statistically significant for DFFS and FS_RISK . We see that the effects of other explanatory variables, except GRW and G_RISK , on the fiscal space do not differ significantly when compared with the results of the linear model in Table 7. The results show that there is no significant relationship between GRW and fiscal space indicators in lower regime (GRW_lower). However, in the upper regime (GRW_upper) there is a statistically significant link between GRW and fiscal space. When G_LIQ exceeds the threshold value of 4.56, the increase in GRW creates an expansionary effect. This situation can be explained as follows: In conditions of high global liquidity, growth-enhancing policies are more effective in increasing the fiscal space due to easier access to the resources. A similar situation is observed in terms of the G_RISK variable. In the lower regime (G_RISK_lower), there is no significant relationship between G_RISK and fiscal space indicators, but in the upper regime (G_RISK_upper) there is a statistically significant and expanding relationship. The fact that the increase in global risk conditions increases the fiscal space in situations where global liquidity is high can be associated with the fact that countries are less inclined to borrow in such an environment and thus the sustainability of public debt is not endangered. As a result, it can be said that the effect of global liquidity on the fiscal space, which does not appear in the linear model, emerges in the nonlinear model through growth and global risk variables.

In the case where G_RISK is the threshold, the estimated value of the threshold is statistically insignificant. While global liquidity creates a meaningful threshold for the regression, this is not the case for the global risk. In other words, while the fiscal space is indirectly affected by global liquidity, it is not affected by global risk in any way. The fact that the global risk is high or low does not change the effect of the variables.

4.2.1. Policy Effects to Amplify Fiscal Space

Last but not least, we focus on policies that can amplify the fiscal space in our analysis. Governments can resort to "revenue raising policies" to increase their

fiscal space. One of the most important policy tools that comes to mind to raise public revenues is “tax reforms”. According to Kose et al. (2018), measures to eliminate legal loopholes regarding revenue collection and policies that ensure taxation of the informal sector will ultimately contribute to the raising of public revenues, directly or indirectly. Hence, reforms aimed at broadening the revenue base and strengthening the tax administration can contribute to expand the fiscal space, especially for emerging market and developing economies (Kose et al., 2018: 3).

We have already seen in Table 7 that tax reforms have a positive impact on the fiscal space. Here, we hypothesize that quality institutions provide policy amplifying effects. In other words, sounder institutions can improve the performance of tax reforms. The rationale behind this hypothesis is that in countries with high institutional quality; corruption is less, political stability prevails, and regulatory rules are implemented more effectively. Therefore, quality institutions provide policy amplifying effect by increasing the implementation time and success of the tax reforms. We expect that sounder institutions can strengthen the positive effect of tax reforms on the fiscal space.

We test whether there is such a relationship between institutional quality (INST) and tax reforms (TAX REF) by employing two methods. First, we add an interaction term to the baseline model and control the impact of TAX_INST variable. Second, to be robust, we perform a threshold regression assuming that institutional quality is the threshold variable that changes the impact of tax reforms on the fiscal space.

Table 9 shows the results obtained when the interaction term is added to the model (Equation 2). The interaction term TAX_INST is simply obtained by multiplying INST and TAXREF variables. The results indicate that TAX_INST is statistically insignificant. In addition, the individual coefficients of INST and TAXREF lose their significance when interaction term is added. We can conclude that changes in institutional quality do not change the impact of tax reform. The absence of such an interaction may be due to the characteristics of the countries in the sample. 27 OECD countries in our sample already have relatively high

institutional quality. Although it is possible for these countries to expand their fiscal space with tax reform, institutional quality does not contribute to this positive effect of tax reform. If we had worked with a different sample group, including developing countries, such an effect might have arisen.

Table 9: Estimation Results of Interaction Term TAX_INST

Variables	(1) DFFS	(2) FS_RISK
GRW	-0.040*** (0.010)	1.345*** (0.391)
TRD	0.007*** (0.002)	-0.245*** (0.075)
INF	-0.054*** (0.018)	1.912** (0.679)
ADR	0.072*** (0.014)	-3.221*** (0.464)
INST	1.963 (2.254)	-74.446 (88.503)
TAXREF	-0.017 (0.034)	0.124 (1.490)
G_LIQ	-0.005 (0.019)	0.068 (0.630)
G_RISK	-0.008 (0.008)	0.243 (0.269)
TAX_INST	-0.030 (0.022)	1.123 (0.900)
_cons	0.952 (3.831)	130.696 (153.829)
# Countries	27	25
# Observations	540	500
R-squared	0.516	0.604

Note: *, **, *** represent the significance levels of 10%, 5% and 1% respectively. The standard errors are given in parenthesis.

Table 10 shows the threshold regression analysis (Equation 2) results for the INST variable. We expect that this method gives us more reliable results than the interaction term addition method because an endogenous threshold is

determined in this method. However, a significant threshold value for institutional quality (INST) could not be obtained in this way either. As seen in Table 10, the estimated thresholds for both fiscal space indicators (1.395 and 1.465) are insignificant suggesting that institutional quality does not split our sample into upper and lower regimes, that is the relationship is linear. We can confirm this result by controlling the coefficients of TAX_REF under different regimes. The coefficients of TAXREF on the fiscal space are significant and very close to each other in both the lower and upper regime. In both methods, our hypothesis that institutional quality can amplify the impact of tax reform is rejected.

Table 10: Estimation Results of Panel Threshold Regression for INST

Variables	(1) DFFS	(2) FS_RISK
Threshold (INST)	1.395	1.465
TAXREF_lower	-0.049*** (0.009)	1.377*** (0.318)
TAXREF_upper	-0.056*** (0.009)	1.602*** (0.316)
GRW	-0.038*** (0.006)	1.268*** (0.235)
TRD	0.006*** (0.001)	-0.227*** (0.044)
INF	-0.057*** (0.010)	2.057*** (0.375)
ADR	0.072*** (0.006)	-3.244*** (0.214)
INST	-0.769*** (0.170)	26.784*** (5.906)
G_LIQ	-0.006 (0.008)	0.124 (0.294)
G_RISK	-0.008** (0.003)	0.205* (0.121)
_cons	4.188*** (0.874)	9.442 (29.402)
# Countries	27	25
# Observations	540	500
R-squared	0.534	0.620

Note: *, **, *** represent the significance levels of 10%, 5% and 1% respectively. The standard errors are given in parenthesis.

4.2.2. Further Analysis

As mentioned earlier, Kose et al. (2017) classify the fiscal space indicators under four aspects. To expand our analysis, we include four different fiscal space indicators in the Kose et al. (2017)'s dataset and try to analyze the effects of the fiscal space determinants on these indicators separately. For this purpose, “debt securities held by nonresidents” (DSNR) from balance sheet composition; “total external debt stocks (EXT_DS)” and “private external debt stocks (EXT_PRV)” from external and private sector; “foreign currency long-term sovereign debt ratings (FCDR)” from market perception are taken as other fiscal space indicators. The estimation results for these other fiscal space indicators are shown in Table 11.

Table 11: Estimation Results for DSNR, EXT_DS, EXT_PRV and FCDR

Variables	(1) DSNR	(2) EXT_DS	(3) EXT_PRV	(4) FCDR
GRW	0.072** (0.026)	-10.901** (4.943)	-9.118* (4.634)	0.051 (0.044)
TRD	-0.046*** (0.013)	11.508*** (1.732)	10.354*** (1.638)	0.005 (0.008)
INF	0.031 (0.066)	-7.110 (5.676)	-4.297 (5.602)	0.078 (0.060)
ADR	0.169*** (0.035)	-29.919*** (5.621)	-29.473*** (5.742)	-0.106** (0.044)
INST	-1.286 (0.928)	46.761 (30.154)	85.177*** (24.604)	8.569*** 0.923
TAXREF	0.035 (0.048)	19.633*** (6.692)	19.287*** (6.307)	-0.073** (0.026)
G_LIQ	-0.013 (0.018)	8.097* (3.976)	7.212* (3.675)	0.070 (0.057)
G_RISK	0.006 (0.027)	-2.599 (1.983)	-2.261 (1.776)	0.020 (0.033)
_cons	-2.147 (3.226)	-1170.001** (536.264)	-1143.163** (505.392)	18.274*** (4.205)
# Countries	27	27	27	27
# Observations	508	486	486	540
R-squared	0.115	0.384	0.362	0.402

Note: *, **, *** represent the significance levels of 10%, 5% and 1% respectively. The standard errors are given in parenthesis.

The results in Table 11 show that the direction and magnitude of the coefficients of determinants considerably differ across fiscal space indicators. GRW significantly increases debt securities held by nonresidents while it significantly decreases external and private debt stocks. G_LIQ leads to increase in external and private debt stocks, but does not significantly affect the debt ratings and debt securities of nonresidents. These results underline an important point in our analysis. In general, these four indicators reflect different perspectives on the fiscal space, such as a country's external debt, debt composition, credibility and market access. In this sense, the factors affecting these aspects differ considerably. For example, debt ratings are more sensitive to political risks and quality of institutions than debt securities of nonresidents or external and private debt stock is more sensitive to exchange rate and liquidity risk than debt ratings. We can conclude that DFFS and FS_RISK, which are the main fiscal space indicators in our analysis, are more in line with the traditional understanding of the literature. These two indicators are both “more informative” and “more inclusive”. Although the calculation methods are different, these indicators also give consistent results with each other. In this sense, we argue that these variables represent the fiscal space of a country better.

4.2.3. Impact of the Covid-19 Pandemic

With the Covid-19 pandemic, which has recently affected the whole world economically and socially, a global financing need has emerged, especially in the health sector. The policies implemented by the countries to eliminate the negative effects of the pandemic made it necessary to use their existing fiscal space. This situation led to a narrowing of the fiscal space and made countries more fragile.

In our analysis, we wanted to test the effect of the pandemic on the fiscal space, at least for 2020 (the beginning year of the pandemic) by adding the dummy variable. As can be seen from Table 12, the DUMMY_2020 variable is statistically significant and has a reducing effect on both fiscal space indicators. It can be said that the main reason for this situation is that countries resort to new borrowing to

meet their financing needs during the pandemic, and this situation causes an increase in public debts and narrows the fiscal space of countries. It is possible to say that the pandemic has damaged the debt sustainability of the countries.

Table 12: Estimation Results About the Impact of the Covid 19 Pandemic

Variables	(1) DFFS	(2) FS_RISK
GRW	-0.036*** (0.008)	1.170*** (0.322)
TRD	0.006** (0.002)	-0.219*** (0.074)
INF	-0.049** (0.020)	1.779** (0.722)
ADR	0.066*** (0.015)	-3.072*** (0.516)
INST	-0.869*** (0.170)	31.116*** (6.311)
TAXREF	-0.055*** (0.008)	1.552*** (0.319)
G_LIQ	-0.045** (0.016)	1.291* (0.634)
G_RISK	-0.009 (0.008)	0.250 (0.264)
DUMMY_2020	0.562*** (0.168)	-17.443*** (6.113)
_cons	5.095*** (1.395)	-19.665 (52.670)
# Countries	27	25
# Observations	540	500
R-squared	0.526	0.610

Note: *, **, *** represent the significance levels of 10%, 5% and 1% respectively. The standard errors are given in parenthesis.

CONCLUSION

The main objective of this study is to empirically reveal the impacts of the determinants of fiscal space and to present policy recommendations within this framework. To this end, we analyze the impacts of selected macroeconomic, institutional, political and global variables (determinants of fiscal space) on the calculated fiscal space indicators by using panel data techniques for 27 OECD countries in between 1999 and 2020. In the study, two different fiscal space indicators are calculated within the framework of de facto fiscal space approach and the Ostry et al. (2010) approach. Among the determinants of fiscal space, we consider economic growth, inflation, trade openness and age dependency ratio as “macroeconomic variables”; institutional quality and tax reform as “institutional and political variables”; global liquidity and global risk as “global variables”.

Results of our study are mostly consistent with the literature. In terms of macroeconomic variables, while higher economic growth and inflation have positive impact on fiscal space; more trade openness and high age dependency ratio affect the fiscal space negatively. When we look at the institutional and political variables, we see that both institutional quality and tax reform have a significant impact on the fiscal space. We can conclude that higher institutional quality contributes to the fiscal space by increasing the revenue generation capacity and tax compliance of countries. Institutional quality also stands out as the variable that has the most impact on the fiscal space among the determinants. In a way, this result confirms the emphasis on institutional quality in the literature. As a revenue raising policy tool, tax reforms also increase fiscal space by ensuring the efficiency of public revenues and expanding the tax base. However, threshold regression and interaction term analysis show that impact of tax reform on fiscal space does not depend on the institutional quality of the countries. In other words, institutional quality does not have an additional impact on the success of tax reforms. Our results also show that global variables do not have a significant and direct impact on the fiscal space but have an indirect impact by characterizing the global environment. While this indirect effect does not occur

with the global risk variable, it occurs in terms of global liquidity. Considering the results of panel threshold regression, most obvious indirect effect of global liquidity on the fiscal space emerges through economic growth. Accordingly, we can say that in conditions of high global liquidity, growth-enhancing policies are more effective in increasing the fiscal space due to easier access to the resources.

Overall, our empirical results indicate some important implications. First, we understand that fiscal space is not just a concept that depends on macroeconomic variables. Institutional structures of the countries and global conditions should also be taken into account in the policies related to the fiscal space. Nevertheless, policies that support economic growth are still one of the concrete policies that can be used to expand the fiscal space. Second, strengthening institutional quality and implementation of tax reform practices may be sound policy options in terms of supporting the fiscal space. In this respect, governments may adopt a more persistent attitude for the success of these policies. Last, global conditions may create an opportunity for countries to expand their fiscal space. Especially, periods of high global liquidity can provide a favorable environment to increase fiscal space through economic growth for the governments.

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APPENDIX A. DATA DEFINITIONS AND SOURCES

Variables	Definitions and Other Notes	Data Source
DFFS	De facto fiscal space indicator (ratio of current year general government debt to average tax revenue of the previous 5 years, % of GDP)	OECD (own calculations)
FS_RISK	Fiscal space indicator based on debt limit (difference between calculated debt limit and current general government debt, % of GDP)	OECD (own calculations)
DSNR	Debt securities held by nonresidents (% of total)	Kose et al., 2017: A Cross-Country Database of Fiscal Space
EXT_DS	Total external debt stocks (% of GDP)	Kose et al., 2017: A Cross-Country Database of Fiscal Space
EXT_PRV	Private external debt stocks (% of GDP)	Kose et al., 2017: A Cross-Country Database of Fiscal Space
FCDR	Foreign currency long-term sovereign debt ratings (index from 1-21)	Kose et al., 2017: A Cross-Country Database of Fiscal Space
GRW	GDP growth (annual %)	The World Bank, World Development Indicators
TRD	Trade openness (sum of exports and imports of goods and services as % of GDP)	The World Bank, World Development Indicators
INF	Inflation, consumer price index (annual %)	The World Bank, World Development Indicators
ADR	Age dependency ratio (% of working-age population)	The World Bank, World Development Indicators
INST	Institutional quality (average of "voice and accountability", "political stability and absence of violence/terrorism", "government effectiveness", "regulatory quality", "rule of law" and "control of corruption" indices from -2.5 to 2.5)	The World Bank, Worldwide Governance Indicators
TAXREF	Tax reform (degree of convergence to the average Tax to GDP ratio of G7 countries, index 1-100, based on the Gnanon and Brun, 2019 approach)	OECD (own calculations)
G_LIQ	Global liquidity (weighted average of broad money -M3- growth rates of Eurozone, USA and Japan)	OECD and The World Bank, World Development Indicators (own calculations)
G_RISK	Global risk (CBOE Volatility Index: VIX, Annual)	FRED St. Louis Fed Database

APPENDIX B. DEBT LIMITS OF THE COUNTRIES

Country	Debt Limit	Country	Debt Limit
Australia	38.139 [37.590, 68.819]	Lithuania	32.02 [32.020, 33.540]
Austria	97.309 [68.599, 107.339]	Luxembourg	19.129 [27.040, 27.209]
Belgium	111.36 [94.629, 140.839]	Netherlands	62.169 [60.090, 66.069]
Canada	105.07 [105.7, 105.7]	Norway	46.799 [36.459, 46.799]
Czech Republic	33.319 [33.319, 33.319]	Poland	51.56 [51.560, 51.560]
Denmark	58.229 [58.219, 59.139]	Portugal	105.669 [105.669, 105.669]
Finland	46.45 [46.450, 46.450]	Slovak Republic	60.95 [60.950, 60.950]
France	112.47 [101.000, 160.004]	Slovenia	78.51 [78.510, 78.510]
Greece	167.084 [135.520, 181.380]	Spain	106.559 [68.25, 106.559]
Hungary	86.029 [86.020, 86.029]	Sweden	57.99 [53.830, 65.160]
Italy	125.51 [125.510, 125.519]	United Kingdom	166.834 [49.490, 111.75]
Japan	157.1 [166.309, 229.679]	United States	132.33 [132.330, 132.330]
Latvia	42.189 [42.189, 42.189]	<i>Note: Confidence intervals are given in the brackets.</i>	

APPENDIX C. ETHICS BOARD WAIVER FORM

	HACETTEPE UNIVERSITY GRADUATE SCHOOL OF SOCIAL SCIENCES ETHICS COMMISSION FORM FOR THESIS
HACETTEPE UNIVERSITY GRADUATE SCHOOL OF SOCIAL SCIENCES DEPARTMENT OF ECONOMICS	
Date: 18/04/2022	
Thesis Title: Determinants of Fiscal Space: An Empirical Analysis for OECD Countries	
My thesis work related to the title above:	
1. Does not perform experimentation on animals or people. 2. Does not necessitate the use of biological material (blood, urine, biological fluids and samples, etc.). 3. Does not involve any interference of the body's integrity. 4. Is not based on observational and descriptive research (survey, interview, measures/scales, data scanning, system-model development).	
I declare, I have carefully read Hacettepe University's Ethics Regulations and the Commission's Guidelines, and in order to proceed with my thesis according to these regulations I do not have to get permission from the Ethics Board/Commission for anything; in any infringement of the regulations I accept all legal responsibility and I declare that all the information I have provided is true.	
I respectfully submit this for approval.	
Name Surname: OKAN ASLAN Student No: N17135758 Department: Economics Program: Economics (English) Status: ☒ MA ☐ Ph.D. ☐ Combined MA/ Ph.D.	Date and Signature
<u>ADVISER COMMENTS AND APPROVAL</u>	
_____ Asst. Prof. Dr. Zühal KURUL	



HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
TEZ ÇALIŞMASI ETİK KOMİSYON MUAFİYETİ FORMU

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT ANABİLİM DALI BAŞKANLIĞI'NA

Tarih: 18/04/2022

Tez Başlığı: Mali Alanın Belirleyicileri: OECD Ülkeleri için Ampirik Bir Analiz

Yukarıda başlığı gösterilen tez çalışmam:

1. İnsan ve hayvan üzerinde deney niteliği taşımamaktadır,
2. Biyolojik materyal (kan, idrar vb. biyolojik sıvılar ve numuneler) kullanılmasını gerektirmemektedir.
3. Beden bütünlüğüne müdahale içermemektedir.
4. Gözlemsel ve betimsel araştırma (anket, mülakat, ölçek/skala çalışmaları, dosya taramaları, veri kaynakları taraması, sistem-model geliştirme çalışmaları) niteliğinde değildir.

Hacettepe Üniversitesi Etik Kurullar ve Komisyonlarının Yönergelerini inceledim ve bunlara göre tez çalışmamın yürütülebilmesi için herhangi bir Etik Kurul/Komisyon'dan izin alınmasına gerek olmadığını; aksi durumda doğabilecek her türlü hukuki sorumluluğu kabul ettiğimi ve yukarıda vermiş olduğum bilgilerin doğru olduğunu beyan ederim.

Gereğini saygılarımla arz ederim.

Tarih ve İmza

Adı Soyadı: OKAN ASLAN
Öğrenci No: N17135758
Anabilim Dalı: İktisat
Programı: İngilizce İktisat
Statüsü: ☒ Yüksek Lisans ☐ Doktora ☐ Bütünleşik Doktora

DANIŞMAN GÖRÜŞÜ VE ONAYI

Dr. Öğr. Üyesi Zühal KURUL

Detaylı Bilgi: <http://www.sosyalbilimler.hacettepe.edu.tr>

Telefon: 0-312-2976860

Faks: 0-3122992147

E-posta: sosyalbilimler@hacettepe.edu.tr

APPENDIX D. ORIGINALITY REPORT

	HACETTEPE UNIVERSITY GRADUATE SCHOOL OF SOCIAL SCIENCES MASTER'S THESIS ORIGINALITY REPORT
HACETTEPE UNIVERSITY GRADUATE SCHOOL OF SOCIAL SCIENCES DEPARTMENT OF ECONOMICS	
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Name Surname: Okan Aslan Student No: N17135758 Department: Economics Program: Economics (English) Date and Signature	
<u>ADVISOR APPROVAL</u> APPROVED. _____ Asst. Prof. Dr. Zühal KURUL	



HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
YÜKSEK LİSANS TEZ ÇALIŞMASI ORJİNALLİK RAPORU

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT ANABİLİM DALI BAŞKANLIĞI'NA

Tarih: 20/04/2022

Tez Başlığı : Mali Alanın Belirleyicileri: OECD Ülkeleri için Ampirik Bir Analiz

Yukarıda başlığı gösterilen tez çalışmamın a) Kapak sayfası, b) Giriş, c) Ana bölümler ve d) Sonuç kısımlarından oluşan toplam 100 sayfalık kısmına ilişkin, 20/04/2022 tarihinde şahsım/tez danışmanım tarafından Turnitin adlı intihal tespit programından aşağıda işaretlenmiş filtrelemeler uygulanarak alınmış olan orijinallik raporuna göre, tezin benzerlik oranı % 17'dir.

Uygulanan filtrelemeler:

- 1- ☒ Kabul/Onay ve Bildirim sayfaları hariç
- 2- ☒ Kaynakça hariç
- 3- ☐ Alıntılar hariç
- 4- ☒ Alıntılar dâhil
- 5- ☒ 5 kelimeden daha az örtüşme içeren metin kısımları hariç

Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Çalışması Orijinallik Raporu Alınması ve Kullanılması Uygulama Esasları'nı inceledim ve bu Uygulama Esasları'nda belirtilen azami benzerlik oranlarına göre tez çalışmamın herhangi bir intihal içermediğini; aksinin tespit edileceği muhtemel durumda doğabilecek her türlü hukuki sorumluluğu kabul ettiğimi ve yukarıda vermiş olduğum bilgilerin doğru olduğunu beyan ederim.

Gereğini saygılarımla arz ederim.

Tarih ve İmza

Adı Soyadı: Okan ASLAN

Öğrenci No: N17135758

Anabilim Dalı: İktisat

Programı: İngilizce İktisat

DANIŞMAN ONAYI

UYGUNDUR.

 Dr. Öğr. Üyesi Zühal KURUL