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**THE IMPACT OF TAX POLICY
ON INCOME DISTRIBUTION
IN TURKEY: 1980-2018**

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ABSTRACT

THE IMPACT OF TAX POLICY ON INCOME DISTRIBUTION IN TURKEY: 1980-2018

Türkyılmaz, Buse

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Nowadays, inequality in income distribution is one of the major problems. In economic development, it is expected that the income should be equally distributed. But income is not evenly distributed without any other external policy intervention. Therefore, governments intervene in income distribution through financial policy via taxes. Direct taxes are fairer taxes because they are charged according to the income level of individuals. However, the share of direct taxes in total tax revenues is lower than the share of indirect taxes in Turkey. The aim of this study is to explain how income distribution is affected by the change in taxes. To see the result of this effect, the relationship between the taxes and Gini coefficient is analyzed by performing ADRL boundary test method. Turkey's data between the 1980-2018 periods is used to indicate how the change in the ratio of various taxes and total tax revenue to GDP affects the Gini coefficient. The result of this study, an increase in tax on goods and services %GDP causes an increase in the Gini index in the short-term and reducing effect in the long-term. A rise in tax revenue %GDP decreases the Gini index in the short-term and increases the Gini index in the long-term. Lastly, an increase in tax on corporate profits %GDP deteriorates income distribution in the long run.

Keywords: income distribution, tax, gini coefficient, public finance

ÖZ

TÜRKİYE'DE VERGİ POLİTİKASININ GELİR DAĞITIMINA ETKİSİ: 1980-2018

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Günümüzde gelir dağılımındaki eşitsizlik en büyük sorunlardan biridir. Özellikle ülkemizde bu konu arka plana atılmıştır. Toplumun barış ve huzur içinde yaşaması için gelirin eşit olarak dağıtılması gerekir. Ancak gelir, başka herhangi bir dış güç müdahalesi olmadan eşit olarak dağılmaz. Bu nedenle devletler vergiler aracılığıyla gelir dağılımına müdahale etmektedir. Doğrudan vergiler, bireylerin gelir düzeyine göre tahsil edildiğinden daha adil vergilerdir. Fakat, Türkiye’de doğrudan vergilerin toplam vergi gelirleri içindeki payı, dolaylı vergilerin payından daha düşüktür. Bu çalışmanın amacı, vergilerdeki değişikliğin gelir dağılımının nasıl etkilendiğini göstermektir. Doğrudan vergilerdeki artışın gelir dağılımı üzerinde olumlu bir etkisi var mı? Bu etkinin sonucunu görmek için vergiler ile Gini katsayısı arasındaki ilişki ADRL sınır testi yöntemi ile incelenmiştir. Çeşitli vergilerin ve toplam vergi gelirinin GSYİH’a oranındaki değişimin Gini katsayısını nasıl etkilediğini göstermek için Türkiye’nin 1980-2018 dönemine ait verileri kullanılmıştır. Bu çalışmanın sonucunda, mal ve hizmet vergilerinin GSYİH’a oranındaki artışı kısa vadede Gini endeksinde artışa, uzun vadede ise azaltıcı etkiye sebep olmuştur. Vergi gelirinin GSYİH’a oranındaki artışı ise kısa vadede Gini endeksini düşürürken ve uzun vade Gini endeksini artırmıştır. Son olarak, kurumlar vergisinin GSYİH’a oranındaki artış uzun vadede gelir dağılımını bozmuştur.

Anahtar Kelimeler: gelir dağılımı, vergi, gini katsayısı, kamu maliyesi

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Buse TÜRKYILMAZ

İzmir, 2021

TEXT OF OATH

I declare and honestly confirm that my study, titled “THE IMPACT OF TAX POLICY ON INCOME DISTRIBUTION IN TURKEY: 1980-2018” and presented as a Master’s Thesis, has been written without applying to any assistance inconsistent with scientific ethics and traditions. I declare, to the best of my knowledge and belief, that all content and ideas drawn directly or indirectly from external sources are indicated in the text and listed in the list of references.

Buse TÜRKYILMAZ

June 9, 2021



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ABBREVIATIONS

PIT: Personal Income Tax

CIT: Corporate Income Tax

VAT: Value Added Tax

SCT: Special Consumption Tax

BITT: Banking and Insurance Transactions Tax

GDP: Gross Domestic Product

ACI: Akaike Information Criterion



1. INTRODUCTION

The distribution of national income between individuals or social groups is called income distribution. Inequality in income distribution plays a role in affecting the continuity of democratic governance. The unequal distribution of income has negative impact on economic development as well as causes uneasiness among the people living in society. Moreover, among the different income groups of households' conflicts deteriorate social peace and stability because of unequal distribution. Especially low-income people find it difficult to meet their basic needs even if they find a job with wages. This situation causes an increase in immoral behaviors in an economy (Ozturk, 2010). Also, egalitarian income distribution is one of the basic criteria of development because unequal income distribution has a negative impact on economic growth as well as economic development (Sezen and Sert, 2017). In this context, reducing the existing income distribution inequalities and raising incomes of low-income groups is necessary.

The concept of income distribution is classified differently by various factors such as the management styles of the countries and their ideological approaches. Types of income distribution are generally classified under four headings: functional income distribution, personal income distribution, regional income distribution, and sectoral income distribution. The four headings that classify income distribution are not independent from each other. In other words, change in one factor affects other factors as well. While functional income distribution is related to the sectoral structure of the economy, the state of the economy as a sector also influences the regional income distribution. Personal income distribution is based on the results of the other three concepts. This multi-faceted relationship is a situation that the economy should focus when producing social policies, planning, and trying to ensure equality of income in the long run (Uysal, 2007). Moreover, various measures have been developed to measure income distribution justice. Gini coefficient and Lorenz curve are commonly used among them.

The main aim of economic policies is to raise the degree of the economic welfare of every individual in society. As the economy grows, the change in income distribution and poverty statistics should be followed to examine the change in the welfare level of economic decision making units. The income distribution data is the main indicator to

be considered to demonstrate the distribution of welfare between individuals (Caliskan, 2010).

Nowadays, unequal income distribution is a common problem in all communities. Taxes are one of the crucial financial instruments of the state in terms of eliminating income distribution injustice and redistribution of income. Because the social purpose of the tax is helping low-income groups with equal distribution. Therefore, tax regulation must adjust according to people's income levels.

These taxes are divided as direct tax and indirect tax. If taxes are collected from expenditure, this is an indirect tax. On the other hand, a direct tax is a tax collected from income and wealth. Indirect and direct tax distinction in the tax system is a traditional sort of classification and their proportions are necessary. Indirect taxes are generally high at the beginning of industrialization. After industrialization, the share of direct taxes increases because of an increase in income per capita and institutionalization (Mutlu and Celen, 2012). The relatively high share of direct taxes in total tax revenues is a kind of transfer from the rich to the middle and low income, reducing the inequality in income distribution. On the contrary, the high share of indirect taxes in total tax revenues increases the inequality of income distribution. Indirect taxes are considered unfair taxes because they do not consider the personal and family circumstances of the individuals.

This study aims to find out the effect of tax policies on income distribution issues. "Are direct taxes or indirect taxes effective in improving income distribution?" The relationship between taxes and the Gini coefficient was analyzed by using the ADRL boundary test method to achieve this aim. The data covers Turkey's data between the 1980-2018 periods.

For this purpose, the tax and the tax system in Turkey are examined in the first section. Direct and indirect taxes were mentioned in detail. Moreover, which taxes are applied directly and indirectly were mentioned. It is touched upon that since when and what rate the taxes applied in Turkey. Lastly in this section, tax burden and tax incidence are mentioned.

In the second part of the thesis the concept of income distribution is examined. Firstly, income distribution theories and types are examined. Then, the income distribution measures are mentioned and each of them is explained separately. After that, income

distribution in Turkey and among countries is examined. Lastly, macroeconomic factors affecting income distribution are considered.

The last part of the study focused on empirical analysis. After examining the impacts of direct and indirect taxes on income distribution separately, the impact of tax policies is analyzed with the ADRL boundary test method. The literature review was made and the most appropriate data set was tried to be created to make the results significant. This model is tried to be estimated by the econometric method, and the effects of direct and indirect taxes on income distribution has been tried to determine. Finally, the results and validity of the model are evaluated.



2. THE TAX AND THE TAX SYSTEM

Taxes are the money that the government and other public institutions make mandatory for people to finance public services. Moreover, the tax structure shows the distribution of taxes collected in one country between different sources. The tax types and the weight of the taxes obtained from each tax type in total tax revenues are one of the main variables that determine the tax structure. The tax structure in Turkey has changed too many times in recent times. Among the reasons for this, the economic crises took first place. Due to the crises, the high financing needs of the state in the short term were tried to be met by taxes. Moreover, the ongoing membership process with the EU and globalization have caused changes in your tax system (Kalkınma Bakanlığı, 2014).

When looked more generally, the factors determining the tax structure were examined under 4 headings in the study of Arslan (2011). The first of these is economic factors. Industrialization can be given as an example. With industrialization, the share of income and corporate taxes were increased, and the importance of customs and real estate taxes were decreased. Secondly, political and social factors. Different social classes and their political power have an impact on the tax structure of that society. Those who possess political power aim to reduce the tax burden imposed on them. Also, the well-organized consumer community can have a say in reducing the burden of excise taxes. Another one is the development levels of countries' tax administration. Another one is the development levels of countries' tax administration. For example, tax administrations in underdeveloped countries are not sufficiently developed. Therefore, taxes, which are easier and more effortless to manage and collect, constitute the majority tax revenues. Unlike developed countries, underdeveloped countries have difficulty in collecting personal income tax or corporate tax. Finally, Socio-Economic Factors. For instance, taxes in the Socialist system are insignificant in the economy because the right to decision and property belongs to the public. Also, government revenues are obtained from government agencies.

Also, policies related to public income can be directed to two main purposes. The first one is a fiscal purpose that is the purpose of providing income for financing public expenditures. In many public revenue policies and practices, the aim is to obtain financing for public spending. The other aim is non-financial objectives. Public revenues are also used for a variety of purposes other than the purpose of providing

income for financing public expenditures. These include the environment, health, education, promotion of entrepreneurship, investment and innovation, prevention of harmful habits (Gunnarsson, 2008). Moreover, regulating the distribution of income should be added to their non-financial objectives. As a result of the normal functioning of a market-based economy, income distribution may not be equally distributed among individuals. Taxation functions as a redistribution, aiming to reduce unequal income distribution (Avi-Yonah, 2005).

The tax system should not hinder or reduce the productive capacity, savings, and investments of an economy. An effective tax system should promote macroeconomic goals. The tax system needs to be transparent and simple. Moreover, tax systems should be vertical and horizontal justice. Unfair tax rates do not create the same tax burden on every taxpayer. Low-income bracket feels more tax burden (Yayman, 2013).

However, in the Turkish tax system, a lot of tax is levied mainly on consumer goods. Also, the tax system is constantly changing in tax legislation to adapt to global economic and national circumstances. Uncertainty in the tax system has negative effects such as reducing predictability in making investment decisions. In addition, due to changes in tax laws, following tax legislation is challenging for taxpayers. Furthermore, Turkey has experienced frequent tax amnesties and the informal economy causes losses in taxes collected. Also, the informal economy causes the tax burden to concentrate on a narrow segment, disrupts the income distribution, and ultimately disrupts our country's development and social welfare growth. Moreover, the abundance of tax reductions and amnesties adversely affects the establishment of tax awareness and taxpayers' tax payments. (Goksen, 2008; Kalkınma Bakanlığı, 2014).

There are several different characters that are subject to the same tax system. Individuals have different income levels, different ages, and different marital status. If taxes could be determined by observing each individual and according to their character, there would be no problem. However, this method is very costly and almost impossible to accomplish this because of things that cannot be observed (Atkinson and Stiglitz, 1976). Therefore, finding an effective and optimal tax rate is challenging.

The purpose of this section is to provide brief information regarding the Turkish tax system. The Turkish tax system is regulated by the Tax Procedure (TP) Law. This Law contains the procedural and official provisions of all tax laws. Also, the taxpayer is the real or legal person responsible for debt according to tax laws. Legal capacity is not required to be a taxpayer or to be responsible for paying taxes (The Republic of Turkey Ministry of Finance Revenue Administration, 2016). The Turkish tax system includes two main types of taxes. As I mentioned before, these are direct and indirect taxes. Moreover, the free criteria are determining direct and indirect taxes (Tüsiad, 2012).

a. Reflection criteria: indirect taxes are easily reflected taxes. The taxpayers paying the tax have reflected the buyers or suppliers of goods and services by taking advantage of the supply-demand-price mechanism.

b. Solvency criteria: direct taxes are usually taxes with a high probability of grasping the taxpayer's solvency. The techniques that allow the tax to be collected according to solvency are applicable to direct taxes. Thus, direct taxes serve the purpose of achieving tax justice more.

c. Certainty criteria: Indirect taxes, the taxpayer is certain in advance. on the other hand, indirect taxes are incurred depending on the persons and institutions consuming goods and services. Direct taxes are accrued at defined intervals. In indirect taxes, it is difficult to mention certainty. The accrual of the tax is based on consumption or transaction. If there is no transaction, there will be no accrual or payment.

The concept of tax structure refers to the composition and weights of direct and indirect taxes in a tax system. The share of total taxes in terms of tax types, it is essential to understand the tax structure and policies of Turkey. Turkey's tax structure has changed a lot from the past to the present due to the economic crises that are frequently experienced. In addition, the high level of financing needs that the public sector needs in the short term due to these crises, the ongoing membership process with the EU and globalization have had important effects on shaping our country's tax system (Kalkınma Bakanlığı, 2014).

A large part of the taxes in Turkey are collected from personal income tax, corporation income tax, and value-added tax. As you can see in the table below, personal and corporate income taxes that constitute taxes on income & profit have decreased from 1990 to nowadays. Taxes on income & profit tax is 33,5% in 1990 and 24,1 % in 2018. A decrease of 9,4 percent is observed. On the contrary, Taxes on goods & services that are included in indirect tax have increased from 27,9% to 40,5%.



Table 1 : Share of Tax Types in Total Tax Revenues

Years	Taxes on goods & services	Taxes on income & profit	Taxes on property	Social security contributions	Other taxes
1990	27,9	33,5	2,3	19,7	16,6
1991	29,3	34,8	2,2	19,6	14,1
1992	29,8	32,5	2	20,4	15,3
1993	31,8	32	2,1	19,7	14,4
1994	37,1	29,7	8,1	15,8	9,3
1995	37,6	28,3	3	12,1	19
1996	38,3	26,2	1,8	15,8	18
1997	37,1	27,4	2,7	14,5	18,2
1998	36,1	33,2	3,5	14,5	12,8
1999	35,9	31,4	2,8	18,5	11,4
2000	42	29,5	3,2	18,7	6,6
2001	40,1	28,9	2,4	21,5	7,1
2002	46,9	24,8	2,9	19,8	5,6
2003	49,4	23,7	3,2	20,8	2,8
2004	47,7	22,1	3,1	23,9	3,2
2005	49,3	21,8	3,3	22,4	3,1
2006	48,7	21,6	3,6	22,4	3,8
2007	47,7	23,7	3,8	21,7	3,2
2008	45,5	23,9	3,6	25	2
2009	45,7	24,1	3,6	24,5	2,1
2010	47,7	21,3	4,1	24,9	2,1
2011	45,2	21	4,1	27,9	1,8
2012	45	21,8	4,2	27,2	1,7
2013	46,1	20,2	4,6	27,4	1,6
2014	44,1	21,1	4,9	28,5	1,4
2015	44,3	20,3	4,9	29	1,5
2016	43,6	21,1	4,8	28,8	1,6
2017	43,5	21,4	4,5	29,3	1,3
2018	40,5	24,1	4,3	29,9	1,1

Source: Worldbank. Revenue Statistics. Retrieved from <https://www1.compareyourcountry.org/tax-revenues/en/1/912+913+914+916+917/default/1990-2018/TUR> on 28 May 2020.

The structural macroeconomics problems may lead to increase the effect in tax. As a result, indirect taxes were used to increase tax revenues. However, this negatively affected the balance between direct and indirect taxation (Yayman, 2013). Indirect taxes are preferred to increase because these taxes is easy to collect and collected in a short time. Both Value Added Tax and Special Consumption Tax are paid every month by taxpayers, which creates an attractive environment for the public sector. While the collection of income taxes is made at the end of a long financial period, income is obtained from these taxes in a short time. This tax is levied on almost every transaction from everybody, regardless of the individual. Therefore, when the government wants to increase tax revenue, the government prefer to increase indirect taxes (Kanli, 2007). However, this situation is against low-income groups and increases inequality in income distribution.

Moreover, after the year 1980s with the financial liberalization of developing countries to global competition, it has become more difficult to tax capital effectively due to foreign capital investment and liberalized financial markets. As a result, indirect taxes dominate the tax systems in developing countries (Goksen et. al. 2008).

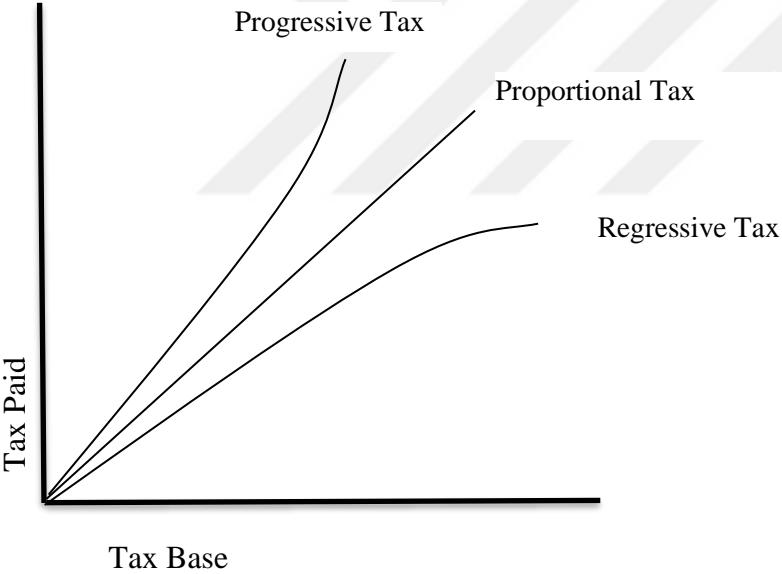
Another reason might be that the government would like to increase economic growth. Value Added Tax has more impact on private consumption expenditures than other tax types. An increase in VAT causes a decrease in consumption. As a result, consumers prefer to save instead of consuming (Sen and Kaya, 2016). However, this aim also affects tax distribution negatively.

The high rate of indirect taxes in total tax revenues disrupts the balance in income distribution and damages the principle of justice in taxation. However, indirect taxes on basic goods and services are preferred by political authorities for reasons such as ease of implementation. Besides all these, one of the most important reasons for this problem in our country is that direct taxes cannot be collected at a sufficient level (Kalkınma Bakanlığı, 2014).

Taxes can also be classified according to their impact on income distribution. These are e progressive, regressive and proportional tax. Progressive tax receives more tax from higher income groups than lower-income groups. These taxes provide a reduction in the upper shares of income and wealth. On the contrary, regressive tax receives a greater percentage of income than low-income groups compared to high-income

groups. Proportional tax receives the same percentage of income from everyone including low, middle, and high-income taxpayers (Roach, 2003). Proportional tax is also accepted as a flat tax, and the tax rate does not change with the increase or decrease of income. Therefore, while progressive taxes reduce inequality in income distribution, regressive and proportional taxes are expected to increase this inequality. In addition, the graph below is added to make these taxes more understandable. The graph shows how taxes follow the income or tax base. As shown in the graph below, the proportional tax increases in direct proportion to the tax base. In regressive tax, the tax paid increased while the tax base increased at a higher rate. When looking at the progressive tax, the opposite of the regressive tax occurred. The tax paid increased while the tax base increased at a lower rate.

Figure 1 : Progressive vs. Proportional vs. Regressive Taxes

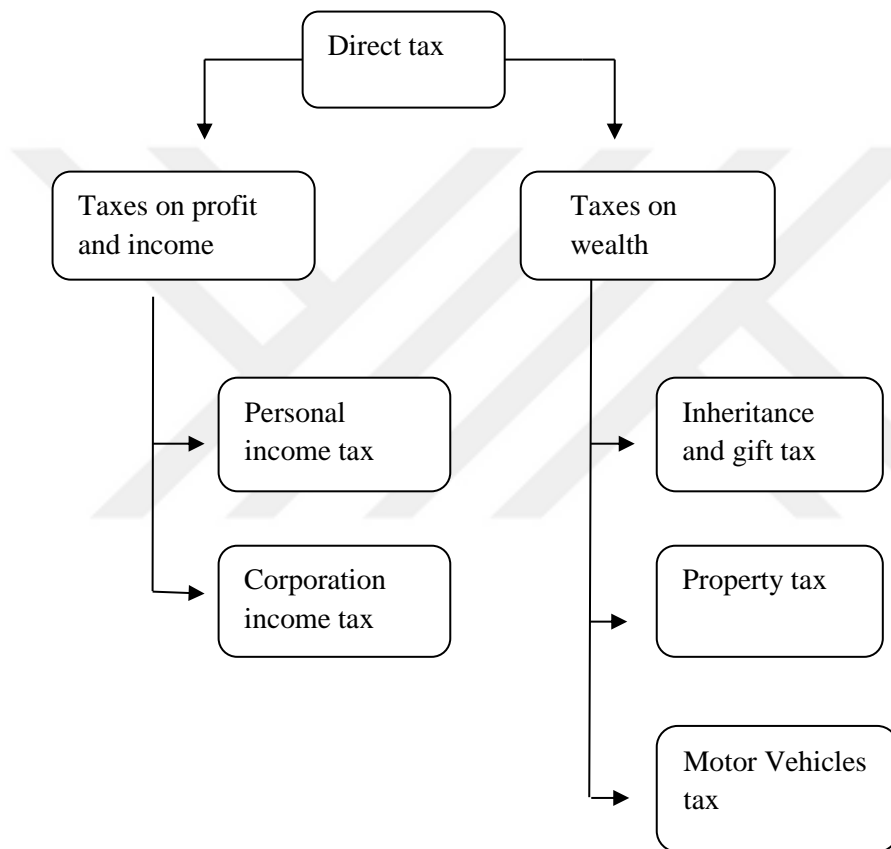


2.1. Direct Tax

Indirect taxes, the taxpayer and the payer are the same. In addition, direct taxes are taxes levied on the level of income obtained from individuals and institutions. The taxpayer cannot reflect his / her tax burden on anyone else. Direct taxes can be progressive or proportional. While corporate income taxes and property taxes are mostly progressive in every process, corporate tax likely to be “U-shaped”, regressive at low corporate income levels and progressive when corporate income goes after a certain level (ILO, 2008). Also, the schema is added to demonstrate which taxes are

included in direct taxes. Direct taxes are divided into two groups as taxes on profit and income and taxes on wealth. Taxes on profit and income consist of income tax and corporate tax. This distinction is made according to whether the tax will be collected from individuals or corporations. Moreover, taxes on wealth are divided into three groups. These are inheritance and gift tax, property tax, and motor vehicle tax. All these processes are described below.

Figure 2: Schema of direct tax



2.1.1. Taxes on Profit and Income

The most essential part of the tax system consists of taxes on income. Looking at the Turkish tax system, there are two different types of tax in this category: income tax and corporate tax. Income tax includes income and income-generating properties of natural persons. On the other hand, corporate tax is responsible for the profits of the corporations specified in the corporate tax. The two taxes are regulated by two separate laws, the Income Tax Law and the Corporate Tax Law. Both are taxable income. The difference arises in terms of the obligatory element (Kanli, 2007).

2.1.1.1. Personal Income Tax

The earlier studies about income tax in Turkey started with Tanzimat era. However, income tax in terms of contemporary taxpaying based on the German Income Tax legislation, and PIT joined our tax system in 1950 with Law No. 5421. However, due to some difficulties in practice, was reorganized and put into practice in 1961 with the Income Tax Law No. 193. Despite many changes, the Income Tax Law still has an important place to form the basis of other laws (Armagan, 2007). In addition, the trend towards reducing income tax rates began in the late 1980s in most countries, with the effect of reforms in the United States in 1986 (Kalkınma Bakanlığı, 2014).

In general, the residence criteria are applied in determining the tax debt for individuals. A person residing in Turkey is obliged to pay tax on income earned from anywhere in the world. This is unlimited liability. In other words, Turkish citizens are considered unlimited liability taxpayers and must pay PIT on income. However, non-residents are only liable to pay tax on those derived from income in Turkey, and this is limited liability. Income earned by residents and non-residents in Turkey is divided into seven elements listed below (Revenue Administration, 2016):

- Business profits,
- Agricultural profits,
- Salaries and wages,
- Incomes from independent personal services,
- Incomes from immovable property and rights (rental income),
- Incomes from capital investment,
- Other incomes and earnings without considering the source of income.

Individual income and earnings are liable to cumulatively calculated progressive income tax rates ranging between 15% and 35% in 2019. The below table shows the 2019 tax rates for each income type in the specified income tax bracket.

Table 2: Individual income tax rates applicable for 2019

Income Scales (TRY) (Employment Income)	Income Scales (TRY) (Non-Employment Income)	Tax Rate
Up to 18.000	Up to 18.000	15 %
18.001-40.000	18.001-40.000	20 %
40.001-148.000	40.001-98.000	27 %
148.001 and over	98.001 and over	35 %

Source: Presidency of the Republic of Turkey: Investment Office. Tax Guide. Retrieved from <https://www.invest.gov.tr/en/InvestmentGuide/Pages/tax-guide.aspx> on 23 Feb. 2020.

2.1.1.2. Corporate Income Tax

After WW1, corporate tax become more widespread in Western countries. In Turkey, corporate tax has been applied by the tax reform in 1949. CIT has been prepared by making use of the German Corporate Tax and has been accepted with the law numbered 5422 dated 03.06.1949. Moreover, corporate tax has been applied to corporate earnings since 1950 (Armagan, 2007).

In Turkey, the tax paid on income and earnings generated by corporations and legal entities is corporate tax. While income tax is an increasing tax, corporate tax is a proportional tax. Corporate tax does not change according to the income of the taxpayer. This tax is fixed, and this rate was 20% between 2006 and 2018. Corporate tax rate increased to 22% for post-2018 tax periods. However, the Council of Ministers is authorized to decrease the 22% rate to 20%. Also, the below table indicates how much corporate tax has been charged since 1990. In 1986, the corporate tax rate was determined as 46%. The government, which came with a policy to encourage institutions, decided to reduce corporate tax rates in 1994. Since 1995, the corporate tax rate was decreased to 25%. Then in 1999, the tax rate was set at 30%. In 2006, the tax rate has been determined by 20% with the new Corporate Tax Law.

Table 3: Ratios of Corporate Income Tax

Years	Tax Ratio	2005	33%
1990	46%	2006	20%
1991	46%	2007	20%
1992	46%	2008	20%
1993	46%	2009	20%
1994	46%	2010	20%
1995	25%	2011	20%
1996	25%	2012	20%
1997	25%	2013	20%
1998	25%	2014	20%
1999	30%	2015	20%
2000	30%	2016	20%
2001	30%	2017	20%
2002	30%	2018	22%
2003	30%	2019	22%
2004	30%	2020	22%

Source: Armagan, R. (2007). Türkiye’de Gelir ve Kurumlar Vergisi Oranlarında İndirimin Vergi Gelirleri Üzerine Etkileri, p. 233.

In addition, all income types specified in the personal income tax section are considered as corporate income if they are obtained by institutions. Corporate Tax is objective for “taxing on income”. Moreover, CIT is a tax type with a single rate tariff structure, which is regulated directly and different from Income Tax. The institutions and organizations determined as taxpayers in the Law regarding corporate tax are as follows (Revenue Administration, 2016):

- Capital companies and similar foreign companies,
- Cooperatives,
- Public enterprises,
- Enterprises owned by foundations societies and associations,
- Joint ventures.

Turkish tax legislation sees established institutions or companies as fully liable taxpayers. Besides, non-residents who are accepted as limited taxpayers are taxed on Turkish income. Taxpayers in this group are listed as follows (Ileri, 2012):

- Profits from commercial, agricultural, and industrial enterprises in Turkey,
- Income arising from the leasing of movable and immovable properties and intangible rights in Turkey,
- Professional fees earned in Turkey,
- Other income and revenues earned in Turkey.

2.1.2. Taxes on Wealth

The main purpose of wealth taxes is to try to achieve social justice when the purpose of income taxes is to provide income to the state. In countries with a low economic development, tax on wealth cannot be used effectively enough due to the reasons arising from the political structure and the difficulty of calculating the wealth technically. Property tax, motor vehicle tax, and inheritance tax are included in taxes on wealth (Arslan, 2001).

2.1.2.1. Inheritance and Gift Tax

Inheritance and gift tax is a taxpayer, real or legal person who earn property through inheritance. While inheritance tax rates range from 1 to 10 percent of the inheritance, gift tax rates range from 10 to 30 percent of valued items. The table below is provided to explain who is responsible for paying this tax. Turkish citizens are obliged to pay this tax for their global assets. Indeed, everyone, except for foreigners residing outside Turkey is obliged to pay this tax.

Table 4 : Transactions regarding inheritance and gift tax in Turkey

Location of Property	Residence and citizenship of eligible person to whom the heritage is transferred		Property inclusion to tax affairs
	Citizenship	Residence	
Turkey	Turkish Citizen	Inside Turkey or Out of Turkey	Included
	Foreigner		
Out of Turkey	Turkish Citizen	Inside Turkey	
	Foreigner		
		Out of Turkey	Not Included

Source: Yereli, A. & Uchar, O. (2014). Inheritance and Gift Tax Application in the Turkish Tax System, p. 64.

2.1.2.2. Property Tax

Property tax is the name given to the tax collected annually from all immovable properties. The property tax collected by the municipalities since 1986 must be paid regularly every year by the owners of the property. Property taxes are divided into two as building tax and land tax. All the structures within the borders of the Republic of Turkey are subject to the Building Tax. Likewise, all lands and buildings located in the Republic of Turkey are subjected to Land Tax under the same law. Property tax rates range from 0.01 to 0.03 percent in places outside the metropolitan area. Besides, for areas located in the metropolitan, property tax rates range from 0,02 to 0,06 percent (PWC, 2021).

2.1.2.3. Motor Vehicle Tax

Individuals and companies with motor vehicles are liable to motor vehicle tax, with some exceptions. In addition to land vehicles, vehicles such as aircraft, helicopters, and motor vehicles must also pay taxes. The vehicles are paid in two installments each year after the registration of the traffic. This tax is calculated by considering some differences such as vehicle type, age, cylinder volume.

2.2. Indirect Tax

Indirect taxes are taxes on the use of goods and services. Everyone who uses taxable goods and services pays the same amount of tax, regardless of income level. However, since people from different income groups pay the same tax, the tax burden is placed more on the low-income group. Even people who have no income are still liable to pay this tax. Such a tax system affects income distribution negatively.

2.2.1. Value Added Tax (VAT)

Value-added tax is levied on the added value created in an economy and practice; the tax burden is reflected on the final consumer. Added value is the obligation to add to the value of a product or service during production. VAT system consists of a series of “interim taxation” transactions for each product and service that are taxed during all stages of the product and service in the production, service, and presentation chain. VAT has been applied in our country since 1985 (Arslan, 2011).

Moreover in 1977, while VAT was applied in 14 OECD member countries, In the 1980s, Turkey; Greece, Iceland, Spain, Mexico, Japan, New Zealand, and Switzerland have begun to implement VAT. Eastern European countries started to implement VAT in the late 1980s and early 1990s. (Kalkınma Bakanlığı, 2014).

In the VAT Law, people who deal with taxable transactions are called VAT taxpayers, regardless of their legal status or qualifications and other tax-related positions. The rate of value-added tax was increased to 18% after 2001 in Turkey. However, while the standard vat rate is 18%, this VAT rate has been reduced in some products. Reduced VAT rate change between 1% and 8% according to products. The table below indicates examples of products with 8% VAT and 1% VAT. Reduced rate of 8% applied to books, medical products, textile products, education services, and tickets for cinema, theater, opera, etc. Also, a reduced rate of 1% applied to newspapers, agricultural commodities, houses, secondhand passenger cars, etc. Moreover, 8% vat and 1% vat can be applied in basic foods. 18% tax is charged on each product, except the product with reduced rates in 2020.

Table 5: Goods and Services Subject to Reduced VAT

Goods and Services	Tax Rate
Basic foods	1%-8%
Cinema, theater, opera, etc.	8%
Books and similar publications	8%
Stationery	8%
Medical products and devices, etc.	8%
Accommodation service	8%
Services provided in nursing homes and orphanages	8%
Services provided in restaurants and cafes	8%
Textile products	8%
Education services provided by private schools	8%
Newspapers and magazines	1%
Agricultural products sold as raw materials	1%
Houses (up to net 150 m2)	1%
Secondhand passenger cars	1%
Funeral services	1%
Financial leasing transactions	1%

Source: Gelir İdaresi Başkanlığı. KDV Oranları Listesi.

<https://www.gib.gov.tr/yararlim-ve-kaynaklar/yararli-bilgiler/kdv-oranlari-listesi> on 04 April 2020.

Moreover, exported products are exempt from VAT to enable exporters to compete in international markets. Value-added tax is only applied on domestic products and imported products. The main purpose of collecting Value Added Tax from goods and services imports is to prevent tax burden differentiation between goods and services produced in Turkey and imported goods and services. The following table shows the ratio of domestic VAT and VAT on imports. In 1988, tax on domestic products accounts for 18,69% of all tax revenue, while the tax on imports is 10,66%. The sum of them constitutes 29,35% of all tax income. The difference between them has decreased with the increase of imports. In 2019, while domestic VAT constitutes 17,67% of all tax revenue, the VAT on import ratio increase to 15,24%. Also, the total VAT return increased to 32,91% of all tax income.

Table 6: Value Added Tax (VAT)

Years	Domestic Value Added Tax	Value Added Tax on Imports	Value Added Tax (VAT)
1988	18,69	10,66	29,35
1989	16,34	8,94	25,29
1990	16,85	10,40	27,25
1991	18,49	10,54	29,03
1992	19,10	10,62	29,72
1993	19,26	11,72	30,98
1994	20,74	12,31	33,04
1994	18,87	11,20	30,07
1995	19,56	13,17	32,74
1996	18,68	14,43	33,11
1997	18,15	14,76	32,91
1998	17,22	12,31	29,53
1999	16,44	11,69	28,13
2000	16,93	14,68	31,62
2001	18,34	12,96	31,30
2002	19,36	14,85	34,21
2003	18,25	13,81	32,06
2004	18,47	15,50	33,97
2005	16,70	15,33	32,03
2006	16,72	16,81	33,53
2007	16,93	15,49	32,41
2008	15,84	15,78	31,62
2009	17,34	13,31	30,65
2010	16,73	15,36	32,09
2011	16,47	17,11	33,59
2012	16,76	15,76	32,52
2013	16,64	17,07	33,71
2014	16,46	16,04	32,50
2015	17,02	16,05	33,07
2016	17,36	14,51	31,87
2017	17,02	15,99	33,01
2018	17,39	16,57	33,96
2019	17,67	15,24	32,91

Source: Gelir İdaresi Başkanlığı. Katma Değer Vergisi'nin Genel Bütçe Vergi Gelirleri İçindeki Payı (1985 - 2019). Retrieved from

https://www.gib.gov.tr/sites/default/files/fileadmin/user_upload/VI/CVI3.htm

on 29 Feb. 2020.

2.2.2. Special Consumption Tax (SCT)

Although Special Consumption Tax (SCT) and Value Added Tax (VAT) are similar, there are some points they leave. SCT arises in the import or first sale of a product. On the other hand, VAT can be applied even when the goods are changed or second-handed. In addition, the subject of SCT may vary in developed and developing countries. In general, this tax is collected from two groups of goods. The first group includes tea, coffee, cigarettes, and alcohol, which are habitual substances, while the other group has luxury products such as automobiles, petroleum derivatives. While the Special Consumption Tax mainly targets luxury goods and habitual substances, in some cases, SCT includes a wide range of industrial products and services, thus creating a general consumption tax (Arslan, 2011). This tax has been applied since 2002 according to the Special Consumption Tax Law. Prices of Special Consumption Tax are constantly changing. Therefore, a few data are provided in the table below to give general idea. Moreover, SCT is determined as a percentage of selling prices or a fixed amount per unit. As seen below, the tax on diesel and gasoline is charged at a certain price per liter. The tax on motor vehicles varies between 10% and 160% depending on the vehicles model. Also, alcohol has the highest tax rate with a 261,2%. Tobacco products have high tax rates ranging from 40% to 67%, although not as much as alcohols. Other products are taxed at more reasonable rates.

Table 7: Special Consumption Tax Amounts and Rates

Type of goods	Tax
Gasoline	2,3765 TL per liter
Diesel	1,7945 TL per liter
Motor vehicles	10%-160%
Alcohol	261,2%
Tobacco	40%-67%
Household appliances	6,70%
Book & newspaper	20%
Jewelry	20%

Source: Gelir İdaresi Başkanlığı. Özel Tüketim Vergisi Tutarları ve Oranları. Retrieved from <https://www.gib.gov.tr/yarlim-ve-kaynaklar/yararli-bilgiler/ozel-tuketim-vergisi-tutarlari-ve-oranlari> on 25 Feb. 2020.

2.2.3. Special Communication Tax

Special Communication Tax (SCT) came after the great earthquake in 1999. After the amendment in the Expenditure Tax Law in 2018, the SCT rate is 7.5 percent for all mobile services subject to SCT. Before 2018, there was 25 percent on mobile communication services, 15 percent on satellite and TV broadcasts, 5 percent on the internet, and 15 percent on other telecommunication services (Tas and Karyagdı, 2020).

2.2.4. Banking and Insurance Transactions Tax

Banking and Insurance Transactions Tax goals to tax all financial transactions in general, especially bank and insurance transactions. Taxpayers are banks, bankers, and insurance companies. They are subject to BITT in every transaction, except for transactions made according to the Financial Leasing Law of 1985. The overall BITT rate is 5%, and some special transactions are down to 1%. Also, foreign exchange transactions are not liable to this tax. Tax applied transactions are listed as follows

- Bank transactions and services,

- Activities of those who make it their job to buy and sell securities on their behalf or behalf of others, to mediate buying and selling or to pay the debts against the securities they buy and sell,
- Continuously collecting money to give deposit interest and to provide similar benefits,
- Borrowing money (TÜSİAD, 2020).

2.2.5. Stamp Duty

The Stamp Duty Law was enacted in 1964 and has been amended many times. Stamp Duty is a type of tax arising from all kinds of contracts and received by the state. In other words, stamp duty is the tax on papers that document the validity of the agreements and transactions between individuals and institutions. People who sign papers with official qualifications and whose limits have been set by the Stamp Duty Law are the taxpayer of stamp duty. Stamp tax rates range between 0,189 and 0,948 percent (PWC, 2020).

2.2.6. Customs Duty

The Customs Duty applies to imported products. The taxpayer is the person who declares to the customs administration. Customs Duty varies for each product. How much Customs Tax will be collected from which product is determined according to HS Codes of the product? Also, the country in which the goods are imported is another important factor in determining the tax. Therefore, Customs tax rates range from no tax to 225 percent tax (İthalat Rejimi Kararına Ek Karar, 2019).

2.3. Tax Burden

Tax burden refers to the numerical decrease in the financial power of individuals created by the tax paid. The tax burden of a country is obtained by proportioning the taxes collected in that country to the Gross Domestic Product (GDP) of that country. This ratio increases in parallel with national income.

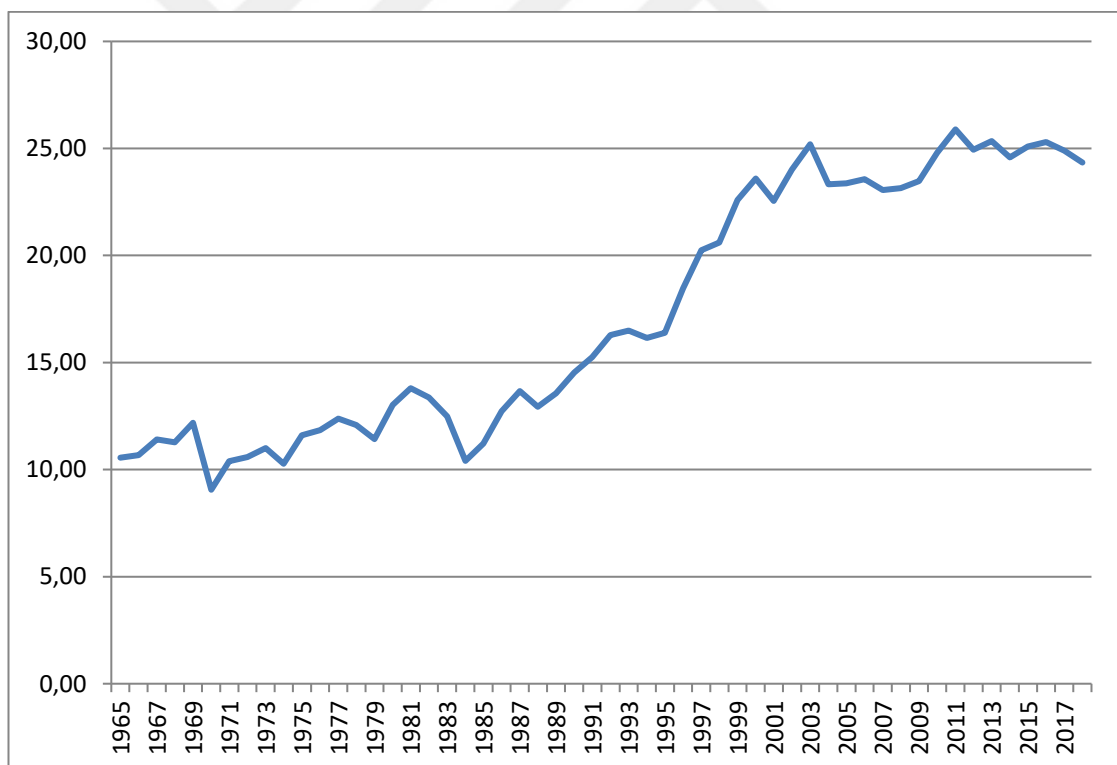
$$\text{Tax burden} = \frac{\text{Tax Revenue}}{\text{GDP}}$$

Taxes, one of the key sources of income for the government, affect various socioeconomic structures. The tax burden is widely used to see how fiscal and tax policies affect socio-economic structures. In other words, the tax burden is the tool

used in determining the effects arising from taxes. When the increase in tax income is more than the increase in income, it is expected that the tax burden will increase. As mentioned before, the increase in tax burden would influence the economic activities such as investments and savings negatively, cause the capital to shift to other places. In addition to affecting many economic factors, the tax burden may also be affected by many economic factors. For example, the financial need of the government is one of the most apparent reasons for the raise in tax burden (Celikay, 2020).

The following chart is included to show the tax burden in Turkey between 1965 and 2018. There is an upward trend in tax burden. It rose from 10,56 to 24,35. The reason for this is an increase in public spending in Turkey. The tax burden in Turkey is still low compared to other developed countries. For instance, the average tax burden of OECD countries is 34,26 in 2018. The tax burden of Turkey is low because the informal economy, (Kalkınma Bakanlığı, 2014).

Figure 3: Tax burden



Source: OECD (2020). Tax revenue. Retrieved from

<https://data.oecd.org/tax/tax-revenue.htm#indicator-chart> on 28 March 2020.

2.4. Tax Incidence

Tax incidence is the transfer of a tax paid by the statutory taxpayer to third parties, in whole or in part through the price mechanism. When there is a tax reflection, the legal taxpayer and the actual taxpayer might be different. When trying to determine how much tax each person has paid, it is essential to analyze the difference between the legal taxpayer and the actual taxpayer (Gemmell and Morrissey, 2002). The main issue of whether the tax can be reflected in the type of tax. While indirect taxes are much easier to reflect than direct taxes. It is challenging to reflect the taxes collected, especially considering personal situations such as income tax.

Tax incidence has emerged because of studies on who undertakes the economic burden of the tax. Incidence usually takes place in four successive stages (Oner, 2013). These stages are listed below.

- **Tax Payment:** In the incidence of tax, the first stage starts with the payment of tax.
- **The Emphasis of Tax:** This stage is the psychological pressure that the taxpayer feels after the tax is paid. The incidence of the tax is a result of the tax's emphasis effect.
- **Transfer of Tax:** The taxpayer who has tax liability can transfer the tax burden to another person depending on the price mechanism and supply and demand factors.
- **Settling of Tax:** The tax incidence eventually has to stop. Reflection chaining cannot continue infinitely. Tax spreads until a taxpayer is unable to reflect the tax. The last step is that person who cannot reflect the tax to another, bears the tax burden.

2.4.1. Incidence Types

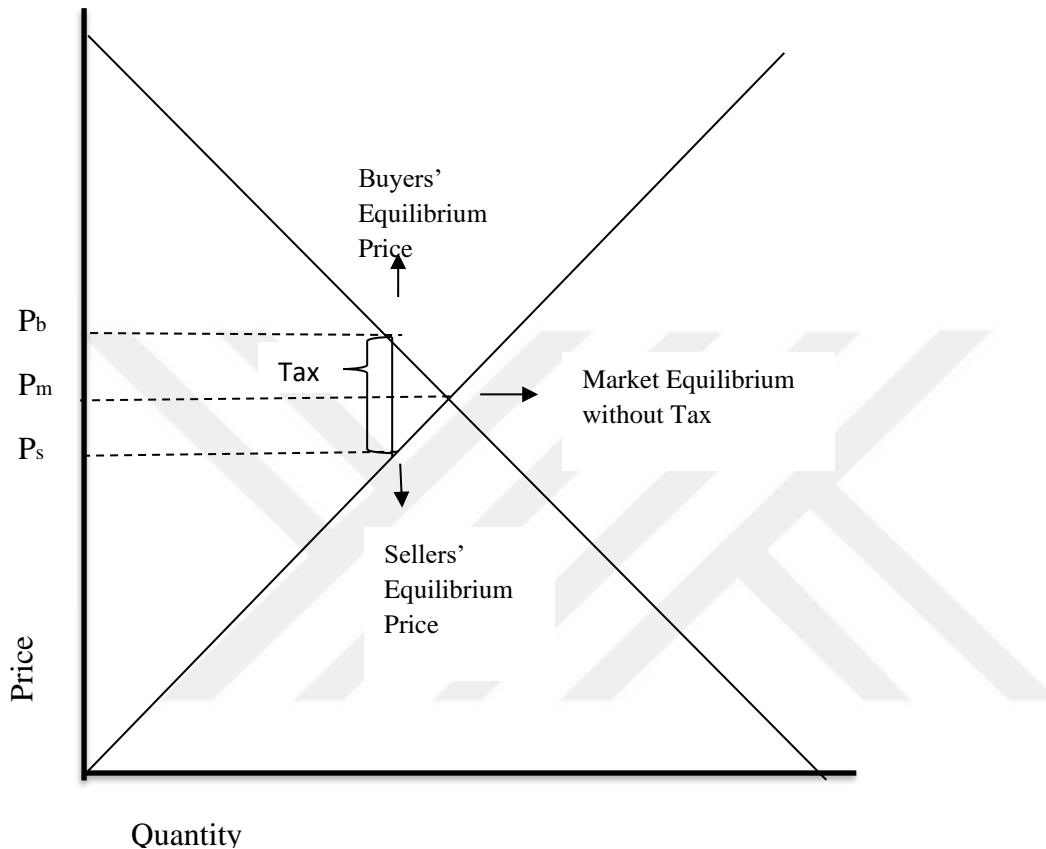
There are several types of incidence in terms of who pays taxes, continuity, and the purpose of the lawmaker. These are examined in detail below.

2.4.1.1. Forward-Backward Tax Incidence

Incidence might be in a forward or backward direction depending on the supply-demand elasticity. Tax incidence or burden falls on both consumers and producers of the taxed goods. To estimate which group will bear most of the load, the demand and

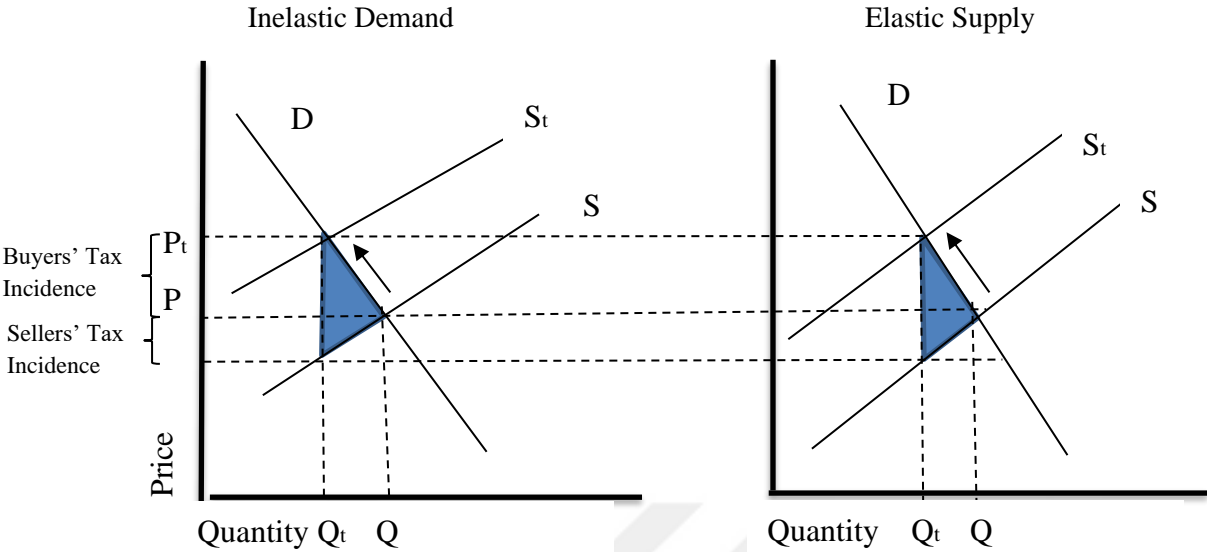
supply flexibility must be examined. As seen in the graph below, if demand and supply curves are unit elastic, incidence shared evenly between consumer and producer.

Figure 4: Incidence evenly split



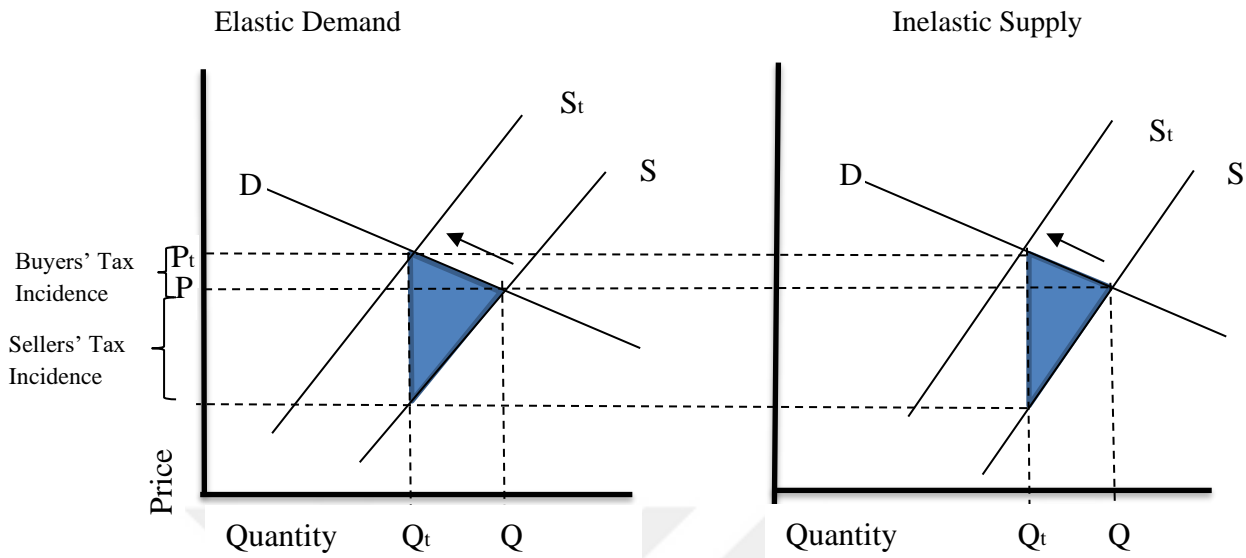
Forward tax incidence is reflected by the producer on the consumer or, in general, from supply to demand. In this case, the money that the producer gets is almost unchanged or changes little. A large part of the tax burden is reflected in consumers (Fullerton and Metcalf, 2002). As seen in the graphic below, the demand must be inelastic, or the supply curve must be elastic to reflect the tax from the producers to the consumers. While the demand curve is not completely elastic or the supply curve is completely elastic, all tax is paid by consumers and there is no change in the earnings of the producers.

Figure 5: Incidence more on the consumer



Backward tax inflation is the reflection of the tax from the consumer to the seller or producer. For producers to sell products, not reflecting the tax on the price is a backward tax incidence. While there is little change in the prices paid by consumers, manufacturers are required to pay the tax from their earnings (Fullerton and Metcalf, 2002). The below graphs are added again to be more descriptive. The demand must be elastic, or the supply curve must be inelastic to reflect the tax from the consumers to the producers. While the demand curve is elastic or the supply curve is inelastic, all the tax burden is imposed on producers.

Figure 6: Incidence more on the producer



The point where the demand and supply curve intersect is called the equilibrium point. At this point, the welfare of both buyers and sellers is at the maximum level. After the tax, the market is intervened, and a new point is determined. There is a difference between the amount earned and lost after taxation, which means a loss. As a result, an additional loss arises because the money earned by the government and taxes are not obtained with full efficiency. This loss is called deadweight loss. The area of the triangle scanned in the graphs shows us how much the deadweight loss is. Therefore, governments generally collect more taxes on products with inelastic demand curves. Medicines or addictive products may be sampled in these products. Since consumers have no alternative to these products, the Government easily charges taxes on these products. As the producers are charged a small part of these taxes, their losses will be less. Also, deadweight loss is less after tax is applied to these products compared to others. Therefore, it is preferable to apply tax to products with inelastic demand curves.

2.4.1.2. Limited and Absolute Tax Incidence

Limited incidence states that the tax incidence has a certain aspect and the stage of tax settlement will take place. In other words, the limited tax incidence will end somewhere. Absolute reflection states indicate the tax is constantly transferred in the market. Absolute tax incidence demonstrates that the stage of tax settlement will not take place and the tax burden has spread to all segments of the society (Oner, 2013).

2.4.1.3. Statutory and Actual Tax Incidence

If the tax is subject to authorization by law, this is a statutory incidence. In other words, statutory incidence reflects taxes based on the law. The law allows the Value Added Tax and Banking and Insurance Transaction Tax to be reflected in Turkey. However, although the law does not have any permission or provision regarding tax incidence, the incidence of the tax is the actual tax incidence. Taxes may be reflected in the market depending on the price mechanism (Oner, 2013). Actual tax incidence occurs according to the supply and demand instead of law.

3. THE CONCEPT OF INCOME DISTRIBUTION

3.1. Income Distribution Theories

Economic theories produced different ideas and created theories about the creation and sharing of income. The role of government in income distribution is determined under the ideas of these economic approaches. In this context, Classical and Neoclassical school of economic thought is at the forefront.

3.1.1. Classical Income Distribution Theory

Adam Smith accepted as the founder of classical economic thought, published “The Wealth of Nations” in 1776 and introduced crucial studies about the source of wealth and how to increase yield. Smith gave great importance to the labor factor. Also, Smith explains labor as the source of value and the first price of all things. Labor is the actual purchase value paid to buy everything. Firstly, Smith attributed the exchange value according to the amount of labor used in the production of goods, and then Smith explained theory at the cost of production, considering the aspect of capital and natural resources in production. Moreover, Smith tried to explain wage and profit levels with price theory. The price of the product consists of three elements: wage, rent, and profit. Since the entrepreneur was capitalist at that time, profit included interest. Both the source of income and its exchange value are formed by these three elements. Wages and profits at all levels are the main component affecting the price level. Rent is not a factor that affects the price. On the contrary, the price level is an element that allows rent. Smith attached rent to the value created by labor, but in his later views, rent was also included in his thought as one of the elements that embodied prices, such as profit and wage. According to Smith, a nation's product in a year was distributed among three income categories which are workers, the owners of the capital, and the owners of the land. Smith considered the distribution in two ways, first correlated wage, profit, and rent with price theory; second, Smith analyzed the distribution of the total product created between labor, capital, and land (Ozturk, 2010).

Another major classical economist is David Ricardo. In 1821, Ricardo focused on how income should be divided among factors of production in his book “The Principles of Political Economy and Taxation”. Agriculture is one of the most important sources of the country's economy in the period in which Ricardo lived. The lands where agriculture is made are not limitless and the agricultural lands located all over the

country do not have the same productivity. Although the land is limited, the population increase, the use of new agricultural land inefficient compared to the old land, the first landowners with high yield will provide high rent. Therefore, the increase depends on the population and the fertility of the land. Ricardo considered this situation in agriculture as the law of diminishing marginal returns. According to Ricardo, labor has a price, as does every commodity has a price. Wages are defined as the amount of money at which the family can meet their basic needs and maintain their generation. In this sense, the price of foods and basic needs determine the wages. Wage-earners generally earn minimum wage, while landowners take most of the income and the other part of the income belongs to the owners of capital. Regardless of the circumstances in which the markets change, the unchanging reality is that wage earners maintain their livelihoods in minimum living conditions. Even if markets change, wage earners maintain their living standards in minimum wage conditions (Hacıtahtiroglu and Aydoğan, 2016).

Marx focuses on the functional distribution of income rather than the interpersonal income distribution. Marx added the unemployment that was not found in the theories of Smith and Ricardo. According to Marx's theory, although the minimum wage, it is not sufficient for full employment in the capitalist system. Marx supported that a key point of the capitalist system is accumulating capital and generating economic growth. Capital accumulation affects unemployment in two ways. First, capital accumulation increases the productivity of employees with more capital-intensive technology and tends to increase wages. The other is that the new technology also increases the industrial concentration, and this effect leads to a decrease in labor demand and lower wages. So, unlike the common view of classical economists, unemployment was a permanent factor of the capitalist economic system and is in an important position for an accurate understanding of income and wealth distribution. Also, besides unemployment, exploitation is an essential feature of Marx's theory of income distribution. While labor is the main factor of production, according to Marx, this is not the case in the capitalist system. In a capitalist system, the workers are paid a living wage instead of the wage they deserve. The difference is the profit caused by the capitalist exploiting the worker (Sandmo, 2015).

3.1.2 Neoclassical Income Distribution Theory

Classical income distribution theories had continued to exist until the 1860s, but classical income distribution has been questioned due to reasons such as population growth, development of urbanization and industrialization, increasing labor conditions, and working conditions of children and women workers. In this period, many criticisms were made to the classical theories and the leading of these criticisms was Alfred Marshall, who was shown as the founder of Neoclassical Economic thought. While classical theories of income distribution emphasize the idea of labor-value, they adopted the principle of marginal utility because they thought that they were at a time when market conditions were changing and the full competition was dominated by the market.

On the contrary to Marx, Neoclassical Economic thought stated that workers' wages will increase based on economic development and marginal productivity increase. While the classical income distribution theories advocate that the wages will be at the level of subsistence within the framework of the labor-value theories, according to the neoclassical income distribution theories, the wages of each worker will be in the measure of the marginal utility of the worker. The neoclassical school of thought assumes that, in a highly competitive world, labor will be employed until the value of the additional product added when using the last unit in an economic enterprise is equal to the unit cost. Also, the return of the last employed unit cannot be less than the value of its contribution to the product. As a result, the worker is guaranteed to receive a salary as much as the marginal contribution (Gerdes and Gerdes, 1977).

Knut Wicksell is another reputable economist helps to raise the neoclassical economic theory school. Wicksell focused on the production and investment decisions in his work. Wicksell put forward the belief of factor substitution and showed that maximization of interests includes the equality between marginal value products and factor prices. Also, Wicksell pointed out social problems and addressed uncontrolled population growth. Wicksell considers that population growth was mentioned in the literature a little. Therefore, Wicksell argued that economic problems should be examined in the context of the population (Sandmo, 2015).

3.2. Types of Income Distribution

Income distribution, which explains income differences, refers to the distribution of income created in an economy in a certain period among individuals, social groups, and production factors. Also, type of income distribution allows understanding and explaining the social and political structure of the society in income distribution research. Types of income distribution are generally classified under four headings: functional income distribution, personal income distribution, regional income distribution, and sectoral income distribution. These types are described in detail below.

3.2.1. Functional Income Distribution

Functional income distribution demonstrates the distribution of the income obtained in the production process among the factors of production. Functional distribution is preferred to analyze the distribution of income between labor and another production factor. The reason for that is the majority of the workers earn labor income when, almost all of the high-income earners had non-labor income (Uysal, 2007).

When viewed from this angle, this grouping seems unhealthy because of changes in wages and profits of social groups. For example, both agricultural workers and holding managers have labor income but there is a huge salary difference between them. However, functional income distribution can be divided into sub-components such as labor income, wages, salaries, high executive income.

3.2.2. Personal Income Distribution

Personal income distribution displays the distribution of national income among individuals or households. Households are a community of one or more people with or without kinship relationships. Those people live in the same house or part of the same household, meet basic needs together and participate in-home services and management (Sezen and Sert, 2017). The income of individuals or households is ranked according to their size. How income is obtained is not included in the analysis. This analysis is a more widely used approach in economic literature. Functional income distribution is used in the more class-based analysis, while personal income distribution is used to measure the global performance of an economy. Also, personal income distribution is used to investigate the sources of income distribution

inequalities. The differences between the income groups at the two extreme points and the reasons leading to this inequality are examined (Bilgic, 2015).

3.2.3. Regional Income Distribution

Regional income distribution demonstrates the geographical distribution of the income gained within the borders of a country. While some regions get more shares from income within the geography of the country, some regions get less share and fall behind. The share of people living in different regions from the income generated in one country is demonstrated. These data should be considered when determining policies to reduce regional income inequality.

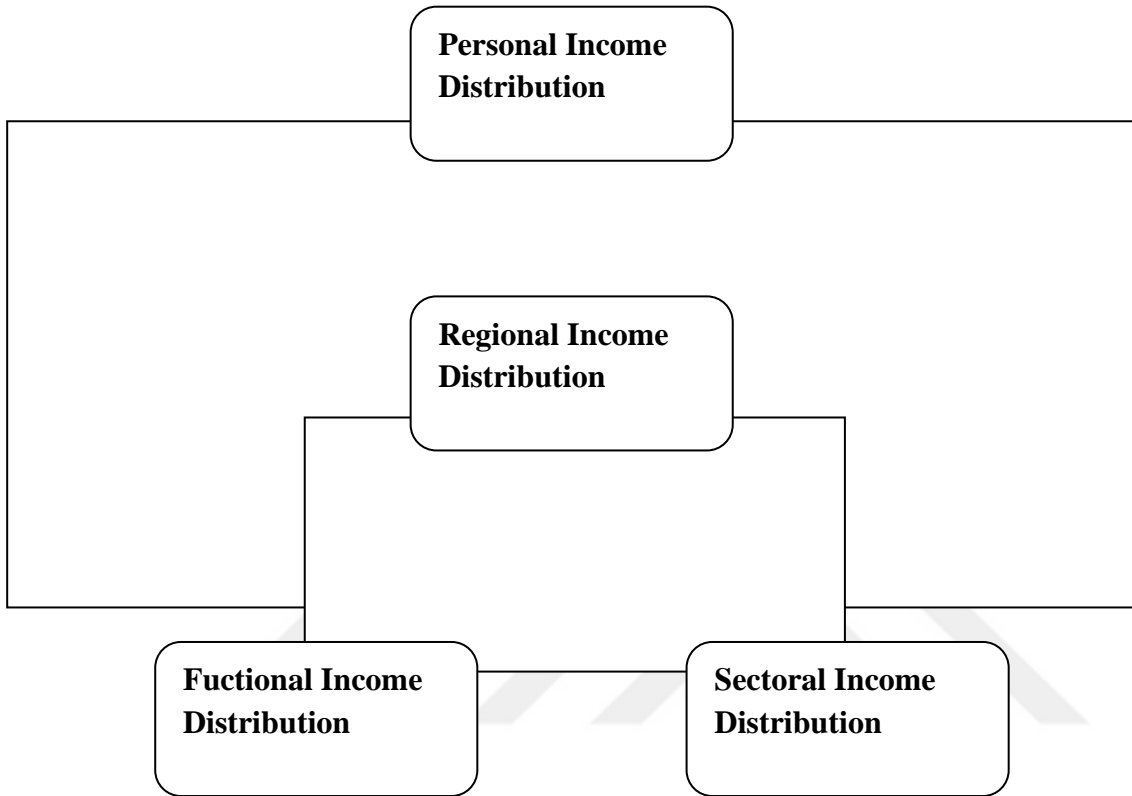
3.2.4. Sectoral Income Distribution

Sectoral income distribution demonstrates the shares of agriculture, industry, and service sectors in national income. Also, other inferences can be made thanks to this analysis. For instance, the agricultural sector is larger in less developed countries so we can have an idea about the level of development of the country by looking at countries' sectoral income distribution. Moreover, which sectors provide better employment income to individuals considering the sectors as public and private sectors, the place of the state in the national economy, and how much the state intervenes in the economy can be determined (Uzun, 2007).

As mentioned before, all four classifying income distribution are interdependent. The graph showing the relationship between these is added below. The characteristics of this relationship are determined by the macroeconomic structure and development level of the country. The level of development is closely related to the sectoral structure of the country's economy. Today, when the sectoral distribution of developed economies' national product is analyzed, the services sector takes first place and the industry and agriculture sectors take the second and third places. Functional income distribution depends on the sectoral structure of the economy. Also, economic activities on a sectoral basis reveal the regional income distribution. Lastly, since personal income distribution defines income distribution in terms of different income groups, personal income distribution includes the other three income distribution types. In short, because of the bidirectional relationship between income distribution types, the change in one affects the others. The intensity of this effect is determined by

factors such as the country's level of development, growth strategy, and geographical conditions (Uysal, 2007).

Figure 7: Types of Income Distribution and Relationships



Source: Uysal, Y. (2007). Gelir Dağılımı Türleri Arasındaki İlişkiler Perspektifinde Türkiye’de Gelir Dağılımının Düzenlenmesine Yönelik Öneriler, p. 255.

3.3. Income Distribution Measurement Methods

One of the main purposes of measuring the income distribution is to assess the inequality in the income distribution. The other is to show how serious the difference between rich and poor is. The last one is to contribute to the development of effective policies by making comparisons with other countries. Various measures have been developed to measure income distribution equality. Six of these measurement methods are described in detail below. Lorenz curve and Gini coefficient are widely used among them.

These methods are expected to meet certain conditions to measure income inequality correctly. One of these conditions is providing the Pigou-Dalton principle. According to this principle, taking income from the rich to the poor reduces inequality, while on

the contrary it increases inequality. Another is the principle of being independent the income scale. Inequality measurements should not be affected by the same proportional changes. For example, if everyone's income level changes at the same rate, distribution of income will not be affected. Measurements also independent from the change in population increase or decrease. For instance, if population increase an inequality criterion should not change against this increase (Heshmati, 2004).

3.3.1. Lorenz Curve

Lorenz curve was found by US economist Max O. Lorenz. Lorenz aims to gain knowledge of how the country's income distribution is distributed and use this information to find out whether countries are becoming more equal or less equal. To create the curve, individuals and households are ranked from the smallest to the largest according to the size of their income (Lorenz, 1905). On the horizontal axis of the Lorenz curve, there are cumulative percentage shares of the population of individuals or households, and on the vertical axis, the cumulative percentage shares of the income obtained by these individuals or households. Such a Lorenz curve is obtained by combining the points that indicate what percentage of the population receives what percentage of income.

In the Lorenz curve, the "Equidistribution line" express everyone receives an equal share of income. For instance, if incomes are evenly distributed among individuals, the Lorenz curve will coincide with the line of complete equality and take the form of a 45 ° line. If there is equality in the distribution of income, Lorenz starts to move away from the line of complete equality. Specifically, the more unequal income distribution causes the greater area (A) between the Lorenz curve and the line of complete equality. While poor individuals have a less share of total income, wealthy individuals receive more share of total income. As a result, the Lorenz Curve is the convex curve as seen below. An increase in convexity indicates an increase in inequality in income distribution (Bellu, 2005).

Figure 8: Lorenz curve

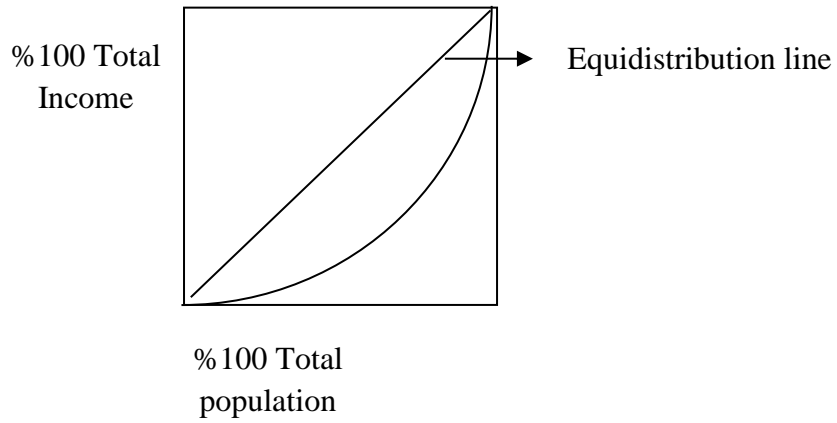
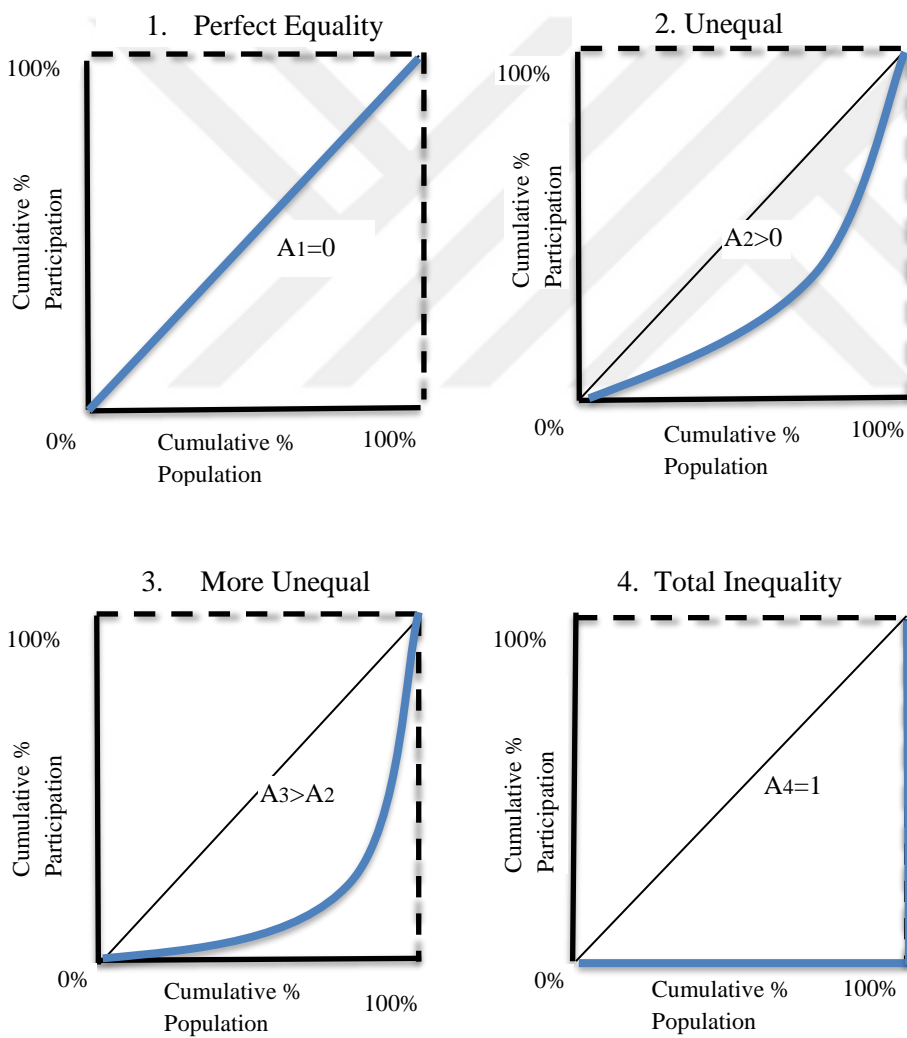
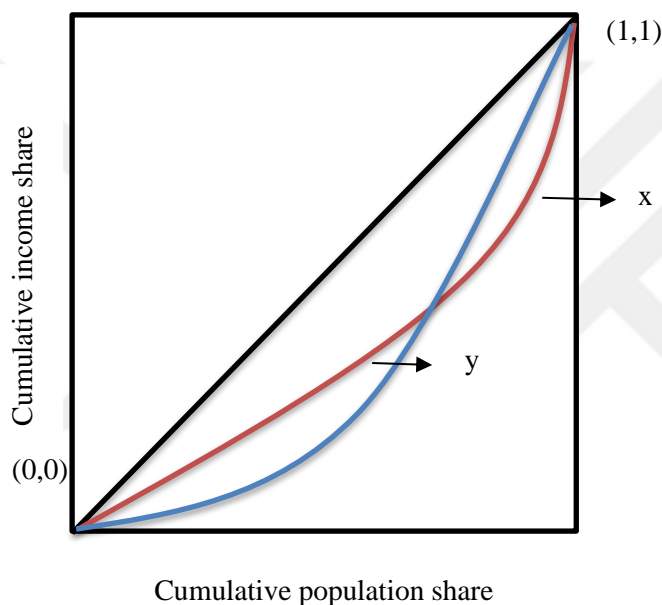


Figure 9: Lorenz curves at different levels of equality



However, the Lorenz curve does not always give a definitive conclusion about inequality. Lorenz curves should not intersect to give exact results. Otherwise, Lorenz's dominance of one income distribution over another can be mentioned. For example, as shown in the graph below, the x curve dominates y before an intersection, while y dominates x after intersection (Bellu, 2005). In this case, it is not possible to comment that the distribution of income is more equally distributed. If the Lorenz curves intersect, further data are needed to decide which income distribution is better (Latham, 1998).

Figure 10: Intersection in the Lorenz Curve



3.3.2. Gini Coefficient

Italian statistician Corrado Gini developed the Gini coefficient. The Gini coefficient is a coefficient used to measure the equal share of income generated in a year in a country to the population. Gini coefficient takes values between zero and one. When the Gini coefficient comes closer to zero, income distribution inequality will decrease. Otherwise, when the Gini coefficient comes closer to one income distribution inequality will increase. If this coefficient is equal to zero, then the income in the country distribution is in full equality. Moreover, if gini coefficient is equal to one in that country accepted as an indication that income distribution is completely unequal (Karaman and Ozcalik, 2007). Lorenz curve is used to calculate the Gini coefficient. The Gini coefficient is the state of the Lorenz curve is a number. Gini coefficient is

defined as the ratio of the area between the complete equality line and the Lorenz curve and the area of the whole triangle under the complete equality line. The formula below shows what is expressed verbally.

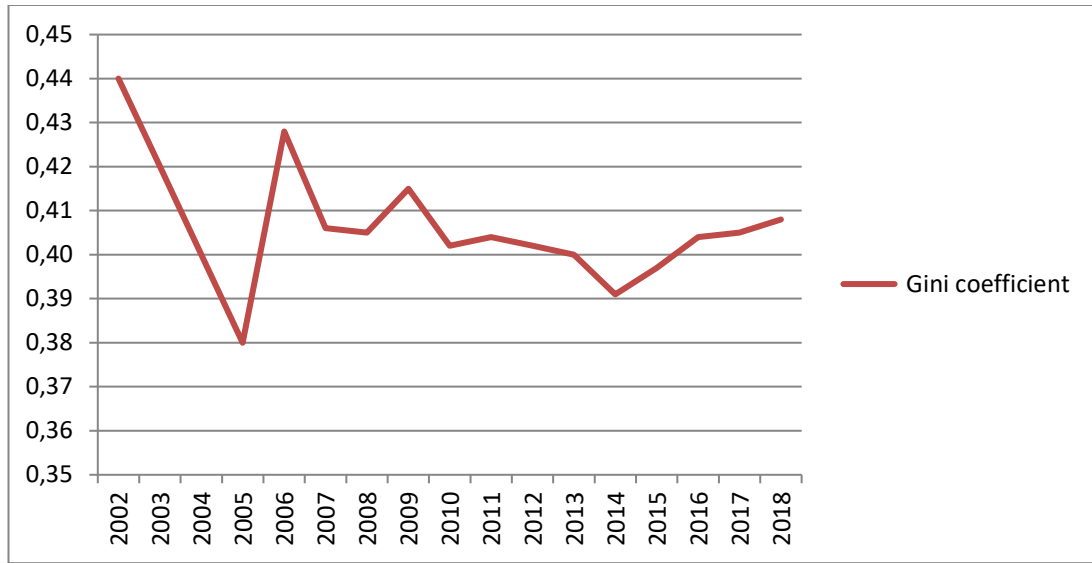
$$\text{Gini coefficient} = A / (A+X)$$

However, the Gini coefficient gives equal weight to all income regardless of people's income level. Extended or Generalised Gini coefficient must be examined to see more weight on lower incomes (Gemmell and Morrissey, 2002). The Generalised Gini coefficient was introduced by Yitzhaki in 1983 and the new index contains different expansions to inequality (Heshmati, 2004). Also, many methods have been tried to estimate the Gini coefficient. Methods include the trapezium rule, Simpson's rule, and Golden's method. The most reliable of these is Simpson's rule. Golden's method rule comes in this order after Simpson's rule. The trapezium rule gives the least reliable results (Fellman, 2012).

The first studies on the Gini coefficient were made by the Government Planning Organization in 1963. There was no previous study for this. This work was continued by Hacettepe University Inequality Institute. In addition to the Government Planning Organization, it is observed that the Government Statistics Institute measured in 1987 with a different methodology. Lastly, the Turkish Statistical Institute (TUIK) has been continuously measuring the Gini coefficient since 2002 (Oz, 2018).

The graph below shows the Gini coefficients are measured by TUIK from 2002 to 2018. Despite fluctuating Gini data, there is a downward trend. Gini coefficient has declined from 0,44 to 0,41. In 2002, the Gini was the highest and the income distribution was the worst. On the contrary, in 2005, the Gini was the lowest with 3,38. This means that Turkey has the most equal income distribution in 2005.

Figure 11: Gini coefficient



Source: TÜİK (2020). Gelir Dağılımı ve Yaşam Koşulları İstatistikleri. Retrieved from <https://biruni.tuik.gov.tr/medas/?kn=65&locale=tr> on 8 March 2020

Moreover, the below table is added to explain the reason for the changes in the Gini coefficient in detail. Gini could not be measured regularly every year before 2002. Only gini data measured in 1994 and 1987 are available. Gini was 0,49 and 0,43 respectively. Therefore, income distribution was more distorted before 2002. The effects of crises generally affect income distribution with delay. Since economic crises cause higher-income losses of upper-income groups, they provide an improvement in income distribution. 2001 crisis had a delayed effect on the improvement of income distribution between 2002 and 2004 in the table. The impact of the crisis has disappeared in 2005. However, 2005 was a record-breaking year in foreign capital inflows and investments. This development has a favorable impact on the employment and income of lower-income groups. In 2009, Turkey had affected by the global crisis that started in the US in 2009. The delayed effect of this crisis was an improvement in income distribution in 2010. Also, improvements created by crises in income distribution are not correct. The correct and meaningful improvement in income distribution is through correct taxation of upper-income groups and increasing the income of lower-income groups (Egilmez, 2015).

Table 8: The reason for the changes in the Gini coefficient

Years	Gini coefficient	Effects
2002	0,44	The impact of the 2001 crisis
2003	0,42	The impact of the 2001 crisis
2004	0,40	The impact of the 2001 crisis
2005	0,38	Increase in foreign capital inflow
2006	0,43	Normal period
2007	0,41	Normal period
2008	0,41	Normal period
2009	0,42	Normal period
2010	0,40	The impact of the 2009 global crisis
2011	0,40	The impact of the 2009 global crisis
2012	0,40	The impact of the 2009 global crisis
2013	0,40	Normal period
2014	0,39	Normal period
2015	0,40	Normal period
2016	0,40	Normal period
2017	0,41	Normal period
2018	0,41	Normal period

Source: Egilmez, M. (2015). Krizler Gelir Dağılımını Düzeltiyor. Retrieved from <http://www.mahfiegilmez.com/2015/09/krizler-gelir-daglmn-duzeltiyor.html> on 8 March 2020.

In addition, there is two weaknesses of the Gini coefficient. The first one is that this measurement method is more delicate to inequalities in the middle of the distribution and cannot fully catch inequalities above and below the distributions. Another weakness is that countries with the same Gini coefficient can have different inequalities. (Stephenson, 2019).

3.3.3. P80/P20 Ratio

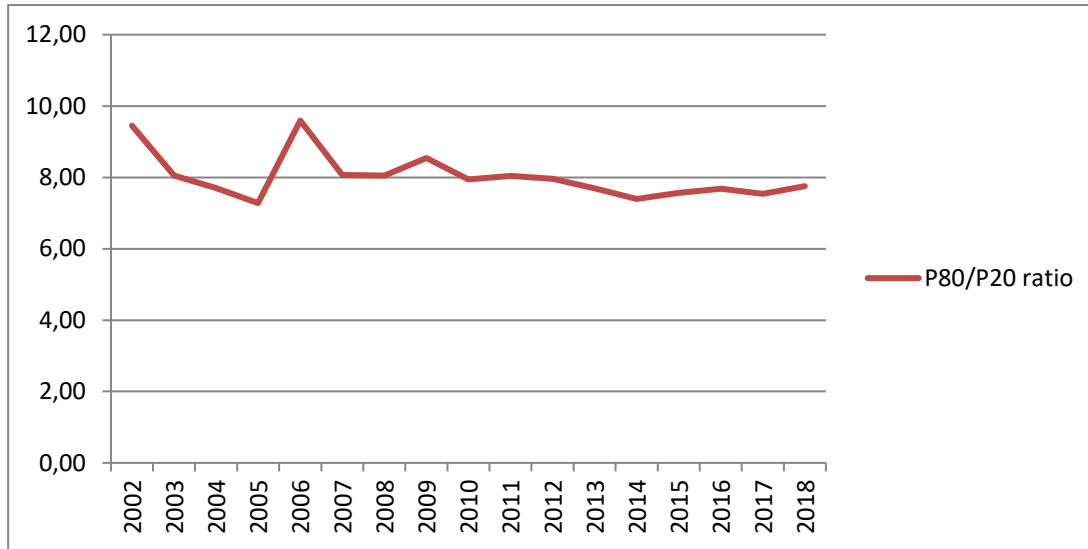
Another measurement method is based on the correct ordering of units from the lowest income to the highest income. Statistics such as the P80 / P20 ratio or P90 / P10 ratio can provide a strong spreading indicator (OECD, 2013). The P80/P20 ratio is the ratio of income in the first 20% of the population to income in the lower 20%. Said differently, the P80 / P20 value is a measure of how many times the richest fifth segment earns more income than the first segment with the least income. As the P80 / P20 ratio grows, the income distribution worsens, while the ratio decreases, the income distribution improves. Also, one of the disadvantages is that this method does not reflect the income bracket that is external to the first and last 20% percentile. Studies about P80 / P20 ratio are carried out by the Government Planning Organization, Hacettepe University Inequality Institute, and the Government Statistics Institute. They have been published in Turkey since 1963 (Oz, 2018).

The graph below shows measured the P80/P20 ratios from 2002 to 2018. There is a downward trend like the Gini coefficient. As the crises affected the Gini coefficient, crises also affected the P80/P20 ratio in the same way. The P80/P20 ratios have decreased from 9,45 to 7,75. In 2005, the P80/P20 ratios were the lowest with 7,28. On the contrary, the P80/P20 ratio with 9,59 value was the highest and the income distribution was the worst in 2006.

Also, the Gini coefficient grows if the share of the richest in income grows or if the share of the poorest gets smaller. The reduction of the Gini coefficient between 2002 and 2005 is a result of the shrinkage of the richest 20% of the income due to the 2001 crisis. In this period, there has been an improvement in income distribution since the share of the poorest 20% remained constant and the decrease in the share of the richest slice shifted to the middle slices. However, there seems to be no improvement in the situation of the poorest. With the effect of the 2001 crisis, the share of the poorest 20% slice from income increased from only 5.3% in 2002 to 6% in 2003. The share of the poorest bracket in income did not change in 2004 and 2005. On the contrary, the share of the richest bracket was 50% in 2002, this share decreased to 44.4% in 2005. The following graph also shows that income inequality decreased in Turkey during the 2002-2005 period and the difference between the poorest 20% and the richest 20% decreased from 9.45 times to 7.3 times. However, this improvement in income distribution is due to the increase in the share of the middle bracket. This improvement

in income distribution is not permanent since the bottom 20% share does not increase. Therefore, policymakers should consider improving the status of the lowest income segment (Caliskan, 2010). As seen in the table below, the difference between the rich and poor increased to 9,59 times in 2006. After 2006, the ratio between them has continued to decrease.

Figure 12: P80/P20 Ratio



Source: TÜİK (2020). Gelir Dağılımı ve Yaşam Koşulları İstatistikleri. Retrieved from <https://biruni.tuik.gov.tr/medas/?kn=65&locale=tr> on 8 March 2020 & Oz, S. (2018). Gelir Dağılımında Gini Katsayısı ve P80/P20 Oranı Arasındaki İlişkiler: 2000-2016 Dönemi Türkiye Örneği.

3.3.4. Palma Ratio

The Palma ratio is also a measure of income inequality. With Gabriel Palma's work in 2011, this became an alternative to the Gini coefficient. This ratio is the ratio of the richest 10% income group to the poorest 40% income group (Cobham and Sumner, 2013). The difference of this measurement from the P80/P20 ratio is that Palma ratio added middle-income people to the calculation in addition to the poorest. Inequality in income distribution affects not only the poorest but also 40 percent of the population who have the least share of income. Palma ratio indicates this effect. Palma is more sensitive to the middle group compared to P80/P20. This aspect is similar to the Gini coefficient (OECD, 2015).

3.3.5. Theil Index

Theil index is used to measure economic inequality developed by Henri Theil. Theil index measures the entropic distance between the ideal egalitarian situation of everyone with the same income and the situation in which the population is now. Theil index can take a value between zero and ∞ . Zero indicates perfect equality that everyone earns the same income. Higher numbers indicate a raise in income inequality. The advantage of the Theil index compared to the Gini coefficient and Lorenz curve is that it is decomposable (OECD, 2016). Also, the Theil index overcomes both failures that the Gini coefficient has.

3.3.6. Atkinson Index

Atkinson is a measure of inequality first proposed by Dalton in 1920 and re-introduced by Atkinson in 1970. Atkinson criticized previous studies' adoption of some summary inequality statistics such as variance, coefficient of variation or Gini coefficient. Atkinson argued that when calculating income inequality, focus should be on the concept of social welfare, which Dalton had previously emphasized (Atkinson, 1970). Therefore, there is a need for a measure that accepts the welfare level of the society as a starting point. The Atkinson index is derived from the Social Welfare Function. The social welfare function is defined as the total of the welfare functions of everyone, and the benefit is assumed to be comparable. The Atkinson index is stating how much of the total income available is sufficient to reach the level of social welfare to be achieved if the income is distributed equally. The Atkinson index ranges from 0 to 1 and takes different values depending on the degree of public sensitivity to inequality. Like the Gini coefficient, the number closer to zero indicates a more equal income distribution than a higher number. If the index is equal to one, income distribution is completely unequal. An example of the interpretation of the Atkinson Index as follows. 0,35 value of the index is assumed. This value indicates that 65% of society will be able to reach the existing social welfare. Therefore, there is a 35% loss of wealth because income is not equally distributed (Rakici, 2008). Today, Atkinson inequality indices are used in almost every discipline.

3.4. Income Distribution Analysis among Countries

When income distribution in countries is analyzed from past to present, increase in inequality has been observed. The crises experienced by countries generally cause an increase in inequality in income distribution. Especially this effect is seen in developing countries. However, inequality in income distribution during the crisis was decreased in Turkey. Moreover, developments that contribute to the national economy are expected to reduce inequality, the opposite may occur. For instance, in the process of globalization and technological change, while some high-income bracket increases their income by keeping up with the age, the low income that could not benefit from improvement and became even poorer (OECD, 2015).

In addition, another reason for the increase in inequality in income distribution is that the tax system in the countries gradually relies on indirect taxes, and the income tax rate decreases. Taxes on goods and services increased in the most country with different levels of development, while the tax rate on income decreased. Compared to the early 1990s and early 2000s, the total share of taxes on goods and services increased 8.5 percent in high-income countries, 11.5 percent in middle-income countries, and 4 percent in low-income countries. On the contrary, the total share of taxes on income decreased 1 percent in high-income countries, 3,5 percent in middle-income countries, and 1,7 percent in low-income countries (ILO, 2008).

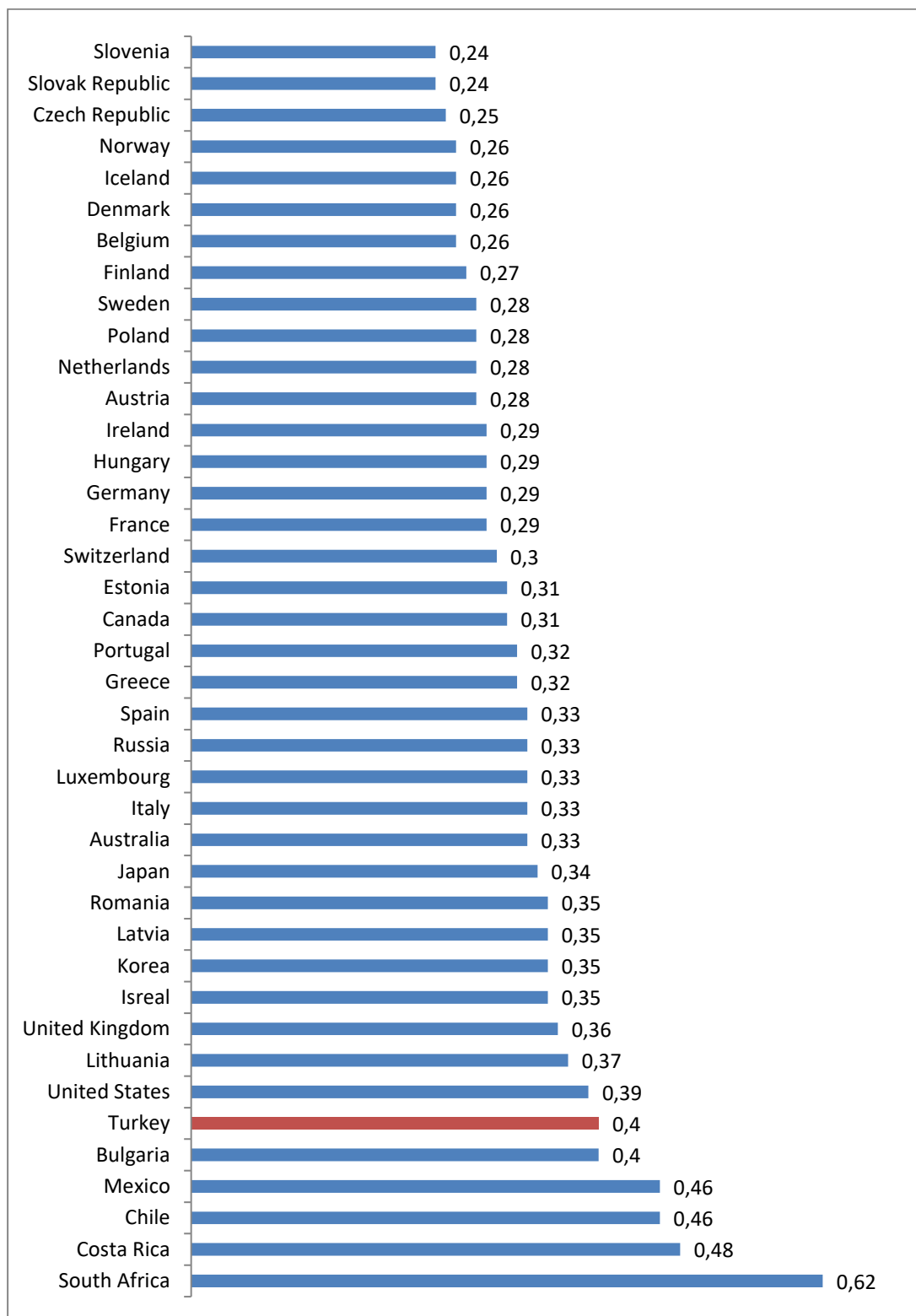
Moreover, in today's economic circumstances in which globalization is aimed, inequalities in income distribution at the national scale should be revealed and the distribution structure in countries with various development levels should be analyzed comparatively. This information is used to determine the inequality in income distribution and the policies to be applied in this regard (Devlet Planlama Teşkilatı, 2001).

Many methods have been used to measure this inequality in income distribution in countries, but the most commonly used method worldwide is the Gini coefficient. The Gini coefficient is used to analyze the income distribution of a country at different times and to compare income distribution between different countries. For this reason, the table below has been prepared to compare income distribution between countries. Gini data in the table are the latest data available from OECD.

Looking at the table below, an example from each country at a different level of development can be seen. While the coefficient of Gini is low in developed countries, the coefficient of Gini is higher in underdeveloped countries. This shows us that there is a more even distribution of income in developed countries. However, America has an unequal distribution of income among the countries below, despite having a high level of development. The reason for this is that American social transfer expenditures are more limited and less than developed countries (ILO, 2008). According to OECD data, the countries with the lowest Gini in the countries below are the Slovak Republic and Slovenia with a coefficient of 0,24. The country with the highest Gini is South Africa with 0,62. China has second-highest Gini with 0.51.



Figure 13: Income inequality



Source: OECD (2020). Income Inequality. Retrieved from <https://data.oecd.org/inequality/income-inequality.htm#indicator-chart> on 28 March 2020.

Developed countries have advanced in terms of income distribution compared to developing countries. Developed countries have used taxes and transfers as a tool to regulate income distribution while developing countries have failed in this regard (Chu et. al. 2000). As a result of this, these countries have a more equal and stable income distribution level. There are many reasons for the distribution of income in developed countries to be more equal. One of them is that most of the population is employed as paid workers. In other words, unemployment is low in developed countries. Also, many factors such as the provision of an advanced social security system, attention to horizontal and vertical equality in taxation, financial transfers to lower-income groups, and strong mechanisms in education lead to equal and stable income distribution (Rakici, 2008).

While income distribution is effective in deciding tax reforms in developed countries, income distribution in the developing countries is discarded (Goksen et. al.2008). One of the results of this, most taxes are collected from direct taxes in developed countries. Also, a significant amount of free economic aid spreads to low-income groups (Kuznets, 1955).

Also, due to poor administration in developing countries, tax evasion is becoming more common and people who are legally liable to pay taxes do not pay their taxes. The share of tax collected income in the GDP remains low. Tax policies they implement are not sufficient to redistribute income since they do not prioritize income distribution in tax reforms. Also, the weak government and the instability in management negatively affect the income distribution (Chu et. al. 2000).

Moreover, the economic development of the world is not equally distributed among countries. While the richest countries have more than 80% of the world's GDP, the poorest countries have almost one percent of the world's GDP (Wade, 2001). This is one of the reasons that income distribution is more equally distributed in developed countries. As seen in the graph above, while poor countries such as Africa have high Gini coefficients, rich countries have low Gini coefficients.

Also, Wade's article mentioned the causes of the unequal distribution of world income. According to his article, there are many causes such as technological developments, different population growth rates in countries, the foreign debt burden of countries,

liberalization, and openness of the economy, and the country is in a region where peace or confusion prevails.

After globalization, the distribution of income not only within the countries but also in the world began to gain importance. Anand and Segal estimated the global distribution of income with and without top incomes. They benefit from survey data to estimate the Gini coefficient. Global inequality with top incomes is 0,727 for 2005. Gini coefficient is very high, but the coefficient has decreased from 2002. The estimated Gini coefficient is 0,735 in 2002. Global poverty has declined in recent years due to total growth in low- and middle-income countries. According to them, total growth should be maintained and the inequality in the country should be reduced to reduce global poverty.

3.5. Income Distribution in Turkey

Income distribution is critical economic problems that countries think and try to find solutions in past. Because an unequal distribution of income, whether countries are developing or at the level of the developed, has political, economic, and social negative consequences. Unfortunately, Turkey has unequal income distribution with a 0,4 coefficient. Gini coefficients above 0.4 indicate that the situation is critical, and something needs to be done to rectify income distribution (Liu and Ansfield, 2007). Beyond this point, growth is negatively affected. Deterioration in income distribution can also cause undesirable political and social effects (Conia and Court, 2004). Therefore, countries with a coefficient above 0.4 should follow policies to improve income distribution including Turkey. Also, Turkey has more unequal income distribution than most countries with the same level of development. The reasons that are mentioned in Boratav and Yeldan (2006)'s research is listed below:

- Oligopolistic industrial and banking structure,
- Long-term import-substitution growth models,
- The stagnant and overpopulated agricultural sector,
- Loose connections with the domestic industry,
- High migration rates because to both economic and political pressures,
- Unequal access to education.

3.5.1 Historical Trends in Income Distribution in Turkey

Income distribution is affected by many factors. At the same time, factors affecting income distribution may differ periodically. In other words, while intervening in income distribution in any country, some economic, political, and social conditions should be taken into consideration. For example, factors affecting income distribution in a warm environment, and their degree of influence differ from a peaceful environment. For this reason, the conditions that are included in the periodic analysis of the income distribution are vital (Rakici, 2008). Analysis of income distribution in Turkey today from the past is examined into two periods. Before 1980, when economic liberalism, etatism, and import substitution industrialization policies were applied. After the year 1980s, an export-based growth model has been established. Also, providing financial liberalization is aimed, to ensure foreign capital liberalization, and to accelerate privatization (Elveren and Galbraith, 2009).

2.5.1.1. Since 1980s

With the establishment of the republic, the liberal economy was implemented, and the private sector was supported. “Aşar” tax, which is a tax left from the Ottoman State, was abolished and some taxes such as profit tax, public property tax, private consumption tax, and entertainment tax were started to be replaced. However, given conditions in Turkey was not able to successfully implement these policies. Also, the economic crisis that spread throughout the World in 1929 After the Great Depression, the transition from a relatively liberal economy to an etatist economy has begun (1929-1939). In this period, while the profitable sector was industrialists, traders, and contractors doing business with the state, the losers were workers, especially wheat farmers and those engaged in foreign trade. Imports have been liberalized since 1946, and as a result, foreign deficits began to emerge when imports could not be met with exports. Thanks to foreign borrowing and foreign capital, an increase in production were achieved (Rakici, 2008).

Between 1960 and 1980, Turkey began to implement economic development plans. Main characteristics of the programs is industrialization through the import substitution policy. Also, during this period, Turkey's economy was dependent on imports and foreign borrowing (Elveren and Galbraith, 2009).

First Five-Year Industrial Plan began in 1930 and lasted until the Second World War. This plan aimed to distribute the economic development in a balanced manner to all parts of the country. After that, the Second Five-Year Industrial Plan was planned to be implemented but second plan could not be implemented due to the Second World War. Moreover, the First Five-Year Development Plan, covering the period 1963-67, aimed to grow in GDP. Other objectives of this plan were to reduce the balance of payments deficit, inflation, and unemployment by creating new employment opportunities. Also, an increase in the rate of domestic investment funds and the achievement of a more equal distribution of income was aimed. GDP increased during the planning process and it can be said that the plan was successful in general (Fry.1971).

3.5.1.2. After 1980s

This section deals with the financial liberalization period on 24 January 1980 and the effects that followed. With the new constitution made in 1982, targets such as reducing the inflation rate permanently without harming growth dynamics, establishing an export-based growth model, ensuring financial liberalization, ensuring foreign capital liberalization, and accelerating privatization (Rakıcı, 2008). Also, the 1982 Constitution closed the country's largest trade union. Companies have benefited from this situation and the main feature of the post-1980 period in Turkey has been a great contraction in real wages (Elveren and Galbraith, 2009).

The characteristics of the period after 1980 were encouraging exports through strong subsidies, managed floating exchange rates, regulated capital movements, and gradual import liberalization (Boratav and Yeldan, 2006). However, tax refunds and cash payments to support exports began to cost the public too much. Therefore, with the approval of the General Agreement on Trade and Tariffs in 1985, export supports were gradually reduced and in 1990 was almost totally removed. Also, customs duty and the number of goods subject to licenses were reduced to increase imports. Also, Turkey has established a customs union with the EU on 1 January 1996. Turkey has eliminated all restrictions applied to the EU and EFTA products and has agreed to apply common tariffs for third countries. Moreover, a flexible exchange rate policy was initiated instead of the fixed exchange rate regime in 1980 to support the trade liberalization process. But as a result, the Turkish lira gradually depreciated. Central Bank sets the exchange rate daily to ensure that Turkey's economy can compete with other

economies. Daily exchange rates were started with the participation of banks and private financial institutions (Yukseler, 2005).

Considering the income distribution in Turkey before and after 1980, Turkey has reached a more unequal point with the economic and social policies implemented after 1980. The main objective of the post-1980 period is to increase exports. However, due to the high dependency on foreign input, the foreign currency required for imports could not be achieved and it was difficult to pay foreign debts. Therefore, policies made the existing negativities and poverty more apparent. 1986 Gini coefficient measured by TÜSİAD is 0.46 and Gini coefficient measured by the State Institute of Statistics is 0.43 (Devlet Planlama Teşkilatı, 2001).

Moreover, the following studies analyzed how the liberalization process experienced in 1980 in Turkey affected income distribution. One of these studies was conducted by Ornek and Elveren (2008). They examined the effect of the neo-liberal model adopted by Turkey after the 1980s on income distribution. In the neo-liberal period, Income distribution negatively affected in both developed and developing countries. Turkey is among the countries whose income distribution has deteriorated. Cointegration analysis was carried out to demonstrate this effect, and their results showed a strong causality between openness and income inequality.

Another study conducted by Milanovic (2005) shows that the effect of openness on income distribution varies according to the development level of countries; this effect has more negative results in less developed countries. The idea that they are the poorest people in the poor countries who should benefit most from the increasing trade with globalization according to the economic theory and the recommendations of the international organization's policies is denied. According to Milanovic to improve the situation of the disadvantaged people in developing countries, trade must be sufficient and an environment that can increase the real income of the poor and the rich must be created. Otherwise, poor people in poor countries will be more negatively affected by the increase in trade.

3.5.2. Regional Income Distribution

The differences between regions in terms of agriculture, industry, trade, service, communication, transportation, health, and education; demographic and social indicators cause an increase in inequality. The income distribution problem of Turkey is integrated with regional development imbalance. Therefore, to improve income distribution, each region's characteristics and problems should be identified. By using this knowledge, solutions that appropriate to each region's characteristics should be produced and useful policies should be implemented (Devlet Planlama Teşkilatı, 2001).

Information is given by the below table based on the results of the Income and Living Conditions Survey which has been started by the Turkey Statistical Institute (TURKSTAT) since 2006. The purpose of the survey is to show the income distribution between individuals and households and to generate data on these issues. All members of the households that live within the borders of the Republic of Turkey were included within the survey. According to the results of the survey, improvement in P80 / P20 Ratio and Gini coefficient has been observed since 2006. Gini coefficient has fallen by 0.02 and P80 / P20 Ratio

When looked at regionally, it is observed that there is a progress in income distribution in every region except Istanbul and West Marmara. Also, there is another exception which is Central West Anatolia. Central West Anatolia has remained almost unchanged since 2006. General Gini coefficient has decreased a little, considering the decrease in most regions. This is because the population of Istanbul is almost one-fifth of the population of Turkey. The increase in Istanbul affects the general Gini coefficient more than in other regions. The highest deterioration in income distribution has been experienced in Istanbul, while the best improvement has been experienced in the Aegean region. Also, the second-best region is the East Marmara according to the Gini coefficient. On the other hand, the second-best improvement has been experienced in the Mediterranean region according to the P80/P20 Ratio. Moreover, income distribution in each region except Istanbul has better income distribution than general Turkey's value. The best distribution of income is East Marmara in both indicators.

Table 9: Income Distribution for Statistical Regions

	Turkey-TR	Istanbul	West Marmara	East Marmara	Aegean	West Anatolia	Mediterranean	Central West Anatolia	West Black Sea	East Black Sea	North East Anatolia	Middle East Anatolia	South East Anatolia	
P80/P20 Ratio	2006	6,7	6,289	6,909	8,601	8,042	9,161	5,53	7,089	6,698	7,149	7,842	7,304	
	2007	8,067	5,276	6,75	6,66	6,233	8,104	5,098	6,044	5,635	7,933	7,187	6,287	
	2008	8,055	6,012	5,668	5,295	7,137	7,287	6,551	6,081	6,357	8,834	7,017	7,058	
	2009	8,548	5,896	6,435	6,175	6,786	7,66	7,224	6,993	6,204	7,839	7,519	7,902	
	2010	7,94	6,367	6,5	5,532	6,866	6,6	7,145	6,179	6,135	7,599	7,634	7,258	
	2011	8,041	6,246	6,333	5,045	7,116	6,692	7,234	6,286	5,659	5,128	7,015	8,344	7,465
	2012	7,962	6,417	6,178	5,569	6,692	6,519	7,481	6,24	5,655	4,755	7,191	7,007	6,737
	2013	7,693	6,646	5,443	5	6,291	7,067	7,097	5,56	5,389	4,733	7,26	6,41	6,658
	2014	7,4	6,147	5,415	5,227	5,894	7,157	7,373	5,924	5,461	4,882	7,322	6,845	6,378
	2015	7,565	7,061	6,13	5,352	6,056	6,713	7,246	5,531	5,787	5,32	6,682	6,488	6,89
	2016	7,679	7,373	6,27	5,117	5,972	6,958	7,47	5,995	5,475	5,541	5,956	6,907	6,309
	2017	7,54	8,229	6,465	5,285	5,846	6,342	6,864	5,113	5,395	4,735	5,177	6,162	5,859
	2018	7,751	8,567	7,156	5,198	5,715	6,662	6,867	5,535	5,596	5,229	5,734	6,105	6,357
	2006	0,428	0,375	0,35	0,392	0,426	0,413	0,421	0,342	0,372	0,378	0,381	0,404	0,396
	2007	0,406	0,346	0,321	0,393	0,376	0,379	0,418	0,328	0,36	0,346	0,405	0,397	0,366
	2008	0,405	0,362	0,331	0,335	0,387	0,402	0,387	0,339	0,366	0,365	0,436	0,405	0,395
	2009	0,415	0,363	0,361	0,368	0,381	0,408	0,403	0,395	0,382	0,359	0,407	0,415	0,411
	2010	0,402	0,373	0,36	0,341	0,387	0,367	0,397	0,362	0,348	0,327	0,404	0,417	0,404
2011	0,404	0,371	0,365	0,326	0,397	0,374	0,404	0,366	0,335	0,327	0,39	0,427	0,396	
2012	0,402	0,384	0,356	0,344	0,382	0,369	0,407	0,36	0,338	0,309	0,393	0,386	0,375	
2013	0,4	0,392	0,337	0,322	0,37	0,396	0,399	0,342	0,331	0,315	0,398	0,373	0,38	
2014	0,391	0,367	0,333	0,336	0,358	0,395	0,395	0,355	0,34	0,309	0,4	0,386	0,379	
2015	0,397	0,397	0,353	0,339	0,363	0,386	0,396	0,341	0,344	0,332	0,38	0,38	0,38	
2016	0,404	0,413	0,364	0,33	0,361	0,395	0,398	0,357	0,34	0,356	0,353	0,388	0,369	
2017	0,405	0,443	0,371	0,342	0,363	0,372	0,382	0,334	0,335	0,325	0,324	0,369	0,358	
2018	0,408	0,444	0,392	0,334	0,353	0,385	0,39	0,341	0,341	0,335	0,346	0,354	0,374	

Source: TÜİK (2020). Gelir Dağılımı ve Yaşam Koşulları İstatistikleri. Retrieved from <https://biruni.tuik.gov.tr/medas/?kn=65&locale=tr> on 08 May 2020.

3.6. Factors Affecting Income Distribution in Turkey

Income distribution can be seen not only as a policy goal on its own but also as an essential factor affecting long-term growth. Uncovering the relationship between income distribution and macroeconomic developments can provide policymakers with the necessary information for the decision-making process (Sarel, 1997). In this study key factors that affect income distribution will be explained.

3.6.1. Economic Growth and Development

Economic growth refers to the increases in the number of goods and services produced by an economy. Economic Development can be defined as the conversion of a country's production structure by producing products with high added value and raise their living standards.

Economic growth is critical variable that affect income distribution as growth increases investments and provides employment. If the welfare achieved through growth is distributed fairly, the income level of the low-income community will be affected positively. However, if capital owners benefit from economic growth, income distribution is negatively affected (Rakici, 2008).

Various economic school of thought have made some proposals about the relation between growth and income distribution. The first and leading systematic relation between economic growth and income distribution in the economic literature was developed by Simon Kuznets. According to Kuznets hypothesis, there is a nonlinear relationship between income distribution and economic growth. Income inequality is expected to increase with growth in the early stages of economic development. However, as economic development continues, income inequality is expected to stop increasing and then decrease (Islam, 2014). Thus, the relationship between income level and income distribution inequality is illustrated as an “Inverted U Curve”.

If this hypothesis is evaluated according to the sector, income in the industrial sector is relatively high, but more unequally distributed than in the agricultural sector. As economic development increases, employment shifts from the agricultural sector to the industrial sector. There will be a difference between low-income groups migrating to urban areas and settled upper income groups. Therefore, while income increases in the first stage of development; income inequality also increases (Kuznets, 1955). This inequality will continue to increase if the agricultural sector maintains an

overwhelming share of the population. However, thanks to the population growth in the industry sector, total income will increase, and inequality will decrease by income approaching each other (Bukey and Cetin, 2017).

3.6.2. Globalization

Groups with international power can benefit from removing obstacles to trade and investment, as well as globalization. Capitalists, high-skilled workers increase their welfare levels by taking advantage of globalization. Even though economic growth has occurred with globalization and productivity and average income has increased, the poor people get negative results from this process due to insufficient income generation opportunities. Consequently, there is no consensus on the impact of globalization on income distribution (Rakici, 2008).

Moreover, trade liberalization has a significant impact during the globalization process. The relationship between trade and inequality is complex and controversial. With the liberalization, inequality in income distribution increased in some countries but decreased in some countries. Hence, liberalization in trade does not explain the change in inequality alone. To talk about the effect of trade on income distribution, it is necessary to know other macroeconomic conditions of countries and how conscious they are about globalization (Cornia and Court, 2004). The liberalization of trade in Turkey started at the beginning of 1980.

Another factor effective in globalization is financial liberalization. The liberalization of the domestic banking and finance sector started to be implemented in most of the developing countries in the mid-1980s.

3.6.3. Technological Change

With the recent technological change, a trend is observed from low value-added activities to high value-added activities (Wade, 2001). This technological development and the difference between wages are associated. With technological development, the need for skilled labor in the market increases. Consequently, while the salary of individuals with skilled labor is increased, unskilled workers are affected in the opposite direction. Technological developments have been observed to negatively affect income distribution in developing countries, but the results are uncertain. The impact of new technologies for countries of all development levels may vary

depending on local policies, particularly public spending on education and financial markets. (Cornia and Court, 2004).

One of the most effective policies to be taken against the deterioration in income distribution arising from technological development is to increase the number of skilled workers trained by improving the education conditions. Thus, as the number of educated people is high, the income gap between skilled and unskilled is reduced (Rakici, 2008).

3.6.4. Inflation

Inflation can be defined as a continuous increase in the general level of prices. Inflation, which is an indicator of an unhealthy and unstable economy, is one of the factors causing worsening in income distribution. There are various costs of inflation to the national economy and preventions that can be taken to avoid these costs. However, the inflation solution is a difficult and complex problem and measures to be implemented can be very costly (Bulíř, 2001).

When the effect of inflation on wages is analyzed, wages do not increase as much as inflation and fall behind inflation. On the contrary, prices increase at the rate of inflation. As a result, while the real value of salaries decreases, the owners of the firm increase their profits. Income distribution is negatively affected because inflation increases the income of the rich and decreases purchasing power in the middle and low class (Li and Zou, 2002).

Inflation also affects income distribution with its debtor-creditor hypothesis. If interest rates on assets are determined in terms of currency without adjusting the inflation rate correctly, nominal borrowers benefit from inflation instead of nominal creditors. Another channel used by inflation is the economic growth. Inflation worsens income distribution by negatively affects economic growth (Li and Zou, 2002).

In the study conducted by Bulíř (2001), the decrease of inflation from hyperinflation levels to normal levels improve income inequality. However, it is observed that continuing to decline towards a very low inflation level increases inequality. His results showed that countries between 5 and 40 percent inflation benefit more from falling inflation and equalizing income compared to countries with inflation below 5 percent annually.

After the policies were implemented by Turkey in 1980, inflation increased to 20-40% between 1982-1987 periods and 60-90% after 1990. The high inflation rate causes significant real income losses in the low-income bracket. The situation of the low-income bracket worsened and inequality in income distribution increased. Also, regulations that do not protect the right of the low-income bracket have worsened income distribution (Devlet Planlama Teşkilatı, 2001) Consecutive political and financial crises in the country carried the high rate of inflation to the present day.

3.6.5. Interest Rate

It has been accepted by the literature that high-interest rates distort both the economic balance and income distribution. In interest rate transactions, one of the parties gives the required amount and takes back with the interest without taking any risks and without spending effort and time. On the contrary, the borrower is obliged to pay the principal and interest by undertaking the risk and spending effort and time. This situation causes a rise in income inequality between the lender and the borrower. Also, when evaluated in the long term, high-interest rates lead to a decrease in real investments, thus a decrease in labor demand and an increase in unemployment. This worsens the income distribution by affecting wages (Bukey and Cetin, 2017).

4. IMPACT OF TAX POLICIES ON INCOME DISTRIBUTION: AN EMPIRICAL ANALYSIS

Taxes are one of the most essential financial instruments available to the government to reduce income inequality and to redistribute income. Because one of the social aims of the tax is to distribute the income at the desired level in favor of individuals with poor financial status. From this point of view, considering the ability of individuals to pay taxes, the tax rate, the type of taxes, and the possibility of tax reflection affect the redistribution of income. The tax rates levied have a significant effect on determining the level of disposable income and the distribution of post-tax income between different groups. Also, tax policies applied can have many interrelated effects. Successful tax policies increase business incentives, savings, and the level of investment, while inadequate tax policies can lead to a decrease in effective demand and employment. (Mieszkowski, 1969).

The income distribution is taken into consideration when deciding on tax reforms in developed countries. However, income distribution is at the forefront in developing countries and fiscal policies are given importance. One of the reasons why the income distribution is put in the second plan is that people with a bad financial situation do not pay taxes directly. Also, the idea that the indirect taxes they pay will not affect them, as they will be based on their consumption. Another is the idea that government spending will be more effective in improving income distribution in developing countries. Therefore, they use tax to fund government spending. Indirect taxes outweigh the developing countries (Gemmell and Morrissey, 2002). In this section, the effect of tax on income distribution is examined under two main headings as indirect and direct taxes below.

4.1. The Impact of Direct Tax Policies on Income Distribution

In this section, the impacts of direct taxes on income distribution are analyzed. Particularly, income tax and corporate tax, which have the highest share of direct taxes, are discussed in detail. Tax policies are vital in ensuring the fairness of income distribution. Taxes include financial liabilities imposed on natural and legal entities, according to their financial strength, to meet public expenses. In this context, the purpose of the tax policy is to provide the desired distribution of income and wealth in favor of those who are economically weak. Also, direct taxes are difficult to reflect

and the legal taxpayer pays tax. Therefore, a direct tax is one of the most important tax items serving this purpose.

4.1.1. The Impact of Personal Income Tax on Income Distribution

The most important factor for the personal income tax to provide equality in the income distribution is that the personal income tax has an increasing rate of the tax structure. In this way, low taxes will be collected from the low-income segment and high taxes from the high-income segment. As a result, the desired equal distribution in the economy will be achieved. However, these taxes must be taken from all kinds of earnings for personal income tax has a beneficial impact on inequality in income distribution. Also, in this way, even if the public sector has been funded and even these resources have been used for investment by the public sector since the private sector will have a decrease in the amount of investment, the overall investment level has not changed much, perhaps even decreased in terms of the whole economy (Bilgiç, 2015).

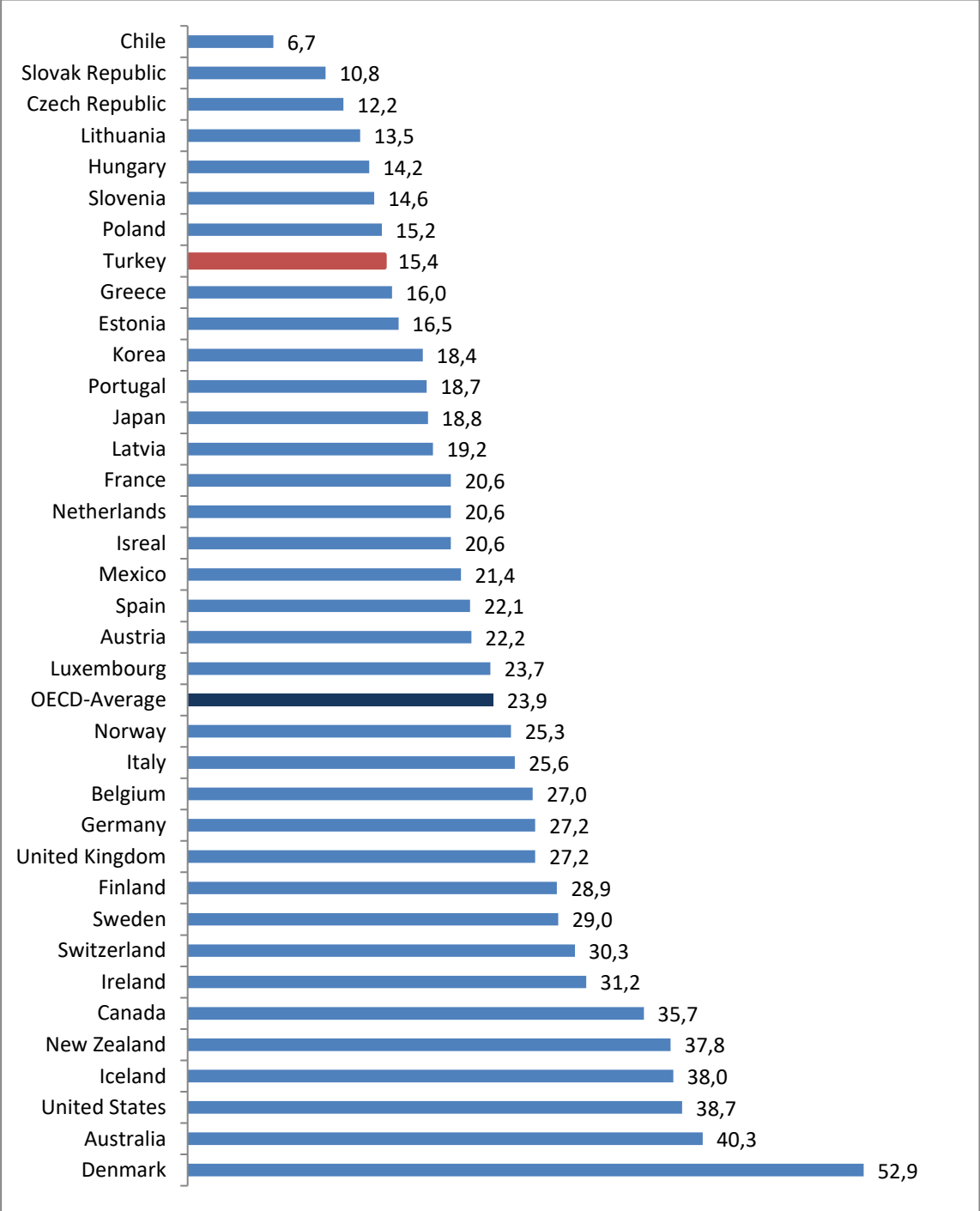
Moreover, as mentioned before, direct taxes are harder to reflect than indirect taxes. Especially, since income tax is taken into consideration in terms of personal situations, it is difficult to reflect. As a result of this, the income distribution is expected to improve as the tax will be paid on the higher income bracket and will not be reflected on the lower-income bracket.

The most significant factor that shows the weight of income tax in a tax system is the share of the revenue from this tax in total tax revenues. The share of income tax is also essential in terms of the income distribution. Because, in countries with high income tax, income distribution is generally more equal. On the contrary, the Gini coefficient is higher in countries where the share of income tax is low.

Looking at the figure below, the share of income tax in tax revenues in developed countries is higher than in other countries. Countries such as the USA, Australia, and Denmark are examples of these. In Denmark, the share of income tax in tax revenues is the highest with 52 percent. Australia follows Denmark with 40.3 percent. USD takes third place with 38.7 percent. Also, the share of income tax in developed countries is generally above the OECD average in terms of these rates. On the contrary, the share of income tax is low in developing and less developed countries. The share of taxes in total tax revenue of developing countries including Turkey is below the OECD average. The countries with the lowest income tax in total tax are Chile, Slovak

Republic, and the Czech Republic. The rates of these countries are 6,7%, 10,8%, and 12,2 respectively. Lastly, Turkey has an eighth low rate with 15.4% among the following countries.

Figure 14: Tax on personal income total, % of taxation, 2018 or latest available



Source: OECD (2020). Tax on Personal Income. Retrieved from

<https://data.oecd.org/tax/tax-on-personal-income.htm> on 28 May 2020.

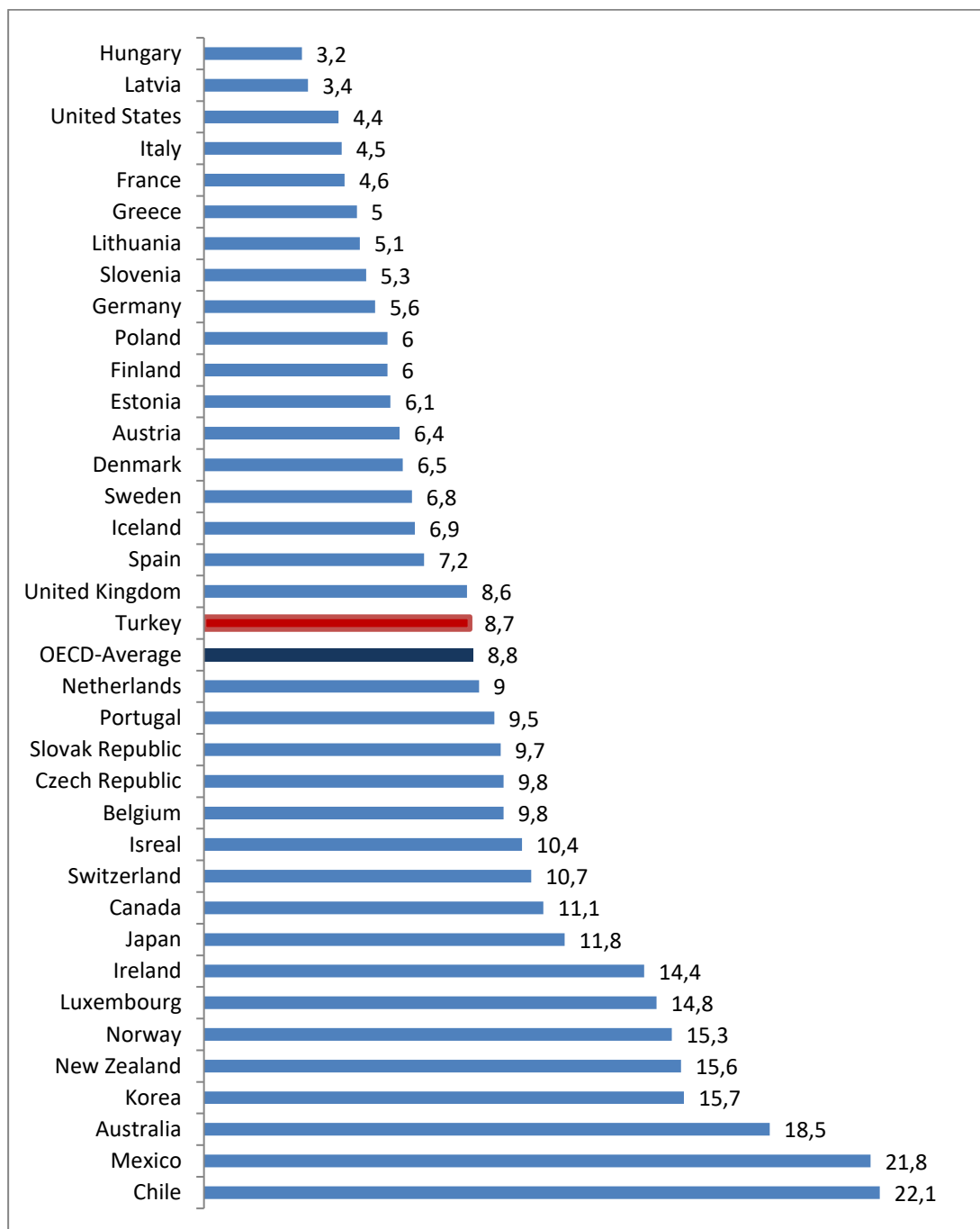
4.1.2. The Impact of Corporate Income Tax on Income Distribution

Corporate tax is another tax on income. Corporate tax has been gaining importance in developing countries in recent years. However, the government has used various tax exemptions to encourage institutions to produce. This situation caused the corporate tax to be behind the income tax in terms of rearranging the income distribution. This tax is usually charged on a single-rate tax. As corporate partners or stockholders are generally high-income people, these taxes affect income distribution inequality. However, evidence has been provided that corporate tax rates have major and significant negative impacts on corporate investment and entrepreneurship. Also, corporate tax has a major negative impact on foreign direct investment (Djankov et. al. 2010).

The Corporate tax remains on capital in short-term conditions because these taxes are difficult to reflect. If the tax burden is effectively met by the capital owners and not transferred to the workers or consumers, this helps increase the progressivity of the tax system (Dwenger et. al., 2017). In addition, generally, companies competing in a competitive market are price takers, so the prices are determined by the market. Therefore, companies in a competitive market often bear the burden of income tax. However, if the capital supply is fully flexible and companies have monopoly power, the tax will be reflected on employees and consumers, not on capital owners. Thus, the progressivity of corporate tax will tend to decrease.

In the figure below, the share of corporation tax collected in Turkey is very close to the average of OECD countries. The country with the lowest rate among the countries below is Hungary. The share of corporate tax in Hungary is 3,2%. Hungary is followed by Latvia with 3,4% and the United States with 4,4%. On the contrary, the country with the highest share of corporate tax in total tax revenue is Chile. 22,1% of Chile's tax income derives from corporate tax. Mexico with 21,8% and Australia with 18,5% come after Chile.

Figure 15: Tax on corporate profit total, % of taxation, 2018 or latest available



Source: OECD (2020). Tax on Corporate Profits. Retrieved from

<https://data.oecd.org/tax/tax-on-corporate-profits.htm> On 25 March 2020.

4.2. The Impact of Indirect Tax Policies on Income Distribution

In developed countries, the weight of tax revenues consists of income and corporate taxes, which are direct. However, indirect taxes have a higher weight in our country's budget revenues. Developing countries turn to indirect taxes to increase their income due to the reasons as mentioned earlier. In Turkey, low-income brackets pay a disproportionate share of their income as indirect tax. Indirect taxes are a regressive tax that the low-income groups pay more of their income as taxes than the high-income groups. Also, indirect taxes are an additional burden for people whose earnings are already below a certain threshold. Therefore, the tax burden on low-income people is higher and this situation negatively affects the income distribution in developing economies (Goksen, 2008). The impact of Value Added Tax and Special Consumption Tax on income distribution are examined under separate headings below.

4.2.1. The Impact of Value Added Tax on Income Distribution

Value-added tax is charged on the added value created in an economy and practice; the tax burden is reflected on the end consumer. For example, producers are often legally liable to pay VAT, but producers can raise prices to compensate for tax obligations. Thus, consumers pay all or part of the tax that producers normally have to pay (Gemmell and Morrissey, 2002).

Spending taxes are flat-rate taxes that do not distinguish between taxpayers. No matter who buys any goods or services subject to VAT, they pay the same rate of tax. From this aspect, it is obvious that VAT brings more burdens to low-income groups. Therefore, the VAT is considered a regressive tax. On the other hand, if VAT is seen as a source of income and provides more revenue to the government, these revenues can also be used to finance transfers and provide goods to reduce inequality. Therefore, the general effects of VAT on inequality are uncertain in theory (Alavuotunki et. al. 2019). However, value-added tax in Turkey and especially in developing countries is a tax that distorts equality in income distribution. To eliminate the negative effects of value-added tax on income distribution, VAT on compulsory goods may be taxed at low rates or exempt from tax.

4.2.2. The Impact of Special Consumption Tax on Income Distribution

Special consumption tax is expected to have a corrective effect on income distribution at first glance. However, these taxes, are not only considered as luxury goods but also

on goods and services such as fuel and communication services, which have a low-price elasticity of demand. This may put serious burdens on lower-income groups. Since fuel products are used not only as final goods but also as inputs in almost all stages of production, they become an element of price and can affect the purchasing power of households (Bilgiç, 2015).

Moreover, the government has two reasons for taxing cigarettes and tobacco, apart from increasing tax revenues. Taxes on tobacco and alcohol are intended to reduce the consumption of products harmful to human health. Smoking harms all respiratory organs, especially the lung. Also, alcohol use negatively affects the ability to think and make decisions by damaging the brain and nerves; and causes balance and attention problems. The government imposes high taxes on these products to prevent damage to the body caused by smoking and alcohol use (Maskaeva et. al. 2019). The other reason is compensating for the public expenditures caused by cigarettes and to reduce the consumption habit. For example, Health problems of both smokers and passive smokers in this bad atmosphere, along with cigarette consumption, can be a big burden on government health expenditures (Beatty. et. al. 2009). Therefore, the government imposes taxes to interfere with this negative externality.

However, an increase in indirect taxes worsens income distribution and causes low-income people to evade taxes. In other words, additional tax application does not eliminate the inequality in the tax system but also deepens the unfair structure. This was demonstrated by Ozkan and Cetin with a survey in 2018. They realized that special consumption taxes on alcohol and tobacco products failed to fulfill the functionality expected for social benefit. Therefore, taxes are not effective in reducing the consumption of these products, which are regarded as harmful for public health and cause the formation of the informal economy. As a result, they have revealed the necessity of carrying out social awareness activities to reduce the consumption of products and efforts to eliminate informality caused by the tax.

Special consumption tax mainly contains luxury goods and addictive items. In addition to these, this tax is an excise tax that covers a wide range of industrial products and services in some specific cases. In this regard, the Private Consumption Tax indirectly decreases environmental pollution due to its increases in the price of fuel oil and thus reduces consumption. On the other hand, Special consumption tax is created for financial purposes rather than environmental purposes, since the consumption amount

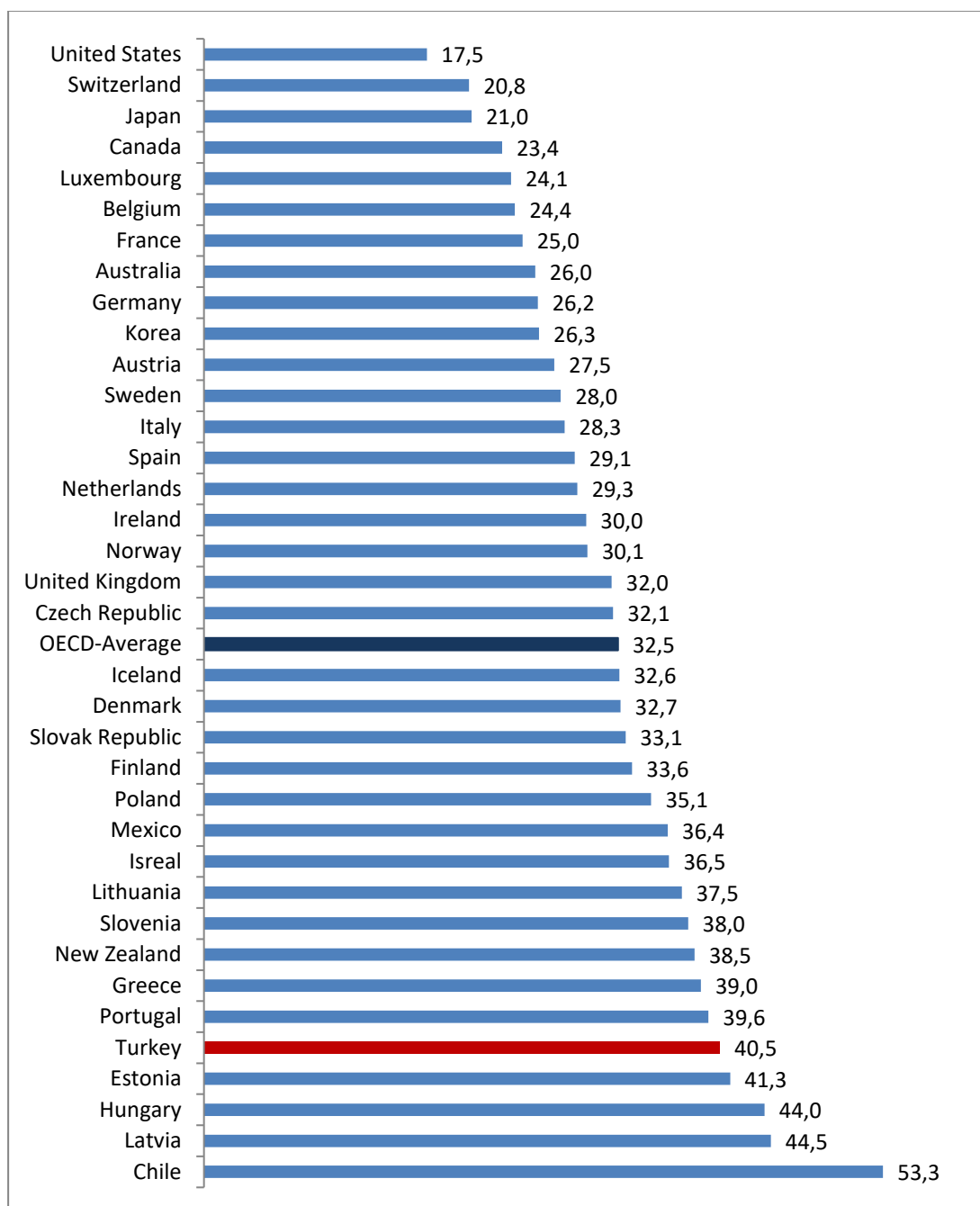
is based on consumption, not the damage to the environment. From this point of view, SCT again affects income distribution negatively.

4.2.3. The Impact of Special Communication Tax on Income Distribution

Communication has become more essential as people live in a globalized world. Also, communication is the right of everyone living in Turkey. However, consumption tax is also higher in Turkey when compared to other countries. Also, wireless certificate fees and wireless usage fees are charged only in Turkey. The high rate of indirect taxes on communication increases the final price and this causes an inflationary effect on the economy. Some sectors related to communication might be affected negatively. Moreover, high taxes constitute more burdens on low-income segments. While communication should be a public sector, low-income people cannot benefit from this service due to high taxes (Yurtsever, 2012). Since this tax is applied regardless of people's income status, this tax is expected to affect the income distribution negatively like other indirect taxes.

Considering the figure below, in Turkey, the share of taxes applied regardless of individual income level is very high. Turkey is ranked fifth among countries with the highest rates. The country that has the highest share Chile with 53,3percent. On the contrary, the United States only provides 17% of its taxes through services and goods. The average of OECD countries with 32,5% is in the middle among the countries below. When the below figure is looked at in general, the rate of tax collected from goods and services to total tax is low in developed countries. Developing and less developed countries have higher shares compared to developed countries.

Figure 16: Tax on goods and services total, % of taxation, 2018 or latest available



Source: OECD (2020). Tax on Goods and Services. Retrieved from

<https://data.oecd.org/tax/tax-on-goods-and-services.htm> on 28 March 2020.

4.3 The Impact of Tax Policies on Income Distribution: An Empirical Analysis

4.3.1. Empirical Framework

Various studies analyze the impact of taxes on income distribution. Some of these studies show that direct tax positively affects income distribution. Also, various methods have been used to show this effect. However, none of the previous studies used the ARDL boundary test approach.

The economic model on the tax mix is analyzed by Atkinson and Stiglitz (1976). They indicate that income tax is required for an equal income distribution and consumption tax is unnecessary. The reason why a uniform lump-sum tax is not preferred is that individuals living under the same authority have different characteristics.

In another study, Bennati-Dragulescu-Yakovenko (BDY) game was used to show how different tax systems effects. This game used by Kulp e.t al. (2019) is a simple agent-based exchange game that designs a simple economic system. The result of this research shows that the income tax applied to poor agencies reduces the Gini coefficient and improves income distribution.

Also, Iosifidi and Mylonidis (2017) use panel data to compare the effective tax rate of OECD countries. Their conclusion indicates that higher the tax burden on labor or consumption than capital causes more unequal income distribution. On the contrary, relying more on labor taxes than consumption taxes improve income equality.

Another study showing how tax policies affect income distribution was done by Garcia and Turnovsky (2011). They concluded that the endogeneity of labor supply is vital because tax policy changes that affect working hours will influence income distribution. They demonstrated that policies that reduce labor supply are not only related to less output but also related to more equal after-tax income distribution.

Bargain and Callan (2010) examine the effects of tax-benefit reforms on income distribution. They used the Shorrocks–Shapley decomposition method. They aimed to measure the effect of policy changes on income distribution in France and Ireland in the 1990s. At that time, policy changes were seen to have had significant effects in both countries. However, different results have appeared in the two countries. Tax

benefit reform effects decreased inequality in income distribution in France. On the other hand, in Ireland, a decrease in unemployment equalized the distribution of income.

Bilgic (2015) analyzes the effect of the taxation policies applied in Turkey on income distribution with 1990-2013 period data and the least-squares method. Gini coefficient is the independent variable in analysis and the share of indirect and direct taxes in GDP are dependent variables. Findings indicate that, the coefficient of indirect taxes was statistically insignificant, and the direct tax coefficient was statistically significant. 1% increase in direct taxes reduces the value of the Gini coefficient by 0.8%.

Another research showing how changes in tax laws and transfer payments in the U.S. affect income distribution was conducted by Zandvakili and Mills (2001). Inequality of household income is measured for both before tax/transfer and after-tax/transfer. They used household income data from the Panel Study of Income Dynamics (PSID). As a result of the applied Bootstrap approach, Social security income and income taxes in the USA significantly reduce income inequality in a given year. Also, income transfers were observed to have less impact on reducing income inequality and cause destruction in the progressivity of taxes.

Moreover, studies have been conducted on how the distribution of income between urban and rural settlements in the country is affected. This kind of research was done by Fu (2016). Fu examines how indirect tax affects the distribution of income between urban and rural areas in China. Tal index between 1994 and 2013 is used to measure the income gap. At the end of the study, VAT damage income distribution and increases the gap between rural and urban.

In addition to the income distribution, how the tax system affects poverty has also been widely reported in the literature. One of these examples is conducted by Goksen, et. al (2008). They concluded that the unfair tax system applied in Turkey causes poverty and unequal income distribution. Consumption taxes applied regardless of the income distribution have increased pressure on the poor and made them unwilling to pay taxes. Unfortunately, deficiencies in the collection of income tax in Turkey cause an increase in the informal economy and consumption taxes.

Many other studies have been conducted to examine the relationships between income distribution and macro-economic factors. One of these was conducted by Kanberoglu

and Arvas (2014). Their study based on from 1980 to 2012 period in Turkey, investigated the effect of financial development on income distribution. In the study, the Gini coefficient dependent variable; the share of private sector loans in GDP, GDP per capita, inflation rate, and the share of foreign trade in GDP were considered as independent variables. ARDL boundary test approach was used in the study. According to the findings of the study, per capita income, inflation, and private sector credits decrease income inequality. On the contrary, foreign trade increases income inequality.

Also, Sarel (1997) focuses on the interaction between macroeconomic factors and income distribution. Sarel used a cross-section empirical framework to examine this relation. As a result of the study, the development of macroeconomic factors decreased income inequality. These factors include investment, growth, income level, the terms of trade, and real depreciation.

Gulmez and Altintas (2015) examine the impact of trade openness and inflation on income distribution in Turkey. In this study, the ratio of total imports and exports to GDP as the trade openness parameter and the Gini coefficient as an indicator of the income distribution were used. In the study based on the period of 1981-2011, both short- and long-term causality and impact response analyses were performed. Both short- and long-term causalities were determined from inflation and trade deficit to income distribution. According to the impact response functions, it was concluded that inflation and trade deficit improved income distribution.

Also, the relationship between income distribution and outward openness shas been analyzed with the cointegration test by Ornek and Elveren (2010). Turkey's data and 1980-2001 period are used. According to the findings of the study, a strong two-way causality relationship was determined between the variables. They show that income inequality worsened in the neoliberal period for both developed and developing countries.

Sameti and Rafie (2010) analyze the economic growth and income distribution of Iran and eastern East Asian countries with panel data regression for the period 1990-2006. According to the results of the analysis, the effect of goods and services taxes on income inequality is insignificant, but income, profit, and capital gains have a positive and significant effect on the Gini coefficient of taxes. Another study examining

economic growth and income distribution is done by Akalın, Ozbek, and Cifci (2018). They analyzed the relationship between income distribution and economic growth. In this study, the validity of the Kuznets Curve Hypothesis between 1984 and 2011 was investigated by the ARDL boundary test. When evaluating the findings obtained from the study, economic growth reduces inequalities in income distribution in Turkey. Sustainable economic growth provides an increase in per capita income in the country's prosperity while ensuring a fairer distribution of income among individuals. In addition, policies that increase the rate of unionization and reduce evasion would help to reduce the income inequality in Turkey.

There is another study that focuses on the Kuznets Curve. Lopez (2004) found Kuznets's type of relationship between economic growth and income inequality. While economic growth will have negative effects on income distribution in the short term, these negative effects are replaced by positive effects in the long term. When Lopez looks at this relationship in the opposite direction, he makes inferences that an increase in inequality causes a decrease in growth.

Also, Perotti (1993) examines income distribution and growth from another perspective. The author analyzed the impact of income distribution on growth by evaluating investment in human capital as the source of growth. Author's theory is based on the non-overlapping generation model with voting. In the model, individuals can be in one of three different income groups. In addition, inequality tends to positively correlate with taxation level and redistribution. Growth and changes in income distribution before tax affects investment in education. Individuals whose income after tax is below the cost of receiving education will not be able to invest in human capital and will get the same preliminary income in the next period. On the contrary, those who can afford to education fee will have a higher income to the next level. This causes increase equality in income distribution. The economy cannot benefit from people with high education levels, so the economy will not improve.

Moreover, some research has been done to examine the relationships between taxes and other economic factors. One of the research that can be an example of this group is conducted by Bukey and Cetin (2017). They studied how economic growth, globalization, inflation, interest, and tax policy affect income distribution in Turkey. Model using the data of the 1980-2014 period and the least-squares method. According to the results of the study, globalization, inflation, and interest variables are significant

and negatively affect income distribution. But economic growth and tax burden variables are statistically insignificant.

4.3.2. Data and the Methodology

In this the study, ARDL bounds testing approach is used to see long-term and short-term relation between income distribution and tax. The data covering the period 1980-2018 is annual and obtained from various sources. As seen in the table below, the Gini index between 1980 and 2001 is taken from Ufuk Dumlu and Özlem Aydın's article. The reason for using the estimated Gini data from this article is that Gini had been not measured regularly before 2002. Gini index after 2002 is taken from World Bank. Also, tax-related data used in this data set are taken from OECD.

Table 10: Variables – Sample 1980-2018

Variable	Name	Source
Gini	Gini İndex	1980-2001 -> Dumlu, U. & Aydın, Ö. (2008). Ekonometrik Modellerle Türkiye İçin 2006 Yılı Katsayısı Tahmini. <i>Ege Akademik Bakış</i> . 8(1):373-393. 2002-2018-> Worldbank. (2020). Gini index (World Bank estimate) - Turkey. Retrieved from https://data.worldbank.org/indicator/SI.POV.GINI?locations=TR (accessed date: 12.09.2020).
tgs	Tax on goods and services %GDP	OECD (2020). Tax on Goods and Services. Retrieved from https://data.oecd.org/tax/tax-on-goods-and-services.htm (accessed date: 28.03.2020).
tpi	Tax on personal income %GDP	OECD (2020). Tax on Personal Income. Retrieved from https://data.oecd.org/tax/tax-on-personal-income.htm (accessed date: 28.03.2020).
tcp	Tax on corporate profits %GDP	OECD (2020). Tax on Corporate Profits. Retrieved from https://data.oecd.org/tax/tax-on-corporate-profits.htm (accessed date: 28.03.2020).
trev	Tax revenue %GDP	OECD (2020). Tax Revenue. Retrieved from https://data.oecd.org/tax/tax-revenue.htm#indicator-chart (accessed date: 28.03.2020).

Cointegration tests are used to analyze the long-term relationships of variables with each other. In classical cointegration tests, variables must be stationary to the same degree. This situation causes an essential constraint in performing the cointegration test. This problem is overcome with the ARDL method, which allows the analysis of the long-term relationship between variables when they are integrated from different degrees. In other words, ARDL test is used to explain the short- and long-term relationships of variables and explains the cointegration relationship without the condition that the series are stationary at the same degree (Pesaran et al., 2001).

To use the test, variables should not be I (2). Table 11 shows the unit root test results of the relevant variables with the help of the Augmented Dickey-Fuller (ADF) test. As seen below, all variables are stationary I (1) at the first difference. Hence, I (1) ARDL Bound Test approach can be used as all variables become stationary when the first-order difference is taken.

Table 11 : ADF Test Results

Variable	ADF					
	Intercept		Trend&intercept		None	
	t-stat	Prob	t-stat	Prob	t-stat	Prob
lngini	-1,831316	0,3602	-1,687186	0,7374	-0,706038	0,4043
dlngini	-7,064853	0,0000	-7,193793	0,0000	-7,061060	0,0000
longs	-1,458363	0,5435	-0,569116	0,9752	1,440692	0,9603
dlntgs	-6,905189	0,0000	-7,218300	0,0000	-6,317902	0,0000
lntpi	-3,393020	0,0176	-3,296796	0,0826	-0,916120	0,3132
dlntpi	-4,471688	0,0010	-4,469147	0,0054	-4,502066	0,0000
lntcp	-3,342812	0,0197	-2,577266	0,2922	-1,277807	0,1820
dlntcp	-6,727501	0,0000	-6,462480	0,0000	-6,823782	0,0000
lntrev	-1,007774	0,7408	-1,220377	0,8918	1,552175	0,9681
dlntrev	-5,000179	0,0020	-4,947224	0,0015	-3,785226	0,0004

At this stage, the appropriate delay numbers are determined and the model can be passed. ARDL model formulation with lngini dependent variables and four independent variables (lntgs, lntpi, lntcp and lntrev) is estimated by econometrics and statistics programs as below.

$$\begin{aligned}\Delta \ln gini_t &= \beta_0 + \sum_{i=1}^m \beta_{1i} \Delta \ln gini_{t-i} + \sum_{i=0}^m \beta_{2i} \Delta \ln tgs_{t-i} + \sum_{i=0}^m \beta_{3i} \Delta \ln tpi_{t-i} \\ &+ \sum_{i=0}^m \beta_{4i} \Delta \ln tcp_{t-i} + \sum_{i=0}^m \beta_{5i} \Delta \ln trev_{t-i} + \beta_6 \ln gini_{t-1} \\ &+ \beta_7 \ln tgs_{t-1} + \beta_8 \ln tpi_{t-1} + \beta_9 \ln tcp_{t-1} + \beta_{10} \ln trev_{t-1} + \varepsilon_t\end{aligned}$$

Long-run model formulation:

$$\begin{aligned}\ln gini_t &= \beta_0 + \sum_{i=1}^m \beta_{1i} \ln gini_{t-i} + \sum_{i=0}^m \beta_{2i} \ln tgs_{t-i} + \sum_{i=0}^m \beta_{3i} \ln tpi_{t-i} \\ &+ \sum_{i=0}^m \beta_{4i} \ln tcp_{t-i} + \sum_{i=0}^m \beta_{5i} \ln trev_{t-i} + \varepsilon_t\end{aligned}$$

Short Term and Error Correction model formulation:

$$\begin{aligned}\Delta \ln gini_t &= \beta_0 + \sum_{i=1}^m \beta_{1i} \Delta \ln gini_{t-i} + \sum_{i=0}^m \beta_{2i} \Delta \ln tgs_{t-i} + \sum_{i=0}^m \beta_{3i} \Delta \ln tpi_{t-i} \\ &+ \sum_{i=0}^m \beta_{4i} \Delta \ln tcp_{t-i} + \sum_{i=0}^m \beta_{5i} \Delta \ln trev_{t-i} + \beta_6 \text{CointEq}_{t-i} + \varepsilon_t\end{aligned}$$

The “CointEq(-1)” in the formula shows the Error Correction Model. Error Correction Model shows how soon shocks that occur due to independent variables in the short term will stabilize in the long term. For the model to work, the Error Correction Model should be negative and statistically significant.

4.3.3. Testing the Model with ARDL bounds testing approach

Direct taxes have a positive effect on income distribution because personal income tax is collected from the direct taxes as a certain percentage of the taxpayer's income and is provided at a higher rate from the higher income groups. Therefore, a decrease in the Gini coefficient is expected when there is an increase in taxes on the profit. On the contrary, tax on goods and services have more effect on low-income bracket. As a result, it is expected that more indirect taxes will increase inequalities in income distribution.

The increase in tax revenue %GDP may affect income distribution positively or negatively. Whether the result is positive or negative depends on who paid this tax and

who will benefit from this increase. If taxes are collected from low-income groups regardless of their income status, income distribution will be negatively affected. Another point that affects income distribution is how the resources collected from taxes will be spent.

The first step of the ARDL model is to determine the appropriate lag length. At this stage, variables are tested with different delay combinations, and the model with the lowest value according to the Akaike information criteria is selected as the appropriate model. As seen figure below, ARDL(1,0,4,0,4) which has the lowest AIC value is chosen for this study.

Figure 17: Akaike Information Criteria

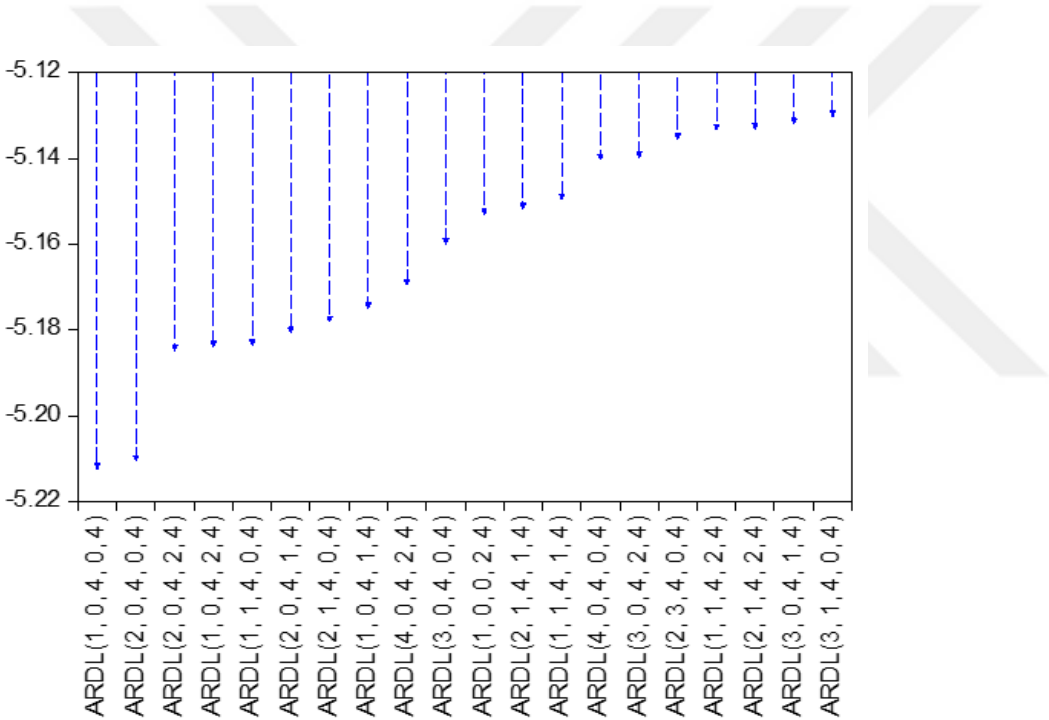


Table 12 : ADRL Test results

Dependent Variable: LNGINI				
Method: ARDL				
Date: 09/12/20 Time: 23:58				
Sample (adjusted): 1984 2018				
Included observations: 35 after adjustments				
Maximum dependent lags: 4 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (4 lags, automatic): LNTCP LNTGS LNTPI LNTREV				
Fixed regressors: C				
Number of models evaluated: 2500				
Selected Model: ARDL(1, 0, 4, 0, 4)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNGINI(-1)	0.524615	0.120724	4.345564	0.0003
LNTCP	0.044595	0.016983	2.625788	0.0158
LNTGS	-0.161406	0.054811	-2.944791	0.0077
LNTGS(-1)	0.000926	0.051935	0.017838	0.9859
LNTGS(-2)	-0.032190	0.054344	-0.592339	0.5599
LNTGS(-3)	-0.006034	0.046935	-0.128564	0.8989
LNTGS(-4)	-0.128382	0.048977	-2.621268	0.0160
LNTPI	-0.042295	0.028659	-1.475802	0.1548
LNTREV	0.192998	0.085662	2.253021	0.0351
LNTREV(-1)	-0.096366	0.093200	-1.033968	0.3129
LNTREV(-2)	0.258669	0.092589	2.793726	0.0109
LNTREV(-3)	-0.158177	0.086673	-1.824995	0.0823
LNTREV(-4)	0.264569	0.074344	3.558713	0.0019
C	1.106696	0.454125	2.436988	0.0238
R-squared	0.921040	Mean dependent var		3.733893
Adjusted R-squared	0.872159	S.D. dependent var		0.043244
S.E. of regression	0.015462	Akaike info criterion		-5.211727
Sum squared resid	0.005020	Schwarz criterion		-4.589588
Log-likelihood	105.2052	Hannan-Quinn criteria.		-4.996965
F-statistic	18.84279	Durbin-Watson stat		1.770547
Prob(F-statistic)	0.000000			

Table 13 : ARDL Long Run Form and Bounds Test

Dependent Variable: D(LNGINI)				
Selected Model: ARDL(1, 0, 4, 0, 4)				
Case 2: Restricted Constant and No Trend				
Sample: 1980 2018 Included observations: 35				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.106696	0.454125	2.436988	0.0238
LNGINI(-1)*	-0.475385	0.120724	-3.937771	0.0008
LNTCP**	0.044595	0.016983	2.625788	0.0158
LNTGS(-1)	-0.327087	0.076673	-4.265967	0.0003
LNTPI**	-0.042295	0.028659	-1.475802	0.1548
LNTREV(-1)	0.461692	0.117846	3.917758	0.0008
D(LNTGS)	-0.161406	0.054811	-2.944791	0.0077
D(LNTGS(-1))	0.166607	0.047034	3.542284	0.0019
D(LNTGS(-2))	0.134416	0.050185	2.678440	0.0141
D(LNTGS(-3))	0.128382	0.048977	2.621268	0.0160
D(LNTREV)	0.192998	0.085662	2.253021	0.0351
D(LNTREV(-1))	-0.365060	0.076815	-4.752484	0.0001
D(LNTREV(-2))	-0.106391	0.084915	-1.252916	0.2240
D(LNTREV(-3))	-0.264569	0.074344	-3.558713	0.0019
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as $Z = Z(-1) + D(Z)$.				
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNTCP	0.093808	0.036036	2.603170	0.0166
LNTGS	-0.688046	0.181044	-3.800431	0.0010
LNTPI	-0.088971	0.062908	-1.414294	0.1719
LNTREV	0.971197	0.295280	3.289068	0.0035
C	2.328000	0.474907	4.902018	0.0001
EC = LNGINI - (0.0938*LNTCP - 0.6880*LNTGS - 0.0890*LNTPI + 0.9712 *LNTREV + 2.3280)				
F-Bounds Test				
Null Hypothesis: No levels relationship				
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	4.403979	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Finite Sample: n=35				
Actual Sample Size	35	10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532

According to test results, all variables are significant except LNTPI. As seen in Table 13, the H0 hypothesis is rejected because the calculated F statistic value (4.404) at the 5% significance level was greater than the upper limit value (4.088). So, there is a cointegration relationship between the variables. Based on this, it is possible to state that there is a long-term relationship between LNGINI, LNCTP, LNTGS, and LNTREV.

Considering the coefficients, there is a positive relationship between LNTCP, LNTREV, and LNGINI in the long run. However, there is a negative relationship between LNTGS and LNGINI in the long term. 1% increase in LNTCP cause 0,093% increase in LNGINI. On the contrary, 1% increase in LNTGS cause 0,688% decrease in LNGINI. Lastly, 1% percent increase in LNTREV cause 0,971% increase in LNGINI.

According to table 14, the signs of LNTGS and LNTREV are the opposite of the long run in the short run. As expected, there is a positive relationship between the lagged 1,2 and 3 values of LNTGS and LNGINI in the short term. Also, there is a negative relationship between the delayed 1 and 3 values of LNTREV and LNGINI. Moreover, as it's supposed to be, error correction (CointEq (-1)) is statistically significant and negative. This means that deviations from balance occurring in the short term approach the balance in the long term. The estimated value of this coefficient is -0.4753 and this value shows that 47.53% of short-term shocks can be eliminated after 1 period.

Table 14: ARDL Error Correction Regression

Dependent Variable: D(LNGINI)				
Selected Model: ARDL(1, 0, 4, 0, 4)				
Case 2: Restricted Constant and No Trend				
Date: 09/13/20 Time: 00:03				
Sample: 1980 2018				
Included observations: 35				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNTGS)	-0.161406	0.042781	-3.772828	0.0011
D(LNTGS(-1))	0.166607	0.040439	4.119988	0.0005
D(LNTGS(-2))	0.134416	0.043581	3.084267	0.0056
D(LNTGS(-3))	0.128382	0.041118	3.122308	0.0052
D(LNTREV)	0.192998	0.063779	3.026043	0.0064
D(LNTREV(-1))	-0.365060	0.063945	-5.708931	0.0000
D(LNTREV(-2))	-0.106391	0.072610	-1.465240	0.1577
D(LNTREV(-3))	-0.264569	0.057125	-4.631415	0.0001
CointEq(-1)*	-0.475385	0.083113	-5.719726	0.0000
R-squared	0.677657	Mean dependent var		-0.002542
Adjusted R-squared	0.578475	S.D. dependent var		0.021403
S.E. of regression	0.013896	Akaike info criterion		-5.497441
Sum squared resid	0.005020	Schwarz criterion		-5.097495
Log likelihood	105.2052	Hannan-Quinn criter.		-5.359380
Durbin-Watson stat	1.770547			
* p-value incompatible with t-Bounds distribution.				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.403979	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

In summary, an increase in tax on goods and services %GDP increase inequality in income distribution in the short-term. On the contrary, there is a reducing effect in the long-term. A rise in tax revenue %GDP decreases inequality in the short-term and increases inequality in the long-term. Lastly, an increase in tax on corporate profits %GDP deteriorates income distribution in the long-run. As the short and long term variables are significant and the cointeq (-1) coefficient is significant, there is a strong causality relationship between the variables. Also, the below tables indicate that there are no autocorrelation and heteroskedasticity in this model. The null hypothesis of no autocorrelation is accepted by using the Breusch-Godfrey serial correlation LM test. Also, The Breusch-Pagan-Godfrey heteroscedasticity test accepts the null hypothesis of homoscedasticity.

Table 15: Breusch-Godfrey Serial Correlation LM Test

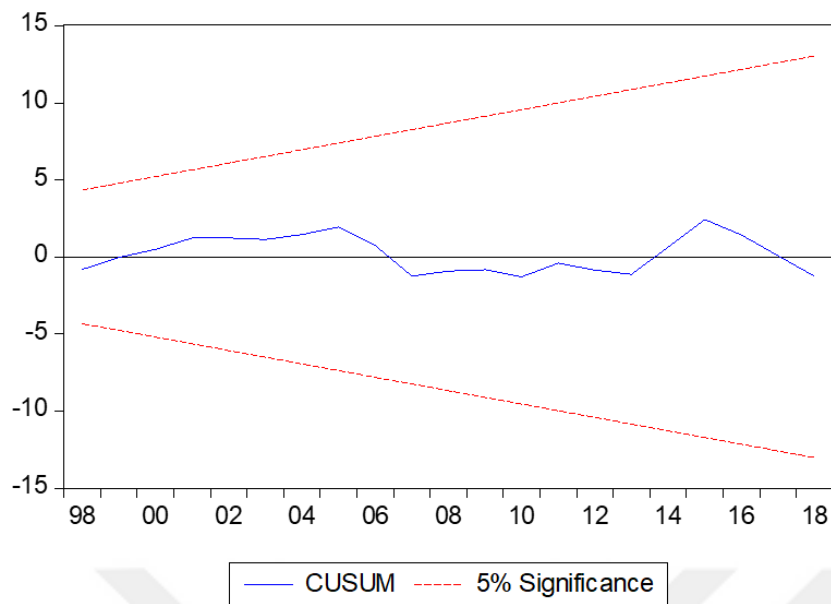
F-statistic	1.768435	Prob. F(2,19)	0.1975
Obs*R-squared	5.492798	Prob. Chi-Square(2)	0.0642

Table 16: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.644364	Prob. F(13,21)	0.7911
Obs*R-squared	9.980203	Prob. Chi-Square(13)	0.6956
Scaled explained SS	4.841530	Prob. Chi-Square(13)	0.9785

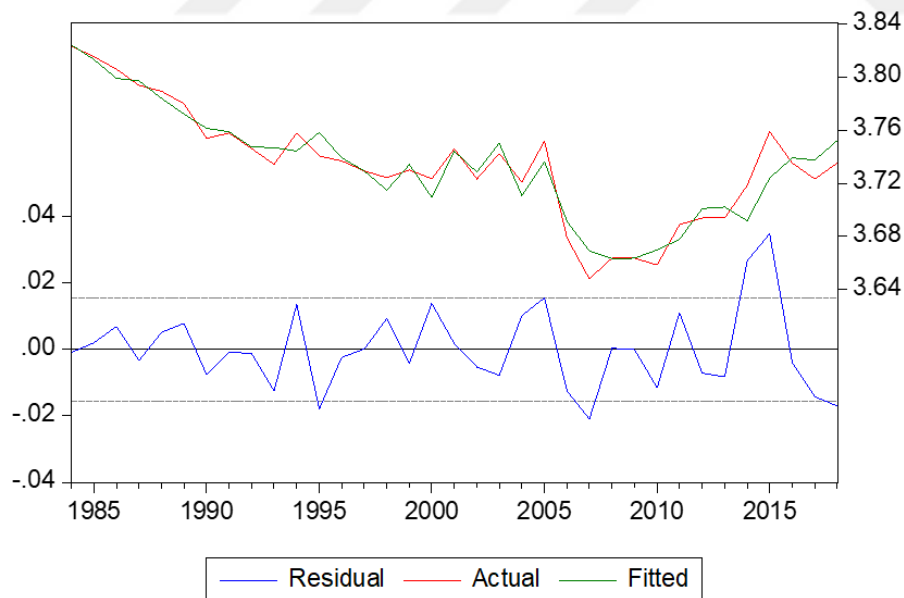
The CUSUM test developed to measure the stability of the coefficients of the variables used in the model is examined. CUSUM tests are based on the cumulative calculation of error terms. As shown in Figure 18, the model created draws a stable path. When the figures are examined, there is no structural break related to the variables used in the analysis. Therefore, the relevant variables are stable for this analyzed period.

Figure 18 : Cusum Test



Finally, Residual, Actual, and Fitted Graph is examined to see the performance of the model created. As seen in the figure below, actual and fitted values are matched. Only the difference between the actual value and the fitted value in 2015 is large. Besides that, the residual line can be evaluated as stable.

Figure 19: Residual, Actual and Fitted Graph



5.CONCLUSION

The concept of income is defined in the most basic sense as the result of all goods and services produced in a country. Also, income distribution shows how these goods and services are distributed among society. Gini coefficient, which is the most widely used tool to measure inequality in personal income distribution, was measured as 0,41 in 2018. This Gini coefficient of 0,41 is indicative of poor income distribution in Turkey. Since 2014, there has been a continuous deterioration in income distribution. Increased inequality in income distribution is not only economic, but also creates socio-cultural problems. To eliminate the inequality in income distribution, policies should be developed to ensure a more equitable distribution of national income derived from the sum of goods and services produced. This requires a tax policy based on direct taxes and wealth taxes and social transfer policies that provide income to low-income groups. As a result of successful policies, the equal distribution of total resources in the country will increase the production potential by ensuring the expansion of the market. Also, society will live socially in better conditions.

In model results, an increase in tax revenue %GDP causes an increase in the Gini index in the long-term. This shows us the Government does not spend its tax revenues to improve income distribution in the long-run. One factor that we cannot show in the model is for what purpose the taxes are used. How the Government spends the collected taxes is as important as from whom the taxes are collected. The Government should spend its tax revenues on policies that improve income distribution, such as providing equal education and job opportunities for all.

The income tax rate applied in Turkey close to developed countries that have equal income distribution. However, the Government has trouble collecting taxes on income, so the ratio of taxes on income to the total tax revenue is lower than in developed countries. Tax amnesties and frequent changes in the tax system discourage individuals from paying taxes. A stronger tax system is needed to properly collect taxes and improve income distribution

Moreover, several non-tax policies can be applied to improve income distribution. One of them is that steady growth is necessary to eliminate inequality in income distribution. For this, the investments should be directed to productive investments. Also, the existing level and quality of education differences must be eliminated. Everyone should have equal access to education. With a high level of education, technological developments that have a positive effect on income distribution will increase. Thanks to this, products with high added value can be produced and exported abroad. Policies based on export rather than import-based positively affect the economy and thus income distribution.

Also, agricultural organizations in rural areas should be established and supported. The labor force should be qualified in the labor market. The efficient functioning of competition and political stability and confidence should be ensured. Thus, effective use of resources and employment will increase.

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