THE IMPACT OF GLOBALIZATION ON TAX REVENUES IN THE EU AND TURKEY

Abstract

This study aims to explain how public revenue systems of European Union (EU) and Turkey has evolved in an economic integration process. Main research problem of our study is that to analyze how severe is the impact of economic integration and globalization on tax revenues of EU member states and Turkey since 1980. High degree of economic integration and globalization increase factor mobility and changed public revenues of EU member states. Those theoretical inferences will be tested for EU and Turkey by using different average effective tax rates as dependent variable. Recently, most of the countries' public revenue systems have been changed significantly, as a result of globalization the share of consumption taxes is increasing in total taxation and this process resulted with higher tax burden on labor indirectly in Turkey and in most of the EU member states. According to our calculations with limited data, there is a negative correlation between trade to Gross Domestic Product (GDP) ratio and tax revenues in the EU. In addition to this result we compare public revenue systems of EU member states and estimate the effect of the crisis of globalization.

Keywords: European economic integration, fiscal federalism, average tax rates, tax policy, panel data

Jel Codes: F15, H20, H30, H71, C23

1. INTRODUCTION

European economic integration has changed economic governance of the EU and also affected revenue systems of member states. Tight monetary policy of European Central Bank (ECB) has forced national states to comply their economic policies with this new economic framework. EU's tax harmonization efforts and creating a fiscal union goal are the important components of EU's economic governance after the financial crisis of Eurozone. Determined by Maastricht Criteria and supported by European Stability Pact (1997), rule based fiscal policy has never been enough for debt reduction policy in post-crisis period. Tight fiscal policies and austerity packages such as limiting budget deficits and debt to gross national product (GNP) are not enough to measure fiscal performance of a country in a Monetary Union. In order to reduce the impact of financial crisis, especially asymmetric shocks, countries should achieve structural reforms and financial risks must be minimized with a common sharing mechanism such as insurance mechanism or European Stability Fund. Therefore taking into account the pre-crisis fiscal harmonization efforts, we will scrutiny harmonization of macroeconomic fiscal policies and tax harmonization separately. As a fundamental issue taxation composes a substructure for EU's fiscal policies. In this study, we will explain tax revenue structures of countries deeply. Existing heterogeneity of tax systems among member states make application of fiscal federalism theory to EU's fiscal governance difficult.

Aftermath of the Eurozone debt crisis, wake of the fiscal union and fiscal federalism debates has point out academic papers. Florin (2010) argue that fiscal federalism is a compatible process with EU's economic governance but considering that certain extend of centralization is a necessity for a full economic integration. When we analyzing fiscal governance in the EU, fiscal federalism theory will be a good guide but it is not enough to explain all kinds of taxes and for eliminating tax system heterogeneity among member states. According to Vallée (2014), without being redesigned in the form of a single roof of EU's own resources, the current system of Monetary Union is not able to reach success. When creating Monetary Union it is taken in to consideration as a monetary policy oriented union, structural differences among countries such as different tax systems and the lack of a common fiscal policy institution are understood better with the debt crisis. Evers (2015) concluded that fiscal transfers among member states would create consumption fluctuations however existence of a central fiscal authority would reduce these fluctuations and increase the effectiveness of risk sharing mechanism. As seen from the previous studies; centralization and coordination of fiscal policies in a Monetary Union will make it more resilient against the crisis.

Although tax policy is not seen as main reason of the Eurozone debt crisis, attaining a stable and inclusive tax policy is very important part of structural reforms which are suggested by international institutions after financial crisis. Norregaard et.al. (2014) analyses that whether wrong tax polies caused Eurozone debt crisis or not. Companies, using excess borrowing instead of own resources, finance their operations by increasing debt to equity ratio. That type of financing is a result of tax policy which allows deducting interest payments of debt. More borrowing rather than financing by equity decreases tax base of companies. Moreover this tax rule increases private debt stock of countries and make countries more fragile against financial crisis.

In pre-crisis period harmonization of tax policies was remedy the glitch of functioning of single market rather than harmonization of fiscal policy. But aftermath of the crisis, tax harmonization efforts mean more stable and resilient revenue system against financial shocks for countries which have fragile fiscal structure. Moreover risk sharing and creating shock absorption mechanism require some degree of harmonized tax systems. In this study, we will scrutiny tax revenue system of member states as structural reform issue and take into account heterogeneity of tax systems when analyzing long term relationship between globalization and tax revenues.

By analyzing revenue side fiscal policies of the EU member states and Turkey, we will focus on public revenues of member states and policy implication of limited centralization of revenues in the EU. What degree of revenue centralization will help to decrease tax base erosion and profit shifting in the EU? EU budget and fiscal structure of member states will be discussed in an empirical analysis. Would a new mechanism of centralized EU budget be accurate system to deal with fiscal deficits' problem? First, public revenues and tax systems of the member states and the EU budget will be examined by an empirical analysis. Secondly interaction between economic integration and tax revenues will be adapted in to the model. Increasing factor mobility, EU enlargement process and globalization have affected fiscal systems of member countries. Another determinant of tax revenues is centralization degree of tax systems of the members. In our model we will test the significance of explanatory variables such as trade openness, FDI flows, growth, fiscal centralization degree and size.

Another important purpose of the paper is that how public revenue systems have evolved in globalization and how financial crisis has affected revenue systems of member states and Turkey. High degree of economic integration increases factor mobility and affects public revenues from different source of income. First we will investigate these fiscal effects properly. Secondly we will

focus on the question that if there is a need for closer revenue side fiscal policy coordination for better European economic governance or not.

2- Tax Revenues of EU Member States and Turkey within the Globalization Process

Globalization gives rise to economic convergence among nations also it changes public revenue systems of countries. Parallel to removing governments' control on capital, taxation of capital movements is more difficult than before. Our research focus on that whether higher economic integration has caused higher tax burdens on labor relative to capital tax burdens.

In the EU, average tax revenues to GDP ratio consists of % 38.7 (European Commission, 2017) and it is above the OECD average. There are significant differences between tax systems of member states. For instance, some countries' public revenues are based on social security contributions, others, especially developing ones' tax systems, are based on indirect taxes and this heterogeneity also exist in the EU. For example, in Denmark, France and Belgium tax revenue to GDP ratio is around %45 and more, while in Romania, Bulgaria and Ireland, that ratio is under % 30. Belgium, Germany and Austria are in a very high level of financial autonomy which means that these countries impose fiscal decentralization while in United Kingdom and Ireland tax revenue share of central government is around % 90 which is very high relative to other EU member states.

In addition, share of social contributions in tax revenues differ from country to country significantly.[1] These differences make common harmonized tax policy unrealistic and there are many political obstacles on creating common fiscal policy in the EU. Moreover lack of harmony in tax policies blocks creating fiscal union unless bring out a centralized, common EU budget. Only creating this type of fiscal capacity may reduce the negative impact of financial crises and accelerate structural reforms in the EU.

If tax rates concerned, new member states impose lower tax rates, especially lower corporate tax rates, in order to attract foreign investment and there is a certain amount of tax competition among new member states. An attractive tax policy for capital flat tax rates are implemented by Baltic sites such as Estonia, Lithuania and Latvia. Besides new member states, old members like the Netherlands and Ireland apply advantageous corporate tax rules to multinational companies. In addition to these countries Greek Republic of Cyprus and Luxemburg are considered as tax haven

[1] European Commission (2017) *Taxation trends in the European Union* | DG Taxation and Customs Union

according to Oxfam research paper.[2] Finally, Switzerland with a high level of banking secrecy, is a loophole in the middle of the EU, although it is not a member of the EU, Switzerland is within the European Economic Area and this situation also affect functioning of single market.

2.1. Tax Revenues in EU-15

As shown in the table (Appendix 1)[3] Finland, Sweden and Denmark have a higher tax revenue/ GDP ratio than it is in southern countries such as Greece, Portugal and Spain which is called periphery and this ratio is much higher than OECD average. When we look from development perspective, Germany, France and Northern countries have higher tax to GDP ratios relative to less developed countries which have less per capita national income.

According to OECD statistics there is no significant fluctuations of tax revenues in countries like England and Germany, but in Greece and Italy tax revenues to GDP ratio has higher volatility although this ratio is increasing steadily aftermath of the crisis. The reason is that these countries revenue side fiscal policies have been affected by 2008 financial crisis which causes deviations of GDP levels. In addition to decreasing economic growth rates, periphery countries' tax revenues are more sensitive to economic activities. In other words, consumption tax revenues are more dependent on economic activity, since these taxes are collected from economic transactions and periphery countries' tax systems are based on consumption taxes. In next sections, we will discuss tax systems of Greece, Italy, Ireland, Portugal and Spain (GIIPS) more closely.

Although the share of indirect taxes which are based on consumption, is higher than the share of direct tax in GIIPS countries, Ireland as the country of most quick recovered from the crisis, becomes separated from these countries with a unique tax system. Unlike other GIIPS countries, in Ireland tax burden, which is calculated by using macroeconomic data, is decreasing steadily. Aftermath of the financial crisis the impact of austerity packages also affects collected tax revenue but this effect is more severe in countries such as Greece relative to Ireland.

[2] (2017). *Oxfam.org*. Retrieved 4 October 2017, from https://www.oxfam.org/sites/www.oxfam.org/files/bp-race-to-bottom-corporate-tax-121216-en.pdf

Graphic (1): Tax Revenues of Greece and Ireland
(in million $, 1980-2015)
Source: OECD revenue statistics.

In countries which have high debt stocks are even getting worse with diminishing tax revenues with the effect of recession. This deterioration in revenue side of budgets make the impact of the crisis more damageable for public finance system of GIIPS. Austerity packages implemented after the crisis have worsen revenue side of fiscal structures of countries which have high debt to GDP ratios. However this fiscal impact has changed public financial system of countries in different levels because of heterogeneity of revenue elasticities in different countries. This is the case of Ireland and the reason why Ireland's tax revenues have been less affected by the crisis that Irish tax revenues are less dependent on economic fluctuations than it is in other GIIPS countries.

In addition to tax revenues, implicit tax rates are good indicators in order to assess macroeconomic impact of globalization especially financial crisis. Moreover implicit tax rates give opportunity to examine tax burdens on different production factors such as labor and capital. Directorate-General for Taxation and Customs Union (DG TAXUD) publishes "Taxation Trends" yearly and this study also covers implicit tax rates on consumption, capital and labor.[4] Implicit tax rates on capital and labor are listed in Appendix II from 2001 to 2015.

[3] ICTD/UNU-WIDER, 'Government Revenue Dataset', June 2016, https://www.wider.unu.edu/project/government-revenue-dataset'
[4] European Commission (2017) *Taxation trends in the European Union* | DG Taxation and Customs Union

If we further look at the analysis in terms of another statistics; GDP shares of different types of tax revenues, we may reach similar results. According to ICTD-GRD [5] statistics; direct and indirect tax revenue shares are summarized in Appendix I for EU-15.

Closer examination of the changes in taxation trends from 1980 to 2015 shows us tax that revenue shares in GDP are increasing steadily in all EU-15 countries except Ireland, France and Austria. In countries, which have relatively low indirect taxes to GDP ratio, the impact of the financial crisis is more severe than the other countries of which tax system is based on direct taxation. Ireland, which has the lowest indirect taxes to GDP ratio, is affected by the financial crisis deeply but Ireland also seems has the most resilient economy among GIIPS countries aftermath of the financial crisis. In other GIIPS countries, indirect taxes share of GDP has increased steadily. For instance, in Greece this ratio has reached %15 in 2015 from %9 in 1980. In Spain and Italy this trend also continues like many developing countries.

Another important inference from table which is shown in Appendix I is that changing composition of income tax towards higher individual tax share in comparison to corporate taxes. Main reason of increasing individual taxation instead of corporate taxation is that tax competition among countries continues on corporate taxation. Multinational corporations' mobility across countries is higher than labor's and countries which aim to attract foreign direct investment reduce corporate tax rates instead of labor tax rates.

Additionally, taxation of individual consumers is easier from collecting and audit perspective. Wage tax, which is an important source of public revenue, is usually collected by deductions from wages and following up these tax revenues is simpler comparison to corporate taxes which are mostly based on declaration.

Finally, most of the EU-15 countries have various tax exemptions and discounted rates which reduce corporate tax base. One of the most relevant example of this tax base erosion is that interest deductions from corporate tax base but distribution of profit or financing from equity is not as advantageous as thin capitalization. Many countries prefer taxing sharing of profits instead of taxing corporate profits directly.

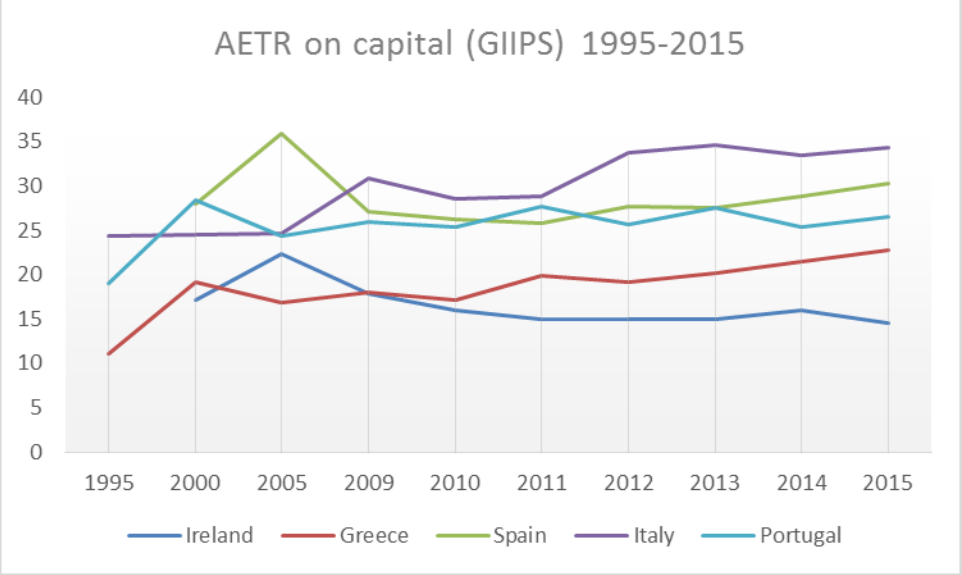
Although the share of indirect taxation such as environmental taxes, is increasing in total taxation, direct taxation is a stable and sustainable source of revenue for the EU-15. This type of taxation is important for fighting with the impact of financial crisis, ensuring justice in taxation and

[5] ICTD/UNU-WIDER, 'Government Revenue Dataset', June 2016, https://www.wider.unu.edu/project/government-revenue-dataset'

also indicates improved tax collection system for some EU-15 countries. On the other hand, GIIPS countries which are also named periphery countries, have more indirect tax oriented revenue system which is a deviation from other EU countries such as Germany and France.

2.2. Tax Revenue Systems of GIIPS and Financial Crisis

The financial crisis that began in the United States in 2008, affected European economic governance and also member states' public finance, particularly in the economies of GIIPS. Increasing tax revenues of GIIPS and maintaining tight fiscal policy are important tools for reduction of debt stock. In crisis time, increasing of implicit tax rates on labor and decreased, at least constant implicit tax rates on capital may be observed from revenue statistics. The depreciation of the company profits in times of crisis, increasing debt burden due to high interest rates and falling stock markets result with lower tax burden on capital since taxation of corporate taxes based on profit declaration. Increasing company losses also affect actual and future capital tax bases negatively. Briefly, financial problems in times of crisis causes erosion of tax capital bases and decreases declared profits in addition to collected tax revenues. But in some countries reduction of collected tax revenues exceeds tax base erosion. In other words, capital tax base erosion causes decline of tax revenues from capital according to tax revenue elasticity to tax base. For instance, in Ireland and Portugal implicit tax rate on capital decrease but in other GIIPS countries this ratio has increased.



Graphic (2): Implicit Tax Rates on Capital(1995-2015)
Source: European Commission DG Taxation and Customs Union

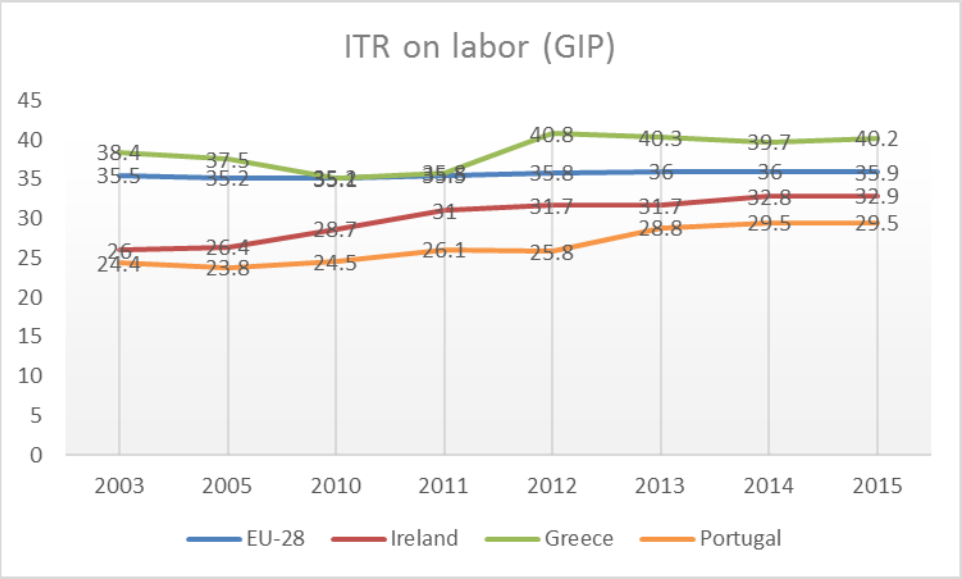
Graphic 2 shows that after the financial crisis, implicit tax rates rise except Portugal and Ireland where capital tax bases decrease but tax revenue depreciation is higher than tax base erosion. These rates are important for explaining the effect of crisis on capital taxation. Ireland has a looser tax system which allows deductions and has many exemptions according to other GIIPS. That's why in crisis time companies, benefit from these tax advantages instead of moving to another country.

This chart also shows us capital tax bases of Greece, Italy and Spain are more sensitive to economic fluctuations than they are in Ireland and Portugal. From previous section, we may conclude that Irish tax system is more responsive to financial crisis and it reduces the impact of financial shocks.

As shown in charts, implicit tax rates on capital which indicates the tax burden on capital, are decreasing but tax burden on labor is in upward trend especially in Greece, Ireland and Portugal. This tendency in public finance shifts tax burden from capital to labor in countries which apply fiscal austerity packages. In addition, due to the ease of its collection and other benefits, rising consumption taxes indirectly affect the tax burden on labor.[6] Fiscal austerity packages caused higher tax burden on labor than it is on capital in GIIPS.

EU's long term growth strategy is built on reducing tax burden on labor and combating international tax competition which causes tax base erosion in periphery countries. Moreover using consumption taxes smartly in order to minimize tax distortions in the market. However trends on implicit tax rates show us this strategy is unrealistic with tight fiscal policy which aims to increase tax revenues. This type of revenue policy increases tax burden on labor via consumption taxes as shown in Graphic 3.

[6] "*The ITR on employed labor is defined as the sum of all direct and indirect taxes and employees' and employers' social contributions levied on employed labor income divided by the total compensation of employees working in the economic territory."* For the methodology of calculating implicit tax rates: European Commission (2017) *Taxation trends in the European Union* | DG Taxation and Customs Union.p.257



Graphic (3): Implicit Tax Rates on Capital (2003-2015)
Source: European Commission DG Taxation and Customs Union

Aftermath of the crisis tax burden on labor has risen in GIIPS except Italy and Spain. In Italy tax burden on labor is already very high, around %40, according to EU average. But in Spain labor tax burden is around % 30 which is lower than EU average (%36 in 2015). In a comparison between tax burden on labor and on capital, we may also conclude that volatility is higher in capital taxation due to high capital mobility in the EU.

2.3. New Member States' Tax System

Most of the new member states of which economic system is based on central planning before independence, has changed public finance and became integrated with the EU's fiscal system. From this perspective, analyzing public revenue system of these countries that gain full membership status after 2004, is also crucial to explain the relationship between economic integration and tax revenues.

Central and Eastern European Countries that became member of the EU after 2004, have transformed their economy from central planning to liberal market economy and this transformation also affected public revenue system dramatically. Although these countries have common features with tax systems, after independence, tax structures of new member states differentiate significantly. Vito Tanzi (2005) mentioned that these countries have unexpected commonalities between tax systems. Firstly, all of new member states have very high total tax to GDP ratio, around % 40, like

many developed countries. In 2005, this ratio was above OECD average and also higher than many EU-15 countries. Secondly, these countries have high budget deficits except Estonia, in spite of high tax revenues (Tanzi, 2005). High budget deficits that mean violation of Maastricht Criteria, continue after 2004 full membership.

Thirdly tax burden on labor is very high in these countries due to high social security contributions and wage tax. High tax burden on labor also incites informal economy. Fourth, those countries decentralize their tax and benefit systems after highly centralized public finance system. Finally, environmental taxation in those countries is on rise and they aim to reduce side effects of industrialization aftermath of central planning (Tanzi, 2005).

According to OECD statistics tax revenue share of GDP is decreasing in seven new member states of the EU according to base year 1995. Due to the impact of liberalization from state oriented economy, seven member states' government share of GDP is diminishing, though increasing trend of tax revenue to GDP ratios in OECD countries. Limited data availability in Central and Eastern European countries that became full member after 2004, makes data analysis for these countries difficult. Only Malta and Cyprus have available tax revenue data and other economic indicators from 1980 to 2015. In our analysis we will use data from 1995 to 2015 for these countries.

2.4. Turkish Tax System:

According to detailed tax statistics of OECD, in Turkey, the share of indirect taxes has increased from 3.84 percent to 13.98 percent, direct taxes such as corporation and income tax revenues remained low relative to consumption tax burdens. Moreover social security contributions have a significant revenue for Turkey in 2000's and the share of those revenues to GDP ratio rises to 8.04 percent in 2013. Higher indirect tax burden and increasing social security payments mean unfair public revenue system for any country. The main problem that developing countries face, is financing their economic growth with ineffective and unfair tax system. That type of public revenue systems do not only create unpleasant income distribution but also cause distortions on the functioning of market economy.

High level of economic integration gives rise to factor mobility and affects public finance models and also tax system of a specific country. As a unitary state Turkey, has a long relationship with the EU which started formally in 1961 with an Ankara Agreement. In 1996, a Customs Union was established between Turkey and the EU. We will focus on economic convergence among

Turkey and EU member states after 1990. Our AETR estimations will be tested whether there is a direct relationship between AETRs and economic integration indicators.

Turkey's financial liberalization has accelerated since 1980 government decisions on exchange rate regime and especially on capital movements. In 1980, exchange rate regime changed rapidly, import substitution model replaced by export-oriented growth model and free movement of capital established by the government. Value added tax became law in 1984 which is the main tax revenue source of the government and a significant tax burden on consumption. Decreasing import tax revenues, due to 24th of January 1980 decisions, have caused a new type of taxation for Turkey in order to compensate revenue loss of Turkish government.

In 2002 Excise Tax Law has been accepted by Turkish Parliament as a part of EU accession reforms. Having first applied Excise Tax Law, has changed Turkish Tax system deeply. The share of consumption has increased relative to capital and labor taxation. Turkey, as a candidate for a full EU membership since 2004, has already been affected by EU's economic conditions and European tax policies. These interdependencies are more effective after 1995 Customs Union Decision. Turkey has followed European economic integration path as a financial and trade liberalization policy tool. This economic anchor also means opening Turkish markets to international trade. Moreover this policy accelerated liberalization of capital/ good markets of Turkey in a global environment.

In the case of Turkey, as a result of globalization the share of consumption taxes is increasing in total taxation and this process resulted with higher tax burden on labor indirectly. AETR on capital is changing more rapidly with business cycles but there is no strong evidence of higher tax burden on capital. Since computation of corporate taxes are more complicated and there are a lot of loopholes in an economic depression capital tax revenues may depreciate rapidly. But labor taxation is more independent from business fluctuations (Yucememis and Erol, 2017).

3. LITERATURE REVİEW AND THEORETICAL FRAMEWORK

According to Musgrave, in a unitary state public funds must be spend and taxes must be collected with respect to utilization principle. On the other hand financial stability and income redistribution mechanism must be assigned to central government (Buchanan and Musgrave, 1999). In a federal state sharing of these duties are more complicated than it is in a unitary country. In our case some degree of centralization of tax revenues may increase the possibility of successful fiscal and economic governance of the EU.

Tanzi (2009) claimed that as international tax competition increased the formation of international tax authority will be required over time in order to prevent from negative externalities of tax competition. Nation States' efforts to reduce tax rates and to minimize the impact of harmful tax competition increase the international organizations' role in the field of international taxation. The OECD and the UN's efforts for harmonization of different national tax rules are the results of this trend. EU is also trying to establish common rules for the single market in the area of commodity taxation and income taxation. Since these institutional struggles have started and accelerated with the pace of globalization, the literature about taxation and globalization has enlarged distinctively.

The relationship between globalization and taxation is examined by academics as an interesting research topic. These studies concentrate on tax competition about corporate taxation, assessing average tax rates within panel data estimation and tax revenue determinants of countries. Empirical results of studies show that there is a complicated association between globalization and tax on mobile production factors. According to game theoretical approach, tax competition among countries to attract FDI and other kind of investments to their countries, does not exist in selected OECD countries with an agglomeration effect of trade (Baldwin & Krugman, 2004; Borck and Pflüger, 2006). But in some countries partial agglomeration exist and there is a limited tax competition in developing countries. On the other hand some academics argue that there is a significant negative relationship between corporate tax rates and globalization (Bretschger and Hettich, 2005). According to Haufler *et. al.* 2008 corporate tax rates are decreasing because of tax competition about capital attractiveness relative to labor taxes with an effect of multinational companies.

Aizenman and Jinjarak (2009), categorized public revenues as "hard to collect taxes" (VAT, income taxes, sales taxes) and "easy to collect taxes" (tariffs, inflation tax and financial repression). They find that there is a positive correlation between openness and "hard to collect" taxes but this relationship is negative for easy to collect taxes. The higher trade openness gives rise hard to collect taxes. Globalization has forced countries to reduce their trade barriers such as tariffs and custom duties. However this trend also increased Value Added Tax (VAT) and sales taxes.

Rodrik (1997) explains the effect of globalization on capital taxation and finds negative correlation between capital taxation and globalization, conversely globalization increases tax burden on labor which is also called efficiency hypothesis. According to Monterio and da Silva

(2011) open economies' tax revenues are more sensitive to tax rates compare to less open economies. But European enlargement does not have impact on tax revenues of member states.

According to quantitative analysis of Neumann et. Al. (2009) increasing mobility causes depreciation of tax revenues but the governments are still have enough power to collect revenues. Krogstrup (2004) also states that capital mobility causes tax competiton and reduction of corporate tax rates of countries. The higher public expenditures are meeting with the higher labor taxation. Parallel to this result; Bretschger and Hettich (2005) explains that globalization affects capital tax rates negatively with a panel data estimation for 12 OECD countries.

The impact of globalization on taxation studies intensify on specifically capital taxation. Adam, Kammas and Lagou (2013), have summarized 20 years of empirical studies about the relationship between globalization and capital taxation meta-data regression model. They concluded that results may differs depending on the measurement of capital tax burden and globalization.

Another article about tax burdens and globalization finds that globalization increases implicit tax rates on capital and national economic policies are not independent from global trends (Dreher, 2006). On the other hand governments still powerful about collecting taxes although labor and capital mobility strains ability to collect tax (Neumann et. al. 2009).

Onaran, Boesch and Leibrecht (2012) investigates the effect of globalization on public expenditures and tax burdens (capital, labor and consumption) of EU-15 and CEE (Central and Eastern Europe) NMS (New member states). They contribute the existing literature by using ITR and KOF index for two different types of welfare states. EU integration dimension is omitted and ITRs are based on European Commission method which is an extension of Mendoza and Tesar (1994) method. According to this study globalization increases tax burden on labor but there is no direct relationship between tax burden on capital and globalization in EU-15. On the other hand, in CEE NMS this negative effect does not exist for labor and capital.

Micro data is also used to analyze the impact of fiscal policies on income distribution. Dolls *et. al.* (2014) used EUROMOD micro-simulation model and estimated the possible results of a joint tax and transfer system in Euro area. Also they simulated a system of fiscal equalization and concluded that a joint tax and transfer system will be beneficial for Eastern European countries and has a stabilizing effect in a contrast with fiscal equalization mechanism.

To our best knowledge in literature there is no specific study about revenue sided fiscal centralization degree of member states and its effect on average effective tax rates. We will contribute three important factors to explain average effective tax rate differences in the EU. First

we will use fiscal centralization degree as an explanatory variable. Secondly we will add our calculations of average effective tax rates of Turkey as a candidate country. Finally Country specific dummies for 2008 financial crisis and economic integration levels will be used in order to scrutiny tax burdens in an economic union.

Our research will be developed in two different theoretical approaches to economic integration. In first approach, academics concentrate on some degree of fiscal centralization and transferring of national budget sovereignty from member states to EU's central fiscal authority. Although federalism is used for decentralization in literature, in our case, fiscal federalism relates to transfer fiscal sovereignty from member states to central EU budget. Federalism also indicates unionist approach instead of intergovernmental one for the EU. Second theoretical approach illustrates fiscal coordination or harmonization of national fiscal policies in the EU. Between these two different approaches we will scrutinize public revenue structure of the EU member states and Turkey.

4. METHODOLOGY

Our First hypothesis is that closer economic integration changes public revenue levels and increases volatility of public revenues. Especially tax revenues that have high degree of mobility cross borders are connected to economic integration process. Our second hypothesis claims that tax revenues which have been collected from mobilized production factors, are more dependent on economic integration and have high volatility. Finally tax competition among member countries reduces stability of public revenues of EU member states and fiscal structures of countries are important determinant of tax competitiveness especially in crisis times.

We will use panel data econometric method to understand impact of globalization on national budgets. We will run ordinary least squares method for the EU member states plus Turkey and demonstrate the change of fiscal structure of member states and Turkey. We have calculated average effective tax rates on capital and labor for Turkey previously (Yucememis and Erol, 2017). These rates are also calculated for 10 EU member states from 1950 to 2015 (Mc Daniel, 2007). We will also use the same model for new member states and Turkey in order to explain the impact of EU enlargement process on tax revenues. Two different data sets consist of new members, Turkey and EU-15 will be estimated separately by panel data analysis.

4.1. Econometric Model

We apply panel data analysis to understand impact of globalization on national budgets. We run ordinary least squares method for the EU and will demonstrate the change of fiscal structure of member states and the EU. Quarterly data from 1980 to 2015 is collected from OECD, World Development Indicators and ICTD- Government Revenue Database. First, we will apply panel unit root tests to our dependent variables such as average effective tax rates tax to GDP ratios. Non-stationary variables will be tested for long-term relationship with panel cointegration test. In addition to globalization indicators such as trade openness and FDI inflows we will also test the significance of centralization degrees.

Short term determinants of stationary dependent variables; tax revenue growth rate and direct/ indirect tax to GDP ratios will be estimated by panel data estimation methods. In order to illustrate short term revenue determinants we will use revenue growth rate as a dependent variable.

Tax Revenues = f (trade, FDI inflows, growth, govexp, inflation, size, centralization)

Explanatory variables and their definitions are listed in Table 1.

Explanatory variables	Definition	Source
Trade	Trade in goods and services/ GDP	World Development Indicators
FDI inflows	Net foreign direct investment inflows/ GDP	World Development Indicators
Growth	GDP growth (annual %)	World Development Indicators
Govexp	Government expenditure/ GDP	World Development Indicators
Inflation	GDP deflator, yearly	World Development Indicators
Size	National GDP/ world GDP	World Economic Outlook
Centralization	Tax revenues of general government/ Total tax	OECD statistics

Since ordinary least squares (OLS) method causes biases in panel data analysis, we have applied GMM to explain tax revenue determinants in 14 EU countries. OLS method may cause endogeneity problem in panel data models. GMM estimator developed by Arellano and Bond (1991) is based on moment equations constructed from further lagged levels of dependent variable and the first-differenced errors. In our tax revenue model, total tax revenue growth is the dependent variable, total tax revenue data is gathered from OECD statistics in million dollars and calculated with growth formula. Moreover we test the significance of direct and indirect tax to GDP ratio as dependent variable. Other dependent variables average effective tax rate (AETR) on capital and

labor are also tested with panel data unit root tests. By using panel cointegration tests we will also scrutiny long-term relationship between AETR on capital and globalization.

4.2. Tax Revenues and Calculating Tax Burdens

Measurement of tax burden differs in various papers. Calculating tax burdens on factor incomes is a common way to analyze macroeconomic impacts of taxation. Our calculations of average AETR on capital and labor reflects this common approach. Other options such as tax revenue levels in constant prices or in dollar, tax to GDP ratios, tax type to total tax revenue ratios help to assess tax system of countries (Yucememis and Erol, 2017).

In order to calculate tax burden of a country or a group of different jurisdictions, different methods have been used by academics. Firstly, OECD publishes tax revenues to GDP ratios or certain type of tax revenue to total tax revenue ratio yearly and those statistics give deep inside for revenue side fiscal performance of OECD member countries. According to OECD's Revenue Statistics tax revenues are measured by Total Tax revenue divided by gross domestic product (GDP). In northern countries such as Denmark, Norway T/GDP ratio is very high. For Turkey there is no separate statistic for tax burden on labor tax to GDP ratio.

Mendoza and Tesar (1994) developed a new indicator of tax burden in a specific economy according economic function by using national account statistics. Devereux and Griffith (2003) analyzed location choice of multinationals by using effective average tax rate (EATR) as an explanatory variable. In this seminal work, Devereux and Griffith developed a new method for EATR and calculated EMTR for multinationals' location choice. EMTR is related to investment profitability and multinationals' location decisions.

In order to calculate tax burden of a country or a group of different jurisdictions, different methods have been used by academics. OECD publishes tax revenues to GDP ratio statistics, certain type of tax revenue to total tax revenue ratios yearly and those statistics give deep inside for revenue side fiscal performance of OECD member countries. According to OECD's Revenue Statistics tax revenues are measured by Total Tax revenue divided by gross domestic product (GDP). In northern countries such as Denmark, Norway tax to GDP ratio is very high. Contrary to developed countries, developing countries such as Turkey has lower tax to GDP ratios. In order to analyze tax burden on income factors we need more detailed national account statistics. For Turkey there is no separate statistic for tax burden on labor tax to GDP ratio.

Secondly Mendoza and Tesar (1994) developed a new indicator of tax burden in a country. Devereux and Griffith (2003) analyzed location choice of multinationals by using effective average tax rate (EATR) as an explanatory variable. In this seminal work, Devereux and Griffith developed a new method for EATR and calculated effective marginal tax rate (EMTR) for multinationals' decision of location choice. EMTR is related to investment profitability and multinationals' location decisions.

In our study, we will use tax burden on capital and labor for analyzing the impact of economic integration on tax burdens on production factors. Our calculation is based on McDaniel (2007) study of measuring average effective tax rates of 15 OECD countries. Mc Daniel (2007) has developed a new formula in order to calculate AETRs. Formula (1) denotes AETR on labor and formula (2) denotes AETR on capital.

Basic Formulas of Mc Daniel (2007);

$$\tau\, h = \frac{SS + HHTL}{(1-\theta)\big(GDP - (T\,P\,I - Sub)\big)} \qquad (1)$$

$$\tau\, k = \frac{HHTC + CT + \mu T\,P\,I}{(\theta(GDP - (T\,P\,I - Sub)) - GOV\ OS} \qquad (2)$$

$\tau\ h$ = average tax rates on labor

SS = Social security contributions

$HHTL$ = Total taxes on income of the households

$(1\ -\ \theta)$ = Share attributed to labor

GDP = Gross domestic product

$T\ P\ I$ = Taxes on production and imports

Sub = Subsidies

$\tau\ k$ = average tax rates on capital

$HHTC$ = Total capital tax revenue collected from household

CT = Corporate Taxes

μ = Share of property taxes paid by other entities (assumed0)

$GOV\ OS$ = Gross operating surplus earned by the government

Basic assumption of the formula is that the tax rate on household labor income is the same as the tax rate on household capital income since national account statistics are not available. To compute (1-θ) we should know the operational surplus of unincorporated enterprises (OSPUE). We will use as (1-θ) International Labor Organization's predictions of labor share of national income of Turkey. According to our own calculations AETR on labor is increasing but AETR on capital is changing parallel to business cycles and it is more volatile than AETR on labor (Yucememis and Erol 2017).

4.3. Globalization and Economic Integration

Free movement of goods, services and capital among countries give rise to the discussion about tax base erosion in developing countries. Tax collecting capacity and institutional framework of developing countries are not as robust as developed economies. Tax revenue mobilization is an indispensable part of globalized economy. EU enlargement process has shown us new member states' economic systems are not same after economic integration.

In this empirical analysis globalization is measured by trade to GDP ratio and net FDI inflows share of GDP. Intra-EU trade is ignored in this study but growth rate, fiscal centralization

degree, size of a country in GDP terms and government expenditure variables are used as control variables.

5- RESULTS and CONCLUDING REMARKS

According to our estimations with limited data in CEE NEMS, there is a negative relationship between trade openness, which is an important economic integration indicator, and tax revenues in the EU and Turkey. As a result of panel data analysis we may conclude that consumption part of total tax revenues is increasing since 1980's. This trend also affects labor share of national income indirectly. Decreasing labor share of income and higher consumption taxes give rise to higher average effective tax rates on labor.

Tax revenue determinants differs between EU-15 and CEE NEMS, although growth is correlated with tax revenues positively in EU-15, this relationship is not as clear as in CEE NEMS and Turkey. Trade openness affect tax revenues negatively in EU-15, other globalization indicator FDI inflows affect tax revenues negatively in NEMS and Turkey. Smaller countries are capable to collect more tax revenue and centralization has a limited positive effect on tax revenues.

Because of global trend of increasing debt burdens, countries started to finance their increasing public expenditures with indirect taxes such as VAT and excise tax. Although these consumption taxes are easy to collect, indirect taxes create distortions in economy. Moreover these type of taxes cause unfair income distribution.

In the case of Turkey and new member states, as a result of globalization the share of consumption taxes is increasing in total taxation and this process resulted with higher tax burden on labor indirectly. AETR on capital is changing more rapidly with business cycles but there is no strong evidence on EU-15 of higher tax burden on capital. Since computation of corporate taxes are more complicated and there are a lot of loopholes in an economic depression capital tax revenues may depreciate rapidly. But labor taxation is more independent from business fluctuations. Moreover GIIPS countries' tax revenues have been affected by financial crisis and tax burden on labor has increased except Italy and Spain.

Macroeconomic analysis is insufficient to assess income distributional effects properly. Dividing the economic agents such as capital earners and laborers may not be helpful to understand income inequality, micro data is the best way to analyze the tax burden on wage and capital earners from different income levels.

EU's inclusive and sustainable growth policy suggest that more labor friendly taxation is a suitable policy for member states. Developing countries such as Turkey should apply more effective consumption taxes such as sugar tax and carbon based taxation and reduce labor tax burden by implementing efficient income tax and benefit system. Increasing the efficiency of social security system will also help ensuring more labor friendly tax system.

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Appendix I

Detailed Tax Statistics of EU-15

Country	Calendar year	Social contributions	TotTax	Direct	Income	Indiv	Corp	Indirect
Austria	1980	0.12	0.27	0.14	0.10	0.09	0.01	0.13
Austria	2015	0.15	0.28	0.16	0.13	0.11	0.02	0.12
Belgium	1980	0.14	0.28	0.18	0.17	0.15	0.02	0.12
Belgium	2015	0.17	0.28	0.18	0.16	0.13	0.03	0.12
Denmark	1980	0.02				0.22	0.01	
Denmark	2015	0.01				0.25	0.03	
Germany	1980	0.13	0.24	0.14	0.13	0.11	0.02	0.10
Germany	2015	0.14	0.23	0.12	0.12	0.10	0.02	0.10
Spain	1980	0.11	0.11	0.06	0.06	0.05	0.01	0.05
Spain	2015	0.12	0.22	0.12	0.10	0.07	0.02	0.11
Finland	1980	0.11	0.25	0.14	0.14	0.13	0.01	0.13
Finland	2015	0.13	0.31	0.17	0.15	0.13	0.02	0.15
France	1980	0.17	0.23	0.09	0.07	0.05	0.02	0.14
France	2015	0.19	0.27	0.16	0.11	0.09	0.02	0.13
UK	1980	0.05	0.25	0.16	0.11	0.09	0.02	0.09
UK	2015	0.08	0.25	0.15	0.12	0.09	0.02	0.11
Greece	1980	0.07	0.14	0.05	0.04	0.03	0.01	0.09
Greece	2015	0.14	0.26	0.11	0.08	0.05	0.02	0.15
Ireland	1980	0.04	0.26	0.12	0.11	0.10	0.01	0.14
Ireland	2015	0.04	0.19	0.11	0.10	0.08	0.03	0.08
Italy	1980	0.11	0.18	0.09	0.09	0.07	0.02	0.08
Italy	2015	0.13	0.30	0.16	0.14	0.11	0.02	0.14
Netherlands	1980	0.16	0.25	0.15	0.13	0.11	0.03	0.11
Netherlands	2015	0.15	0.24	0.12	0.11	0.08	0.03	0.12
Portugal	1980	0.07	0.16	0.05	0.04			0.11
Portugal	2015	0.12	0.23	0.11	0.10	0.07	0.03	0.14
Sweden	1980	0.13	0.32	0.21	0.19	0.18	0.01	0.11
Sweden	2015	0.10	0.33	0.21	0.15	0.12	0.03	0.12

Source: ICTD/UNU-WIDER, 'Government Revenue Dataset', June 2016,

https://www.wider.unu.edu/project/government-revenue-dataset'

Appendix II-A

Implicit Tax Rates On Labor

									Difference (1)	Ranking
	2003	2005	2010	2011	2012	2013	2014	2015	2005 to 2015	2015
EU-28	35.5	35.2	35.1	35.5	35.8	36.0	36.0	35.9	0.7	
EA-19	37.7	37.1	37.1	37.5	38.2	38.5	38.6	38.6	1.5	
Belgium	43.0	43.5	43.2	43.5	43.3	43.6	43.4	43.6	0.2	1
Denmark	36.7	35.8	33.6	33.6	34.1	33.8	33.3	34.2	-1.6	14
Germany	38.7	37.2	36.9	37.1	37.4	37.6	37.7	38.0	0.9	10
Ireland	26.0	26.4	28.7	31.0	31.7	31.7	32.8	32.9	6.4	16
Greece	38.4	37.5	35.2	35.8	40.8	40.3	39.7	40.2	2.7	7
Spain	30.8	31.3	30.3	30.9	31.6	31.8	32.1	31.3	0.0	20
France	38.6	38.9	38.5	39.1	40.3	40.9	41.3	41.3	2.5	5
Italy	42.9	42.2	43.9	43.4	44.0	44.1	43.6	43.2	1.0	2
Luxembourg	28.1	28.8	29.7	30.4	30.9	32.3	32.1	32.7	3.9	18
Netherlands	30.0	29.9	31.9	32.3	32.4	32.1	32.1	32.7	2.8	17
Austria	42.1	41.8	41.5	41.8	42.0	42.4	42.6	43.1	1.2	3
Portugal	24.4	23.8	24.5	26.1	25.8	28.8	29.5	29.5	5.7	24
Finland	41.8	40.6	38.3	38.9	39.5	39.7	40.3	40.7	0.1	6
Sweden	43.5	43.5	39.2	39.1	38.9	38.8	38.6	38.9	-4.6	9
United Kingdom	24.8	26.1	25.6	26.0	25.2	24.9	24.8	24.8	-1.2	26

(1) In percentage points.

Source: DG Taxation and Customs Union, based on Eurostat data

Appendix II-B

Implicit Tax Rates on Capital in the EU-15

	1995	2000	2005	2009	2010	2011	2012	2013	2014	2015	Diff. 1995 to 2015
Belgium	24.7	28.8	31.1	28.3	27.4	29.6	34.4	37.4	37.4	38.0	13.3
Denmark	27.9	31.6	45.3	31.8	38.7	36.5	37.6	33.4	40.4	34.4	6.5
Germany	20.8	26.4	20.4	20.4	19.2	20.9	22.8	23.4	23.8	24.2	3.4
Ireland		17.2	22.3	17.9	16.0	15.0	15.0	15.0	16.0	14.5	-2.4
Greece	11.1	19.1	16.9	18.0	17.2	19.9	19.2	20.2	21.4	22.8	11.7
Spain		27.9	35.9	27.1	26.2	25.8	27.7	27.6	28.8	30.3	2.2
France	36.5	42.3	44.1	44.7	43.5	45.5	51.3	54.4	53.9	52.7	16.2
Italy	24.3	24.5	24.7	30.9	28.6	28.9	33.7	34.6	33.5	34.3	10.0
Netherlands	19.6	18.6	13.5	11.6	10.9	8.8	9.7	9.7	11.4	12.1	-7.5
Austria	25.9	26.8	24.3	24.6	23.4	23.8	23.7	27.1	27.7	29.9	4.0
Portugal	19.0	28.4	24.4	26.0	25.4	27.7	25.6	27.5	25.4	26.5	7.4
Finland	31.5	40.6	28.6	29.3	29.2	28.6	29.3	33.5	30.6	31.4	-0.1
Sweden	18.8	39.2	31.5	29.3	27.5	28.2	27.2	29.7	28.7	32.7	14.0
United Kingdom	24.4	34.0	33.4	33.6	32.6	31.4	31.5	31.0	29.4	31.6	7.2