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EMPIRICAL RELATIONSHIP BETWEEN CORPORATE INCOME TAX, GOVERNMENT REVENUE, AND EMPLOYMENT IN OECD COUNTRIES

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Abstract. This paper applies the technique of correlation analysis to find out the impact of corporate tax on government revenue and employment in OECD countries. The findings of the study suggest that there is no relationship between corporate income tax, government revenue, and employment during 2000 and 2019.

Keywords: corporate tax, taxation, government revenue, employment, OECD countries.

1. Introduction

Corporate taxation is an important source of revenue for the government (Cobham & Jansky, 2018). Moreover, taxation is also an effective instrument for promoting equity and addressing social and economic concerns (OECD, n.d.). Studies have empirically verified that reduction in corporate income tax reduces capital constraints on firms that encourage the formation of corporations with the resultant increased employment levels ina country (Chen et al., 2018).

The paper focuses on the impact of corporate taxation government revenues and employment levels in countries that belong to the Organization of Economic Cooperation and Development (OECD) group. In OECD countries, a non-linear relationship exists between economic growth and corporate tax burden (Bodgan & Maria, 2017). Increasing the tax burden was found to have a detrimental effect on economic growth in OECD countries in the long run (Bodgan & Maria, 2017). The effect on the economy of increasing the tax burden in countries belonging to the OECD group was negative when the surplus tax revenues were spent on unproductive expenditures (Connolly & Li, 2016).

The objective of the paper is to quantify and empirically verify the impact of corporate income tax on government revenues and employment levels between the period 2000 and 2019. The innovation of the paper is that it combines the systematic literature review with the empirical analysis regarding the topic. Moreover, the study is first of a kind in that it empirically verifies and determines the magnitude of the relationship between corporate income tax, government revenues, and employment in OECD countries using correlation analysis.

2. Literature Review

Taxation is one of the most important source of revenue for the government (Shakibaei & Ahmadinejad, 2016). Corporate income tax is taxation on the corporate sector as opposed to the non-corporate sector (Harberger, 1962). Bua et al. (1990) had examined 800 industrial firms during the period 1980-87 and found that a decrease in the corporate tax led have a positive long term impact in employment and company activities. But Bua et al. (1990) had also found that for some companies a decrease in corporate taxation can have a negative effect on employment. The results imply corporate tax cuts can have long and short term effects and that the effect of tax cuts will be positive in long term duration.

Gober and Burns (1997) had studied the relationship between economic indicators and tax structure in OECD countries. The findings of the study found inconsistent effect on government revenues. However, Korovly (2020) had found that tax regulation has an important influence on the social stability and economic development.

Another study by Strulik & Siegfried (1999) posits that corporate tax cuts leads to increased employment. Strulik and Siegfried (1999) used a mathematical model to suggest that tax cuts leads to higher marginal returns to investment and employment due to which the employment rate increases. Moreover, Strulik and Siegfried (1999) also suggest that an increase in employment is negatively correlated to the debt to equity ratio. A reduction in tax rates according to Strulik and Siegfried (1999) results in lower debt to equity ratio that spurs the corporation to invest more resulting in increased employment rate.

Feld and Kirchgasssner (2001) had used econometric models to investigate the impact of corporate tax on Swiss firms between 1985 and 1997. The findings of Feld and Kirchgasssner (2001) study show that increase in corporate income tax reduces the employment levels in the region. The authors had also cited works of Bartik (1985), Papke (1991) and Hines (1996) that showed a negative impact between corporate income taxes and employment levels. The study by Feld and Kirchgasssner (2011) concludes that companies prefer locations where the tax burdens is lower leading to increased employment in the region. Arnold (2008) had examined the corporate tax structures in 21 OECD countries and concluded that the corporate tax had a negative impact on the economic output of a country.

An IMF (2002) report that studied effect of corporate taxation in the Slovak Republic had concluded that corporate tax cuts, increased profitability, and corporate restructuring resulted in an increase in the fixed investment. The

report by IMF (2002) had also found that an decrease in tax, rising employment and wages, and redeeming the National Property Funds accelerated private consumption.

Persson and Tabellini (1994) had found that increase in corporate taxation leads to reduced growth. A study carried out by Priess and Spooner (2003) who concluded that corporate tax was negatively related to employment growth. An increase in corporate taxation leads to an increase in employment growth while a decrease in corporate taxation leads to a decrease in the corporate taxation. Similar conclusions were made by Harden et al. (2003) who found that high corporate taxation is inefficient as it does not reduce the loss in employment.

An opposite view is presented by Uhlig and Yannagawa (1996) who had suggested that higher corporate taxation leads to increased growth within the endogenous growth model. Uhlig and Yannagawa (1996) had used a novel model that related the taxation and economic output through the impact of the tax burden on the supply of public goods and services. According to Uhlig and Yannagawa (1996), there is a non-linear influence of corporate taxation on economic growth. The findings by Uhlig and Yannagawa (1996) also suggest and increase in compensation of employees in OECD countries with higher corporate taxes and a positive impact on growth. A study by Nam and Radulescu (2004) suggest that the reduction in corporate taxation will not lead to increased investment when the inflation rate is high. Inflation levels may be the reason that Uhlig and Yannagawa (1996) found that increase in taxation leads to increased growth. The study by Uhlig and Yannagawa (1996) did not account for control factors such as inflation that could affect the economic activity.

Corporate taxation has also been found to result in a decrease in the wage rate. A study by Hassett and Mathur (2015) found an inverse relationship between corporate taxation and wage rates. The findings of Hassett and Mathur (2015) show that 1 percent increase in the corporate taxation rate leads to a 0.5 percent decrease in the wage rate. Hassett and Mathur (2015) had come to the conclusion after analysing a panel of 66 countries for a period of 25 years. Similar conclusion was drawn by a study carried out by Peichel et al. (2013) regarding German business tax whereby a one euro increase in the annual tax rate leads to a 50 cent decrease in the wage bill. According to Peichel et al. (2013), the burden of increase corporate tax is borne by high and medium skilled labor. The study by Piechel et al. (2013) had also found that the impact on the general equilibrium wage level in Germany was negligible due to high labor mobility.

However, another study carried out by Riedel (2011) had concluded that an increase in corporate taxation rate results in an increase in the wage level domestic workers and a decrease in wages of domestic workers. According to Riedel (2011), the increase in wages of domestic workers happen due to the worker's union wage bargaining as per the Separate Accounting (SA) model that is used in the EU region to tax corporate income. Riedel (2011) contends that the opposite happens under the formula apportionment (FA) method used in the US and Canada whereby the wages of the domestic workers decrease but the foreign workers increase upon increase in corporate tax rates. Moreover, a study by Dwenger et al. (2011) had found that any increase in the wages due to negotiation after a substantial corporate tax reform is negated due to a reduction in employment level.

Another study by Dwenger et al. (2011) had found that a decrease in the taxation by 1 euro results in an increase the wage bill by 0.47 euro. Dwenger et al. (2011) had made the conclusion after examining the effect of corporate taxation on employment in Germany between 1998 and 2006.But a study by Bajrami (2017) that had examined the effect of corporate taxation in Belgian had found that corporate taxation burden does not seem to be passed to the employees.

Corporate taxation affects firms within a country differently. Bernal et al. (2017) had found that an increase in the corporate taxation had positively affected employment in small and micro firms. Bernal et al. (2017) had examined formal employment data in non-public firms in Columbia and found that the effect of tax cuts on medium and large firms was negligible. Agarwal and Chakraborty (2019) had found that the effective corporate tax rate for small firms is generally higher than the tax rate for large corporations. The findings of the study by Agarwal and Chakraborty (2019) also found that the impact of the corporate taxation rate is more on the capital than on the labor.

Reduced taxation is found to lead to an increased investment (Ohrn, 2018). Lower taxation results in increased after-tax profit that enhances capacity of firms to invest in new technologies (Cai et al., 2018). Moreover, policy makers often use employment tax reduction as a public policy to stimulate economic recovery and growth (Zeli, 2020). A study of 19 member EU states founds that any changes in the fiscal and tax policy had an impact on the investments within a country (Mitroi, 2018). Studies have also found that countries with high wages generally charge a lower tax as compared to countries with lower wages (Mittermaier & Rincke, 2013). It has been shown that countries compensate firms for the wage differential with an increase in compensation cost differential triggering a reduction in the corporate tax rate (Mittermaier & Rincke, 2013). Moreover, studies have also shown that an increase in labor cost differential by one standard deviation leads to a decrease in the statutory corporate tax rate by 7.3 to 7.5 percentage points (Mittermaier & Rincke, 2013).

A landmark study by economists at the OECD had found that the corporate taxation decrease the economic growth in a country (Hodge, 2016). A study by Kapko (2018) also found that an increase in corporate tax also resulted in reduced job creation. Andre and Hwang (2018) had examined firms in Finland and found that competitive corporate taxation resulted in increased local production. Using a dynamic stochastic model Chen et al. (2014) found that employment rate reduce the non-employment in a country by about 5.4 percent. Chen et al. (2014) study suggest that the

employment is created due to reduced corporate taxation in the form of entry of new firms and existing firms changing the form of legal organization.

Sen and Cevik (2021) studied the effect of corporate tax rate in Turkey between the period 1980 and 2019. It was found that corporate income tax was negatively related to government corporate taxation revenues. Moreover, Sen and Kevik (2021) had also found that the revenue maximization rate is about 23.5 percent, which is near the statutory corporate taxation rate in Turkey of 22 percent. It was also concluded by Sen and Kevik (2021) that increasing taxation revenue through a hike in the corporate tax rate is not the right tax policy. According to Sen and Kevik (2021), a more effective strategy is to cut the corporate tax rate as it will have a positive effect on employment and economic growth.

Corporate taxation also has an effect on the capital mobility apart from trade within a country. Swank and Steinmo (2002) had carried out an empirical study examining 14 developed economies between the period 1981 and 1995. It was concluded by Swant and Steinmo (2002) that reduction in statutory corporate tax rates positively affects the trade and capital mobility in a country.

Studies show that the tax rates have been declining around the world (Kelly & Graziani, 2004). Lowering the tax rates encourages investment that in turn leads to increased capital stock and productivity of employees (Kouparitas et al., 2016). Misuse of the taxation law does occur as companies carry on aggressive tax planning to reduce the tax burden through investment fund merger repetitions (Lukes & Skalova, 2021). Some studies have also found that firms respond to tax cuts by increasing their physical capital and borrowings while remaining the employment levels unchanged (Li et al., 2021). In fact, studies have found that decreasing the corporate tax results in a decrease in the firm level labour share (Lie et al., 2021).

The literature review suggests that corporate taxation affects employment and growth. Our study aims to contribute to the literature review by using a Pearson correlation analysis to determine the impact of corporate taxation on employment and economic output in OECD countries. We intend to empirically confirm the existence of linear or non-linear relationship between corporate taxation, employment and government revenues in 36 OECD countries.

The remaining portion of the paper is structured as follows. Section 3 describes the hypothesis that will be tested in the study. Section 4 explains the data methodology used for analysing the data. Section 5 describes the results of the analysis and Chapter 6 concludes the study with a recommendation for future research.

3. Hypothesis

Previous studies offer mixed results about the impact of corporate taxations on employment levels in different countries. Some studies suggest that firms that pay less tax tend to create fewer employment opportunities (Leigh, 2018; Fuest et al., 2018). In contrast, another study posits that reducing corporate tax reduces the tax constraints that encourage the formation of C corporations resulting in increased employment (Chen et al., 2018). Moreover, a seminal paper by Harbenger (1962) cited by Chen et al. (2018) found no relationship between corporate tax and labour supply in a country. We are interested to find out whether there is a relationship between government taxation and unemployment rate in OECD countries, which leads to our first hypothesis.

H1: A relationship exists between corporate income taxation and unemployment rates in OECD countries.

According to the corporate-income tax rate-revenue paradox, corporate taxation causes tax revenues to increase but the GDP to fall (Dixon & Nassios, 2006; Ohno, et al., 2015). We want to know if there actually exists any relationship between taxation and government revenues in a country.

H2: relationship exists between corporate income taxation and government revenues in OECD countries.

4. Data Methodology

Data Analysis Method

The Pearson correlation method has been used to find out the relationship between corporate income tax, government revenue and unemployment. The method has been selected to find out whether the variables selected for the study are related to each other. Our aim is to find out whether a change in one variable leads to a corresponding increase or decrease in another variable.

Data Sample

The data for the study were sourced from the OECD website. The OECD website provides current and historical economic data of all OECD countries, including taxation, government revenues in terms of gross domestic product (GDP), employment, public investment, government consumption, and many other metrics. The historical data regarding taxation, government revenues in terms of gross domestic product (GDP) has been reviewed for the study.

The sample consists of 34 OECD countries with data selected for the years 2000-2019. Table 1in Annexure shows the corporate income tax rates of selected OECD countries.

Table 2a in Annexure displays the GDP stats of 34 OECD countries between the period 2000 and 2019, while table 2b shows the average annual GDP rate of OECD countries. Table 3a in the Annexure shows unemployment rate of 34 OECD countries, while table 3b shows the average annual unemployment rate of OECD countries.

5. Results

The results of the correlation analysis are shown in Table 4 and 5 of the Annexure. From the data analysis, it is found that there is no correlation between government taxation, revenues, and employment in OECD countries. The data analysis shows that government taxation, revenues and employment in OECD countries is not related.

A change in the taxation was found to have no significant effect on the government revenues or employment in OECD countries during the 20 year period between 2000 and 2019.

6. Conclusion & Recommendation

The data analysis shows that corporate taxation, government revenues, and employment in OECD countries are not related. No significant relationship was found between the study variables during the period 2000 and 2019. The results show that there might be other variables that explain the changes in taxation, government revenues and employment in OECD countries.

The results of the literature review showed that a decrease in taxation leads to improved investments. But most studies did not take account of aggregate taxes during a particular period. The findings of the study meet the aggregate tax elasticity model suggested by Deverux (2007a) and Brill and Hassett (2007) that a Laffer curve is attained when the corporate income tax hovers around 30 percent. Table 1 b shows that the average aggregate tax for the OECD countries during the period 2000 and 2019 is about 26.5 percent, which near the 30 percent. At the Laffer curve, the government income tax revenues would not be responsive to a change in the tax rate. The conclusion is not made by most studies reviewed since they have not assessed aggregate taxation rates.

The firm's investment choices during a particular period may be influenced by many factors. Further research is recommended to discover the latent, mediating, and moderating variables that affect the relationship between corporation taxation, government revenues and employment in OECD countries. The ex-ante tax reforms should be considered when assessing the impact of taxation on government revenues and employment levels within a country.

Hardenberg's uncertainty principle seems to apply in measuring the effect of the taxation. Corporate taxation is a complex topic and simplified empirical formulation cannot help in accurately recording the accurate position. Firms may have been given tax incentives or there might be tax agreements regarding tax payments in a particular location. There might also be taxation on profits of multinational firms that needs to be considered. Accounting for all the different factors is a complex endeavour that is beyond the scope and budget of this study.

Policy makers need to consider the fact that a significantly lower than average rate beyond the Laffer curve can result in increased investment. But the other relevant factors should be considered. For instance, the government must create a policy that encourage firm to invest in capital projects that will generate more revenues and investment rather than securities and bonds. A country can also benefit by cooperating with other countries regarding taxation of multi-national firms.

The effect of the change in tax structure depends on the reaction of the firms. The study findings show that the aggregate taxation rate in OECD countries does not affect government revenues and employment. From the findings of the study, it can be concluded that various exogenous factors affect the relationship between corporate taxation, government revenues and employment levels within a country. All these factors need to be studied to create an effective fiscal policy to stimulate the economy.

Various measures can help ensure optimal corporate taxation policy. One effective measure to ensure optimal corporate tax rate is to create a plan that takes into account the potential effects of changes in the corporate taxation policy. The plan should be created with input from different departments in the public and private firms. Feedback should be taken from managers, business owners, and C-level executives regarding effects of a change in the taxation rate. The interdepartmental effort can help in creating an effective taxation policy that is based on specific benefits and risks identified by the professionals of different corporations. The objective of the taxation policy should be carefully monitored and changes should be made as necessary.

Implementing changes in the corporate policy is one of the challenging parts of corporate taxation policy. There might be negative impact of a possible increase in the corporate taxation that can have an adverse effect on the government revenues. Firms could take steps such as hiding revenue stream through creative accounting tactics to reduce the taxation. The actions of the corporations should be closely monitored to ensure that firms present an accurate picture about the financial position.

Creating a plan for effective corporate taxation for the initiative is just the first step of ensuring maximum benefits on the government revenues, corporate investment, and employment levels. A taxation plan should structure the funding sources for meeting the goals of the corporate taxation. The plan should drive the decision making and direction of the government's initiative in meeting the plan. This plan should identify short, medium, and long-run goals for changes in the corporate taxation. A plan should also include benchmarks to evaluate the effectiveness of the corporate policy changes. It should identify the factors that can have an effect on the implementation of any policy changes regarding corporate taxation. Any ramifications that may arise due to changes in the corporate policy should also be documented in the plan. Some of the potential challenges in the implementing plan include negative reaction from the corporate sector particularly multinational companies. These challenges can be overcome through a collaborative goal setting, proper communication, and continuous monitoring of the efforts to implement the plan. The taxation planning is important to ensure the best outcome from a change in the rates for boosting government revenues.

It is important to overcome the challenges and objections to the implementation of the effective corporate taxation policy that have a positive impact on the government taxation revenues.

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Annexure

Table 1

Corporate Income Tax Rates of 34 OECD Countries, while table 2b shows the average annual income tax rate of OECD countries.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Australia	34.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %
Austria	34.0 %	34.0 %	34.0 %	34.0 %	34.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %
Belgium	40.2 %	40.2 %	40.2 %	34.0 %	34.0 %	34.0 %	36.0 %	34.0 %	34.0 %	34.0 %	34.0 %	34.0 %	34.0 %
Canada	42.4 %	40.5 %	38.0 %	35.9 %	34.4 %	34.2 %	33.9 %	34.0 %	31.4 %	30.9 %	29.4 %	27.7 %	26.1 %
Chile	15.0 %	15.0 %	16.0 %	16.5 %	17.0 %	17.0 %	17.0 %	17.0 %	17.0 %	17.0 %	17.0 %	20.0 %	20.0 %
Czech Republic	31.0 %	31.0 %	31.0 %	31.0 %	28.0 %	26.0 %	24.0 %	24.0 %	21.0 %	20.0 %	19.0 %	19.0 %	19.0 %
Denmark	32.0 %	30.0 %	30.0 %	30.0 %	30.0 %	28.0 %	28.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %
Estonia	26.0 %	26.0 %	26.0 %	26.0 %	26.0 %	24.0 %	23.0 %	22.0 %	21.0 %	21.0 %	21.0 %	21.0 %	21.0 %
Finland	29.0 %	29.0 %	29.0 %	29.0 %	29.0 %	26.0 %	26.0 %	26.0 %	26.0 %	26.0 %	26.0 %	26.0 %	24.5 %
France	37.8 %	36.4 %	35.4 %	35.4 %	35.4 %	35.0 %	34.4 %	34.4 %	34.4 %	34.4 %	34.4 %	36.1 %	36.1 %
Germany	51.6 %	38.3 %	38.3 %	39.6 %	38.3 %	38.4 %	38.4 %	38.4 %	29.4 %	29.4 %	29.5 %	29.6 %	29.6 %
Greece	40.0 %	37.5 %	35.0 %	35.0 %	35.0 %	32.0 %	29.0 %	25.0 %	25.0 %	25.0 %	24.0 %	20.0 %	20.0 %
Hungary	18.0 %	18.0 %	18.0 %	18.0 %	16.0 %	16.0 %	17.3 %	20.0 %	20.0 %	20.0 %	19.0 %	19.0 %	19.0 %
Iceland	30.0 %	30.0 %	18.0 %	18.0 %	18.0 %	18.0 %	18.0 %	18.0 %	15.0 %	15.0 %	18.0 %	20.0 %	20.0 %
Ireland	24.0 %	20.0 %	16.0 %	12.5 %	12.5 %	12.5 %	12.5 %	12.5 %	12.5 %	12.5 %	12.5 %	12.5 %	12.5 %
Israel	36.0 %	36.0 %	36.0 %	36.0 %	35.0 %	34.0 %	31.0 %	29.0 %	27.0 %	26.0 %	25.0 %	24.0 %	25.0 %
Italy	41.3 %	40.3 %	40.3 %	38.3 %	37.3 %	37.3 %	37.3 %	37.3 %	31.4 %	31.4 %	31.4 %	31.4 %	31.3 %
Japan	40.9 %	40.9 %	40.9 %	40.9 %	39.5 %	39.5 %	39.5 %	39.5 %	39.5 %	39.5 %	39.5 %	39.5 %	39.5 %
South Korea	30.8 %	30.8 %	29.7 %	29.7 %	29.7 %	27.5 %	27.5 %	27.5 %	27.5 %	24.2 %	24.2 %	24.2 %	24.2 %
Latvia	25.0 %	25.0 %	22.0 %	19.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %	15.0 %
Lithuania	24.0 %	24.0 %	15.0 %	15.0 %	15.0 %	15.0 %	19.0 %	18.0 %	15.0 %	20.0 %	15.0 %	15.0 %	15.0 %
Luxembourg	37.5 %	37.5 %	30.4 %	30.4 %	30.4 %	30.4 %	29.6 %	29.6 %	29.6 %	28.6 %	28.6 %	28.8 %	28.8 %
Mexico	35.0 %	35.0 %	35.0 %	34.0 %	33.0 %	30.0 %	29.0 %	28.0 %	28.0 %	28.0 %	30.0 %	30.0 %	30.0 %
Netherlands	35.0 %	35.0 %	34.5 %	34.5 %	34.5 %	31.5 %	29.6 %	25.5 %	25.5 %	25.5 %	25.5 %	25.0 %	25.0 %
New Zealand	33.0 %	33.0 %	33.0 %	33.0 %	33.0 %	33.0 %	33.0 %	33.0 %	30.0 %	30.0 %	30.0 %	28.0 %	28.0 %

Norway	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %
Poland	30.0 %	28.0 %	28.0 %	27.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %
Portugal	35.2 %	35.2 %	33.0 %	33.0 %	27.5 %	27.5 %	27.5 %	26.5 %	26.5 %	26.5 %	26.5 %	28.5 %	31.5 %
Slovak Republic	29.0 %	29.0 %	25.0 %	25.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %	19.0 %
Slovenia	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	23.0 %	22.0 %	21.0 %	20.0 %	20.0 %	18.0 %
Spain	35.0 %	35.0 %	35.0 %	35.0 %	35.0 %	35.0 %	35.0 %	32.5 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %
Sweden	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	28.0 %	26.3 %	26.3 %	26.3 %	26.3 %
United Kingdom	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	28.0 %	28.0 %	28.0 %	26.0 %	24.0 %
United States	39.3 %	39.3 %	39.3 %	39.3 %	39.3 %	39.3 %	39.3 %	39.3 %	39.3 %	39.2 %	39.2 %	39.2 %	39.1 %

	2013	2014	2015	2016	2017	2018	2019
Australia	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Austria	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Belgium	34.0%	34.0%	34.0%	34.0%	34.0%	29.6%	29.6%
Canada	26.2%	26.2%	26.7%	26.7%	26.7%	26.8%	26.6%
Chile	20.0%	21.0%	22.5%	24.0%	25.0%	25.0%	25.0%

Czech Republic	19.0%	19.0%	19.0%	19.0%	19.0%	19.0%	19.0%
Denmark	25.0%	24.5%	23.5%	22.0%	22.0%	22.0%	22.0%
Estonia	21.0%	21.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Finland	24.5%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
France	38.0%	38.0%	38.0%	34.4%	44.4%	34.4%	34.4%
Germany	29.6%	29.7%	29.8%	29.8%	29.9%	29.9%	29.9%
Greece	26.0%	26.0%	29.0%	29.0%	29.0%	29.0%	24.0%
Hungary	19.0%	19.0%	19.0%	19.0%	9.0%	9.0%	9.0%
Iceland	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Ireland	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%
Israel	25.0%	26.5%	26.5%	25.0%	24.0%	23.0%	23.0%
Italy	31.3%	31.3%	31.3%	31.3%	27.8%	27.8%	27.8%
Japan	37.0%	37.0%	32.1%	30.0%	30.0%	29.7%	29.7%
South Korea	24.2%	24.2%	24.2%	24.2%	24.2%	27.5%	27.5%
Latvia	15.0%	15.0%	15.0%	15.0%	15.0%	20.0%	20.0%

Lithuania	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
Luxembourg	29.2%	29.2%	29.2%	29.2%	27.1%	26.0%	24.9%
Mexico	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Netherlands	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
New Zealand	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Norway	28.0%	27.0%	27.0%	25.0%	24.0%	23.0%	22.0%
Poland	19.0%	19.0%	19.0%	19.0%	19.0%	19.0%	19.0%
Portugal	31.5%	31.5%	29.5%	29.5%	29.5%	31.5%	31.5%

Slovak Republic	23.0%	22.0%	22.0%	22.0%	21.0%	21.0%	21.0%
Slovenia	17.0%	17.0%	17.0%	17.0%	19.0%	19.0%	19.0%
Spain	30.0%	30.0%	28.0%	25.0%	25.0%	25.0%	25.0%
Sweden	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	21.4%
United Kingdom	23.0%	21.0%	20.0%	20.0%	19.0%	19.0%	19.0%
United States	39.0%	39.1%	39.0%	38.9%	38.9%	25.8%	25.9%

Source: OECD, Tax Database: https://stats.oecd.org/

Table 1 b

Historical average Tax rate of 34 OECD Countries

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Income Tax (%)	32.2 %	31.3 %	30.0 %	29.4 %	28.6 %	27.5 %	27.1 %	26.5 %	25.5 %	25.3 %	25.1 %	25.1 %	25.0 %

Year	2013	2014	2015	2016	2017	2018	2019
Income Tax (%)	25.1%	24.9%	24.7%	24.4%	24.2%	23.7%	23.5%

Source: OECD, Tax Database: https://stats.oecd.org/

Table 2 a

Historical GDP of 34 OECD Countries

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Australia	28252.63	29493.21	30740.96	32248.26	33865.91	35570.81	37842.93	39596.04	40094.83	41614.09	42787.07	44419.31	43879.18
Austria	29388.78	29715.64	31178.05	32123.7	33756.26	35024.56	37614.94	39384.19	41316.02	40957.26	42053.24	44469.21	46477.66
Belgium	27797.33	28799.33	30281.67	30901.38	32036.94	33176.68	35211.89	36745.5	37883.23	37779.03	39868.99	40943.34	42290.48
Canada	29363.15	30214.3	30963.22	32333.61	33911.22	36327.66	38107.14	39555.52	40376.33	38893.73	40114.22	41666.72	42290.88
Chile	9519.174	9937.065	10292.92	10793.77	11757.51	12667.85	15685.22	16872.27	16447.33	16119.89	18129.09	20302.79	21446.54

Czech Republic	16214.97	17615.6	18245.67	19503.29	20894.61	22046	23827.15	26189.8	27853.55	27656.02	27789.61	28999.75	29258.9
Denmark	28679.27	29459.85	30639.95	30791.9	32920.68	34152.88	37286.32	38969.12	41283	40361.79	43041.19	44407.94	44808.55

Estonia	9408.747	10292.33	11635.37	13081.09	14482.63	16574.46	19251.86	22128.13	22807.73	20590.6	21785.16	24738.85	26141.08
Finland	26796.41	27807.75	28605.12	29021.64	31175.73	32051.76	34408.82	37792.56	40083.7	38000.02	38985.87	40916.65	40872.85
France	26106.05	27506.16	28528.16	28148.12	29040.97	30504.06	32431.44	34086.96	35102.87	34711.66	35939.46	37447.95	37684.2
Germany	27462.91	28670.79	29504.29	30238.27	31715.39	32236.74	34620.41	36813.71	38432.45	37492.65	39707.33	42541.51	43359.54
Greece	19524.7	20963.82	22615.96	23871.92	25439.32	25577.45	28510.88	29284.61	30855.94	30381.48	27934.32	25671.29	24912.13
Hungary	11858.33	13213.64	14526.39	15465.37	16230.26	17073.55	18337.21	19041.09	20696.73	20689.05	21716.65	22999.83	23206.26
Iceland	29792.56	31875.05	32598.38	32690.5	35522.71	37427.93	39579.74	41435.18	43456.22	41803	39810.8	40938.66	42006.54
Ireland	30199.65	32580.73	35212.04	36230.74	38711.71	40447.51	44211.66	46717.77	44184.55	41532.21	43320.05	44903	46274.52
Israel	24939.69	24906.78	25204.73	23800.65	25152.87	24743.43	25580.83	27352.81	27304.81	27504.02	28836.16	30497.57	31706.19
Italy	27084.2	28043.05	28716.2	29116.35	29448.8	30016.16	32252.42	33897.28	35274.31	34347.7	34860.58	36183.32	36002.91
Japan	26841.23	27476.22	28170.05	28943.72	30354.46	31667.91	33094.34	34507.17	34803.66	33201.99	34994.37	35775.26	37213.84
South Korea	18539.42	19713.6	21396.72	22084.78	23763.31	25186.64	26875.23	29050.16	29945.9	29529.79	31748.35	32546.52	33557.03
Latvia	8033.097	9034.533	10067.8	11027.78	12240.34	13877.98	15797.29	18179.67	19516.02	16973.37	17658.75	19887.75	21414.57
Lithuania	8449.658	9440.144	10480.72	12055.24	13019.58	14510.65	16461.79	19071.45	20721.03	18130.05	20112.1	22884.8	24703.7
Luxembourg	55279.77	55853	58709.02	59960.03	63998.59	68140.65	77880.53	83837.45	86591.99	82250	85587.01	91814.04	91526.72
Mexico	10870.41	10931.09	10999.98	11302.74	11921.84	12539.96	13720.69	14233.03	14885.9	14532.39	15257.67	16546.64	17220.07
Netherlands	31883.7	33194.9	34447.05	34115.07	35779.62	37625.25	40959.19	43885.02	46419.04	44590.78	45079.37	46599.23	47271.97
New Zealand	21471.62	22387.15	23180.06	23856.57	24995.65	25590.13	27682.12	29304.03	29784.43	30587.84	31174.16	32680.39	32924.63
Norway	36952.28	37778.56	37981.69	38552.71	42513.85	47800.54	54084.29	55864.47	61719.34	55401.83	57966.87	62077.85	65349.22
Poland	10677.5	11123.67	11803.76	12278.87	13343.39	13898.41	15135.75	16784.45	18308.04	19088.29	20828.99	22553.51	23455.56
Portugal	18884.87	19533.39	20356.72	20829.64	21459.95	22725.35	24649.68	25701.79	26665.77	26478.49	27282.77	26769.43	26438.14
Slovak Republic	11356.25	12389.81	13307.88	14150.81	15185.21	16595.26	18826.14	21110.42	23608.98	22963.91	25030.42	26084.11	26973.79
Slovenia	18004.8	18957.42	20236.43	21084.86	22739.14	23848.6	25673.49	27526.54	29594.67	27531.13	27844.9	28931.42	29048.33
Spain	21600.82	23006.61	24376.33	25015.22	26160.19	27600.94	30704.58	32423.53	33242.25	32112.82	31716.71	31872.36	31724.63
Sweden	29631.19	29940.41	30926.36	31782.18	33830.67	34244.36	37679.72	40855.47	42158.47	40309.18	42256.28	44608.64	45432.31

United Kingdom	26423.95	27733.45	28999.26	30238.34	31922.8	32586.15	34668.8	35507.37	36634.61	35052.17	36468.17	37154.16	38296.7
United States	36304.6	37099.91	37979.61	39426.09	41647.84	44043.73	46230.85	47902.06	48311.22	47028.16	48396.74	49814.37	51548.02

	2013	2014	2015	2016	2017	2018	2019
Australia	47761.21	47644.76	47317.25	50237.79	50853.62	53061.63	53067.88
Austria	47936.68	48813.53	49942.06	52665.09	54185.34	57068.53	58664.72
Belgium	43672.71	44929.93	46201.69	48599.2	50436.26	52668.41	54693.24
Canada	44298.51	45753.78	44670.05	46472.37	48319.72	50250.04	50666.14
Chile	22352.53	22687.93	22603.77	23349.68	24402.91	24743.08	26128.4
Czech Republic	30828.53	32504.22	33909.31	36101.29	38842.9	41147.63	43015.81
Denmark	46742.94	47905.48	49058.14	51967.02	55356.49	57459.17	60308.07
Estonia	27596.46	29107.89	29436.42	31574.45	33902.1	36406.05	38880.85
Finland	41492.92	41749.86	42490.21	44934.49	47570.27	49726.71	51620.97
France	39528.47	40144.06	40829.89	42855.94	44480.72	46456.11	49225.56
Germany	44993.67	47011.28	47609.56	50579.48	52952.9	54954.69	55891.16
Greece	25947.87	26642.23	26720.91	27471.22	28644.98	29680.9	30869.25
Hungary	24498.66	25642.56	26777.47	27911.66	29465.13	31829.55	33949.74
Iceland	44404.73	45995	49203.29	53486.62	55648.25	58139.72	59567.24
Ireland	47924.39	51212.5	69133.71	71793.29	78739.39	85027	89561.46

Israel	34167.04	34282.24	35487.89	37806.43	38849.91	40351.27	41964.74
Italy	36067.71	36194.92	36899.4	39926.97	41581.13	43085.03	44367.94
Japan	39008.36	39183.47	40398.4	39983.64	40992.39	41724.03	42385.77
South Korea	34244.24	35324.26	37902.36	39575.3	40957.35	42486.74	42728.03
Latvia	22811.03	23798.23	24964.05	26712.84	28666	30814.22	32057.95
Lithuania	26721.6	28184.5	28834.46	30925.15	33761.91	36346.42	38756.14
Luxembourg	95246.11	100933.6	103760.1	110260.9	112187.7	116480.8	120670.5
Mexico	17461.8	18178.4	18454.8	19516.15	19947.2	20519.42	20741.1
Netherlands	49242.79	49233.23	50288.35	52289.4	55089.58	57899.82	59468.67
New Zealand	36100.25	37133.67	37338.64	39896.68	42208.48	43376.97	44152.06
Norway	66956.29	65895.67	60352.72	58923.24	64050.37	69709.38	68343.74
Poland	24272.84	25162.88	26534.72	27985.34	29714.59	31613.69	33774.13
Portugal	27936.01	28742.31	29660.85	31607.61	33044.7	34931.86	36760.02

Slovak Republic	28004.53	28997.38	29927.68	29659.33	30097.99	31561.92	32550.32
Slovenia	29979.62	30872.73	31631.84	33942.77	36515.7	38952.06	41181.43
Spain	32452.66	33544.35	34929.21	37313.63	39580.19	40780.29	42211.81
Sweden	46312.29	47184.72	49103.06	50430.17	51947.94	53553.31	55068.77
United Kingdom	39945.1	41292.49	42571.65	44125.53	45757.78	47163.17	48542.09
United States	53056.68	55008.01	56831.65	58000.89	60091.57	63043.05	65240.38

Source: OECD, GDP Database: https://stats.oecd.org/

Table 2 b

Historical average GDP rate of OECD Countries

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP Growth (%)	3.99 %	1.41 %	1.55 %	2.05 %	3.22 %	2.84 %	3.10 %	2.73 %	0.27 %	-3.44 %	2.94 %	1.85 %	1.28 %
Annual Change	0.81 %	-2.58 %	0.14 %	0.51 %	1.17 %	-0.38 %	0.26 %	-0.37 %	-2.46 %	-3.71 %	6.38 %	-1.09 %	-0.57 %

Year	2013	2014	2015	2016	2017	2018	2019
GDP Growth (%)	1.51%	2.07%	2.42%	1.75%	2.57%	2.21%	1.63%
Annual Change	0.23%	0.56%	0.35%	-0.67%	0.82%	-0.36%	-0.58%

Source: Macrotrends, GDP Rate Database: https://www.macrotrends.net/countries/OED/oecd-members/gdp-growth-rate

Table 3a

Unemployment rate of 34 OECD countries

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Australia	6.285546	6.742173	6.368911	5.92842	5.396734	5.033881	4.78524	4.379151	4.23433	5.560385	5.21334	5.081195	5.223376
Austria	3.933333	3.983333	4.383333	4.758333	5.508333	5.633333	5.25	4.866667	4.141667	5.325	4.841667	4.575	4.883333
Belgium	6.875	6.591667	7.525	8.175	8.391666	8.433333	8.25	7.483333	6.975	7.891667	8.316667	7.166667	7.566667
Canada	6.816667	7.216667	7.675	7.575	7.191667	6.758333	6.35	6.066667	6.175	8.375	8.116667	7.558333	7.333333
Chile	9.6675	9.8525	9.805	9.54	10.0075	9.235	7.8	7.13	7.7925	9.675	8.15	7.125	6.545561
Czech Republic	8.775	8.125	7.291667	7.775	8.291667	7.941667	7.133333	5.325	4.408333	6.683333	7.291667	6.716667	6.975
Denmark	4.325	4.525	4.583333	5.408333	5.5	4.841667	3.908333	3.75	3.708333	6.408333	7.766667	7.758333	7.8
Estonia	14.45833	13.04167	11.33333	10.35	10.08333	7.975	5.941667	4.6	5.516667	13.575	16.74167	12.425	9.991667
Finland	9.783334	9.125	9.075	9.008333	8.825	8.4	7.716667	6.866667	6.366667	8.241667	8.383333	7.775	7.683333
France	9.558333	8.741667	8.633333	8.5	8.85	8.866667	8.841666	7.991667	7.425	9.108334	9.266666	9.183333	9.766666
Germany	8.008333	7.858333	8.683333	9.808333	10.5	11.28333	10.275	8.541667	7.425	7.641667	6.966667	5.833333	5.383333
Greece	11.23333	10.675	10.33333	9.741667	10.60833	10.00833	9.033334	8.416667	7.766667	9.625	12.75	17.91667	24.49167
Hungary	6.266667	5.575	5.583333	5.741667	6.066667	7.175	7.458333	7.391667	7.8	9.675	10.8	10.66667	10.675
Iceland	3.516667	3.408333	2.883333	3.208333	2.475	3.333333	8.016666	8.3	7.675	6.633333	5.841667	5.408333	4.508333
Ireland	4.5	4.175	4.725	4.85	4.741667	4.633333	4.783333	5	6.783333	12.65	14.55833	15.40833	15.49167

Israel	8.770606	9.348134	10.29844	10.71266	10.36771	8.989903	8.403837	7.318558	6.099141	7.544086	6.636595	5.602376	6.85
Italy	10.05	9.008333	8.475	8.433333	8	7.708333	6.791667	6.075	6.708333	7.75	8.35	8.35	10.64167
Japan	4.716667	5.033333	5.375	5.258333	4.716667	4.425	4.141667	3.841667	3.991667	5.066667	5.05	4.583333	4.35
South Korea	4.425	4	3.258333	3.55	3.658333	3.75	3.475	3.258333	3.175	3.633333	3.708333	3.408333	3.225
Latvia	14.34167	13.48333	12.49167	11.64167	11.75	10.05	7.041667	6.058333	7.741667	17.56667	19.475	16.21667	15.04167
Lithuania	16.44167	17.41667	13.775	12.43333	10.89167	8.316667	5.791667	4.258333	5.825	13.8	17.84167	15.39167	13.40833
Luxembourg	2.233333	1.9	2.558333	3.808333	4.95	4.65	4.575	4.166667	4.916667	5.116667	4.583333	4.833333	5.066667
Mexico	2.505833	2.756667	2.978333	3.405833	3.915833	3.595785	3.596744	3.721604	3.974655	5.479068	5.380876	5.233573	4.952769
Netherlands	3.666667	3.075	3.666667	4.841667	5.675	5.883333	5.008333	4.175	3.666667	4.35	5.008333	4.991667	5.825
New Zealand	6.15	5.45	5.3	4.775	4.025	3.825	3.85	3.575	4.025	5.875	6.225	6.025	6.475
Norway	3.241667	3.408333	3.666667	4.208333	4.275	4.525	3.425	2.558333	2.733333	3.283333	3.733333	3.408333	3.3
Poland	16.075	18.30833	20.03333	19.75	19.14167	17.925	13.96667	9.608334	7.041667	8.116667	9.675	9.65	10.10833
Portugal	5.075	5.133333	6.141667	7.4	7.766667	8.766666	8.866667	9.133333	8.783334	10.68333	11.98333	12.88333	15.78333
Slovak Republic	18.90833	19.45833	18.80833	17.69167	18.35833	16.375	13.46667	11.23333	9.575	12.11667	14.5	13.68333	13.95833
Slovenia	6.741667	6.191667	6.341667	6.7	6.341667	6.541667	5.991667	4.858333	4.391667	5.891667	7.275	8.208333	8.891666
Spain	11.91667	10.55833	11.44167	11.49167	10.95833	9.166667	8.458333	8.225	11.26667	17.86667	19.875	21.40833	24.79167
Sweden	5.6	5.825	5.95	6.566667	7.375	7.641667	7.041667	6.116667	6.166667	8.3	8.575	7.766667	7.966667
United Kingdom	5.458603	5.09697	5.184958	5.007329	4.747302	4.823375	5.417598	5.32914	5.68196	7.611054	7.867382	8.106182	7.965578
United States	3.991667	4.733333	5.775	5.991667	5.533333	5.066667	4.616667	4.616667	5.775	9.266666	9.616667	8.95	8.066667

	2013	2014	2015	2016	2017	2018	2019
Australia	5.66194	6.077244	6.056423	5.710301	5.59376	5.299855	5.159245
Austria	5.358333	5.641667	5.733333	6.033333	5.516667	4.858333	4.508333
Belgium	8.45	8.533334	8.5	7.858333	7.1	5.958333	5.366667
Canada	7.125	6.941667	6.941667	7.05	6.4	5.891667	5.733333
Chile	6.08222	6.495096	6.328377	6.684913	6.965175	7.376639	7.22264
Czech Republic	6.966667	6.116667	5.058333	3.966667	2.908333	2.266667	2.016667
Denmark	7.391667	6.883333	6.3	6.008333	5.816667	5.116667	5.058333

Estonia	8.566667	7.383333	6.208333	6.766667	5.816667	5.375	4.4
Finland	8.191667	8.658334	9.375	8.791667	8.633333	7.358333	6.691667
France	10.31667	10.3	10.35833	10.04167	9.425	9.025	8.45
Germany	5.241667	4.991667	4.633333	4.133333	3.758333	3.4	3.15
Greece	27.49167	26.55	24.95833	23.56667	21.53333	19.30833	17.33333
Hungary	9.85	7.5	6.633333	4.975	4.05	3.591667	3.3
Iceland	3.341667	3.283333	3.1	3.933333			
Ireland	13.78333	11.91667	9.958333	8.408334	6.741667	5.766667	4.966667
Israel	6.208333	5.908333	5.241667	4.808333	4.216667	4	3.8
Italy	12.13333	12.65	11.89167	11.675	11.225	10.61667	9.966666
Japan	4.025	3.591667	3.375	3.116667	2.808333	2.441667	2.35
South Korea	3.1	3.491667	3.591667	3.675	3.683333	3.833333	3.783333
Latvia	11.875	10.85	9.883333	9.633333	8.708333	7.4	6.308333
Lithuania	11.8	10.725	9.133333	7.9	7.116667	6.183333	6.283333
Luxembourg	5.875	6.05	6.458333	6.333333	5.616667	5.5	5.591667
Mexico	4.929466	4.828958	4.352943	3.881356	3.419046	3.328549	3.49458
Netherlands	7.241667	7.425	6.891667	6.025	4.858333	3.841667	3.4
New Zealand	5.85	5.425	5.4	5.125	4.725	4.325	4.1
Norway	3.758333	3.633333	4.5	4.758333	4.191667	3.875	3.7
Poland	10.34167	9.016666	7.525	6.191667	4.883333	3.858333	3.283333
Portugal	16.45833	14.125	12.65833	11.175	9.016666	7.05	6.55
Slovak Republic	14.225	13.20833	11.5	9.666667	8.125	6.541667	5.766667
Slovenia	10.15833	9.741667	9	8.008333	6.6	5.125	4.45
Spain	26.11667	24.45	22.075	19.65	17.23333	15.26667	14.10833
Sweden	8	7.933333	7.4	6.95	6.683333	6.325	6.766667
United Kingdom	7.603673	6.178483	5.383935	4.892704	4.401906	4.080814	3.833521
United States	7.375	6.166667	5.291667	4.866667	4.35	3.9	3.666667

Source: OECD, GDP Database: https://stats.oecd.org/

Table 3b

Average annual unemployment rate of OECD countries.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Unemployment Rate (%)	6.78 %	6.62 %	7.18 %	7.30 %	7.19 %	6.83 %	6.27 %	5.81 %	6.14 %	8.28 %	8.43 %	8.03 %	8.01 %
Annual Change	- 0.39 %	- 0.15 %	0.56 %	0.12 %	- 0.11 %	- 0.36 %	- 0.56 %	- 0.45 %	0.32 %	2.14 %	0.15 %	- 0.40 %	- 0.02 %

Year	2013	2014	2015	2016	2017	2018	2019						
Unemployment Rate (%)	7.93 %	7.41 %	6.83 %	6.42 %	5.89 %	5.44 %	5.36 %						
Annual Change	-0.08 %	-0.52 %	-0.58 %	-0.41 %	-0.53 %	-0.44 %	-0.09 %						

Source: Macrotrends, Unemployment Rate Database: https://www.macrotrends.net/countries/OED/oecd-members/unemployment-rate

Table 4

Correlation Analysis between Tax and GDP.

Correlations

		Tax	GDP
Tax	Pearson Correlation	1	.256
	Sig. (2-tailed)		.275
	N	20	20
GDP	Pearson Correlation	.256	1
	Sig. (2-tailed)	.275	
	N	20	20

Table 5

Correlation Analysis between Tax and Unemployment.

Correlations

		Tax	Unemployment
Tax	Pearson Correlation	1	.086
	Sig. (2-tailed)		.718
	N	20	20
Unemployment	Pearson Correlation	.086	1
	Sig. (2-tailed)	.718	
	N	20	20