

**THE LAFFER CURVE - AN EMPIRICAL ESTIMATION FOR
EUROZONE MEMBER COUNTRIES**

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Dissertation submitted as partial requirement for the conferral of

Master in Economics

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October 2014

Sumário

A grave crise económica e orçamental que tem vindo a assolar os países da Zona Euro levou alguns governos, maioritariamente devido a imposições externas (FMI, Comissão Europeia e BCE, a *troika*), a aumentar as taxas de imposto, com o objetivo de aumentar a receita fiscal para evitar a ocorrência de défices excessivos, que se têm verificado continuamente, e dessa forma combater a elevada dívida pública que caracteriza uma parte dos países da Zona Euro (principalmente os Países do Sul). Terá sido esta a decisão mais correta? Qual a relação entre a taxa de um dado imposto e a sua receita? Qual é a taxa de imposto que maximiza a receita desse imposto? A teoria económica encontra na Curva de Laffer a resposta a estas perguntas. Através de estimação econométrica com dados em painel, compreendidos entre 1995-2011 (impostos diretos) e 2000-2011 (imposto indireto), iremos estimar a Curva de Laffer para a Zona Euro, evidenciando possíveis diferenças entre países. Para tal escolhemos os três impostos que mais contribuem para as receitas do estado - o Imposto sobre o Valor Acrescentado (IVA); o Imposto sobre o Rendimento das Pessoas Coletivas (IRC) e, por último, o Imposto sobre o Rendimento das Pessoas Singulares (IRS). Através das nossas estimações concluímos que existe evidência da Curva de Laffer para a Zona Euro para o IVA e para o IRS, enquanto que para o IRC, chegamos à conclusão inversa. Para Portugal a taxa ótima para o IRC é de 30% e para o IRS é de 49%.

Palavras-chave: Curva de Laffer, Países da Zona Euro, Estimação com Dados em Painel, Estimação com Modelo SUR.

Códigos do JEL: C23, E62, H21.

Abstract

The current economic and sovereign crisis in the Eurozone led some European governments, due mainly to outside impositions (of the IMF, European Commission, and the ECB, the *troika*), to increase the tax rates, with the goal of boosting tax revenues, and in that way to decrease excessive deficits, and to fight high public debt, which most countries of the Eurozone, in particular Southern Countries, face. Were these decisions the most correct? What is the relationship between tax rates and tax revenues? What is the tax rate that maximizes the revenue? In the economic literature we find in the concept of the Laffer Curve the answer for the previous questions. Using panel-data, observed between 1995 and 2011 (for direct taxes) and 2000 and 2011 (for indirect taxes), we will estimate Laffer Curves for the Eurozone countries, either for the Eurozone as a whole and also for each individual Eurozone member country. We chose the three taxes that contribute the most to the state revenue, and they are the value added tax (VAT), as an indirect tax; the corporate income tax, and the household income tax. We can conclude for the existence of a Laffer Curve in the Eurozone for VAT and for the individual income tax, but in case of the corporate income tax, we come to the opposite conclusion. In the case of Portugal the optimal tax rate for the individual income tax is 49% and for the corporate income tax is 30%.

Keywords: Laffer Curve, Eurozone Countries, Panel-Data Estimations, SUR Model Estimations.

JEL Codes: C23, E62, H21.

Acknowledgements

I would like to thank my two supervisors Professors Alexandra Ferreira Lopes and Luís Martins, due to their helpful comments and support. Without them this research would not be possible. To Professor Alexandra for her precious comments about Macroeconomics and English, and to Professor Luís for his helpful comments about Econometrics.

Also, I would like to thank my family, my work colleagues, and in special to Maria Inês Balsa. She always supported me and their comments never let me give up.

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List of abbreviations:

ECB (BCE) – European Central Bank (Banco Central Europeu);

GDP – Gross Domestic Product;

GLS - Generalized Least Squares;

IMF (FMI) – International Monetary Found (Fundo Monetario Internacional);

OECD - Organisation for Economic Co-operation and Development;

OLS - Ordinary Least Squares;

SUR Model - Seemingly Unrelated Regressions Model;

VAT (IVA) – Value Added Tax (Imposto sobre o Valor Acrescentado).

1. Introduction

In the last 6 years, the European Union member countries have come across a major economic and financial crisis, comparable to the Great Depression. The crises severely affected the Eurozone, particularly the Southern countries, and from an economic and financial crisis, soon turned into a sovereign debt crisis.

Consequently, in these last years, European governments implemented austerity measures to combat rising public budget deficits and public debts. Since 2008 taxes have been increasing significantly in order to try to boost fiscal revenues and cut budget deficits.

Many people have raised serious doubts about the efficiency of these austerity measures to cut public budget deficits. Most of these doubts were raised based on a concept called the Laffer Curve. The Laffer Curve, which expresses a relation between the marginal tax rates and revenues, was first introduced by Wanniski (1978), when he defined it as: “there are always two tax rates that yield the same revenue”. Using this definition we can conclude that the relationship between tax rates and tax revenues is an inverted U-shaped Curve, in which there is a maximum level to the tax rate and a maximum level of revenues. He gave the name to this Curve on behalf of the economist Arthur Laffer, since he was the first to talk about this relationship/trade-off.

This dissertation estimates, using panel data econometric techniques, Laffer Curves for the Eurozone member countries and, whenever exists, calculates the optimal tax rate for 3 of the most important taxes – the corporate tax, the personal income tax – these two direct -, and the VAT – an indirect tax. Additionally, using SUR models, we estimate country-specific Laffer Curves for each of the three taxes. The estimations for the direct taxes are for the period 1995-2011, and for the VAT is for 2000-2011. Another aim is to test the trade-off between the tax rate and the tax revenue (Laffer, 2004), i.e., when a government decides to increase one type of tax, *ceteris paribus*, if that decision leads to an increase or decrease in the revenue from that same tax. According to Laffer, this depends on the starting point on the Laffer Curve, when the tax increase is implemented.

We choose to perform the estimations for the Eurozone member countries since they share the same monetary regime and face some of the same restriction in fiscal terms. This work is important for the current discussion about austerity policies in Europe.

This dissertation is organized in the following way. The next section presents the literature review, especially empirical and for European countries, about the Laffer Curve. Section 3

describes the dataset, variables, period, and sources, while Section 4 describes the econometric methodology. Section 5 presents the results for the estimations using panel-data and SUR techniques and Section 6 presents the conclusions and policy implications.

2. Literature Review

The Laffer Curve concept was first introduced by Wanniski (1978), when he defined it as: “there are always two tax rates that yield the same revenue”. With this statement we can conclude that the relationship between tax rates and tax revenues is an inverted U-shaped Curve and that Curve can give us the maximum tax rate and a maximum level of revenues. The Curve is named after the economist Arthur Laffer, since he was the first to talk about this relationship/trade-off.

In 2004, Arthur Laffer published an article explaining the meaning of the Laffer Curve to himself, which represents a trade-off between two effects on tax revenue – the arithmetic effect and the economic effect. The economic effect “recognizes the positive impact that lower tax rates have on work, output and employment...” The arithmetic effect always works on the opposite direction from the economic effect”. The author also explains other concept, in the Curve exists a prohibitive range region (in Figure 1, is designated as the “Region of declining revenue”) – that range is located to the right of the optimal tax rate (in Figure 1 the optimal tax rate is defined as “Revenue maximising point”), i.e., if the tax rate increases tax revenues decrease, that situation happens, according to Laffer, because the economic effect is stronger than the arithmetic effect (that situation occurs when the tax rate is higher than the maximum tax rate).

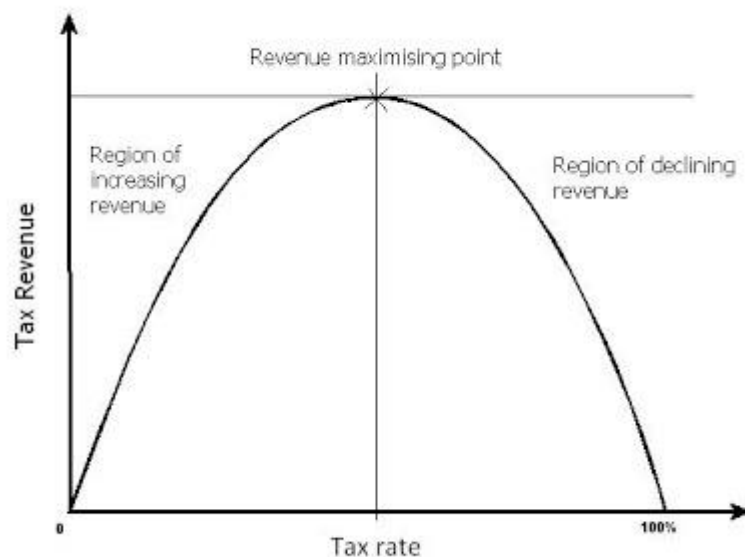


Figure 1 - Laffer Curve

There are some empirical works that estimate the Laffer Curve for individual countries and also for groups of countries.

In what concerns individual countries, Hsing (1996) for the USA, estimated a Laffer Curve for the period 1959 - 1991, using the personal income tax, and four specific functional forms - linear, log-log, linear-log and log-linear. The author confirmed the inverted U-shaped for the tax studied, and the tax rate that maximizes revenues was between 32% and 35%.

Feige and McGee (1983) estimated a Laffer Curve for Sweden using the income tax rate, using a theoretical model, which they simulated, with calibration from empirical data. The authors estimated a Laffer Curve for the marginal tax rate (which included direct and indirect taxes and social security contributions), finding an optimal tax rate for Sweden between 54% and 62%.

Ravestein and Vijlbrief (1988) estimated by OLS the Laffer Curve for Netherlands, over the period 1960-1985, for tax rates on earnings and indirect taxes. They computed the optimal tax rate, for example, for Netherlands in 1970, which they found to be 66.9%, using a OLS (Ordinary Least Squares).

Heijman and van Ophem (2005) estimate, by optimization methods, the Laffer Curve for Austria, Belgium, Switzerland, Germany, Spain, France, Italy, Ireland, Japan, Netherlands, Sweden, and the United Kingdom. These authors introduce the “black economy” into their model and according to their assumptions the optimal marginal tax rate is always lower than 36%. Another important conclusion is that when there is an increase in the tax rate there is a

negative effect in revenues and a decrease in economic activities in the formal economy, which leads to an increase in the “black economy”, or, in others words, informal economy. This conclusion is similar to Matthews’s (2003) conclusion, presented below.

Ioan (2012) calculated an aggregate Laffer Curve for Romania, over the period 1999-2009 with quarterly data, using the Linear Probit Model. This model provides information about the probability of changes in tax revenues, when occurs a variation in the tax rate. The author concludes with that when government increase taxes rates, fiscal revenues go down, and even a stronger conclusion, if taxes decrease, tax evasion decreases also.

For groups of countries there are two studies for OECD countries. Hansson and Stuart (2003) compute the Laffer limits for OECD countries, using data between 1972 and 1992. They estimated the model and calibrate it, using as a dependent variable the tax rate (in their model the tax rates are the marginal tax rates of labor income, capital income, and interest income) and as an independent variable tax revenues. They calculated the Laffer limit as a fraction of Gross National Product (GNP) and the authors concluded that it is hard to maintain the full tax higher than 70%. Brill and Hasset (2007) study an existence (or not) of a corporate Laffer Curve, using a panel for OECD countries over the period 1981-2005. The authors estimate the Laffer Curve for the corporate tax rate and they concluded for the existence of a trade-off between the corporate tax rate and corporate tax revenues. The maximum corporate tax rate was estimated at 31%.

Matthews (2003) for EU-14 used an unbalanced time-series of data for VAT for many countries [Austria (1974-97); Belgium (1971-97); Denmark (1970-95); France (1970-97); Germany (1970-97); Greece (1987-97); Italy (1973-98); Ireland (1972-96); Luxembourg (1971-96); Netherlands (1970-97); Portugal (1986-97); Spain (1986-97); Sweden (1980-1998); UK (1973-98)], to estimate the Laffer Curve, computed using OLS and LAD. The maximum range is 18%-19.3%, for EU-14. The author emphasize if one government increases VAT, consumption goes down as people try to scape to pay VAT.

Trabandt and Uhlig (2011) computed a Laffer Curve for consumption, labour and capital taxes, for the EU-14 and for the USA. These two authors estimate the Curves using a theoretical model, which they simulate, using calibration, and the period of the empirical calibration is between 1995 and 2007. The authors calculate an optimal tax rate for labour taxes of 30% and 40% for the USA and the EU-14, respectively, while in the case of capital taxes, the optimal tax rates was 40% and 35% for the USA and the EU-14, respectively. According to the authors, only Sweden and Denmark stay on the right side of the optimal tax rate, and the EU-14 stays closer to the optimal tax rate than the USA. These authors, in theirs estimations, do not find an

optimal tax rate for consumption. In 2012, these two authors perform the same estimation over the period 1995 – 2010, for the same taxes, and find that countries moved closer to the optimal tax rate in the case of the labour tax rate, but in case of the capital tax rate, the tax rate moves farther away from the optimal tax rate.

Oliveira and Costa (2013) estimate the Laffer Curve for EU-27 over 2000-2010, using the VAT and panel-data robust (truncated) estimation method. The optimal VAT rate found is 22.5%. The authors used three types of models – the Laffer Curve estimated with all observations; only using observations in which economies experienced periods of low economic growth; and in which economies experienced periods of high economic growth.

3. Data

We have chosen to analyse the Eurozone member countries since these countries share the same monetary regime and in what concerns fiscal policy they also share some common restrictions, namely through the Stability and Growth Pact and all the other fiscal mechanisms and surveillance mechanisms put in place since 2008.

We will use three types of taxes, two direct taxes - Taxes on Income of Companies and Individuals, - and one indirect tax –VAT. Our yearly data are from Eurostat and DataStream. Data series is between 1995-2011 for direct taxes and 2000-2011 for VAT. We collect data for the tax rates and also for tax revenues.

These three taxes were chosen because they represent the most important revenues for government accounts, in each country, and these three taxes together, represent about 90% of all tax revenues for the central state.

For Germany, we used data from DataStream, since Eurostat did not have information for the period between 1995 and 2000. We consider more important to maintain Germany in your data set, even if using a different data source. In fact, German economy is one of the largest in the Eurozone.

We used the GDP deflator – Price Deflator of the Gross Domestic Product at Market Prices (PVGDP), base year 2005, from EUROSTAT – to deflate the tax revenues series, for each of the three tax revenues. We used this deflator in order to withdraw the effect of prices from the tax revenues time series.

4. Methodology

According to Wanniski (1978), the Laffer Curve represents a non-linear relationship between tax revenues and tax rate. This non-linear relationship is usually represented by a concave quadratic function. Traditionally, empirical estimations of the Laffer Curve only use the tax rate as explanatory variable and the tax revenues as the dependent variable, which we will also follow, as it can be seen in Equation (1), below:

$$Revenues = a + b Rate + c Rate^2 \quad (1)$$

Where “*a*”, “*b*” and “*c*” are coefficients and *Revenues* represents the Tax Revenues and *Rate* represents the tax rate, which varies between 0% and 100%. The existence of a Laffer Curve requires a negative and significative value for the coefficient “*c*” and a positive value for the coefficient “*b*”. When we guarantee that situation, we are in the presence of a Laffer Curve, and we can calculate the optimal tax rate, in that way we can obtain the maximum tax revenues that a given state can collect. The optimal tax rate is obtained by maximizing equation (1) (*Revenues*) in order to the tax rate (*Rate*), and given by the following solution:

$$Rate^* = \frac{-b}{2c} \quad (2)$$

Where *Rate*^{*} is the optimal tax rate in Equation (2).

Substituting the optimal tax rate (*Rate*^{*}) in Equation (1), we get the optimal tax revenues, as can be seen in Equation (1’):

$$Revenues^* = a + b Rate^* + c Rate^{*2} \quad (1')$$

Where (*Revenues*^{*}) are the optimal tax revenues.

Initially we had the objective to estimate a Laffer Curve for each individual Eurozone country, using time-series regression techniques, but since our database only has seventeen observations for direct taxes and twelve observations for indirect taxes, time-series estimation wouldn’t be reliable and cross-country dependences lost. Therefore, we use panel-data estimations techniques. This estimation method allows us to safely analyze our results and infer some conclusions about our estimations.

Under Panel-Data estimation, we compute a Laffer Curve with two different model specifications, first a Seemingly Unrelated Regressions (SUR) model and, second by Panel

Model with individual effects. When we estimate a Laffer Curve by the SUR method, it gives us a Revenue/Tax rate relationship for each individual Eurozone country, but preserving cross-country interactions besides time dependence. This method is characterized by a system of equations in which we have exogenous errors for all data. More specifically, it is given by:

$$\begin{aligned} \text{Revenues}_{it} &= a_i + b_i \text{Rate}_{it} + c_i \text{Rate}_{it}^2 + u_{it} & (3) \\ i &= 1, \dots, 18 \text{ (countries)} \\ t &= 1, \dots, 12/17 \text{ (years)} \end{aligned}$$

Where the errors can be correlated and/or heteroskedastic and the country-specific unknown coefficients are estimated by Generalized Least Squares (GLS), (See Zellner, 1962, for further details).

In order to obtain the final results in the SUR estimations, we need to exclude some countries (those for which we have evidence of $a_i=b_i=c_i=0$), because for those cases the tax rate did not vary over time, or when they did, these changes are marginal. These situations where small variations in the tax rates occur give very high standard errors (s.e.), making it difficult, if not impossible, to obtain significant T-tests (the null hypothesis can be interpreted as “*the variable is not significant*” and the alternative hypothesis as “*the variable is significant*”). We have excluded all countries which don’t have significant p-values for the coefficients. This analysis was realized for each tax, i.e., country A can be excluded when estimate a Laffer Curve for VAT and not excluded for household income or corporate income tax.

As an alternative model specification, we have a Laffer Curve using panel-data estimations, where the parameters a, b, c across all Eurozone countries are equal and the error term may include country-specific individual effects. Compared to the SUR model (above), $a_i=a, b_i=b$ and $c_i=c$ for all i and the unobserved error u_{it} may be decomposed as $u_{it}=q_i+ v_{it}$. The countries’ idiosyncrasies are modeled through q_i and no longer at the main parameters level. Assuming the same Laffer Curve across countries might be an important limitation of this model. Thus, the estimated model is a kind of EuroZone Laffer Curve.

This econometric approach assumes the existence (or not) of individual errors and of the type Random Effects (RE) or Fixed Effects (FE). In order to evaluate the existence (or not) of individual errors, we compute the Redundant Fixed Effects Test (Redundant Test). The Redundant Test assumes as a null hypothesis “no individual effects” and as an alternative hypothesis “the existence of individual effects”.

If there is evidence in favor of the existence of individual effects, we have to apply the Correlated Random Effects Test (Hausman Test) to evaluate the nature of the individual effects.

The Hausman Test assumes as the null hypothesis “The existence of Random Effects” and as the alternative hypothesis “The existence of Fixed Effects”. Taking into account the *p-value* of the Hausman Test, we will estimate the Laffer Curve under one of these individual effects, when these individual effects exist. When we specify the Laffer Curve under RE (FE) we use the correspondent RE (FE) estimator which is consistent and efficient.

If we do not reject the null hypothesis in the Redundant Test, the proper way to estimate the Laffer Curve is by GLS (for further details see Wooldridge, 2010).

We estimate the Laffer Curves both in real values (such as mentioned above, revenues were deflated using the GDP deflator) and in nominal values.

Also, for each tax identified above, we estimate Laffer Curves, in each econometric technique (SUR and Panel Data).

5. Results

In this section we will provide the results of our estimations, based on equation (1). In the tables presented we will only show results for the countries which exhibit statistically significant results for the model’s coefficients. First, we discuss the results of our estimations for the Laffer Curve under the SUR estimations and then under the Panel-Data estimations, and in the last subsection we compare these two results. For each econometric method we will analyse each of the three taxes separately. We will also make a distinction and provide results for estimations using real and nominal revenues.

5.1. SUR Model

In this section we estimate the Laffer Curve for the three taxes and obtain the optimal tax rate for each country under the SUR model.

5.1.1. Corporate Income Tax

Tables 1 and 3 provide estimates of the Laffer Curve for the corporate income tax. In Table 1 we estimate it using real revenues (deflated by the GDP deflator), while in Table 3 we use nominal revenues.

Table 1 - SUR Estimation for Corporate Income Tax (Real Revenues)

<i>Country</i>		<i>Coefficient</i>	<i>Ratio T-Test</i>
Cyprus*	a	23.45	10.11
	b	-1.85	-6.45
	c	0.04	5.84
Germany*	a	723.61	2.28
	b	-33.50	-2.24
	c	0.45	2.70
Greece	a	-110.86	-2.02
	b	11.18	3.04
	c	-0.19	-3.14
Netherlands	a	-543.29	-1.45
	b	43.21	1.69
	c	-0.65	-1.52
Portugal	a	-59.50	-1.56
	b	7.12	3.07
	c	-0.12	-3.45
Slovak Republic*	a	44.63	4.73
	b	-2.20	-3.16
	c	0.04	3.05
Slovenia	a	-188.86	-2.34
	b	18.08	2.50
	c	-0.41	-2.59
Spain	a	-22640.26	-2.85
	b	1418.08	2.88
	c	-21.84	-2.88

Note: All coefficients in the Table are statistically significant. * - Countries with minimum instead of maximum.

According to the definition of the Laffer Curve, stated above, and looking at Table 1, a Laffer Curve is only observed for Greece, Netherlands, Portugal, Slovenia, and Spain. In these five countries we can obtain, by using Equation (2), their optimal tax rate (Rate*), presented in Table 2.

Table 2 - Optimal Tax Rate for Corporate Income Tax (in Real Values)

<i>Country</i>	<i>Rate*</i>
Cyprus	20.99% *
Germany	36.83% *
Greece	30.11%
Netherlands	33.18%
Portugal	29.78%
Slovak Republic	30.77% *
Slovenia	21.79%
Spain	32.47%

Notes: * - Countries with minimum instead of maximum.

According to our results Cyprus, Germany, and the Slovak Republic don't verify the conditions for the existence of a Laffer Curve, so although the parameters found are significant, the rates presented in Table 2 for these countries are a minimum and not a maximum. The optimal tax rates range between 21.79% for Slovenia and 33.18% for the Netherlands, which represents a significant variation.

When we estimate the same Laffer Curve using nominal revenues, the main conclusions hold, although the coefficient values change dramatically, as we can see in Table 3. In Table 4 the optimal tax rates are presented, as well as the minimum tax rates (again) for Cyprus, Germany, and the Slovak Republic. In this case the optimal tax rates don't change much and range between 21.47% for Slovenia and 32.25% for Spain, still representing a significant variation. Figures 2 and 3 show the Laffer Curve, using real and nominal revenues, respectively, for the corporate income tax for Portugal. The relationship between tax and tax revenues is represented by a curve in which the maximum level is around 29% and 26%, in the case of real revenues and nominal revenues, respectively. It is worth noting that 29% is the observed rate at the end of the sample (2010, 2011) and 26% the years before (2007-2009). That is, it might be the case that Portugal just reached its maximum (possible) revenue for the Corporate Income Tax.

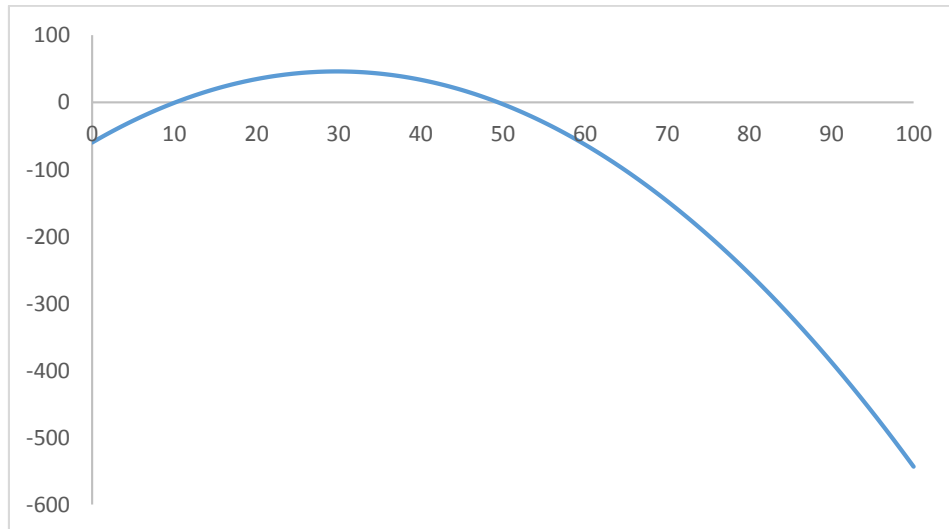


Figure 2 - Laffer Curve for the Corporate Income Tax for Portugal (Real Revenues)

Table 3 - SUR Estimation for Corporate Income Tax (Nominal Revenues)

<i>Country</i>		<i>Coefficient</i>	<i>T-Test</i>
Cyprus*	a	2599.78	8.74
	b	-203.80	-5.54
	c	4.62	4.77
Germany*	a	79292.49	2.45
	b	-3683.39	-2.41
	c	49.11	2.84
Greece	a	-14767.21	-2.82
	b	1426.37	4.11
	c	-24.40	-4.39
Netherlands	a	-77462.68	-1.66
	b	6086.26	1.92
	c	-98.27	-1.86
Portugal	a	-2681.17	-0.58
	b	563.81	1.99
	c	-10.73	-2.52
Slovak Republic*	a	5279.70	7.11
	b	-268.71	-4.92
	c	4.00	4.37
Slovenia	a	-20177.99	-2.34
	b	1964.00	2.54
	c	-45.75	-2.66
Spain	a	-2677354.63	-3.29
	b	168550.15	3.34
	c	-2613.02	-3.35

Note: All coefficients in the Table are statistically significant. * - Countries with minimum instead of maximum.

Table 4 - Optimal Tax Rate for Corporate Income Tax (Nominal Values)

<i>Country</i>	<i>Optimal Tax Rate</i>
Cyprus	22.04%*
Germany	37.50%*
Greece	29.23%
Netherlands	30.97%
Portugal	26.28%
Slovak Republic	33.63%*
Slovenia	21.47%
Spain	32.25%

Notes: * - Countries with minimum instead of maximum.

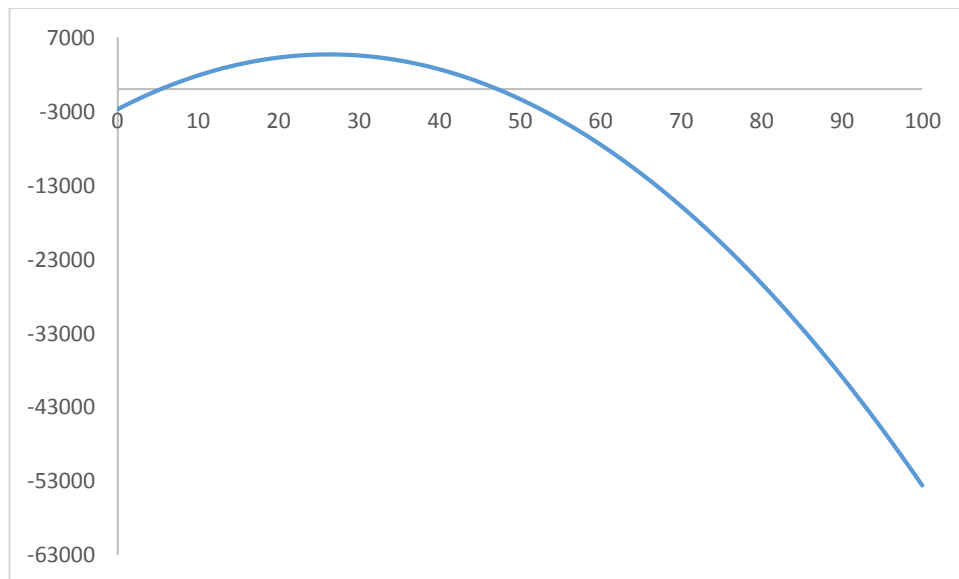


Figure 3 - Laffer Curve for the Corporate Income Tax for Portugal (Nominal Revenues)

Table 5 allows us to compare our optimal tax rate estimates, with real and nominal revenues, with the average tax rate in our data set for the period between 1995 and 2011.

Table 5 -Optimal Tax Rate for Real and Nominal Revenues and Average Tax Rate – Corporate Income Tax

<i>Country</i>	<i>Rate* (Real)</i>	<i>Rate* (Nominal)</i>	<i>Average Tax Rate (1995-2011)</i>
Cyprus	20.99% *	22.04% *	18.24%
Germany	36.83% *	37.50% *	42.31%
Greece	30.11%	29.23%	34.26%
Netherlands	33.18%	30.97%	31.56%
Portugal	29.78%	26.28%	32.35%
Slovak Republic	30.77% *	33.63% *	27.06%
Slovenia	21.79%	21.47%	23.88%
Spain	32.47%	32.25%	33.68%

Notes: * - Countries with minimum instead of maximum.

In this analysis we will not make any comparison for the results found for Cyprus, Germany, and the Slovak Republic and the average tax rate of our data set for the corporate income tax rate, because, as concluded above, the results do not make economic and fiscal policy sense, since they are a minimum and a not a maximum.

In countries in which the Laffer Curve is verified, our results, in both nominal and real estimations, are close to the average tax rate for corporate income tax observed in these five countries.

The average tax rates for Greece, Portugal, and Spain, three external intervened countries¹ (with austerity programs), and, also Slovenia are in the “*prohibitive range*” of the Laffer Curve. In the case of the Netherlands, the average tax rate is very close to the optimal tax rate, and in the case of the estimations for real revenues, even below. According to our estimations a decrease in the corporate income tax, in the four countries mentioned above, would shift these countries out of the prohibitive side of the Laffer Curve and possibly increase fiscal revenues for this tax.

¹ Countries have applied a restructuring program imposed by the *Troika* (European Central Bank, European Commission and International Monetary Fund). Greece and Portugal had a formal intervention, Spain only had a bank saving program.

5.1.2. Individual Income Tax

Tables 6 and 8 provide estimates for the Laffer Curve for the individual income tax. In Table 6 we show the results of the estimations in which we use real revenues. However, despite of having statistically significant results, Greece and Spain don't verify the conditions for the existence of the Laffer Curve.

Table 6 - SUR Estimation for Individual Income Tax (Reals Revenues)

<i>Country</i>		<i>Coefficient</i>	<i>T-Test</i>
Germany	a	-3261.18	-2.30
	b	179.25	3.21
	c	-1.65	-3.01
Greece*	a	1987.31	3.64
	b	-86.07	-3.45
	c	0.96	3.39
Portugal	a	-511.00	-1.45
	b	24.73	1.55
	c	-0.25	-1.40
Spain*	a	7078.27	4.38
	b	-249.42	-3.81
	c	2.36	3.59

Note: All coefficients in the Table are statistically significant. * - Countries with minimum instead of maximum.

A Laffer Curve exists for Germany and Portugal. In Table 7 we show the optimal tax rates for these two countries for the individual income tax. In the cases of Greece and Spain the rates presented are the minimum rates.

Table 7 - Optimal Tax Rate for Individual Income Tax (Real Revenues)

<i>Country</i>	<i>Optimal Tax Rate</i>
Germany	54.36%
Greece	44.59%*
Portugal	49.07%
Spain	52.92%*

Notes: * - Countries with minimum instead of maximum.

Figures 4 and 5 shows the Laffer Curve for Portugal for the individual income tax, using real and nominal values, respectively. The relationship between tax and tax revenues is represented by a curve in which the maximum level is around 49% and 48%, in case of real revenues and nominal revenues, respectively. Again, Portugal experienced a tax rate of about 49% (the optimal one) in 2011, exactly the last observation in the sample.

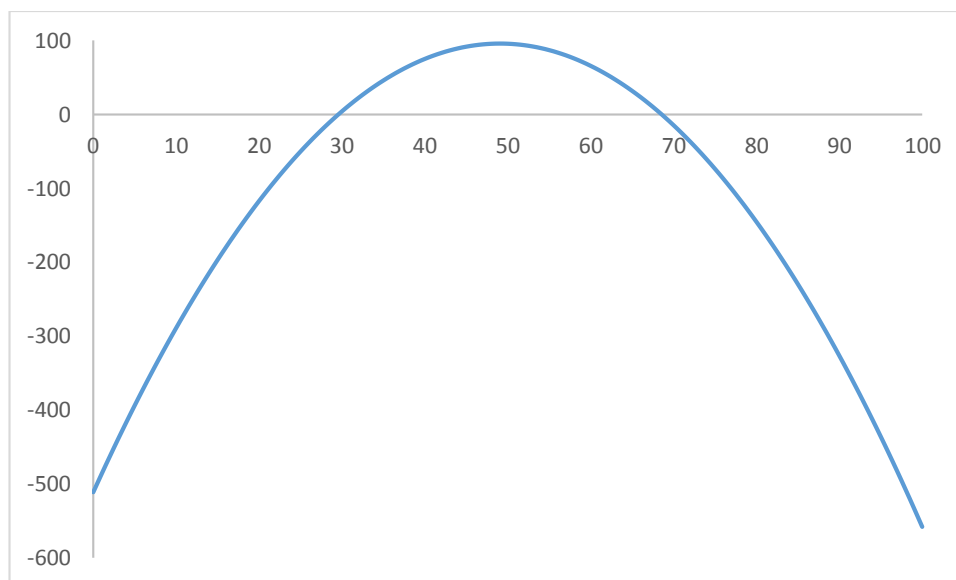


Figure 4 - Laffer Curve for the Individual Income Tax for Portugal (Real Revenues)

Table 8 presents our estimations for the individual income tax using nominal revenues. In this case Finland and the Slovak Republic also present statistically significant estimations, although in the case of Finland, the country does not show evidence of the existence of a Laffer Curve. A Laffer Curve is confirmed for the Slovak Republic.

Table 8 – SUR Estimation for Individual Income Tax (Nominal Revenues)

<i>Country</i>		<i>Coefficient</i>	<i>T-Test</i>
Finland*	a	134965.62	3.43
	b	-3547.91	-2.48
	c	25.94	2.01
Germany	a	-428234.18	-2.27
	b	22948.59	3.09
	c	-224.48	-3.08
Greece*	a	336311.95	4.48
	b	-14847.17	-4.33
	c	166.68	4.28
Portugal	a	-154752.50	-2.46
	b	6946.29	2.44
	c	-72.82	-2.28
Slovak Republic	a	-545.96	-0.48
	b	154.77	1.77
	c	-2.75	-1.89
Spain*	a	1032770.49	4.56
	b	-37011.64	-4.04
	c	343.37	3.74

Notes: All coefficients in the Table are statistically significant. * - Countries with minimum instead of maximum.

In Table 9 we present our computed optimal tax rates for Germany, Portugal, and the Slovak Republic for the case of nominal revenues. The optimal tax rate for the Slovak Republic stands out for being substantially lower than the others.

Table 9 - Optimal Tax Rate for Individual Income Tax (Nominal Revenues)

<i>Country</i>	<i>Optimal Tax Rate</i>
Finland	68.38%*
Germany	51.11%
Greece	44.54%*
Portugal	47.70%
Slovak Republic	28.19%
Spain	53.89%*

Notes: * - Countries with minimum instead of maximum.

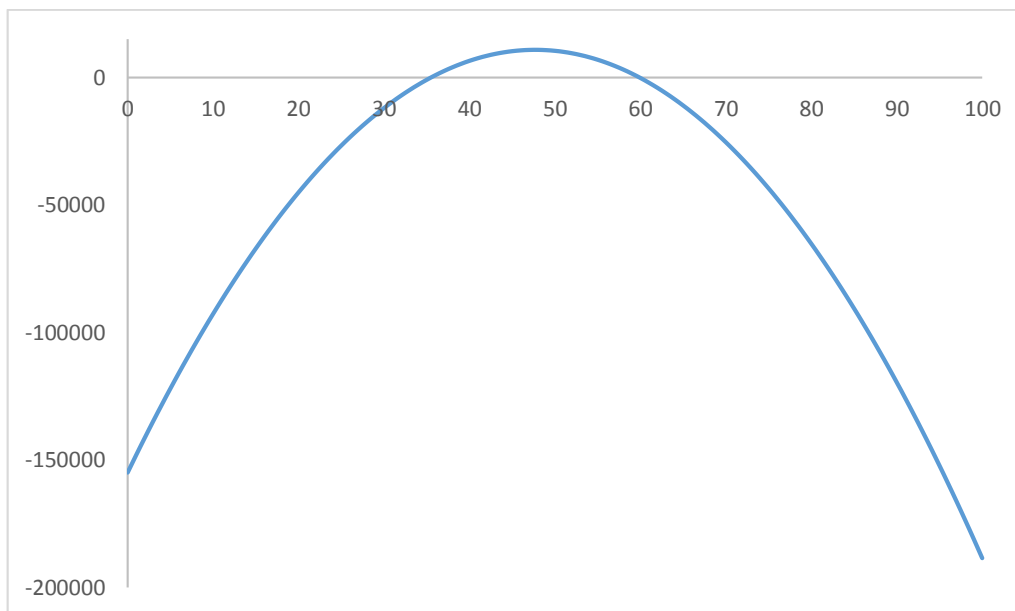


Figure 5 - Laffer Curve for the Individual Income Tax for Portugal (Nominal Revenues)

Table 10 allows us to compare our results, both with nominal and real revenues, and the average tax rate for the individual income tax rate for the period 1995-2011. Our first conclusion is that our estimations are close to the rate applied in each country. Only in the case of Spain case the optimal tax rate deviates further from the average tax rate. Regarding this particular tax, only the Slovak Republic is located in the “*prohibitive range*” of the Laffer Curve. Germany and Portugal are in the region of increasing revenues. Actually, in Portugal since the beginning of the austerity program in 2011, the individual income tax has been consistently increased.

Table 10 - Optimal Tax Rate for Real and Nominal Revenues and Average Tax Rate – Individual Income Tax

<i>Country</i>	<i>Rate* (Nominal)</i>	<i>Rate* (Real)</i>	<i>Average Tax Rate (1995-2011)</i>
Finland	68.38%*	-	53.55%
Germany	51.11%	54.36%	50.81%
Greece	44.54%*	44.59%*	42.97%
Portugal	47.70%	49.07%	41.41%
Slovak Republic	28.19%	-	30.71%
Spain	53.89%*	52.92%*	47.82%

Notes: * - Countries with minimum instead of maximum.

5.1.3. Value Added Tax

Table 11 and 13 provide results for the Laffer Curve for the VAT. Table 11 shows the results for the estimations performed using real revenues.

Estimation of the Laffer Curve for VAT give us three countries - Cyprus, Greece, and the Slovak Republic - with statistically significant values for the estimated coefficients, although the results for Cyprus don't have economic and fiscal meaning, since they exhibit a positive value for "c", and in that way, instead of having a maximum, we have a minimum. For Greece and the Slovak Republic we obtain the expected results for the existence of a Laffer Curve.

Table 11 – SUR Estimation for VAT (Real Revenues)

<i>Country</i>		<i>Coefficient</i>	<i>T-Test</i>
Cyprus*	a	78.33	2.36
	b	-12.64	-2.27
	c	0.55	2.46
Greece	a	-1348.81	-2.53
	b	144.47	2.76
	c	-3.47	-2.73
Slovak Republic	a	-482.12	-2.00
	b	52.23	2.25
	c	-1.31	-2.36

Notes: All coefficients in the Table are statistically significant. * - Countries with minimum instead of maximum.

In Table 12 we present the optimal tax rates for the VAT for the estimations made using real revenues. The results for Cyprus are for a minimum and not a maximum tax rate. The estimated optimal tax rate for Greece and the Slovak Republic are very close.

Table 12 - Optimal Tax Rate for VAT

<i>Country</i>	<i>Optimal Tax Rate</i>
Cyprus	11.44%*
Greece	20.80%
Slovak Republic	20.00%

Notes: * - Countries with minimum instead of maximum.

When we compute the same model, for the same tax (VAT), the only difference being the use of nominal revenues in the estimations, the most important conclusions hold, i.e., the results for Cyprus do not show evidence of a Laffer Curve but Greece and the Slovak Republic do.

Table 13 - SUR Estimation for VAT (Nominal Revenues)

<i>Country</i>		<i>Coefficient</i>	<i>T-Test</i>
Cyprus	a	11162.06	2.60
	b	-1847.50	-2.54
	c	79.77	2.70
Greece	a	-298185.09	-3.98
	b	30036.74	4.09
	c	-712.63	-3.99
Slovak Republic	a	-66781.21	-2.15
	b	7135.33	2.38
	c	-179.44	-2.50

Notes: All coefficients in the Table are statistically significant.

In Table 14 we provide the computed optimal tax rates for VAT for the estimations made using nominal revenues. The value for the tax rate presented for Cyprus is again a minimum as in Table 12. The values for Greece and the Slovak Republic are again close to each other and similar to the ones presented in Table 12.

Table 14 - Optimal Tax Rate for VAT (Nominal Revenues)

<i>Country</i>	<i>Optimal Tax Rate</i>
Cyprus	11.58%*
Greece	21.07%
Slovak Republic	19.88%

Notes: * - Countries with minimum instead of maximum.

Table 15 provides a comparison between our results (estimations with real and nominal revenues) and the average VAT rate for the period between 2000 and 2011. Our estimated optimal tax rates are very close to the average VAT rate for Greece and the Slovak Republic, although both the two minimum value estimated for Cyprus are above the average VAT rate. In the case of the Slovak Republic we can assume that the country has been applying the optimal VAT rate. In the case of Greece, the average VAT rate is still below our estimated optimal tax rates, but the country has been increasing the VAT rate since 2008, and is exceeding the optimal VAT rate.

For the Portuguese economy there seems not to exist a Laffer Curve for the VAT rate. Most probably, the functional form is not the standard quadratic but rather one that needs to be determined in future research.

Table 15 - Optimal Tax Rate for Real and Nominal Revenues and Average Tax Rate - VAT

<i>Country</i>	<i>Rate* (Real)</i>	<i>Rate* (Nominal)</i>	<i>Average Tax Rate (2000-2011)</i>
Cyprus	11.44%*	11.58%*	14%
Greece	20.80%	21.07%	19%
Slovak Republic	20.00%	19.88%	20%

Notes: * - Countries with minimum instead of maximum.

5.2. Panel-Data Estimation under Fixed or Random Effects

In session 5.2, we will provide results for the three taxes, like in the last section, but under panel-data estimation. We will follow the same order as in the last section.

When we estimate the Laffer Curve under panel-data specification -, this method assumes the same coefficients across all countries. In economic terms we can say that we are estimating something like a Laffer Curve for the Eurozone, although it is something that in reality does not exist, since each country of the Eurozone has its own fiscal policy and there is no fiscal harmonization. So our analysis must be read carefully when we mention the Eurozone.

5.2.1. Corporate Income Tax

Table 16 provides the results of our estimation under FE and RE for corporate income tax using real revenues.

Table 16 - Laffer Curve for Corporate Income Tax (Real Revenues)

	<i>Estimation with FE</i>		<i>Estimation with RE</i>	
	<i>Coefficient</i>	<i>T-Test</i>	<i>Coefficient</i>	<i>T-Test</i>
a	124.32	4.91	118.57	3.49
b	-2.40	-1.54	-2.18	-1.40
c	0.04	1.63	0.04	1.59
Minimum	30.66%*		28.59%*	
Redundant	0.0000		0.0000	
Hausman	0.0129		0.0129	

Notes: All coefficients in the Table are statistically significant. * - Countries with minimum instead of maximum.

In this case, we estimate under FE and RE because despite the p-value of the Hausman Test is close to zero, the estimation with FE does not provide results with economic meaning. Our conclusions are similar for the two estimates – we cannot offer evidence of a Laffer Curve for the corporate income tax in the Eurozone. In Table 16 we present a minimum instead of a maximum, a result derived from statistically significant coefficients, but that does not corroborate the Laffer Curve.

Table 17 provides results when we estimate for the same tax, but using nominal revenues, and in this case, like in the estimation with real revenues, we conclude for the non-existence of a Laffer Curve. In this estimation, coefficient “c” is negative, but “b” is negative also, hence, when we compute equation (2) we arrive to an optimal tax rate which is negative, not having any economic meaning². That is, for the admissible range [0%,100%], the revenues are a decreasing function of the tax rate.

² See Section 4 - Methodology. In order to obtain the Laffer Curve we need to have the coefficient “c” negative and “b” positive. Only in this way the optimal tax rate will be a rate between 0% and 100%.

Table 17 - Laffer Curve for Corporate Income Tax (Nominal Revenues)

	<i>Estimation with FE</i>	
	<i>Coefficient</i>	<i>T-Test</i>
a	10220.92	31.99
b	-32.79	-1.56
c	-0.48	-1.40
Maximum	-34.21%	
Redundant	0.0000	
Hausman	0.0052	

Notes: All coefficients in the Table are statistically significant.

Table 18 shows us our estimations results and the average tax rate in all Eurozone countries for the corporate income tax (individually). The minimum tax rate that we have obtained from our estimations using real revenues is close to the average in most countries. The average corporate income tax rate in our data set is 30.38% (the Eurozone), very close to the minimum rates estimated.

Table 18 - Comparison between our Results and Average Corporate Income Tax

<i>Country</i>	<i>Average Rate (1995-2011)</i>	<i>Minimum (Real) FE</i>	<i>Minimum (Real) RE</i>	<i>Maximum (Nominal) FE</i>
Austria	30.29%	30.66%	28.59%	-34.21%
Belgium	36.92%			
Cyprus	18.24%			
Estonia	24.29%			
Finland	27.29%			
France	36.39%			
Germany	42.31%			
Greece	34.26%			
Ireland	20.38%			
Italy	39.78%			
Latvia	19.76%			
Luxemburg	33.38%			
Malta	35.00%			
Netherlands	31.56%			
Portugal	32.35%			
Slovak Republic	27.06%			
Slovenia	23.88%			
Spain	33.68%			

5.2.2. Individual Income Tax

Tables 19 and 20 provide results of our estimations for the individual income tax, using real and nominal revenues, respectively. Both estimates were done under FE.

Table 19 - Laffer Curve for Individual Income Tax (Real Revenues)

	<i>Estimation with FE</i>	
	<i>Coefficient</i>	<i>T-Test</i>
a	184.31	2.37
b	14.36	3.96
c	-0.23	-5.41
Rate*	31.22%	
Redundant	0.0000	
Hausman	0.0323	

Notes: All coefficients in the Table are statistically significant.

Table 20 - Laffer Curve for Individual Income Tax (Nominal Revenues)

	<i>Estimation with FE</i>	
	<i>Coefficient</i>	<i>T-Test</i>
a	3620.53	0.32
b	2739.35	5.26
c	-44.41	-7.27
Rate*	30.84%	
Redundant	0.0000	
Hausman	0.0102	

Notes: All coefficients in the Table are statistically significant.

Taking into account our estimations for the three coefficients we can say that the Laffer Curve is verified for the Eurozone economy as a whole in both estimations. The optimal rate found is similar (31.22% and 30.84%, in Table 19 and 20, respectively).

Table 21 - Comparison between our Results and Average Individual Income Tax

<i>Country</i>	<i>Average Tax Rate (1995-2011)</i>	<i>Rate* (Real)</i>	<i>Rate* (Nominal)</i>
Austria	50.00%	31.22%	30.84%
Belgium	56.67%		
Cyprus	34.71%		
Estonia	24.29%		
Finland	53.55%		
France	53.35%		
Germany	50.81%		
Greece	42.97%		
Ireland	43.35%		
Italy	46.50%		
Latvia	24.94%		
Luxemburg	43.04%		
Malta	35.00%		
Netherlands	54.82%		
Portugal	41.41%		
Slovak Republic	30.71%		
Slovenia	47.35%		
Spain	47.82%		

How we can see in Table 21, our estimations for Laffer Curve shows us that both estimated optimal tax rate (Rate*) are significantly lower than the average tax rate for the period 1995 - 2011 in the Eurozone countries. Only countries as Estonia and Latvia applied a lower tax rate than the optimal tax rates in the analysed period. All other countries are located in the “*prohibitive range*” of the Laffer Curve. When we compare our optimal tax rates with the average tax rate found in our data set (43.41%) for the 18 Eurozone member countries, these conclusions are again verified.

When we compare the government options on the two direct taxes, we can conclude that most choose to apply the higher tax rate on income of individuals than on corporate income. One possible explanation for this is that capital moves quicker than people, so people are easier targets to tax.

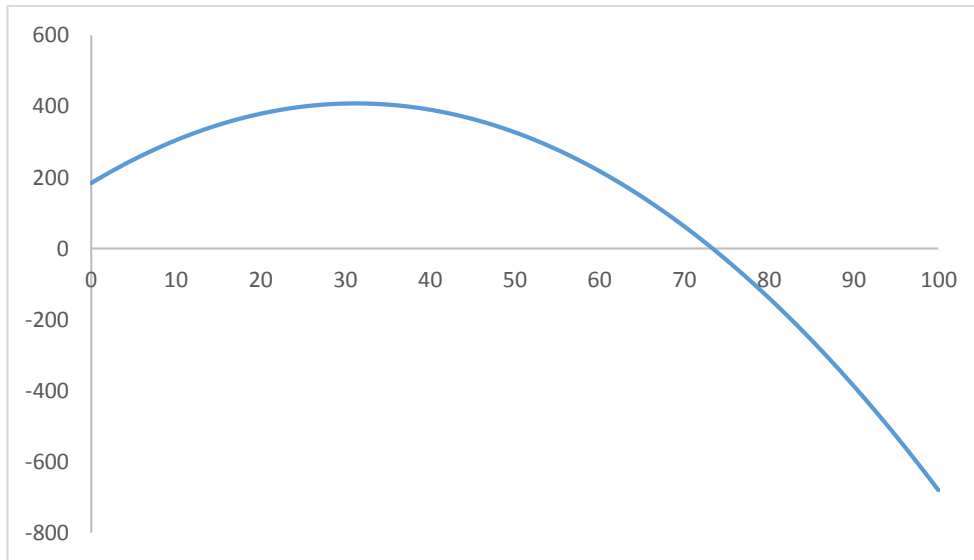


Figure 6 - Laffer Curve for the Individual Income Tax for the Eurozone (Real Revenues)

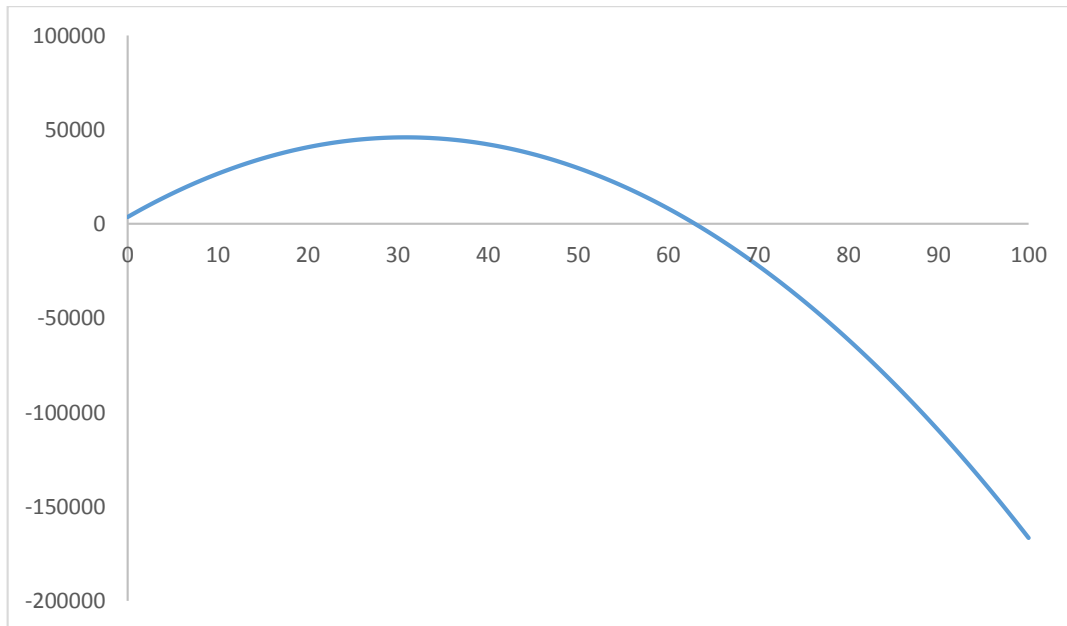


Figure 7 - Laffer Curve for the Individual Income Tax for the Eurozone (Nominal Revenues)

Figures 6 and 7 show the Laffer Curve for the Eurozone for the individual income tax, using real and nominal values, respectively. The relationship between tax and tax revenues is represented by a curve in which the maximum level is around 31%, for both real revenues and nominal revenues.

5.2.3. Value Added Tax

Table 22 provides results for our estimations of the Laffer Curve for VAT, using real revenues. According to the Hausman test we estimate equation (1) under RE. Looking at the coefficients presented in the Table, we can confirm the existence of a Laffer Curve for VAT in the Eurozone. The optimal tax rate computed is 34.89%. In the case of our estimations for VAT using nominal revenues, the results point to the nonexistence of a Laffer Curve.

Table 22 - Laffer Curve for VAT (Real Revenues)

	<i>Estimation with RE</i>	
	<i>Coefficient.</i>	<i>T-Test</i>
a	-49.37	-0.27
b	26.21	2.45
c	-0.38	-1.54
Rate*	34.89%	
Redundant	0.0000	
Hausman	0.4689	

Notes: All coefficients in the Table are statistically significant.

Table 23 allows us to compare the estimations under real revenues with the average VAT rate between 2000 and 2011, for each Eurozone country. Our optimal tax rates for VAT would be “faraway” of the average VAT rate in each country, but the one obtained using real revenues (34.89%) is closer to the ones that Eurozone governments currently apply in their countries. Still, in case of the average VAT rate for the Eurozone (18.78%), our estimate remains far from the average verified in the referred period.

According to this we can affirm that all Eurozone countries are in the left side of the optimal tax rate, in the region of “increasing revenues” (in the case of an increase in the tax rate). That is, countries may believe that raising VAT tax is beneficial to lower budget deficits so they may be tempted to do it.

Table 23 - Comparison between our Results and Average VAT

<i>Country</i>	<i>Average Tax Rate (2000-2011)</i>	<i>Rate* (Real)</i>
Austria	20%	34.89%
Belgium	21%	
Cyprus	14%	
Estonia	19%	
Finland	22%	
France	20%	
Germany	17%	
Greece	19%	
Ireland	21%	
Italy	20%	
Latvia	18%	
Luxemburg	15%	
Malta	17%	
Netherlands	19%	
Portugal	20%	
Slovak Republic	20%	
Slovenia	20%	
Spain	16%	

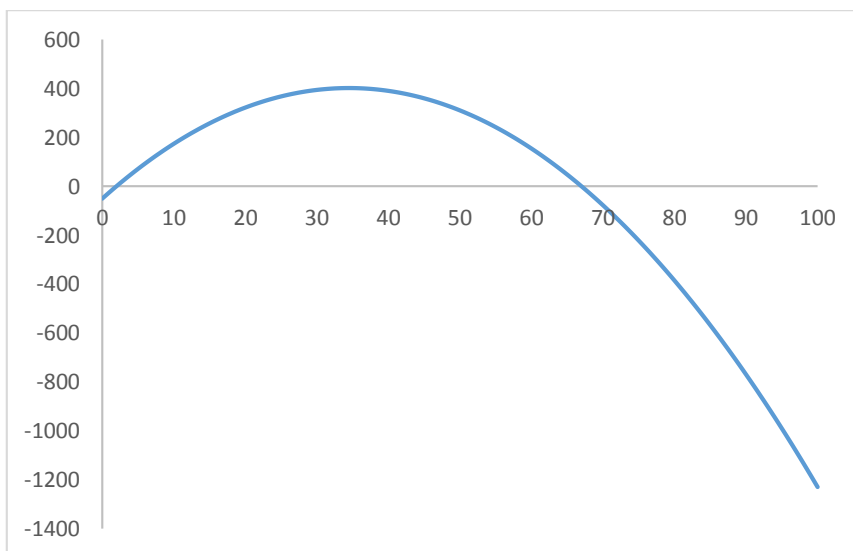


Figure 8 - Laffer Curve for the VAT for the Eurozone (Real Revenues)

Figure 8 shows the Laffer Curve for the Eurozone for the VAT, using real values. The relationship between tax and tax revenues is represented by a curve in which the maximum level is around 35% for real revenues.

5.3. Comparison between SUR Estimation and Panel-Data Estimation

In this section our main goal is to compare the results of the two previous sections. We will, again, follow the same order for the three taxes. We will compare our results for in three specific points: (1) if the estimation provides evidence of a Laffer Curve, (2) if the estimate has economic and fiscal meaning, and (3) if the estimated optimal tax rates are near to the tax rates applied in the Eurozone countries.

5.3.1. Corporate Income Tax

Tables 24 and 25 provide summary results for the corporate income tax for the SUR and Panel-Data estimation, respectively.

Table 24 - Optimal Corporate Income Tax Rate - SUR Estimation

	<i>Rate*</i> <i>(Real)</i>	<i>Rate*</i> <i>(Nominal)</i>
Cyprus	20.99%*	22.04%*
Germany	36.83%*	37.50%*
Greece	30.11%	29.23%
Netherlands	33.18%	30.97%
Portugal	29.78%	26.28%
Slovak Republic	30.77%*	33.63%*
Slovenia	21.79%	21.47%
Spain	32.47%	32.25%

Notes: * - Countries with minimum instead of maximum.

Table 25 - Optimal Corporate Income Tax Rate – Panel-Data Estimation

<i>Minimum (Real) FE</i>	<i>Minimum (Real) RE</i>	<i>Maximum (Nominal) FE</i>
30.66%	28.59%	-34.21%

Estimations under the SUR technique provide better results than under the panel-data technique. Under panel-data we did not find evidence of the existence of a Laffer Curve for the Eurozone. In the case of the SUR estimation, this econometric model, for some countries, leads us to the same conclusions, but we are able to estimate the Laffer Curve for countries like Greece, Netherlands, Portugal, Slovenia, and Spain.

Only the results for the estimation under panel-data models using nominal revenues are completely out of economic meaning, since they assume an optimal (maximum) tax rate of (–34.21%). All other results have economic sense, even if it is a maximum or a minimum, and the results for the “optimal tax rate” are near the average ones observed in our dataset, although above the average tax rates (i.e., countries are in the “*prohibitive range*”).

5.3.2. Individual Income Tax

Tables 26 and 27 provide summary results for the individual income tax for the SUR and Panel-Data estimation, respectively.

Table 26 - Optimal Individual Income Tax Rate - SUR Estimation

	<i>Rate* (Nominal)</i>	<i>Rate* (Real)</i>
Finland	68.38%*	-
Germany	51.11%	54.36%
Greece	44.54%*	44.59%*
Portugal	47.70%	49.07%
Slovak Republic	28.19%	-
Spain	53.89%*	52.92%*

Notes: * - Countries with minimum instead of maximum.

Table 27 - Optimal Individual Income Tax Rate – Panel – Data Estimation

<i>Rate* (Real)</i>	<i>Rate* (Nominal)</i>
31.22%	30.84%

In this case, and opposite to what happened in the case of the corporate income tax, we obtain evidence of a Laffer Curve for panel-data estimation. For Germany, Portugal, and the Slovak Republic SUR estimations also provides evidence of the existence of a Laffer Curve.

When we compare our estimations under panel-data estimations with the average tax rate for each country between 1995 and 2011, we conclude that our two optimal tax rates are lower than the majority of these averages. But estimates of the optimal tax rates presented under the SUR estimations are closer to the effective taxes than the ones for panel-data. The Slovak Republic presents an estimated optimal tax rate under the SUR estimation similar to the panel-data estimations (and really close to its own average of 30.71% for this period), although slightly below, but the ones for Germany and Portugal are quite different.

5.3.3. Value Added Tax

Tables 28 and 29 provide summary results for the VAT for the SUR and Panel-Data estimation, respectively.

Table 28 - Optimal VAT Rate - SUR Estimation

	<i>Rate* (Real)</i>	<i>Rate* (Nominal)</i>
Cyprus	11.44%*	11.58%*
Greece	20.80%	21.07%
Republic Slovak	20.00%	19.88%

Notes: * - Countries with minimum instead of maximum.

Table 29 - Optimal VAT Rate – Panel-Data Estimation

<i>Rate* (Real Revenues)</i>
34.89%

In the case of the SUR estimations, Greece and the Slovak Republic present evidence of the existence of a Laffer Curve, but Cyprus doesn't, although the coefficients are statistically significant. The optimal tax rates obtained under the SUR estimations are really close to the ones observed in our data set for the period 2000 – 2011, but the optimal tax rate obtained under the panel-data estimations is much higher. According to this estimation most countries are in the region of increasing revenues of the Laffer Curve.

6. Conclusions

Using a database between 1995 and 2011 for the corporate income tax and individual income tax and between 2000 and 2011 for the VAT we estimate the Laffer Curve for the Eurozone member countries. We compute the Laffer curve under the SUR specification, which allows to estimate a Laffer Curve for each country individually, and also under the panel-data method, which provides a unique estimate for the Eurozone.

Results for the corporate income tax do not provide empirical evidence of the existence of a Laffer Curve across Eurozone countries, using panel-data techniques. Only with the SUR method we can confirm the existence of a Laffer Curve for some countries like Greece, Netherlands, Portugal, Slovenia, and Spain. The computed optimal tax rates show that countries like Greece, Portugal, Slovenia, and Spain are in the “*prohibitive range*” of the Laffer Curve. In the case of the individual income tax we obtain a Laffer Curve with both econometrics methods. In this way we obtain an optimal tax rate for the Eurozone (around 31% for both estimations, using real and nominal revenues) with the panel-data estimation, and with the SUR method we obtain a Laffer Curve for Germany, Portugal, and the Slovak Republic. Only the Slovak Republic has an estimate of the optimal tax rate that shows the average tax rate applied in the country between 1995 and 2011 is in the “*prohibitive range*”.

For the VAT we provide evidence of the existence of a Laffer Curve for Eurozone, under panel-data estimations, and under SUR estimations, for only two countries - Greece and the Slovak Republic. The optimal tax rates in the Eurozone case is 35% (real revenues). Optimal tax rates

for Greece and the Slovak Republic under the SUR method are much lower – 21% and 20%, respectively, and close to the average rate.

Comparing our two estimation methods with empirical evidence, we can conclude that the most reliable method is the SUR, which provides results closer to the averages found in the data set. This result is the expected one, since the SUR method provides results about each country individually, opposite to panel-data estimations. When we compare our results using real or nominal revenues, we conclude that results obtained with real revenues make more economic sense than the ones with nominal revenues.

We can also conclude that Southern European countries tend to apply taxes rates higher than the optimal tax rate, when we compare with Central and Northern European countries. May be this is explained by the existence of a more developed unobserved (underground) economy in Southern countries, and also because Northern countries are more efficient in terms of tax collecting.

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Appendix A – Real Revenues and Tax Rate for the VAT

Years/Country	Aus_rev	Aus_rate	Bel_rev	Bel_rate	Cyp_rev	Cyp_rate	Est_rev	Est_rate	Fin_rev	Fin_rate	Fra_rev	Fra_rate	Ger_rev	Ger_rate
2000	182.27	20	201.25	21	6.24	10	6.69	18	108.71	22	1181.02	19.6	1476.60	16
2001	183.29	20	193.81	21	6.84	10	6.86	18	108.54	22	1173.03	19.6	1450.47	16
2002	188.62	20	198.25	21	8.07	13	7.50	18	114.20	22	1166.93	19.6	1406.26	16
2003	185.65	20	195.85	21	9.71	15	7.89	18	122.52	22	1177.33	19.6	1395.16	16
2004	189.69	20	206.00	21	10.79	15	7.89	18	128.04	22	1225.23	19.6	1382.80	16
2005	194.13	20	213.62	21	12.24	15	9.70	18	134.44	22	1266.25	19.6	1398.10	16
2006	193.70	20	220.52	21	13.50	15	11.17	18	140.53	22	1289.33	19.6	1466.82	16
2007	201.77	20	228.18	21	15.01	15	11.72	18	142.43	22	1303.09	19.6	1668.31	19
2008	207.48	20	225.44	21	16.08	15	10.06	18	142.76	22	1281.90	19.6	1711.86	19
2009	206.34	20	217.94	21	13.67	15	9.55	20	135.62	22	1204.10	19.6	1709.31	19
2010	208.71	20	228.30	21	13.86	15	9.78	20	137.99	23	1240.93	19.6	1716.00	19
2011	210.93	20	230.85	21	12.87	15	10.29	20	148.94	23	1269.69	19.6	1786.37	19

Notes:

Aus_rev – Austria Tax Revenues

Aus_rate – Austria Tax Rate

Bel_rev – Belgium Tax Revenues

Bel_rate – Belgium Tax Rate

Cyp_rev – Cyprus Tax Revenues

Cyp_rate – Cyprus Tax Rate

Fin_rev – Finland Tax Revenues

Fin_rate – Finland Tax Rate

Fra_rev – France Tax Revenues

Fra_rate – France Tax Rate

Ger_rev – Germany Tax Revenues

Ger_rate – Germany Tax Rate

Years/Country	Gre_rev	Gre_rate	Ire_rev	Ire_rate	Ita_rev	Ita_rate	Lat_rev	Lat_rate	Lux_rev	Lux_rate	Mal_rev	Mal_rate	Net_rev	Net_rate
2000	115.22	18	93.04	21	884.32	20	4.31	18	14.25	15	2.65	15	331.88	17.5
2001	124.65	18	91.72	20	866.05	20	4.43	18	15.15	15	2.84	15	355.84	19
2002	131.65	18	99.64	21	864.14	20	4.70	18	15.63	15	2.92	15	353.11	19
2003	127.47	18	102.84	21	824.63	20	5.44	18	15.65	15	2.99	15	358.59	19
2004	129.27	18	112.05	21	829.96	20	5.71	18	17.41	15	3.41	18	366.81	19
2005	133.98	19	123.64	21	853.17	20	7.04	18	18.63	15	3.97	18	369.50	19
2006	145.57	19	133.58	21	914.31	20	8.59	18	18.35	15	3.99	18	391.95	19
2007	156.97	19	136.35	21	918.37	20	9.06	18	19.47	15	3.97	18	413.64	19
2008	153.58	19	128.30	21	877.65	20	7.18	18	21.14	15	4.21	18	408.30	19
2009	131.55	19	105.26	21.5	794.06	20	5.27	18	21.58	15	4.08	18	378.32	19
2010	142.23	23	103.99	21	891.91	20	5.73	19	20.84	15	4.10	18	399.26	19
2011	129.70	23	100.48	21	888.76	20	6.18	21	21.50	15	4.37	18	385.12	19

Notes:

Gre_rev – Greece Tax Revenues

Gre_rate – Greece Tax Rate

Ire_rev – Ireland Tax Revenues

Ire_rate – Ireland Tax Rate

Ita_rev – Italy Tax Revenues

Ita_rate – Italy Tax Rate

Lat_rev – Latvia Tax Revenues

Lat_rate – Latvia Tax Rate

Lux_rev – Luxembourg Tax Revenues

Lux_rate – Luxembourg Tax Rate

Mal_rev – Malta Tax Revenues

Mal_rate – Malta Tax Rate

Net_rev – Netherlands Tax Revenues

Net_rate – Netherlands Tax Rate

Years/Country	Por_rev	Por_rate	SloR_rev	SloR_rate	Slo_rev	Slo_rate	Spa_rev	Spa_rate
2000	113.18	17	26.99	23	20.71	19	469.17	16
2001	112.50	17	29.09	23	20.48	19	470.02	16
2002	115.45	19	29.46	23	21.95	20	470.96	16
2003	116.36	19	32.85	20	22.47	20	499.71	16
2004	118.61	19	35.90	19	23.50	20	530.02	16
2005	130.01	21	38.80	19	24.72	20	582.13	16
2006	133.91	21	39.86	19	25.92	20	607.57	16
2007	135.62	21	39.84	19	27.47	20	573.84	16
2008	134.35	20	43.16	19	28.57	20	493.02	16
2009	110.48	20	39.90	19	26.13	20	387.26	16
2010	123.98	21	39.33	19	26.89	20	525.91	18
2011	130.23	23	43.59	20	26.62	20	512.72	18

Notes:

Por_rev – Portugal Tax Revenues

Por_rate – Portugal Tax Rate

SloR_rev – Slovak Republic Tax Revenues

SloR_rate – Slovak Republic Tax Rate

Slo_rev – Slovenia Tax Revenues

Slo_rate – Slovenia Tax Rate

Spa_rev – Spain Tax Revenues

Spa_rate – Spain Tax Rate

Appendix B – Real Revenues and Tax Rate for the Corporate Income Tax

Years/Country	Aus_rev	Aus_rate	Bel_rev	Bel_rate	Cyp_rev	Cyp_rate	Est_rev	Est_rate	Fin_rev	Fin_rate	Fra_rev	Fra_rate	Ger_rev	Ger_rate
1995	30.51	34	57.15	40	3.81	25	1.39	26	25.18	25	246.19	36.7	198.13	56.8
1996	41.44	34	65.69	40	4.30	25	0.95	26	31.80	28	287.64	36.7	257.63	56.7
1997	45.09	34	72.40	40	4.38	25	1.19	26	41.93	28	327.45	41.7	259.80	56.7
1998	48.97	34	88.12	40	5.13	25	1.76	26	54.64	28	346.76	41.7	280.00	56
1999	42.39	34	87.19	40	6.52	25	1.41	26	56.84	28	407.32	40	234.21	51.6
2000	48.99	34	89.79	40	7.15	29	0.70	26	81.50	29	443.32	37.8	248.61	51.6
2001	73.56	34	88.02	40	7.44	28	0.58	26	59.24	29	494.26	36.4	-4.44	38.3
2002	55.06	34	86.82	40	7.35	28	0.99	26	60.03	29	416.93	35.4	29.45	38.3
2003	53.96	34	82.73	34	5.39	15	1.53	26	49.99	29	352.76	35.4	84.15	39.6
2004	57.21	34	92.05	34	4.82	15	1.71	26	53.82	29	396.97	35.4	132.04	38.3
2005	56.95	25	98.16	34	6.25	10	1.60	24	52.48	26	398.85	35	163.33	38.7
2006	58.53	25	111.12	34	7.64	10	1.84	23	55.68	26	512.41	34.4	228.27	38.7
2007	68.02	25	112.26	34	9.96	10	2.15	22	67.03	26	521.59	34.4	224.91	38.7
2008	70.64	25	108.42	34	10.78	10	2.08	21	60.52	26	492.51	34.4	154.45	29.8
2009	47.62	25	78.78	34	9.70	10	2.00	21	32.20	26	219.22	34.4	69.01	29.8
2010	53.34	25	86.88	34	9.33	10	1.51	21	41.88	26	336.50	34.4	114.65	29.8
2011	62.71	25	97.92	34	10.42	10	1.52	21	46.09	26	411.28	34.4	147.05	29.8

Notes:

Aus_rev – Austria Tax Revenues

Aus_rate – Austria Tax Rate

Bel_rev – Belgium Tax Revenues

Bel_rate – Belgium Tax Rate

Cyp_rev – Cyprus Tax Revenues

Cyp_rate – Cyprus Tax Rate

Fin_rev – Finland Tax Revenues

Fin_rate – Finland Tax Rate

Fra_rev – France Tax Revenues

Fra_rate – France Tax Rate

Ger_rev – Germany Tax Revenues

Ger_rate – Germany Tax Rate

Years/Country	Gre_rev	Gre_rate	Ire_rev	Ire_rate	Ita_rev	Ita_rate	Lat_rev	Lat_rate	Lux_rev	Lux_rate	Mal_rev	Mal_rate	Net_rev	Net_rate
1995	20.40	40	21.32	40	149.65	52.2	0.84	25	7.91	40.9	0.86	35	122.19	35
1996	21.68	40	26.50	38	178.72	53.2	0.89	25	8.27	40.9	0.69	35	159.41	35
1997	24.88	40	30.38	36	249.68	53.2	1.14	25	10.21	39.3	0.95	35	182.30	35
1998	38.46	40	34.76	32	229.74	41.3	1.25	25	11.20	37.5	0.84	35	186.53	35
1999	47.72	40	44.05	28	334.45	41.3	1.17	25	10.50	37.5	1.08	35	187.47	35
2000	65.93	40	47.21	24	303.38	41.3	0.95	25	11.90	37.5	1.42	35	192.53	35
2001	55.16	37.5	47.52	20	324.03	40.3	1.24	25	13.08	37.5	1.30	35	192.43	35
2002	58.10	35	52.21	16	287.82	40.3	1.41	22	15.12	30.4	1.34	35	162.29	34.5
2003	52.99	35	54.02	12.5	257.11	38.3	1.15	19	13.75	30.4	1.68	35	138.18	34.5
2004	57.03	35	54.61	12.5	243.95	37.3	1.43	15	11.19	30.4	1.31	35	153.58	34.5
2005	63.93	32	55.03	12.5	303.29	37.3	1.81	15	12.42	30.4	1.46	35	170.69	31.5
2006	55.44	29	64.70	12.5	358.13	37.3	2.29	15	10.79	29.6	1.66	35	175.96	29.6
2007	53.79	25	60.81	12.5	451.06	37.3	2.99	15	12.47	29.6	2.44	35	178.99	25.5
2008	52.92	35	49.66	12.5	408.26	31.4	3.39	15	12.32	29.6	2.71	35	177.73	25.5
2009	50.08	35	39.60	12.5	308.96	31.4	1.38	15	12.77	28.6	2.72	35	109.51	25.5
2010	47.38	24	40.78	12.5	318.32	31.4	0.84	15	13.70	28.6	2.76	35	119.65	25.5
2011	37.77	20	38.54	12.5	315.55	31.4	1.28	15	11.01	28.8	2.76	35	114.85	25

Notes:

Gre_rev – Greece Tax Revenues

Gre_rate – Greece Tax Rate

Ire_rev – Ireland Tax Revenues

Ire_rate – Ireland Tax Rate

Ita_rev – Italy Tax Revenues

Ita_rate – Italy Tax Rate

Lat_rev – Latvia Tax Revenues

Lat_rate – Latvia Tax Rate

Lux_rev – Luxembourg Tax Revenues

Lux_rate – Luxembourg Tax Rate

Mal_rev – Malta Tax Revenues

Mal_rate – Malta Tax Rate

Net_rev – Netherlands Tax Revenues

Net_rate – Netherlands Tax Rate

Years/Country	Por_rev	Por_rate	SloR_rev	SloR_rate	Slo_rev	Slo_rate	Spa_rev	Spa_rate
1995	25.85	39.6	19.81	40	1.01	25	119.27	35
1996	31.21	39.6	15.11	40	1.82	25	130.75	35
1997	37.68	39.6	13.38	40	2.16	25	182.21	35
1998	39.09	37.4	12.39	40	2.17	25	179.29	35
1999	46.47	37.4	11.87	40	2.67	25	215.19	35
2000	51.83	35.2	10.12	29	2.79	25	242.79	35
2001	45.44	35.2	10.42	29	3.11	25	231.19	35
2002	46.71	33	10.57	25	4.02	25	268.71	35
2003	39.07	33	12.12	25	4.59	25	266.35	35
2004	39.98	27.5	12.00	19	5.32	25	303.83	35
2005	38.45	27.5	13.45	19	7.95	25	356.77	35
2006	43.05	27.5	15.53	19	9.01	25	398.57	35
2007	54.50	26.5	17.63	19	10.49	23	466.59	32.5
2008	56.13	26.5	19.50	19	8.43	22	287.15	30
2009	41.59	26.5	14.90	19	5.70	21	221.78	30
2010	42.60	29	15.61	19	5.89	20	176.14	30
2011	48.22	29	15.42	19	5.32	20	180.00	30

Notes:

Por_rev – Portugal Tax Revenues

Por_rate – Portugal Tax Rate

SloR_rev – Slovak Republic Tax Revenues

SloR_rate – Slovak Republic Tax Rate

Slo_rev – Slovenia Tax Revenues

Slo_rate – Slovenia Tax Rate

Spa_rev – Spain Tax Revenues

Spa_rate – Spain Tax Rate

Appendix C – Real Revenues and Tax Rate for the Individual Income Tax

Years/Country	Aus_rev	Aus_rate	Bel_rev	Bel_rate	Cyp_rev	Cyp_rate	Est_rev	Est_rate	Fin_rev	Fin_rate	Fra_rev	Fra_rate	Ger_rev	Ger_rate
1995	179.40	50	328.32	60.6	3.57	40	4.84	26	155.26	62.2	728.65	59.1	1599.52	57
1996	193.86	50	324.14	60.6	2.91	40	4.64	26	174.29	61.2	768.65	59.6	1559.64	57
1997	211.01	50	342.03	60.6	3.12	40	5.06	26	171.66	59.5	838.50	57.7	1563.56	57
1998	219.48	50	348.93	60.6	3.79	40	5.73	26	175.43	57.8	1182.99	59	1585.36	55.9
1999	227.29	50	352.62	60.6	3.87	40	5.62	26	177.20	55.6	1259.25	59	1622.33	55.9
2000	226.60	50	371.30	60.6	3.60	40	5.41	26	199.95	54	1328.13	59	1639.43	53.8
2001	244.52	50	383.19	60.1	4.21	40	5.47	26	199.27	53.5	1330.94	58.3	1587.08	51.2
2002	241.84	50	382.73	56.4	4.69	40	5.75	26	201.09	52.5	1292.38	57.8	1577.33	51.2
2003	242.21	50	377.09	53.7	4.77	30	6.24	26	200.93	52.2	1308.73	54.8	1570.49	51.2
2004	241.40	50	385.28	53.7	3.61	30	6.45	26	202.70	52.1	1332.08	53.4	1468.42	47.5
2005	233.74	50	391.56	53.7	4.21	30	6.22	24	212.11	51	1387.97	53.5	1432.10	44.3
2006	244.16	50	385.91	53.7	4.44	30	6.86	23	218.53	50.9	1388.11	45.8	1476.19	44.3
2007	259.53	50	391.27	53.7	4.73	30	7.71	22	225.26	50.5	1366.23	45.8	1542.56	47.5
2008	278.68	50	407.13	53.7	4.93	30	7.90	21	230.01	50.1	1408.79	45.8	1630.58	47.5
2009	255.05	50	381.81	53.7	5.25	30	6.15	21	212.09	49.1	1323.69	45.8	1563.95	47.5
2010	255.97	50	396.67	53.7	5.51	30	6.04	21	207.08	49	1339.36	45.8	1493.29	47.5
2011	263.58	50	407.87	53.7	5.78	30	6.39	21	216.26	49.2	1417.58	46.7	1584.71	47.5

Notes:

Aus_rev – Austria Tax Revenues

Aus_rate – Austria Tax Rate

Bel_rev – Belgium Tax Revenues

Bel_rate – Belgium Tax Rate

Cyp_rev – Cyprus Tax Revenues

Cyp_rate – Cyprus Tax Rate

Fin_rev – Finland Tax Revenues

Fin_rate – Finland Tax Rate

Fra_rev – France Tax Revenues

Fra_rate – France Tax Rate

Ger_rev – Germany Tax Revenues

Ger_rate – Germany Tax Rate

Years/Country	Gre_rev	Gre_rate	Ire_rev	Ire_rate	Ita_rev	Ita_rate	Lat_rev	Lat_rate	Lux_rev	Lux_rate	Mal_rev	Mal_rate	Net_rev	Net_rate
1995	49.14	45	79.66	48	1087.05	51	2.46	25	15.16	51.3	1.59	35	303.96	60
1996	50.59	45	88.10	48	1121.04	51	2.49	25	15.60	51.3	1.39	35	293.64	60
1997	57.62	45	96.68	48	1189.85	51	2.84	25	16.43	51.3	1.78	35	268.16	60
1998	72.51	45	100.77	46	1295.58	46	3.09	25	16.22	47.2	1.62	35	269.53	60
1999	78.37	45	104.78	46	1369.49	46	3.22	25	16.82	47.2	1.99	35	279.02	60
2000	79.77	45	109.30	44	1350.80	45.9	3.40	25	18.17	47.2	1.92	35	288.26	60
2001	75.20	42.5	108.04	42	1395.18	45.9	3.62	25	18.33	43.1	2.32	35	303.15	52
2002	78.30	40	100.48	42	1376.78	46.1	3.94	25	17.27	39	2.51	35	335.85	52
2003	79.34	40	99.31	42	1378.19	46.1	4.39	25	18.04	39	2.55	35	321.78	52
2004	84.60	40	113.25	42	1391.80	46.1	4.87	25	19.13	39	2.67	35	301.87	52
2005	90.43	40	117.97	42	1412.59	44.1	5.16	25	21.62	39	2.81	35	338.20	52
2006	94.48	40	123.48	42	1484.28	44.1	6.04	25	23.84	39	2.97	35	368.47	52
2007	101.75	40	132.93	41	1563.34	44.9	6.75	25	24.18	39	2.60	35	407.13	52
2008	101.30	40	132.81	41	1603.11	44.9	6.81	25	27.31	39	2.64	35	404.79	52
2009	101.16	40	123.95	41	1526.05	44.9	4.78	23	26.02	39	3.02	35	462.67	52
2010	86.07	49	120.21	41	1586.64	45.2	5.32	26	26.28	39	2.93	35	465.51	52
2011	85.37	49	147.16	41	1558.47	47.3	5.11	25	28.10	42.1	3.10	35	447.70	52

Notes:

Gre_rev – Greece Tax Revenues

Gre_rate – Greece Tax Rate

Ire_rev – Ireland Tax Revenues

Ire_rate – Ireland Tax Rate

Ita_rev – Italy Tax Revenues

Ita_rate – Italy Tax Rate

Lat_rev – Latvia Tax Revenues

Lat_rate – Latvia Tax Rate

Lux_rev – Luxembourg Tax Revenues

Lux_rate – Luxembourg Tax Rate

Mal_rev – Malta Tax Revenues

Mal_rate – Malta Tax Rate

Net_rev – Netherlands Tax Revenues

Net_rate – Netherlands Tax Rate

Years/Country	Por_rev	Por_rate	SloR_rev	SloR_rate	Slo_rev	Slo_rate	Spa_rev	Spa_rate
1995	62.91	40	11.82	42	11.34	50	489.17	56
1996	68.23	40	13.95	42	11.93	50	512.81	56
1997	67.43	40	15.94	42	12.41	50	479.06	56
1998	69.11	40	16.65	42	12.20	50	502.59	56
1999	72.48	40	16.45	42	12.78	50	498.38	48
2000	78.73	40	13.13	42	13.45	50	517.25	48
2001	81.05	40	14.14	42	14.15	50	546.40	48
2002	79.11	40	13.75	38	14.63	50	579.43	48
2003	78.37	40	14.13	38	15.09	50	546.95	45
2004	76.88	40	12.37	19	15.82	50	571.14	45
2005	79.37	40	13.01	19	15.83	50	608.39	45
2006	82.25	42	13.39	19	17.45	50	680.16	45
2007	87.84	42	15.06	19	18.01	41	765.98	43
2008	89.43	42	17.11	19	19.66	41	726.58	43
2009	88.91	42	14.41	19	18.02	41	671.28	43
2010	88.32	45.9	14.23	19	17.81	41	701.67	43
2011	96.21	50	16.11	19	17.61	41	716.99	45

Notes:

Por_rev – Portugal Tax Revenues

Por_rate – Portugal Tax Rate

SloR_rev – Slovak Republic Tax Revenues

SloR_rate – Slovak Republic Tax Rate

Slo_rev – Slovenia Tax Revenues

Slo_rate – Slovenia Tax Rate

Spa_rev – Spain Tax Revenues

Spa_rate – Spain Tax Rate

Appendix D – Nominal Revenues and Tax Rate for the VAT

Years/Country	Aus_rev	Aus_rate	Bel_rev	Bel_rate	Cyp_rev	Cyp_rate	Est_rev	Est_rate	Fin_rev	Fin_rate	Fra_rev	Fra_rate	Ger_rev	Ger_rate
2000	16839.55	20	18129.70	21	532.20	10	520.30	18	10394.53	22	107163.00	19.6	140020.00	16
2001	17250.93	20	17817.40	21	606.10	10	568.30	18	10690.35	22	108581.00	19.6	139090.00	16
2002	17972.01	20	18591.00	21	723.20	13	650.50	18	11390.95	22	110413.00	19.6	136780.00	16
2003	17892.88	20	18730.40	21	912.30	15	712.10	18	12137.00	22	113622.00	19.6	137190.00	16
2004	18589.69	20	20121.70	21	1047.30	15	743.80	18	12745.00	22	120224.00	19.6	137430.00	16
2005	19413.49	20	21362.40	21	1224.00	15	969.90	18	13444.00	22	126625.00	19.6	139810.00	16
2006	19735.35	20	22568.80	21	1395.90	15	1214.80	18	14172.00	22	131693.00	19.6	147140.00	16
2007	20969.50	20	23907.80	21	1620.40	15	1423.20	18	14793.00	22	136541.80	19.6	170080.00	19
2008	21934.70	20	24126.10	21	1816.20	15	1287.80	18	15264.00	22	137736.00	19.6	175870.00	19
2009	22157.98	20	23600.10	21	1545.60	15	1224.00	20	14714.00	22	130303.00	19.6	177680.00	19
2010	22735.31	20	25229.50	21	1597.40	15	1257.20	20	15023.00	23	135579.00	19.6	180220.00	19
2011	23446.90	20	26020.60	21	1516.90	15	1363.00	20	16654.00	23	140506.00	19.6	189920.00	19

Notes:

Aus_rev – Austria Tax Revenues

Aus_rate – Austria Tax Rate

Bel_rev – Belgium Tax Revenues

Bel_rate – Belgium Tax Rate

Cyp_rev – Cyprus Tax Revenues

Cyp_rate – Cyprus Tax Rate

Fin_rev – Finland Tax Revenues

Fin_rate – Finland Tax Rate

Fra_rev – France Tax Revenues

Fra_rate – France Tax Rate

Ger_rev – Germany Tax Revenues

Ger_rate – Germany Tax Rate

Years/Country	Gre_rev	Gre_rate	Ire_rev	Ire_rate	Ita_rev	Ita_rate	Lat_rev	Lat_rate	Lux_rev	Lux_rate	Mal_rev	Mal_rate	Net_rev	Net_rate
2000	9824.00	18	7656.52	21	77473.00	20	334.72	18	1234.00	15	235.76	15	28849.00	17.5
2001	10960.00	18	7998.61	20	78056.00	20	350.83	18	1313.50	15	258.50	15	32509.00	19
2002	11969.00	18	9167.98	21	80382.00	20	383.92	18	1382.85	15	273.14	15	33493.00	19
2003	12043.00	18	9814.40	21	79099.00	20	461.14	18	1467.02	15	288.16	15	34754.00	19
2004	12573.00	18	10947.31	21	81515.00	20	518.47	18	1661.82	15	332.61	18	35811.00	19
2005	13398.00	19	12363.97	21	85317.00	20	703.98	18	1862.71	15	397.42	18	36950.00	19
2006	14910.00	19	13801.62	21	92992.00	20	956.30	18	1958.92	15	409.80	18	39888.00	19
2007	16611.00	19	14333.82	21	95623.00	20	1213.44	18	2156.00	15	419.96	18	42873.00	19
2008	17020.00	19	13102.12	21	93698.00	20	1080.79	18	2350.90	15	458.44	18	43221.00	19
2009	14914.00	19	10337.75	21.5	86544.00	20	782.78	18	2418.71	15	456.82	18	40086.00	19
2010	16308.00	23	10055.98	21	97586.00	20	844.92	19	2503.37	15	477.06	18	42654.00	19
2011	15027.00	23	9781.78	21	98557.00	20	965.88	21	2690.31	15	519.85	18	41610.00	19

Notes:

Gre_rev – Greece Tax Revenues

Gre_rate – Greece Tax Rate

Ire_rev – Ireland Tax Revenues

Ire_rate – Ireland Tax Rate

Ita_rev – Italy Tax Revenues

Ita_rate – Italy Tax Rate

Lat_rev – Latvia Tax Revenues

Lat_rate – Latvia Tax Rate

Lux_rev – Luxembourg Tax Revenues

Lux_rate – Luxembourg Tax Rate

Mal_rev – Malta Tax Revenues

Mal_rate – Malta Tax Rate

Net_rev – Netherlands Tax Revenues

Net_rate – Netherlands Tax Rate

Years/Country	Por_rev	Por_rate	SloR_rev	SloR_rate	Slo_rev	Slo_rate	Spa_rev	Spa_rate
2000	9733.50	17	2167.63	23	1598.86	19	38159.00	16
2001	10021.35	17	2454.26	23	1717.74	19	39831.00	16
2002	10668.12	19	2581.82	23	1981.47	20	41648.00	16
2003	11075.87	19	3031.37	20	2140.44	20	46030.00	16
2004	11568.71	19	3506.94	19	2311.42	20	50795.00	16
2005	13000.96	21	3879.71	19	2472.15	20	58213.00	16
2006	13763.61	21	4103.73	19	2647.15	20	63273.00	16
2007	14333.38	21	4147.08	19	2922.60	20	61713.00	16
2008	14423.97	20	4621.42	19	3165.24	20	54280.00	16
2009	11971.20	20	4221.29	19	2990.80	20	42669.00	16
2010	13517.31	21	4182.10	19	3045.26	20	57992.00	18
2011	14234.73	23	4710.91	20	3049.19	20	56547.00	18

Notes:

Por_rev – Portugal Tax Revenues

Por_rate – Portugal Tax Rate

SloR_rev – Slovak Republic Tax Revenues

SloR_rate – Slovak Republic Tax Rate

Slo_rev – Slovenia Tax Revenues

Slo_rate – Slovenia Tax Rate

Spa_rev – Spain Tax Revenues

Spa_rate – Spain Tax Rate

Appendix E – Nominal Revenues and Tax Rate for the Corporate Income Tax

Years/Country	Aus_rev	Aus_rate	Bel_rev	Bel_rate	Cyp_rev	Cyp_rate	Est_rev	Est_rate	Fin_rev	Fin_rate	Fra_rev	Fra_rate	Ger_rev	Ger_rate
1995	2759.71	34	4879.80	40.2	284.10	25	67.10	26	2212.15	25	21222.00	36.7	18600.00	56.8
1996	3778.70	34	5629.80	40.2	328.20	25	56.90	26	2783.74	28	25158.00	36.7	24340.00	56.7
1997	4102.73	34	6258.60	40.2	341.80	25	78.50	26	3743.02	28	28901.00	41.7	24610.00	56.7
1998	4469.85	34	7760.00	40.2	413.10	25	122.30	26	5044.77	28	30922.00	41.7	26680.00	56
1999	3880.50	34	7702.30	40.2	538.80	25	104.50	26	5296.34	28	36387.00	40	22359.00	51.6
2000	4525.58	34	8088.90	40.2	609.60	29	54.60	26	7792.35	29	40226.00	37.8	23575.00	51.6
2001	6923.03	34	8091.40	40.2	659.80	28	47.80	26	5835.21	29	45751.00	36.4	-426.00	38.3
2002	5246.72	34	8141.60	40.2	658.40	28	86.20	26	5988.00	29	39449.00	35.4	2864.00	38.3
2003	5200.24	34	7911.60	34	506.10	15	137.80	26	4952.00	29	34044.00	35.4	8275.00	39.6
2004	5607.00	34	8991.40	34	468.10	15	161.20	26	5357.00	29	38952.00	35.4	13123.00	38.3
2005	5695.23	25	9815.80	34	624.80	10	159.50	24	5248.00	26	39885.00	35	16333.00	38.7
2006	5963.71	25	11372.20	34	790.00	10	199.60	23	5615.00	26	52338.00	34.4	22898.00	38.7
2007	7069.37	25	11762.50	34	1074.50	10	261.00	22	6962.00	26	54654.00	34.4	22929.00	38.7
2008	7467.54	25	11602.50	34	1217.80	10	266.30	21	6471.00	26	52919.00	34.4	15868.00	29.8
2009	5113.86	25	8530.80	34	1095.90	10	256.30	21	3494.00	26	23723.00	34.4	7173.00	29.8
2010	5810.43	25	9601.20	34	1075.00	10	193.80	21	4559.00	26	36765.00	34.4	12041.00	29.8
2011	6970.55	25	11037.20	34	1228.10	10	201.10	21	5153.00	26	45513.00	34.4	15634.00	29.8

Notes:

Aus_rev – Austria Tax Revenues

Cyp_rate – Cyprus Tax Rate

Ger_rev – Germany Tax Revenues

Aus_rate – Austria Tax Rate

Fin_rev – Finland Tax Revenues

Ger_rate – Germany Tax Rate

Bel_rev – Belgium Tax Revenues

Fin_rate – Finland Tax Rate

Bel_rate – Belgium Tax Rate

Fra_rev – France Tax Revenues

Cyp_rev – Cyprus Tax Revenues

Fra_rate – France Tax Rate

Years/Country	Gre_rev	Gre_rate	Ire_rev	Ire_rate	Ita_rev	Ita_rate	Lat_rev	Lat_rate	Lux_rev	Lux_rate	Mal_rev	Mal_rate	Net_rev	Net_rate
1995	1354.00	40	1458.15	40	11449.00	52.2	47.54	25	633.30	40.9	71.09	35	9459.00	35
1996	1545.00	40	1813.46	38	14329.00	53.2	57.29	25	682.50	40.9	57.39	35	12500.00	35
1997	1893.00	40	2154.92	36	20532.00	53.2	78.64	25	826.70	39.3	79.54	35	14673.00	35
1998	3078.00	40	2614.28	32	19395.00	41.3	91.35	25	903.00	37.5	71.70	35	15300.00	35
1999	3935.00	40	3442.37	28	28741.00	41.3	86.84	25	891.70	37.5	93.32	35	15651.00	35
2000	5622.00	40	3885.27	24	26578.00	41.3	73.72	25	1030.60	37.5	126.58	35	16736.00	35
2001	4850.00	37.5	4143.90	20	29204.00	40.3	98.42	25	1133.70	37.5	118.57	35	17580.00	35
2002	5282.00	35	4803.75	16	26773.00	40.3	115.25	22	1337.71	30.4	125.01	35	15394.00	34.5
2003	5007.00	35	5155.45	12.50	24662.00	38.3	97.11	19	1288.59	30.4	161.59	35	13392.00	34.5
2004	5547.00	35	5335.00	12.50	23960.00	37.3	130.11	15	1068.30	30.4	128.05	35	14994.00	34.5
2005	6393.00	32	5503.24	12.50	30329.00	37.3	181.16	15	1241.53	30.4	146.35	35	17069.00	31.5
2006	5678.00	29	6685.00	12.50	36425.00	37.3	255.27	15	1151.90	29.6	170.73	35	17907.00	29.6
2007	5692.00	25	6393.00	12.50	46965.00	37.3	400.74	15	1381.00	29.6	257.99	35	18552.00	25.5
2008	5864.00	35	5071.46	12.50	43586.00	31.4	510.84	15	1370.30	29.6	294.70	35	18814.00	25.5
2009	5678.00	35	3889.00	12.50	33674.00	31.4	205.19	15	1431.43	28.6	304.73	35	11604.00	25.5
2010	5432.00	24	3944.00	12.50	34828.00	31.4	123.34	15	1645.98	28.6	321.17	35	12782.00	25.5
2011	4376.00	20	3751.38	12.50	34992.00	31.4	200.00	15	1378.04	28.8	328.10	35	12409.00	25

Notes:

Gre_rev – Greece Tax Revenues

Gre_rate – Greece Tax Rate

Ire_rev – Ireland Tax Revenues

Ire_rate – Ireland Tax Rate

Ita_rev – Italy Tax Revenues

Ita_rate – Italy Tax Rate

Lat_rev – Latvia Tax Revenues

Lat_rate – Latvia Tax Rate

Lux_rev – Luxembourg Tax Revenues

Lux_rate – Luxembourg Tax Rate

Mal_rev – Malta Tax Revenues

Mal_rate – Malta Tax Rate

Net_rev – Netherlands Tax Revenues

Net_rate – Netherlands Tax Rate

Years/Country	Por_rev	Por_rate	SloR_rev	SloR_rate	Slo_rev	Slo_rate	Spa_rev	Spa_rate
1995	1887.78	39.6	1165.51	40	53.80	25	8417.00	35
1996	2333.27	39.6	926.61	40	108.05	25	9546.00	35
1997	2927.08	39.6	871.04	40	138.89	25	13621.00	35
1998	3152.23	37.4	847.54	40	149.64	25	13735.00	35
1999	3870.30	37.4	871.37	40	195.84	25	16918.00	35
2000	4457.20	35.2	813.05	29	215.68	25	19747.00	35
2001	4047.55	35.2	878.61	29	261.03	25	19592.00	35
2002	4316.58	33.0	926.11	25	362.83	25	23763.00	35
2003	3718.55	33.0	1118.24	25	437.08	25	24534.00	35
2004	3899.31	27.5	1171.94	19	522.89	25	29118.00	35
2005	3844.83	27.5	1344.52	19	794.51	25	35677.00	35
2006	4424.32	27.5	1599.05	19	920.01	25	41507.00	35
2007	5760.09	26.5	1835.46	19	1116.33	23	50179.00	32.5
2008	6026.05	26.5	2087.47	19	933.47	22	31615.00	30
2009	4506.57	26.5	1576.97	19	652.03	21	24436.00	30
2010	4644.42	29	1659.23	19	666.58	20	19423.00	30
2011	5270.50	29	1665.95	19	609.60	20	19852.00	30

Notes:

Por_rev – Portugal Tax Revenues

Por_rate – Portugal Tax Rate

SloR_rev – Slovak Republic Tax Revenues

SloR_rate – Slovak Republic Tax Rate

Slo_rev – Slovenia Tax Revenues

Slo_rate – Slovenia Tax Rate

Spa_rev – Spain Tax Revenues

Spa_rate – Spain Tax Rate

Appendix F – Nominal Revenues and Tax Rate for the Individual Income Tax

Years/Country	Aus_rev	Aus_rate	Bel_rev	Bel_rate	Cyp_rev	Cyp_rate	Est_rev	Est_rate	Fin_rev	Fin_rate	Fra_rev	Fra_rate	Ger_rev	Ger_rate
1995	16228.43	50	28031.30	60.6	266.50	40	233.80	26	13639.20	62.2	62812.00	59.1	150160.00	57
1996	17679.13	50	27777.50	60.6	222.10	40	278.20	26	15255.69	61.2	67228.00	59.6	147350.00	57
1997	19200.82	50	29566.60	60.6	243.50	40	334.90	26	15324.64	59.5	74007.00	57.7	148110.00	57
1998	20035.09	50	30727.10	60.6	304.80	40	398.40	26	16195.36	57.8	105493.00	59	151060.00	55.9
1999	20806.97	50	31149.00	60.6	320.00	40	417.50	26	16511.50	55.6	112492.00	59	154880.00	55.9
2000	20935.01	50	33447.90	60.6	307.10	40	421.40	26	19118.21	54	120511.00	59	155460.00	53.8
2001	23013.25	50	35227.50	60.1	373.00	40	453.70	26	19626.96	53.5	123198.00	58.3	152190.00	51.2
2002	23043.04	50	35891.00	56.4	420.60	40	498.90	26	20057.70	52.5	122282.00	57.8	153420.00	51.2
2003	23343.85	50	36063.30	53.7	448.00	30	563.60	26	19905.00	52.2	126303.00	54.8	154430.00	51.2
2004	23657.29	50	37633.40	53.7	350.60	30	608.10	26	20177.00	52.1	130709.00	53.4	145940.00	47.5
2005	23374.05	50	39156.10	53.7	420.50	30	622.20	24	21211.00	51	138797.00	53.5	143210.00	44.3
2006	24875.77	50	39496.10	53.7	458.70	30	746.40	23	22038.00	50.9	141783.00	45.8	148080.00	44.3
2007	26972.12	50	40995.70	53.7	510.50	30	935.70	22	23396.00	50.5	143158.00	45.8	157260.00	47.5
2008	29461.38	50	43569.10	53.7	557.10	30	1010.90	21	24593.00	50.1	151370.00	45.8	167520.00	47.5
2009	27388.42	50	41344.50	53.7	593.90	30	788.60	21	23011.00	49.1	143245.00	45.8	162570.00	47.5
2010	27883.65	50	43836.10	53.7	634.80	30	776.40	21	22545.00	49	146333.00	45.8	156830.00	47.5
2011	29299.08	50	45973.50	53.7	680.70	30	845.80	21	24181.00	49.2	156871.26	46.7	168480.00	47.5

Notes:

Aus_rev – Austria Tax Revenues

Aus_rate – Austria Tax Rate

Bel_rev – Belgium Tax Revenues

Bel_rate – Belgium Tax Rate

Cyp_rev – Cyprus Tax Revenues

Cyp_rate – Cyprus Tax Rate

Fin_rev – Finland Tax Revenues

Fin_rate – Finland Tax Rate

Fra_rev – France Tax Revenues

Fra_rate – France Tax Rate

Ger_rev – Germany Tax Revenues

Ger_rate – Germany Tax Rate

Years/Country	Gre_rev	Gre_rate	Ire_rev	Ire_rate	Ita_rev	Ita_rate	Lat_rev	Lat_rate	Lux_rev	Lux_rate	Mal_rev	Mal_rate	Net_rev	Net_rate
1995	3262.00	45	5448.41	48	83167.00	51	138.73	25	1214.10	51.3	130.54	35	23530.00	60
1996	3605.00	45	6027.96	48	89882.00	51	160.73	25	1286.40	51.3	115.11	35	23026.00	60
1997	4384.00	45	6857.51	48	97844.00	51	195.46	25	1329.70	51.3	149.16	35	21583.00	60
1998	5804.00	45	7578.74	46	109375.00	46	225.53	25	1307.40	47.2	137.98	35	22108.00	60
1999	6463.00	45	8187.52	46	117688.00	46	240.15	25	1428.20	47.2	171.54	35	23294.00	60
2000	6802.00	45	8994.92	44	118340.00	45.9	263.95	25	1573.40	47.2	170.70	35	25057.00	60
2001	6612.00	42.5	9421.68	42	125745.00	45.9	287.24	25	1588.50	43.1	211.07	35	27695.00	52
2002	7119.00	40	9244.87	42	128068.00	46.1	321.89	25	1528.43	39	234.29	35	31856.00	52
2003	7496.00	40	9477.04	42	132197.00	46.1	372.32	25	1690.14	39	245.41	35	31187.00	52
2004	8229.00	40	11064.75	42	136696.00	46.1	442.04	25	1825.40	39	261.03	35	29471.00	52
2005	9043.00	40	11796.70	42	141259.00	44.1	515.72	25	2161.52	39	281.21	35	33820.00	52
2006	9677.00	40	12757.81	42	150963.00	44.1	673.28	25	2545.89	39	305.46	35	37498.00	52
2007	10767.00	40	13973.99	41	162778.00	44.9	904.18	25	2678.00	39	274.89	35	42199.00	52
2008	11226.00	40	13562.34	41	171147.00	44.9	1025.18	25	3036.36	39	287.73	35	42849.00	52
2009	11469.00	40	12172.80	41	166324.00	44.9	709.98	23	2916.57	39	338.05	35	49024.00	52
2010	9868.00	49	11624.62	41	173599.00	45.2	784.53	26	3156.77	39	341.48	35	49731.00	52
2011	9891.00	49	14326.13	41	172823.00	47.3	798.89	25	3516.87	42.1	368.88	35	48370.43	52

Notes:

Gre_rev – Greece Tax Revenues

Gre_rate – Greece Tax Rate

Ire_rev – Ireland Tax Revenues

Ire_rate – Ireland Tax Rate

Ita_rev – Italy Tax Revenues

Ita_rate – Italy Tax Rate

Lat_rev – Latvia Tax Revenues

Lat_rate – Latvia Tax Rate

Lux_rev – Luxembourg Tax Revenues

Lux_rate – Luxembourg Tax Rate

Mal_rev – Malta Tax Revenues

Mal_rate – Malta Tax Rate

Net_rev – Netherlands Tax Revenues

Net_rate – Netherlands Tax Rate

Years/Country	Por_rev	Por_rate	SloR_rev	SloR_rate	Slo_rev	Slo_rate	Spa_rev	Spa_rate
1995	4595.16	40	695.28	42	603.98	50	34521.00	56
1996	5100.60	40	855.08	42	707.21	50	37441.00	56
1997	5238.51	40	1037.24	42	798.25	50	35811.00	56
1998	5572.29	40	1138.19	42	840.34	50	38502.00	56
1999	6037.41	40	1207.83	42	938.15	50	39182.00	48
2000	6770.81	40	1054.50	42	1038.72	50	42070.00	48
2001	7219.81	40	1193.16	42	1186.92	50	46304.00	48
2002	7310.04	40	1204.57	38	1320.34	50	51240.00	48
2003	7459.47	40	1303.89	38	1437.04	50	50381.00	45
2004	7499.15	40	1207.99	19	1555.76	50	54736.00	45
2005	7937.41	40	1301.07	19	1582.57	50	60839.00	45
2006	8454.09	42	1377.95	19	1782.09	50	70832.00	45
2007	9283.83	42	1567.25	19	1916.27	41	82376.00	43
2008	9601.80	42	1832.24	19	2177.53	41	79995.00	43
2009	9633.70	42	1524.29	19	2062.78	41	73962.00	43
2010	9629.35	45.9	1513.42	19	2016.82	41	77373.00	43
2011	10516.38	50	1741.38	19	2017.11	41	79076.00	45

Notes:

Por_rev – Portugal Tax Revenues

Por_rate – Portugal Tax Rate

SloR_rev – Slovak Republic Tax Revenues

SloR_rate – Slovak Republic Tax Rate

Slo_rev – Slovenia Tax Revenues

Slo_rate – Slovenia Tax Rate

Spa_rev – Spain Tax Revenues