International Journal of Business and Industrial Marketing
2018; 3(1): 8-27
http://www.aascit.org/journal/ijbim
ISSN: 2381-117X (Print); ISSN: 2381-1188 (Online)

AASCIT American Association for Science and Technology

The Effects of Tax Evasion on the European Union Economy

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Citation

Aušrinė Stankevičiūtė. The Effects of Tax Evasion on the European Union Economy. *International Journal of Business and Industrial Marketing.* Vol. 3, No. 1, 2018, pp. 8-27.

Received: July 31, 2017; **Accepted**: January 16, 2018; **Published**: February 12, 2018

Abstract: This empirical research stems from the European Commission's call to action to fight against tax fraud and Tax Evasion in the European Union. It aims to quantify and evaluate the overall monetary damage that Tax Evasion entails on the EU tax revenue streams. The sample size examined in the research process is comprised of the 28 current EU member states (in 2016) over the period of 12 years, ranging from 2003 to 2014. The methodology of this study utilizes shadow economy as a proxy for Tax Evasion and builds upon existing research in the field. This particular study focuses on addressing past trends in Tax Evasion by analyzing trend patterns in tax revenue losses. The data generated through model calculations exhibited an overall positive trend in Tax Evasion losses in the EU. Further hypothesis testing exposed specific EU countries with evasive tax payers that are sensitive or insensitive to EU membership, size of national tax rates and state of their country's economy. The empirical findings obtained in this research have reaffirmed the European Commission's distress regarding the negative effect of Tax Evasion on the EU economy and laid out a comprehensive quantitative groundwork for tax policy makers to make informed decisions in the future with the goal of reducing Tax Evasion losses in the EU and beyond.

Keywords: European Union, Financial Crime, Tax Fraud, Tax Evasion, Tax Revenue, Shadow Economy

1. Introduction

1.1. The Background

The European tax system is a highly complex economic and fiscal organism. The free flow of human capital, financial resources as well as goods and services among the EU member countries generates revenue and tax payables for EU tax payers. However, a number of them willingly function in the clandestine part of the economy known as the shadow economy. This is done in order to bypass the tax system and withhold a taxable portion of their income from the fiscal jurisdiction. Even though the shadow economy is a natural and normal part of every economy (despite its negative connotations), it directly affects the official economy by shaping the government's ability to accumulate tax revenue and finance its public expenditures in a debt-free way (Schneider *et al.*, 2015, p. 35).

Tax Evasion is one of the key observable symptoms of the shadow economy. Willingly evading mandatory tax liabilities is against the law in the EU as it is in the rest of the developed world, therefore it should be viewed and understood as a form of financial crime. Tax Evasion persists predominately because it is profitable for tax payers to evade taxes due to the alluring mix of high value and low risk outcomes (Schneider *et al.*, 2015, p. 40). Tax Evasion is defined in the relevant literature as: "the illegal non-payment or under-payment of taxes, usually resulting from the making of a false declaration or no declaration at all of taxes due to a relevant tax authority or a false claim for expenses to offset against income legally declared to a tax authority which might in either case result in legal penalties (that may be civil or criminal) if the perpetrator of the tax evasion is caught" (Murphy, 2012, p. 6). This specific definition is implied whenever the term "Tax Evasion" in used in the present research paper.

When a tax payer evades compulsory tax liability, the uncollected tax revenue contributes to the growing shortage in in the government's budget known as the *tax gap*, which is nothing more than the asymmetry between the legal tax revenue potential of a country and the actual tax revenue collected (Khwaja & Iyer, 2014, p. 3). Ideally, all financial activities within the economy would be documented, taxed and paid in full, however, the existence of the shadow economy means that a number of taxable transactions are able to escape the fiscal authorities and contribute to the widening of the tax gap, which is estimated to deprive the EU budgets of approximately 1 trillion Euro annually. Roughly

85% of the tax gap is created by Tax Evasion, making it by far the largest contributor to the shrinking tax revenue potential in the EU. The rest of the tax gap is attributed to tax avoidance, which is a practice of profiteering from existing loopholes in the tax system without the intention to deceive the tax authorities (Murphy, 2012, p. 2). This empirical study will only focus on the tax revenue losses created by Tax Evasion, as tax avoidance possess less of a threat to the EU economy due to its significantly lower contribution to the tax gap. It should, however, be noted that tax avoidance, although not illegal, is still considered to be an unethical practice because it shrinks the government's revenue potential (Murphy, 2012, p. 2 & 6).

1.2. Scope of the Problem

One of the most prominent and immediate consequences of Tax Evasion is the loss of tax revenue for the government. The trimmed government revenue resonates negatively with the annual budget as well as adversely impacts the state's ability to leverage its public expenditures (Raczkowski, 2014, p. 59). On a global scale, the losses that accumulate due to missing government revenue are enormous: 2010 data shows that Tax Evasion in 145 countries has pulled more than 2.7 trillion Euro out of the global economy (roughly 5,1% of the GDP of the 145 countries studied) (TJN, 2011, p. 3). In the European Union, the financial casualties attributed to Tax Evasion in 2009 were a little over 860 billion Euro (approximately 7% of the EU GDP that year) (Murphy, 2012, p. 11). These statistics clearly show that Tax Evasion is a major problem worldwide, which warrants the need for heightened awareness and due diligence to subdue it.

1.3. Relevance of the Topic

The subject of Tax Evasion in the EU has always been of great significance due to the fact that EU member states do not share a uniform fiscal policy. Indeed, the EU government has no jurisdiction over the tax rates of individual EU countries, their tax collection processes nor how the collected tax revenue is allocated within the economy[1]. Therefore close cooperation and coordination among EU member states towards reducing Tax Evasion is imperative. However, the preexisting structural differences in tax collection mechanisms create a wide range of problems for the member states as they labor to achieve some form of cohesion in an otherwise distinctly diverse European tax system. With so much fiscal friction caused by unrestrained cross-country trade, the tax administration in EU is underperforming and exposing areas of improvement in the present system. The apparent lack of an integrated supranational fiscal policy is at the center of the problem, contributing to the substandard communication between national tax authorities and poor results (Schneider *et al.,* 2015, p. 40).

1.4. Purpose of the Research

The purpose of this empirical study is to zoom in on the individual EU country data regarding Tax Evasion losses and then zoom out in order to identify the existing Tax Evasion trends within the wider European Union theme. The subject of Tax Evasion in the EU has been studied in the past, however there is a need for more expanded and comprehensive research using the latest data available. This research is specifically aimed at evaluating the national Tax Evasion trends for individual EU members and investigating the existence of correlations between Tax Evasion trends and important economic variables. The findings of this research are designed to serve as a quantitative basis for future research in the field as well as aid policy makers in their decision-making process as they seek a viable remedy.

1.5. Research Problem and Objectives

Research Problem: The main focus of this study is the sustainability of EU government revenue streams impeded by Tax Evasion.

Research Question: What is the relative size of the tax revenue losses that are accrued by the EU governments due to Tax Evasion and what are the existing trends of these losses?

Research Goal: To estimate the tax revenue losses caused by Tax Evasion in each of the 28 current EU member states for the period of 12 years, ranging from 2003 until 2014, and to analyze the overall trends and patterns hidden in the generated data.

Research Objectives: This study has 3 main research objectives. It seeks to:

1. Evaluate the overall tax revenue losses attributed to Tax Evasion in the EU.
2. Determine the existing Tax Evasion trends in the EU.
3. Determine the existence of correlations between Tax Evasion losses and important Economic variables.

2. Methods

2.1. Empirical Research Methods

Attempting to measure Tax Evasion losses poses a number of empirical and conceptual challenges to both past and present researchers (Slemrod & Yitzhaki, 2002, p. 1438-1439). It is largely a data-related complication, caused by the lack of transparent statistical reports from the tax authorities regarding the definitive monetary extent of Tax Evasion in the European Union. Ergo, the shadow economy frequently serves as a statistical proxy for Tax Evasion as it encompasses all deliberately unreported and untaxed economic transactions (Cartwright, 2014, p. 149). Indeed, it is the very act of evading mandatory tax liability that displaces the economic transaction from the official economy into the unofficial economy, making Tax Evasion a prerequisite for shadow economy and thus nearly perfectly synonymous (Schneider *et al.,* 2015, p. 35). Therefore, this research will utilize shadow economy statistics as a stand-in for Tax Evasion losses. This method is preferred until Tax Evasion data is made public by the European tax authorities so that more accurate estimations can be generated.

The statistical mechanism for Tax Evasion estimation utilized in this study is based on the previous research conducted by Murphy (2012). Based on Murphy's (2012, p. 10) research model which uses shadow economy as a proxy for Tax Evasion, the following two formulas can be

1 European Union Taxation Policy

employed in order to estimate each individual EU member state's Tax Evasion losses:

GDP (Mil €) * Size of Shadow Economy (% of GDP) = Value of Shadow Economy (Mil €) (1)

Value of Shadow Economy (Mil €) * Overall Tax Burden (% of GDP) = Total Tax Evaded (Mil €) (2)

All model calculations in the present study were conducted using *Microsoft Excel*.

2.2. Empirical Research Process

Table 1. *Detailed overview of the independent variables used in the study.*

Name of Variable	Unit of Measure	Description
Size of Shadow Economy	% of Official GDP	Calculated using the MIMIC method, estimates the size of shadow economies in EU member states
GDP	Million €	GDP represents the value of the country's overall annual economy, including the value of the shadow economy
Tax Burden	% of Official GDP	Data on the overall tax burden in the EU
GDP Growth	% Change from previous year	Data on fluctuations in GDP growth. Used as a means to represent the stability and health of the economy
Population	Thousand people. Converted to actual count	Data on population count for each EU member state
Government Revenue	Million €	Data on overall annual government revenue
Government Expenditure	Million €	Data on overall annual government expenditure

Table 1. *Continued.*

Name of Variable	Use in the Research	Date Collected	Date Last Updated	Source
Size of Shadow Economy	Independent Variable in Model Calculations	2015-10-16	2015-01-14	(Schneider *et al.*, 2015, p. 45)
GDP	Independent Variable in Model Calculations	2016-01-05	2016-01-04	Eurostat Data base. Product Code: nama_10_gdp
Tax Burden	Independent Variable in Model Calculations and Hypothesis 2 testing	2016-01-05	2015-12-17	Eurostat Data base. Product Code: gov_10a_taxag*
GDP Growth	Variable used in Hypothesis 3 testing	2016-01-05	2015-09-28	Eurostat Data base. Product Code: tec00115
Population	Variable used to calculate Tax Evasion per capita	2016-01-05	2015-12-18	Eurostat Data base. Product Code: nama_10_pe
Government Revenue	Variable used for comparison purposes	2016-02-14	2016-02-12	Eurostat Data base. Product Code: ei_naga_a
Government Expenditure	Variable used for comparison purposes	2016-02-14	2016-02-12	Eurostat Data base. Product Code: ei_naga_a

*Please note that the Tax burden data for Greece for the years 2003, 2004 and 2005 was missing in the aforementioned publication and was therefore taken from an earlier publishing by Eurostat, product code: gov_a_tax_ag, last updated on 24-Jul-2014.

2.3. Participants and Time Horizons

The time horizons analyzed in this research are cross-sectional and longitudinal in their form. The length of the period researched is 12 years, ranging from 2003 till 2014. The study examines a sample of 28 European countries that were members of the European Union at the time this study was conducted (2016). The 28 sample countries are listed in alphabetical order in Table 2. In total, the study will generate and examine 336 unique data points.

Table 2. *List of sample countries: the 28 current members of the European Union.*

	Country
1.	Austria
2.	Belgium
3.	Bulgaria
4.	Croatia
5.	Cyprus
6.	Czech Republic
7.	Denmark
8.	Estonia
9.	Finland
10.	France
11.	Germany
12.	Greece
13.	Hungary
14.	Ireland
15.	Italy
16.	Latvia
17.	Lithuania
18.	Luxembourg
19.	Malta
20.	Netherlands
21.	Poland
22.	Portugal
23.	Romania
24.	Slovakia
25.	Slovenia
26.	Spain
27.	Sweden
28.	United Kingdom

2.4. Hypothesis Testing

The specific role of Hypothesis testing in regards to this empirical research is to investigate whether evasive tax payers are sensitive to certain economic conditions and if so,

how these conditions correlate with Tax Evasion losses.

Research Hypotheses:

H1: Joining the EU reduces Tax Evasion losses among new members.

H2: Tax Rates are positively correlated with Tax Evasion losses.

H3: Economic growth is negatively correlated with Tax Evasion losses.

All Hypothesis testing calculations were conducted in *Program R* version 3.2.3 (Codename: Wooden Christmas-Tree), released on 2015-12-10. The Tax Evasion data used in the Hypothesis testing was generated through Murphy's (2012) model calculations. The aforementioned data was compiled alphabetically in *Microsoft Excel*, then converted into a Tab Delimited format and uploaded into *Program R* for further testing. The alpha level chosen for all three Hypotheses was 0.05.

2.4.1. Hypothesis 1

The aim of Hypothesis 1 is to test the existence of a statistically significant decrease in Tax Evasion losses among newly joined EU members (joined 2004 and later) by comparing the Tax Evasion losses before and after joining the European Union. All in all, 13 countries were examined (refer to Table 3 for a comprehensive list). The statistical period examined was 2003-2014, resulting in a total of 156 observations. Note that 11 of the observed countries joined in the middle of a given year (specifically, in May of 2004 and in July of 2013), therefore their status as an EU member was only established in the data of the following year (that is, starting from 2005 and 2014 respectfully). The results are expected to point out whether membership in the European Union has a positive or negative relationship with Tax Evasion losses.

Table 3. *13 new members of the EU and their respectful joining dates.*

	Country	Joining Date
1.	Bulgaria	2007, January
2.	Croatia	2013, July
3.	Cyprus	2004, May
4.	Czech Republic	2004, May
5.	Estonia	2004, May
6.	Hungary	2004, May
7.	Latvia	2004, May
8.	Lithuania	2004, May
9.	Malta	2004, May
10.	Poland	2004, May
11.	Romania	2007, January
12.	Slovakia	2004, May
13.	Slovenia	2004, May

A factor was used to separate the data into 2 groups:

1 – Factor used to indicate Tax Evasion losses after joining the EU;

2 – Factor used to indicate Tax Evasion losses before joining the EU.

The null and alternative Hypothesis were as follows:

H_0: $\mu_1 = \mu_2$

H_1: $\mu_1 < \mu_2$

In other words:

H_0: the means of Tax Evasion losses among new members of the EU are the same before and after joining.

H_1: the means of Tax Evasion losses among new members of the EU are lower after joining.

The generated p-value conveyed the significance of the relationship and indicated whether the null hypothesis should be rejected or retained.

The *Program R* command used in the hypothesis testing was as follows:

t.test (Taxevasion~Factor, alternative = "less")

2.4.2. Hypothesis 2

The purpose of Hypothesis 2 is to investigate the existence of a statistically significant correlation between the size of the national tax burden and the prevalence of Tax Evasion among tax payers in the EU. Tax Evasion data from all 28 current EU members was examined along with a corresponding tax burden data for the same period (2003-2014). In total, 336 observations were analyzed. In addition to overall EU-wide testing, each country was tested separately to identify individual correlations and their level of significance.

The null and alternative Hypothesis were as follows:

H_0: $r = 0$

H_1: $r \neq 0$

Which translates to:

H_0: There is no significant correlation between Tax Evasion and Tax Burden.

H_1: A correlation exists between Tax Evasion and Tax Burden.

The correlation coefficient r generated in the Hypothesis 2 testing communicated the direction (positive or negative) and the strength (weak, moderate or strong) of the correlation between tax rates and Tax Evasion losses.

The *Program R* command used in the hypothesis testing was as follows:

cor.test (Taxevasion, Taxburden, method = "pearson", alternative = "two.sided")

2.4.3. Hypothesis 3

The role of Hypothesis 3 is to investigate whether a correlation exists between the state of the economy (that is, economic growth or economic decline) and the pervasiveness of Tax Evasion. GDP growth in percentage terms (to reflect change from previous year) will be used to represent the state of the economy. To establish a conclusive answer, data from all 28 current EU members was tested for the period of 2003-2014, resulting in a total of 336 observations. Hypothesis testing was conducted for complete EU-wide data pool as well as for each country individually in order to account for differences between countries in terms of fiscal policy and to provide comprehensive results.

The null and alternative Hypothesis were as follows:

H_0: $r = 0$

H_1: $r \neq 0$

Which translates to:

H_0: There is no significant correlation between Tax Evasion losses and the state of the economy.

H_1: A correlation exists between Tax Evasion losses and the state of the economy.

The generated correlation coefficient r revealed the direction (positive or negative) and the strength (weak, moderate or strong) of the correlation between the two variables tested.

The command used in the hypothesis testing in this case was as follows:

cor.test (Taxevasion, Gdpgrowth, method="pearson", alternative="two.sided")

3. Results

3.1. Research Data and Results

The model calculations of this study were completed in accordance with the research methodology outlined thoroughly in Chapter 2. The main goal of the model calculations was to fulfill the first research objective of this study which aims to evaluate the overall tax revenue losses attributed to Tax Evasion in the EU. The generated findings reflect the tax revenue losses accrued from Tax Evasion for all 28 current EU member states between 2003 and 2014, spanning over the course of 12 years in total. The data generated in this process was then utilized to fulfill the second research objective – to identify existing trends in the data, and for the third objective – to test the data for statistical correlations with relevant macroeconomic variables.

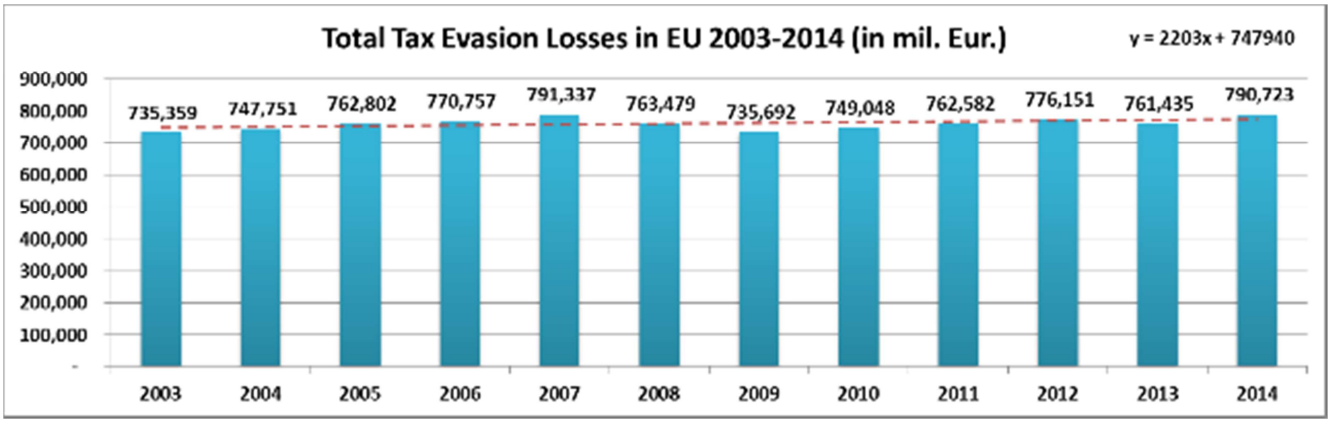

Figure 1. *Total Tax Revenue Losses from Tax Evasion in the EU for the period 2003-2014 represented in millions of Euro. Results obtained from model calculations.*

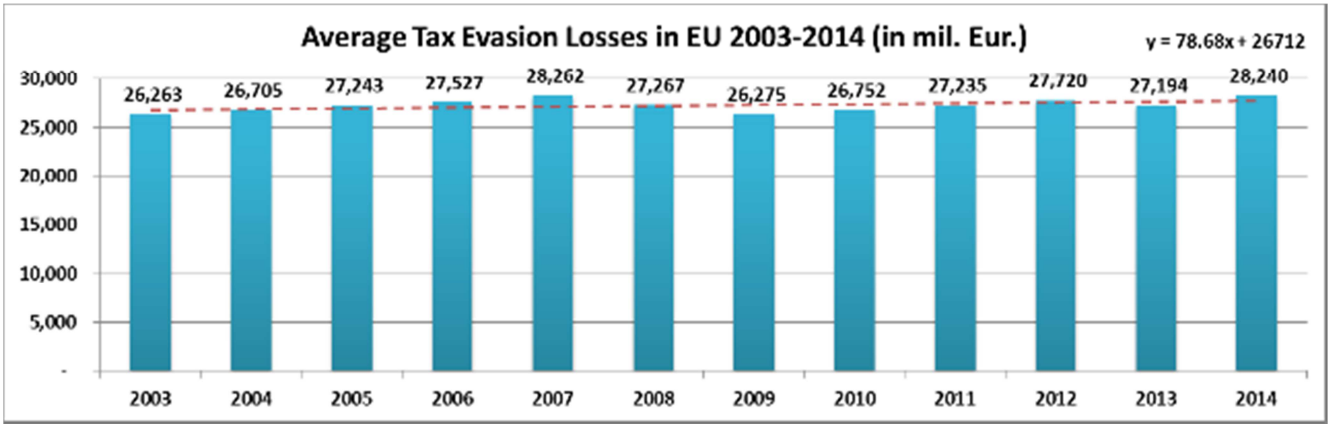

Figure 2. *Average Tax Revenue Losses from Tax Evasion in the EU for the period 2003-2014 represented in millions of Euro. Results obtained from model calculations.*

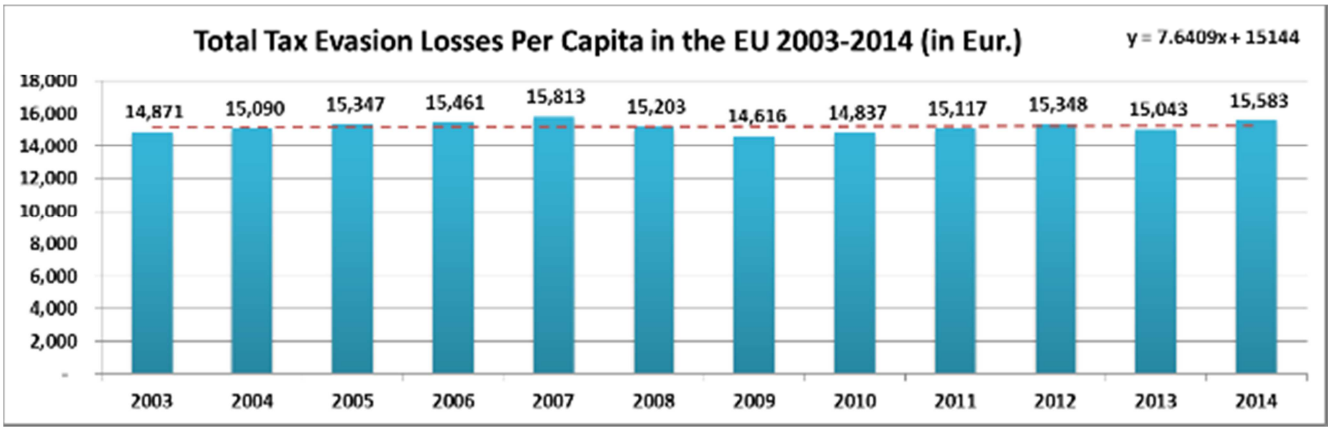

Figure 3. *Total Tax Revenue Losses from Tax Evasion in the EU Per Capita for the period 2003-2014 represented in Euro. Results obtained from model calculations.*

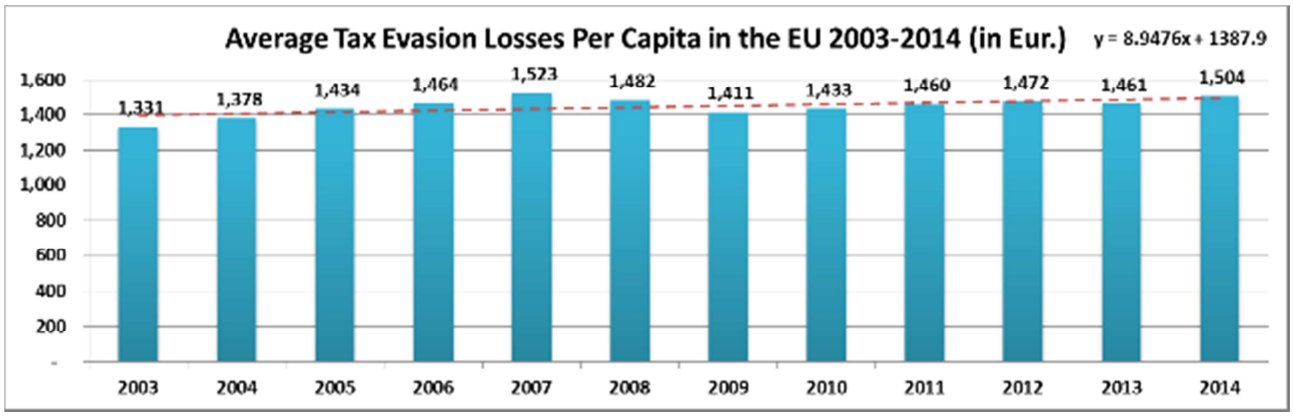

Figure 4. *Average Tax Revenue Losses from Tax Evasion in the EU Per Capita for the period 2003-2014 represented in Euro. Results obtained from model calculations.*

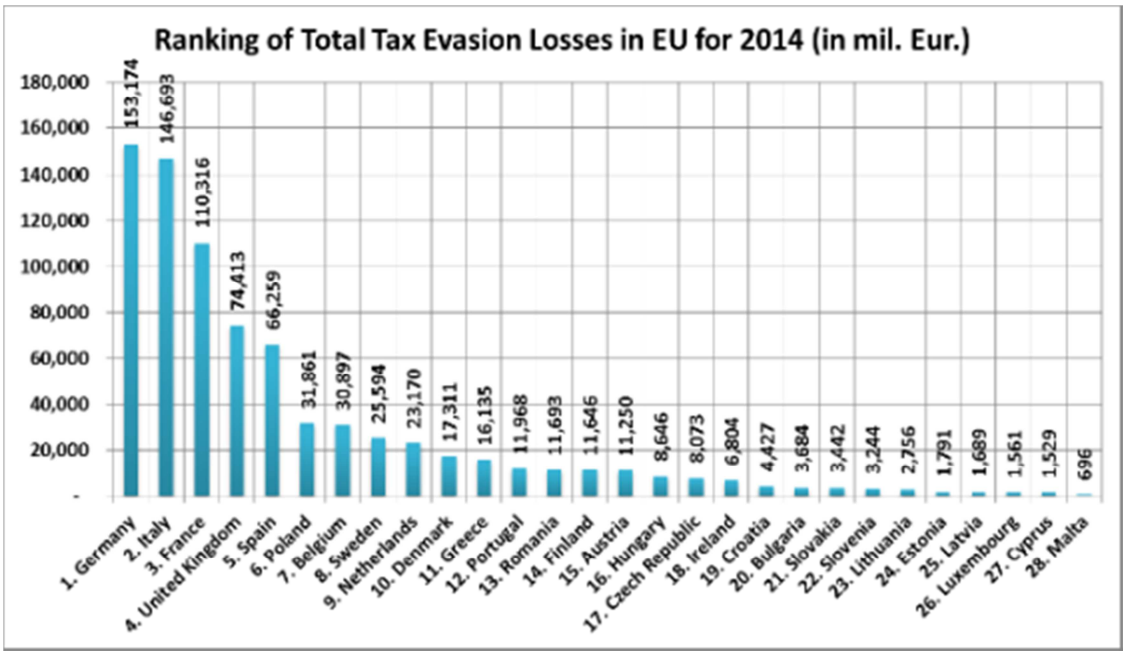

Figure 5. *Total Tax Revenue losses from Tax Evasion in EU in 2014 represented in millions of Euro. Countries were ranked from highest losses to lowest losses.*

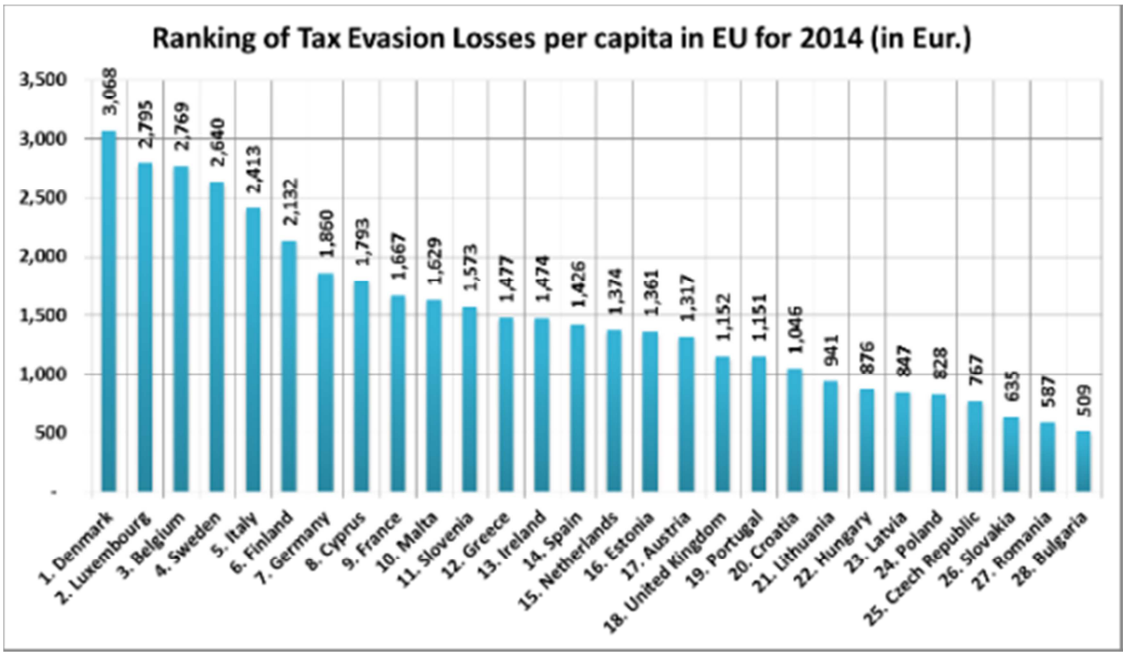

Figure 6. *Tax Revenue losses from Tax Evasion in EU Per Capita in 2014 represented in Euro. Countries were ranked from highest losses to lowest losses.*

The linear trend lines located in Figures 1, 2, 3 and 4 all portray a positive slope in Tax Evasion losses. These findings allude to a positive growth in regards to Tax Evasion losses within the EU economy. These trends will be discussed in more details in the Tax Evasion Trends subsection 3.2. later in this chapter. Tax Evasion data for the year 2014 (most recent and thus most relevant) has been ranked from highest to lowest in regards to tax revenue losses. The ranking is represented both in terms of overall tax revenue losses from Tax Evasion (Figure 5) as well as tax revenue losses per capita (Figure 6).

3.2. Tax Evasion Trends

Past Tax Evasion trends can be observed in the model data generated in the research process. The direction of the trend (positive or negative) will be derived from the slope of the trend line indicated by the linear trend equation. Table 4 depicts the overall trends of Tax Evasion losses in each EU member state, using the data from both overall Tax Evasion as well as Tax Evasion per capita.

Table 4. *Trends in Tax Evasion in EU in terms of Overall and Per Capita data.*

Tax Evasion Trends 2003-2014	Overall Tax Evasion		Tax Evasion Per Capita	
	Slope of Trend line	Type of Trend	Slope of Trend line	Type of Trend
Austria	-53.7	Negative	-11.8	Negative
Belgium	291.0	Positive	7.6	Positive
Bulgaria	137.7	Positive	21.3	Positive
Croatia	55.8	Positive	14.5	Positive
Cyprus	34.6	Positive	11.3	Positive
Czech Republic	225.6	Positive	19.3	Positive
Denmark	-11.5	Negative	-15.1	Negative
Estonia	80.4	Positive	63.5	Positive
Finland	7.9	Positive	-7.9	Negative
France	-198.3	Negative	-12.2	Negative
Germany	444.1	Positive	6.4	Positive
Greece	-142.1	Negative	-13.6	Negative
Hungary	90.4	Positive	10.9	Positive
Ireland	-113.1	Negative	-47.3	Negative
Italy	373.4	Positive	-6.7	Negative
Latvia	60.5	Positive	36.7	Positive
Lithuania	95.3	Positive	40.4	Positive
Luxembourg	44.5	Positive	40.5	Positive
Malta	24.7	Positive	52.1	Positive
Netherlands	-81.6	Negative	-10.1	Negative
Poland	1218.5	Positive	31.1	Positive
Portugal	64.2	Positive	6.3	Positive
Romania	542.7	Positive	29.6	Positive
Slovakia	150.5	Positive	27.6	Positive
Slovenia	43.9	Positive	16.5	Positive
Spain	-206.7	Negative	-18.1	Negative
Sweden	30.9	Positive	-17.1	Negative
United Kingdom	-1006.3	Negative	-25.3	Negative
EU AVERAGE	78.7	Positive	9.0	Positive
EU TOTAL	2203.0	Positive	7.6	Positive

Based on the overall Tax Evasion trend data, Tax Evasion losses in the EU increase by 2.2 billion Euro every year. That's an average of 78 million Euro per EU member state. In per capita terms, Tax Evasion losses increase by 7.6 Euro annually per EU citizen. EU average per capita losses of tax revenue increase by 9 Euro annually.

Based on the total Tax Evasion data, 20 out of 28 counties exhibit a positive trend (71% of sample countries), while 8 of them display a negative trend (29% of sample countries). In terms of Tax Evasion losses per capita data, fewer countries display a positive Tax Evasion trend than when overall Tax Evasion data is used. 17 out of 28 countries display a positive trend (61% of sample countries), while the remaining 11 show a negative trend (39% of sample countries).

3.3. Hypothesis Testing

The alpha level chosen to estimate the significance of the statistical calculations is 0.05 or 5%, meaning that all findings are produced with 95% certainty. The hypothesis is deemed proven if its associated p-value is less than the chosen alpha level (p-value < 0.05). Correlation strength was interpreted using the Table 5 criteria, obtained from Evans (1996). For convenience, all correlation coefficients and p-values generated have been rounded to 3 decimals.

Table 5. *Correlation Strength Interpretation.*

Correlation Strength	Correlation Interpretation
.00-.19	Very Weak
.20-.39	Weak
.40-.59	Moderate
.60-.79	Strong
.80-1	Very Strong

3.3.1. Hypothesis 1

Hypothesis 1: Joining the EU reduces Tax Evasion losses among new members.

The hypothesis testing was carried out using 156 observations from 13 new EU members (those who joined in 2004 and later) over the period of 12 years, spanning from

2003 and 2014. The sample data included Tax Evasion losses both prior and after the EU joining date for all 13 countries. This data was derived from the model calculations administered in the earlier stages of the research process. The p-values generated in the process clearly point out that the average Tax Evasion losses are greater, not smaller, among new EU members after joining the EU. Based on the results of the hypothesis testing, the null hypothesis cannot be rejected.

Table 6. *Hypothesis 1 Results obtained from Program R through T-test calculations.*

Tax Evasion Data Used	Overall	Per Capita
p-value	0.97	0.998

3.3.2. Hypothesis 2

Hypothesis 2: Tax Rates are positively correlated with Tax Evasion losses.

Hypothesis 2 testing was carried out twice using Tax Evasion data represented in overall terms as well as in per capita terms. In both cases the generated p-values were very low, signaling that there is a significant correlation between tax rates and Tax Evasion losses in the EU. Furthermore, the per capita data depicts a stronger positive correlation (0.775) than the overall EU data (0.367). Tables 8 and 9 present the comprehensive findings of country-by-country Hypothesis 2 testing.

Table 7. *Hypothesis 2 Results obtained from Program R.*

Tax Evasion Data Used	Overall	Per Capita
p-value	3.905e-12	<2.2e-16
cor	0.367	0.775

Table 8. *Hypothesis 2 Results obtained using Overall Tax Evasion data and represented in country-by-country basis, generated in Program R.*

	Correlation	Correlation Direction	Correlation Strength	Level of Significance (p value)	Is the correlation significant at alpha level 0.05? (p value<alpha)
Austria	0.426	Positive	Moderate	0.168	No
Belgium	0.910	Positive	Very Strong	3.89E-05	Yes
Bulgaria	-0.518	Negative	Moderate	0.084	No
Croatia	-0.073	Negative	Very Weak	0.821	No
Cyprus	0.819	Positive	Very Strong	0.001	Yes
Czech Republic	-0.324	Negative	Weak	0.305	No
Denmark	0.867	Positive	Very Strong	0.0002	Yes
Estonia	0.551	Positive	Moderate	0.063	No
Finland	0.820	Positive	Very Strong	0.001	Yes
France	0.252	Positive	Weak	0.430	No
Germany	0.736	Positive	Strong	0.006	Yes
Greece	-0.789	Negative	Strong	0.002	Yes
Hungary	0.736	Positive	Strong	0.006	Yes
Ireland	0.957	Positive	Very Strong	1.10E-06	Yes
Italy	0.731	Positive	Strong	0.007	Yes
Latvia	0.601	Positive	Strong	0.039	Yes
Lithuania	-0.021	Negative	Weak	0.949	No
Luxembourg	0.387	Positive	Weak	0.215	No
Malta	0.824	Positive	Very Strong	0.001	Yes
Netherlands	-0.212	Negative	Weak	0.507	No
Poland	-0.005	Negative	Very Weak	0.987	No
Portugal	0.768	Positive	Strong	0.004	Yes
Romania	0.072	Positive	Very Weak	0.825	No
Slovakia	-0.645	Negative	Strong	0.024	Yes
Slovenia	-0.684	Negative	Strong	0.014	Yes
Spain	0.714	Positive	Strong	0.009	Yes
Sweden	-0.024	Negative	Very Weak	0.940	No
United Kingdom	0.363	Positive	Weak	0.246	No

Based on the results found in Table 8, when overall Tax Evasion data is used to test Hypothesis 2, 12 out of 28 EU member states (42.9% of countries tested) displayed a statistically significant positive correlation between tax rates and Tax Evasion losses. 3 out of 28 (10.7% of countries tested) revealed a statistically significant negative correlation. The remaining 13 countries (46.4% of countries tested) showed no individual significant correlation between the two variables tested. However, as displayed by Table 7, the EU-wide data does show an existing positive correlation.

Table 9. *Hypothesis 2 Results obtained using Per Capita Tax Evasion data and represented in country-by-country basis, generated in Program R.*

	Correlation	Correlation Direction	Correlation Strength	Level of Significance (p value)	Is the correlation significant at alpha level 0.05? (p value<alpha)
Austria	0.346	Positive	Weak	0.270	No
Belgium	0.829	Positive	Very Strong	0.001	Yes
Bulgaria	-0.564	Negative	Moderate	0.056	No
Croatia	-0.089	Negative	Very Weak	0.783	No
Cyprus	0.875	Positive	Very Strong	0.0002	Yes
Czech Republic	-0.312	Negative	Weak	0.323	No
Denmark	0.682	Positive	Strong	0.015	Yes
Estonia	0.554	Positive	Moderate	0.062	No
Finland	0.521	Positive	Moderate	0.082	No

	Correlation	Correlation Direction	Correlation Strength	Level of Significance (p value)	Is the correlation significant at alpha level 0.05? (p value<alpha)
France	-0.118	Negative	Very Weak	0.714	No
Germany	0.747	Positive	Strong	0.005	Yes
Greece	-0.813	Negative	Very Strong	0.001	Yes
Hungary	0.734	Positive	Strong	0.007	Yes
Ireland	0.900	Positive	Very Strong	6.75E-05	Yes
Italy	-0.235	Negative	Weak	0.462	No
Latvia	0.627	Positive	Strong	0.029	Yes
Lithuania	-0.178	Negative	Very Weak	0.579	No
Luxembourg	0.182	Positive	Very Weak	0.572	No
Malta	0.833	Positive	Very Strong	0.001	Yes
Netherlands	-0.419	Negative	Moderate	0.176	No
Poland	0.015	Positive	Very Weak	0.964	No
Portugal	0.852	Positive	Very Strong	0.0004	Yes
Romania	0.016	Positive	Very Weak	0.961	No
Slovakia	-0.645	Negative	Strong	0.023	Yes
Slovenia	-0.648	Negative	Strong	0.023	Yes
Spain	0.872	Positive	Very Strong	0.0002	Yes
Sweden	0.398	Positive	Weak	0.200	No
United Kingdom	0.390	Positive	Weak	0.210	No

Based on the findings derived from Hypothesis 2 country-by-country testing using Tax Evasion per capita data (Table 9), 10 out of 28 EU member states (35.7% of countries tested) show a statistically significant positive correlation between tax rates and Tax Evasion losses. 3 out of 28 countries (10.7% of countries tested) reveal a statistically significant negative correlation. The remaining 15 out of 28 countries (15.6% of countries tested) exhibit no statistically significant correlation.

Based on the Hypothesis 2 testing results, the null hypothesis is rejected for EU as a whole. According to the country-by-country testing results, the specific EU members for which null hypothesis was successfully rejected are displayed in Table 10.

Table 10. *Hypothesis 2 testing. List of countries for which null hypothesis is rejected.*

	Hypothesis 2 results: EU countries for which null hypothesis is rejected	
	Overall Tax Evasion data	Tax Evasion per capita data
1.	Belgium	Belgium
2.	Cyprus	Cyprus
3.	Denmark	Denmark
4.	Finland	Germany
5.	Germany	Hungary
6.	Hungary	Ireland
7.	Ireland	Latvia
8.	Italy	Malta
9.	Latvia	Portugal
10.	Malta	Spain
11.	Portugal	-
12.	Spain	-

3.3.3. Hypothesis 3

Hypothesis 3: Economic growth is negatively correlated with Tax Evasion losses.

A relationship between economic growth (in terms of GDP growth in %) and Tax Evasion losses in the EU was tested. The comprehensive EU-wide results presented in Table 11 depict a statistically significant negative correlation between GDP growth (in %) and losses from Tax Evasion.

Table 11. *Hypothesis 3 Results obtained from Program R.*

Tax Evasion Data Used	Overall	Per Capita
p-value	0.009	0.001
cor	-0.142	-0.186

A negative correlation between the two variables is to be expected. However, no negative correlation could be established as statistically significant in any of the EU members tested. In fact, quite surprisingly, the opposite results were obtained, both in the case of overall Tax Evasion data (Table 12) and Tax Evasion per capita data (Table 13). This finding will be further discussed in the Additional Findings subjection of this chapter.

Table 12. *Hypothesis 3 Results obtained using Overall Tax Evasion data and represented in country-by-country basis, generated in Program R.*

	Correlation	Correlation Direction	Correlation Strength	Level of Significance (p value)	Is the correlation significant at alpha level 0.05? (p value<alpha)
Austria	0.32	Positive	Weak	0.311	No
Belgium	-0.162	Negative	Very Weak	0.614	No
Bulgaria	-0.489	Negative	Moderate	0.107	No
Croatia	-0.44	Negative	Moderate	0.152	No
Cyprus	-0.189	Negative	Very Weak	0.555	No
Czech Republic	-0.451	Negative	Moderate	0.141	No
Denmark	0.652	Positive	Strong	0.021	Yes
Estonia	-0.36	Negative	Weak	0.25	No
Finland	0.375	Positive	Weak	0.23	No
France	0.276	Positive	Weak	0.385	No
Germany	-0.197	Negative	Weak	0.54	No
Greece	-0.027	Negative	Very Weak	0.934	No

	Correlation	Correlation Direction	Correlation Strength	Level of Significance (p value)	Is the correlation significant at alpha level 0.05? (p value<alpha)
Hungary	-0.425	Negative	Moderate	0.168	No
Ireland	0.659	Positive	Strong	0.02	Yes
Italy	-0.327	Negative	Weak	0.3	No
Latvia	-0.249	Negative	Weak	0.435	No
Lithuania	-0.312	Negative	Weak	0.324	No
Luxembourg	0.06	Positive	Very Weak	0.854	No
Malta	0.309	Positive	Weak	0.328	No
Netherlands	0.505	Positive	Moderate	0.094	No
Poland	-0.211	Negative	Weak	0.509	No
Portugal	0.088	Positive	Very Weak	0.786	No
Romania	-0.196	Negative	Very Weak	0.541	No
Slovakia	-0.477	Negative	Moderate	0.117	No
Slovenia	-0.276	Negative	Weak	0.386	No
Spain	0.512	Positive	Moderate	0.089	No
Sweden	0.604	Positive	Strong	0.037	Yes
United Kingdom	0.648	Positive	Strong	0.023	Yes

Based on total Tax Evasion data, a statistically significant positive correlation was established in 4 out of 28 countries tested: Denmark, Ireland, Sweden and the UK (14.3% of countries tested). Other countries did not exhibit any statistically significant correlation between economic growth in terms of GDP growth expressed in % terms and Tax Evasion losses.

Table 13. *Hypothesis 3 Results obtained using Per Capita Tax Evasion data and represented in country-by-country basis, generated in Program R.*

	Correlation	Correlation Direction	Correlation Strength	Level of Significance (p value)	Is the correlation significant at alpha level 0.05? (p value<alpha)
Austria	0.358	Positive	Weak	0.2529	No
Belgium	0.156	Positive	Very Weak	0.6289	No
Bulgaria	-0.518	Negative	Moderate	0.08461	No
Croatia	-0.468	Negative	Moderate	0.1252	No
Cyprus	0.244	Positive	Weak	0.4447	No
Czech Republic	-0.412	Negative	Moderate	0.1833	No
Denmark	0.695	Positive	Strong	0.01216	Yes
Estonia	-0.358	Negative	Weak	0.2539	No
Finland	0.563	Positive	Moderate	0.05647	No
France	0.366	Positive	Weak	0.2413	No
Germany	-0.201	Negative	Weak	0.5309	No
Greece	0.033	Positive	Weak	0.9188	No
Hungary	-0.431	Negative	Moderate	0.1619	No
Ireland	0.679	Positive	Strong	0.01521	Yes
Italy	0.142	Positive	Very Weak	0.6604	No
Latvia	-0.275	Negative	Weak	0.3867	No
Lithuania	-0.317	Negative	Weak	0.3153	No
Luxembourg	0.171	Positive	Very Weak	0.5961	No
Malta	0.311	Positive	Weak	0.3245	No
Netherlands	0.515	Positive	Moderate	0.08651	No
Poland	-0.2	Negative	Very Weak	0.5335	No
Portugal	0.099	Positive	Very Weak	0.7587	No
Romania	-0.233	Negative	Weak	0.466	No
Slovakia	-0.475	Negative	Moderate	0.119	No
Slovenia	-0.198	Negative	Weak	0.537	No
Spain	0.795	Positive	Strong	0.002	Yes
Sweden	0.676	Positive	Strong	0.016	Yes
United Kingdom	0.591	Positive	Moderate	0.043	Yes

Based on Tax Evasion per capita data, a statistically significant positive correlation could be established in 5 out of 28 countries tested (17.9% of total countries tested). These countries were Denmark, Ireland, Spain, Sweden and the UK. No other statistically significant correlation between the two variables was found within the data. Despite the lack of specific countries with a negative correlation between tax rates and Tax Evasion losses, the EU-wide correlation remains to be negative and statistically significant. Therefore, in a general EU sense, a relevant statistical relationship between the two variables tested does exist and the null hypothesis is therefore rejected.

3.4. Additional Findings

This section of the research study contains unexpected and peculiar findings that were discovered in the relevant data.

Hypothesis 1: a curious case of Greece, Slovakia and Slovenia has been identified in Tables 8 and 9. A statistically significant negative correlation has been established between tax rates and Tax Evasion losses where a positive correlation would be expected. These 3 countries stand out from the rest of the sample as they are the only ones with a statistically significant negative correlation among 12 (when using total Tax Evasion data; refer to Table 8) and 10 (when using per

capita Tax Evasion data, refer to in Table 9) with statistically significant positive correlations. In order to identify the possible explanations for the existence of negative correlations, we must first look at the data itself. Table 4 shows that Greece has a negative Tax Evasion trend. Further data retrieved from Eurostat show a positive trend in tax rates. Therefore if a statistically significant correlation is established, it is logical that it will be a negative one. The opposite is true for Slovakia and Slovenia – both of the countries demonstrate positive Tax Evasion trends but negative tax rate trends, resulting in a negative correlation between the variables.

Hypothesis 2: While a weak, but statistically significant negative correlation was established between economic growth (represented by GDP Growth in % terms) and Tax Evasion losses when EU-wide data was used, none of the country-by-country calculations yielded a negative correlation. In fact, all the statistically significant correlations found in Tables 12 and 13, namely in the cases of Denmark, Ireland, Sweden, the UK and Spain (only in per capita data), are positive and in most cases – quite strong. This is a very surprising finding given the circumstances, but nothing that cannot be explained by taking a closer look at the raw data. The reason behind the peculiar results is that Denmark, Ireland and the UK have negative Tax Evasion trends and negative GDP growth trends. The opposite is true for Sweden – both trends are positive. This results in a positive correlation in all 4 countries.

4. Discussion

4.1. Model Calculations

The final results obtained in the research process have revealed that the overall Tax Evasion trend within the European Union is a positive one (although not a steep one), meaning that the tax revenue losses accrued from the illegal act of Tax Evasion are slowly increasing over time. When individual EU country data was examined, a positive trend was identified in 20 out of 28 in terms of total Tax Evasion losses (71.4% of countries studied) and 17 out of 28 with regards to Tax Evasion losses in per capita terms (60.7% of countries studied). Indeed, the analyzed data provides sufficient proof that between 2003 and 2014, the Tax Evasion losses exhibit a largely positive trend.

When compared to the model study calculations used in Murphy's (2012) original study, the results of this empirical research are within a reasonable range of possibility. Murphy's (2012) calculations were only completed for one year, 2009. In Table 14, the results of the present study and Murphy's (2012) study are compared side by side for 2009.

Table 14. *Comparison between the model calculation results: original calculations by Murphy (2012) vs. researcher's calculations found in Chapter 4. Values in mil. Eur.*

	2009		Difference in%
	Murphy's calculations (2012)	Researcher's Calculations	
Austria	11,763	10,181	15.5%
Belgium	33,629	28,062	19.8%
Bulgaria	3,673	3,292	11.6%
Croatia	-	4,940	-
Cyprus	1,671	1,572	6.3%
Czech Republic	9,205	8,048	14.4%
Denmark	19,922	15,308	30.1%
Estonia	1,680	1,470	14.3%
Finland	13,732	10,565	30.0%
France	120,619	98,743	22.2%
Germany	158,736	142,244	11.6%
Greece	19,165	19,537	-1.9%
Hungary	9,445	8,629	9.5%
Ireland	6,951	6,437	8.0%
Italy	180,257	145,406	24.0%
Latvia	1,398	1,396	0.1%
Lithuania	2,532	2,424	4.5%
Luxembourg	1,511	1,283	17.8%
Malta	577	537	7.4%
Netherlands	29,801	22,613	31.8%
Poland	30,620	26,326	16.3%
Portugal	12,335	11,427	7.9%
Romania	10,738	9,558	12.3%
Slovakia	3,440	3,099	11.0%
Slovenia	3,546	3,265	8.6%
Spain	72,709	64,386	12.9%
Sweden	30,596	21,508	42.3%
United Kingdom	74,032	63,437	16.7%
EU AVERAGE	32,010	26,275	21.8%
EU TOTAL	864,283	735,692	17.5%

In the majority of cases, the data produced by this research is more conservative than in the original study. The average difference between the calculations between the present study and the original study is estimated to be 15%. This difference may be explained by the use of newly updated data sources. In his research, Murphy (2012) did not calculate Tax Evasion losses per capita therefore no comparison can be made in that regard. Please note that in

Murphy's (2012) calculations, Croatian data is missing as it was not an EU member in 2009. However, all calculations for the period of 2003-2014 are present in this empirical study regardless whether the country was a member or not at that point in time, as long as it was an active EU member in 2016 when the calculations were made.

Despite the minor differences between the results obtained by Murphy's (2012) study and this research, the underlying meaning of the data is crystal clear: Tax Evasion creates a substantial problem in the EU by reducing a crucial stream of tax revenue for EU governments, which form the bulk of European Union's overall proceeds (Murphy, 2012, p. 23).

4.2. Hypothesis Testing

Hypothesis testing conducted in this study was able to successfully reject the null hypothesis in Hypotheses 2 and 3, while in the case of Hypothesis 1 the null hypothesis could not be rejected conclusively. In particular, Hypothesis 2 and 3 testing yielded highly contrasting results when testing was administered separately for both the complete EU-wide dataset and for each individual EU member. Although the null hypothesis was rejected in both cases when EU-wide data was used, country-by-country testing revealed a unique and diverse spectrum of correlations: in some cases, no statistically significant correlation could be established, other cases revealed very strong correlations while yet another group of countries displayed a significant correlation of a direction different than expected. The results obtained from the hypothesis testing provided some interesting insights into the European economy in terms of Tax Evasion losses and the nature of its often complicated relationship with important economic variables like EU membership, tax rates and economic growth.

5. Implications

5.1. Model Calculations

The big picture of the European Union taxation framework remains to be distinctly uneven with a striking lack of uniformity. Indeed, in terms of fiscal policy, it is up to the individual country to decide how robust and scrupulous their anti-tax evasion measures and policies ought to be. The European Union can only recommend certain policies and compliance incentive mechanisms, yet it is up to each of the EU member states to implement and enforce them[2]. It is important to note that reducing and even controlling Tax Evasion is a costly effort. One would say it is almost a luxury. Indeed, the Tax Evasion losses that have been accumulated in the past may never be fully recovered, as emphasized by Murphy (Murphy, 2012, p. 15). Anti-Tax Evasion programs and policies require a massive amount of initial investment to set up and a continuous stream of funding to maintain at high efficiency, as resourceful tax evaders quickly adapt to new policies and learn ways to bypass them. Future tax policies should focus on reducing and controlling Tax Evasion, not eliminating it, as it is a normal part of any dynamic economy and cannot be fully eradicated. Despite the costs associated with regulating Tax Evasion, ignoring the problem comes at an even bigger price – shrinking tax revenue means shrinking budgets, which forces governments to borrow and accumulate public debt.

There exists a prominent disparity regarding Tax Evasion losses among the individual EU members, especially when the losses are expressed in per capita terms. Why does each citizen of Denmark account for, on average, six times more tax revenue losses than a similar Bulgarian citizen? Is it perhaps because more shadow economy activity is detected and recorded in Denmark and under detected or under recorded in Bulgaria? Or may it be that the differences in income influence Danes more than Bulgarians to take on more risk for a higher payoff? The data cannot answer for efficiency and effectiveness of each country's tax policies, only their officially documented outcomes. Indeed, the tragedy of misinterpreted data is that countries which enforce a more formidable tax administration (that is, perform more audits, random inspections, rigorous data analysis for inconsistencies, etc.) would in turn detect and record higher losses. In contrast, a country with a lenient tax administration would identify and report a much lower number of tax evaders. The paradox lies in the fact that a strong tax administration creates an appearance of excessive Tax Evasion, while a weak tax administration paints an image of Tax Evasion seemingly under control. This fact is crucial for restraining hasty assumptions regarding the correlation between a country's Tax Evasion losses and the effectiveness of its tax administration. It is quite easy to assume that a country with the lowest Tax Evasion losses must therefore have the best anti-Tax Evasion policies. However, this assumption would most likely be false. This empirical study does not, by any means, attempt to draw any conclusions regarding the relationship between Tax Evasion and fiscal policy effectiveness as the data is more likely to lie than tell the truth on this particular matter.

A crucial implication that can be drawn from the positive Tax Evasion trend in the EU is that it may signify a growth in other types of financial crimes in the European Union as well as other developed countries. Furthermore, globalization brings with it a convergence of markets and policies, thus other developed countries may suffer from similar problems related to growing Tax Evasion losses.

5.2. Hypothesis Testing

5.2.1. Hypothesis 1

A sizable degree of insight can be gleaned from the results obtained from the hypothesis testing. The failure to reject the null hypothesis in Hypothesis 1 calls Europeans to rethink how they weigh new EU members against the old ones in terms of the size of their shadow economy. There is no statistical proof of EU membership is related to lower Tax Evasion losses. Indeed, EU membership seems to have no positive impact on curbing Tax Evasion within the economy, as in most cases Tax Evasion losses increased immediately following the joining. Therefore, all EU members – whether they are old or new – should recognize that being in the EU does not create a protective barrier somehow shielding them from tax evaders. In fact, data suggests quite the opposite – becoming a member of the European Union ties the

2 European Union. Taxation. Retrieved from: http://europa.eu/pol/tax/index_en.htm

economies of member states closer together and creates more opportunities for tax payers to evade taxes as it becomes easier to sell and purchase products and services across borders and thus across different tax policies of varying degrees of vigilance. Let this be a message to future EU members – EU membership alone does not protect from lost tax revenue nor does it help in recovering it. Each individual EU member state should focus on devising custom tax policies tailored to its own distinct fiscal environment and the intensity of its shadow economy. The key lesson is for the EU members to work together and cooperate on solving and preventing financial crimes, increasing the exchange of cross-border information and coordinate the implementation and improvement of future tax policies concerning Tax Evasion in the EU, carefully considering the possibility for a joint fiscal policy effort.

5.2.2. Hypothesis 2

The outcome of Hypothesis 2 yielded noteworthy presumptions regarding the peculiar relationship between tax rates and Tax Evasion losses in the EU. This research identified a strong positive correlation between the two variables in nearly half of the EU member states studied. Policy makers in those specific countries should be made aware that an increase in the overall tax burden within the economy is correlated with an increase in uncollected tax revenue for the government. Indeed, it may even turn out that increasing tax rates with the purpose of aggregating more tax revenue may result in the exact opposite: a lower tax revenue yield than when lower tax rates were in place (unless it's Greece, Slovakia or Slovenia, which are the only countries in the EU featuring a negative correlation between the two variables). Thus, research regarding Tax Evasion and its correlates should be carefully consulted when formulating future tax policies as there is no "one size fits all" cure. Each European Union member is unique in their Tax Evasion losses and their tax revenue needs, therefore a policy that works wonders in Ireland may entail disastrous consequences in Greece. In terms of tax rates, the research conducted in this study suggests this assumption to be very likely, if not entirely true.

5.2.3. Hypothesis 3

Hypothesis 3 aimed at testing whether there is any connection between the state of the economy and the prevalence of Tax Evasion. One would logically assume that in times of economic downturn the decreasing demand for goods and services and the slowing down of markets would play a role in incentivizing tax evasive behavior among tax payers, while an economic boom and a prospering market would render Tax Evasion unnecessary. Despite the existence of a negative correlation between the variables when the entire EU data pool is tested as a whole, country-by-country testing tells a different story. The individual county data not only shows this assumption to be unfounded statistically, it actually points to a reverse connection in countries such as Denmark, Ireland, Sweden, Spain and the UK. In these 5 EU member states, a growing economy is more likely to go hand in hand with a growing shadow economy and with it – mounting tax revenue losses from Tax Evasion. Tax authorities in these countries need to be acutely aware of the economic cycles and closely monitor the current state of their economy in order to be able to properly address Tax Evasion instances and anticipate future changes in tax revenue losses. This knowledge can give a much needed advantage for the tax administration because they can increase funding for audits and inspections when the economy is growing and decrease it when the economy is shrinking. By focusing their efforts on times when Tax Evasion is most likely to take place, tax authorities are more likely to catch a higher number of tax evaders red handed.

5.3. Summary

The fundamental implications that can be drawn with conviction from the findings of this research are such:

a. Monetary losses from Tax Evasion exhibit a positive trend in the EU, signaling a dire need for stricter and more vigilant tax policies to manage future surges in Tax Evasion losses and ultimately subdue them.
b. Tax policies aiming to control Tax Evasion should be tailored to each country as their Tax Evasion losses vary in size and intensity, their tax revenue needs differ and their tax administration is of diverse firmness.
c. Policy makers ought to be mindful of the existing positive correlation between tax rates and rising Tax Evasion in certain EU countries.
d. Tax administration should focus on monitoring the rhythm of the economy in order to anticipate future fluctuations in Tax Evasion losses in certain EU countries.

6. Limitations

6.1. Internal Validity

Please note that all calculations generated in the study are, at best, plausible estimates. This is the nature of macroeconomic data on which the results are hinged on. It is important to recognize the complexity of gauging illegal activities which heavily rely on the possibility of enduring undetected. Thus official records of Tax Evasion are practically non-existent as not every tax evader gets caught by the tax authorities and it is often hard to accurately gauge the entire amount of tax liability evaded. Therefore, the most reliable method of measuring Tax Evasion is indirectly, through approximation. The data generated through this method should consequently be regarded as an educated guess within a safe and reasonable range of validity.

6.2. External Validity

The findings of this study should not serve as a target of gross overgeneralization. The generated numbers do not convey more than their inherent statistical value. The implications formed in the previous section are only applicable to EU member states being studied. Even so, the data only suggests, not proves, the probable Tax Evasion rates that imply a level of similarity among other developed countries in the Western world, such as the United States, Canada, Switzerland, etc. The researcher asserts a position of caution when considering the broader external validity of the research conducted in this paper. Further research is needed if broader generalizations are yearned to be made.

6.3. Further Research

The main aim of this research is to serve as a quantitative base for future research of qualitative nature – looking for further connections, veiled meanings and gaps in knowledge. Further research should focus on the specific measures and policies needed to control and reduce Tax Evasion losses as well as a thorough and critical evaluation of current methods and policies utilized in the effort. The next logical step would be to measure Tax Evasion losses in other countries and identify patterns in the data that would hopefully highlight the key weak spots in the current tax policies utilized with the purpose of managing Tax Evasion losses.

7. Conclusion

The mission of this empirical research paper was to estimate the overall monetary value of the tax revenue losses amassed due to the illegal evasion of mandatory taxes by taxpayers in the European Union for the period of 2003-2014. The vision for this research is to aid and inspire further inquiry into the subject of missing public funds that are diverted to the shadow economy as well as to contribute to the building of new knowledge which would aid policy makers and help retain more public money in public hands.

The first research objective of this empirical study was concerned with the quantitative calculations of the overall Tax Evasion losses in the EU. The objective was satisfied in Chapter 3, which convenes the statistical findings resulting from model calculations as well as the hypothesis testing. The derived data not only provided the desired quantitative results, but it also went on to establish a strong groundwork for the execution of the remaining objectives of this research.

The second objective was interested with determining the existing Tax Evasion trends in the EU. This research objective was fulfilled in Chapter 3, where the previously generated Tax Evasion data was meticulously analyzed in order to identify the trends hidden in the data.

The last and final research objective aimed at determining the existence of statistically significant correlations between Tax Evasion losses and important economic variables within the EU. The variables analyzed were EU membership, tax rates and economic growth. This research objective was fulfilled through the process of rigorous hypothesis testing which highlighted the specific countries in which Tax Evasion exhibits a statistically significant correlation with one, two, three or none of the variables tested.

The present study, although modest in size, contributes to the contemporary research inquiry into financial crime within the European Union context by taking the pulse of the shadow economy that enables it. The study also expands the model study in scale and scope, as it encompasses a period of 12 recent years (2003-2014) versus 1 year (2009) examined by Murphy in 2012. This research was able to identify the direction and slope of Tax Evasion trends in the EU. The findings established in the research call for immediate action in the form of appropriate policies that would target shadow economies and help reduce the prevalence of Tax Evasion among EU member states.

Appendix

Table 1A. *Overall Tax Revenue losses from Tax Evasion in EU, 2003-2014 (in Mil. Euro).*

EU TOTAL	EU AVERAGE	United Kingdom	Sweden	Spain	Slovenia	Slovakia	Romania	Portugal	Poland
735,359	26,263	73,437	25,271	60,468	2,641	1,803	4,962	11,129	17,789
747,751	26,705	80,754	25,875	65,839	2,771	2,002	5,528	11,044	18,522
762,802	27,243	83,818	26,036	71,158	2,904	2,174	7,311	11,503	22,558
770,757	27,527	83,595	25,389	74,725	3,086	2,309	8,962	11,629	25,354
791,337	28,262	83,225	25,467	77,389	3,239	2,761	11,210	11,791	28,950
763,479	27,267	72,665	23,570	67,571	3,352	3,066	11,848	11,674	32,389
735,692	26,275	63,437	21,508	64,386	3,265	3,099	9,558	11,427	26,326
749,048	26,752	68,879	24,414	67,313	3,295	3,117	10,160	11,642	29,403
762,582	27,235	70,340	25,894	65,766	3,290	3,235	11,088	12,133	30,889
776,151	27,720	73,010	26,334	66,076	3,176	3,188	10,840	11,271	31,154
761,435	27,194	69,158	26,529	64,834	3,094	3,356	11,225	12,035	30,804
790,723	28,240	74,413	25,594	66,259	3,244	3,442	11,693	11,968	31,861

Table 1A. *Continued.*

Netherlands	Malta	Luxembourg	Lithuania	Latvia	Italy	Ireland	Hungary	Greece	Germany
23,165	394	994	1,515	878	145,616	6,757	7,048	17,204	149,576
23,577	409	1,033	1,682	973	143,870	7,359	7,672	18,181	140,744
23,636	456	1,154	1,914	1,137	142,555	7,824	8,163	18,917	136,418
23,360	489	1,243	2,225	1,444	144,843	8,103	8,180	18,665	139,287
22,671	520	1,320	2,605	1,768	149,385	8,033	9,560	19,566	143,345
22,642	528	1,222	2,921	1,811	145,021	6,956	9,816	19,817	142,597
22,613	537	1,283	2,424	1,396	145,406	6,437	8,629	19,537	142,244
23,176	558	1,298	2,372	1,359	145,967	6,178	8,580	19,635	136,996
22,935	588	1,357	2,484	1,489	144,882	6,279	8,472	18,161	143,317
22,371	611	1,436	2,584	1,641	152,412	6,462	8,596	17,575	143,994
22,033	636	1,471	2,663	1,669	147,828	6,458	8,550	16,305	144,482
23,170	696	1,561	2,756	1,689	146,693	6,804	8,646	16,135	153,174

Table 1A. *Continued.*

France	Finland	Estonia	Denmark	Czech Republic	Cyprus	Croatia	Bulgaria	Belgium	Austria	Total Tax Evaded (Million Euro)
105,428	11,337	826	15,880	5,849	1,064	3,679	2,045	27,702	10,902	2003
107,396	11,448	933	16,572	6,336	1,160	3,934	2,340	28,320	11,476	2004
108,817	11,543	1,020	17,354	6,921	1,327	4,163	2,502	28,549	10,971	2005
103,182	11,171	1,221	16,606	7,593	1,455	4,615	2,762	28,537	10,727	2006
101,708	11,255	1,495	16,480	8,070	1,684	4,954	3,358	28,513	11,014	2007
98,142	11,040	1,504	15,449	8,844	1,718	5,243	3,671	28,378	10,026	2008
98,743	10,565	1,470	15,308	8,048	1,572	4,940	3,292	28,062	10,181	2009
99,590	10,713	1,440	15,757	8,513	1,613	4,841	3,234	28,905	10,099	2010
102,388	11,382	1,530	15,825	9,041	1,636	4,643	3,373	29,950	10,216	2011
104,806	11,373	1,635	16,098	8,794	1,575	4,574	3,538	30,786	10,241	2012
99,322	11,571	1,679	16,126	8,465	1,439	4,528	3,648	31,042	10,485	2013
110,316	11,646	1,791	17,311	8,073	1,529	4,427	3,684	30,897	11,250	2014

Table 2A. *Tax Revenue losses from Tax Evasion in EU per capita, 2003-2014 (in Euro).*

EU TOTAL	EU AVERAGE	United Kingdom	Sweden	Spain	Slovenia	Slovakia	Romania	Portugal	Poland	Netherlands
37,256	1,331	1,231	2,821	1,433	1,323	335	230	1,064	466	1,428
38,592	1,378	1,347	2,877	1,536	1,387	372	258	1,053	485	1,449
40,140	1,434	1,387	2,883	1,630	1,451	404	343	1,095	591	1,449
40,995	1,464	1,374	2,796	1,684	1,537	428	423	1,105	665	1,430
42,656	1,523	1,357	2,784	1,711	1,604	512	537	1,118	760	1,384
41,491	1,482	1,175	2,557	1,469	1,658	567	577	1,106	850	1,377
39,506	1,411	1,019	2,313	1,389	1,599	572	469	1,081	690	1,368
40,126	1,433	1,098	2,603	1,446	1,608	574	502	1,101	763	1,395
40,874	1,460	1,111	2,740	1,407	1,603	599	550	1,149	802	1,374
41,223	1,472	1,146	2,766	1,413	1,544	590	540	1,072	808	1,335
40,913	1,461	1,079	2,763	1,391	1,502	620	562	1,151	800	1,311
42,107	1,504	1,152	2,640	1,426	1,573	635	587	1,151	828	1,374

Table 2A. *Continued.*

Malta	Luxembourg	Lithuania	Latvia	Italy	Ireland	Hungary	Greece	Germany	France
989	2,198	444	384	2,536	1,691	696	1,574	1,813	1,695
1,020	2,253	498	430	2,487	1,809	759	1,660	1,706	1,714
1,130	2,478	576	508	2,450	1,881	809	1,722	1,654	1,724
1,207	2,628	681	651	2,479	1,898	812	1,694	1,691	1,623
1,278	2,746	806	803	2,541	1,826	951	1,771	1,743	1,590
1,290	2,499	913	832	2,448	1,547	978	1,789	1,736	1,526
1,303	2,575	766	652	2,441	1,418	861	1,759	1,737	1,527
1,345	2,558	766	648	2,440	1,355	858	1,766	1,676	1,533
1,413	2,613	820	723	2,412	1,372	850	1,635	1,752	1,568
1,456	2,702	865	807	2,526	1,408	866	1,591	1,758	1,598
1,503	2,697	900	829	2,438	1,403	864	1,487	1,760	1,508
1,629	2,795	941	847	2,413	1,474	876	1,477	1,860	1,667

Table 2A. *Continued.*

Finland	Estonia	Denmark	Czech Republic	Cyprus	Croatia	Bulgaria	Belgium	Austria	Tax Evasion Per Capita (in Euro)
2,175	601	2,946	573	1,482	855	261	2,671	1,343	2003
2,190	683	3,067	621	1,593	913	301	2,719	1,405	2004
2,200	751	3,202	676	1,797	966	323	2,726	1,334	2005
2,121	904	3,054	740	1,937	1,070	359	2,707	1,297	2006
2,128	1,113	3,018	782	2,195	1,148	438	2,684	1,328	2007
2,078	1,124	2,812	848	2,184	1,216	482	2,650	1,205	2008
1,979	1,100	2,772	767	1,946	1,147	434	2,601	1,221	2009
1,997	1,080	2,841	809	1,944	1,127	429	2,656	1,208	2010
2,112	1,151	2,841	861	1,923	1,084	459	2,728	1,218	2011
2,101	1,234	2,879	837	1,823	1,072	484	2,785	1,215	2012
2,127	1,272	2,873	805	1,669	1,064	502	2,795	1,237	2013
2,132	1,361	3,068	767	1,793	1,046	509	2,769	1,317	2014

Table 3A. *Total Tax Evasion Change, 2003-2014 (in %).*

EU TOTAL	EU AVERAGE	United Kingdom	Sweden	Spain	Slovenia	Slovakia	Romania	Portugal	Poland
1.69%	5.92%	9.96%	2.39%	8.88%	4.94%	11.02%	11.41%	-0.77%	4.12%
2.01%	7.14%	3.79%	0.62%	8.08%	4.79%	8.60%	32.25%	4.16%	21.79%
1.04%	5.69%	-0.27%	-2.49%	5.01%	6.28%	6.19%	22.59%	1.09%	12.39%
2.67%	7.83%	-0.44%	0.31%	3.56%	4.94%	19.58%	25.08%	1.40%	14.19%
-3.52%	0.01%	-12.69%	-7.45%	-12.69%	3.50%	11.03%	5.69%	-1.00%	11.88%
-3.64%	-5.79%	-12.70%	-8.75%	-4.71%	-2.59%	1.08%	-19.33%	-2.11%	-18.72%
1.82%	1.90%	8.58%	13.51%	4.55%	0.90%	0.58%	6.30%	1.88%	11.69%
1.81%	2.73%	2.12%	6.06%	-2.30%	-0.14%	3.79%	9.13%	4.21%	5.06%
1.78%	1.13%	3.80%	1.70%	0.47%	-3.45%	-1.45%	-2.24%	-7.10%	0.86%
-1.90%	-0.10%	-5.28%	0.74%	-1.88%	-2.60%	5.27%	3.56%	6.78%	-1.12%
3.85%	3.21%	7.60%	-3.53%	2.20%	4.84%	2.57%	4.17%	-0.55%	3.43%

Table 3A. *Continued.*

Netherlands	Malta	Luxembourg	Lithuania	Latvia	Italy	Ireland	Hungary	Greece	Germany	France
1.78%	3.82%	3.89%	11.06%	10.75%	-1.20%	8.90%	8.86%	5.68%	-5.90%	1.87%
0.25%	11.51%	11.73%	13.76%	16.85%	-0.91%	6.31%	6.40%	4.05%	-3.07%	1.32%
-1.17%	7.20%	7.71%	16.27%	27.09%	1.61%	3.57%	0.20%	-1.33%	2.10%	-5.18%
-2.95%	6.24%	6.23%	17.06%	22.41%	3.14%	-0.86%	16.87%	4.83%	2.91%	-1.43%
-0.13%	1.59%	-7.41%	12.14%	2.41%	-2.92%	-13.41%	2.68%	1.28%	-0.52%	-3.51%
-0.13%	1.75%	4.96%	-17.02%	-22.91%	0.27%	-7.46%	-12.09%	-1.41%	-0.25%	0.61%
2.49%	3.77%	1.18%	-2.12%	-2.68%	0.39%	-4.02%	-0.57%	0.50%	-3.69%	0.86%
-1.04%	5.46%	4.56%	4.71%	9.63%	-0.74%	1.63%	-1.25%	-7.51%	4.61%	2.81%
-2.46%	3.88%	5.82%	4.02%	10.18%	5.20%	2.92%	1.46%	-3.23%	0.47%	2.36%
-1.51%	4.16%	2.39%	3.04%	1.71%	-3.01%	-0.05%	-0.54%	-7.23%	0.34%	-5.23%
5.16%	9.46%	6.11%	3.49%	1.20%	-0.77%	5.35%	1.13%	-1.04%	6.02%	11.07%

Table 3A. *Continued.*

Finland	Estonia	Denmark	Czech Republic	Cyprus	Croatia	Bulgaria	Belgium	Austria	Tax Evasion% Change
0.98%	12.92%	4.36%	8.33%	8.99%	6.94%	14.43%	2.23%	5.27%	2004
0.83%	9.38%	4.72%	9.23%	14.41%	5.81%	6.92%	0.81%	-4.40%	2005
-3.22%	19.64%	-4.31%	9.70%	9.60%	10.86%	10.40%	-0.04%	-2.23%	2006
0.75%	22.49%	-0.76%	6.29%	15.75%	7.34%	21.60%	-0.08%	2.68%	2007
-1.90%	0.58%	-6.26%	9.59%	2.03%	5.82%	9.31%	-0.47%	-8.97%	2008
-4.30%	-2.28%	-0.91%	-9.00%	-8.47%	-5.77%	-10.31%	-1.12%	1.54%	2009
1.40%	-2.00%	2.93%	5.78%	2.59%	-2.00%	-1.76%	3.01%	-0.81%	2010
6.24%	6.23%	0.43%	6.20%	1.47%	-4.11%	4.29%	3.62%	1.16%	2011
-0.08%	6.85%	1.73%	-2.73%	-3.76%	-1.48%	4.88%	2.79%	0.24%	2012
1.74%	2.71%	0.17%	-3.74%	-8.66%	-1.01%	3.12%	0.83%	2.39%	2013
0.65%	6.63%	7.35%	-4.63%	6.28%	-2.22%	0.98%	-0.47%	7.29%	2014

Table 4A. *Per Capita Tax Evasion Change, 2003-2014 (in %).*

EU TOTAL	EU AVERAGE	United Kingdom	Sweden	Spain	Slovenia	Slovakia	Romania	Portugal	Poland
3.58%	5.66%	9.39%	1.99%	7.20%	4.89%	10.96%	12.04%	-1.01%	4.16%
4.01%	6.83%	3.00%	0.22%	6.09%	4.60%	8.51%	33.07%	3.97%	21.85%
2.13%	5.39%	-0.94%	-3.03%	3.36%	5.91%	6.11%	23.32%	0.91%	12.48%
4.05%	7.46%	-1.24%	-0.44%	1.56%	4.37%	19.45%	26.95%	1.20%	14.23%
-2.73%	-0.34%	-13.40%	-8.16%	-14.11%	3.34%	10.84%	7.46%	-1.14%	11.88%
-4.79%	-6.14%	-13.31%	-9.52%	-5.50%	-3.53%	0.85%	-18.65%	-2.21%	-18.80%
1.57%	1.65%	7.72%	12.55%	4.11%	0.55%	0.35%	6.93%	1.84%	10.63%
1.86%	2.66%	1.27%	5.26%	-2.66%	-0.34%	4.41%	9.67%	4.37%	5.03%
0.85%	0.97%	3.11%	0.95%	0.41%	-3.64%	-1.60%	-1.81%	-6.72%	0.84%
-0.75%	-0.21%	-5.87%	-0.11%	-1.52%	-2.73%	5.13%	3.94%	7.36%	-1.04%
2.92%	3.09%	6.78%	-4.48%	2.48%	4.72%	2.46%	4.58%	-0.01%	3.48%

Table 4A. *Continued.*

Netherlands	Malta	Luxembourg	Lithuania	Latvia	Italy	Ireland	Hungary	Greece	Germany	France
1.45%	3.15%	2.49%	12.31%	11.98%	-1.94%	7.02%	9.10%	5.42%	-5.88%	1.12%
0.00%	10.78%	10.00%	15.63%	18.12%	-1.50%	3.95%	6.62%	3.74%	-3.03%	0.57%
-1.31%	6.81%	6.07%	18.14%	28.24%	1.19%	0.90%	0.36%	-1.63%	2.22%	-5.84%
-3.17%	5.85%	4.50%	18.46%	23.39%	2.51%	-3.80%	17.05%	4.56%	3.04%	-2.03%
-0.50%	0.94%	-9.02%	13.30%	3.51%	-3.67%	-15.26%	2.86%	1.01%	-0.35%	-4.04%
-0.65%	0.99%	3.06%	-16.10%	-21.63%	-0.30%	-8.34%	-11.96%	-1.67%	0.05%	0.10%
1.96%	3.27%	-0.67%	-0.04%	-0.61%	-0.04%	-4.46%	-0.34%	0.37%	-3.55%	0.36%
-1.52%	5.00%	2.16%	7.10%	11.68%	-1.12%	1.25%	-0.97%	-7.37%	4.59%	2.30%
-2.80%	3.09%	3.41%	5.43%	11.54%	4.71%	2.63%	1.98%	-2.70%	0.30%	1.89%
-1.79%	3.20%	-0.20%	4.09%	2.76%	-3.50%	-0.31%	-0.26%	-6.55%	0.11%	-5.64%
4.76%	8.42%	3.64%	4.50%	2.12%	-1.01%	5.05%	1.40%	-0.70%	5.69%	10.59%

Table 4A. *Continued.*

Finland	Estonia	Denmark	Czech Republic	Cyprus	Croatia	Bulgaria	Belgium	Austria	Tax Evasion Per capita Change
0.69%	13.65%	4.11%	8.28%	7.54%	6.87%	15.04%	1.80%	4.61%	2004
0.48%	9.97%	4.41%	8.94%	12.77%	5.73%	7.48%	0.26%	-5.05%	2005
-3.59%	20.36%	-4.63%	9.35%	7.78%	10.83%	10.97%	-0.70%	-2.73%	2006
0.32%	23.20%	-1.18%	5.71%	13.31%	7.27%	22.23%	-0.83%	2.34%	2007
-2.36%	0.92%	-6.82%	8.46%	-0.50%	5.90%	9.83%	-1.26%	-9.26%	2008
-4.76%	-2.09%	-1.45%	-9.54%	-10.90%	-5.65%	-9.86%	-1.88%	1.30%	2009
0.94%	-1.82%	2.48%	5.52%	-0.06%	-1.74%	-1.10%	2.13%	-1.04%	2010
5.75%	6.52%	0.02%	6.41%	-1.09%	-3.80%	6.93%	2.72%	0.83%	2011
-0.55%	7.21%	1.35%	-2.85%	-5.22%	-1.16%	5.49%	2.08%	-0.21%	2012
1.27%	3.10%	-0.22%	-3.75%	-8.45%	-0.75%	3.62%	0.37%	1.77%	2013
0.21%	6.98%	6.78%	-4.76%	7.45%	-1.65%	1.51%	-0.93%	6.45%	2014

Table 5A. *Tax Revenue losses from Tax Evasion in terms of GDP, 2003-2014 (in %).*

EU AVEAGE	United Kingdom	Sweden	Spain	Slovenia	Slovakia	Romania	Portugal	Poland	Netherlands
7.92%	4.27%	8.61%	7.53%	10.04%	6.00%	9.37%	7.61%	9.25%	4.57%
7.80%	4.37%	8.42%	7.64%	9.99%	5.77%	9.00%	7.25%	9.04%	4.50%
7.69%	4.31%	8.31%	7.65%	9.93%	5.54%	9.11%	7.25%	9.21%	4.33%
7.45%	4.05%	7.58%	7.41%	9.78%	5.09%	9.11%	6.99%	9.27%	4.03%
7.28%	3.84%	7.14%	7.16%	9.21%	4.92%	8.94%	6.72%	9.23%	3.70%
6.93%	3.81%	6.69%	6.05%	8.83%	4.66%	8.32%	6.53%	8.91%	3.54%
6.98%	3.80%	6.95%	5.97%	9.03%	4.86%	7.94%	6.51%	8.37%	3.66%
6.84%	3.80%	6.62%	6.23%	9.09%	4.62%	8.02%	6.47%	8.13%	3.67%
6.74%	3.77%	6.39%	6.14%	8.92%	4.59%	8.32%	6.89%	8.13%	3.57%
6.74%	3.56%	6.22%	6.34%	8.83%	4.40%	8.12%	6.69%	8.00%	3.47%
6.64%	3.39%	6.09%	6.29%	8.62%	4.55%	7.78%	7.07%	7.81%	3.39%
6.68%	3.30%	5.94%	6.36%	8.70%	4.56%	7.78%	6.90%	7.76%	3.50%

Table 5A. *Continued.*

Malta	Luxembourg	Lithuania	Latvia	Italy	Ireland	Hungary	Greece	Germany	France
8.22%	3.84%	9.09%	8.39%	10.47%	4.64%	9.38%	9.62%	6.74%	6.44%
8.41%	3.73%	9.22%	8.34%	9.93%	4.71%	9.19%	9.39%	6.20%	6.28%
8.88%	3.88%	9.11%	8.29%	9.56%	4.60%	9.02%	9.49%	5.93%	6.14%
9.08%	3.72%	9.24%	8.38%	9.35%	4.38%	8.95%	8.57%	5.82%	5.57%
9.03%	3.59%	8.97%	7.81%	9.28%	4.08%	9.41%	8.41%	5.70%	5.23%
8.62%	3.25%	8.93%	7.45%	8.88%	3.71%	9.13%	8.19%	5.57%	4.92%
8.75%	3.54%	9.00%	7.45%	9.24%	3.80%	9.21%	8.23%	5.78%	5.09%
8.45%	3.28%	8.46%	7.64%	9.09%	3.72%	8.74%	8.69%	5.31%	4.98%
8.54%	3.21%	7.95%	7.39%	8.84%	3.61%	8.41%	8.77%	5.30%	4.97%
8.45%	3.30%	7.75%	7.46%	9.44%	3.70%	8.69%	9.19%	5.23%	5.02%
8.31%	3.16%	7.62%	7.32%	9.20%	3.60%	8.44%	9.04%	5.12%	4.69%
8.59%	3.19%	7.56%	7.16%	9.09%	3.60%	8.29%	9.09%	5.25%	5.17%

Table 5A. *Continued.*

Finland	Estonia	Denmark	Czech Republic	Cyprus	Croatia	Bulgaria	Belgium	Austria	Tax Evasion in terms of GDP
7.48%	9.49%	8.21%	6.65%	8.32%	11.98%	10.91%	9.80%	4.72%	2003
7.22%	9.61%	8.19%	6.61%	8.38%	11.76%	11.12%	9.48%	4.75%	2004
7.02%	9.06%	8.15%	6.33%	8.88%	11.40%	10.42%	9.17%	4.34%	2005
6.47%	9.03%	7.36%	6.14%	9.01%	11.48%	10.10%	8.74%	4.03%	2006
6.03%	9.20%	7.06%	5.85%	9.65%	11.28%	10.27%	8.27%	3.90%	2007
5.70%	9.11%	6.41%	5.49%	9.13%	10.89%	9.82%	8.02%	3.43%	2008
5.84%	10.39%	6.65%	5.42%	8.51%	10.96%	8.84%	8.05%	3.56%	2009
5.73%	9.79%	6.52%	5.44%	8.44%	10.76%	8.57%	7.92%	3.43%	2010
5.78%	9.18%	6.43%	5.53%	8.37%	10.38%	8.24%	7.90%	3.31%	2011
5.69%	9.08%	6.37%	5.47%	8.09%	10.41%	8.49%	7.95%	3.23%	2012
5.71%	8.83%	6.32%	5.39%	7.96%	10.39%	8.70%	7.90%	3.25%	2013
5.68%	8.97%	6.64%	5.22%	8.79%	10.28%	8.62%	7.71%	3.42%	2014

Table 6A. *Tax Revenue losses from Tax Evasion in terms of Government Revenue, 2003-2014 (in %).*

EU AVERAGE	United Kingdom	Sweden	Spain	Slovenia	Slovakia	Romania	Portugal	Poland	Netherlands
19.66%	11.30%	16.23%	19.85%	23.24%	16.12%	29.53%	18.62%	23.36%	10.96%
19.35%	11.28%	15.85%	19.78%	23.04%	16.25%	28.00%	18.18%	23.43%	10.74%
18.93%	10.98%	15.25%	19.35%	22.79%	15.09%	28.24%	17.91%	22.77%	10.30%
18.31%	10.13%	14.16%	18.32%	22.73%	14.53%	27.53%	17.10%	22.57%	9.33%
17.66%	9.64%	13.48%	17.50%	21.88%	14.39%	25.29%	16.20%	22.40%	8.66%
16.96%	9.17%	12.79%	16.48%	20.80%	13.57%	25.04%	15.70%	21.83%	8.09%
17.14%	9.80%	13.26%	17.14%	21.33%	13.46%	25.21%	16.11%	22.08%	8.57%
16.85%	9.72%	12.94%	17.19%	20.83%	13.40%	24.52%	15.92%	21.34%	8.50%
16.58%	9.61%	12.67%	16.98%	20.54%	12.62%	24.67%	16.15%	20.97%	8.36%
16.30%	9.25%	12.26%	16.89%	19.87%	12.24%	24.38%	15.61%	20.58%	8.02%
15.83%	8.62%	11.94%	16.45%	19.03%	11.85%	23.55%	15.67%	20.34%	7.69%
15.80%	8.63%	11.86%	16.49%	19.41%	11.72%	23.25%	15.50%	19.97%	7.96%

Table 6A. *Continued.*

Malta	Luxembourg	Lithuania	Latvia	Italy	Ireland	Hungary	Greece	Germany	France
22.78%	9.00%	28.12%	26.32%	23.89%	13.76%	22.31%	24.81%	15.44%	13.16%
22.21%	8.99%	28.26%	24.76%	22.96%	13.64%	21.72%	24.20%	14.56%	12.80%
22.44%	9.08%	27.01%	24.54%	22.27%	13.28%	21.60%	24.11%	13.86%	12.35%
22.87%	9.10%	27.15%	23.62%	21.24%	11.95%	21.15%	21.87%	13.54%	11.10%
23.19%	8.67%	26.04%	23.46%	20.50%	11.27%	20.89%	20.83%	13.26%	10.52%
22.44%	7.63%	25.52%	22.49%	19.68%	10.64%	20.23%	20.15%	12.83%	9.87%
22.69%	7.98%	25.15%	21.57%	20.15%	11.39%	19.99%	21.14%	13.04%	10.27%
22.31%	7.59%	23.91%	21.13%	19.93%	11.15%	19.40%	21.06%	12.34%	10.04%
22.26%	7.34%	23.69%	20.75%	19.37%	10.95%	19.00%	19.94%	12.12%	9.78%
21.77%	7.37%	23.51%	20.65%	19.75%	10.94%	18.76%	19.83%	11.78%	9.65%
21.13%	7.19%	23.13%	20.35%	19.14%	10.58%	17.95%	18.71%	11.54%	8.86%
20.93%	7.28%	22.15%	20.02%	18.87%	10.47%	17.51%	19.60%	11.79%	9.65%

Table 6A. *Continued.*

Finland	Estonia	Denmark	Czech Republic	Cyprus	Croatia	Bulgaria	Belgium	Austria	Tax Evasion as% of Government Revenue
14.43%	25.65%	15.35%	15.79%	24.03%	28.26%	28.49%	20.02%	9.58%	2003
14.02%	26.17%	14.87%	16.76%	23.99%	28.10%	28.00%	19.44%	9.77%	2004
13.54%	25.81%	14.51%	16.35%	23.91%	27.43%	27.56%	18.76%	8.95%	2005
12.38%	24.75%	13.43%	15.92%	23.86%	27.44%	28.41%	17.96%	8.44%	2006
11.62%	25.01%	12.93%	14.90%	23.56%	26.54%	26.67%	17.13%	8.16%	2007
10.87%	24.56%	11.93%	14.44%	23.12%	25.98%	25.49%	16.30%	7.10%	2008
11.17%	23.68%	12.32%	14.24%	23.09%	26.37%	24.98%	16.50%	7.29%	2009
10.98%	24.05%	12.01%	14.12%	22.53%	26.08%	25.64%	16.05%	7.10%	2010
10.84%	23.79%	11.74%	13.75%	22.77%	25.33%	25.64%	15.70%	6.86%	2011
10.54%	23.39%	11.61%	13.51%	22.44%	24.96%	24.92%	15.39%	6.60%	2012
10.37%	23.17%	11.39%	13.05%	21.81%	24.53%	23.61%	15.01%	6.55%	2013
10.33%	23.16%	11.57%	12.85%	21.73%	24.17%	23.74%	14.83%	6.83%	2014

Table 7A. *Tax Revenue losses from Tax Evasion in terms of Government Expenditure, 2003-2014 (in %).*

EU AVERAGE	United Kingdom	Sweden	Spain	Slovenia	Slovakia	Romania	Portugal	Poland	Netherlands
18.36%	10.37%	15.84%	19.66%	21.91%	15.03%	28.21%	16.80%	20.25%	10.22%
18.37%	10.33%	15.95%	19.76%	22.04%	15.26%	26.98%	15.73%	20.67%	10.31%
18.17%	10.08%	15.78%	19.96%	22.11%	14.00%	27.27%	15.53%	20.73%	10.24%
17.81%	9.44%	14.76%	19.37%	22.11%	13.19%	25.79%	15.46%	20.75%	9.37%
17.46%	8.96%	14.39%	18.40%	21.84%	13.62%	23.37%	15.11%	21.43%	8.71%
15.99%	8.18%	13.29%	14.71%	20.13%	12.70%	21.44%	14.40%	20.05%	8.13%
14.76%	7.67%	13.08%	13.04%	18.72%	11.05%	19.55%	12.97%	18.50%	7.60%
14.70%	7.78%	12.93%	13.65%	18.45%	11.02%	20.27%	12.49%	17.82%	7.62%
14.85%	8.03%	12.65%	13.46%	17.84%	11.34%	21.26%	13.77%	18.63%	7.59%
14.96%	7.60%	12.04%	13.21%	18.17%	10.96%	22.27%	13.79%	18.80%	7.36%
14.61%	7.53%	11.63%	13.93%	14.30%	11.08%	22.10%	14.15%	18.41%	7.29%
14.72%	7.52%	11.48%	14.31%	17.45%	10.94%	22.33%	13.35%	18.40%	7.56%

Table 7A. *Continued.*

Malta	Luxembourg	Lithuania	Latvia	Italy	Ireland	Hungary	Greece	Germany	France
18.20%	9.11%	27.06%	25.10%	22.16%	14.07%	19.07%	20.64%	14.09%	12.20%
19.91%	8.77%	27.10%	24.03%	21.21%	14.21%	18.88%	19.71%	13.38%	11.95%
21.01%	9.11%	26.74%	24.23%	20.30%	13.79%	18.19%	20.84%	12.83%	11.61%
21.46%	9.42%	26.93%	23.22%	19.64%	12.94%	17.33%	18.99%	13.02%	10.61%
21.92%	9.63%	25.44%	23.01%	19.84%	11.36%	18.78%	17.86%	13.32%	10.01%
20.24%	8.26%	23.45%	20.00%	18.58%	8.86%	18.72%	16.12%	12.77%	9.28%
20.91%	7.89%	20.05%	17.09%	18.07%	8.05%	18.18%	15.21%	12.15%	8.97%
20.58%	7.50%	20.01%	17.12%	18.23%	5.66%	17.63%	16.56%	11.24%	8.83%
20.85%	7.42%	18.70%	18.96%	18.00%	7.94%	16.91%	16.17%	11.86%	8.89%
19.94%	7.40%	21.46%	20.19%	18.59%	8.84%	17.87%	16.66%	11.76%	8.84%
19.83%	7.30%	21.42%	19.85%	18.03%	9.07%	17.04%	14.87%	11.51%	8.23%
19.92%	7.53%	21.73%	19.19%	17.75%	9.41%	16.62%	18.20%	11.87%	8.99%

Table 7A. *Continued.*

Finland	Estonia	Denmark	Czech Republic	Cyprus	Croatia	Bulgaria	Belgium	Austria	Tax Evasion as% of Government Expenditure
15.15%	26.97%	15.31%	13.71%	20.51%	25.55%	28.20%	19.33%	9.25%	2003
14.65%	27.99%	15.45%	15.68%	21.69%	25.09%	29.33%	19.37%	8.89%	2004
14.25%	26.66%	15.91%	15.13%	22.58%	25.21%	28.32%	17.82%	8.51%	2005
13.39%	26.90%	14.78%	15.04%	23.23%	25.47%	29.93%	18.06%	8.02%	2006
12.89%	27.00%	14.24%	14.64%	25.59%	25.12%	27.44%	17.15%	7.94%	2007
11.81%	22.91%	12.68%	13.68%	23.64%	24.39%	26.59%	15.95%	6.90%	2008
10.66%	22.56%	11.71%	12.44%	20.10%	23.15%	22.40%	14.86%	6.57%	2009
10.46%	24.16%	11.43%	12.67%	19.98%	22.82%	23.43%	14.86%	6.50%	2010
10.64%	24.53%	11.31%	12.88%	19.69%	21.29%	24.15%	14.52%	6.51%	2011
10.14%	23.24%	10.91%	12.31%	19.33%	22.13%	24.47%	14.24%	6.32%	2012
9.91%	23.09%	11.17%	12.66%	19.22%	21.78%	23.12%	14.22%	6.38%	2013
9.74%	23.61%	11.87%	12.26%	17.82%	21.36%	20.48%	14.00%	6.48%	2014

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