DEFINITION OF INFORMAL ECONOMY AND ESTIMATION OF TAX EVASION FOR EUROPEAN COUNTRIES

THE IMPACT OF FINANCIAL CRISIS ON TAX EVASION ESTIMATION

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ABSTRACT

In the first part of the paper, we focused on the definition of informal economy. Then, we discussed on factors could increase it. In the second part of the paper, we analysis how the informal economy could be quantify. To do that we took the VAT gap of the European countries and we calculated tax evasion. At the same time, we estimated the influence of economy on VAT gap and tax evasion. Finally, we did and 2013 VAT gap and tax evasion estimation.

Keywords: Tax and development, Informal Economy VAT gap, Tax Evasion, Financial crisis

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1 THEORETICAL FRAMEWORK

1.1 Introduction

In these last years, especially with the economic-financial crisis that has affected many countries, states have admitted that tax evasion and tax avoidance have reached a level that undermines economic activities and democracies.

At the international level, the major organizations such as the Organization for Economic Co-Operation Development (OECD), the World Bank (WB) and the International Monetary Fund (IMF) are searching for strategies to address these problems both to developing and developed economies.

1.2 Definition of informal economy

There is no a unique definition of the informal economy, authors use what best fits with the object of own analysis.

Someone, like Joshi (Joshi, et al., 2013), discriminates between registered or unregistered economic activity[1].

Other authors, like Andrews (Andrews, et al., 2011), first give a general definition of informal economy, such as "*economic activities and transactions that are sufficiently hidden*" and then explicit the areas and subjects that are most affected. The areas identified are social protection, tax evasion and economic growth, while subjects are employees, self-employed and companies.

Perry (Perry, et al., 2007), relates informal economy to "*bad things*", such as unprotected workers, evasion of the rule of law[2], and like Andrews, analyses three groups: workers, micro-businesses and companies.

Schneider (Schneider & Buehn, 2009) defines informal economy as all market-based legal production of goods and services that are deliberately concealed from public authorities to avoid: payment of income, value added, social security contributions, legal labour market

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[1] *"The conception of the informal sector thus moved to a focus on the legal status of the business: whether or not it was registered and followed appropriate legislation. It is this legal definition that has widespread use today (Gerxhani 2004, Kenyon 2007)"* (Joshi, et al., 2013).

2 *"The term informality means different things to different people, but almost always bad things: unprotected workers, excessive regulation, low productivity, unfair competition, evasion of the rule of law, underpayment or non-payment of taxes, and work "underground" or in the shadows".* (Perry, et al., 2007).

standards and administrative procedures All these different definitions highlight the need to delineate the concept of informal economy taking into account subjects and areas.

In this paper, we define the informal economy as **what should be formal according to the law of a state but it is not**. We will limit the analysis to the activities that **affect public revenue and expenditure and**, at the same time, **cause a distortion in the market**.

To sum up, informality will be the part of the economy affecting efficiency of both public revenue and expenditure, undermining the potential socio-economic development of a country or a region.

On the side of the public revenue, the informal economy decreases them and alters the distribution of the tax burden. On the expenditure side, ineffective and/or inefficient management policies cause a waste of public resources.

In this view, we can consider the informal economy also when the ratio between tax burden and public services established by the State does not match that one desired by the citizens. That happens when citizens consider tax burden too high in comparison with the level of public service.

There are several reasons why people choose to stay in formal or informal economy. For example, someone could consider to be formal a high and unnecessary cost. By contrast, others would prefer formal economy because they aspect to increase the activity or no to pay a fine or simply because it is right to do so. This is to say it is important that government should offer concrete vantages to be formal and not only justify tax burden with generic public services so if there are not relevant advantages to be formal (albeit not pay a fine), is more likely that people could prefer to be totally or partially informal. In this case, the informal economy is the result of a personal cost-benefit analysis in short-medium term.

"*A study by the French Ministry of Foreign Affairs (MAE) on strengthening local taxation in Africa, based on surveys in Benin, Cameroun, Ghana, Mali and Mauritania, showed that people often refused to pay tax because they could see little in return in terms of government services or investments. The study showed that this circle of non-compliance is hard to break. Lack of resources and a lack of capable local administration staff resulted typically in low quality goods and services to citizens.* […] *However, in some cases local authorities made efforts to communicate and explain actions they had taken to provide services.* […] *For example to inform citizens of a market renovation which was carried out with public funds coming from local taxes. Experience showed that these awareness-*

raising measures only succeed when a link could be established between taxes and a concrete project considered useful by citizens". (OECD, 2008)

There is also a different approach based on the fact that taxation should be included in the social responsibility of a company. In this way, taxation should not be considered as a cost, but "*a distribution out of profits. That puts tax in the same category as a dividend—are turn to the stakeholders in the enterprise. This reflects the fact that companies do not make profit merely by using investors' capital. They also use the societies in which they operate, whether that is the physical infrastructure provided by the state, the people the state has educated, or the legal infrastructure that allows companies to protect their property rights. Tax is the return due on this investment by society from which companies benefit. Moreover, tax is properly due to the state in which a company generates its profit, not to that state to which it can relocate its profit for taxation purposes*". (Eijsden, 2013)

Finally, we specific that the concept of informal economy, we have talked about, does not consider illegal activities that are naturally part of the informal economy. That could be relevant considering that they affect the formal economy in several ways.

1.3 Main causes of the informal economy

Many factors cause or encourage informal economy depending on the country and the historical moment of which we speak. It is important to know what may be the main factors of the problem to adopt appropriate policies.

The informal economy also has a historical and cultural nature. There are countries where it is widespread and is not perceived as such, but as another way of doing business, often the only one. In most cases, when the informal economy has reached a significant size, we have a problem of poor public governance (Moore, 2007) (OECD, 2008).

First, the form of government affects the informal economy. When there is not a strong relationship between state and citizens, the latter seek alternative ways to operate forming what could be defined as informal economy (this time with a wider connotation than it can be a motivation in tax matters). An example of a form of government that can counter the rise of the informal economy is democracy.

But for good governance, you also need an appropriate institutional apparatus on the relationship between citizen and government is founded. In these countries, people have a particular interest to operate in the formal economy, as an economic activity, to grow, requires public institutions and the informal economy consequently have a reduced dimension.

The literature had underline three main factors that have a strong correlation with the informal economy. They are tax burden, intensity of regulations, governance structure. (OECD, 2010) (Schneider & Buehn, 2009)

This vision does not want to be exhaustive, but it gives a better understanding on what we should care about when we study how lowering informal economy.

So we select the following three factors that could have a main correlation in informal economy: fiscal burden, intensity of the law and public services[3]. (Schneider & Buehn, 2009)

1.3.1 Tax burden

Fiscal burden is a primary factor to incentive people to choose informal economy. Supposing a state given money instead of demanding it, people would comply with that.

"*The literature frequently cites tax evasion as a key reason for firms to operate informally. Firms evade taxes when they under-report their income or profits in order to evade taxes or fail to pay valued added, sales, real estate or other taxes.*" (OECD, 2010)

Schneider (2009) divides between tax and social security contribution burdens. "*The bigger the difference between the total cost of labour in the official economy and the after-tax earnings (from work), the greater is the incentive to avoid this difference and to work in the shadow economy. Since this difference depends broadly on the social security burden/payments and the overall tax burden, they latter are key features of the existence and the increase of the shadow economy*" (Schneider & Buehn, 2009)

This is mainly because labour force has a special connection with informal economy. Moreover, a way to quantify the informal economy is through the number of black workers. (Perry, et al., 2007)

There are three main type of taxes: direct taxes (corporate and personal), indirect tax (mainly VAT) and social security contributions.

In our analysis, like other authors[4], we found a positive correlation when we considered for fiscal burden the overall 2013 *Paying Taxes* ranking[5] by the World Bank and the rank 2013 of Corruption Perception Index (CPI).

[3] The actors of the informal economies are divided into three groups: black employees; self-employed without employees working in the informal way; production of goods and services by formal and informal companies. (Andrews, et al., 2011)

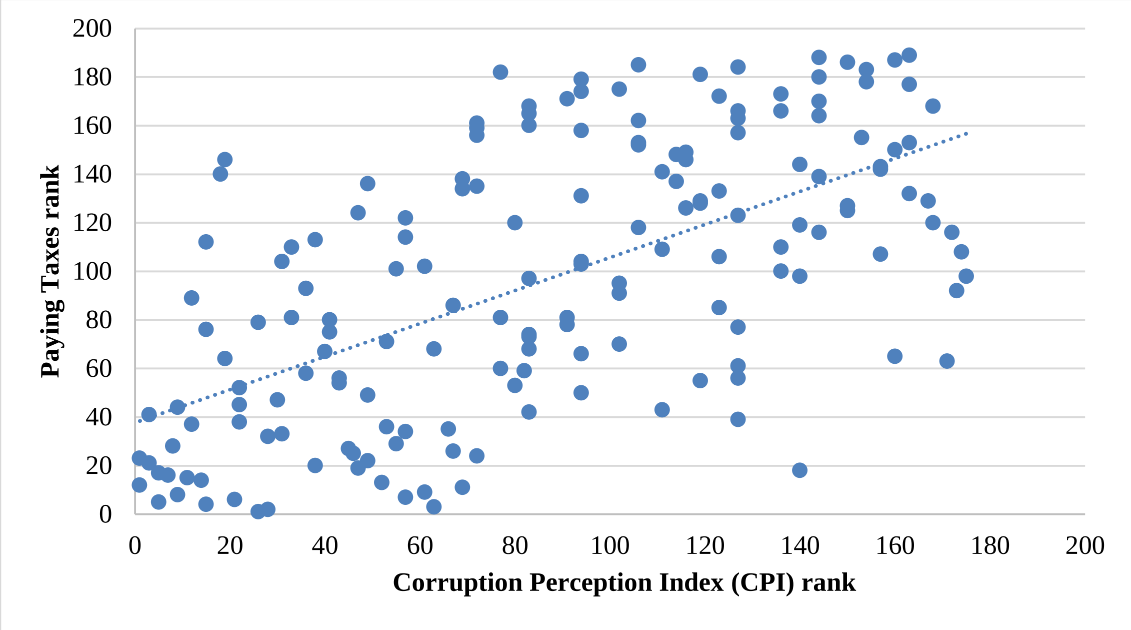


Figure 1: Correlation between Corruption Perception Index (CPI) rank 2013 (Transparency International, 2013) and Paying Taxes rank 2013 (World Bank, 2013)- Own calculation-

Therefore, we analysis if fiscal corporate burden has a strong correlation with ICP, and more in general with informal economy. We compare corporate tax rate of 108 countries all over the world and regions. We take the rate from 2006 to 2013 and the Corruption Perception Index (CPI) and we do not find any significant linear correlation[6].

At the same consideration come Kuehn "*despite a positive relation between tax rates and the informal economy, for countries with equally high tax rates, informal economy estimates are strikingly different.*" (Kuehn, 2007 Version 2009) At the conclusion of his analysis, Kuehn reckons that: "*differences in tax rates alone do not account for differences in the informal economy across high-income countries.* […] *The quality of governance plays a more significant role in accounting for the observed differences in informal economy.*" (Kuehn, 2007 Version 2009)

Furthermore, when we compare Informal Economy 2012, calculated by Schneider (Schneider, 2012), and the corporate tax rate 2013 (KPMG, 2014) for European countries

[4] "*Empirical results of the influence of the tax burden on the shadow economy is provided in the studies of Schneider (1994b, 2000, 2004, 2005, 2007) and Johnson, Kaufmann and Zoido-Lobatón (1998a, 1998b); they all found statistically significant evidence for the influence of taxation on the shadow economy*". (Schneider & Buehn, 2009).

[5] This rank is a combination of three index: Payments (number per year); Time (hours per year); Total tax rate (% of profit).

[6] Change in tax rate 2006-2013 / CPI 2013 Score - Pearson correlation 0,185; Corporate tax rate 2013 / CPI 2013 Score - Pearson correlation 0,075; Change in tax rate 2006-2013 / Country Rank CPI 2006-2013 - Pearson correlation -0,115. We repeat this correlation with 31 Europe countries and we found no correlations.

and others[7] we found a negative linear correlation. That means given high tax rates match to low informal economies.

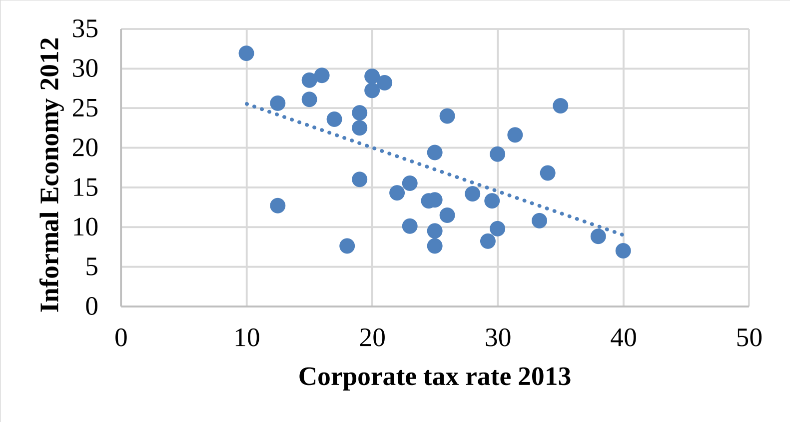


Figure 2: *Correlation between Informal economy 2012 (Schneider, 2012) and Corporate tax rate 2013 (KPMG, 2014) - Own calculation -*

Moreover, there is a positive correlation between high percentage of tax revenue over GDP and developed economies where informal economy is lower.[8] A high rate of this percentage comes together with quite advanced public institution. Except for the Anglo-Saxon countries that usually have a lower share, from 1965 to 2012 the fiscal income in percentage of GDP has increased. (OECD, 2013) In this way, real fiscal burden could be symptomatic of the robustness of the institutional framework of the country.

High rate tax could be, also, a real problem of competitiveness. "Higher tax rates can remove the productivity advantage of large formal firms. When the cumulative cost of complying with tax and other regulations is high, informal firms will have a substantial competitive advantage over formal firms, which may prevent the entry or expansion of formal firms in the market." (OECD, 2010)

Less competitiveness is correlating with informal economy: "the negative relation across 21 high-income OECD countries between the Global Competitiveness Index and estimates of the informal economy. This negative relationship is robust to various alternative measures of institutional quality by the World Bank such as the Government Effectiveness Index, the Rule of Law Index, or the Control of Corruption Index. (Kaufmannet al 2006)" (Kuehn, 2007 Version 2009)

The fiscal burden is not a standalone problem: it is a political matter. It has a strong impact of the citizen, and it is, quite often, a relevant matter of the political agenda. Changes in fiscal burden could be better deal to handle the fiscal function of redistribution of the

[7] Norway, Switzerland, Turkey, Australia, Canada, Japan, New Zealand, United States (USA).

[8] "At the top level of informality, we find Sub-Saharan Africa, and at the lowest level of informality, we find the OECD countries." (Schneider, et al., 2010)

wealth. So for example, there could be a reducing in tax rate for new companies or companies with high investment on innovation.

Talking about informal economy and tax rate, what we are looking for is the equilibrium between the level of the tax rate and the income needed by the state. Thus, we do not find a strong linear correlation between high tax rate and informal economy, we know that taxes are a cost for companies and people so the lower the better.

In this focus, we could say that the level of tax rate could have a stronger impact on private cost than on informal economy and so it could be a tool of economic policy.

For example, between 2007 and 2012 Germany and Canada lowed the corporate tax rate respectively of 9,00% and 10,00% (KPMG, 2014). This reduction, during the economic crisis, has been given a lower tax cost of compliance for companies.

It is important because there is a correlation between tax rate and public revenue. In a curve of Laffer we find an inverse u correlation between tax rate and public revenue. Some of the problems of this curve are to find out which tax rate maximizes the revenue and the elasticity of the two variables.

We already know that when taxes do not cover all the public expenditure, governments usually borrow by issuing government bonds or directly from a supranational organization (e.g. the World Bank) or international financial institutions. Moreover, the margin for a possible increase in the tax rate is also due to the economic trend. So when the economy is growing this margin tends to increase too; unlike during a financial-economic crisis the fiscal cost is more relevant and thus the margin gets thinner. In these cases, a State could offset the drop in revenue produced by the crisis with an increase in the tax rate.

However, if the tax burden was already quite high a further increase could depress economic activities and encourage tax evasion; and thereby increase the informal economy.

Therefore, some countries, especially in Europe, are paying greater attention to public finances. In particular, they try to divide the current public spending by the extraordinary, and to find the elasticity of revenue with respect to the economic trend.

To sum up, when asking what relation exist between the tax burden and the informal economy and in general economic growth, we have found that there is a positive linear correlation between paying taxes and the informal economy (or ICP). However, this correlation disappears when we take in consideration the corporate tax rate.

In a period of recession, it could be more difficult a tax compliance behaviour. If the State does not have the opportunity to reduce the rate, should probably increase it to avoid a high public deficit. These could be traduce in an excessive cost that could increase the informal economy. Therefore, countries with a good public accountability have low informal economy.

1.3.2 Intensity of the law

Legislation in tax administration is not only necessary but it is important because guarantee the redistribution function of the fiscal system. It could be described as inverse U. Too much legislation increases the fiscal compliance cost and at the same time it could be used to legitimate elusion methods[9].

On the other side "*specific and targeted rules which link the tax treatment in the country concerned to the tax treatment in another country in appropriate situations hold significant potential to address certain hybrid mismatch arrangements and have recently been introduced by a number of countries*." (OECD, 2012)

So, if on the one hand, legislation is necessary to better handle tax evasion and manage public services, on the other one, an abuse of it provoke, as we have already said, more loopholes.

"*Overly burdensome or inefficient regulation can, in turn, significantly increase the cost of both joining the formal economy and operating within it. By reducing these barriers, policy makers can increase participation in the formal economy. Furthermore, reducing unnecessary restrictions on businesses may increase the intensity of competition in the formal economy as more firms may be willing to enter it*." (OECD, 2010)

The World Bank quantifies the size of intensity of the legislation around the world in the study "Doing Business" "*The DBIs are designed to capture that ease of doing business in ten areas, one of which monitors the ease of registering a business.*" In measuring the ease of starting a business, countries are ranked on:

a) the number of procedures that a company needs to complete before legally starting operations;

[9] This happens because there are political reasons in legislation. Therefore, broadly, there is not poor governance at all but political measures defend the interest of the elite instead of all of population. "*...the state is behaving in a deliberately and coherently exclusionary manner, manifesting an underlying stable political-economy equilibrium where incumbent business and labour elites defend their rents and will find ways to offset and nullify any tinkering*" (Perry, et al., 2007)

b) the time (in terms of number of days) necessary to complete each of these procedures;
c) the cost to complete each of these procedures and to start operating the business (as a percentage of income per-capita) and
d) the minimum capital that must be paid in by firms in order to start a business (as a percentage of income per-capita). (OECD, 2010)

Talking about labour regulations cover hiring, firing, severance pay, minimum wage, and overtime hours and pay as well as mandatory benefits packages, social security payments, rights of association and collective bargaining rights, among others. "*They are often enacted and designed to protect workers from unfair and discriminatory actions". "While governments try to find the right balance between protecting workers and ensuring labour market flexibility, most developing countries put excessive rigidity to the detriment of businesses and workers alike. Businesses, as a result, are more likely to hire informally when regulations are less flexible*". (OECD, 2010)

Research backs this up and finds an association between intensity of lax and the extent of informality within an economy. (World Bank, 2007)

Also for a competition agency, in addressing market distortion caused by the informal economy, has to understand why firms operate in the shadows rather than as part of the formal economy. While there are many reasons, one documented cause is that burdensome regulation can make it difficult for entrepreneurs to enter the formal market and thus drive them underground (OECD, 2010).

Business registration regulations burden.

"*De Soto (1989), Djankov et al. (2002), Friedman et al. (2000), Loayza, Servén, and Oviedo (2005), and Schneider (2005), among many others, have stressed the very high registration costs, the regulatory burden to becoming formal, as well as the high ongoing costs of fully integrating with the state that drive firms to stay off the state's radar."* (Perry, et al., 2007)

"*Recent studies have conducted extensive empirical testing of this proposition using Doing Business and other related indicators. Bruhn (2011, 2013), among the leading studies employing natural experiments, use quarterly national employment data collected by the Mexican government between 2000 and 2004 and the fact that different regions started implementing business registration reform—called Systems of Fast Opening of Firms (SARE)-*" (World Bank, 2013)

As Hernando De Soto notes: "*As in Peru, for example, it takes a new entrepreneur thirteen years to overcome the legal and administrative hurdles required to build a retail market for food that would help take vendors off the street; twenty-one years to obtain authorisation to construct a legally titled building on wasteland; twenty-six months to get authorisation to operate a new bus route; and nearly a year, working six hours a day, to gain the legal license to operate a sewing machine for commercial purposes*" (Soto, 2002)

"*Only 3 OECD countries (United States, Australia and Denmark) are listed among the top 10 in terms of ease of employment. High severance costs encourage firms to use informal labour as employment decisions do not always work out well and economic downturns may lead to costly layoffs.*" (OECD, 2010)

1.3.3 Governance and public services

Another relevant factor studying the cause of informality is public service and more in general governance. We do not refer only to the public services to the community, but also to the policies to reduce informal economy and, among other things, increase tax compliance.

We will analyse the following three dimensions in which a state relates to economic activities: governance in general, public services and community interests. They are not fixed areas as governance could include the other two sections.

Therefore, our question is how a state through governance, public sector and community interests could maximize the formal economy and the social and economic development. We start from the concept that in a globalized world, a region is strategic for economic activities, basically, for two reasons: it is an important market to sell in or/and it is rich of resources (human, capital, naturals…).

When we talk about governance in general, we will refer also but not only to public institutions and the organization of the government. Some studies show the importance of the state for the private sector. Its role changes, due to the context, to follow or anticipate the evolution of the economy. "*Sound public institutions that can adequately secure property rights, establish an impartial judiciary and reduce corruption are perhaps the most fundamental contributions that public policy can make to promoting participation in the formal sector (Loayza, 1996; de Soto, 1989). Indeed, countries with a strong rule of law – proxied by a legal system that protects property rights, have an independent judiciary and an impartial court system – tend to have a smaller informal sector*."[10] (Andrews, et al., 2011)

In this context, we could talk, also, about effective of governance: "*…firms may either be under reporting revenue or the number of employees in order to hide activities from corrupt government officials or because firms simply don't want to pay taxes and finance an ineffective government*". (OECD, 2010)

[10] Rule of law refers is an index based on seven components: judicial independence, impartial courts, protection of property rights, military interference in rule of law and the political process, integrity of the legal system, legal enforcement of contracts and regulatory restrictions on the sale of real property. These indicators were assembled from three primary sources: the International Country Risk Guide, the Global Competitiveness Report, and the World Bank's Doing Business project. Source: Euro Barometer 2007 Survey of undeclared work in the European Union, OECD STAN Database, and Economic Freedom of the World, Annual Report 2010

Kuehn (2007 Version 2009) presents a model where he finds correlation between governance and informality. Furthermore, when he takes into account different level of tax rate the correlation gets stronger.

On the next focus, we will analyse the relation between public services, informal economy and fiscal burden.

In other words, public services could justify part of the fiscal burden and they have an effect on informal economy. Moreover, we take the hypothesis that an economy activity needs a set of public services to operate, at least at the basic stage. Law, policies, infrastructures are some of these services.

"*Disclosure of public expenditure information, and the participation of and supervision by citizens—that is, "voice"—in the way taxes will be spent, may also help increase trust in the state and may contribute to social norms of compliance. These factors have been credited with success in increasing tax compliance (and collections) in Chile and Spain, particularly through widespread consensus among political parties about the need for the reform of the tax system, improved democratic governance, and highly visible enhancements in social and other public services.*" (Perry, et al., 2007) Moreover, "*this finding indicates that countries with better institutional quality (e.g., bureaucracy quality or corruption) can potentially raise tax collection without undue extra burden on the economy*". (Minh Le, et al., 2012)

Among the services directly connected with tax compliance, we agree with Perry (2007) when said: "*Promoting taxpayer education and developing taxpayer services in filing returns and paying taxes, broadcasting advertisements that link taxes with government services, stimulating voluntary compliance by lowering compliance costs, simplifying taxes and their payment, and promoting a taxpayer—and a tax administrator—"code of ethics" have proved to be useful complementary measures to the punishment paradigm to enhance compliance.*" (Perry, et al., 2007)

Keeping tax rate fixed, we could increase tax compliance through the "*carrot and stick*" approach where the "carrot" is the set of policies and public services to promote, directly and indirectly, compliance and the "stick" is the tax burden apparatus of resources to audit and control the respect of the law. This is just to say that the two thing come together because both are services. At the same time, we could also think that the private sector gives "carrots" to the government by paying taxes and if it does not receive the right set of services through the election's system "sticks" the government. "*Effective government enforcement encourages firms to comply with tax and other regulations. When insufficient* *resources are dedicated towards audit and collection programs for example, the incentive of firms to evade the rule of law increases, however. Low and inconsistent penalties also encourage such behaviour. In particular, perceptions of government ineffectiveness are associated with greater informality while corruption is positively related to it*". (OECD, 2010)

In this area, it is important tax administrative structure and management. "*The use of semiautonomous revenue authorities has been shown in several countries to improve tax administration with a more service-oriented approach to tax enforcement. The service paradigm fits squarely with the perspective that emphasizes the role of social norms in tax compliance. Experience from other countries shows that a government's commitment to even handily enforce the tax laws while facilitating taxpayer compliance can have an important effect on the pervasive culture of noncompliance found in many countries in the region.*" (Perry, et al., 2007) So, *"... reforms should also emphasize the "service paradigm" with policies to enhance the role of the tax administration as a facilitator and a provider of services to taxpayer-citizens.*" (Perry, et al., 2007)

Other literature evidences the tax compliance as a corporate responsibility. "*Tax is the missing element in corporate responsibility debates. Corporate responsibility should start with tax compliance. Anti-tax lobbies seek to portray tax as a cost. This is the wrong way to see it. Tax is not a cost, but a distribution out of profits. That puts tax in the same category as a dividend—a return to the stakeholders in the enterprise. This reflects the fact that companies do not make profit merely by using investors' capital. They also use the societies in which they operate, whether that is the physical infrastructure provided by the state, the people the state has educated, or the legal infrastructure that allows companies to protect their property rights. Tax is the return due on this investment by society from which companies benefit. Moreover, tax is properly due to the state in which a company generates its profit, not to that state to which it can relocate its profit for taxation purposes*"[11]. (Eijsden, 2013) In addition, the European Commission promotes the three principles of good tax governance – namely transparency, exchange of information and fair tax competition – in relations between states. Enterprises are encouraged, where appropriate, also to work towards the implementation of these principles (EC, 2011).

[11] More about the connection between tax and corporate responsibility in Tax Justice and Christian Aid.

Turning to the third point, the state has to defend the interest of the community against a particular economic interest. In this area, such as environment, labour law and so on the state limits the economic activities.

"*Citizens are more likely to hold their governments accountable when they have to pay more taxes; and as a result, the governments have incentives to design and implement policies that improve the welfare of the population. However, in a poverty-ridden country, without prior redistribution of a small share to citizens, taxation is likely to remain impossible*". (Devarajan , et al., 2010)

Consequently, the more people interested and involved in the government policies the more accounted the government has to be to better answer social need.

To sum up, finding the right equilibrium between governance, public services and community interests is the way to increase economy activities, tax compliance, and more broadly development. Meanwhile we know that all these policies, to be really implemented, have to be, first, found at international level. At international level, there are more problems because it is more complex, and governance could be less transparent and accountability.

During the last decade many international organization like World Bank, IMF, OECD and others have stressed the need of more transparency and fairly competition at the international level. At the same time non-governmental organization like Extractive Industries Transparency Initiative (EITI), are trying to do the same. EU and US try to go in the same direction, but progress are very slow.

Too many unanswered questions, like tax heaven, anonymous companies, are on the table; the problem is mainly competition. At the international level, countries compete each other in every sector and the strategic areas like natural resources, and raw materials in general, are extremely important.

Uncontrolled globalisation tend to uniform standards in transparency, accountability, human right, labour right, environment, so on.

2 VAT GAP AND TAX EVASION ESTIMATION

2.1 Introduction

In the first, part we focused on how informal economy could be defined. We said that it was informal an activity that should be formal according to the law of a state but it not. At the same time, this activity has to be relevant and should have consequence for both public revenue and expenditure. Then, we discuss on factors could increase it such as tax burden, intensity of law, governance and public services.

In this part of the paper, we try to quantify the informal economy. To do that we focus on informal economy effecting the public revenue. It is impossible to exactly quantify how big informal economy is. The problem is that informal economy represents missing data that could be just estimated. There is not a unique method to measure it because there is not a common definition of it. Also because, it could be seen as a sum up of different things. Transfer pricing, unreported sales, unregistered activities or illegal workers, are only a sample of where informal economy could be found.

Another problem, in measuring informal economy is that could vary depending on the region or the state we are talking about. As we already said, governance, institution, legislation and corruption, are some of the indicators that we could defined as "*friendly informal economy*". When they score badly, they foster informal economy.

So, in the next analysis we estimate informal economy for European countries doing an indirect calculation of the tax evasion through the VAT gap. First, we report the estimation of VAT gap provided by European Commission, OECD and other authors. Secondly, we try to calculate the effect of the economy on tax evasion to better focus on tax compliance without economic distortion. Finally, thanks to the data available we estimate the VAT gap and the tax evasion for 2012.

2.2 Informal economy –VAT gap estimation in the literature

Due to the difficult to quantify the real informal economy, we try to estimate the tax evasion from the VAT gap. To calculate the VAT gap we can choose between two methods: the bottom-up or the top-down. How the words suggest the different is, according to the data, if you add or deduct components.

In the following pages, we present the estimations of VAT gap for the European countries. We propose this data to evidence different approach to the matter. For comments concerning the difference in the estimation and the result we refer to each study where the authors discuss it in details.

2.2.1 Bottom-up method

European Commission estimation

A recent study sponsored by European Commission -Director General TAXUD- quantifies the VAT gap for European Countries using a bottom-up method. The VAT gap is estimated as the difference between the VAT really receipts and the VAT should have been receipt, also called VAT Total Tax Liability (VTTL). The VTTL takes into account the less amount of revenue due to exemption, special regime, reduce rate, etc.

In the study of the commission, the VTTL is calculated with a bottom-up method by sum-up the VAT resulting related to every national consumption to the right VAT rate. (EC, 2013) (EC, 2014)

The main group of consumption expenditure are:

- **Household Consumption Liability**: this is the main voice. The amount of VAT is calculated by splitting the consumption between taxable amount and tax. Or in other words, as the product of the appropriate VAT rates and the amount of consumption of individual products or services;
- **Intermediate Consumption on trade**: the amount of VAT paid on inputs by industries that cannot claim a credit because their sales are exempt from VAT;
- **Gross Fixed Capital Formation (GFCF)**: VAT paid on inputs to GFCF activities of industries that cannot claim a credit because their sales are exempt from VAT.
- **Government Consumption**: amount of VAT on inputs on government consumption that cannot be recovered because most government activities are exempt from VAT.

  For example, Government consumption in Education is composed of wages and salaries of Education workers, plus inputs into the education activities of the government at all levels. The VAT paid on such inputs is generally not recoverable, and therefore included into the VTTL.

The difference between the VTTL, so calculated, and the VAT really receipt gives us what we already said the VAT gap. The VAT gap so calculated is usually called compliance VAT to distinguish it from the gap related to the policy. The policy gap is the part of VAT not collected by legislation previsions. It is the case for reduce rate for primary products or exemption for services like health and education.

VAT gap - Millions Euros	VAT gap - Millions Euros 2012	VAT gap on VTTL 2011
Austria	€ 3.244	12%
Belgium	€ 2.991	10%
Bulgaria	€ 957	20%
Czech Republic	€ 3.267	22%
Denmark	€ 2.141	8%
Estonia	€ 255	14%
Finland	€ 905	5%
France	€ 25.583	15%
Germany	€ 21.957	10%
Greece	€ 6.651	33%
Hungary	€ 2.971	25%
Ireland	€ 1.262	11%
Italy	€ 46.034	33%
Latvia	€ 818	34%
Lithuania	€ 1.436	36%
Luxembourg	€ 204	6%
Malta	€ 241	31%
Netherlands	€ 1.966	5%
Poland	€ 9.317	25%
Portugal	€ 1.228	8%
Romania	€ 8.841	44%
Slovakia	€ 2.787	39%
Slovenia	€ 270	9%
Spain	€ 12.412	18%
Sweden	€ 2.886	7%
United Kingdom	€ 16.557	10%

Table 1 (EC, 2014)

2.2.2 Top-down method

Due to the difficult process to estimate the VAT gap with the bottom-up method, some authors, like OECD (OECD, 2012), prefer calculate the VAT Revenue Ratio (VRR), called, also, *c-efficiency*. The VRR is the amount of VAT that could be collected not taking in consideration the legislation on VAT and apply the standard VAT rate. In other words, is it a hypothetically value that combine the compliance gap (what we call simply VAT gap) and policy gap.

The VRR is the ratio from the actual VAT revenue and a Full VAT or, called also, Notional Ideal Revenue. The Full VAT as theoretical amount of VAT that should be collected applying the standard VAT rate with no exemption and reduce rate and with a completed tax compliance. In other words, it is a VAT that includes, also, the compliance gap (what we simply call VAT gap) and the policy gap, a situation with a zero VAT Gap.

$$VRR = \frac{Actual\ VAT\ revenues}{Full\ VAT}$$

"*It is clear that the VRR is a combination of the "Policy Efficiency Ratio" and the "Compliance Efficiency Ratio". Methods may be developed to produce breakdowns of the composition of the VRR. One method may consist in using the tax expenditure (i.e. the revenue cost of departure from the application of the standard rate to the "entire" tax base) which may allow for calculating the policy efficiency ratio. The remaining difference between Policy Efficiency Ratio and the actual VRR would provide the compliance efficiency ratio by deduction"*. (OECD, 2012)

The estimation of VAT gap with a top-down method follows the calculation developed by Richard Murphy. (Murphy, 2014)

$$VRR\ GAP = 1 - \frac{Actual\ VAT\ revenue}{Full\ VAT}$$

Thanks to VRR gap calculated by the European Commission (EC) (EC, 2013) it is possible to calculate the amount of full VAT.

$$Full\ VAT = \frac{Actual\ VAT\ revenues}{(1 - VRR\ GAP\ )}$$

This VAT includes the VAT receipt, the compliance gap and the policy gap.[12]

In this way, if we deduct the policy gap from the VRR GAP to find a VTTL

[12] Keen (Keen, 2013) divide the policy gap between VAT exemptions and reduced rate operations.

$$VTTL = Full\,VAT\ (1 - Policy\ gap)$$

The VTTL as we already said before is the VAT that is expected after taking in account a reduction due to exemption and reduce rate in VAT legislation.
The difference between VTTL and Actual VAT revenues give the VAT gap

$$VAT\ gap = VTTL\ - Actual\,VAT\ revenues$$

The VAT gap, so calculated, is similar to the one calculated with the bottom-up method.

A. **European Commission estimation**

The European Commission -Director General TAXUD- has commissioned also a study of VAT gap using a top-down method. The estimation reported below from the research carry out by Reckon LLD calculate the VAT gap "*by identifying and measuring the categories of expenditure that give rise to irrecoverable VAT. The main categories of relevant expenditures that give rise to irrecoverable VAT are final consumption expenditure by households, non-profit institutions serving households (NPISH) and government, intermediate consumption expenditure on goods and services used in making exempt supplies of goods and services; and gross fixed capital formation on assets and changes in the stock of valuables which can be allocated to exempt supplies of goods and services*". (Reckon LLP, 2009)

VAT gap, 2006 (EUR million) (Reckon LLP, 2009)

Member State	Theoretical VAT liability	VAT receipts	VAT gap	VAT gap as a share of theoretical liability
AT	22.844	19.735	3.108	14%
BE	25.360	22.569	2.791	11%
CZ	9.216	7.541	1.675	18%
DE	164.115	147.150	16.965	10%
DK	23.611	22.560	1.051	4%
EE	1.325	1.215	111	8%
ES	63.013	61.595	1.418	2%
FI	15.176	14.418	758	5%
FR	140.817	131.017	9.800	7%
GR	21.746	15.183	6.563	30%
HU	8.882	6.813	2.070	23%

IE	14.043	13.802	241	2%
IT	119.197	92.860	26.337	22%
LT	2.335	1.826	510	22%
LU	1.961	1.941	20	1%
LV	1.751	1.374	378	22%
MT	463	410	53	11%
NL	41.269	39.888	1.381	3%
PL	23.784	22.127	1.657	7%
PT	14.371	13.757	614	4%
SE	29.294	28.487	807	3%
SI	2.764	2.647	116	4%
SK	4.632	3.320	1.312	28%
UK	155.697	128.721	26.976	17%
EU-25	907.667	800.955	106.712	12%

Table 2. Note: EU-25 excludes Cyprus. Non-Euro currencies converted to EUR using the average exchange rate in 2006.

B. OECD estimation

The VAT Revenue Ratio provided by the OECD gives the percentage of actual VAT revenue on the theoretically VAT. The ratio is usually less than 1; because VAT legislation always gives special regime, exemption, reduce rate etc.

"*The aim of the VRR is to provide a comparative measure of a country's ability to secure effectively the potential tax base for VAT. The VRR measures the difference between the VAT revenue actually collected and what would theoretically be raised if VAT was applied at the standard rate to the entire potential tax base in a "pure" VAT regime and all revenue was collected*". (OECD, 2012)

As reported in the study of European Commission (EC, 2013) more interesting could be the so-called VRR gap. The VRR gap is the ratio between the actual VAT and the theoretical VAT minus one. This part represents the lost part of VAT due policy and compliance gap.

VAT Revenue Ratio (VRR)															
	Standard VAT rate 2009	1976	1980	1984	1988	1992	1996	2000	2003	2005	2006	2007	2008	2009	Difference 2000 2009
AUSTRALIA	10,0								0,55	0,56	0,55	0,54	0,50	0,52	0,52
AUSTRIA	20,0	0,65	0,65	0,66	0,61	0,60	0,60	0,62	0,61	0,61	0,59	0,61	0,61	0,61	-0,01
BELGIUM	21,0	0,57	0,61	0,50	0,53	0,50	0,47	0,51	0,48	0,50	0,52	0,51	0,48	0,47	-0,05
CANADA	5,0					0,44	0,48	0,51	0,51	0,52	0,48	0,52	0,51	0,49	-0,02
CHILE	19,0					0,62	0,67	0,64	0,67	0,67	0,64	0,67	0,70	0,59	-0,05
CZECH REPUBLIC	19,0						0,43	0,43	0,41	0,57	0,53	0,55	0,58	0,56	0,13
DENMARK	25,0	0,64	0,61	0,60	0,60	0,55	0,58	0,60	0,60	0,62	0,64	0,65	0,62	0,59	-0,02
ESTONIA	18,0						0,73	0,70	0,69	0,75	0,81	0,80	0,67	0,76	0,05
FINLAND	22,0						0,54	0,60	0,60	0,60	0,61	0,60	0,58	0,55	-0,05
FRANCE	19,6	0,65	0,68	0,62	0,61	0,52	0,51	0,50	0,50	0,51	0,51	0,51	0,49	0,46	-0,04
GERMANY	19,0	0,56	0,57	0,52	0,50	0,62	0,60	0,61	0,56	0,55	0,57	0,55	0,56	0,56	-0,05
GREECE	19,0				0,46	0,46	0,43	0,50	0,49	0,48	0,47	0,48	0,46	0,39	-0,10
HUNGARY	20,0					0,30	0,43	0,52	0,46	0,49	0,55	0,59	0,57	0,62	0,10
ICELAND	24,5					0,56	0,54	0,59	0,54	0,62	0,65	0,60	0,54	0,47	-0,12
IRELAND	21,5	0,30	0,21	0,44	0,42	0,46	0,52	0,58	0,57	0,65	0,66	0,62	0,54	0,46	-0,12
ISRAEL	15,5						0,68	0,64	0,63	0,64	0,64	0,69	0,68	0,68	0,04
ITALY	20,0	0,46	0,43	0,40	0,40	0,39	0,40	0,45	0,41	0,41	0,43	0,43	0,41	0,37	-0,08
JAPAN	5,0					0,68	0,71	0,68	0,66	0,71	0,70	0,69	0,67	0,67	-0,01
KOREA	10,0					0,64	0,59	0,61	0,69	0,66	0,65	0,65	0,65	0,67	0,06
LUXEMBOURG	15,0	0,60	0,56	0,56	0,57	0,47	0,57	0,68	0,75	0,87	0,87	0,91	0,94	0,92	0,24
MEXICO	15,0		0,33	0,28	0,26	0,32	0,25	0,29	0,30	0,31	0,34	0,34	0,35	0,31	0,02
NETHERLANDS	19,0	0,49	0,54	0,51	0,56	0,59	0,57	0,60	0,57	0,61	0,60	0,62	0,60	0,55	-0,06
NEW ZEALAND	12,5				0,89	0,97	0,99	0,98	1,07	1,02	1,03	0,96	0,97	0,99	0,01
NORWAY	25,0	0,66	0,66	0,63	0,69	0,58	0,60	0,67	0,56	0,57	0,61	0,63	0,57	0,54	-0,13
POLAND	22,0						0,43	0,42	0,42	0,46	0,50	0,53	0,49	0,46	0,04
PORTUGAL	20,0				0,45	0,50	0,56	0,60	0,54	0,57	0,53	0,53	0,51	0,44	-0,16
SLOVAK REPUBLIC	19,0						0,48	0,43	0,53	0,61	0,57	0,53	0,54	0,48	0,04
SLOVENIA	20,0							0,68	0,65	0,66	0,67	0,69	0,67	0,62	-0,06
SPAIN	16,0				0,59	0,62	0,45	0,53	0,53	0,56	0,57	0,54	0,45	0,34	-0,19
SWEDEN	25,0	0,45	0,36	0,39	0,42	0,41	0,50	0,52	0,52	0,55	0,56	0,57	0,58	0,57	0,05
SWITZERLAND	7,6						0,68	0,75	0,73	0,73	0,75	0,74	0,74	0,71	-0,05
TURKEY	18,0				0,45	0,44	0,43	0,45	0,47	0,38	0,34	0,36	0,35	0,34	-0,11
UNITED KINGDOM	15,0	0,47	0,45	0,49	0,53	0,48	0,49	0,48	0,49	0,48	0,48	0,48	0,46	0,47	-0,02
Unweighted average		0,54	0,51	0,51	0,53	0,53	0,55	0,58	0,57	0,59	0,59	0,60	0,58	0,55	-0,02

Table 3 VRR estimation (OECD, 2012)

C. The HRMC estimation

The UK tax administration has actually developed a methodology to estimate the VAT gap (HMRC, 2011). It uses national accounts data to calculate the theoretical total VAT liability in the UK, which is defined as the amount, which would be collected in the absence of any fraud, avoidance, debt or other losses. The difference between actual cash receipts and this theoretical amount of VAT is the VAT gap. The gross VAT theoretical tax liability is built up from five expenditure components: household consumption; capital expenditure on housing; government expenditure; charities expenditure; and expenditure of partially exempt businesses. The measure takes into account the applicable VAT rates on that expenditure based on commodity breakdowns; the legitimate refunds (deductions) and exemptions occurring through schemes and reliefs. The VAT gap measure is close, in terms of methodology, to the way the VRR is calculated although the theoretical VAT liability reflects actual tax rates, exemptions and thresholds applied to a narrower base than total final consumption as in the national accounts.

Estimated VAT gap (£ billion) [1]					
	2007-08	**2008-09**	**2009-10**	**2010-11**	**2011-12**
Net VTTL	92.8	93.0	80.8	95.3	109.8
Net VAT receipts [2]	82.0	79.8	71.4	85.4	98.4
VAT gap (point estimate)	**10.8**	**13.2**	**9.4**	**9.9**	**11.4**
of which MTIC fraud	1.0-1.5	1.0-1.5	1.0-1.5	0.5-1.0	0.5-1.0
of which debt	0.9	2.4	1.8	0.9	1.8
VAT gap (per cent) [3]	**11.7%**	**14.2%**	**11.6%**	**10.4%**	**10.4%**

Table 4. (HMRC, 2013)

1 The amounts are rounded to the nearest £0.1 billion.
2 Net VAT receipts are expressed net of payments and repayments.
3 The VAT gap as a percentage of VTTL has been rounded to the nearest 0,1 per cent.

2.2.3 Limits of the interpretation of VAT gap

The compliance gap is the estimation of the degree of compliance by taxpayers that with right precautions and small adjustments could be at least representative when not coincident to the VAT evasion.

From this value, we could estimate the amount of tax evasion related to this VAT gap. However, it does not cover the definition of tax evasion given in the previous paragraph, but only the situation in which the evasion comes from a lower VAT that we could expected. This definition, for example, does not take into account tax evasion related to transfer pricing. The compliance VAT gap could be consequence of different situation. Below there are four different behaviour that generate VAT gap.

	Worked example 1: Evasion with complicity	**Worked example 2: Evasion without complicity**	**Worked example 3: MTIC carousel fraud**	**Worked example 4: Fraudulent consumer import**
V Applicable VAT rate	20%	20%	20%	20%
A VAT receipts	0	30	–24	0
B Final consumption (including VAT)	120	300	0	120
C = B*V/(1+V) Tax that ought to have been remitted	20	50	0	20
D = C – A Tax not remitted	**20**	**20**	**24**	**20**

Table 5. (Reckon LLP, 2009)

As it is possible to see in the table an equal amount of tax evasion could be generated by different revenues.

2.3 The economic impact on the VAT gap

Taking into account the different approach of VAT gap estimation, its limits and observations, we report in the table below VAT gap carry out by European Commission (EC, 2014). Of the given period of twelve years (2000-2012) we compare VAT gap on VTTL of the four more significant year.

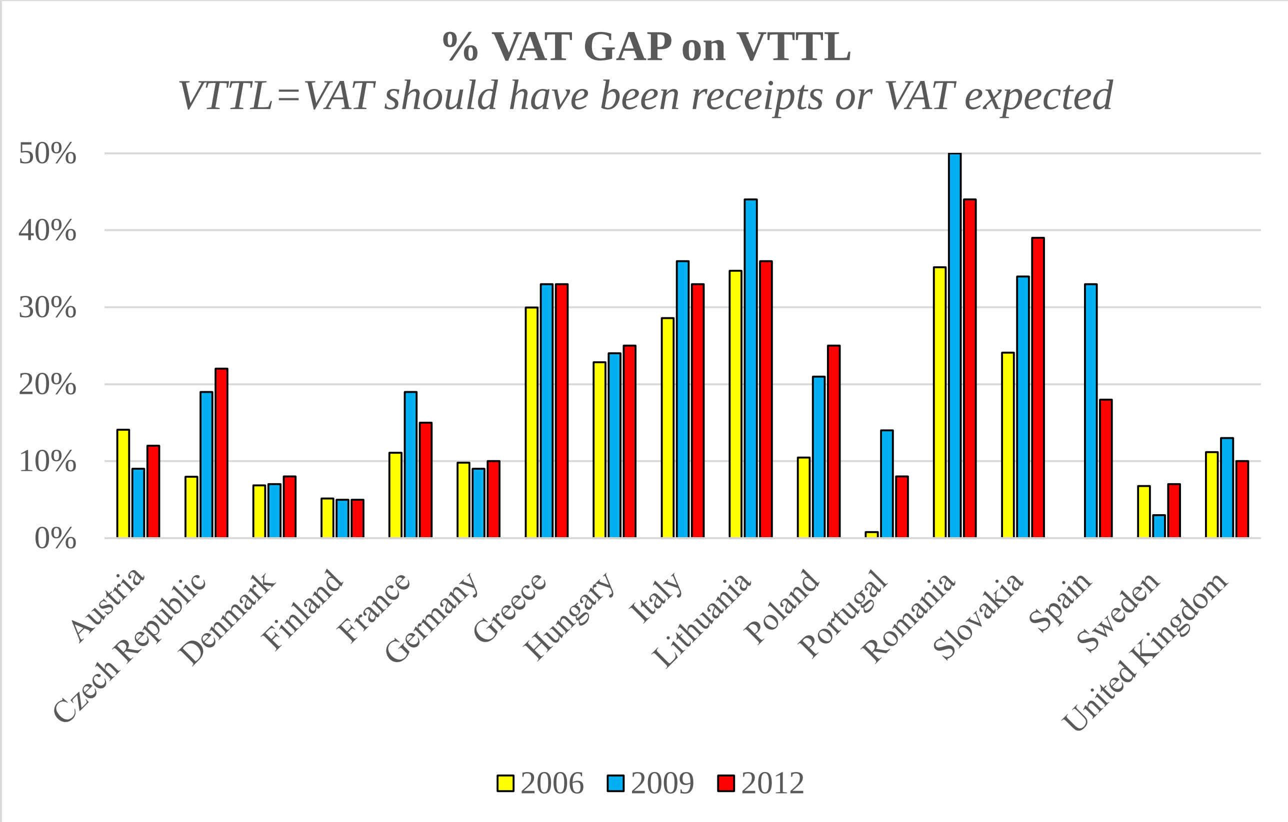


***Figure3.** Own calculation based on European Commission VAT GAP (CASE, 2014)13*

Different economy trends characterized the period from 2000 to 2011. In 2000, there was an energy crisis followed by years of economic expansion and most of the European economy in particular Spain, Ireland and east countries had a flourish period. This situation changed drastically with the crisis of 2007. The GDP of most countries had a recession during 2008 and 2009. Since those years, some European countries in particular Italy, Spain, Ireland and Greece have suffered more problems to exit from the recession. Moreover, in these countries the unemployment rate had been risen since then.

As we know, the economy influences VAT and revenue in general. The economic trend could also have effect on tax compliance and on other factor directly correlated with VAT gap.

The **VAT Gap** is defined as the difference between the expected VAT that could be collected and the actual VAT receipts by each member states. As we said, the VAT Gap is strictly related to the trend of the economy and to the tax compliance of the people. Due to

[13] CASE in the report of 2013 provided data from 2000 to 2011. In the report of 2014, it revised the value of VAT gap from 2009 to 2012. To better do a comparison all over the years we recalculate the data from 2000 to 2008 using the average of variation of the revised data of the next period.

the 2007-2008 financial crisis we could compare the previous period of the crisis characterized by growth with the next one.
This division is quite important because it shows the weight of economy on VAT gap. During a period of crisis the fall of tax compliance, the presence of bad debts and other factors contribute to increase VAT gap.

In 2007/2008 with the boom of the crisis, most countries recorded a huge hike of the VAT gap on VTTL. So, we see how the crisis affected more the VAT collected than the VAT gap. Revenue are more elastic than VAT gap. In other words, a change in the trend of GDP affect more the revenue and less the gap. So when the economy grows the revenue also grows and the gap has a less weight on the economy, because its change is softer. Nevertheless, in the crisis starting on 2008/2009 the sharply contraction of the economy and the financial problems of the entrepreneurs gave as result a strong increase of the gap in both absolute and relative term. This is to justify the fact that during the crisis the bad debts as well as tax evasion increase.

Taking this into account, there could be several methods to estimate the weight of the economy on VAT gap. Among others, we have divided the countries in three different groups depending on how the economy affects the VAT gap.
In the first group, we selected the countries which economy has risen again, on average, after the crisis. We calculate the average of VAT gap from 2000 to 2007/2008, depending when the crisis began. Then, we compare the result with the VAT gap of 2009 and 2010, taking the average of the two differences. This is was the amount to rest from the 2012 VAT gap.

Group 1	**Average growth of GDP 2000-2007**	**Growth GDP 2009**	**Average growth of GDP 2010-2013**	**Year of max GDP (2000-2012)**	**%VAT GAP on VTTL Average from 2000-2007/2008**	**Average of change of %VAT GAP on VTTL in the first two years of the crisis compare of period before crisis**	**2012 VAT GAP without economic influence**	**2012 VAT GAP**
Belgium	4,16%	-1,65%	2,96%	2012	9%	-3,02%	6,98%	10%
Bulgaria	11,90%	-1,40%	3,43%	2012	19%	-4,14%	15,86%	20%
Czech	11,04%	-7,83%	1,31%	2011	14%	-6,53%	15,47%	22%

Republic								
Denmark	3,95%	-4,92%	2,74%	2012	8%	-0,21%	7,79%	8%
Estonia	14,72%	-13,95%	7,46%	2012	11,42%	-1,38%	12,62%	14%
Finland	4,52%	-7,19%	2,95%	2012	6%	-0,71%	4,29%	5%
France	3,94%	-2,45%	2,24%	2012	11%	-6,21%	8,79%	15%
Hungary	10,38%	-13,38%	1,77%	2008	22%	-2,41%	22,59%	25%
Ireland	8,73%	-9,97%	0,29%	2007	7%	-6,37%	4,63%	11%
Italy	3,79%	-3,52%	0,67%	2011	30%	-2,28%	30,72%	33%
Latvia	14,34%	-19,08%	6,14%	2008	17%	-22,33%	11,67%	34%
Lithuania	12,75%	-17,77%	6,80%	2012	36%	-5,28%	30,72%	36%
Luxembourg	7,96%	-4,81%	6,37%	2012	2%	-1,60%	4,40%	6%
Netherlands	4,59%	-3,57%	1,26%	2012	2%	-1,98%	3,02%	5%
Poland	8,05%	-14,45%	5,93%	2012	18%	-1,38%	23,62%	25%
Romania	17,69%	-15,43%	4,78%	2008	38%	-9,64%	34,36%	44%
Slovakia	13,99%	-2,51%	3,54%	2012	23%	-11,80%	27,20%	39%
United Kingdom	3,74%	-13,36%	4,61%	2007	11%	-1,71%	8,29%	10%

Table 6. Own calculation

In the second group, we have the countries with a negative growth of GDP during the period after the crisis. For these countries, we calculate the 2012 VAT gap as the average of the period before and after crisis. The periods, with opposite trends give a depurate value of gap.

Group 2	**Average growth of GDP 2000-2007**	**Growth GDP 2009**	**Average growth of GDP 2010-2013**	**Year of max GDP (2000-2012)**	**%VAT GAP on VTTL Average from 2000-2008**	**%VAT GAP on VTTL Average from 2009-2012**	**2012 VAT GAP without economic influence (average)**	**2012 VAT GAP**
Greece	7,13%	-0,91%	-5,78%	2008	26%	33%	29%	33%
Portugal	4,16%	-2,01%	-0,40%	2010	1%	11%	6%	8%
Slovenia	7,03%	-4,90%	-0,09%	2008	6%	11%	8%	9%
Spain	7,62%	-3,76%	-0,57%	2008	6%	21%	13%	18%

Table 7. Own calculation

In a third group, we include the countries in which the trend of economy has no influence on VAT gap. In these countries, the financial crisis gave a contraction of the gap; however we could not deduct the crisis had a positive effect on the VAT gap of these countries. Probably, other important factors played a stronger influence.

3° Group	Average growth of GDP 2000-2007	Groth GDP 2009	Average growth of GDP 2010-2013	Year of max GDP (2000-2012)	%VAT GAP on VTTL Average from 2000-2007/2008	Average of change of %VAT GAP on VTTL in the first two years of the crisis compare of period before crisis	2012 VAT GAP without economic influence	2012
Austria	3,99%	-2,30%	3,19%	2012	11%	1,41%	13,41%	12%
Germany	2,48%	-4,03%	3,63%	2012	11%	1,36%	11,36%	10%
Sweden	3,43%	-12,24%	9,70%	2012	6%	3,34%	10,34%	7%

Table 8 Own calculation

The graph below shows, starting from the left the countries with VAT gap more sensible to economic trends.

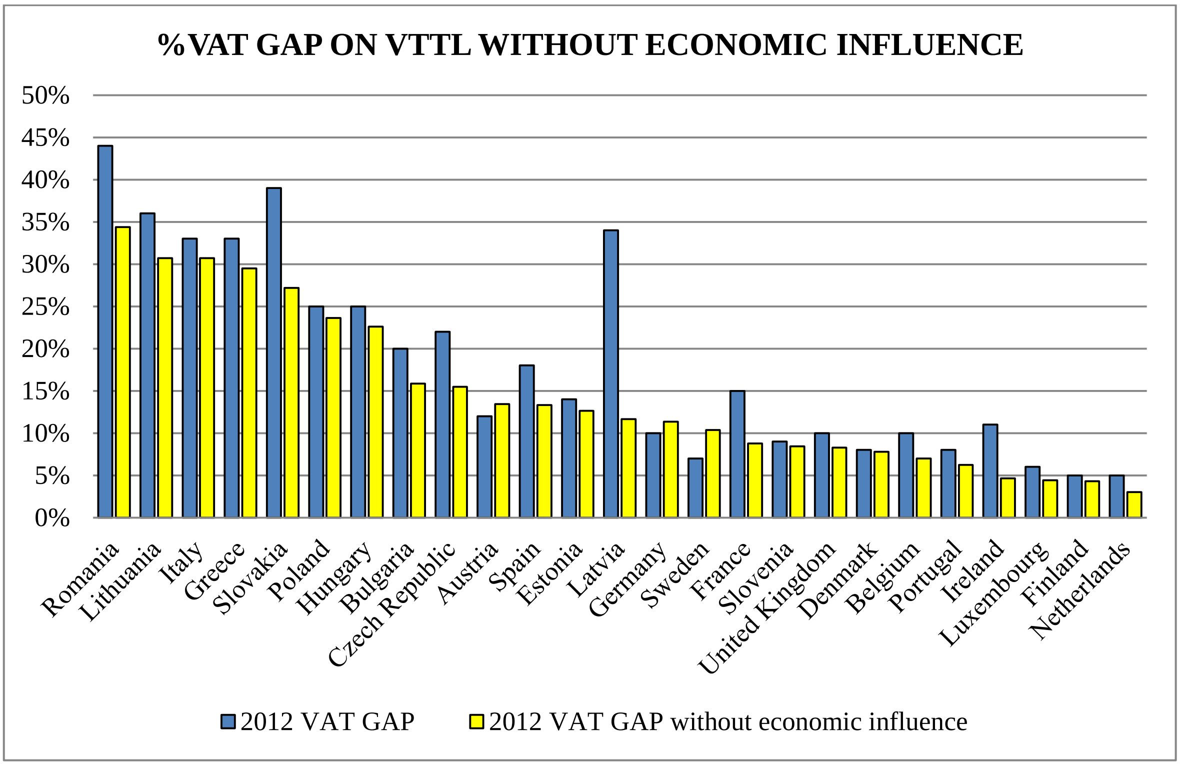


Figure 4. *Own calculation*

As it can be seen, Latvia (-22,33%) and Slovakia (-11,80%) have a high difference between 2012 VAT gap and the gap estimated. Romania also has a high score (9,64%) but like Slovakia maintain an high percent of VAT GAP. Furthermore, it is possible to notice that Hungary and Italy, despite a great gap, do not have a justification in the economic trend.

In terms of ratio of VAT gap to their own VTTL, Romania (34,36%), Lithuania (30.72%) Italy (30,72%), Greece (29,00%), Slovakia (27,20%), Poland (23,62%) Hungary (22,59%), were the countries with an important VAT Gap without economic distortion during 2012. On the other hand, with the same VTTL, in absolute value, the largest European economies recorded the highest score. In detail, Italy (€ 33,3 bn), Germany (€ 27.7 bn), France (€ 25 bn), and the UK (€ 18, 7 bn) contributed over half of the total VAT Gap.

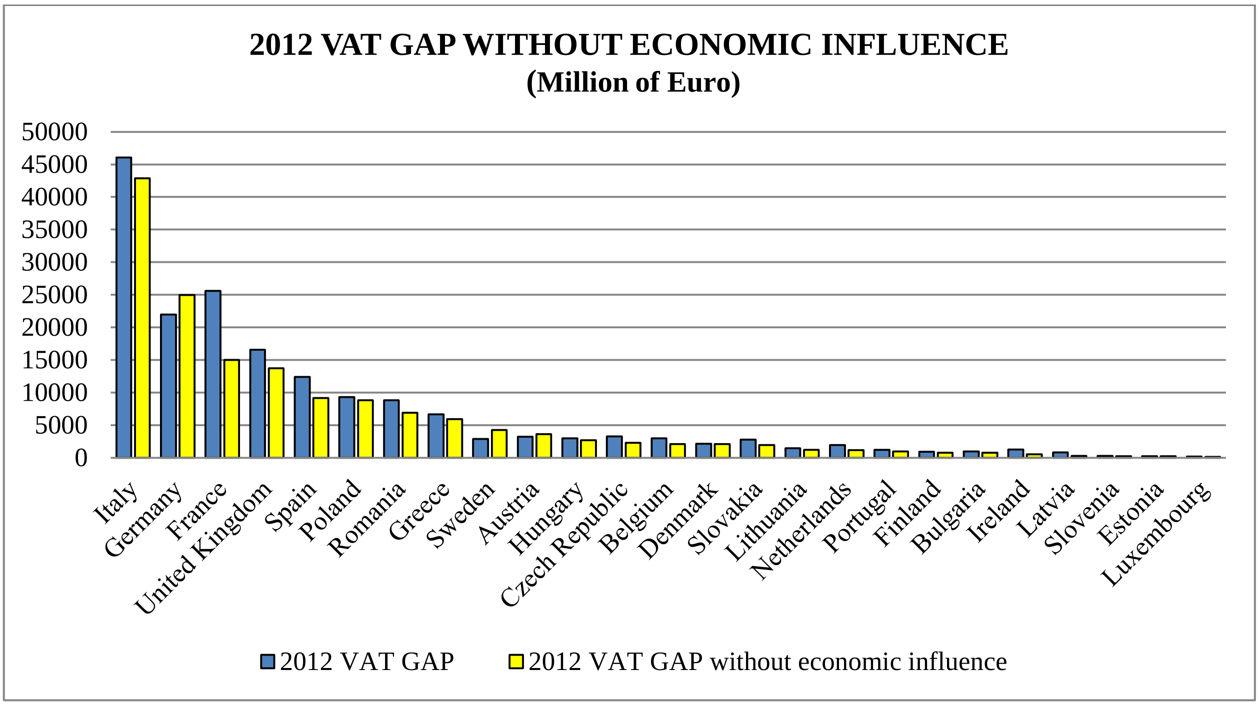


Figure 5. *Own estimation*

The next graph shows the weight of the estimated VAT gap on GDP. This evaluation adds information about the magnitude of the VAT gap in each country. As it is possible to see, the firsts countries are, in other order, the same countries with higher estimated VAT gap on VTTL.

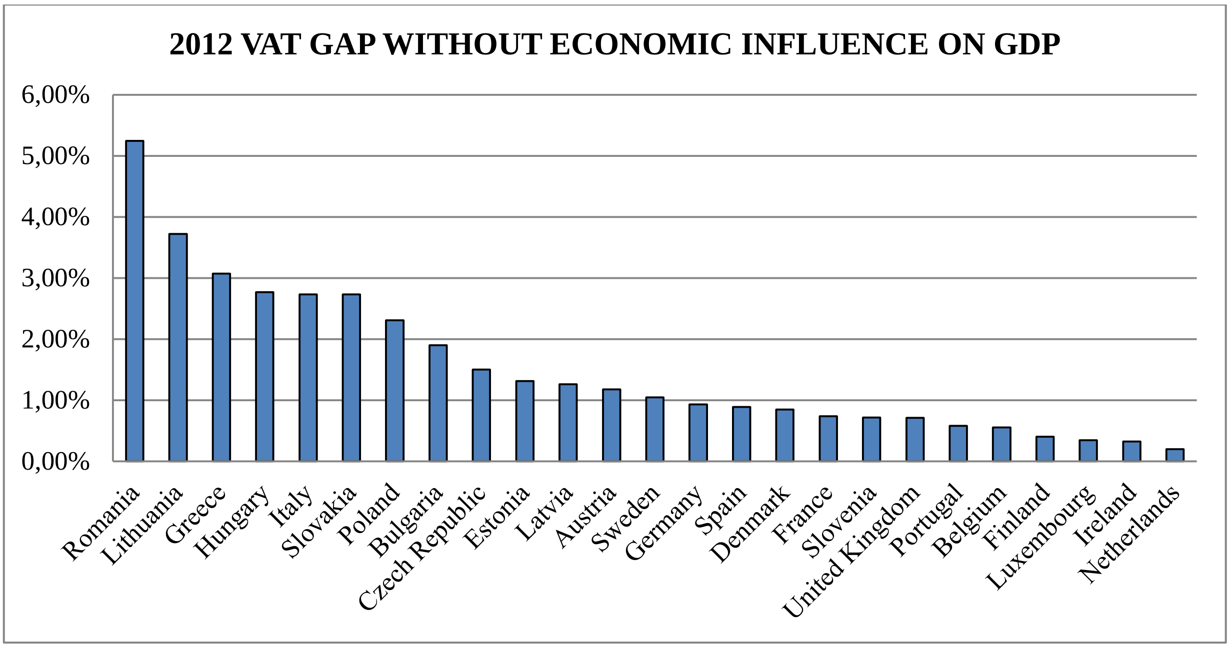


Figure 6. *Own estimation*

Through the three graphs, it is possible to notice how Romania has a difference between the VTTL and VAT gap out of average. This could be an evidence that the country has a loopholes tax system. We recall the attention that VTTL is already depurated from the reduce VAT rate and exemption. So we could reckon that after the deduction of economic trends that could explain a part of VAT gap, we could associate the estimated VAT gap to undeclared sales or in other word to tax evasion.

2.4 2013 Vat GAP estimation

In this paragraph, we gave an estimation of VAT gap on 2013. For this calculation we adopted a top-down method with data take from European Commission, OECD and EUROSTAT. However, we could not have access to data used by European Commission and OECD. We noticed that in the late of the October 2014 European Commission released an important update of the data on VAT gap In this publication they did a more accurate estimation. Another limit is that there are few publication about it so it could be difficult compare the data.

Below, we will explain the method we used.

First, we took the VTTL divided by "Household Consumption", "Government & NPISH Consumption", "Intermediate Consumption by Industries", "Gross fixed capital formation" (EC, 2013).

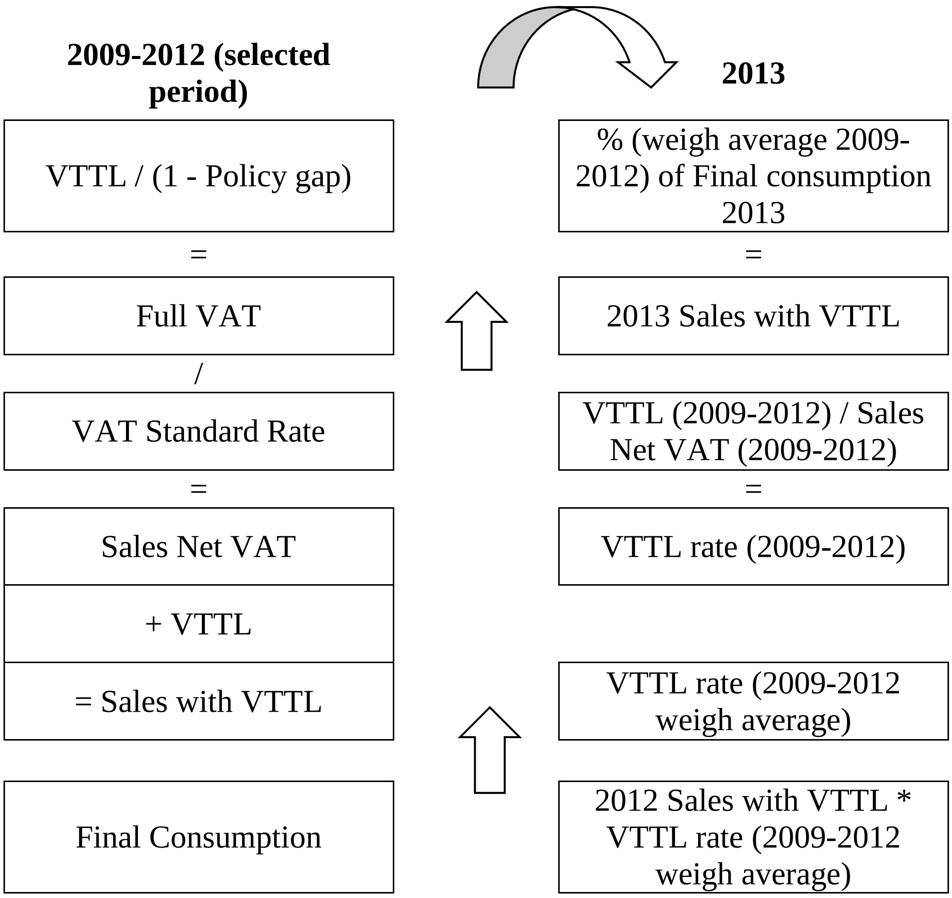
Than, thanks to the "Policy Gap" obtained with the following formula

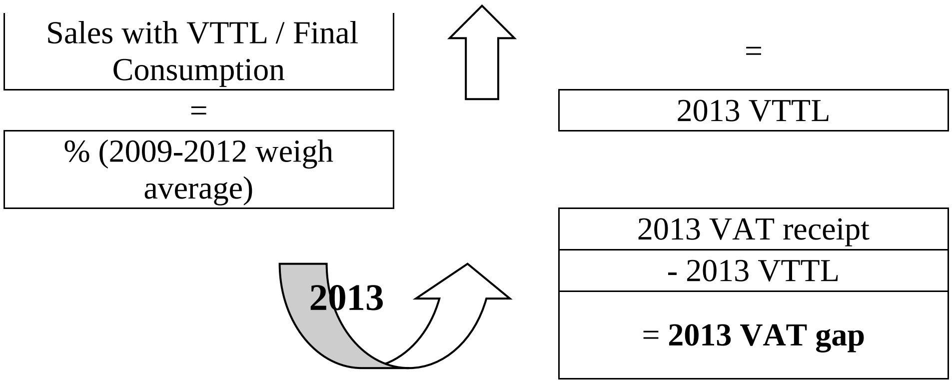
$$\textbf{Policy Gap} = \frac{(VRR\ GAP - VAT\ GAP)}{(1 - VAT\ GAP)}$$

We could calculate the "FULL theoretical VAT". With this value of VAT applying the standard rate we arrive to the "sales net VAT". At the sales net VAT, we sum up the VAT Liability (VTTL) to have the sales with the VTTL.

In the next step, we took the weight average of the proportion between sales with VTTL and Final consumption during selects period from 2009 to 2012. We use this average to take the right proportion to final consumption of 2013. Thanks to this result and with an weight VTTL rate average we could calculate the 2013 VAT GAP.

Below there is a simple scheme of the method.





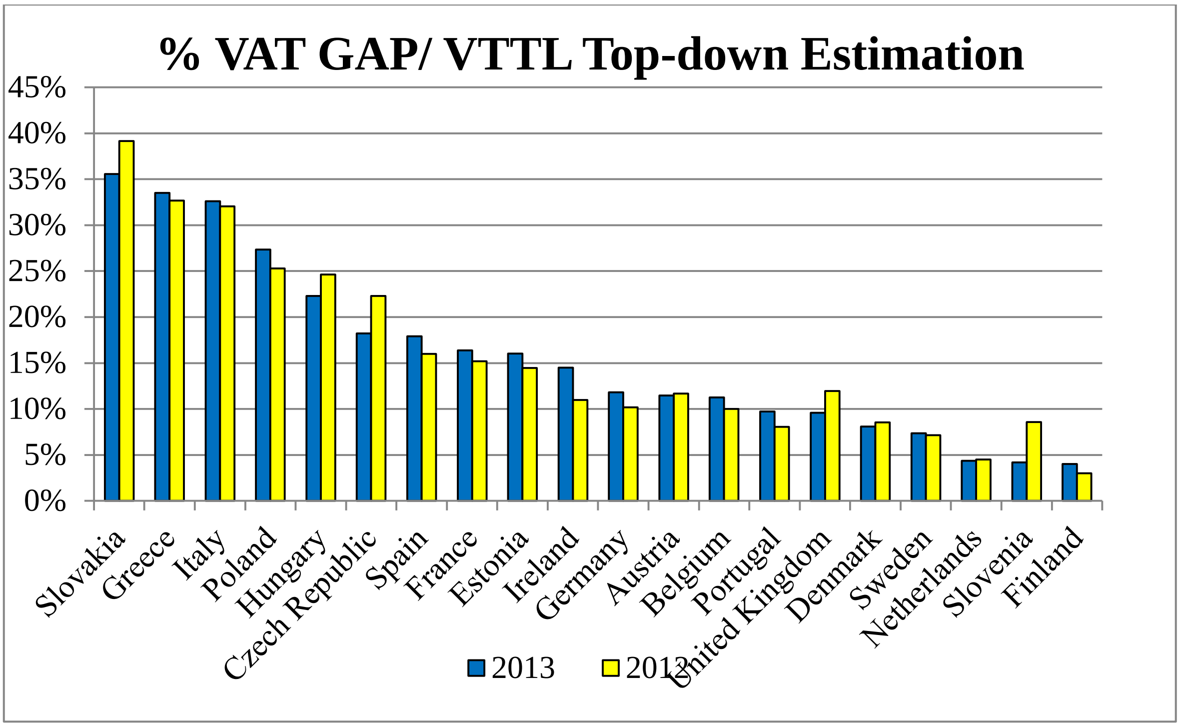


Figure 7. *Own estimation*

	2013				2012		
GEO/TIME	**VTTL**	**VAT**	**VAT GAP**	**% VAT GAP / VTTL**	**VTTL 2012**	**% VAT GAP/ VTTL Inderect method**	**% VAT GAP / VTTL**
Slovakia	7.290	4.696	2.593	35,58%	5243	39,17%	39,00%
Greece	18.943	12.593	6.350	33,52%	15450	32,67%	33,00%
Italy	139.193	93.812	45.381	32,60%	100331	32,04%	33,00%
Poland	38.230	27.780	10.449	27,33%	25015	25,31%	25,00%
Hungary	11.676	9.073	2.603	22,29%	8180	24,64%	25,00%

Table 9 *VAT GAP ESTIMATION*

In terms of ratio to their own VTTL, Slovakia (35,58%), Greece (33,52%), Italy (32,60%) Poland (27,33%), Hungary (22,29%), Spain (23,91%) were the countries with the largest percent of VAT gap on VTTL during 2013.

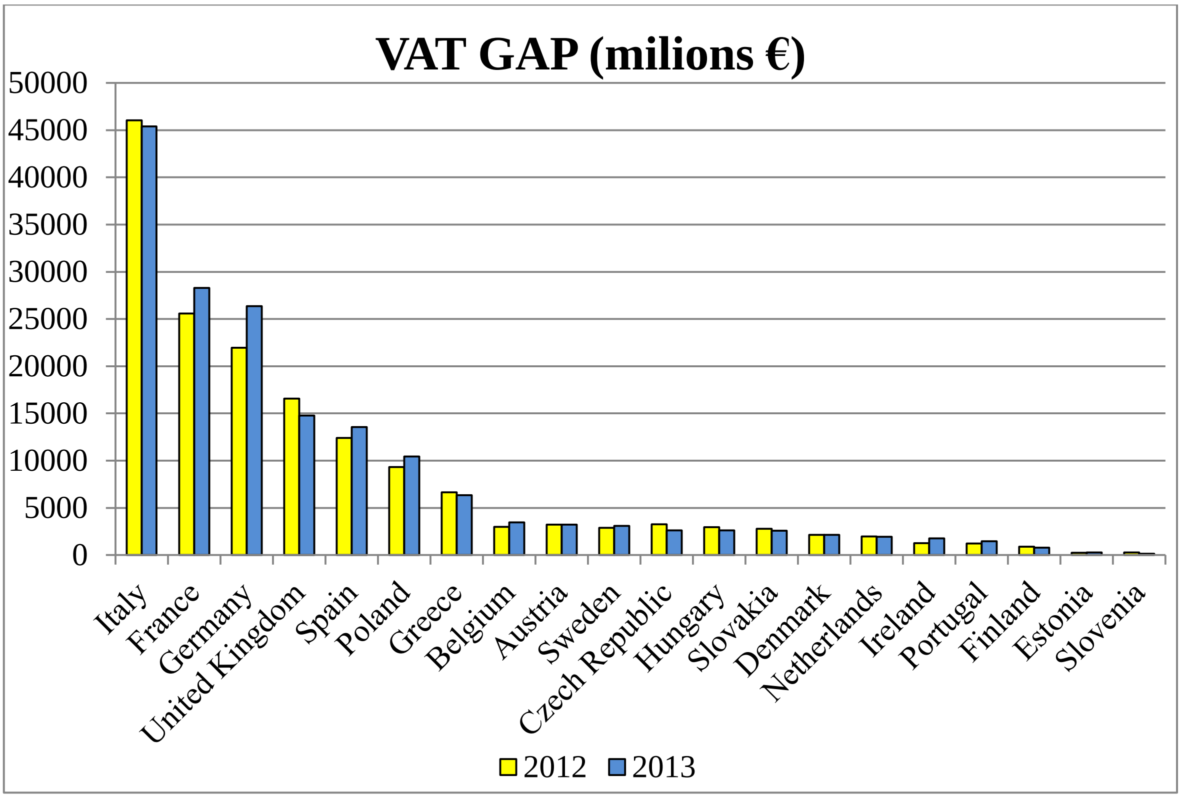


Figure 8 *Own estimation*

As in 2012, in the 2013 major European economies have a VAT gap higher than the other countries. Among these, Italy is in the first position with an VAT gap of € 45.381,00 with a decrement from the 2012.

3 2013 TAX EVASION ESTIMATION

Vat gap could be explained by tax evasion. On this basis, we could calculate tax evasion through unrecorded sales. We suppose unreported sales were with the standard VAT rate[14]. The presumption of this estimation is that unreported VAT is on unreported sales. On these sales, we calculated the unreported tax due.

Once we take the amount of unreported sales, we can quantify tax evasion. There are several assumptions and hypotheses we could take into account to calculate the right amount of tax on these sales. To simplify and to make better comparisons among countries, we took average tax rate considering corporate and individual .

As in the VAT gap, the largest economies have a tax evasion bigger than the others.

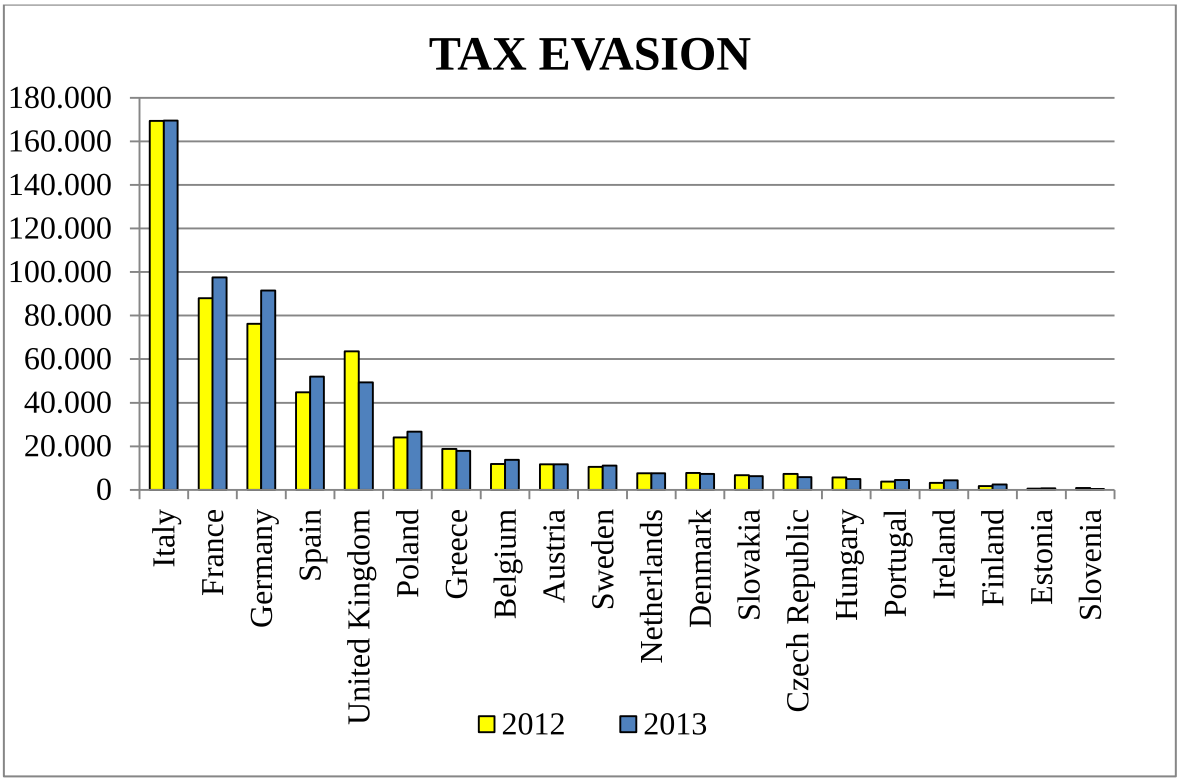


Figure 9 *Own estimation*

Italy, among the others, has the first place both in the absolute and in the relative estimation. Also Spain, United Kingdom have a relevant size of informal economy. This means that tax evasion is an important problem for these countries. On the other side, there are countries like Slovakia that suffer an high rate of tax evasion but have small economies. In this case, the problem could better and easily handled.

[14] We use the standard rate because we already taken in account reduce rate and exemption in Policy Gap.

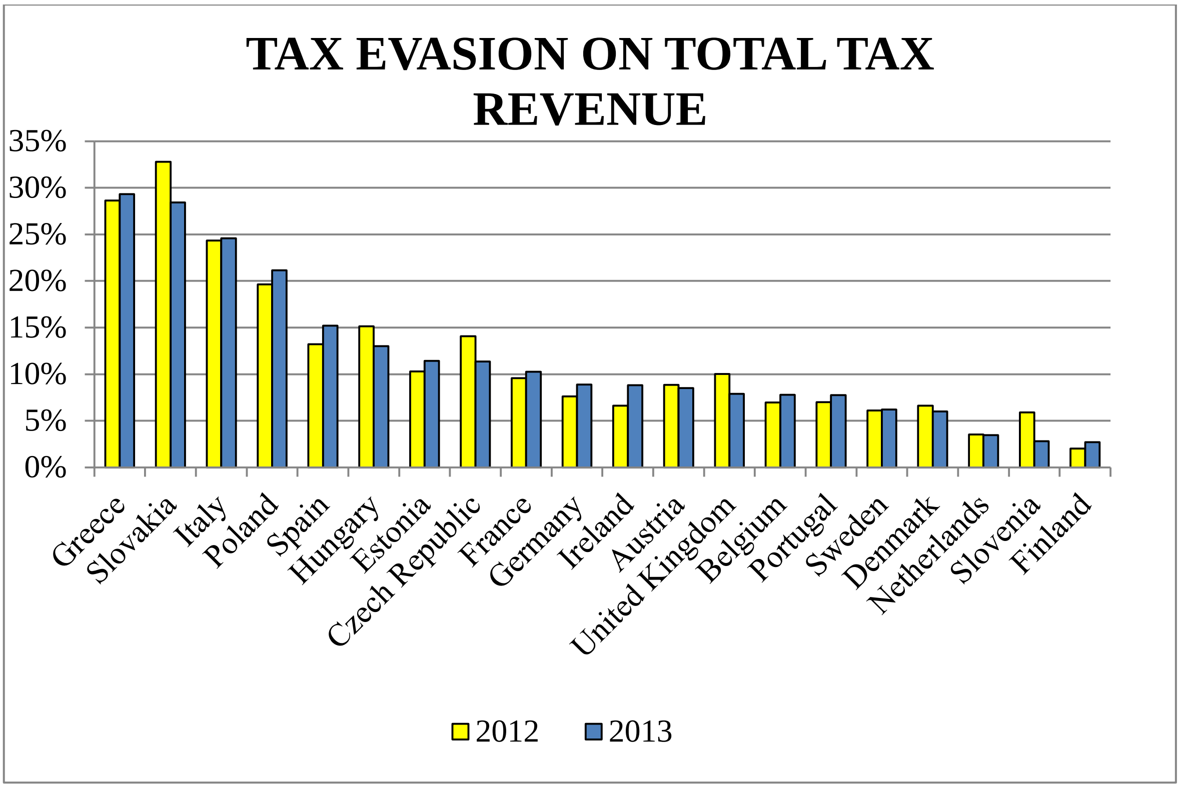


Figure 10 Own estimation

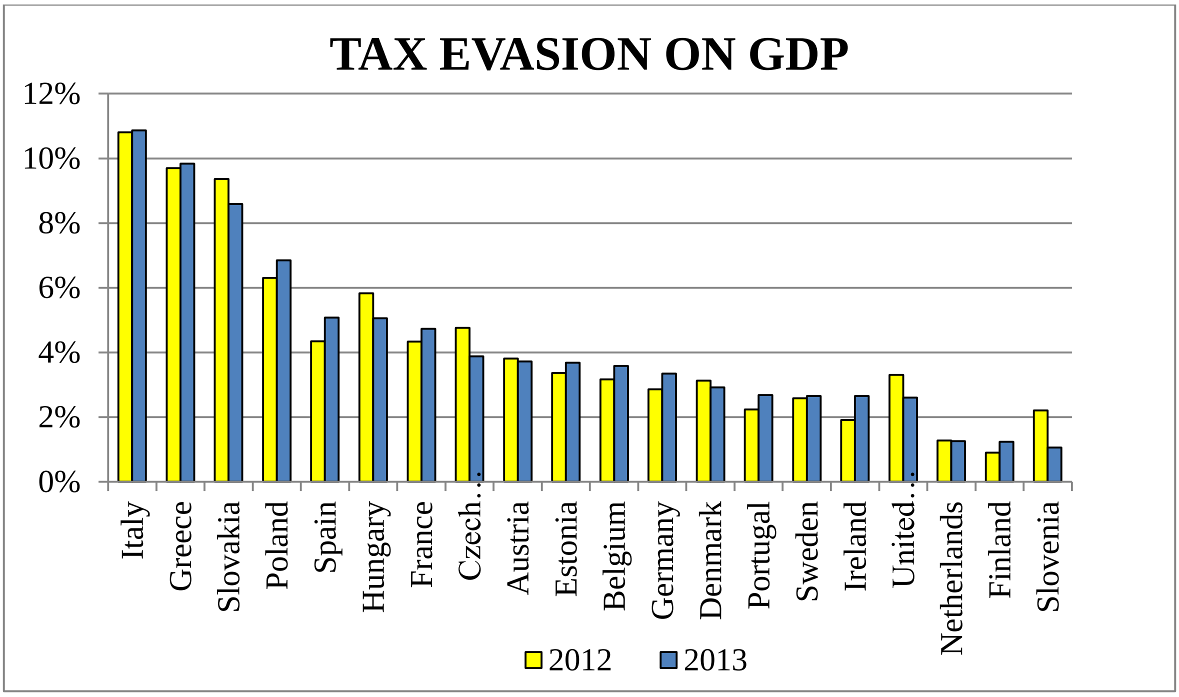


Figure 11 Own estimation

In conclusion, tax evasion is not a country problem but European ones. Tax evasion is both a sign of uneasiness y inefficient of system and gives a wrong base for socio-economic development.

4 CONCLUDING REMARKS

The VAT gap without economic influence, we estimated, give us the real amount of the problem especially for the countries that before the crisis known an economic growth. For these countries, the weight of the VAT gap rose sharply during the first years of the crisis showing the fragility of the revenue.

We are conscious that estimating VAT gap and tax evasion we had done several hypotheses that could limit the interpretation of the data. However, evidences coming from other studies[15] show that the margin of error could be in a small percentage. Mayor preoccupation is that we do not take in account tax evasion from elusion operation. This type of tax evasion is more sophisticated and it could be the real problem of a country. However, the unreported sales we estimated, are divided among miles of activities, it could be representative of the economic contest of a society.

Another problem is that what it is legal in a country could promote tax evasion of another country inside European Union or the European Free Trade Area (EFTA). In this way, countries like Luxemburg or Switzerland could have strong governance, institutions and low scores of corruption, but could give a legal base to hide profit. The Financial Secrecy Index tries to give a measure of the problem (Tax Justice Network, 2013).

To sum up, the tax gap calculated gives a glance of the problem of evasion among European countries with consequences in competitiveness area (OECD, 2010). As always, tax evasion gives a higher tax burden especially for middle lower class of the society that is the most vulnerable part of the society that could not evade tax obligation.

[15] See (Murphy, 2014)

Annex

Countries	2012 VAT GAP	2012 VAT GAP without economic influence	Difference
Austria	12%	13,41%	-1,41%
Belgium	10%	6,98%	3,02%
Bulgaria	20%	15,86%	4,14%
Czech Republic	22%	15,47%	6,53%
Denmark	8%	7,79%	0,21%
Estonia	14%	12,62%	1,38%
Finland	5%	4,29%	0,71%
France	15%	8,79%	6,21%
Germany	10%	11,36%	-1,36%
Greece	33%	29%	3,52%
Hungary	25%	22,59%	2,41%
Ireland	11%	4,63%	6,37%
Italy	33%	30,72%	2,28%
Latvia	34%	11,67%	22,33%
Lithuania	36%	30,72%	5,28%
Luxembourg	6%	4,40%	1,60%
Netherlands	5%	3,02%	1,98%
Poland	25%	23,62%	1,38%
Portugal	8%	6%	1,76%
Romania	44%	34,36%	9,64%
Slovakia	39%	27,20%	11,80%
Slovenia	9%	8%	0,56%
Spain	18%	13%	4,68%
Sweden	7%	10,34%	-3,34%
United Kingdom	10%	8,29%	1,71%

Table 10. (figure 4) *Own estimation.* Percent of VAT gap on VTTL without economic influence

Countries	2012 VAT GAP	2012 VAT GAP without economic influence
Austria	3244	3625,91
Belgium	2991	2087,87
Bulgaria	957	758,80
Czech Republic	3267	2297,33
Denmark	2141	2083,89
Estonia	255	229,88
Finland	905	776,26
France	25583	14984,71
Germany	21957	24942,53
Greece	6651	5942,51
Hungary	2971	2684,57
Ireland	1262	530,81
Italy	46034	42850,25
Latvia	818	280,73
Lithuania	1436	1225,51
Luxembourg	204	149,55
Netherlands	1966	1186,85
Poland	9317	8802,72
Portugal	1228	957,79
Romania	8841	6904,30
Slovakia	2787	1943,81
Slovenia	270	253,29
Spain	12412	9184,41
Sweden	2886	4265,00
United Kingdom	16557	13730,96

Table 11. (figure 5) *Own estimation.* 2012 VAT gap without economic influence.

2013							2012			
GEO/TIME	**SALES**	**sales net VTTL**	**VTTL**	**VAT**	**VAT GAP**	**% VAT GAP / VTTL**	**VTTL 2012**	**% VAT GAP/ VTTL Inderect method**	**% VAT GAP / VTTL**	**VAT GAP**
Italy	1.322.133	1.182.940	139.193	93.812	45.381	32,60%	100331	32,04%	33,00%	46034
France	1.665.939	1.493.229	172.711	144.414	28.297	16,38%	107190	15,20%	15,00%	25583
Germany	2.095.517	1.872.156	223.361	197.005	26.356	11,80%	135841	10,17%	10,00%	21957
United Kingdom	1.580.267	1.426.197	154.070	139.293	14.777	9,59%	103683	11,94%	10,00%	16557
Spain	702.272	626.532	75.741	62.179	13.562	17,91%	49751	15,98%	18,00%	12412
Poland	350.914	312.684	38.230	27.780	10.449	27,33%	25015	25,31%	25,00%	9317
Greece	137.811	118.868	18.943	12.593	6.350	33,52%	15450	32,67%	33,00%	6651
Belgium	286.180	255.506	30.674	27.226	3.448	11,24%	17278	10,01%	10,00%	2991
Austria	243.560	215.376	28.184	24.953	3.231	11,47%	18524	11,67%	12,00%	3244
Sweden	358.299	316.153	42.146	39.048	3.098	7,35%	21778	7,15%	7,00%	2886
Czech Republic	117.477	103.179	14.298	11.695	2.604	18,21%	9037	22,31%	22,00%	3267
Hungary	71.967	60.292	11.676	9.073	2.603	22,29%	8180	24,64%	25,00%	2971
Slovakia	52.276	44.986	7.290	4.696	2.593	35,58%	5243	39,17%	39,00%	2787
Denmark	191.557	165.051	26.506	24.360	2.146	8,10%	14961	8,54%	8,00%	2141
Netherlands	414.914	370.548	44.365	42.424	1.941	4,38%	23719	4,50%	5,00%	1966
Ireland	95.246	83.115	12.131	10.371	1.760	14,51%	7243	10,99%	11,00%	1262
Portugal	123.617	108.429	15.188	13.710	1.479	9,74%	10738	8,07%	8,00%	1228
Finland	146.027	126.391	19.636	18.848	788	4,01%	10261	3,01%	5,00%	905
Estonia	13.367	11.512	1.855	1.558	297	16,02%	1180	14,46%	14,00%	255
Slovenia	26.235	23.057	3.178	3.045	133	4,18%	2241	8,57%	9,00%	270

Table 12. 2013 VAT GAP ESTIMATION. *Own estimation.*

								2012						
GEO/TIME	**SALES**	**sales net VTTL**	**VTTL**	**vat 2013**	**VAT GAP**	**rate**	**Undeclared sales**	**Average rate (corporate, income)**	**Profit tax estimated evasion**	**vat + profit evasion**	**GDP 2012**	**Total tax Revenue**	**TAX EVASION ON GDP**	**TAX EVASION ON TOTAL TAX REVENUE**
Austria	240.299	212.492	27.807	24.563	3.244	13,09%	24790	34%	8459	11703	307.004	132.200,0	3,81%	8,85%
Belgium	278.836	248.949	29.887	26.896	2.991	12,01%	24915	36%	8906	11897	375.852	170.700,0	3,17%	6,97%
Czech Republic	120.319	105.675	14.644	11.377	3.267	13,86%	23577	17%	4008	7275	152.926	51.688,9	4,76%	14,08%
Denmark	191.968	165.405	26.563	24.296	2.267	16,06%	14118	38%	5400	7667	245.252	115.758,9	3,13%	6,62%
Estonia	12.703	10.940	1.763	1.508	255	16,12%	1582	21%	332	587	17.460	5.700,0	3,36%	10,30%
Finland	141.885	123.340	18.545	17.987	558	15,04%	3711	32%	1171	1729	192.350	85.300,0	0,90%	2,03%
France	1.621.292	1.453.210	168.082	142.526	25.556	11,57%	220953	28%	62508	88064	2.032.297	920.100,0	4,33%	9,57%
Germany	2.026.431	1.810.434	215.997	194.034	21.963	11,93%	184089	30%	54352	76315	2.666.400	1.002.300,0	2,86%	7,61%
Greece	148.150	127.786	20.364	13.712	6.652	15,94%	41742	29%	12105	18757	193.347	65.500,0	9,70%	28,64%
Hungary	74.305	62.250	12.055	9.084	2.971	19,37%	15341	18%	2685	5656	96.968	37.332,8	5,83%	15,15%
Ireland	90.145	78.664	11.481	10.219	1.262	14,59%	8645	22%	1859	3120	163.939	47.100,0	1,90%	6,62%
Italy	1.344.114	1.202.607	141.507	96.170	45.337	11,77%	385300	32%	124066	169403	1.566.912	695.900,0	10,81%	24,34%
Netherlands	408.364	364.699	43.665	41.699	1.966	11,97%	16420	35%	5675	7641	599.338	217.559,7	1,27%	3,51%
Poland	341.445	304.247	37.198	27.783	9.415	12,23%	77003	19%	14631	24045	381.480	122.455,0	6,30%	19,64%
Portugal	123.900	108.677	15.223	13.995	1.228	14,01%	8767	28%	2466	3694	165.107	52.900,0	2,24%	6,98%
Slovakia	51.017	43.903	7.114	4.328	2.786	16,20%	17195	23%	3869	6655	71.096	20.300,0	9,36%	32,78%
Slovenia	26.950	23.790	3.160	2.889	271	13,28%	2039	25%	510	780	35.319	13.200,0	2,21%	5,91%
Spain	686.607	618.070	68.537	57.584	10.953	11,09%	98775	34%	33769	44722	1.029.002	338.200,0	4,35%	13,22%
Sweden	346.413	305.665	40.748	37.834	2.914	13,33%	21859	35%	7596	10510	407.820	172.508,0	2,58%	6,09%
United Kingdom	1.635.975	1.476.474	159.501	140.457	19.045	10,80%	176292	25%	44514	63558	1.921.905	634228,617	3,31%	10,02%

2013

GEO/TIME	SALES	sales net VTTL	VTTL	vat 2013	VAT GAP	rate	Undeclared sales	Average rate (corporate, income)	Profit tax estimated evasion	vat + profit evasion	GDP 2013	2013 Total tax Revenue	TAX EVASION ON GDP	TAX EVASION ON TOTAL TAX REVENUE
Italy	1.322.133	1.182.940	139.193	93.812	45.381	11,77%	385672	32%	124186	169567	1.560.024	690.300	10,87%	24,56%
France	1.665.939	1.493.229	172.711	144.414	28.297	11,57%	244649	28%	69211	97508	2.059.852	952.000	4,73%	10,24%
Germany	2.095.517	1.872.156	223.361	197.005	26.356	11,93%	220908	30%	65223	91579	2.737.600	1.030.400	3,35%	8,89%
Spain	702.272	626.532	75.741	62.179	13.562	12,09%	112183	34%	38352	51914	1.022.988	341.800	5,07%	15,19%
United Kingdom	1.580.267	1.426.197	154.070	139.293	14.777	10,80%	136786	25%	34538	49315	1.899.098	624.803	2,60%	7,89%
Poland	350.914	312.684	38.230	27.780	10.449	12,23%	85468	19%	16239	26688	389.695	126.261	6,85%	21,14%
Greece	137.811	118.868	18.943	12.593	6.350	15,94%	39846	29%	11555	17905	182.054	61.100	9,84%	29,31%
Belgium	286.180	255.506	30.674	27.226	3.448	12,01%	28723	36%	10267	13715	382.692	176.400	3,58%	7,78%
Austria	243.560	215.376	28.184	24.953	3.231	13,09%	24694	34%	8427	11658	313.067	137.200	3,72%	8,50%
Sweden	358.299	316.153	42.146	39.048	3.098	13,33%	23241	35%	8076	11175	420.849	180.123	2,66%	6,20%
Netherlands	414.914	370.548	44.365	42.424	1.941	11,97%	16215	35%	5604	7546	602.658	217.560	1,25%	3,47%
Denmark	191.557	165.051	26.506	24.360	2.146	16,06%	13362	38%	5111	7257	248.975	121.002	2,91%	6,00%
Slovakia	52.276	44.986	7.290	4.696	2.593	16,20%	16005	23%	3601	6195	72.134	21.800	8,59%	28,42%
Czech Republic	117.477	103.179	14.298	11.695	2.604	13,86%	18788	17%	3194	5798	149.491	50.976	3,88%	11,37%
Hungary	71.967	60.292	11.676	9.073	2.603	19,37%	13439	18%	2352	4954	97.948	38.102	5,06%	13,00%
Portugal	123.617	108.429	15.188	13.710	1.479	14,01%	10556	28%	2969	4447	165.690	57.300	2,68%	7,76%
Ireland	95.246	83.115	12.131	10.371	1.760	14,59%	12056	22%	2592	4352	164.050	49.400	2,65%	8,81%
Finland	146.027	126.391	19.636	18.848	788	15,54%	5070	32%	1600	2388	193.443	88.600	1,23%	2,70%
Estonia	13.367	11.512	1.855	1.558	297	16,12%	1845	21%	387	685	18.613	6.000	3,68%	11,41%
Slovenia	26.235	23.057	3.178	3.045	133	13,78%	963	25%	241	373	35.275	13.300	1,06%	2,81%

Table 13. 2013 TAX EVASION ESTIMATION. *Own estimation*

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