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Shadow Economy and its effects on decision making in the European Union

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ABSTRACT

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The aim of this work is to find out how the countries of the European Union apply shadow economy in to their key economic figures, how the inclusion could affect those figures and how this affects to the decisions they make based on those economic figures. The work is done by examining Gross Domestic Product and shadow economy's part in it.

It was noticed that even though there are regulations concerning the calculation of national accounts, the inclusion of shadow economy differs still among countries. This leads to the fact, that if every country would include shadow economy in to their figures, these figures would change a lot at least for starters. Gross Domestic Product is widely used to compare economies and considering shadow economy as a part of it can have a significant affect in those comparisons.

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Veera Toivonen

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1 INTRODUCTION

According to an article in the Economist, in Greece 24% of all economic transactions happened hidden from taxes and regulations in 2013 (The Economist, 2014). In Foreign Policy Magazine Robert Neuwirth wrote in 2011 that shadow economy in the world is worth almost as much as the United States' economy (Neuwirth, 2011).

In 2009 according to the OECD and Neuwirth, shadow economy employed almost 1.8 billion people, and by 2020 two thirds of the population of the world will work in the shadows (Neuwirth, 2011). The Economist has presented that in Greece the situation is already so (The Economist, 2014). Shadow economy grows the fastest in the developing countries. It does appear in developed countries also, but not as much. (Neuwirth, 2011)

Germany's central bank Deutsche Bank in their year-end note of 2009 stated that if a country's shadow economy is on an "average" level, it suffers crisis more than those that's shadow economy is either only a small or relatively big ratio compared to Gross Domestic Product. According to this research the financial crisis of 2008-2009 affected in a way that in countries where shadow economy's portion of official economy is fairly small, the Gross Domestic Product came down by 2-4%, and in countries where shadow economy's portion of the official economy is bigger, Gross Domestic Product came down less than 1% (Deutsche Bank Research, 2009).

Shadow economy is a challenge to the world because it is an economy that is outside of all regulations and rules. This is why many countries are dedicated to shrink it size, rather than accepting it. There are countries that have made it to somewhat successful thanks to shadow economy, because no legal entity wanted to take the risk of step into the market of that country. In Africa, Latin America and China, accepting shadow economy has made it possible for those countries to grow their economies (Neuwirth, 2011).

1.1 Background and motivation of the study

As a motivator of this work is the fact that countries and their policy-makers can themselves decide how to calculate their Gross Domestic Product and other economic indicators. There have been no regulations on whether or not to include shadow economy in to their official figures. Shadow economy is not a simple figure or amount to just add to the other figures, which is why it is so easy to include all the official and mandatory information, but leave out something you don't want to include.

Shadow economy has been studied a lot and there are many papers written on shadow economy in European Union, as well as in the whole world. There is a research gap on the influences of shadow economy in official decision making. This has been the ultimate motivation for conducting this research.

Before this research, Marcelina Michalec has made her own research on a few European countries and their methods to include shadow economy into their official figures. Michalec's research has acted as a base for this research, giving a start on the studied matter. In addition to Michalec's work, other references have been searched to unravel the bigger picture.

1.2 The scope and focus of the study

The three main elements of this study are Gross Domestic Product and economic indicators that are derived from it, shadow economy and decision making inside the European Union. Gross Domestic Product is an element because it is a main economic indicator and most of other economic indicators used in decision making are based on Gross Domestic Product. In this study the method for resolving how shadow economy affects on decision making, is to resolve how shadow economy effects on Gross Domestic Product and indicators that are derived from it.

Shadow economy is the number one element of this study. The theory part clears out what it is, where it comes from and how it appears in everyday life. The empirical part is built on Michalec's study added with more study on the subject; how do countries take note of shadow economy in their balance sheets. In addition to this, the empirical part includes a simple analysis on how the inclusion of shadow economy can affect on official figures.

This research is not made to find out the size of shadow economy in the European Union. The aim is not trying to find methods on how to reduce shadow economy. The focus of the work is to find out if it is observed by officials and how it affects decisions.

This research is limited to the area of countries in the European Union. The European Union is close, it is a unite collection of countries and also because the decision making and practices should be similar within the area. This work is made to find out if this comes true.

1.3 Research questions and main objectives

The objective of this work is to analyze shadow economy and the application of the concept in key figures of economies. This study is made to find out if and how shadow economy is targeted in countries. In addition to this, this study finds out how the addition of shadow economy could affect reported GDP figures, in case it is not included before.

These objectives are targeted by answering the research questions. The main research question is:

Does shadow economy affect on an economy and its decision making in the European Union?

The answer to this question is resolved by answering these sub-questions:

1. How is shadow economy taken into account when calculating a country's GDP?
2. How does the inclusion of shadow economy alter GDP and decisions made based on it?

In addition to these questions, the aim of the work is to evaluate how and what aspects of shadow economy should be included in the calculation of national accounts.

1.4 Research method

This research is a quantitative research. The information in which this research relies on is collected from papers written by experts and official websites of for example countries and their statistical offices. Statistics are used in form of countries' official economic figures. The effects of shadow economy are evaluated based on the effects on these figures. The measures used in the empirical part are a mix of interpretative and analytical; the effects are evaluated in a hypothetical scale, and the results analysed based on those hypotheses.

The literature review is based on economic literature and previous research on shadow economy. The empirical part of the study has been conducted using the European Union member countries' official websites, Bureau of Statistics' official websites and all the found material from those websites, accordingly. Michalec (2014) has also contacted some of the Bureaus personally to find more exhaustive information to work as a base of the study.

The calculations are based on official information gained from Eurostat and their statistics on the countries' performance. The analysis is a simple and robust analysis on how Gross Domestic Product and other indicators would change if the information on shadow economy would be used. The analysis on how this affects

into the decisions made is based on European Union's systems on decision making and the countries own policies on how to use their economic information on decision making.

1.5 Structure of the study

The structure of the study is following. The second chapter introduces the basic theory behind this study, starting with Gross Domestic Product in theory. It is explained what it includes and how it is calculated. This chapter also includes the other indicators used in decision making and how these indicators are used in the process especially in the European Union.

Chapter three opens up the concept of shadow economy based on previous literature made by experts on the subject. Chapter three outlines the definition, the most usual causes as well as the ways to measure shadow economy. Measuring shadow economy is tackled here theoretically, based on previous literature and in addition to this the chapter presents the System of National Account and the European System of Accounts, the instructions on how to measure shadow economy for national accounts.

Chapter four is the literature review of the study. This chapter presents how shadow economy and Gross Domestic Product link together. The chapter sums up a few of the most important researches that give examples on how shadow economy can affect on the official economy. Chapter four also presents the shadow economy in the member countries of the European Union today. The chapter includes tables and graphs on shadow economy based on few researches on the matter. It expresses the amount of shadow economy as well as the development of it over time. The chapter is based on papers because not every country's officials want to publish their information.

The fifth chapter is a research on how the EU countries take shadow economy into the calculations of their national accounts. In this chapter every EU country is not

introduced because of the lack of official information on shadow economy. The chapter still shows what kind of methods there are in use. Not every country wants to make their data public and therefore this chapter presents a summary of different studies and researches of the subject from recent years.

Chapter six is a study how the inclusion of shadow economy affects on decision making. There are some explanations how the exclusion or inclusion can distort the figures in to the direction the country's government may want. Chapter six also includes the authors discussion on how and what aspects of shadow economy could be included into national accounts the most comparable and reliable way.

In chapter seven the results of the work are assembled under one headline. Chapter eight summarizes and concludes the study. There also are the suggestions for further research on the subject.

2 GROSS DOMESTIC PRODUCT

2.1 What does it measure

Gross Domestic Product (GDP), measures a country's economic performance. It is the overall value of everything that is produced and manufactured in a country. GDP is measured using product's market prices; it directly tells how much a product is worth for the economy. The GDP calculation method does not take into account how much the producing does cost. (Mankiw & Taylor, 2014, p. 437-439)

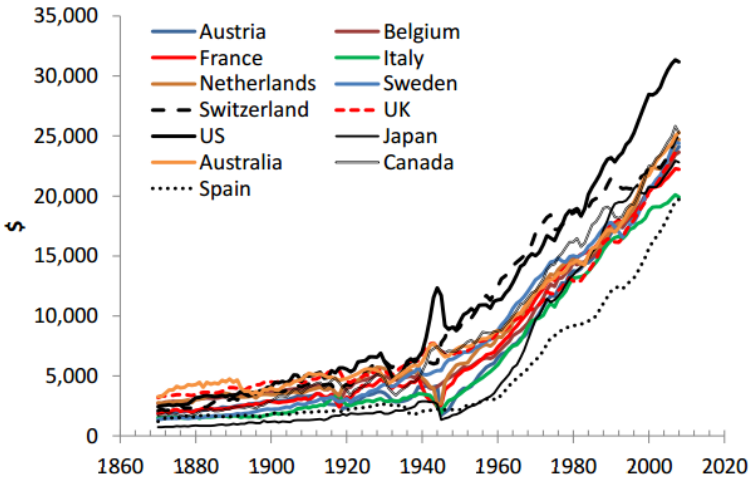

Figure 1. Real GDP growth per capita, 1870-2011 (Kitov & Kitov, 2012, p. 7).

Figure 1 represents the development of real GDP per capita from between 1870 and 2011. The figure shows that GDP has grown whereas the economy has developed during time. From this figure it is also seen that external factors can affect on the economy, the irregularity in the chart after the year 1940 is about the time of the Second World War. After this, in this scale the growth has been quite steady. (Kitov & Kitov, 2012, p. 8)

GDP might also leave out some activities that can not or are particularly difficult to be measured. Some of these items are things that are never sold or bought. GDP includes work through salaries and wages, but it doesn't measure free time or the

worth of it. It also doesn't include any external impacts that affect also the economy, for example pollution. (Begg et al., 2014, p. 359, 633) The illegal market is also counted in to these activities. Illegal economy is the part of the economy where no one pays taxes and the exchange of goods and services happen hidden. (Mankiw & Taylor, 2014, p. 439-441)

In addition to these GDP doesn't measure activities inside a household. For example, when goods are bought from a store, taxes are included in the price and the action adds up to GDP. When someone produces these goods themselves only to their own use, it is invisible for the economy and does not benefit the GDP. (Mankiw & Taylor, 2014, p. 439-441)

Some countries try to estimate the amount of shadow economy into GDP calculation. The European Union countries try to capture the illegal activities also, such as prostitution, smuggling and drug markets. (Vilkkumaa, 2011, p. 111)

GDP measures a country's output as a whole, without specifying who contributes into that output. The concept should not be confused with Gross National Product (GNP), or Gross National Income (GNI). GNP, or GNI, meaning the same thing, measures a country's total income, no matter from where that income is coming from. GDP is Gross national income minus the international transfer payments. GNI does grow a country's income, but not the output. (Begg et al., 2014, p. 347-353)

2.2 How is it calculated

GDP is calculated by adding up all the forms of spending money inside a country with the following equation (Mankiw & Taylor, 2014, p. 442).

$$GDP = C + I + G + NX \quad (1)$$

In equation (1) *C* means consumption, *I* is investment, *G* is government purchases and *NX* is net exports. Consumption means all the goods and services bought by households. Investment category includes companies' stocks, as well as machinery and structures. Government purchases then again include all the purchases made by national and municipal governments. These purchases include the workers of public administration in the form of their salaries. Net exports are the total value of exported goods and services minus imported goods and services. (Mankiw & Taylor, 2014, p. 441-445) Salaries of an ordinary citizen are included in the consumption part, because the income of a household grows their purchasing power. Taxes are therefore included in the government purchases, because taxes are the incomes of a government, and they enable the government to buy goods and services. (Begg et al. 2014, p. 350)

There are three methods for measuring GDP (Table 1). These are the income method, expenditure method and output method. Income method sums up different incomes, salaries, operating incomes that are for example profits and rents, and other incomes. By adding indirect taxes to this number, and adjusting it with statistic error result is GDP. (Begg et al. 2014, p, 354)

The second method is the expenditure method. From expenses the household consumption is the biggest item. Into that we add consumption by government, investments made by households and governments, and exports from where we deduct the amount of imports. With corrections of the statistical error again we get GDP by expenditure method. (Begg et al., 2014, p. 354)

The third method is the output method. The output method calculates GDP detailed by industry. It takes the values added from every industry separately and this way ends up with GDP by the output method. (Begg et al., 2014, p.354-355)

Table 1. Methods to measure GDP (Begg et al., 2014, p. 355).

Income method	Expenditure method	Output method
Wages and salaries	Household consumption	Agriculture, forestry, fisheries
Operating surpluses (profit,rent, interest of private and public firms)	Government consumption	Manufacturing
Other incomes	Private investment / + government investment	Other production (mining, energy, water)
GDP at basic prices	Exports	Construction
Net indirect taxes	Less imports	Services, of which:
		Distribution, catering
		Transport, communications
		Business/financial services
Statistical discrepancy	Statistical discrepancy	Government and other services
GDP at market prices	**GDP at market prices**	**GDP at market prices**

It is also important to point out what kind of GDP is in case, nominal or real. A nominal GDP means a calculation that has been done with the prices on the market at that exact time and it does not regard the changes in prices over time. Real GDP is GDP at constant prices. This means that a year is chosen to be a base year and the results of following years' calculations are compared to this figure. (Begg et al. 2014, p.355-360)

2.3 Most important ratios

GDP is the most used indicator for measuring a country's economic performance. GDP and its growth tell how fast and how much an economy is growing. (Begg et al., 2014, p. 357) In addition to GDP, there are other indicators that countries use to evaluate their own and compare each other's economies. These ratios are often based on GDP, hence its comparability and similarity between countries. (Begg et al, 2014, p. 358)

One of these ratios used is GDP per capita. It measures GDP divided by the population of a country and it can tell the productivity of the country's population or

even give some direction of the quality of life in a country. (Begg et al., 2014, p. 358)

Few other indicators are current accounts' relationship to GDP, public corporations' expenses in relation to GDP, tax rate, the financial balance of the country or public corporations in relation to GDP, and the debt of a country or public corporations in relation to GDP. Countries also compare employment rate, investments, income and lending to GDP to see how their economy is doing. (Taloudellinen katsaus, kesä 2015)

It is possible to assess the economy by many other ratios also. In the EURO area governments measure the deficit to GDP ratio and the percentage of trade balance of GDP. A few other measured figures are revenue's, government's investment, government's expenditure and debt's relationships to GDP. In the Euro area these ratios are used to measure how different countries perform in comparison with each other, as well as for trying to decide what to do to make their economies better. The European Union also tries to make some forecasts based on these ratios on how the economy is going to develop further on. (European Commission, Report on Public Finances in 2014, p. 1-29)

2.4 Decisions based on GDP and GDP related ratios

GDP and other key figures of national accounts are widely used in decision making. These figures and their growth are used in politics among other things. The size of GDP, or GNP might even determine the level of taxation in some countries. It is also a one determinant for loans for example from the World Bank and other large institutions. The level of GDP defines also the level of interest on these loans. (Tanzi 1999, p. 341)

The membership of for example the G-groups (Group of five, eight, ten and twenty) and other authoritative groups of countries is decided by the size of a country's GDP (Tanzi, 1999, p. 341).

GDP is used to evaluate a country's economy, and especially economic growth. Countries get credit ratings from companies that are specialised to it. These companies are for example Moody's and Standard & Poor's. These credit ratings are highly valued all over the world, and they affect for example to lending for a country. The United States Department of Commerce's Economic and Statistic Administration has listed their most important financial indicators, and GDP is one of these. (United States Department of Commerse, 2015)

Cantor and Packer made a study on sovereign credit ratings in 1996. They tried to find out what information is needed and in what weights are they combined to make a credit rating for a country. They found out that Standard and Poor and Moody's have a similar system to rate a country, and they use similar data. The growth of GDP is one determinant, simply because if an economy and its production is growing, it must have better qualifications to survive of its debts. (Cantor & Packer, 1996, p. 39)

The European Union has its own different kinds of regulations that member countries need to meet. One of these is the Maastricht criteria or treaty. The Maastricht Treaty was developed besides founding the European Monetary Union. The Treaty contains a note that countries must keep their debt and deficit in a certain level. According to the Treaty, a country's public debt-to-GDP ratio can be maximum 60% and deficit-to-GDP maximum 3%. (Stability and Growth Pact, 2015) These limits mean that the bigger the GDP is, the easier these regulations are to meet. On the other hand, every member country needs to contribute financially in to the European Union's budget and a lower GDP lowers this amount. (Tanzi, 1999, p.341) This financing amount is not negotiated every year, but for a few years ahead. GDP is a determinant for the amount a country needs to pay, but not the only determinant and in the end the amount is a result of negotiations between all the members. (Suomen Jäsenmaksut EU:lle, 2015)

The European Union financial policy requires following and staying on track with the members financial situation from the European Commission. In addition to the Maastricht criteria, that defines the limits the European Union has a treaty on how

to perform if for some reason these limits are exceeded. This is the treaty of the functioning of the European Union. (Treaty of the functioning of the European Union, 2012, p. 99-102)

As said, the Maastricht criteria require that the deficit-to-GDP should not exceed the reference value, which is 3%. If the value should go above this, the commission has to take that country in to closer supervision. The public investment costs and long term financial situation will be checked. After the commission has looked into the matter, they will bring the subject to the knowledge of the European council, which then decides on what kind of instructions for acting to give the country on the situation. If the member country doesn't follow these instructions, the council will order some measures to force the deficit to shrink down. If even these measures do not work, the council can demand the country to publish their information on the deficit to other parties before giving obligations and securities, order the European investment bank to check the loan policy towards that country or even order a penalty or the country to give the union a deposit until the time the deficit has shrunk to a qualified amount. (Treaty of the functioning of the European Union, 2012, p. 99-102)

The European commission supervises the countries' financial balance, and makes their suggestions and regulations based on them. They observe if the European Union's agreements and contracts are followed in the member countries. The commission makes country-specific recommendations yearly, after the members provide their information. Based on that information, the commission gives its notes. (Country specific recommendations, 2015)

The excessive procedures seen in Figure 2 mean that if a country's debt or deficit is not in the limits that are given in the Maastricht criteria the European council needs to proceed accordingly. The actions are in theory seen in the figure and start from the bottom. Going upwards, the severity of the problems and the interference grows. The excessive deficit procedure is a preventive measure, it does not fix the problems afterwards but it is a method for not to let the country's deficit or debt to grow too much. (The corrective arm, 2015.)

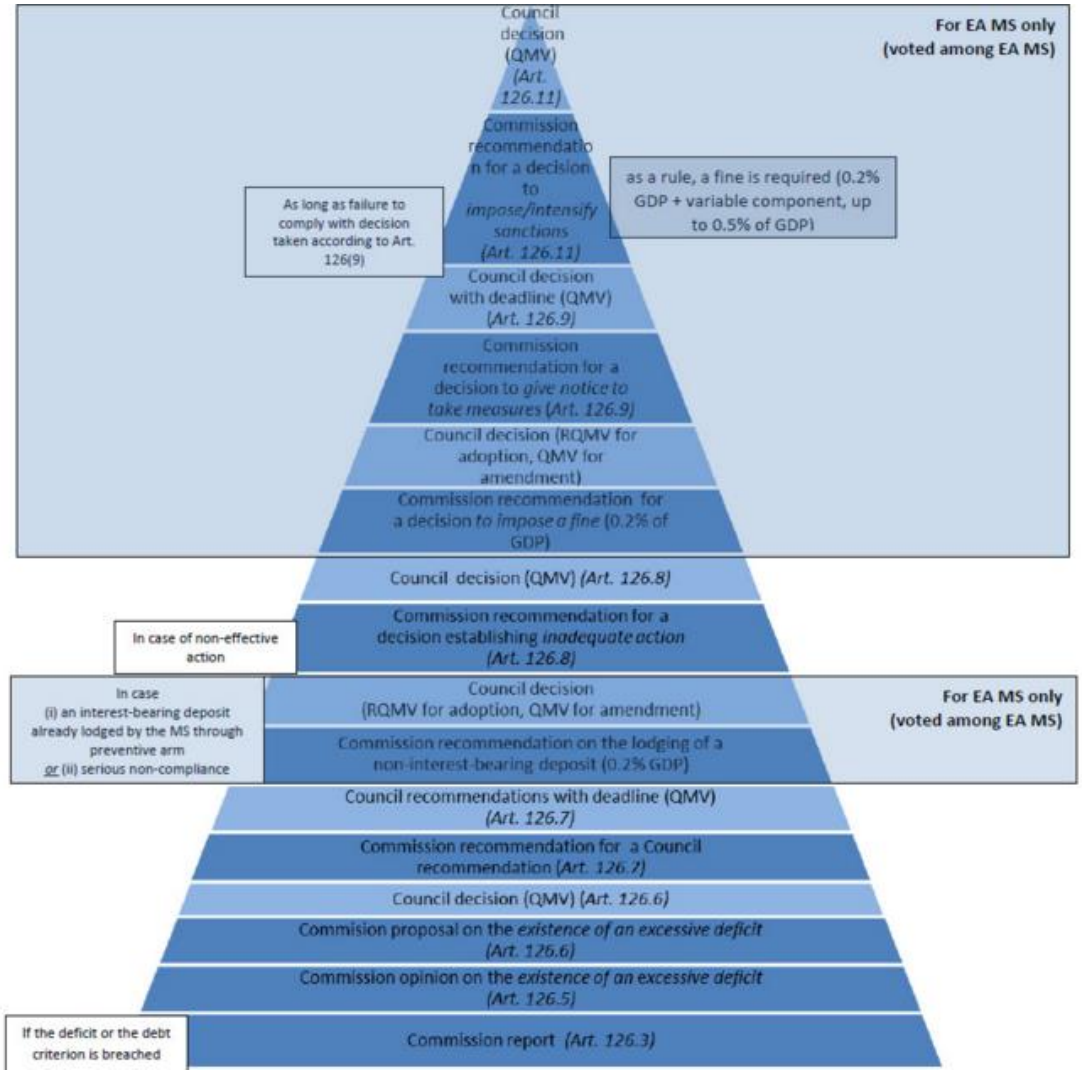

Figure 2. The excessive deficit procedure. (The corrective arm, 2015).

Figure 3 shows the situation today, in what state countries are and for which countries the Commission needs to take actions. In Figure 3 the countries are divided by their financial status, and what level of instabilities their current accounts have. The countries are divided in groups that specify how serious and long-term problems they have experienced. The groups are in six levels between no imbalances and imbalances so severe that extra measures have already been taken. Vertically the countries are divided into two groups. On the left side of the margin are the countries that are already in the excessive deficit procedure and on the right side those that are not. (The European Semester, 2015)

Figure 3. The Macroeconomic imbalances and government deficits (The European Semester, 2015).

One example from the countries that are experiencing imbalances and require closer monitoring and actions but are not yet in the European Union's special program is Sweden. The European council has noticed that household debt is too high and growing still, too fast when comparing to the country's overall economy. The council ordered Sweden different measures that would help the housing market grow more efficient and slow the household indebtness. In the eyes of the European council Sweden still needs to make mortgages less attractive, for

example by not giving the option to deduct the taxes of interests. In addition to this they should make renting more attractive to their citizens. These are the kinds of situations some of the countries might be in, especially those that are experiencing some imbalances but are not yet in the corrective arm. (Macroeconomic imbalances – country report, Sweden, 2015, p. 1-2)

In the most serious cases Greece and Cyprus there was no stability program made for those countries in the year 2015. The situation has developed in a direction that they are already in an economic adjustment program under the surveillance of the European Union. These programs include loans and specific policies and rules made for these countries and are the most intensive actions that the European Union makes, if a country can not meet the regulations set for member countries. (Greece, Economic outlook, 2015)

3 SHADOW ECONOMY

3.1 Definition

Shadow economy is a term that is hard to define. Different researchers use different definitions. Schneider (2005) in his research on shadow economy presents few of the most used definitions. From the studies of Tanzi (1999), Thomas (1999), Giles (1999) and Petersen (2003) Schneider has gathered that shadow economy is economic operations that should be included in the gross national product, but are not registered anywhere. (Schneider 2005, p. 599) Smith (1994) uses a definition that explains shadow economy as producing goods and services either legally or illegally, and that is for some reason not seen in official calculations (Smith, 1994, p. 18).

According to Tanzi (1999) all incidents that affect to an economy can not be measured comprehensively and comparably. The evidently illegal parts are often difficult to measure reliably. Most of the time they are not taxed either and therefore are not included in a country's GDP. A comparability problem occurs also from different legislation of countries. Some processes and incomes may be legal in one and illegal in another country, which creates a problem to international comparison. In addition, not all income that is not taxed is illegal, even though it may not be reported to the authorities. One example of these kinds of incomes is for example helping out a friend build or renovate a house and getting some kind of compensation of your time from it.

In Finland, law determines legal obligations on organisations and companies, especially employer companies. These obligations could be for example taxes, retirement-, accident-, unemployment insurance payments or payments required for the customs, or getting improper refunds. When the organisations violate these obligations, mainly by not making the payments, they are a part of shadow economy. (Laki harmaan talouden selvitysyksiköstä)

Schneider has established his definition of shadow economy, which is repeated in most of his researches (Schneider, 2007, p. 5; Schneider, 2005, p. 513; Schneider & Enste, 2000, p. 79). He uses a table to explain what shadow economy can include, and what components are included in illegal and legal activities. The table is originally from the research of Lippert and Walker (1997), with changes made by Schneider. (Schneider, 2007, p. 5; Schneider, 2005, p. 513; Schneider & Enste, 2000, p. 79)

Table 2. Shadow economy (Lippert and Walker, 1997).

Type of activity	Monetary transactions	Nonmonetary transactions
ILLEGAL ACTIVITIES	Trade in stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling and fraud	Barter: drugs, stolen goods, smuggling etc. Produce or growing drugs for own use. Theft for own use.
	Tax evasion.	Tax avoidance.
LEGAL ACTIVITIES	Unreported income from self-employment; wages, alaries and assets from unreported work related to legal services and goods; Barter of legal services and goods	Employee discounts, fringe benefits; All do-it-yourself work and neighbor help

Shadow economy is often referred as non-observed economy, black economy or hidden economy. The System of National Accounts calls shadow economy as non-observed economy, and divides it into three classes of activities. These stages of shadow economy are underground activity, informal activity and illegal activity. Underground activities are legal activities that do not come to knowing of official authorities for some reason, usually because the parties want to avoid paying taxes for those actions. The informal activities are activities that have no written record kept of them, for example contracts and official agreements. Illegal activities then again are those that are clearly illegal such as stealing and selling of drugs. (Non-observed economy in national accounts, 2008, p. 2)

3.2 Causes of shadow economy

Many studies have discovered the main causes of shadow economy all over the world. Schneider and Enste (2000) among others list the sources of shadow

economy as following; increasing taxes and other social security payments, great amount of different regulations, not allowing to work as much as wanted, forcing to retire earlier than needed, unemployment, civic virtue not being that important anymore and public institutions not being as trustworthy in citizen's eyes than before.

Schneider and Enste (2000) draw a conclusion that in their opinion the rise in taxes and other social securities is one of the biggest causes of shadow economy. This is because when generally the labor costs increase and earnings after taxes decrease temptation to work in the shadow becomes bigger. (Schneider & Enste, 2000, p. 82) Many other researches also propose that the increase in tax and social security payments is the main cause of shadow economy (Schneider, 2004, p. 516; Tanzi 1999, p. 338-340; Giles 1999a, p. 622).

There are of course other incentives for shadow economy also. One of these is increased regulation. Regulations in this concept mean laws and other requirements. Regulations are there to help workers and employers, but they cause costs as well. These costs occur in an employee's salary by decreasing the amount left in hand for the worker from the actual salary, therefore shadow economy would seem more appealing to the employee. (Schneider & Enste, 2000, p. 83) As regulations and laws cause costs to employees, there are own costs on the side of the employer. The labor costs that are required from a company make such a big expense that they may not afford to have as many employees as they would need. From the view of shadow economy, these kinds of reasons are what could seem attractive for both sides. (Schneider, 2000, p. 87)

Third one of the main causes is social welfare payments. Many European Union countries have very advanced social welfare and social welfare payments system. In case of unemployment, people are supported by the government. In some cases the financial support may be so good, that the threshold to find work is higher, because the financial support is given as long as a citizen does not work. People in these kinds of situations may decide to work in the shadow economy, so

they get the financial support as well as their salary. (Schneider & Enste, 2000, p. 86)

As few causes of shadow economy the researchers have listed a forced reduction of working hours and earlier retirement against the will of the employee. In theory and in the long run shortening working days should reduce unemployment. The disadvantage of this is that if the employee does not want to reduce their working hours or retire earlier, even though the work could be distributed, they can work more in the grey area. Reduction of working hours should be implemented with the consent and willingness of the employees themselves. (OECD, 1998, pp. 123-88)

All in all, the causes and effects of shadow economy make a circle where shadow economy is prevented with measures that are the most common factors that cause shadow economy. Increasing taxes and regulations etc. increase shadow economy, which increases the government's actions on the matter, to increase taxes and regulations even more. Therefore, according to the studies, shadow economy should be prevented with other ways that don't increase costs. (Schneider & Enste, 2000, pp. 87-88)

3.3 Measuring shadow economy

Schneider and Hofreither (1986-87) as well as Feld and Schneider (2010) present the most common methods to measure shadow economy. These are called direct approaches, indirect approaches and the model approach.

The direct approaches in their opinion provide only low estimates of the shadow economy, because they do not catch all activities that are included in the shadow economy. Direct approaches measure shadow economy on a voluntary perspective, from surveys and replies. In addition they can't measure the growth of shadow economy. (Schneider & Hofreither, 1986-87, p. 18.; Feld & Schneider, 2010, p. 111-112)

Indirect approaches are also called indicator approaches. The indicators have information about shadow economy's development over time. Schneider and Hofreither list four indicators that measure shadow economy at least in some amount. These indicators are the following; 1. The difference between national expenditure and income in official data, 2. The difference between the official and actual labor force, 3. The transactions approach, which shows the direct difference between income and expenses and 4. The currency demand approach, which reveals shadow economy from the demand of currency. (Schneider & Hofreither, 1986-87. p. 18)

National expenditure is often bigger than incomes are. As such, in theory it appears to be the result of shadow economy. In practice though, this is not as simple. The results may also show a difference because of measurement statistics errors. (Schneider & Hofreither, 1986-87. p. 18) The difference between the official and actual labor force is a result from measuring the size of the labor force. If the size is assumed to be constant but the actual number shrinks, this refers that employees are moving towards shadow economy. This indicator though assumes that all the other variables besides labor force must also be constant. In addition to that, disadvantages of this indicator are that people may work in the official economy and in the shadow economy at the same time. (Schneider & Hofreither, 1986-87. p. 18)

The third indicator is the transaction approach. This approach is based on the assumption that the quantity of transactions and official Gross National Product has a relation at all times. (Schneider & Hofreither, 1986-87. p. 18-19) The fourth indicator is the currency demand approach. This approach is based on the assumption that all activities or transactions in the shadow economy are made with cash payments, so that they don't leave traces to be followed. This means that when the demand for currency increases, it must be a sign of shadow economy increase. To measure this currency demand, there is an equation that controls the other factors, development of income, payment habits and for example tax burden. With this equation the increase in currency demand that the

other factors don't explain can be calculated. (Schneider & Hofreither, 1986-87, p.19)

The third way to measure shadow economy is the model approach. The model approach takes many factors into consideration when measuring shadow economy, whereas the previous approaches take only one factor into consideration at a time. The model approach uses the MIMIC (Multiple Indicators Multiple Causes) model, which means there is multiple indicators as well as multiple causes for the phenomenon measured. (Schneider & Hofreither, 1986-87. p. 19) The MIMIC model is also widely criticized because it only gives estimates of the size and growth of shadow economy (Feld & Schneider, 2010, p. 113).

Many studies have ended up to use the modelling approach, or to say the MIMIC model to measure shadow economy. This is because the other measures only take one indicator in to consideration and the indicator used to measure should include all the factors that effect on shadow economy. (Schneider et al. 2010, p.448) These studies are for example Schneider et al (2010), Dreher and Schneider (2010), Giles (1999a) Giles (1999b), and Schneider & Hofreither (1986).

3.3.1 The System of National Accounts and The European System of Accounts

The System of National Accounts and European System of Accounts give methods to recognize, measure and include shadow economy into national accounts in a way that is comparable throughout almost the entire world. The System of national accounts 1993 is the United Nations', the Commission of the European Communities, the International Monetary Funds, the Organization for Economic Co-operation and Development's (OECD) and the World Bank's joint international standard for assembling and reporting national accounts. The 1993 System of National Accounts is a conceptual framework for countries, to help them gather the data. The United Nations' statistic division has created handbooks on how to follow the System of National Accounts in practice. (System of National

Accounts 1993, 2015) The European Union or the European commission has their own version of the framework. They created the European System of National Accounts 95, for countries in the European Union. They updated the framework, and since September 2014 European System of Accounts 2010 has been the valid framework in Europe. This European system is based on the United Nation's System of National accounts, with some specifications important to the European Union. (European System of Accounts 2010, p. 3)

The European System of Accounts is created and implemented in Europe and the European Union to harmonise the methods in which the countries provide their statistics, and make the results comparable with each other. The European System of Accounts 2010 is based on the System of National Accounts, and thus is consistent with it, with few exceptions that concern the Union's own needs and uses. The European Parliament and the Council have adopted the European System of Accounts as a regulation, to ensure that it is applied in every country in the Union. The European System of Accounts requires that the production of goods and housing by own-account, of goods for own use, of services by paid domestic staff, that is forbidden by law but all perform it voluntarily, and from which all revenues don't come out to the fiscal authorities is registered in national accounts in the production boundary of the European System of Accounts. These activities are registered whether they are legal or illegal or the producers don't pay taxes or social securities for them. The services consumed in a household, and volunteer services that don't include production of goods for example are not inside the production boundary and these are not therefore included in the European System of Accounts. (European System of Accounts 2010, p. 3-54)

The European System of Accounts acknowledges that some activities that should create tax incomes to the country never do. The European System of Accounts gives two alternatives on how to record the actual tax amounts in to the national accounts. These are made by assessments and declarations on the amounts that were never collected, or cash receipts of the taxable activity. In the European System of Accounts non-observed economy in case of employment is in principle taken into account. They are included in national accounts production boundary as

three types of activity. These types are illegal activities where every party is voluntarily executing the activity, activities that are legal but are hidden from officials and informal activities that are usually not in any records. European System of Accounts mentions in principle this is to be taken into account in employment compensation. Theft or any other illegal activities are not included. According to the European System of Accounts it is also necessary to make some adjustments into accounting data, for example into the value of sales. It should be noted that some enterprises might underestimate their sales to avoid taxes; therefore an adjustment should be made into the figures based on information from tax offices. An adjustment should also be made when employees do work free of charge and get either goods or services for it, or free housing for example. (European system of accounts 2010. p. 95-464)

OECD has written a handbook for its members, and all countries, for the estimation of underground, illegal or in any way non-observed economy. This handbook is directed to the staff of government's statistical officers who prepare the national accounts of a country. It does not give the absolute right way to estimate the figures; it gives options on how to at least take them into account somehow. In writing the handbook, it is based on the 1993 System of National Accounts as the way to measure national accounts. The handbook gives ways to measure the non-observed economy, within the boundaries the 1993 System of National Accounts requires. The 1993 System of National Accounts requires measuring the non-observed economy in national accounts for GDP estimates to be as accurate as possible. (OECD framework, 2002)

The handbook presents four different analytical frameworks, by which the aspects of non-observed Economy can be identified to make its measuring more organized and effective. These frameworks are the Istat Analytical framework, Eurostat Tabular framework, Unit and Labor Input framework and Production Income framework. The first two of these are more known, and more tested. All these methods divide non-observed economy into groups that help measuring them and that complement each other in a way that makes the measurement thorough. The handbook stresses out that none of these frameworks probably is perfect or

measures non-observed economy exhaustively. It is told that when collecting national accounts, statisticians should either choose or develop or combine a method or a framework that serve on their country's needs the best. (OECD framework, 2002, p. 1-49)

3.3.2 Eurostat Tabular Approach and Istat Analytical Framework

The Eurostat Tabular Approach and Istat Analytical framework both give an organized method to recognize shadow economy and the parts that are not measured in national accounts. They are very similar to each other, hence that the Eurostat approach is developed based on the Istat method. They both divide the aspects of shadow -or non-observed- economy into several categories, to make it easier to include all parts of the shadow economy in to calculations. Both Eurostat and Istat approaches divide non-observed economy in to seven categories. The tabular approach's first version was created in 1998-2000, and in the first version the division was made in to eight categories (T1-T8). Since then has been updated in 2002-2003 when the categories' amount was reduced to seven and the identification of the categories was changed to N1-N7 to differ the framework from the Istat framework. (Eurostat Tabular Approach, UNECE, 2007) The type T8 was an addition to the Istat framework made by Eurostat because the tabular approach was originally developed to make the EU candidate countries' figures more comparable to the existing EU countries (OECD framework, 2002, p. 45; Gyomai & van de Ven, 2014, p. 3)

As said, the two frameworks are very similar to each other, especially when the Eurostat method has been shrunk down to having also seven categories. They both also divide the causes of shadow economy into types of reporting or recognizing problems, from which all of the seven fall under one type. Eurostat method's division is in four parts whereas Istat method is in three parts. (SNA Eurostat tabular approach types of non-exhaustiveness, 2012; OECD framework, 2002) Istat framework's three problems are lack of information -either due to productive parts of the economy not registering or the information not being

updated accordingly-, households and companies not answering to surveys and underreporting. Eurostat's four problems are not registering, not surveyed, misreporting and other deficiencies. The categorization of T1-T7 and N1-N7 also differ from each other a little, so that identification of which framework is used is needed. Both frameworks specify the production or economic transaction that is not registered under different reasons why the information is available. (OECD framework, 2002)

Both approaches divide shadow economy to those that don't register deliberately because they try to gain economic profit (N1; T5), those that do not work through the formal lines because they are part of illegal business (N2; T7), and those that are for some reason not even required to register anywhere (N3; T6). The Istat framework has also the T3, for actors that are not registered for other than the previous mentioned reasons, only for statistical reasons. N4 and N5 within Eurostat tabular approach are the not surveyed factors and the reasons for this could be anything, databases are not updated or the producer, company or an entrepreneur is out of the range surveyed. In case of Istat, the biggest difference is here, there is no equivalent factor for this one but T1 could be the closest one. It includes still only the non-response part. T2 and N7 are closest to each other. N7, the statistical deficiencies are usually due to problems with data whereas T2 is only for the data that is not used because the sources are not updated frequently enough. T4 and N6 mean those that misreport or underreport their earnings, to gain economic benefits usually. (OECD framework, 2002) Below, these categorizations are shown also in a form of a table (Table 3).

Table 3. Eurostat Tabular Approach and Istat Analytical Framework (OECD framework, 2002).

Eurostat Tabular Approach		Istat Analytical Framework	
Producer deliberately not registering - underground	N1	Non-response (statistically underground)	T1
Producer deliberately not registering - illegal	N2	Not updated	T2
Producer not required to register	N3	Not registered (statistical underground)	T3
Legal persons not surveyed	N4	Underreporting	T4
Registered entrepreneurs not surveyed	N5	Units not registered (economic underground)	T5
Producers deliberately misreporting	N6	Not registered (informal sector)	T6
Other statistical deficiencies	N7	Illegal producers	T7

4 LITERATURE REVIEW

Chapters two and three present GDP and Shadow Economy theoretically, definitions and the ways to measure them. This chapter brings those two concepts together, explores their relationship and goes through the existing researches on the subject.

The literature review of this work is implemented by using the state-of-the-art procedure. The work is started by entering generic words related to the topic into databases to find the most important papers. Shadow economy and GDP are the most important entrywords concerning this research. From those words ahead the entries are refined and the most relative researches for this work are found.

4.1 State-of-the-art procedure

The most important sources for this literature review were Google Scholar, Springer Link and EBSCOhost Business Source Complete. The first ones and therefore the most generic searches gave a wide amount of results, almost 130 000 results. As the entrywords were modified the results became more relevant. Most of the results were studies and researches on the size of shadow economy in different parts of the world.

Many of these result papers were skimmed through, but obviously the entrywords were too general especially for Google Scholar. In terms of this study, the search was changed, and one word was added to the search. The search was conducted with the entry “Shadow economy affect gdp”. The entry is kept plain so that the results would not be left out because of grammar. With this entry the search gave around 73 000 results and all of the databases were able to give a respectable amount of researches. Not all of this material is used in the study and much of it is used a little. The work is also deepened with more specific entries to find really what was looked for. This second search although gave already the most

important results for the literature review. The results of the search are also used in chapter three where shadow economy is explained in theory.

Table 4 presents the most important papers that have studied shadow economy and its effects on GDP. The first three papers in the table, Eilat and Zinnes (2002), Schneider and Enste (2002) and Schneider (2005) are mainly used for exploring how shadow economy's existence affects on the official economy and GDP. Schneider et al. 2010 is the foundation on the research of the size of shadow economy in the European Union's official economies.

Table 4 The most important researches on shadow economy and GDP

Author(s)	Title	The purpose of the study	Main findings
Yair Eilat and Clifford Zinnes, 2002	The Shadow Economy in Transition Countries: Friend or Foe? A Policy Perspective	The research aims to resolve the size of shadow economy of the official economy in 25 transition countries in 1990-97. It also examines what kind of influences does shadow economy have concerning economic growth and competitiveness and how they occur.	Shadow economy makes decision making ineffective in a way that those decisions do not affect those working in the shadows. Shadow economy also lessens the income from taxes and other official payments. Shadow economy tends to add shadow economy.
Friedrich Schneider and Dominik H. Enste, 2000	Shadow Economies: Size, Causes, and Consequenses	The purpose of the research is to get some comparable information on the size, causes an consequenses of shadow economy around the world.	Measuring shadow economy is difficult, but not impossible. By combining multiple methods the most reliable results are achieved. The research proves that any of the existing methods alone is not the absolute best one. Every method has their own perspective. The research concludes that shadow economy has grown during time in every part of the world. The most important causes of shadow economy affiliate with growing taxes and regulations. The authors akcnowledged that some studies show the effects of shadow economy to be positive on the official economy and others again show they are negative. According to Schneider and Enste this point needs further research.
Friedrich Schneider, 2005	Shadow economies around the world: what do we really know?	Paper's aim is to estimate the size of shadow economy in 110 countries around the world.	In this research author has managed to estimate the size of shadow economy for the 110 countries in 1990-91, 1994-95 and in 1999-2000. The author has also found some evidence on the influence of shadow economy in to official economy. The research concludes that shadow economy is present everywhere whether it is admitted or not, and it is so significant in the official economy that governments should themselves study how it affects their economy.
Friedrich Schneider, Andreas Buehn and Claudio E. Montenegro, 2010	New Estimates for the Shadow Economies all over the World	To estimate the size of shadow economy of the official economy in 162 countries around the world	The study estimated shadow economy's size in 162 countris between 1999 and 2007. The conclusion was that in this period of time the average of shadow economy has reduced in all the countries. In addition to this the research revealed that there is no country or area where there would not be any shadow economy. The level or amount of shadow economy then again does vary according to the area measured. The most important causes of shadow economy are taxation and regulation.

4.2 Shadow economy and Gross Domestic Product

GDP is the most important measure of countries' economic performance (Mankiw & Taylor, 2014, p. 437-439). GDP measures the same thing in every country; productivity and size of economy and this is why it is a simple point of reference when comparing economies. (Investopedia GDP, 2016). This is why GDP is

chosen to be the comparison point for this work also. As explained earlier in chapter 3, shadow economy is not a single figure but hides in every aspect of GDP

Based on researches -both empirical and theoretical- the biggest consequences or effects of shadow economy are budget deficit, political instability, inefficient policy, corruption, economic changes and even economic crisis. Simplified, the official economy needs to cover the expenses or income that should come from those that work in the shadow economy. (Startiene & Trimonis, 2010, p. 278) It must be remembered that shadow economy causes positive side effects too. Schneider (1998) and Bhattacharyya (1993, 1999) found out that the income from shadow economy is in great amount spent in the official economy. (Schneider 2004, p. 523)

GDP figures can often be reported short. As explained in chapter 2, a country's GDP is calculated by using the official numbers and amounts of production. The official figures do not always include shadow economy, and are therefore imperfect. (Begg et al. 2014, p 356) Some countries though include some estimation, as we can see later in chapter five. Adding shadow economy grows GDP. Shadow economy is more work and goods made than is measured, therefore if shadow economy is not in the official figures the country's tax revenue is not as much as it could be. (Begg et al., 2014, p. 356)

Schneider in his studies presents that many other researchers in addition to himself, have found results of the link between shadow economy and the official economy. Adam and Ginsburgh found already in 1985 results of that the growth of shadow economy leads to growth in the official economy also. Although there have been studies that show the opposite. Loyaza (1996) with proof from the Latin American countries states that when shadow economy increases, the official GDP per capita decreases. The first theory where the effect of shadow economy on official economy is positive is more widely approved and studied further. (Schneider & Enste, 2000, p. 88-90.; Schneider, 2005, p. 612-614)

Loyaza has in his study in 1996 examined the relationships of shadow economy and economic growth and shadow economy and public services by correlation and regression analyses. His research shows that the correlation between these variables is negative. He has done the regression analysis with growth of GDP, to an index of public infrastructure that consists of four indicators that could model all public services. The regression analysis shows that the amount of shadow economy has a negative affect on GDP growth. As indicators of public services he has used electricity consumption, telephone mainlines, population's access to safe water and roads in good condition. (Loyaza, 1996. p. 150-152) The study of Schneider (2005) divides the countries in developing and developed countries. Based on Schneider's research the growth of shadow economy and the growth of official economy have a negative correlation in developing countries, whereas in developed countries they correlate positively. (Schneider, 2005, p. 618-619)

According to Sakir and Eurostat Italy's GDP would rise by 1,3%, UK's 4% and other European countries somewhere between 3 to 5%, only by adding illegal activities into their figures. This is only to add the illegal economy, and doesn't include other shadow economy. In case of Italy, the addition would grow it's GDP to the level that the European Union requires in indebtness. The inclusion of illegal activities would grow Europe's and it's countries' GDP, but Sakir brings up the problem that if you add illegal activities to grow GDP, wouldn't it make them as acceptable as the legal activities. (Sakir, 2014)

Whereas the level of taxation in a country can give a push for some to join shadow economy, the existence of shadow economy also can grow the level. A government's work is to provide public services and products, especially services. Tax revenues from citizens and companies enable this. When these revenues are small, or shrink still, the ability to provide the necessary services is not in the level they should be. Governments have ways to get these revenues on a level accepted. They can grow taxes again, to get the revenues from the same channel, which leads to a never-ending circle of companies avoiding taxes etc. A government can also try to get the revenue from another channel. One way to do

this is to raise overall prices of goods, which then again leads to growing inflation. (Eilat & Zinnes, 2002, p. 1237-1238)

Inflation causes inflation. In countries with high inflation, especially shadow economy does not use cash. Companies and other actors tend to seek other ways to make their transactions. Usually this is by using another currency, one that's value is better than their own. (Eilat & Zinnes, 2002, p. 1237-1238)

Shadow economy has both, macroeconomic and microeconomic consequences. From macroeconomic point of view, policies and regulations may become non effective because of shadow economy. Companies in shadow economy do not use official services as much as companies in the official economy and policies are often made based on the official information. Monetary policy for example does not concern those that do not work through official banks. Some governments help companies and industries by issuing benefits or grants. If there is a large amount of shadow economy discovered in one industry, governments may not prefer companies in those industries with their backup. (Eilat & Zinnes, 2002, p. 1237-1238)

The microeconomic consequences then again concern mostly the ones dealing in shadow economy. They do have an advantage in the labor market; they don't have to obey regulations or minimum wages. The employees in shadow economy companies therefore may not have a sufficient network of services available for them. These services include healthcare and unemployment services. On the other hand, these shadow companies don't have the ability to provide collateral and therefore their investment possibilities are fewer than their official competitors. (Eilat & Zinnes, 2002, p. 1237-1238)

Shadow economy can indirectly affect decision-makers' credibility. In an economy that includes an informal part, the fact is that always part of the people pays the services of all, including those working in the shadows. This makes people question if the decision makers can guarantee a sufficient quality of life for all people. Shadow economy also generates more shadow economy. When people

see that someone is not following the rules, they feel that they don't need to either. (Eilat & Zinnes, 2002, p. 1237-1238)

As said before, shadow economy has some positive effects also. At least some of the money earned in shadow economy is spent in the official economy and thus it still benefits growth and tax revenues on some parts. It also adds competition and can act as an impact for decreasing bureaucracy and maybe even lowering the tax burden of companies. (Eilat & Zinnes, 2002, p. 1236-1237)

4.3 Estimations of shadow economy size in the European Union

Multiple researches have been made on shadow economy and its share of the official economy (Schneider et al., 2010; Schneider, 2007; Alañón & Gomez-Antonio, 2005; Dell'Anno et al. 2006). In Friedrich Schneider's research published in 2007 the author made estimations on shadow economy over the period of 1999 and 2005. In the making of this research the author had to admit that the MIMIC method is not enough to produce absolute figures of the shadow economy, and has had to use different studies made by the currency demand method to add their estimations. (Schneider, 2007, p. 21) These two methods are used together in the following research from 2010. The MIMIC method is used to measure shadow economy and the currency demand method is used to convert these results as complete figures. In Table 5 below are the results of Schneider et al. 2010. In this research the authors studied shadow economy between the period of time 1999 and 2007. The numbers are the average of the country's shadow economy in this period of time. This research analyses shadow economy and its development in 162 countries in the world between 1999 and 2007. (Schneider et al., 2010, p.447)

The empirical research of Schneider et al (2010) is made with the MIMIC model. The authors have chosen the MIMIC model because with other methods such as currency demand approach or transactions approach the assumption is, that just one indicator can describe all effects of shadow economy, whereas the MIMIC method assumes there are multiple indicators that reveal shadow economy and

multiple causes that create shadow economy. (Schneider et al., 2010,p. 447) The MIMIC method is by far the most popular method used. In theory there are several methods to measure shadow economy, but in practice all researches are made with the MIMIC method. A few researches with currency method were found, but none that meet the limitations of this research and are in time. As said, the research behind these figures is made by Schneider, Buehn and Montenegro's (2010).

Table 5 Shadow economy in Europe 1999-2007, % of official GDP (Schneider et al. 2010, p. 447).

Austria	9.8%
Belgium	21.9%
Bulgaria	35.3%
Croatia	32.1%
Cyprus	28 %
Czech Republic	18.4%
Denmark	17.7%
Estonia	31.2%
Finland	17.7%
France	15.0%
Germany	16.0%
Greece	27.5%
Hungary	24.4%
Ireland	15.8%
Italy	27.0%
Latvia	29.2%
Lithuania	32.0%
Luxembourg	9.7%
Malta	27.2%
Poland	27.2%
Portugal	23.0%
Romania	32.6%
Slovakia	18.1%
Slovenia	26.2%
Spain	22.5%
Sweden	18.8%
The Netherlands	13.2%
United Kingdom	12.5%

As we can see from Table 5, the size of shadow economy in European Union varies a lot between countries. The variation based on this research is from under 10% to over 35% of the official GDP figures. When we divide these countries to western, eastern and southern countries, we find a clearer division. We see that in countries we categorize as western, the share of shadow economy has remained moderate even though in more than one country the amount is closer to 20% of GDP. On the contrary to western Europe's moderate figures, in Eastern and Southern Europe the share of shadow economy in official economy is much bigger, in most of the countries it is over 20%, and usually closer to 30% (Table 6).

Table 6 Shadow economy size of the official economy divided in regions between 1999 and 2007 (Schneider et al., 2010, p. 447).

Western Europe	
Austria	9.8%
Belgium	21.9%
Denmark	17.7%
Finland	17.7%
France	15.0%
Germany	16.0%
Ireland	15.8%
Luxembourg	9.7%
Sweden	18.8%
The Netherlands	13.2%
United Kingdom	12.5%
Average	**15.5%**

Eastern Europe	
Bulgaria	35.3%
Croatia	32.1%
Czech Republic	18.4%
Estonia	31.2%
Hungary	24.4%
Latvia	29.2%
Lithuania	32 %
Poland	27.2%
Romania	32.6%
Slovakia	18.1%
Slovenia	26.2%
Average	**32.00%**

Southern Europe	
Cyprus	28.0%
Greece	27.5%
Italy	27.0%
Malta	27.2%
Portugal	23.0%
Spain	22.5%
Average	**26.0%**

Table 7 is practically the same table as Table 6, but the timeline is different. The timeline in the study Table 7 is based on is from 2003-2015. In this work we needed only the results beginning from 2007. (Schneider, 2015, p. 6) Comparing these tables, we can see that the overall value of shadow economy has decreased over this time. Table 7 shows the average values of shadow economy from the official GDP at the time between 2007 and 2015. (Schneider, 2015, p. 6)

Table 7 Shadow economy size of the official economy divided in regions between 2007 and 2015 (Schneider, 2015, p. 6).

Western Europe	
Austria	8.13%
Belgium	17.06%
Denmark	13.55%
Finland	13.53%
France	11.17%
Germany	13.36%
Ireland	12.42%
Luxembourg	8.43%
Sweden	14.51%
The Netherlands	19.11%
United Kingdom	10.17%
Average	**12.86%**

Southern Europe	
Cyprus	25.83%
Greece	24.15%
Italy	21.42%
Malta	25.31%
Portugal	18.96%
Spain	18.92%
Average	**22.43%**

Eastern Europe	
Bulgaria	31.87%
Croatia	29.16%
Czech Republic	16.16%
Estonia	28.34%
Hungary	22.71%
Latvia	26.08%
Lithuania	28.5%
Poland	24.73%
Romania	29.11%
Slovakia	15.68%
Slovenia	23.91%
Average	**25.11%**

In addition to these tables, the figures 4, 5 and 6 below show the development of shadow economy in the European Union over the period of 1999 and 2015 as a line graph. The figures are made by uniting the two before mentioned researches and their results.

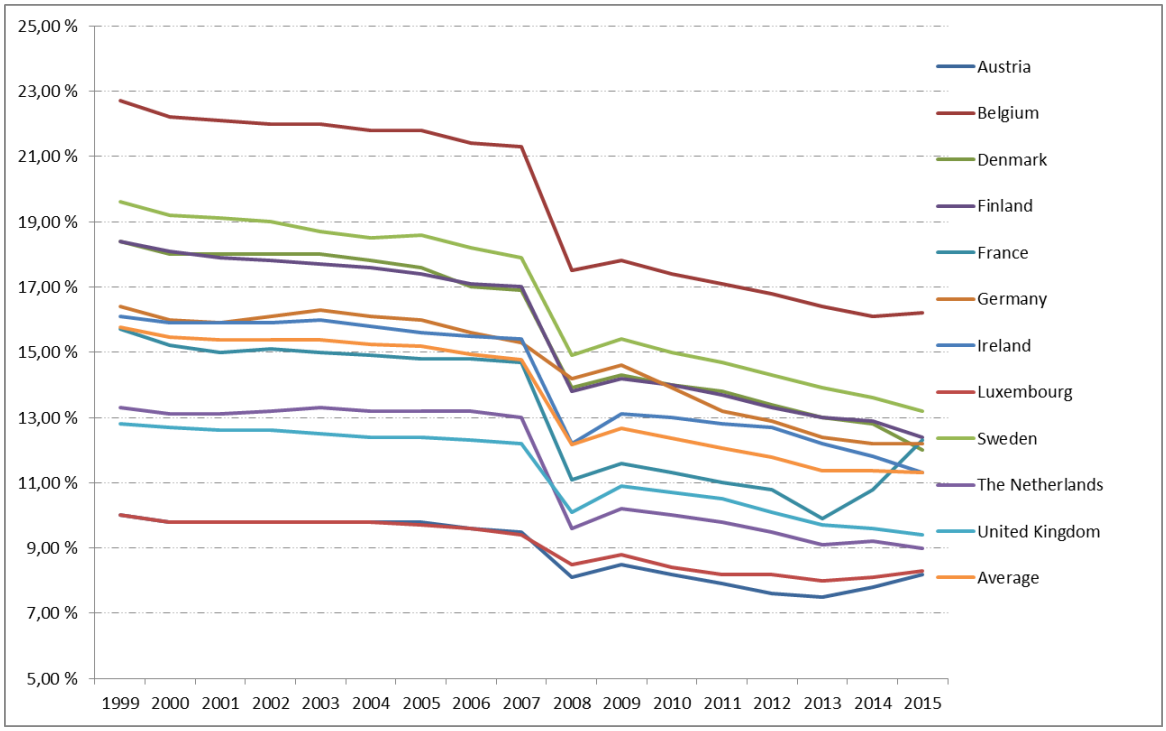

Figure 4. Shadow economy development in Western Europe between 1999-2015 (Schneider et al., 2010, p. 447; Schneider, 2015, p. 6).

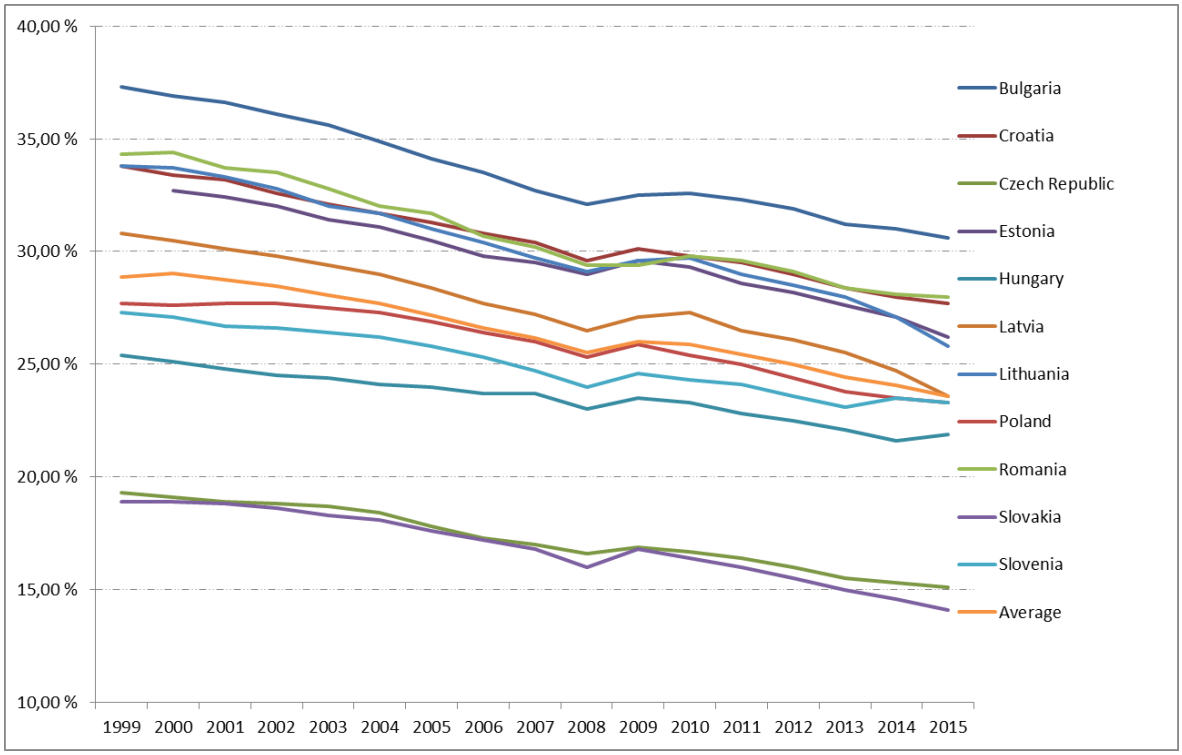

Figure 5. Shadow economy development in Eastern Europe between 1999-2007 (Schneider et al., 2010, p. 447; Schneider, 2015, p. 6).

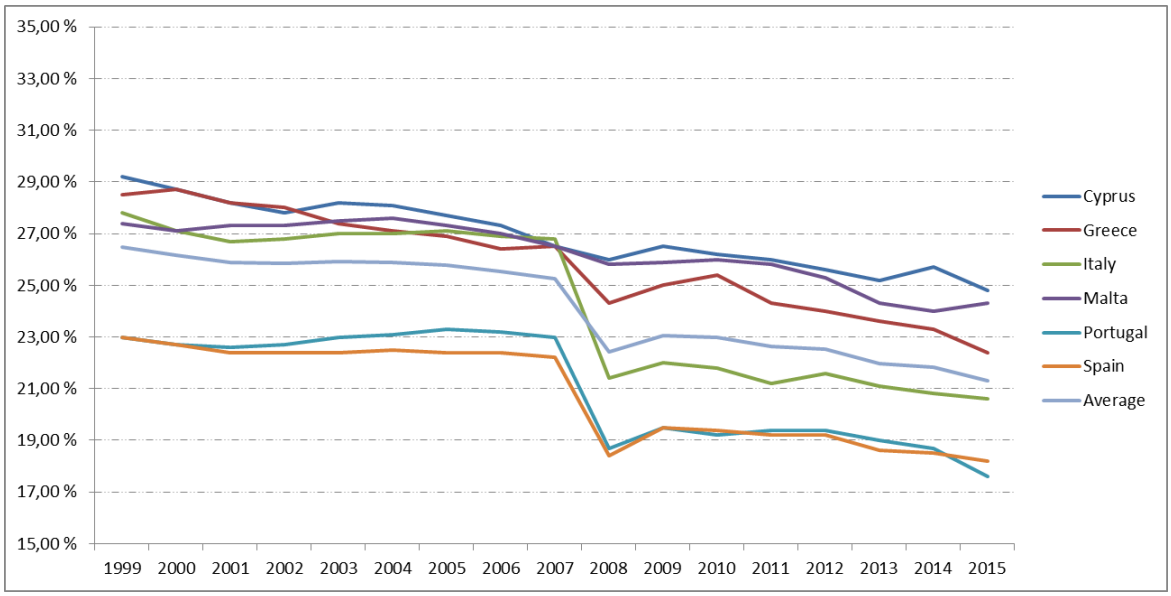

Figure 6. Shadow economy development in Southern Europe between 1999-2007 (Schneider et al., 2010, p. 447; Schneider, 2015, p. 6).

Figure 4 presents the development of shadow economy in Western European countries, Figure 5 in the Eastern European countries and Figure 6 in the Southern European countries. The development has been similar during this time in the whole area of the European Union. A trend can be seen from the figures, every country has been able to lower the amount of shadow economy until 2008. The 2009 recession can be seen from these figures, when every country's shadow economy rose almost back to the level it was in 2007.

5 SHADOW ECONOMY IN NATIONAL ACCOUNTS

This chapter is a research on the countries' existing methodologies to gather information on shadow economy, calculate and form it as a figure and then how to include it in their national accounts. As main references for this chapter is Michalec's research from 2014 on shadow economy in the European Union. This research is an unpublished paper, and its results are presented here for the first time. Michalec's research about shadow economy in the European Union countries is done in 2014 by checking statistical data that is available in National Statictics Offices and relevant websites. She found results concerning a few countries.

As other references is a United Nations' published study on reporting non-observed economy in UNECE-countries and few outside countries. The study is based on OECD's and Eurostat's definition on the non-observed economy. This definition includes five areas of non-observed economy. The study reveals what countries statistical offices have made to achieve exhaustiveness in GDP figures. There have been previous studies on the subject made by UNECE, and this one published in 2008 is follow-up for them. The count of responses from the countries studied has increased every time. 45 countries answered to this last survey and from those 43 gave information on their methods to estimate non-observed economy. (Non-Observed economy in National Accounts, 2008)

The study is published in 2008 and the survey was made in the years 2005-2006 (Non-Observed economy in National Accounts, 2008, p. 1). The study shows different ways of the countries to observe and estimate shadow economy. Many of them do not estimate illegal activities at all, or do estimate them but still don't include them into national accounts. Few examples of these are Bulgaria, Finland, Ireland and Latvia. At the time the study was made, countries decided themselves how or if to take shadow economy into calculations. Many of them did apply the OECD's and Eurostat's frameworks, or chose the most suitable parts of those frameworks to apply. (Non-Observed economy in National Accounts, 2008)

In addition to these, information is searched from countries' own websites, statistical offices websites and annual reports. Main references are still other researches, only a few countries have public information on their methods to measure shadow economy. This study doesn't list all the results of the United Nations publication, but as publishing the results of Michalec's research, the same countries are looked more specifically from other sources too. As an addition to Michalec's study, a few other countries are included and studied more thoroughly. These countries are chosen randomly, as an example of what kind of practices there are being used. A few of the European Union's biggest countries are chosen to research further, such as Germany and the United Kingdom. The results of the OECD study affected also, if the research found results, some other references are tried to find. Still, not every country that is mentioned in the OECD research is taken into closer consideration. This is mostly because majority of those countries do not publish information of their estimations of shadow economy.

5.1 Michalec's results

The French Central Statistical Office (CSO) publishes its information on their methods and data of shadow economy, though only in French. In the Netherlands studies are more available, and Statictics of the Netherlands have published their estimates they have made of shadow economy. There are also many researchers that have made their own studies. (Michalec, M., 2014, p.1)

According to Michalec (2014) the Belgian National Accounts include an estimate of black economy. Belgium reports their national accounts according to the European system of national accounts. The Netherlands have made estimates on shadow economy's amount and impact on GDP. There is a report made in 1998 by Netherlands Official Statistics that evaluated the illegal activities in GDP. The Statistics Netherlands made also a paper that explains some of the estimates they have made concerning the revision of European System of Accounts 2010. (Michalec, 2014, p. 1)This paper is gone through more thoroughly in chapter 5.2.

According to Michalec's study, Finland does not publish their information on shadow economy's estimation or inclusion in National Accounts. The country does include their own calculations and estimations of shadow economy in their Gross value added. Finland has not confirmed the Organisation for Economic Co-operation and Development's estimations to be correct. (Michalec, 2014, p. 2)

Michalec found that Greece doesn't have any handbook or specific methodology on estimating shadow economy. The Greek statistics office estimates shadow economy by number of employees per industry and from there adjusts their variables. They use many sources to find out the number of employees. (Michalec, 2014)

According to Michalec's research, Greek ELSTAT, which is the source of statistical data, includes illegal activities such as production and trade of drugs, prostitution and smuggling of alcohol and tobacco in their national accounts. However, they do not have a handbook or public reports of how they include shadow economy. (Michalec, 2014, p. 2)

In Poland, the CSO calculates the National Accounts. The CSO has estimated that the shadow economy's part of the country's GDP is somewhere around 13%. The Polish Institute for Market Economics (IBnGR) has stated a differing opinion that the amount should be higher. This is because the CSO has not included illegal activities into their estimation at all before the year 2014, although starting from there they are planning to include those estimations as well. The Institute has estimated the 2014 amount of shadow economy is 19,5% of GDP. They have adjusted the CSO estimates with their own estimates of the areas that the CSO's estimations don't include. The CSO estimates shadow economy on two forms, undervaluation of registered business entities and undeclared economic activity. The Institute for Market Economics makes their estimates on three activities, they include the CSO's estimation, hidden part of business and informal economy, as well as illegal activities. (Michalec, 2014, p. 2-3)

5.2 Other resources

Table 8 is to remind the indicators of Eurostat Tabular Approach and Table 9 shows what components the countries mentioned do apply.

Table 8. Eurostat Tabular Approach (OECD framework, 2002).

Eurostat Tabular Approach	
Producer deliberately not registering - underground	N1
Producer deliberately not registering - illegal	N2
Producer not required to register	N3
Legal persons not surveyed	N4
Registered entrepreneurs not surveyed	N5
Producers deliberately misreporting	N6
Other statistical deficiencies	N7

Based on the OECD research and the EU countries official statistic offices, many countries in the European Union calculate their GDP rather by combining multiple ways than only choose one method. By doing this, they ensure exhaustive calculations. As mentioned in chapter 3, the Istat analytical framework and Eurostat tabular approach are the most used methods to recognize shadow economy. In the OECD research was also mentioned if a country uses these approaches, and which ones of the categories they estimate to include into their national accounts. (Non-Observed economy in National Accounts, 2008)

Bulgaria has ended up to a solution in where they combine all three approaches; production, expenditure and income approach to measure their GDP. In this number the country includes some parts of shadow economy but not all. (Non-Observed economy in National Accounts, 2008) In Bulgaria the National Accounts

are assembled in the way the System of National Accounts 2008 and European System of Accounts 2010 demand. When using production approach, Bulgaria calculates GDP by adding gross value added with adjustments. These adjustments include taxes on products. GDP by the expenditure method include consumption expenditure, gross fixed capital, changes in inventories and net exports. Alongside these methods Bulgaria also calculates GDP by income approach. The income approach is used to supplement the information production approach gives. (Troianski et al., 2015, p, 142-146) There is no mention of shadow economy in Bulgaria's statistics, but according to OECD's report, Bulgaria does include some components in their national accounts and estimates them according to Eurostat tabular approach (Table 9).

Croatia estimates shadow economy with Eurostat tabular approach also. According to Croatian Statistical office they implement the European System of Accounts 2010 when calculating their National Accounts (National Accounts). As Bulgaria's statistic office, Croatia's Statistical office's press releases, data information or other information on their National Accounts, don't include a separate mention about shadow economy (Croatian Bureau of Statistics). Based on OECD's research, Croatia includes many components of the Eurostat tabular approach into their calculations (Table 9).

Many of the countries did not answer to the surveys and questionnaires the OECD sent in regarding to their estimations of shadow economy. Table 9 lists the countries that have answered in the OECD research and estimate shadow economy by Eurostat Tabular Approach. These countries also include these estimations into their national accounts. Many countries do not want to publish their estimations, or even their methods of estimations. As seen in the table, all of these countries estimate or find out some other way the categories N1, N6 and N7. The variation comes from the categories N2, N3, N4 and N5. In this sample, from seven countries four include N2 already, but four do not include N4. From these countries only Latvia and Estonia don't include N3. This table doesn't reflect the whole European Union because of the sample size, but even in this table it is seen that the countries habits differ between each other.

Table 9. Countries using Eurostat Tabular Approach (Non-Observed economy in National Accounts, 2008).

	N1	N2	N3	N4	N5	N6	N7
Bulgaria	X		X			X	X
Croatia	X	X	X	X		X	X
Czech Republic	X	X	X	X	X	X	X
Estonia	X	X				X	X
Hungary	X	X	X			X	X
Latvia	X			X		X	X
Poland	X		X		X	X	X

All of the countries in the table calculate their GDP by more than one method, like almost all European countries. The information to this table is gathered from the report about Non-observed economy. From the survey, these countries answered that they estimate shadow economy by using the Eurostat Tabular Approach, and include these estimations in their calculations of national accounts. They do not include all of the categories in all of the calculations, the categories of non-observed economy are included in one or more in of their calculations. A country may calculate GDP by expenditure method and include N1 and N3 into that. Then they calculate GDP by production method and include the rest of the categories into that calculation.

As an example for the countries not using Eurostat tabular approach, the Netherlands have followed several steps while estimating their NOE. For starters, they listed the activities that were non-observed and after that they made a best estimate for the production and consumption of this activity. They made the estimate based on various resources, for example research reports and newspaper articles. After this they translated the estimates of production and value added into labor inputs, such as the average number of worked hours per a worker. The most important underground activities in the Netherlands are house renovations, car repair and maintenance, hairdressing, food and beverage service, landscaping and temporary employment through employment agencies. The illegal activities included in the National accounts are the production and sale of drugs,

prostitution, smuggling of cigarettes, fencing, illegal copying of software, movies or films, illegal gambling and illegal employment by employment agencies. In the case of Netherlands the illegal activities make estimations more difficult, because for example prostitution is partly legal, as is the possession and use of cannabis. These estimations were adjusted by the parts it is assumed they are already within the National accounts. (Statistics Netherlands, 2014, p. 2-14)

The inclusion also has so called white spots that are not illegal or underground, but for some reason are not declared income either. The spots are own account construction, tips, renting private house, cleaning and babysitting. The revision of the Dutch National accounts has exposed some underreporting in the past. Due to the recalculating the man-years of self-employment has increased by 95 thousand, and the amount of jobs has increased by almost 300 thousand man-years. (Statistics Netherlands, 2014, p. 2-14)

The Netherlands have published a paper in 2014 about the revision of national accounts according to the European System of Accounts 2010. In this paper they admit that illegal activities should have been included into the national accounts already when pursued the European System of Accounts 1995, but most of the countries in European Union, including the Netherlands did not do so. This paper is done to show how the Netherlands have decided to take illegal and also non-observed activities into their calculations. Illegal activities are taken into account according to European System of Accounts 2010. The paper also distinguishes that other non-observed economy activities are taken into account, and they are done abiding the OECD's handbook. (Statistics Netherlands, 2014, p. 2-14)The study made by the United Nations confirms that this has been done already in 2008. Researches have been made a lot, and when shadow economy occurs in the Netherlands, it is included in the National Accounts. (Non-Observed economy in National Accounts, 2008)

The National Bank of Belgium has published a document in 2010, where it has estimated the black economy's impact on national accounts of Belgium in the year 2007. The document is drawn together from the official national accounts, and

added with the evaluations of higher figures by other studies. (National Bank of Belgium, 2010)

According to OECD's report Belgium takes shadow economy, or the underground economy into their calculations of GDP (National Bank of Belgium, 2010, p.1). They take hidden labor and tax evasion into their calculations, but all other forms, including illegal activities are excluded from their national accounts (Non-Observed economy in National Accounts, 2008). They state that the value added of the shadow economy is already 3.7 – 3.9% of the official GDP of Belgium. Some studies claim that the shadow economy in Belgium is in fact even five times bigger than what is reported officially. (National Bank of Belgium, 2010, p. 1)

Finland has created a tax system to detect and shrink the tax gap that comes from non-observed economy. In year 2013 there were 3,9 billion euros of unpaid taxes in Finland. This includes all unpaid taxes, whether ignored to pay or otherwise. In addition the Finnish government has developed many other programmes to cut down the shadow economy. It has for example a project of tax control in the construction sector. (Annual report 2013, p. 14-16)

Greece was one of the countries that did not answer to the survey made by United Nations (Non-Observed Economy in National Accounts, 2008).

Germany underlines that their National accounts are calculated identically in compliance with the regulations of European Union and United Nations. These regulations were presented in chapter 3. (Statistiches Bundesamt, National Accounts, 2015, p.10) According to the United Nations study Germany's Federal Statistical Office has additional measures to those that the frameworks provide. The FSO does not need the activities to be declared for taxes for them to be included. Germany makes specific calculations in economic areas where otherwise calculations that are all-inclusive would be made rarely. In more than one area the calculation method is also already planned to take shadow economy into consideration. (Non-Observed economy in National Accounts, 2008)

The United Kingdom did not answer to the United Nations survey on at which areas it estimates shadow economy. They did answer that illegal activities are not taken into calculations, but still they do try to make their figures as exhaustive as possible. (Non-Observed economy in National Accounts, 2008)

To summarize, the most popular ways to estimate shadow economy are based on surveys, labor and tax statistics and more than one approach to calculate GDP. Almost all of the countries that answered to the survey have expressed that these are the ways they estimate shadow economy in their countries. (Non-Observed economy in National Accounts, 2008)

Shadow economy is a difficult concept for countries. It is not a one concept that is totally its own and added after everything else in to any calculation. It hides in every transaction and every monetary item that happens. This means that even though there is no mention of shadow economy in any official documents, that doesn’t necessarily mean that it’s not taken into consideration.

6 SHADOW ECONOMY'S EFFECT ON DECISION MAKING

This chapter illustrates the calculations of how including shadow economy into official figures can change GDP and calculations made based on it. There are some simple examples that give direction on the matter. Results and some discussion on their meaning are gone through more detailed in the results section of this work.

6.1 Data collection

Eurostat publishes the official figures of the member countries of the European Union. The data for the comparison of before and after shadow economy is collected from the Eurostat official database. (Eurostat) The official GDP was found on its own sheet and it shows the figure for every country in the European Union. The GDP used in this example is GDP at market prices, millions of euros (Appendix 1). Deficit-to-GDP is from the sector of general government net lending or borrowing, as a percentage of GDP (Appendix 2). Debt-to-GDP is also found calculated as percentage of gross domestic product. This indicator is government debt at nominal value, in the end of the year (Appendix 3).

The year from which the figures are chosen is 2013 because of the information coverage. All the information needed was found on this year. The countries chosen for this case are France, Portugal, Malta and The Netherlands. The countries are not chosen for this example based on that they wouldn't include shadow economy at all in their national accounts. They are chosen based on their indicator values, to show all the possible outcomes on shadow economy effects. The inclusion of shadow economy is a harsh example, just added to the original value of GDP.

The sizes of shadow economy are taken from researches Friedrich Schneider has made, in 2013 a research in cooperation with AT Kearney and VISA and checked

with a research from 2015. The author has calculated the size as a percentage of the official GDP. Both calculations have been made using the MIMIC method. (Schneider et al. 2013, p. 4; Schneider, 2015, p. 6)

Schneider's results of the calculations on shadow economy in Europe are shown in Appendix 4. As mentioned, the reference year in this study is 2013, mainly because the other research of Schneider is made on year 2013.

6.2 Case study

Debt-to-GDP and Deficit-to-GDP are indicators that are used in the European Union to evaluate a country's economy and to make decisions concerning that country (Chapter 2). In these examples the effects are thus shown by these indicators in the four case countries. This calculation is made on the vision that these countries national accounts do not include any part of shadow economy, and here it is added as a whole set to add up the production and income.

As said, the figures on the official side are collected from the Eurostat Database. The inclusion of shadow economy is calculated as the official figure multiplied by the amount of shadow economy as percentage of the official GDP. In terms of this study the countries are of different sizes and economic conditions, to show all forms of possibilities. The range of the size of shadow economy is also wide, shadow economy in the Netherlands is 9% of the official economy and in Malta it is 24,3% of the official economy. Tables 9 and 10 show what consequences it would have if countries added shadow economy into calculations. These calculations are very simple, and only direction giving for the subject. The tables show if a country could avoid being in the company of countries in the corrective arm of the European Union (chapter 2.4). Countries 1 and 2 (Table 10) wouldn't avoid the excessive deficit procedure

Examples on France and Portugal represent the situation where the addition would not change that much in the eyes of Deficit-to-GDP and Debt-to-GDP. This

is because the amounts are so clearly over the setpoint value, that the countries are already in the corrective arm of European Union, the excessive deficit procedure (Chapter 2). After the addition of shadow economy the difference is only that the numbers look a bit cleaner because are a little closer to the setpoint values .

Table 10 Shadow economy's effect on countries 1 and 2.

France			
		Shadow economy	**10 %**
Official GDP	2 116 565	GDP with shadow economy	2 328 222
Debt-to-GDP	92.3%		83.91%
Deficit-to-GDP	4.1%		3.73%
Portugal			
		Shadow economy	**19 %**
Official GDP	170 269	GDP with shadow economy	202 621
Debt-to-GDP	129 %		108 %
Deficit-to-GDP	4.8%		4.03%

In case of Malta and the Netherlands, the consequences would be more striking (Table 11). In these countries' values the debt-to-GDP indicator is so close to the setpoint value 60%, that the addition of shadow economy grows the GDP of the country just so much that they would avoid the excessive deficit procedure.

Malta would be a borderline case, which is the best one to illustrate what can or could happen. The GDP of the country is small and the relative value of shadow economy of it is in the greater end of the fluctuation of the European Union. In the table below it is seen that in case of a country where the indicators value is already close to the value that is accepted, the addition of shadow economy can push the figures over the border to the accepted side.

Table 11 Shadow economy's effect on countries 3 and 4.

Malta			
		Shadow economy	**24,3 %**
Official GDP	7 534	GDP with shadow economy	9 364
Debt-to-GDP	69.6%		55.99%
Deficit-to-GDP	2.6%		2.09%
The Netherlands			
		Shadow economy	**9 %**
Official GDP	650 857	GDP with shadow economy	709 434
Debt-to-GDP	67.9%		62.29%
Deficit-to-GDP	2.4%		2.2%

In case of the Netherlands this calculation is only hypothetical, as shown in chapter 5 their National accounts already do include shadow economy in to that extent they have been able to estimate the size.

This illustration shows what effects the addition would have in terms of Debt-to-GDP and Deficit-to-GDP. It needs to be remembered that the examples are made assuming that the official figures do not include any parts of shadow economy.

In reality, shadow economy is included different ways in different countries, so the deviation is not that radical than in the examples. The example gives a peak on what the inclusion can mean in extreme cases.

7 RESULTS

The methods that national statistics use to collect the data for official figures vary a lot between countries, even inside the European Union where directives and regulations have been made to unite the methods. Many of the countries deliberately leave illegal actions out of their equations and many countries do not want to publish their methods and numbers. The European Standard of National Accounts is made exactly for this purpose, and legislated to make the calculations unite. The block for this is that national authorities probably don't want to admit how big a part shadow economy is of their economy.

The revision to the European Union countries' GDP following the implementation of the European Standard of National Accounts 2010 has changed the figures a little. The biggest changes occur in the different accounting of research and development, but the addition of illegal activities caused difference also. Illegal activities caused an increase of the whole European Union GDP of 0,4%. This amount covers the countries that before this revision did not include all the three illegal activities (prostitution, production and selling drugs and smuggling of alcohol and tobacco) in their GDP. (Annual national accounts, 2015.)

As mentioned in chapter three, the European System of National Accounts and the OECD handbook give some methods by which to measure non-observed or shadow economy. Neither one of them give a set of rules or directions by which countries would have to estimate shadow economy. Even though the European System of Accounts is a legislated directive, European Union member countries can use their own judgment on what to include in to their calculations.

The tables in chapter 6 show the result of including shadow economy into national accounts, in a fairly simple way though. In case of other indicators mentioned in chapter two, the growth of GDP would affect differently in them, depending on the indicator. Some figures, for example public expenses in addition to debt, would at least seem cleaner or nicer, when the numbers would be smaller in relation to

GDP. These indicators are though only for countries and governments themselves to use, because the level of public expenses and wages etc. are so different in different countries, that figures that include these are not comparable.

When exploring these changes in the figures, must be remembered that the growth of GDP is not the main thing, it will not keep growing if the calculating manners change. When a country decides to include shadow economy into its national accounts, the first including year the amount will be bigger, but after that it will even out.

When concerning other indicators, for example investments relation to GDP, the main task of this indicator is to tell the government on what kind of level this value is. Policy makers can mainly follow this indicator. They can also decide to increase some supporting actions for companies, so that in the future they would make more investments.

The International Monetary Fund for example gives loans based on countries' economic performance. They don't mention any indicators per se that would be the basis of their decision making; they make their lending decisions based on the entire economic situation.

In chapter six are the illustrations of GDP before and after shadow economy is included into them. In these illustrations shadow economy is added as a whole set. In real life the changes and results would not then be as clear as here presented. As a result of the calculations was found out that adding shadow economy can make huge differences into a country's official figures. It also can have a smaller effect. The difference can affect in many things, and in many decisions. In most of the situations the base for those decisions is not only one figure, but the big picture. In this research the results are shown only on GDP of a country, when in the real situation the addition would effect on many other figures too and the decisions are not made based on only one figure of economy. The inclusion of shadow economy grows a country's GDP, the more when a country has not before included any part of it.

8 SUMMARY, CONCLUSIONS AND FUTURE RESEARCH

The aim of this study was to resolve if adding shadow economy as a unit in to the main economic measuring indicators would make a difference in those figures, and therefore have an effect on a country's decision making. There have been many studies on shadow economy in the past. The majority of these studies concentrate on the size of shadow economy, trying to find the most exhaustive way to measure it. The examination of the impacts of shadow economy if it is considered is not that much studied.

Shadow economy is not a simple unit just to add into calculations. It is buried in economic transactions and for the sake of its nature it is not that easily detected. Many professionals and organizations have made studies on what is the best way to implement shadow economy in economic figures.

In this work the implementation of shadow economy in the European Union countries is studied based on their official information. The problem of finding out how shadow economy is estimated and taken into consideration, is the nature of it. Many countries do not want to make their methods public and because shadow economy lies inside of the numbers, it is possible to leave the information out. The research shows that countries have very different approaches on the matter. Some follow the instructions very clearly whereas some have made their own adjustments to those instructions. There are also countries that do not tell how they include shadow economy but still inform that they do. Even inside the European Union the methods are very colorful.

The example calculations are made on four different countries' official numbers. Those calculations show the difference between the figures now and what they could be if they included shadow economy. These examples are made on the assumption that shadow economy is not estimated in any part of GDP calculations. The examples showed the effect on GDP, Debt-to-GDP and Deficit-to-GDP.

Based on these calculations the inclusion of shadow economy in to official figures would make the biggest difference in countries with some economic difficulties. In countries where the economy is in a good condition, the effect is not that clear and

in countries with poor economy the inclusion would not make such a big difference. The examples show that the inclusion could make the base for decisions a lot different. If shadow economy would be included, the overall GDP of countries and the European Union also would be bigger.

GDP is the most used economic indicator in the world. It measures the size of an economy and is used in comparison of different economies. If countries apply different methods in calculating the figure, or include different concepts these figures aren't really that comparable with each other. As this work shows, methods for the inclusion of shadow economy and making exhaustive and comparable calculations do exist, these methods just should be incorporated in a coherent way in every country's calculations. The problem is that no country is obligated to use the methods, or publish their manners of including shadow economy. As long as this is possible no one can know if the economic figures are really comparable.

After making this research, I think that every country should acknowledge the fact that shadow economy is everywhere. The illegal economy, stealing and selling and buying guns for example is not necessary to include. Many countries just try to reduce shadow economy and don't want to admit that it influences their decisions. A directive from the European Union that requires using a detailed form on measuring and implementing shadow economy would guarantee that every country gives information that really is comparable. Information and methods should be more transparent than they are today.

As future research ideas there would be expanding this research outside of European Union, the results would probably differ a lot more. The European System of Accounts was legislated in September 2015, it would be interesting to see how this is really implemented and what kind of results it has had. A one kind of continuity for this research would be to move it into corporate world. It would be interesting to find out what figures and indicators companies can alter or influence in, while calculating them according to rules.

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GDP and main components (output, expenditure and income) [nama_10_gdp]										
Last update	26.10.15									
Extracted on	30.10.15									
Source of data	Eurostat									
UNIT	Current prices, million euro									
NA_ITEM	Gross domestic product at market prices									
GEO/TIME	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
European Union (28 countries)	11 510 087,9	12 177 005,1	12 909 441,5	12 993 621,0	12 249 585,5	12 794 296,1	13 177 263,3	13 428 968,2	13 541 722,8	13 944 015,3
European Union (15 countries)	10 790 913,5	11 370 131,2	11 973 044,1	11 932 703,1	11 307 172,8	11 781 936,3	12 116 899,9	12 356 797,6	12 447 163,3	12 819 982,0
Euro area (EA11-2000, EA12-2006, EA13-2007, EA15-2008, EA16-2010, EA17-2013, EA18-2014, EA19)	8 324 660,0	8 750 598,7	9 254 257,9	9 494 935,4	9 228 234,7	9 483 846,6	9 751 778,1	9 793 603,4	9 894 554,6	10 090 580,2
Euro area (19 countries)	8 459 274,8	8 903 916,5	9 401 390,8	9 634 224,9	9 288 123,7	9 544 572,1	9 803 222,4	9 849 134,4	9 952 775,2	10 126 889,1
Euro area (18 countries)	8 438 272,5	8 879 837,3	9 372 350,1	9 601 528,6	9 261 188,9	9 516 570,8	9 771 975,1	9 815 820,4	9 917 819,6	10 090 580,2
Euro area (12 countries)	8 324 660,0	8 750 598,7	9 219 105,3	9 432 086,7	9 103 707,8	9 354 727,8	9 601 938,7	9 641 179,5	9 740 688,0	9 909 058,7
Belgium	311 480,8	326 662,1	344 712,5	354 065,9	348 781,1	365 100,5	379 106,3	387 418,8	392 699,0	400 642,9
Bulgaria	24 001,6	27 349,9	32 708,0	37 373,3	37 245,0	37 723,8	40 955,1	41 693,3	41 911,8	42 750,9
Czech Republic	109 394,0	123 743,2	138 004,0	160 961,5	148 357,4	156 369,7	163 583,2	160 706,6	156 932,6	154 738,7
Denmark	212 906,5	225 592,0	233 439,5	241 087,3	230 213,3	241 516,9	246 074,7	250 786,4	252 938,9	257 753,1
Germany (until 1990 former territory of the FRG)	2 300 860,0	2 393 250,0	2 513 230,0	2 561 740,0	2 460 280,0	2 580 060,0	2 703 120,0	2 754 860,0	2 820 820,0	2 915 650,0
Estonia	11 262,3	13 521,7	16 246,4	16 517,3	14 145,9	14 718,5	16 667,6	18 006,0	19 014,9	19 962,7
Ireland	169 977,7	184 923,3	197 053,7	187 547,2	169 431,7	166 157,5	173 940,0	174 844,2	179 447,7	189 045,9
Greece	199 242,3	217 861,6	232 694,6	241 990,4	237 534,2	226 031,4	207 028,9	191 203,9	180 389,0	177 559,4
Spain	930 566,0	1 007 974,0	1 080 807,0	1 116 207,0	1 079 034,0	1 080 913,0	1 070 413,0	1 042 872,0	1 031 272,0	1 041 160,0
France	1 771 978,0	1 853 267,0	1 945 670,0	1 995 850,0	1 939 017,0	1 998 481,0	2 059 284,0	2 086 929,0	2 116 565,0	2 132 449,0
Croatia	36 508,4	40 197,8	43 925,8	48 129,8	45 090,7	45 004,3	44 708,6	43 933,7	43 561,5	43 084,8
Italy	1 490 409,4	1 549 188,0	1 610 304,9	1 632 933,4	1 573 655,1	1 605 694,4	1 638 857,3	1 614 672,5	1 606 894,7	1 613 859,1
Cyprus	14 946,2	16 140,7	17 453,8	18 822,0	18 482,3	19 117,7	19 547,1	19 468,9	18 064,6	17 393,7
Latvia	13 710,6	17 235,0	22 639,5	24 317,9	18 731,2	17 772,4	20 144,2	21 982,7	22 805,2	23 580,9
Lithuania	21 002,4	24 079,2	29 040,7	32 696,3	26 934,8	28 027,7	31 263,1	33 334,7	34 962,2	36 444,4
Luxembourg	29 733,5	33 409,3	36 766,1	37 647,4	36 268,2	39 525,5	42 226,9	43 574,1	46 541,1	48 897,5
Hungary	90 543,0	91 345,0	101 605,9	107 503,1	93 670,7	98 198,4	100 704,5	98 972,8	101 273,3	104 239,1
Malta	5 142,1	5 386,1	5 757,5	6 128,7	6 138,6	6 599,5	6 892,8	7 205,0	7 533,6	7 941,3
Netherlands	545 609,0	579 212,0	613 280,0	639 163,0	617 540,0	631 512,0	642 929,0	645 164,0	650 857,0	662 770,0
Austria	253 009,3	266 478,0	282 346,9	291 930,4	286 188,4	294 627,5	308 630,3	317 055,8	322 878,3	329 295,6
Poland	244 822,0	273 418,0	313 654,1	363 691,8	314 689,4	361 744,3	380 176,9	389 273,3	394 601,8	410 844,6
Portugal	158 652,6	166 248,7	175 467,7	178 872,6	175 448,2	179 929,8	176 166,6	168 398,0	170 269,3	173 446,2
Romania	80 225,6	98 418,6	125 403,4	142 396,3	120 409,2	126 746,4	133 305,9	133 511,4	144 253,5	150 018,5
Slovenia	29 235,4	31 561,2	35 152,6	37 951,2	36 166,2	36 252,4	36 896,3	35 988,3	35 907,5	37 303,2
Slovakia	39 219,9	45 396,2	56 090,6	65 839,8	63 818,5	67 387,1	70 443,5	72 420,0	73 835,1	75 560,5
Finland	164 387,0	172 614,0	186 584,0	193 711,0	181 029,0	187 100,0	196 869,0	199 793,0	202 743,0	205 178,0
Sweden	313 218,0	334 876,5	356 434,3	352 317,1	309 678,7	369 076,6	404 945,5	423 340,7	435 752,1	430 634,6
United Kingdom	1 945 624,5	2 063 309,5	2 168 911,7	1 908 370,2	1 667 594,9	1 813 331,2	1 866 018,3	2 053 612,8	2 042 895,0	2 253 310,9
Iceland	13 484,6	13 627,6	15 565,2	10 719,5	9 204,9	9 995,1	10 534,7	11 046,4	11 569,8	12 845,5
Norway	248 332,2	275 289,8	293 128,0	316 813,6	278 386,1	323 587,2	358 248,4	396 678,0	393 098,4	377 008,6
Switzerland	327 755,2	342 123,1	348 864,9	376 326,4	388 781,9	439 140,5	501 642,7	517 666,2	515 680,3	528 779,8
Former Yugoslav Republic of Macedonia, the	5 032,0	5 472,2	6 095,7	6 744,0	6 765,9	7 108,3	7 550,2	7 585,8	8 160,6	8 534,6
Albania	:	:	:	:	:	:	:	:	:	:
Serbia	21 103,3	24 434,6	29 451,6	33 704,5	30 654,7	29 766,3	33 423,8	31 683,1	34 262,9	33 059,0
Special value:										
:	not available									

Extracted on	30.10.15									
Source of data	Eurostat									
UNIT	Percentage of gross domestic product (GDP)									
SECTOR	General government									
NA_ITEM	Net lending (+) /net borrowing (-)									
GEO/TIME	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
European Union (28 countries)	:	-1,6	-0,9	-2,5	-6,7	-6,4	-4,5	-4,3	-3,3	-3,0
European Union (27 countries)	:	-1,6	-0,9	-2,5	-6,7	-6,4	-4,5	-4,3	-3,3	-3,0
European Union (25 countries)	:	-1,6	-0,9	-2,4	-6,7	-6,4	-4,5	-4,3	-3,3	-3,0
Euro area (19 countries)	:	-1,5	-0,6	-2,2	-6,3	-6,2	-4,2	-3,7	-3,0	-2,6
Euro area (18 countries)	:	-1,5	-0,6	-2,2	-6,3	-6,2	-4,1	-3,7	-3,0	-2,6
Euro area (17 countries)	:	-1,5	-0,6	-2,1	-6,2	-6,2	-4,1	-3,7	-3,0	-2,6
Belgium	-2,6	0,3	0,1	-1,1	-5,4	-4,0	-4,1	-4,1	-2,9	-3,1
Bulgaria	1,0	1,8	1,1	1,6	-4,1	-3,2	-2,0	-0,6	-0,8	-5,8
Czech Republic	-3,1	-2,3	-0,7	-2,1	-5,5	-4,4	-2,7	-4,0	-1,3	-1,9
Denmark	5,0	5,0	5,0	3,2	-2,8	-2,7	-2,1	-3,6	-1,3	1,5
Germany (until 1990 former territory of the FRG)	-3,4	-1,7	0,2	-0,2	-3,2	-4,2	-1,0	-0,1	-0,1	0,3
Estonia	1,1	2,9	2,7	-2,7	-2,2	0,2	1,2	-0,3	-0,1	0,7
Ireland	1,3	2,8	0,3	-7,0	-13,8	-32,3	-12,5	-8,0	-5,7	-3,9
Greece	:	-5,9	-6,7	-10,2	-15,2	-11,2	-10,2	-8,8	-12,4	-3,6
Spain	1,2	2,2	2,0	-4,4	-11,0	-9,4	-9,5	-10,4	-6,9	-5,9
France	-3,2	-2,3	-2,5	-3,2	-7,2	-6,8	-5,1	-4,8	-4,1	-3,9
Croatia	-3,7	-3,2	-2,4	-2,7	-5,8	-5,9	-7,8	-5,3	-5,4	-5,6
Italy	-4,2	-3,6	-1,5	-2,7	-5,3	-4,2	-3,5	-3,0	-2,9	-3,0
Cyprus	-2,2	-1,0	3,2	0,9	-5,5	-4,8	-5,7	-5,8	-4,9	-8,9
Latvia	-0,4	-0,6	-0,7	-4,1	-9,1	-8,5	-3,4	-0,8	-0,9	-1,5
Lithuania	-0,3	-0,3	-0,8	-3,1	-9,1	-6,9	-8,9	-3,1	-2,6	-0,7
Luxembourg	0,2	1,4	4,2	3,3	-0,5	-0,5	0,5	0,2	0,7	1,4
Hungary	-7,8	-9,3	-5,1	-3,6	-4,6	-4,5	-5,5	-2,3	-2,5	-2,5
Malta	-2,7	-2,6	-2,3	-4,2	-3,3	-3,2	-2,6	-3,6	-2,6	-2,1
Netherlands	-0,3	0,2	0,2	0,2	-5,4	-5,0	-4,3	-3,9	-2,4	-2,4
Austria	-2,5	-2,5	-1,3	-1,4	-5,3	-4,4	-2,6	-2,2	-1,3	-2,7
Poland	-4,0	-3,6	-1,9	-3,6	-7,3	-7,5	-4,9	-3,7	-4,0	-3,3
Portugal	-6,2	-4,3	-3,0	-3,8	-9,8	-11,2	-7,4	-5,7	-4,8	-7,2
Romania	-1,2	-2,2	-2,9	-5,6	-9,1	-6,9	-5,4	-3,2	-2,2	-1,4
Slovenia	-1,3	-1,2	-0,1	-1,4	-5,9	-5,6	-6,6	-4,1	-15,0	-5,0
Slovakia	-2,9	-3,6	-1,9	-2,3	-7,9	-7,5	-4,1	-4,2	-2,6	-2,8
Finland	2,6	3,9	5,1	4,2	-2,5	-2,6	-1,0	-2,1	-2,5	-3,3
Sweden	1,8	2,2	3,3	2,0	-0,7	0,0	-0,1	-0,9	-1,4	-1,7
United Kingdom	-3,5	-2,9	-3,0	-5,1	-10,8	-9,7	-7,7	-8,3	-5,7	-5,7
Norway	:	:	:	:	:	:	13,4	13,8	10,8	9,1
Special value:										
:	not available									

General government gross debt																				
% of GDP and million EUR																				
Percentage of gross domestic product (GDP)																				
geo\time	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
EU (28 countries)	:	:	:	:	:	:	:	:	:	:	:	60,4	57,8	61	73	78,4	81	83,8	85,5	86,8
EU (27 countries)	:	:	:	:	:	:	:	:	:	:	:	60,5	57,9	61	73,1	78,5	81,1	83,8	85,5	86,8
Euro area (19 countries)	:	:	:	:	:	:	:	:	:	:	:	67,3	64,9	68,5	78,3	83,8	86	89,3	91,1	92,1
Euro area (18 countries)	:	:	:	:	:	:	:	:	:	:	:	67,4	65,1	68,7	78,5	84	86,1	89,5	91,3	92,3
Euro area (17 countries)	:	:	:	:	:	:	:	:	:	:	:	67,5	65,2	68,8	78,6	84	86,2	89,6	91,4	92,4
Belgium	130,5	128	123,2	118,2	114,4	108,8	107,6	104,7	101,1	96,5	94,6	90,9	86,9	92,4	99,5	99,6	102,2	104,1	105,1	106,7
Bulgaria	:	:	97,3	69,3	76,1	71,2	64,7	51,1	43,5	35,8	26,6	20,9	16,2	13	13,7	15,5	15,3	17,6	18	27
Czech Republic	13,6	11,6	12,1	13,9	15,2	17	22,8	25,9	28,1	28,5	28	27,9	27,8	28,7	34,1	38,2	39,9	44,7	45,2	42,7
Denmark	:	:	:	:	:	52,4	48,5	49,1	46,2	44,2	37,4	31,5	27,3	33,4	40,4	42,9	46,4	45,6	45	45,1
Germany	54,8	57,6	58,8	59,4	60	58,9	57,7	59,3	63	64,7	66,9	66,4	63,6	65	72,5	81	78,4	79,7	77,4	74,9
Estonia	8,2	7,5	7	6	6,5	5,1	4,8	5,7	5,6	5,1	4,5	4,4	3,7	4,5	7	6,6	5,9	9,5	9,9	10,4
Ireland	78,5	69,9	61,6	51,5	46,7	36,1	33,2	30,6	29,9	28,2	26,1	23,6	23,9	42,4	61,8	86,8	109,3	120,2	120	107,5
Greece	:	:	:	:	:	:	:	:	:	:	:	103,5	103,1	109,4	126,7	146,2	172	159,4	177	178,6
Spain	61,7	65,6	64,4	62,5	60,9	58	54,2	51,3	47,6	45,3	42,3	38,9	35,5	39,4	52,7	60,1	69,5	85,4	93,7	99,3
France	55,8	59,7	61,1	61	60,2	58,7	58,2	60,1	64,2	65,7	67,2	64,4	64,4	68,1	79	81,7	85,2	89,6	92,3	95,6
Croatia	:	:	:	:	:	:	:	36,3	37,5	39,8	40,7	38,3	37,1	38,9	48	57	63,7	69,2	80,8	85,1
Italy	116,9	116,3	113,7	110,8	109,6	105,1	104,7	101,9	100,4	100	101,9	102,5	99,7	102,3	112,5	115,3	116,4	123,2	128,8	132,3
Cyprus	47,9	49,2	53,2	54,8	55,1	55,1	56,9	60,1	63,5	64,5	63,2	59,1	53,9	45,1	53,9	56,3	65,8	79,3	102,5	108,2
Latvia	13,9	13,3	10,7	9	12,1	12,1	13,9	13,2	13,9	14,3	11,8	9,9	8,4	18,7	36,6	47,5	42,8	41,4	39,1	40,6
Lithuania	11,5	13,9	15,4	16,5	22,7	23,5	22,9	22,1	20,4	18,7	17,6	17,2	15,9	14,6	29	36,2	37,2	39,8	38,8	40,7
Luxembourg	8,1	8	7,9	7,6	6,7	6,1	6,6	6,5	6,4	6,5	6,3	7	7,2	14,4	15,5	19,6	19,2	22,1	23,4	23
Hungary	84,5	71,6	62,1	60	59,9	55,1	51,7	55	57,6	58,5	60,5	64,7	65,6	71,6	78	80,6	80,8	78,3	76,8	76,2
Malta	34,4	38,7	46,6	51,2	62,1	60,9	65,5	63,2	69,1	72	70,1	64,6	62,4	62,7	67,8	67,6	69,8	67,6	69,6	68,3
Netherlands	73,1	71,2	65,6	62,5	58,2	51,4	48,7	48,2	49,3	49,6	48,9	44,5	42,4	54,5	56,5	59	61,7	66,4	67,9	68,2
Austria	68	68	63,2	63,6	66,4	65,9	66,5	66,3	65,5	64,8	68,3	67	64,8	68,5	79,7	82,4	82,2	81,6	80,8	84,2
Poland	47,6	42,4	42,3	38,4	39	36,5	37,3	41,8	46,6	45,3	46,7	47,1	44,2	46,6	49,8	53,3	54,4	54	55,9	50,4
Portugal	58,3	59,5	55,2	51,8	51	50,3	53,4	56,2	58,7	62	67,4	69,2	68,4	71,7	83,6	96,2	111,4	126,2	129	130,2
Romania	6,6	10,6	14,9	16,7	21,6	22,4	25,7	24,8	21,3	18,6	15,7	12,3	12,7	13,2	23,2	29,9	34,2	37,4	38	39,9
Slovenia	18,3	21,6	22,1	22,8	23,7	25,9	26,1	27,3	26,7	26,8	26,3	26	22,7	21,6	34,5	38,2	46,4	53,7	70,8	80,8
Slovakia	21,7	30,5	33	33,9	47,1	49,6	48,3	42,9	41,6	40,6	33,9	30,8	29,9	28,2	36	40,8	43,3	51,9	54,6	53,5
Finland	55,1	55,3	52,2	46,9	44,1	42,5	41	40,2	42,8	42,7	40	38,2	34	32,7	41,7	47,1	48,5	52,9	55,6	59,3
Sweden	69,9	70,3	68,2	66,7	61,5	50,6	51,7	49,8	48,9	47,9	48,2	43,2	38,3	36,8	40,4	37,6	36,9	37,2	39,8	44,9
United Kingdom	48,2	47,8	46,6	44	41,7	38,9	36	35,8	37,3	40,2	41,5	42,4	43,5	51,7	65,7	76,6	81,8	85,3	86,2	88,2
Iceland	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Norway	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	27,5	29,2	29,3	26,6
Switzerland	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
:=not available																				
:																				
Source of Data:	Eurostat																			
Last update:	30.10.2015																			
Date of extraction:	06 Nov 2015 11:47:35 CET																			
Hyperlink to the table:	http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdde410																			
General Disclaimer of the EC website:	http://ec.europa.eu/geninfo/legal_notices_en.htm																			
Short Description:	The indicator is defined (in the Maastricht Treaty) as consolidated general government gross debt at nominal (face) value, outstanding at the end of the year in the following categories of government liabilities (as defined in ESA2010): c																			
Code:	tsdde410																			

Table 1: Size of the Shadow Economy of the 28 EU-Countries over 2003 – 2015 (in % of off. GDP)

Country / Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Austria	10.8	11.0	10.3	9.7	9.4	8.1	8.5	8.2	7.9	7.6	7.5	7.8	8.2
Belgium	21.4	20.7	20.1	19.2	18.3	17.5	17.8	17.4	17.1	16.8	16.4	16.1	16.2
Bulgaria	35.9	35.3	34.4	34.0	32.7	32.1	32.5	32.6	32.3	31.9	31.2	31.0	30.6
Croatia	32.3	32.3	31.5	31.2	30.4	29.6	30.1	29.8	29.5	29.0	28.4	28.0	27.7
Czech Republic	19.5	19.1	18.5	18.1	17.0	16.6	16.9	16.7	16.4	16.0	15.5	15.3	15.1
Denmark	17.4	17.1	16.5	15.4	14.8	13.9	14.3	14.0	13.8	13.4	13.0	12.8	12.0
Estonia	30.7	30.8	30.2	29.6	29.5	29.0	29.6	29.3	28.6	28.2	27.6	27.1	26.2
Finland	17.6	17.2	16.6	15.3	14.5	13.8	14.2	14.0	13.7	13.3	13.0	12.9	12.4
France	14.7	14.3	13.8	12.4	11.8	11.1	11.6	11.3	11.0	10.8	9.9	10.8	12.3
Germany	17.1	16.1	15.4	15.0	14.7	14.2	14.6	13.9	13.2	12.9	12.4	12.2	12.2
Greece	28.2	28.1	27.6	26.2	25.1	24.3	25.0	25.4	24.3	24.0	23.6	23.3	22.4
Hungary	25.0	24.7	24.5	24.4	23.7	23.0	23.5	23.3	22.8	22.5	22.1	21.6	21.9
Ireland	15.4	15.2	14.8	13.4	12.7	12.2	13.1	13.0	12.8	12.7	12.2	11.8	11.3
Italy	26.1	25.2	24.4	23.2	22.3	21.4	22.0	21.8	21.2	21.6	21.1	20.8	20.6
Latvia	30.4	30.0	29.5	29.0	27.5	26.5	27.1	27.3	26.5	26.1	25.5	24.7	23.6
Lithuania	32.0	31.7	31.1	30.6	29.7	29.1	29.6	29.7	29.0	28.5	28.0	27.1	25.8
Luxembourg (Grand-Duché)	9.8	9.8	9.9	10.0	9.4	8.5	8.8	8.4	8.2	8.2	8.0	8.1	8.3
Malta	26.7	26.7	26.9	27.2	26.4	25.8	25.9	26.0	25.8	25.3	24.3	24.0	24.3
Netherlands	12.7	12.5	12.0	10.9	10.1	9.6	10.2	10.0	9.8	9.5	9.1	9.2	9.0
Poland	27.7	27.4	27.1	26.8	26.0	25.3	25.9	25.4	25.0	24.4	23.8	23.5	23.3
Portugal	22.2	21.7	21.2	20.1	19.2	18.7	19.5	19.2	19.4	19.4	19.0	18.7	17.6
Romania	33.6	32.5	32.2	31.4	30.2	29.4	29.4	29.8	29.6	29.1	28.4	28.1	28.0
Slovenia	26.7	26.5	26.0	25.8	24.7	24.0	24.6	24.3	24.1	23.6	23.1	23.5	23.3
South-Cyprus	28.7	28.3	28.1	27.9	26.5	26.0	26.5	26.2	26.0	25.6	25.2	25.7	24.8
Spain	22.2	21.9	21.3	20.2	19.3	18.4	19.5	19.4	19.2	19.2	18.6	18.5	18.2
Slovakia	18.4	18.2	17.6	17.3	16.8	16.0	16.8	16.4	16.0	15.5	15.0	14.6	14.1
Sweden	18.6	18.1	17.5	16.2	15.6	14.9	15.4	15.0	14.7	14.3	13.9	13.6	13.2
United Kingdom	12.2	12.3	12.0	11.1	10.6	10.1	10.9	10.7	10.5	10.1	9.7	9.6	9.4
28 EU-Countries / Average (unweighted)	**22.6**	**22.3**	**21.8**	**21.1**	**20.3**	**19.6**	**20.1**	**19.9**	**19.6**	**19.3**	**18.8**	**18.6**	**18.3**