

Tax morale in times of economic depression: The case of Greece

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Abstract

A report of the International Labour Organization on undeclared work in Greece refers to failures of formal institutions which contribute to the asymmetry between state and civic morality. The particular asymmetry is explored through the context of tax morale, which is one of the major determinants of the shadow economy. Although several papers have been published on the Greek shadow economy, tax morale in Greece has not been adequately explored. This research aims to investigate the effect of the economic downturn on the factors determining the level of tax morale through primary data from a European Union funded research project on the Greek shadow economy. The findings provide policy orientations towards transferring activities from the shadow to the official economy, a goal which is part of Europe 2020 strategy.

Keywords: economic depression; Greece; shadow economy; tax compliance; tax evasion; tax morale.

INTRODUCTION

The global financial and economic crisis that was triggered in 2007 has admittedly ended in the first half of the 2010s. However, full recovery is still in question (see Vlachos et al., 2016). The requirement for a broader-based and more sustained recovery has led the European Union (EU) institutions to undertake initiatives such as the European Commission's Investment Plan for Europe (known as the Juncker Plan) which led to the development of the European Fund for Strategic Investments. Other initiatives such as the 'Employment Package' and the 'European Platform to enhance cooperation in tackling undeclared work' concern the fight against the shadow economy in general (and in particular undeclared work), which is part of the Europe 2020 agenda. The particular initiatives are based on transforming activities in the shadow economy to activities in the official economy (e.g. transformation of undeclared work into regular employment) in order to satisfy the aim of boosting official economic activity. The transformation requires policies that would not just cease activities in the shadow economy, since it is not guaranteed that economic agents who cease their activities in the shadow economy would initiate new activities in the official economy.

The failure of Greece's successive economic adjustment programs to revive the Greek economy until 2016 requires for immediate actions that would not collide with the means of succeeding the targets of the latest adjustment program (e.g. if tax cuts and an increase of public expenditure are policy options they should not threaten the program's targets). An action in this direction would be transferring activities from the shadow to the official economy. Such action would confront the measures adopted by the Greek government for ceasing unregistered economic activities (i.e. activities in the shadow economy) and which result in reducing the sources of income for the part of the society mostly hit by the crisis.

The reader should note that the latest annual data available at the time of writing this paper was until 2016. Preliminary data on fiscal performance in 2017 indicates that Greece is on track to successfully complete the latest economic adjustment program on time. However, doubts over Greece's future still remain regarding an exit from the crisis.

Based on a large and unique source of primary (research) data, the aim of this paper is to investigate the determinants of tax morale in Greece amid the economic downturn. The analysis is based on data from the 2015-2016 period, when the imposition of capital controls increased uncertainty and deepened further the recession of the Greek economy. Although much has been written on the Greek shadow economy, the determinants of tax morale in Greece remain the least explored. Shedding light on the drivers of Greek tax morale will be beneficial for the formulation of policy orientations towards transferring activities from the shadow to the official economy and as such, for setting the foundations for the revival of the Greek economy. Such orientations would be useful both, in altering the aim "of ceasing and not transferring activities in the shadow economy" of Greek policies to tackle tax evasion, and contributing to the existing policy tools (primarily audits and fines) with initiatives that would enhance tax morale.

Although there are several terms in the literature that describe the hidden sector (for reasons not discussed in this paper), e.g. hidden/unofficial/informal/shadow/black/underground economy, the term shadow economy is preferred in this paper since it is considered that the particular part of the hidden sector may be transferred to the official economy. The narrower definition of

“shadow economy includes all market-based legal production of goods and services that are deliberately concealed from public authorities” (Muller et al., 2013: p. 19). Additionally, the term ‘Greek crisis’ in this paper comprises all the dimensions (e.g. corruption, bureaucracy, clientelism, thus political and economic) that characterize the context of the Greek crisis and which, altogether have contributed to the downturn of the Greek economy.

The rest of the paper is organized as follows. Section 2 provides background information to our study with an overview of the factors determining the size of the shadow economy. The discussion revolves around the concept of tax morale, the dimensions of the Greek crisis, previous research on tax morale and the shadow economy in Greece, and the performance of tax collection in Greece. Section 3 presents the aim of this study, the hypotheses tested, the data, and the statistical method of analysis. Section 4 presents and discusses the findings. Finally, Section 5 puts forward some conclusions and policy orientations.

TAX MORALE AND THE SIZE OF THE SHADOW ECONOMY IN GREECE

This section provides a background to the study of tax morale in Greece. Section 2.1 gives an overview of the factors shaping tax morale and discusses how the concept is related with tax compliance. Section 2.2 briefly discusses the cross-country data that is available to researchers for exploring the concept of tax morale. Section 2.3 gives an overview of indicators regarding the impact of the Greek crisis management on the performance of the Greek economy. The performance of key economic indicators reveals why the crisis still continues in Greece (the very least from an economic perspective) and why policies beside fiscal consolidation such as transferring activities from the shadow to the official economy are critical for reviving the economy. Section 2.4 overviews and discusses the findings of previous research on the level of tax morale and the size of the shadow economy in Greece. Finally, section 2.5 highlights some points with regard to the performance of tax collection in Greece. These points are necessary for the policy orientations based on the findings of this study, provided later on.

The concept of tax morale and its impact on tax evasion

Luttmer and Singhal (2014: p. 155) define tax morale as a set of underlying motivations for tax compliance and outline five motivations/channels/mechanisms through which tax morale operates:

- a) intrinsic motivation (utility from the amount of taxes that an individual decides to pay),
- b) reciprocity (utility from the provision of public goods and perception about the fairness of the tax system),
- c) peer effects and social influences (the effect of the behaviors of others on the utility from the amount of taxes that an individual decides to pay),
- d) long-run cultural factors (broad social norms that persist over long periods of time and across generations, which the utility from the amount of taxes that an individual decides to pay), and
- e) information imperfections and deviations from utility maximization (i.e. misperception of the probability of being detected in evading taxes).

Luttmer and Singhal (2014) discuss each of these channels with reference to findings of empirical studies. We do not repeat this discussion here and we prefer to use the

more exploratory term “dimensions”, so that the level of tax morale may be measured in the context of the abovementioned five dimensions.

The prominence of tax morale as a driver of tax compliance is evident in the concept of ‘conditional cooperation’ (i.e. the motives to pay taxes beyond the influence of fines and audits). For example, Frey and Torgler (2007) find strong robust relationships between the size of tax evasion and the level of tax morale, and also between institutional quality and the level of tax morale. The evidence in support of the concept of ‘conditional cooperation’ led to the development of the ‘slippery slope’ framework, where the routes to tax compliance are deterrence of tax evasion through audits and fines (coercive power instruments of tax authorities) on the one hand, and building a trusting relationship with taxpayers through services and support (persuasive power of tax authorities) on the other. Although an evasion-minded taxpayer is supposed to depend on the level of coercive power and a compliance-minded taxpayer on the level of persuasive power, both forms of power instruments by tax authorities may well be complements instead of substitutes (see Prinz et al., 2014).

The persistence of tax evasion in countries with high levels of corruption such as Greece indicates the difficulty in establishing trust relationships between citizens and government authorities (i.e. low or no persuasive power). Litina and Palivos (2015) use the concept of “stigma” to show that in such cases the establishment of strong moral values can be a crucial supplement to deterrence policies.

Similar to its importance to tax compliance behavior, tax morale is also found by several studies of the shadow economy (for a discussion see Bitzenis et al., 2016a) to be a key determinant of activities in the shadow economy. For example, Bitzenis et al. (2016a) who survey the literature about the Greek shadow economy and provide estimates for its size, find that tax morale is one of the main drivers, the other being the self-employed and the size of the tax and social security burden. Although the inclusion of tax morale as a determinant of the shadow economy is typical in macroeconomic estimations like that of Bitzenis et al. (2016a) because it leads to more robust estimates and accurate predictions, it is also somewhat peculiar under the consideration that tax morale is a causal element of the rest of the determinants. For example, the importance of self-employment to the size of the shadow economy indicates the extent to which citizens can and choose to participate in the shadow economy. In contrast to wage employment whose income is not directly reported (and particularly those employed in the public sector), the self-employed can and may choose not to declare (part of) their income. As such, tax morale influences the particular choice of the self-employed. In addition, the influence of the size of the tax and social security burden on the size of the shadow economy indicates the risk of perceived or known information on the probability of being detected and fined, and the effect of social influences (e.g. fairness). With respect to its five dimensions, tax morale reveals why and if individuals evade taxes when they have the opportunity to do so. Weber et al. (2014) discuss these issues in a European Commission paper on behavioral economics and taxation.

Furthermore, the relationship between the shadow economy and its quantifiable determinants is not that straightforward since it is influenced greatly by the quality of institutional frameworks. It is not higher taxes per se that lead to deepening shadow economy, but weak institutions and rule of law, which altogether are reflected in the level of tax morale. For example, the shadow economy depends on government choices (towards taxation, bureaucracy, etc.) that, in turn, depend on exogenous factors (historical, cultural, etc.), and altogether generate a continuum of

country-specific shadow economy equilibrium rates. Within this context, it is justified why countries with higher tax and social security burdens may have smaller shadow economies than countries with lower ones. Brink and Porcano (2016) investigate how national cultural variables and economic variables impact tax morale attitudes and tax evasion to imply that national strategies against tax evasion should be tailored to the culture and economic conditions present in each country.

With regard to the role of institutions, Williams and Horodnic (2016) who investigate the relationship between the level of tax morale and the propensity to engage in undeclared work in the EU and find a strong association between participation in undeclared work and the level of tax morale, also indicate that higher tax morale (and thus a lower propensity to engage in undeclared work) is strongly correlated with greater levels of state intervention and with individual-level characteristics. As such, low/inadequate levels of state intervention in work and welfare arrangements leaves workers less than fully protected and dependent on undeclared work as a survival strategy in the absence of other means of livelihood and support (Williams and Horodnic, 2016: p. 326).

Regarding individual and state characteristics, Williams and Krasniqi (2017) evaluate the individual and national heterogeneity in tax morale and explore the social actor model of tax morale. With regard to individual characteristics their findings from 35 Eurasian countries indicate that tax morale is higher for the middle-aged, married, home owners with children, those with a university degree and the employed. With regard to country characteristics, their findings suggest that there is higher tax morale in more developed countries with stronger legal systems and less corruption, and higher levels of state intervention in the form of both taxation and expenditure.

Regarding the role of education as a driver of tax morale, Rodríguez-Justicia and Theilen (2018) analyze the channels through which education shapes tax morale. Based on data from the European Values Survey, they find that education has a positive impact on tax morale for the net beneficiaries of the welfare state, and a negative impact for the net contributors. Their results also indicate that the more highly educated exhibit higher levels of tax morale in countries that have better quality public services, a fairer tax system and higher quality institutions.

The brief discussion above on the factors driving tax morale indicates that findings published after the definition of tax morale by Luttmer and Singhal (2014), do not deviate from concept of the five dimensions.

Measuring tax morale

International surveys (databases) with cross-country data on tax morale offer a unidimensional description of tax morale (e.g. World Values Survey) by usually focusing on whether (or how much of) tax evasion is justifiable. Luttmer and Singhal (2014) who review the literature to give evidence for each of dimension of tax morale discussed previously, do that separately, drawing from the findings and conclusions of different studies. This may well be an indication of the difficulty in providing evidence through a single study that uses the existing popular databases discussed briefly below. For a in-depth discussion of tax compliance data issues the reader should refer to Torgler (2016).

Daude et al. (2012: pp. 12-14) explore the determinants of tax morale in developing countries and their comprehensive literature review on the subject indicates that cross country analyses are based on data from World Values Survey,

Latinobarómetro, and Afrobarometer. They indicate that the first asks whether cheating or evading taxes can be justified; the second adds, if you have the chance and whether good citizens should pay taxes; the third focuses on enforcement, asking whether the tax administration has always the right to make people pay taxes or not.

Halla (2012: p. 3) explores the importance of moral considerations to explain compliance behavior of American born citizens in the United States and uses data from the American General Social Survey (American born respondents) and the European and World Values Surveys (ancestors' country of origin). Regarding the European and World Value Surveys, responses concerned whether cheating on taxes if you have a chance is justifiable (ordered scale from never justifiable-1 to always justifiable-10). Regarding the American Survey, respondents considered four situations possible answers categories not wrong-1, a bit wrong-2, wrong-3 and seriously wrong-4) for whether it feels wrong or not wrong if a taxpayer does not report all of his income in order to pay less income taxes (Halla, 2012: p. 9).

Data from the Eurobarometer survey is used from Williams and Horodnic (2016: p. 327) for their analysis of participation in undeclared work and the level of tax morale in EU, and ILO (2016) for producing a report on undeclared work in Greece. The ILO (2016: p. 27) report indicates that the Eurobarometer survey measures tax morale by asking respondents to rate the acceptability of participating in six types of undeclared work using a 10-point Likert scale (absolutely unacceptable-1 and absolutely acceptable-10):

1. An individual is hired by a household for work and s/he does not declare the payment received to the tax or social security authorities even though it should be declared.
2. A firm is hired by a household for work and it does not declare the payment received to the tax or social security authorities.
3. A firm is hired by another firm for work and it does not declare its activities to the tax or social security authorities.
4. A firm hires an individual and all or a part of the wages paid to him/her are not officially declared.
5. Someone evades taxes by not declaring or only partially declaring their income.
6. Someone receives welfare payments without entitlement.

The devastating consequences of the Greek economic and debt crises

By the end of 2009 and in the beginning of 2010, as a result of the global crisis and uncontrolled Greek government spending, economic scandals, large tax evasion rates, high corruption and large numbers of bureaucratic procedures, the Greek economy faced its most severe crisis since 1974 as the Greek government revised its deficit from an estimated 6 percent to 15.4 percent of GDP in 2009 (Vlachos, 2013: p. 137). Since then, the country faces three interlocked (banking, sovereign debt, and growth) crises, which fuel a deflationary spiral that has entrapped the Greek economy into depression. However, there is optimism that the late economic adjustment program will be completed successfully in 2018 and that there will be support to ease servicing costs on sovereign debt in order to restore the track to growth in the Greek economy.

Table 1 presents the devastating consequences of the global financial and economic crisis (that was triggered in 2007) for the Greek economy through several indicators. Gross domestic product (GDP) in real terms (i.e. chain linked volumes)

started to decline from 2008 onwards and by the end of 2016 GDP had declined by an approximate total of 26.5 percent vis-à-vis its value in 2007. Households' consumption expenditure in real terms has also been decreasing, being in 2016 approximately 76.6 percent of its value in 2008 (the last year it increased). The decline of GDP has led approximately one third of the Greek population to live in a situation at risk of poverty and/or social exclusion (see OECD, 2016: p. 17), and has increased the number of households facing material deprivation. A UNICEF report (2016: p. 32) indicates that the material deprivation rate of a household with two adults and one or two dependent children was approximately 20 percent in 2015, and over 35 percent for a single person with dependent children. The number of the unemployed also rose tremendously and was totaling approximately 24 percent of the active population in 2016. Against this background, the size of households' consumption expenditure in Table 1 reveals the incredible rise of income inequality caused by economic depression.

Table 1 indicates Greece's lack of competitiveness through volumes of investment and exports. The Greek depression is the outcome of massive disinvestment as the size of gross fixed capital formation in real terms has diminished to approximately one third of its respective value in 2007. The trade deficit in real terms still persists despite all efforts of internal devaluation during the economic adjustment programs (from 2010 onwards). Nevertheless, the trade deficit has shrunk significantly, mainly due to the great decrease of the value of imports (in 2016 imports reached approximately two thirds of their value in 2007).

The economic adjustment programs may have not contributed to the recovery of the Greek economy, but have had a positive impact on the management of government finances. As indicated in Table 1, the size of government debt, the net lending position and the size of interest payable have all been following a declining trend (with government debt expected to decline after securing a general government net borrowing position). The failure of economic adjustment to contribute to the revival of the Greek economy to date, fuels the discussions about reforming the Greek economy and curing the pathologies that made Greece vulnerable to the crisis. Indeed, by considering fractional numbers of Greece's GDP and government debt indicators (Eurostat data accessed 16 Dec. 2017: <http://ec.europa.eu/eurostat/data/database>) it is clear that although government debt has increased by approximately €13 billion during 2009-2016, due to economic depression (and the three recapitalisations of Greek banks for a total of €43 billion during 2010-2015), it has increased from 126.7 in 2009 to 146.2 in 2010 (first economic adjustment program) and to 180.8 percent of GDP in 2016.

Insert Table 1 here

Shadow economy and tax morale in Greece

The indicators that contribute to the escalation of the Greek economic downturn, either directly (e.g. competitiveness, size and viability of debt), or indirectly (e.g. corruption, bureaucracy and unofficial economic activity), are not unrelated and rather set an institutional background that needs to be reset for exiting the economic crisis. Literature surveys on the Greek economic crisis and on the country's shadow economy (for example, see respectively Vlachos, 2013; Bitzenis et al., 2016a) indicate that clientelism and rent-seeking behavior are the main phenomena inflating systemic corruption. Motivated by the Greek crisis, Litina and

Palivos (2015) provide a theoretical explanation and empirical support for (what they term as) the vicious circle of political corruption and tax evasion, and Bitzenis et al. (2016a) who discuss the relation between the size of corruption and the size of the shadow economy in Greece, find that their relationship is complementary. Interestingly, Cooray et al. (2017) find that the complementary relationships between large shadow economies and high levels of corruption suggest that a reduction in the levels of corruption would also lead to a fall in the size of the shadow economy and thus public debt. Greece may well be a case that satisfies the conditions of this relationship. Greece's Corruption Perception Index scores are among the worst in the EU and macroeconomic estimates (Schneider et al., 2015; Bitzenis et al., 2016a) indicate that the average size of the Greek shadow economy (2003-2014) is 25.4 percent of GDP (among the largest in the euro area).

The same (macroeconomic) estimates indicate that the size of the Greek shadow economy has been declining since 2011 (Schneider et al., 2015; Bitzenis et al., 2016a). This trend contradicts all expectations, since the effect of the policies adopted after the eruption of the Greek crisis (and during the economic adjustment programs) on three of the main drivers of the Greek shadow economy should have led to a different outcome (i.e. tax and social security burden and unemployment are record high and tax morale has worsen). Possible explanations for this may be statistical errors, miscalculations [e.g. the particular estimates methods do not account for the effect of irregular migration and studies like Maroukis et al. (2015) indicate how irregular migration and the shadow economy complement each other in southern Europe], the decrease of self-employment (Eurostat data indicate that self-employment in Greece decreased from 1.33 million in 2008 to approximately 1.1 million in 2015), the relocation of Greek enterprises to neighboring EU countries with lower corporate tax rates (under the assumption that it is more efficient to be taxed at a lower rate than to evade higher taxes), and the increase of credit/debit card payments (not only due to the capital restrictions imposed in 2015 but mainly as a result of the rising use of credit as disposable income decreases).

The effect of the Greek crisis on the determinants of the shadow economy suggests that the contraction in Greek shadow economy rates may well be the outcome of ceasing unregistered economic activities (either from policies adopted or socio-economic conditions) and not that of transferring them to the official economy. The outcome of policies to restrain the shadow economy is not adequately discussed in the literature (e.g. which policies and under what conditions would cease unregistered economic activities, and which would transfer these activities to the official economy) and as such, the debate on the interaction between the shadow- and official economies over the business cycle continues (Bitzenis et al., 2016a: pp. 169-170). The act of ceasing unregistered economic activities and not transferring them to the official economy is in contrast to Europe 2020 strategy for economic growth and social inclusion. For example, the Europe 2020 strategy stresses "the need to move from informal or undeclared work to regular employment" (European Commission, 2014: p. 7) and the requirement for measures and "forms of support to enable undeclared work to be converted into lawful employment" (European Economic and Social Committee, 2014: p. 14). Obviously, the legal framework for the shadow economy in the EU does not concern only undeclared work but all forms of activities in the shadow economy (see Bitzenis et al., 2016b).

Bitzenis et al. (2013; 2016a) highlight this issue and argue that since the economic adjustment programs do not allow for a reduction of the tax and social security burden and for policies that would drastically decrease the levels of

unemployment, all efforts should turn into the improvement of citizens' tax morale. Indeed, the importance of tax morale is also discussed in the ILO report (2016: pp. 9-10) on fighting undeclared work in Greece. The report stresses that a major difference between formal institutions that prescribe 'state morality' about what is socially acceptable (i.e. laws and regulations), and informal institutions that prescribe 'citizen morality' (i.e. socially shared rules) persists in Greece. The failings of formal institutions are responsible for the levels of undeclared work in Greece, where state morality is different from citizens' morality. The formal institutional failings considered in the report are institutional voids (e.g. weak welfare 'safety net' which forces citizens into undeclared work to survive), institutional inefficiencies or resource misallocations, institutional uncertainty and institutional weaknesses and instability. The particular failings result in citizens viewing as socially acceptable what is deemed illegal by the state and undeclared work arises by the misalignment between their moralities with formal institutions (state morality). The report highlights their importance and states that unless these failings are addressed, then the asymmetry between state and civic morality will persist, and so will the prevalence of undeclared work.

The emphasis of the ILO report (2016) on the difference between formal and informal institutions is clearly related with the context of tax morale discussed in section 2.1. An exploration of the dimensions of tax morale would provide policy orientations towards the successful transfer of unregistered economic activities to the official economy.

Although much has been written on the Greek shadow economy, the dimensions of Greek tax morale remain the least explored. For example, Vlachos and Bitzenis (2016) who explore the issue within the context of firm tax compliance base their findings on data before the crisis emerged and indicate that the tax burden and corruption in terms of bribing determine non-compliance behavior. Kaplanoglou et al. (2016) use experimental data from 550 Greek small and micro enterprises to explore aspects of the slippery slope framework and find that that entrepreneurs perceive a strong connection between the quality of political and tax institutions, morality deters strategic evasion and strengthens voluntary tax compliance, and that reciprocity is low in terms of the tax burden's size and fairness of the tax system. Kaplanoglou and Rapanos (2015) base their findings on questionnaires filled by undergraduate university students and indicate that the obvious 'low power of authorities – low trust in government' condition favors strategic tax evasion more than any other condition, and that neither the 'low power – high trust' nor 'high power – low trust' conditions are the most important conditions increasing strategic taxpaying behavior (with the latter being the least important). The ILO report on undeclared work in Greece explores the concept through data from the 2013 Eurobarometer survey data (2016: pp. 114-115) and focuses on demographic, socio-economic and spatial characteristics. Bitzenis et al. (2016a) review all relevant literature to tax morale in Greece and investigate its importance to estimating the size of the shadow economy. Bitzenis et al. (2016a) highlight that the level of trust to authorities has deteriorated tremendously due to clientelism and rent-seeking behavior, the level of reciprocity is low, and that waged employees and pensioners reflect an inversely proportional share as a source for revenue from income taxation. Unfortunately, with exception of Kaplanoglou et al. (2016), either all five dimensions of tax morale are not explored by the abovementioned studies and/or their data is not sufficient (i.e. either the sample covers a time period before the crisis or the sample does not reflect the population).

This study aims to fill this gap by focusing on the five main determinants of tax morale in Greece through data collected in times of crisis.

Tax aggregates and collection in Greece

The brief overview of the performance of tax collection in Greece in this section highlights three key points (discussed below in the following order): weak enforcement of law regarding collection, laxity of authorities responsible for collection resulting to the concentration of tax debt to a very small fraction of total debtors' population, and unfair treatment between wage employment and entrepreneurs/self-employed.

An IMF report on the Greek economy (2013: pp. 21-27) highlights several issues which were still relevant at the time (2015-2016) that the questionnaire survey on tax compliance for this study took place. The report refers to weak enforcement as the main cause behind the large share of assessed taxes that remains unpaid. It is stated that 25 percent of total assessed taxes accrued (new debt of €13.1 billion) in 2012, of which only 12 percent (approximately €1.4 billion) were collected in the same year. The annual report of the Independent Authority for Public Revenue in Greece (former General Secretariat for Public Revenue) indicates that 13.9 percent of total assessed taxes accrued (new debt of approximately €7.4 billion) in 2016, of which only 9.1 percent (approximately €670.6 million) were collected in the same year (Independent Authority for Public Revenue, 2017: pp. 31, 37, 47). The increasing size of debt from assessed taxes is not only a matter of collection but also the outcome of tax debt settlements through installment schemes, which postpone its full payment. The particular schemes should not be related with weak enforcement but rather with managing the rising tax burden amid economic depression. Nevertheless, it is considered that these schemes are also available to taxpayers who are in no particular need. Analogous to these issues of tax collection (i.e. rising debt and settlement schemes) are also concerning social security contributions.

The annual report of the Independent Authority for Public Revenue (2017: pp. 37-38) about its operations in 2016, indicates a persisting problem of tax collection, which concerns the concentration of tax debt to a very small fraction of total debtors' population. The amount of outstanding taxes on 1 Dec. 2016 was €92.9 billion (8.6 percent greater than the previous year and almost half of the country's GDP in 2015) and was allocated to approximately 4.3 million physical and legal entities and approximately 85 percent of the amount came from 0.4 percent of total debtors' population (who owed an amount over €300 thousand). About 79.2 percent of total debtors' population owed an amount up to €2000 and 55.4 percent up to €500.

With regard to the sources contributing to the amount of outstanding taxes on 1 Dec. 2016, 34 percent came from uncollected fines to enterprises or self-employed, 21 percent from uncollected VAT, 18.5 percent from uncollected income tax, 9.7 percent from loans and the rest from other (several) categories. The sum of uncollected fines, which reflects the presence of unregistered economic activities, indicates along with all the other sums a further distinction between wage employment and enterprises and the self-employed (the other being the choice for income declaration): the tax for non-self-declared income is prepaid (usually in full). This distinction gives rise to unfair treatment. In addition, 78.7 percent of taxable income in 2016 belonged to wage employment and 6.6 percent came from entrepreneurial activities, while firm profits taxed separately equaled 1.7 percent of taxable income in 2016 (see annual statistical summaries of the Independent

Authority for Public Revenue in Greece available at <http://www.aade.gr/menoy/statistika-deiktos/eisodema/etesia-statistika-deltia>).

The IMF report (2013) mentioned above, makes also a reference to tax evasion and highlights that low probability of detection and low effective penalties (both) combined with high tax rates, are major incentives to evade taxes. Unlike wage employment, the self-employed, who are above the EU average in Greece, may exploit this opportunity. The report also refers to tax amnesties (the practice of minor additional tax liability in exchange for not being audited, which is another factor contributing to unfair treatment between wage employment and entrepreneurs/self-employed) and socio-economic factors (i.e. perceived unfairness of the tax system, dissatisfaction with public goods and services and economic survival) to explain tax evasion in Greece.

With regard to the contribution of tax types to tax aggregates, Table 2 presents the major differences between Greece and the euro area. Firstly, Table 2 reveals that tax aggregates “A (A1-A3)” and social security aggregates “B” were more volatile in Greece than in the euro area over the period 2000-2015. This is partly the result of tax rate changes (and other tax system reforms) occurring almost on an annual basis in Greece. Secondly, Table 2 indicates that differences between the receipts’ size in Greece and the euro area exist for both tax and social security aggregates (the biggest difference concerning direct taxation – taxes on income). In 2015 for example, receipts from taxes on production and imports are 12.2 percent higher in Greece than in the euro area, other current taxes are 2.3 percent higher, taxes on income are 14.1 percent lower, and social security contributions are 1.9 percent lower.

Insert Table 2 here

RESEARCH METHOD AND HYPOTHESES

This paper aims to investigate the determinants of tax morale in Greece amid economic depression through data collected between mid-2015 to mid-2016 from a questionnaire survey on tax compliance (tax compliance questionnaire for citizens available at http://www.paraoikonomia.gr/quest2/?page_id=119, accessed 18 Oct. 2016) conducted for the EU RESEARCH PROJECT THALES titled “The Shadow (Black Economy) in Greece: Size, Reasons and Impact”. The purpose of the project was to research and measure all the aspects of the shadow economy in Greece (i.e. tax and social security contribution evasion and avoidance, undeclared work, self-consumption, tax morale and tax compliance) including corruption illegal and criminal and acts (i.e. black or underground economy, money-laundering, human and drug trafficking and bribes). Data were gathered from all economic agents in Greece, both citizens and corporations (students, pensioners, unemployed, companies and all professional categories, e.g. public servants, self-employed, etc.). The research was performed across all sectors/areas of economic activity and aimed on the measurement of the Greek shadow economy and the selection and analysis of primary data about its determinants and impact on the official economy. Approximately 15,000 companies and individuals have contributed to the 6 questionnaires of the research project. Information about the project in English is available at <http://excellence.minedu.gov.gr/thales/en/thalesprojects/380420> (accessed 18 Oct. 2016). Further information (publications, questionnaires, etc.) is available at <http://www.paraoikonomia.gr/> (accessed 18 Oct. 2016).

Specific questions from the questionnaire survey on tax compliance aimed to reveal the five dimensions of tax morale discussed by Luttmer and Singhal (2014). In particular:

- a) Given the economic difficulties that we currently face in Greece, is it justified for someone not to declare part of his/her economic activities?
- b) Do you feel that your tax contribution is rewarding?
- c) If not, is it due to unequal allocation of the tax burden?
- d) If not, is it due to low quantity and quality of public goods and services?
- e) Do you believe that you should pay your tax burden even if other citizens believe otherwise and/or do not pay?
- f) Does morality discourage citizens to evade taxes?
- g) Do high fines discourage citizens to evade taxes?

Question “a” aims to explore intrinsic motivation; questions “b, c, & d” concern reciprocity, question “e” is about peer effects and social influences; question “f” concerns cultural factors and question “g” is about information imperfections. As Luttmer and Singhal (2014: p. 155) explain, although the particular dimensions are interrelated they may be used as distinguishing factors. The responses to all questions except “b” and “e” follow a seven Likert-type scale response form, where 1 denotes no, 4 means indifferent, and 7 yes. Responses to questions “b” and “e” follow a yes or no (and “maybe” for question “b”) format.

The measurement of tax morale by the European and World Value Surveys is done via a forced-choice (of 10 points) scale and a “don’t know” option. The questionnaire design of the THALES project follows a (seven) mid-point scale and a “don’t know” option. There is support for choosing a mid-point scale following Krosnick and Presser (2010: p. 269): “for someone with a neutral attitude, a dichotomous scale without a midpoint would be suboptimal, because it does not offer the point most obviously needed to permit accurate mapping.” In addition, following the directions of Krosnick and Presser (2010), the choice of a seven-point scale over a five-point scale is more desirable for two reasons:

- The expertise of previous practice should be an element of the questionnaire design of the THALES project. The length of the forced-choice scale measuring tax morale by the European and World Value Surveys indicate that people may be able to differentiate more than a 5-point scale would allow for.
- A nine-point scale would not offer greater differentiation. Each point of the seven-point scale answers of the THALES project has a description (for example, 1-extremely unfavorable, 2-moderately unfavorable, 3-slightly unfavorable, 4-indifferent, 5-slightly favorable, 6-moderately favorable, 7-extremely favorable), whereas the European and World Value Surveys forced-choice (of 10 points) scale does not.

A final issue regarding the questionnaire design is the concern of Nadler et al. (2015) about midpoints in their study, because their findings suggest that participants tend to select the midpoint more when there is no opinion option. The questionnaire design of the THALES project addressed this issue by adopting a “don’t know” option.

Two other questions of the questionnaire survey on tax compliance concerned “expenses covered by reported income received” and “expenses not covered by reported income received”. In particular:

- Average amount spent each month as a household from the individual (non-married) or family income (married) to meet the needs of your household expenses (if expenses are paid by others they should not be reported, e.g.

children's tuition fees paid by grandparents, your monthly rent paid by your parents, etc.).

- Average amount required each month to cover all your household expenses, regardless if you have the income to cover them.

If expenses are not covered by reported income received, missing income would have to be generated either by credit or unreported income. Although the provision of loans has been extremely difficult in Greece after the crisis emerged (since Greek banks have been recapitalized three times), credit is still provided to individuals with a steady level of income. However, under the fact that approximately one third of the Greek population lives in a situation at risk of poverty and/or social exclusion (see OECD, 2016: p. 17), it is not likely for the particular third that the expenses not covered by reported income received would be paid through credit.

Furthermore, under the consideration that capital controls were introduced in Greece in June 2015 and that the time of the questionnaire survey was between mid-2015 – mid-2016 it is very likely that the expenses not covered by reported income received would not be paid through credit. It is assumed that agents would find it more difficult than prior to capital controls to access the decreased amount of available credit. Thus, excess reported expenses over reported income are closer to an indication of the agent being more inclined to participate in activities of the shadow economy. This assumption is based on the effect of the cost of credit access indicated by Blackburn et al. (2012: p. 249): *the marginal benefit (cost) to an agent of disclosing more wealth is higher the lower (higher) is the cost of financial intermediation.*

Therefore, the excess of expenses not covered by reported income received is more likely to indicate the presence of unreported income with up to a size corresponding to these expenses. Accordingly, a variable about unreported income is constructed that has two values and it is assumed that income not reported is a consequence of economic depression: 1 for expenses covered by income received (i.e. income reported) and 2 for expenses not covered (i.e. income not reported). The particular measurement of the shadow economy through “excess expenses over income” is based on the commonly used approach of the discrepancy between national expenditure and income statistics, as mentioned among others by Medina and Schneider (2018: p. 11).

The variables and descriptive statistics for the data discussed above are presented in Table 3 and Table 4 presents frequencies of five demographic variables of the sample. The statistical analysis takes place with the Wilcoxon signed-ranks test (ordinal responses) and the McNemar test (binary responses). Both forms of nonparametric testing are performed because individuals are subjected to more than one condition. With respect to each of the seven questions above (unfolding the five dimensions of tax morale) both tests are performed to assess the difference in tax morale between individuals reporting and not reporting income (McNemar for *rec1* and *peer* and the Wilcoxon signed-ranks test for *intr*, *rec2*, *rec3*, *cul* and *info*). The difference between cases of reporting and not reporting income is included in the analysis in order to indicate the difference between attitudes and actual behaviors (Onu, 2016) and thus to improve the validity of the findings.

Prior to running the Wilcoxon and the McNemar tests, the subjects are matched into pairs of cases with reported and unreported income according to the predicted probabilities of an ordinal logistic regression. The seven questions on the dimensions of tax morale discussed above are independent variables and the variable “whether tax evasion is justified” (which follows a seven Likert-type scale response

form similar to question “a”) as dependent. Data for the particular variable was also collected from the questionnaire survey on tax compliance discussed above and descriptive statistics are also presented in Table 3.

In other words, building on the discussion of previous sections, the common measure of tax morale in terms of whether (or how much of) tax evasion is justified (see World Values Survey) is used for obtaining predicted probabilities. The latter are used for matching the cases of the sample into pairs of unreported (i.e. excess expenses over income) and reported income (the opposite). The nonparametric tests performed reveal the matched cases’ differences for each of the dimensions of tax morale indicated by Luttmer and Singhal (2014).

Insert Table 3 here

Five hypotheses are tested by following the steps described above (i.e. matching cases and analyzing them with the Wilcoxon and the McNemar tests). They are about worsening economic conditions, which:

1. favor the acceptance of activities in the shadow economy (H_1).
2. decrease reciprocity in terms of the utility gained from the provision of public goods and services, and of the perception about the fairness of the tax system (H_2).
3. decrease the impact of peer effects and social influences on the amount of taxes that an individual decides to pay (H_3).
4. do not alter the effect of morality on tax compliance (H_4).
5. do not alter the perception that high fines discourage tax evasion (H_5).

H_1 is accepted if intrinsic motivation (*intr*) to engage in activities of the shadow economy is higher for individuals suffering the most by economic depression (i.e. whose expenses exceed their income). H_2 is accepted if *rec1* reveals that tax contribution is not rewarding and that *rec2* and/or *rec3* have a greater effect on the low sense of reciprocity of individuals affected mostly by economic depression. H_3 is accepted if *peer* has a lesser effect on the tax compliance of individuals affected mostly by economic depression (i.e. their ability to pay would be more important than to follow the general trend). H_4 is accepted if *cul* does not have an alternate effect on the tax compliance of individuals affected mostly by economic depression (i.e. norms that persist over long periods would not change rapidly). H_5 is accepted if *info* does not have an alternate effect on the tax compliance of individuals affected mostly by economic depression (i.e. high fines would discourage individuals to evade taxes despite their economic conditions).

Insert Table 4 here

RESULTS

The descriptive statistics presented in Table 3 indicate a mixed reception regarding the declaration of economic activity (*intr*). Approximately 40 percent of the sample justifies the concealment of income amid economic depression and about 47 percent of the sample does not. The ‘Ranks’ column of Table 5 indicates that 785 individuals of the matched cases with unreported income have a higher *intr* score, while 645 with reported income have a higher *intr* score. The Wilcoxon signed ranks test shows that there is a statistically significant difference ($Z = -3.808$, $p = 0.000$) between individuals reporting and not reporting income, with regard to justifying

income concealment as an effect of the economic downturn (median *intr* score is 3.00 for individuals reporting, and 4.00 for individuals not reporting income as an effect of the economic downturn). The results indicate that worsening economic conditions have favored the acceptance of activities in the shadow economy and H_1 is accepted.

Insert Table 5 here

Table 3 indicates that approximately 83 percent of the sample considers that tax contribution is not rewarding (*rec1*). The McNemar test results in Table 6 indicate that there is no statistically significant difference for *rec1* scores between individuals reporting and not reporting income as an effect of the economic downturn ($N = 1610$, $p = 0.678$). The results indicate that worsening economic conditions do not have an alternate effect on those affected mostly by the crisis.

Insert Table 6 here

Approximately 77 percent of the sample (see Table 3) considers that the unequal allocation of the tax burden (*rec2*) is a reason for believing that their tax contribution is not rewarding. The 'Ranks' column of Table 5 indicates that 634 individuals of the matched cases with unreported income have a higher *rec2* score, while 559 with reported income have a higher *rec2* score. The Wilcoxon signed ranks test shows that there is a statistically significant difference ($Z = -2.059$, $p = 0.039$) between individuals reporting and not reporting income with regard to the unequal allocation of the tax burden as a reason for believing that their tax contribution is not rewarding (mean *rec2* score is 5.68 for individuals reporting, and 5.84 for individuals not reporting income as an effect of the economic downturn). The results indicate that the unequal allocation of the tax burden during economic downturns has a greater negative effect on the low sense of reciprocity of citizens affected mostly by the crisis. According to the results for *rec2* scores, H_2 is accepted.

Low quantity and quality of public goods and services (*rec3*) is also considered by the greater part of the sample (72 percent) as a reason for believing that their tax contribution is not rewarding (see Table 3). The 'Ranks' column of Table 5 indicates that 638 individuals of the matched cases with unreported income have a higher *rec3* score, while 606 individuals with reported income have a higher *rec3* score. The Wilcoxon signed ranks test shows that, there is no statistically significant difference ($Z = -0.217$, $p = 0.828$) between individuals reporting and not reporting income with regard to low quantity and quality of public goods and services as a reason for believing that tax contribution is not rewarding. The results indicate that worsening economic conditions do not have an alternate effect on those affected mostly by the crisis. According to the results for *rec3* scores, H_2 is rejected.

The descriptive statistics in Table 3 indicate a mix reception regarding the willingness of citizens to pay their tax burden when fellow citizens fail or do not appear to do so (*peer*). The McNemar test results in Table 6 indicate there is a statistically significant difference between the *peer* scores of individuals reporting and not reporting income as an effect of the economic downturn ($N = 1548$, $p = 0.012$). There are 424 cases where individuals reporting income would pay their tax burden and equally where individuals not reporting would not pay. On the contrary, there are 353 cases where individuals reporting income would not pay their tax burden and equally where individuals not reporting would pay. The results indicate that worsening economic conditions have a greater negative effect on the unwillingness of

citizens affected mostly by the crisis to pay their tax burden, when fellow citizens fail or do not appear to do so. As such H_3 is rejected.

Approximately 42 percent of the sample (see Table 3) considers that morality (*cul*) does discourage citizens to evade taxes and about 36 percent considers that it does not. The Wilcoxon signed ranks test (see Table 5) shows that there is no statistically significant difference as an effect of the economic downturn between the *cul* scores of individuals reporting and not reporting income ($Z = -0.620$, $p = 0.535$). The results indicate that worsening economic conditions do not have an alternate effect on those affected mostly by the crisis and H_4 is accepted.

Finally, about 74 percent of the sample (see Table 3) considers that high fines discourage citizens to evade taxes (*info*). The Wilcoxon signed ranks test (see Table 5) shows that there is no statistically significant difference as an effect of the economic downturn between the *info* scores of individuals reporting and not reporting income ($Z = -0.869$, $p = 0.385$). Again, the results indicate that worsening economic conditions do not have an alternate effect on those affected mostly by the crisis and H_5 is accepted. Under the consideration that high fines discourage tax evasion irrespectively of economic conditions, there can be an inference that the probability of being detected in Greece is low (since fines are high and have increased throughout the years of the crisis).

DISCUSSION & CONCLUSIONS

The transfer of activities from the shadow to the official economy is part of Europe 2020 strategy for economic growth and social inclusion. The achievement of such a transfer for Greece would further enhance the efforts to overcome depression and revive the economy. The policies that have been adopted in Greece for reducing the size of the shadow economy rely on efforts that aim to cease unregistered economic activities (mainly through audits and fines). This is partly because the literature about the shadow economy does not concentrate on specifically how such a transfer can be achieved and accordingly, it is assumed that any reduction in the size of the shadow economy would be replaced by an increase in the size of (i.e. transferred to) the official economy.

Based on data from a questionnaire survey on tax compliance, this study aims to investigate the factors affecting the level of tax morale in Greece amid economic depression. Considering the significance of tax morale in explaining tax compliance behavior, it is important to study the motivations/channels/mechanisms that shape tax morale (Luttmer and Singhal, 2014) in Greece in order to develop policy orientations for transferring unregistered economic activities to the official economy. For that reason, an analysis of the effect of worsening economic conditions on the dimensions (term used in this study) of tax morale is conducted, and not an exploration of the slippery slope framework.

The measure of tax morale relevant to that of the World Values Survey in terms of whether (or how much of) tax evasion is justified, is used for obtaining predicted probabilities. These are used for matching the cases of the sample into pairs of unreported (i.e. excess expenses over income) and reported income (the opposite). The nonparametric tests performed reveal the matched cases' differences for each of the dimensions of tax morale indicated by Luttmer and Singhal (2014). Limitations regarding this approach and possibilities for future research are to account for demographic variables possibly by grouping the cases prior to matching by

educational and income level. Probably for investigating tax morale in 2019-2020, which will (hopefully) be a period that the Greek economy will grow.

The research findings on the factors determining the level of tax morale in Greece amid economic depression indicate that:

- Reciprocity and information imperfections are the most important factors for low tax morale in Greece amid economic depression.
- Peer effects and social influences, cultural factors, and intrinsic motivation respectively, have a lesser influence on the level of tax morale in Greece amid economic depression.

With regard to the hypotheses tested, worsening economic conditions:

1. favor the acceptance of activities in the shadow economy,
2. decrease reciprocity in terms of the perception about the fairness of the tax system (but not about the utility gained from the provision of public goods and services),
3. do not decrease the impact of peer effects and social influences on the amount of taxes that an individual decides to pay, and
4. do not alter the effect of morality on tax compliance, and
5. do not alter the perception that high fines discourage citizens to evade taxes.

The conclusions with regard to the tested hypotheses is that worsening economic conditions in Greece decrease the level of citizens' tax morale because of a rising tax burden that is not fairly allocated and results in favor of participating to activities in the shadow economy (hypotheses 1 and 2). Apparently, tax morale remains low for the whole sample (i.e. not by considering only those suffering the most by depression), since only 30-40 percent does not justify participation in the shadow economy or tax evasion, and merely 10 percent does not consider loss in utility gained from the provision of public goods and services, while their costs rise (see Table 1). An inference regarding individuals with moral values being unaffected by the behavior of peers arises from observing the behavior of the whole sample: the percentage of individuals considering that moral values enforce tax compliance (42 percent) is close to the percentage of compliance-minded individuals acting irrespectively of peers' compliance (see Table 1). Also evident in Table 1 from the high levels (60 percent of the whole sample) of unreported income and the perception that high fines deter tax evasion (74 percent of the whole sample) is the unlikely event of the probability that a fine may occur, since fines are not low under current legislation. For example, under current legislations, fines (on all physical and legal entities) concerning income and property tax range from 10 to 50 percent of the amount of tax saved, and 50 percent of the tax not paid regarding VAT. There is also a provision for prison sentence from 2 (up to €100 thousands of taxes saved per annum or up to €50 thousand of undeclared VAT per annum) to over 5 years (over €150 thousands of taxes saved per annum or over €100 thousand of undeclared VAT per annum).

The findings on the level of tax morale in Greece reveal that Greek economic agents are fully aware of the failure of the efforts to date to combat tax evasion. The lack of economic resources has introduced the acceptance of activities in the shadow economy, by questioning the fairness of the tax system, as reciprocity failure increases with compliance. Except from the seemingly successful Voluntary Disclosure of Income Scheme (according to Greek media reports, e.g. <http://www.cnn.gr/oikonomia/story/1092>) there has not been any official reports on the effectiveness of the policies to fight tax evasion (again Greek media report on lost opportunities, e.g. <http://www.cnn.gr/oikonomia/story/105201/xamiles-epidoseis-stin->

pa). On the contrary, the sum of uncollected fines (which equal approximately one third of the vast amount of outstanding taxes) reflects the persistence of unregistered economic activities.

The discussion about the findings on the level of tax morale in Greece indicates the requirement for the designation of policies under a plan that would not be aiming only at fiscal consolidation. Transferring part of the shadow to the official economy, fiscal restructuring and productive reconstruction should be the pillars of a national crisis exit strategy. The overly unidirectional orientation towards fiscal consolidation since the beginning of the crisis, has failed to deliver institutional and structural reforms that would increase the level of tax morale and thus both voluntary and involuntary compliance.

Unavoidably, the impact of the economic adjustment programs on the sizes of the Greek shadow and official economies has brought attention to the possibility of transferring activities from the shadow to the official economy. This possibility has been discussed from a broader perspective by EU institutions and has become an official target of the Europe 2020 strategy (Bitzenis and Vlachos, 2017). Reforms towards achieving this target, which arise by the findings on the level of tax morale in Greece, should primarily focus on reciprocity and inspections. With regard to inspections, reports reveal that insufficient resources are dedicated to the collection of new tax debt so that it quickly becomes uncollectable. Greater resources to collection are required, as the workforce continues to be dedicated mostly to tax assessment. In addition, resources need to be dedicated to detecting tax evasion and undeclared work. Accordingly specialized working groups should audit small, medium-sized, large firms and the self-employed (with no employees), because their forms of tax and social security evasion are different. Audits should be carried out on a regular basis (e.g. every 2 years) and should be mandate for business as a certificate of good practice. These working groups should have incentives to meet their targets and should face penalties if a minimum number of audits are not performed.

Increasing reciprocity in tax services requires for a friendlier and more efficient tax setting. Although lowering the corporate tax rates in the short-term is not probable due to the economic adjustment programs, lowering firm tax compliance costs, which are of considerable size and are not the only compliance costs that a firm faces (Stamatopoulos et al., 2017) should be a priority. Tax rates, which alter almost on an annual basis, should also stabilize (e.g. by being the byproducts of medium-term growth strategies). With regard to reciprocity, phenomena of unfairness should be targeted. Tax amnesties (e.g. for voluntary disclosure of income) and preferential tax treatments (e.g. for the shipping industry and elected representatives) should come to a halt as they affect negatively the level of tax morale. All physical and legal persons convicted of tax evasion should be banned from public tenders and funding, including funding from European funds and there should be exemplary punishments to public officials and politicians. Due to the extraordinary high unemployment rates, severe fines such as a levy on firm's turnover should be imposed in the detection of undeclared work (to be collected by the undeclared worker) as an incentive to testify in the public interest (whistle blowing) for the purpose of combating undeclared work and tax evasion.

Finally, there should be initiatives aiming to reduce the tax and social security contribution burden. For example, a policy initiative that would not alter the current tax rates and as such would not jeopardize the targets of Greece's economic adjustment program, could allow for new Greenfields to be income tax free for a

certain period in order to compensate for personnel costs and moreover, attract investors.

The abovementioned policy proposals are oriented towards improving the level of tax morale, a critical factor contributing to the success of tax reforms and tax administration modernizations and the transfer of unregistered economic activities to the official economy. Improvement in tax morale is not only a mean to generate government revenue by transferring activities from the shadow to the official economy, but also a sign that the asymmetry between state and civic morality is reduced and that trust in authorities is on the path to be restored. Reforms that successfully alter the political and economic conditions that made Greece vulnerable to the crisis would assuage the economic difficulties and social suffering of economic depression and end up increasing the level of Greek citizens' tax morale. However, like any kind of institutional reforms, improvements in tax morale require time to materialize and as such, immediate action is needed in order to meet Europe 2020 targets with regard to transferring activities from the shadow to the official economy.

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TABLE 1 – The Greek economy before and after the global financial and economic crisis of 2007

Indicator/Year	2002	2004	2007	2008	2009	2011	2013	2015	2016
Final consumption expenditure of households ¹	12.3	13.20	14.5	15.0	14.7	12.3	11.1	11.3	11.5
Gross domestic product at market prices ²	205.50	228.42	250.72	249.88	239.13	205.39	184.22	184.47	184.49
Gross fixed capital formation ²	42.65	50.54	61.62	57.19	49.22	31.56	22.12	21.05	21.07
Exports of goods and services ²	39.92	46.98	56.51	58.47	47.64	49.97	51.32	57.16	56.01
Imports of goods and services ²	60.21	67.52	89.12	90.30	71.92	62.89	55.80	60.21	59.94
General government – Net lending (+) /net borrowing (-) ³	-9.85	-17.10	-15.61	-24.63	-35.97	-21.28	-23.75	-10.43	1.29
General government – Interest, payable ³	9.10	9.27	10.47	11.65	11.97	15.08	7.28	6.33	5.65
General government consolidated gross debt ³	171.41	199.28	239.92	264.78	301.06	356.29	320.51	311.67	314.90
Unemployment (annual average) ⁴	0.48	0.52	0.42	0.39	0.49	0.88	1.33	1.20	1.13
Active population (annual average) ⁴	4.67	4.83	4.89	4.91	4.95	4.86	4.78	4.74	4.73

Source: Eurostat, <http://ec.europa.eu/eurostat/data/database> [Accessed 13 Sep. 2017].

Notes: ¹ chain linked volumes (2010), thousand euro per capita; ² chain linked volumes (2010), billion euro; ³ billion euro; ⁴ million persons.

TABLE 2 – Greece and euro area tax and social security contributions aggregates

Geo/Receipts/Time		19 95	20 00	20 04	20 07	20 08	20 10	20 13	20 14	20 15
GREECE	A ₁ Taxes on production and imports	64	56	58	60	60	60	57	61	62
		.1	.4	.5	.0	.0	.0	.1	.2	.8
	A _{1.1} Taxes on products, except VAT and import taxes	29	25	22	22	21	22	21	20	20
		.9	.5	.7	.9	.7	.0	.0	.6	.0
	A _{1.2} Value added type taxes (VAT)	30	27	32	33	33	33	28	28	28
		.4	.3	.8	.9	.5	.7	.3	.1	.7
	A _{1.3} Other taxes on production	3.	3.	2.	2.	4.	3.	7.	12	13
		4	6	8	9	1	8	5	.3	.8
	A ₂ Taxes on income	30	38	36	35	34	33	31	33	31
		.6	.7	.3	.2	.8	.7	.5	.6	.9
A _{2.1} Taxes on individual or household income	16	18	20	21	21	18	24	23	21	
	.8	.7	.6	.5	.7	.9	.0	.2	.1	
A _{2.2} Taxes on the income or profits of corporations	11	17	13	10	10	12	4.	7.	8.	
	.6	.2	.7	.9	.2	.1	6	4	5	
A ₃ Other current taxes	3.	3.	4.	4.	4.	5.	11	4.	4.	
	7	5	4	2	0	8	.0	9	9	
A	Total receipts from taxes (excluding social security contributions) after deduction of amounts assessed but unlikely to be collected	64	66	62	62	62	61	64	65	64
		.9	.7	.1	.8	.3	.5	.6	.2	.8
B	Total receipts from social security contributions (including imputed contributions)	35	33	37	37	37	38	35	34	35
		.1	.3	.9	.2	.7	.5	.4	.8	.2
EURO AREA	A ₁ Taxes on production and imports	-	50	52	50	49	51	50	50	50
			.5	.3	.4	.8	.9	.4	.8	.6
	A ₂ Taxes on income	-	46	44	46	47	45	46	45	46
			.9	.3	.8	.5	.0	.1	.8	.0
	A ₃ Other current taxes	-	2.	2.	2.	2.	2.	2.	2.	2.
			0	2	2	2	4	8	7	6
A	Total receipts from taxes (excluding social security contributions) after deduction of amounts assessed but unlikely to be collected	-	62	61	63	62	61	62	62	62
			.4	.6	.5	.6	.3	.4	.6	.9
B	Total receipts from social security contributions (including imputed contributions)	-	37	38	36	37	38	37	37	37
			.6	.4	.5	.4	.7	.6	.4	.1

Source: Eurostat, <http://ec.europa.eu/eurostat/data/database> [Accessed 16 Feb. 2017].

Notes: $A_{1,1}$ - $A_{1,3}$ are expressed as percentages of A_1 and $A_{2,1}$ - $A_{2,3}$ of A_2 . A_1 , A_2 and A_3 are expressed as percentages of A . A and B are expressed as percentages of total receipts from tax and social security contributions. Euro area 11 countries for 2000, 12 for 2004, 13 for 2007, 15 for 2008, 16 for 2010, 17 for 2013, 18 for 2014 and 19 for 2015 and 2016.

TABLE 3 – Descriptive Statistics

Variables/Statistics	Mean	Median	Std. Deviation	Variance	Frequencies (response percentages)
Is it justified for someone not to declare part of his/her economic activities? [intr]	3.62	4.00	2.11	4.47	negative (1-3) 46.6%; indifferent (4) 12.2%; positive (5-7) 39.9%; missing 1.3%.
Is your tax contribution rewarding? [rec1]	1.87	2.00	0.34	0.11	yes (or maybe) 12.5%; no 82.8%; missing 4.7%.
If not, is it due to unequal allocation of the tax burden? [rec2]	5.77	6.00	1.46	2.14	negative (1-3) 7.7%; indifferent (4) 11.5%; positive (5-7) 77.1%; missing 3.7%.
If not, is it due to low quantity and quality of public goods and services?	5.55	6.00	1.58	2.49	negative (1-3) 10.3%; indifferent (4) 13.6%; positive (5-7) 72.0%; missing 4.1%.

[rec3]					
Should you pay your tax burden even if other citizens believe otherwise and/or do not pay? [peer]	1.50	2.00	0.50	0.25	yes 46.2%; no 46.6%; missing 7.2%.
Does morality discourage citizens to evade taxes? [cul]	4.11	4.00	1.94	3.76	negative (1-3) 36.3%; indifferent (4) 20.9%; positive (5-7) 41.9%; missing 0.9%.
Do high fines discourage citizens to evade taxes? [info]	5.39	6.00	1.55	2.40	negative (1-3) 11.5%; indifferent (4) 13.8%; positive (5-7) 73.9%; missing 0.9%.
Unreported income.	1.60	2.00	0.49	0.24	reported 40.2%; unreported 59.8%.
Is it justified for someone to evade taxes?	3.24	4.00	2.03	4.11	negative (1-3) 54.6%; indifferent (4) 13.3%; positive (5-7) 30.3%; missing 1.6%.

Notes: Total number of cases is 4373. Variable codes in square brackets.

TABLE 4 – Frequencies of four demographic variables

Variables/Frequencies	Frequencies (percentages in brackets)
Employment type	farmers 31 (0.7), unemployed 354 (8.1), public sector employees 1164 (26.6), private sector employees 1108 (25.3), self-employed without personnel 349 (8), entrepreneurs – self-employed with personnel 103 (2.4), pensioners 150 (3.4), students 1002 (22.4), missing 91 (2.1)
Educational attainment	elementary 27 (0.6), gymnasium 66 (1.5), lyceum 595 (13.6), vocational education and training 279 (6.4),

	technical university 525 (12), university 2011 (46), postgraduate 706 (16.1), Ph.D. 126 (2.9), missing 38 (0.9)
Expenses covered by income	up to €300: 966 (22.1); €301-600: 1084 (24.8); €601-1000: 1115 (25.5); €1001-1500: 493 (11.3); €1501-2000: 336 (7.7); 2001 or over: 203 (4.6); missing: 176 (4)
Gender	females 2419 (55.3), males 1910 (43.7), missing 44 (1)
Age	up to 20 years old: 372 (8.5); 21-30 years old: 1427 (32.6); 31-40 years old: 885 (20.2); 41-50 years old: 899 (20.6); 51-60 years old: 512 (11.7); 61-70 years old: 100 (2.3); 71 years old or over: 25 (0.6); missing: 153 (3.5)

Note: Total number of cases is 4373. Expenses covered by income may act as a proxy for income level.

TABLE 5 – Wilcoxon signed ranks tests results

Variables (mean & median)		Ranks (N)		Test statistics	
<i>intr (unreported)</i>	3.75	Negative	645	<i>Z based on negative ranks</i>	-3.808
	4.00	Positive	785		
<i>intr (reported)</i>	3.44	Ties	280	<i>Asymp. Sig. (2-tailed)</i>	0.000
	3.00	Total	1710		
<i>rec2 (reported)</i>	5.68	Negative	634	<i>Z based on positive ranks</i>	-2.059
	6.00	Positive	559		
<i>rec2 (unreported)</i>	5.84	Ties	453	<i>Asymp. Sig. (2-tailed)</i>	0.039
	6.00	Total	1646		
<i>rec3 (reported)</i>	5.49	Negative	638	<i>Z based on positive ranks</i>	-0.217
	6.00	Positive	606		
<i>rec3 (unreported)</i>	5.59	Ties	400	<i>Asymp. Sig. (2-tailed)</i>	0.828
	6.00	Total	1644		
<i>cul (reported)</i>	4.10	Negative	731	<i>Z based on positive ranks</i>	-0.620
	4.00	Positive	732		
<i>cul (unreported)</i>	4.13	Ties	261	<i>Asymp. Sig. (2-tailed)</i>	0.535

	4.00	<i>Total</i>	1724		
<i>info (reported)</i>	5.33	<i>Negative</i>	689	<i>Z based on positive ranks</i>	-0.869
	6.00	<i>Positive</i>	666		
<i>info (unreported)</i>	5.43	<i>Ties</i>	374	<i>Asymp. Sig. (2-tailed)</i>	0.385
	6.00	<i>Total</i>	1729		

Notes: Mean in the upper cell and median in the lower for each variable. Ranks are the outcome of the upper minus the lower cell variable.

TABLE 6 – McNemar tests results

Crosstabs (N)			Test statistics	
<i>rec1 (unreported & reported)</i>	yes	no	<i>N (total)</i>	1610
	yes	28 181	<i>Chi-square</i>	0.173
	no	190 1211	<i>Asymp. Sig.</i>	0.678
<i>peer (unreported & reported)</i>	yes	no	<i>N (total)</i>	1548
	yes	418 353	<i>Chi-square</i>	6.306
	no	424 353	<i>Asymp. Sig.</i>	0.012

Notes: For crosstabs “unreported” cases in rows and “reported” in columns.