

Andriopoulou, Eirini; Kanavitsa, Eleni; Leventi, Chrysa; Tsakloglou, Panos

**Working Paper**

## The Distributional Impact of Recurrent Immovable Property Taxation in Greece

GLO Discussion Paper, No. 604

**Provided in Cooperation with:**  
Global Labor Organization (GLO)

Suggested Citation: Andriopoulou, Eirini; Kanavitsa, Eleni; Leventi, Chrysa; Tsakloglou, Panos (2020) : The Distributional Impact of Recurrent Immovable Property Taxation in Greece, GLO Discussion Paper, No. 604, Global Labor Organization (GLO), Essen

This Version is available at:  
<http://hdl.handle.net/10419/222413>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

**Eirini Andriopoulou**

Council of Economic Advisors, Hellenic Ministry of Finance and  
Athens University of Economics and Business

**Eleni Kanavitsa**

Athens University of Economics and Business

**Chrysa Leventi**

Council of Economic Advisors, Hellenic Ministry of Finance, University of Essex and  
Athens University of Economics and Business

**Panos Tsakloglou**

Athens University of Economics and Business, IZA and Hellenic Observatory (LSE)

## ***The Distributional Impact of Recurrent Immovable Property Taxation in Greece***

### **Abstract**

During the last decade, Greece faced one of the most severe debt crises among developed countries, leading to Economic Adjustment Programs in order to avoid a disorderly default. Public expenditure was cut, tax rates were increased and new taxes were introduced aiming at restoring public finances. Prominent among the latter were recurrent property taxes that were playing a very minor role before the crisis. These taxes helped boosting public revenues but were hugely unpopular. The paper examines in detail their distributional impact and finds that they led to increases in inequality and (relative) poverty. The result is stronger in the case of inequality indices that are relatively more sensitive to changes close to the bottom of the distribution and poverty indices that are sensitive to the distribution of income among the poor.

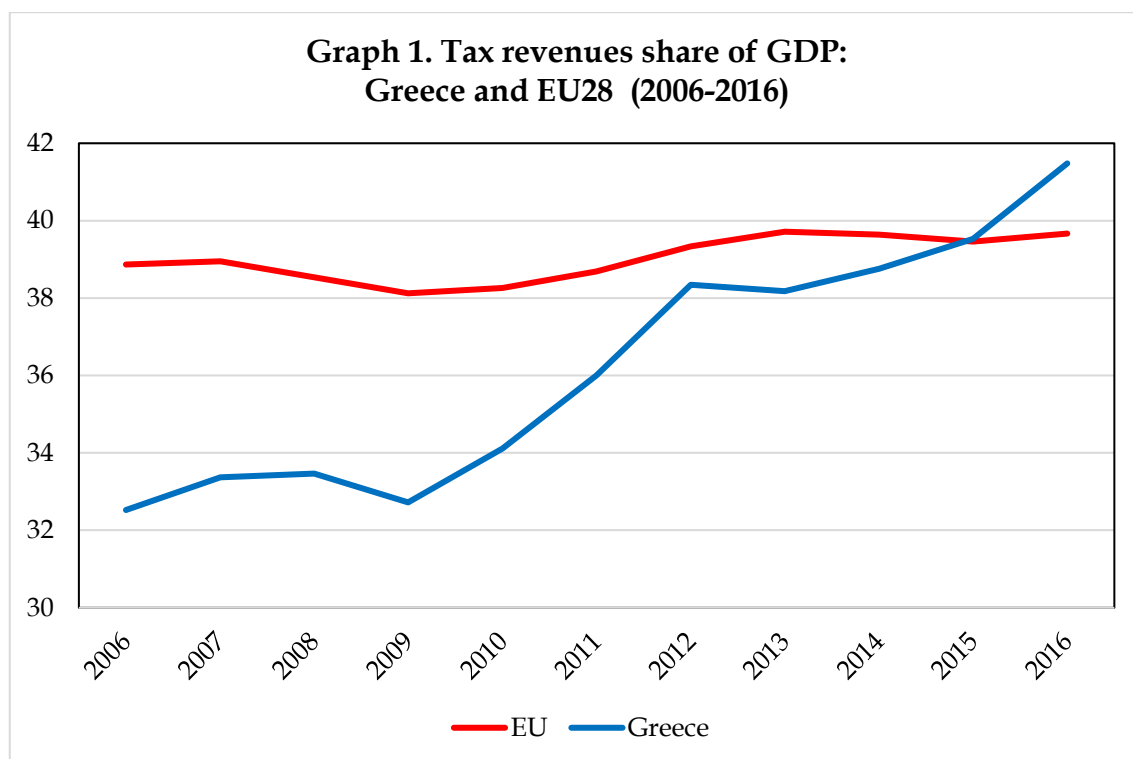
JEL Numbers: D31, H22

Keywords: Property taxation, inequality, poverty, progressivity, Greece

*\* Acknowledgements: The research of Eleni Kanavitsa was co-financed by Greece and the EU (ESF) through the Operational Program "Human Resources Development, Education and Lifelong Learning" (project "Strengthening Human Resources Research Potential via Doctorate Research", MIS-5000432), while the research of Eirini Andriopoulou and Panos Tsakloglou was supported through Research Grant No EP-3035-01 of the Athens University of Economics and Business. The views expressed in the article are those of the authors and should not be attributed to the Council of Economic Advisors.*

## 1. Introduction

During the period 1995-2007 Greece's average growth rate was 3.9% per annum; second only to Ireland among the Eurozone countries and 1.5% above the Eurozone mean. However, Greece's growth model was based primarily on the expansion of consumption and was largely financed by the inflow of external funds. Even though Greek banks were not directly exposed to American subprime bonds, when the economic recession following the Lehman Brothers collapse erupted, the deficiencies of this model became apparent. In 2008 output stagnated and in 2009 the economy moved into full recession. Internal and external imbalances that were steadily growing in earlier years deteriorated sharply and the economy faced enormous "twin deficits" (in the general government budget and the current account); the deficit in the current account exceeded 15% of GDP in 2008 and the budget deficit was over 15% in 2009. In 2010, Greece was cut off from the international capital markets and had to rely on the help of her Eurozone partners and the IMF, through three Economic Adjustment Programs that lasted for eight years (2010-2018) in order to avoid a disorderly default.<sup>1</sup>



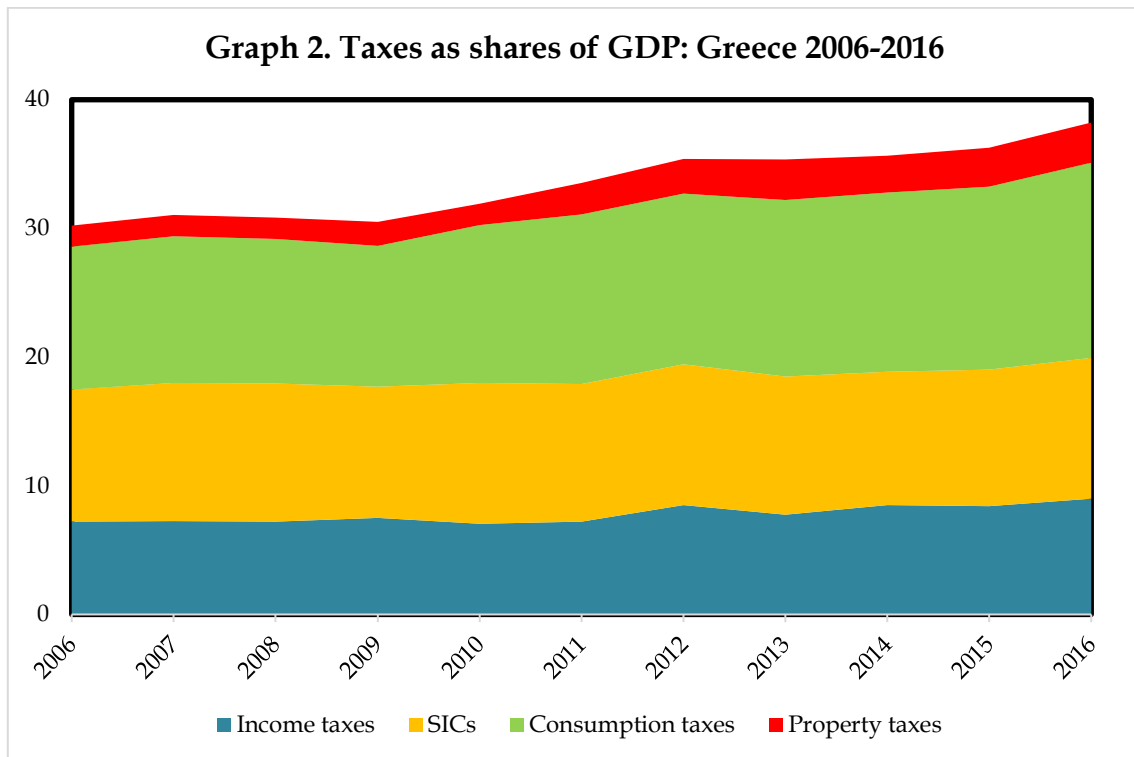
Source: AMECO

In the framework of these programs, Greece agreed to rebalance its public finances through both expenditure cuts and tax increases. As shown in Graph 1, before the Economic

---

<sup>1</sup> Ioannides and Pissarides (2015), Tsakloglou et al. (2016) and Meghir et al. (2017) provide accounts of the Greek crisis.

Adjustment Programs, Greece's share of taxes in GDP fluctuated around 33%, far below the EU average (close to 39%). In the years of the Economic Adjustment Programs, Greece's share of taxes in GDP rose rapidly and stabilized above the EU average, close to 41%. During this period, almost all tax rates were increased, while new taxes were introduced. As a result, the share of all types of taxes in GDP (direct taxes, indirect taxes, social insurance contributions and property taxes) rose, as shown in Graph 2. Regarding property taxes, although their share in GDP is small, it rose markedly after the introduction of a new property tax in 2011.



Source: Eurostat

As Mirrlees et al. (2011, p. 368) point out “Most taxes nowadays are levied on flows of income and of expenditure. But land and property have been taxed for centuries – certainly for longer than income – and they continue to form an important part of the tax base in most advanced economies”. Property taxation and especially, the taxation of land, has been popular among economists mainly on efficiency grounds. Following Ramsey (1927), Diamond and Mirrlees (1971) show that this type of taxation causes far fewer distortions than other types of taxes, particularly since it affects minimally labour supply decisions and hence, *ceteris paribus*, can be considered as a tool to maximize production and welfare. Moreover, due to the immovable

nature of real estate, property taxation is usually associated with high rates of collectability, making it popular among policy makers (Cabral and Hoxby, 2012).<sup>2</sup>

However, in most cases property taxes are hugely unpopular among the members of the general population (Norregaard, 2013). Mirrlees et al. (2011) conjecture that this unpopularity may be due to the fact that since in most countries income and consumption taxes are withheld at source and remitted to the government by firms, for the majority of the population, property taxes may be the single or the largest taxes they are asked to pay directly personally. Further, there is evidence that a considerable proportion of the population thinks that it is unfair to tax housing property (Lyons, 2007) particularly since, at least in the short run, these taxes are independent from someone's current income and, hence, ability to pay (Slack and Bird, 2014). This unpopularity may be mitigated in cases where property taxes are local taxes and are somehow considered as "service charges" to the local community, thus collectively increasing local property values (Musgrave and Musgrave, 1989).

However, in most cases property taxes are hugely unpopular among the members of the general population (Norregaard, 2013). Mirrlees et al. (2011) conjecture that this unpopularity may be due to the fact that since in most countries income and consumption taxes are withheld at source and remitted to the government by firms, for the majority of the population, property taxes may be the single or the largest taxes they are asked to pay directly personally. Further, there is evidence that a considerable proportion of the population thinks that it is unfair to tax housing property (Lyons, 2007) particularly since, at least in the short run, these taxes are independent from someone's current income and, hence, ability to pay (Slack and Bird, 2014). This unpopularity may be mitigated in cases where property taxes are local taxes and are somehow considered as "service charges" to the local community, thus collectively increasing local property values (Musgrave and Musgrave, 1989).

The expected distributional incidence of property taxes depends on the tax base (primary residence only, all housing, industrial buildings, agricultural land, other land types, etc), the tax rates applied both within and across types of real estate as well as the tax relief measures applied. In general, it was expected that since property is a form of capital and capital is more concentrated than income, the redistributive effects of property taxation should be progressive (Aaron, 1974). However, empirical studies in several countries show that usually

---

<sup>2</sup> Moreover, property taxes can also be used as policy tools in order to manage urban density, land use and housing market prices as well as speculation and "bubbles" in real estate and, thus, economic cycles.

property taxes constitute a higher fraction of the income of lower rather than higher income deciles<sup>3</sup>, thus increasing rather than reducing inequality; see, for example, the results of Kim and Lambert (2009), Davis et al. (2009) and Joumard et al. (2012) for the United States, Chawala and Wannell (2003) and Palameta and Macredie (2005) for Canada and Joumard et al. (2012) for the United Kingdom. On the opposite side, Marical (2009) reports that, due to a number of generous income- and family-related tax reliefs, recurrent taxes on immovable property in France are marginally progressive. In the case of Greece, although the contribution of these taxes to the stabilization effort of the economy was significant, their distributional effects have not been investigated yet. The present research aims to fill this gap.

The remainder of the paper is organized as follows. Section 2 provides a description of property taxation in Greece in a comparative perspective vis-à-vis other EU countries. Section 3 presents the data and methods used in the empirical analysis. Section 4 contains the empirical results on the distributional effects of recurrent immovable property taxation in Greece. Section 5 provides the conclusions.

## **2. Immovable property taxation in Greece**

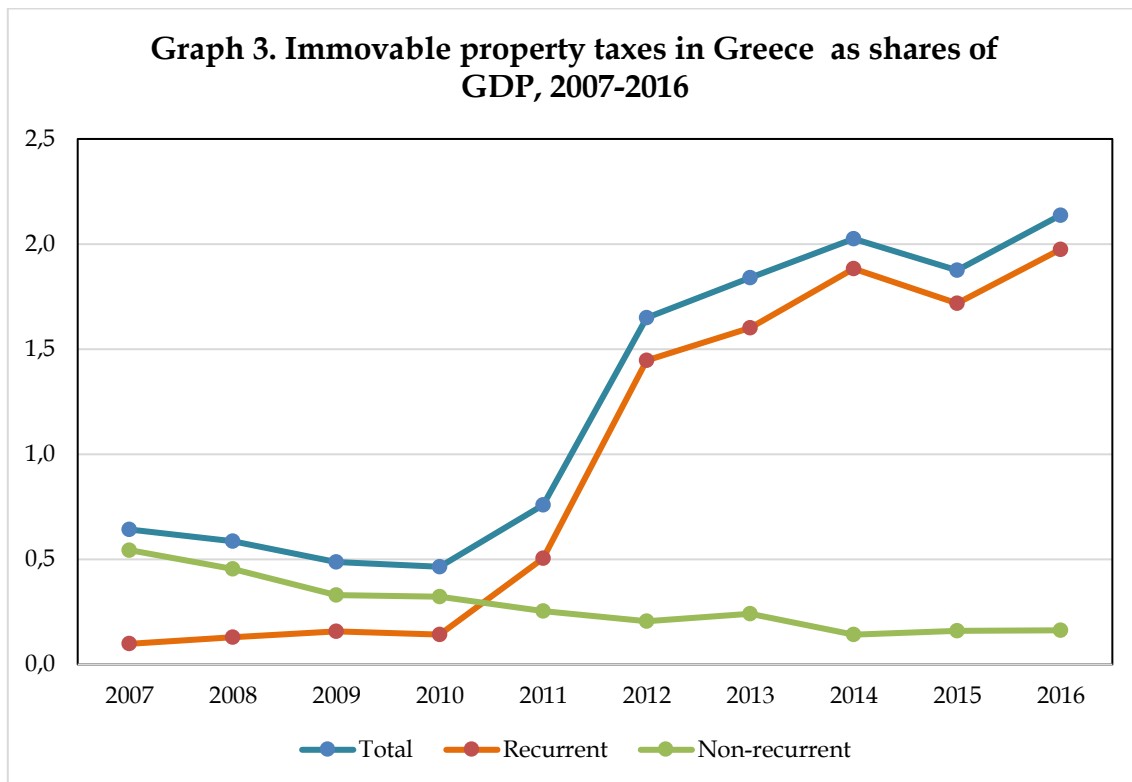
Traditionally, immovable property taxation in Greece was relying on non-recurrent taxes (taxes on transactions, inheritances and in-vivo transfers of immovable property). Usually, such taxes were accounting for around 0.4%-0.5% of GDP. Before the 2000s, several attempts to introduce recurrent property taxation were unsuccessful mainly due to lack of property valuations. In the 2000s, with a proper valuation system in place covering most parts of the country, a number of attempts to introduce such taxes under various schemes took place, the most important of which were: the Unified Real Estate Duty (ETAK), the Tax on Large Real Estates (FMAP) and the Municipal Real Estate Duty (TAP). Nevertheless, as shown in Graph 3, the revenues raised from these schemes remained very low (between 0.1% and 0.2% of GDP).

The picture changed dramatically during the crisis, under the urgent need to increase revenues. In 2011, the Emergency Special Duty of Buildings Connected to the Electricity Grid (EETHDE) was introduced. The tax was applied only to buildings, both private households and firms were eligible for payments and, in order to reach a high collectability rate, it was

---

<sup>3</sup> Throughout the text, the term “decile” denotes “decile group” rather than “decile point”.

collected through electricity bills.<sup>4</sup> In 2014, the Unified Real Estate Property Tax (ENFIA) replaced EETHDE and was extended to the possession of land. On top of this, a supplementary tax was introduced for individuals with total taxable property value over 200,000 euros (covering the top 8% of the distribution of natural persons), aimed to introduce some progressivity to the scheme. Moreover, reduced rates applied to some of the most vulnerable population groups. Since 2014, changes in the level of tax have taken place mainly in order to introduce further tax deductions for vulnerable groups and gradual deleverage with successive horizontal tax rate deductions in the most recent years.



Source: Hellenic Ministry of Finance, General Accounting Office

As shown in Graph 3, after the introduction of EETHDE and, especially, ENFIA, the share of recurrent immovable property taxes in national income shot up, reaching 2.0% of GDP. Collectability rates were high. For example, according to the General Accounting Office data for 2018, the collectability rate of ENFIA was 84%.<sup>5</sup> At the same time, due to the crisis, real

<sup>4</sup> The tax was introduced in late 2011 and the tax bill could be paid in installments. Most units eligible to the tax paid part of it in 2011 and part in 2012. For this reason, in Graph 3 only part of the effect of the introduction of the tax is recorded in 2011.

<sup>5</sup> The corresponding rate for the non-withheld part of personal income taxes was 77% and even lower for indirect taxes.

estate transactions declined sharply leading to a fall in non-recurrent property tax revenues as a share of GDP and recurrent taxes accounted for the lion's share of property taxes.

The recurrent taxes introduced in the period under consideration were assessed at the individual level and the tax base for the calculation of the tax was the taxable value of each asset. This, in turn, was determined mainly by the (administratively assessed) value of the geographical zone of the real estate asset. A major problem with the assessment of these taxes was that during the crisis property market values declined by over 40% (Bank of Greece, 2019, Table II.6), while their taxable values remained unchanged. The problem was further complicated because Greece lacks a complete cadastral and the re-assessment of detailed taxable values would have been a very hard exercise given the low number of transactions in the real estate market during the crisis. This is a usual drawback of real estate taxes in practice in many countries. As Almy (2014) points out, valuation practices frequently ignore revaluation requirements, which almost by definition occur in periods of rapid recession or growth. This lack of revaluation can enhance the perception of taxpayers that property taxes may be unfair. It should be noted that these taxes were introduced close to the peak of the Greek crisis. Output was down by 26%, the rate of unemployment was above 27%, while the disposable income of the average household was 42% below its peak (Andriopoulou et al., 2018). Unsurprisingly, the new tax was hugely unpopular and, according to many commentators, contributed to the downfall of the, then, government in the 2015 elections.

Graphs 4 and 5 compare Greece with the EU countries with respect to revenues collected through property taxation.<sup>6</sup> Graph 4 shows that until 2010 Greece was lagging behind the European average in terms of the share of property taxes in GDP. The gap can be attributed exclusively to the difference in the share of taxes collected through recurrent taxes. After 2010, though, the picture changes completely. Due to the introduction of EETHDE and, then, ENFIA, the share of both recurrent and total property taxes in Greece's GDP exceed the European average by a wide margin; in the last year under consideration in Graph 4, the differences are 1.1% and 0.6% of GDP, respectively.

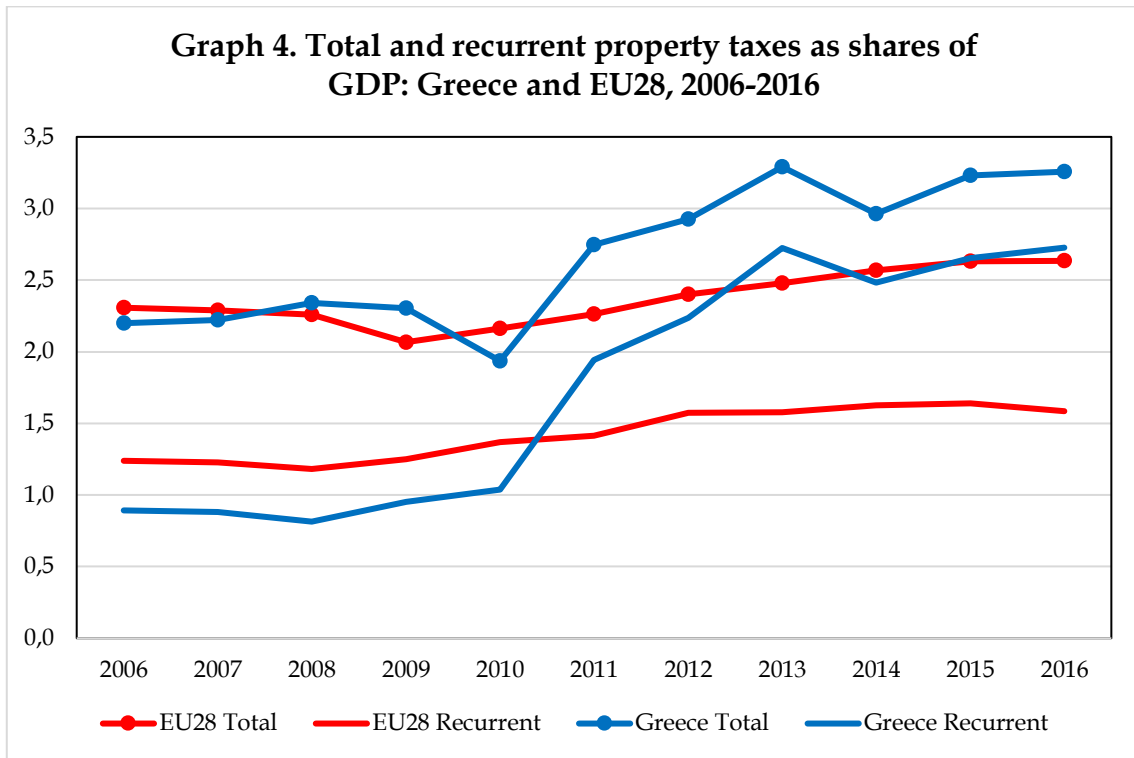
Graph 5 shows that in 2017 Greece's share of property taxes in GDP was the fourth highest in the EU (behind France, the UK and Belgium), while in terms of the share of recurrent property taxes in GDP, only two countries were collecting higher revenues than Greece (France and the United Kingdom). Furthermore, Greece's share of property taxes in total taxes collected (8.0%)

---

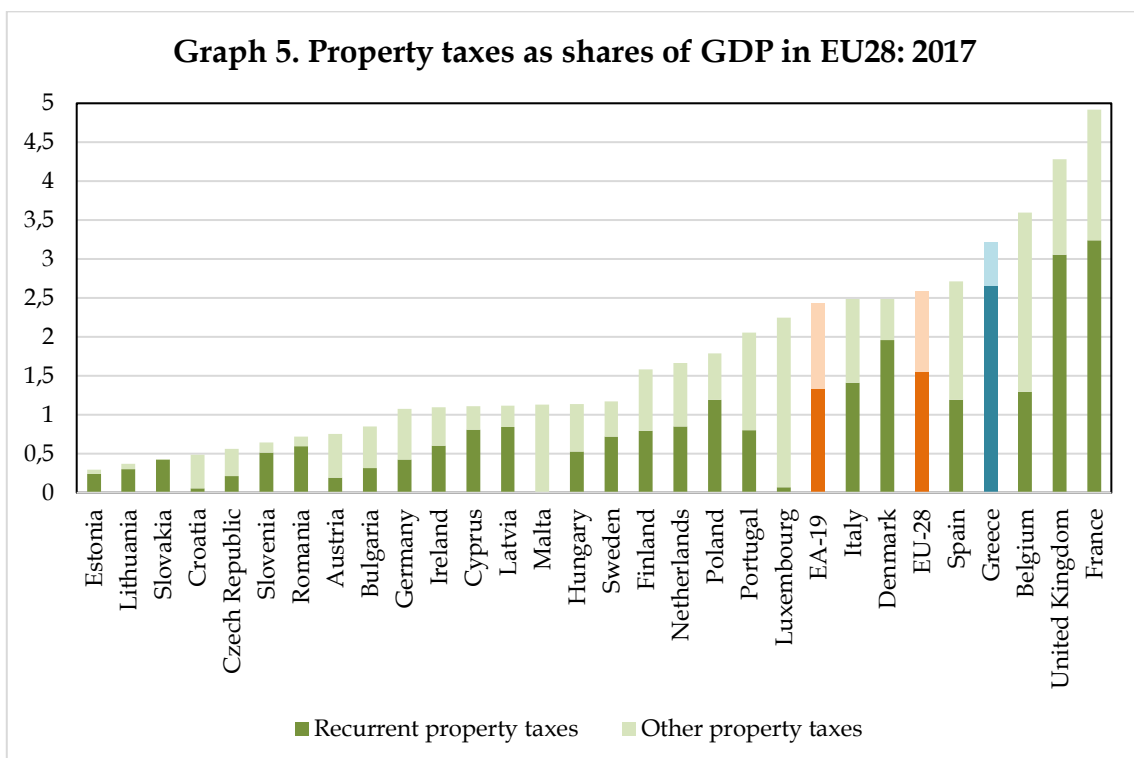
<sup>6</sup> These graphs refer to property taxation in general; not only immovable property taxation. However, in all countries the latter is the main component of property taxation.



is substantially higher than the corresponding mean EU figure (6.0%) (European Commission, 2019).

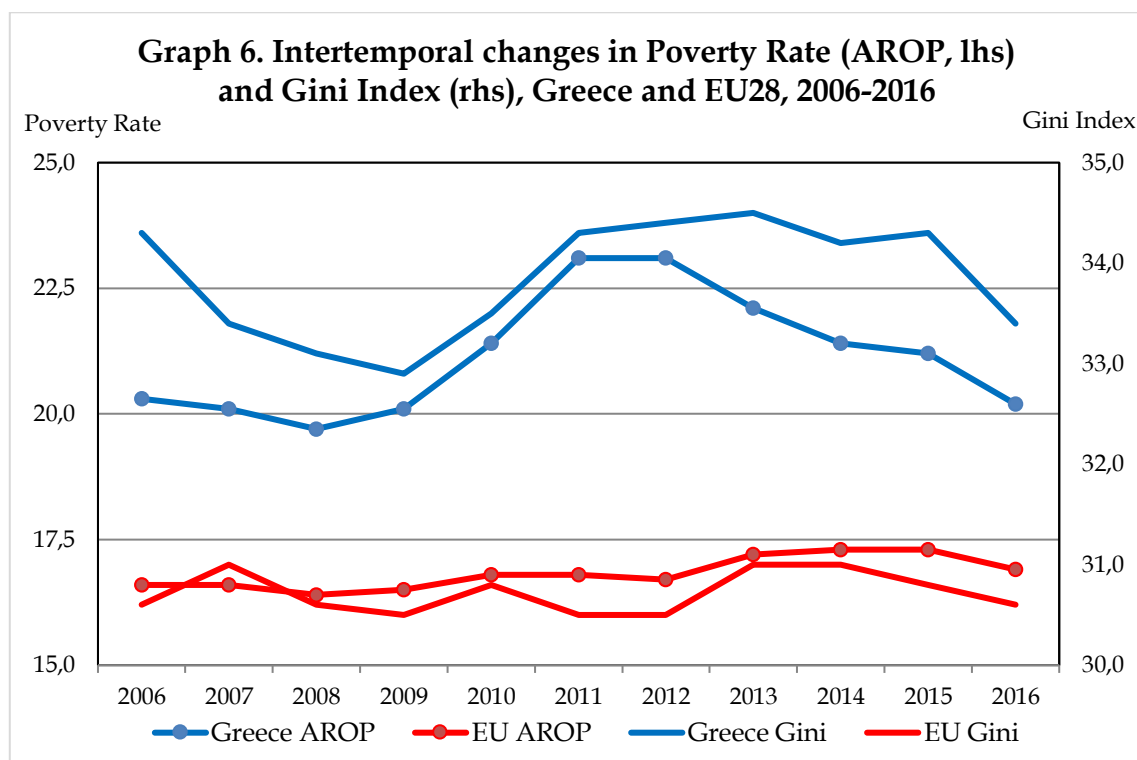


Source: Eurostat



Source: European Commission (2019)

Finally, before moving to the empirical results, a few words on changes in inequality and poverty in Greece during the period under consideration are needed. Despite the dramatic changes in living standards of the Greek population during this period, the evidence of Graph 6 that reports intertemporal changes in the Gini index and the poverty rate when the poverty line is set at 60% of the median equivalized income of the contemporaneous distribution suggest that the changes in inequality and poverty were not that large. Both of the indices remained substantially higher than the EU averages in Greece during this period, rose in the early years of the Economic Adjustment Programs following the sharp increase in unemployment rate and declined in the later years. Nevertheless, detailed analysis using inequality indices that are more sensitive than the Gini index to changes close to the tails of the income distribution (especially the bottom end of the distribution) and poverty indices that are sensitive to the depth of poverty as well as the distribution of income among the poor in Andriopoulou et al. (2018; 2020) records stronger changes in inequality - although the pattern is similar to that of Graph 6 - and very considerable rises in poverty using “floating” and, especially, “anchored” poverty lines. Interestingly, unlike what is often heard in the Greek public discourse, the elderly improved their relative position while there was substantial deterioration in the relative position of the enlarged group of the unemployed, who swelled the ranks of the poor.



Source: Eurostat

### 3. Data and methods

The data used in the paper are drawn from the Statistics on Income and Living Conditions (SILC) for Greece. We use SILC waves 2007 to 2017, corresponding to income years 2006 to 2016. The data set contains information on property taxes paid. The information appears to be very reliable. For example, in 2017 the sum of recurrent property taxes reported in SILC was 2.3 billion euro, while the total reported by the tax authorities was 2.7 billion euro. However, the latter figure also includes recurrent property taxes paid by firms as well as households.

Due to the complexity of income surveys, such income data become available with a considerable delay. For instance, the EU-SILC 2020 survey data (reporting incomes earned in 2019) will not be released before 2022. Tax-benefit microsimulation models can fill this gap, providing timely estimates of the effects of changes in taxes and benefits on the income distribution (Figari et al., 2015). In order to assess the distributional impact of changes in property taxation in the most recent years (i.e. 2017, 2018 and 2019), we make use of the Greek component of EUROMOD, the tax-benefit microsimulation model of the EU.

EUROMOD is a tool that enables researchers to estimate in a comparable way the effects of taxes and benefits on the income distribution. The model simulates personal tax and social insurance contribution liabilities as well as cash benefit entitlements for all EU countries based on the national tax-benefit policy rules of a given year and the information available in the underlying microdata. The components of the tax-benefit systems that cannot be simulated are taken directly from the data, along with information on original incomes. EUROMOD has been validated both at micro and macro level and has been extensively used to address a broad range of economic and social policy questions (Sutherland and Figari, 2013). One of the most important advantages of EUROMOD is attribution; the model allows researchers to isolate the effects of each policy, taking into account the complex ways in which policies interact with each other.

In this paper, EUROMOD's underlying microdata are drawn from SILC 2017. Updating incomes and non-simulated benefits from 2017 to 2019 is carried out using factors based on available administrative or survey statistics. Specific updating factors are derived for each income source, reflecting statutory rules or the change in the average amount per recipient between the income data reference period and the target year. In order to enhance the credibility of our estimates, an effort has been made to address issues such as tax evasion and

benefit non take-up.<sup>7</sup> It should be noted that the estimates of inequality, poverty and progressivity indices reported below using EUROMOD are not strictly comparable with the estimates derived using SILC data. The differences in the simulated results and the results derived from SILC can be attributed primarily to the simulation of several benefits in EUROMOD that are severely under-reported in SILC data (Tammik, 2019). When these corrections are made in EUROMOD, the incomes of a number of poor households rise and the corresponding estimates of inequality and poverty indices are lower than those derived from SILC. Therefore, these estimates are shown primarily in order to identify trends in recent years that SILC data are not available.

For the period 2017-2019, the applicable property tax is ENFIA. As noted earlier, it consists of two parts: the primary and the supplementary. The primary tax is computed based on an elaborate formula which, amongst other parameters, takes account of the cadastral value of the property, its surface, use and age as well as the floor it is located at. There is also a social provision which grants discounts of 50% or 100% on the tax assessed to taxpayers with low family income, families of 3 or more dependent children, or with members suffering serious disabilities. The supplementary tax is applicable for taxpayers with properties whose cadastral values exceeding €200,000. The value of ENFIA is reported in SILC. However, since SILC provides no information on properties' cadastral values, the policy is switched off in the baseline and the tax for 2017-2018 is taken directly from the input data (only minor changes were implemented in these years). However, in 2019 ENFIA was reduced by 10%-30% depending on the cadastral value of the property.<sup>8</sup> This reduction is simulated in EUROMOD. In order to approximate properties' values we used the average cadastral values for urban and rural/semi-rural areas according to tax data provided by the Greek authorities (i.e. €1,338 per square meter for those residing in urban areas and €745 per square meter for those residing in rural/ semi-rural areas).

For the calculation of inequality, poverty and progressivity indices as well as for the classification of the population members in particular decile groups, we used the member's equivalized household disposable income. This is the sum of all incomes of all household members net of income taxes and social insurance contributions (and, when needed, property

---

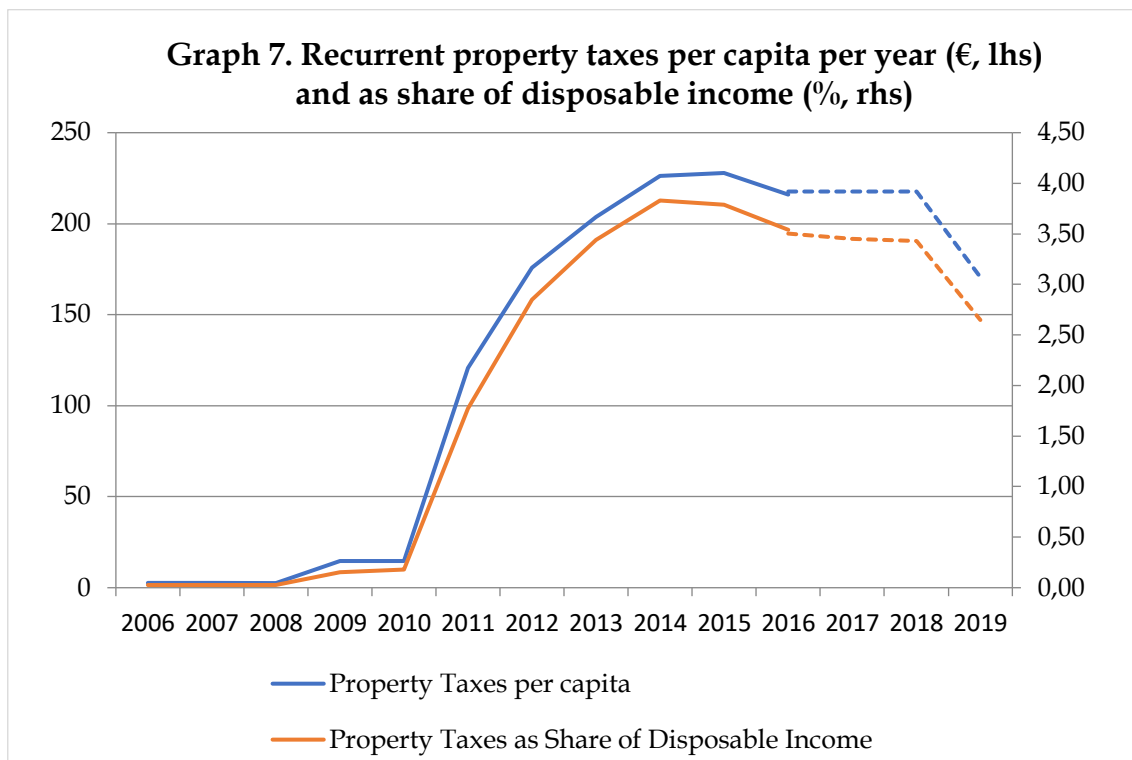
<sup>7</sup> Detailed information about each of these issues as well as validations against external sources are available in the EUROMOD Country Reports for Greece: <https://www.euromod.ac.uk/using-euromod/country-reports/>

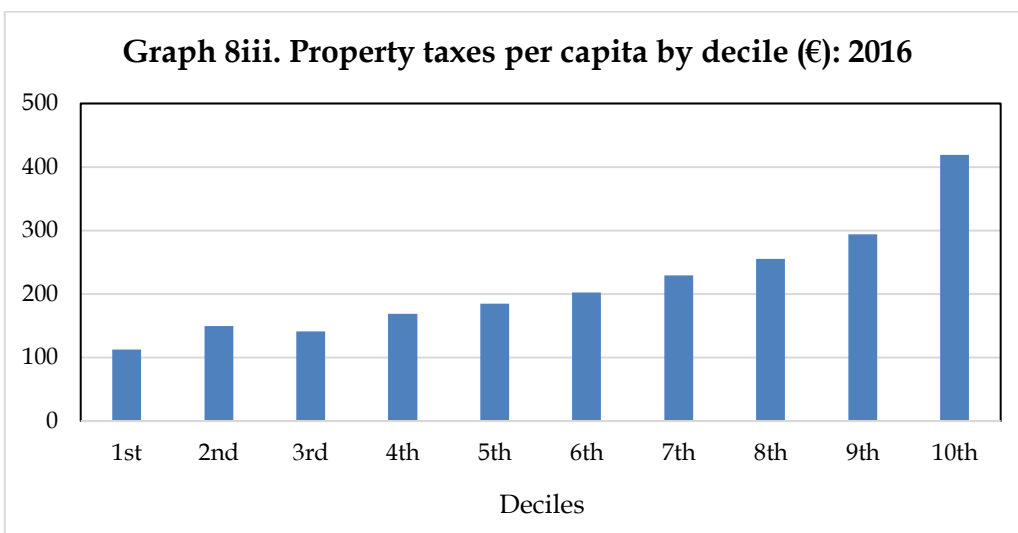
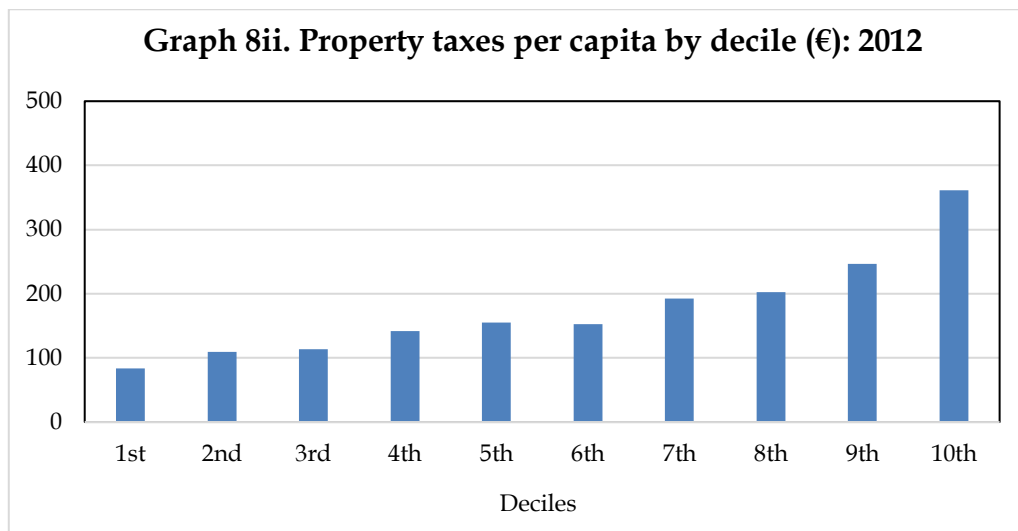
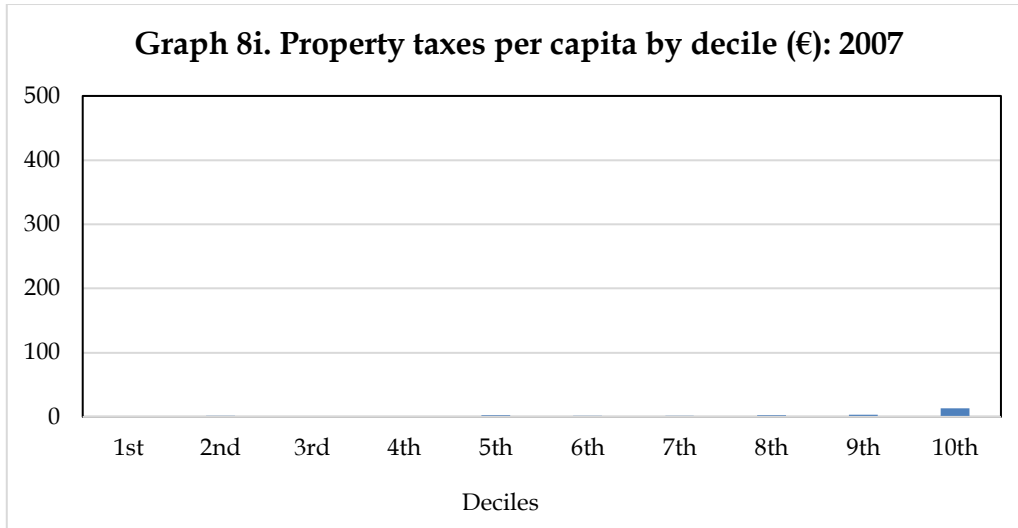
<sup>8</sup> By 30% when the total cadastral value of the properties was below 60,000 euros, by 27% if it was between 60,000 and 70,000, by 25% if it was between 70,000 and 80,000, 20% if it was between 80,000 and 1,000,000 and 10% if it was above 1,000,000 euros.

taxes) divided by the household equivalence scale. The latter is the one used by EUROSTAT that assigns 1 to the household head, 0.3 to each household member aged below 14 and 0.5 to each of the remaining household members.

#### 4. Empirical results

Recurrent immovable property taxes per capita over time are shown in Graph 7 along with their share in household disposable income. For the first years of the period under examination, the recurrent property taxes in per capita terms are close to zero, while the introduction of ETAK in 2009 led to marginal increases. However, the introduction of EETHDE in 2011 increased sharply the amount of tax individuals paid from €15 on average in 2010 to €175 in 2012. Two years later, when EETHDE was replaced by ENFIA, the corresponding figure rose further, reaching a maximum of €225 in 2015. Since then, property taxes per capita started to decline due to reductions of cadastral values in many areas across the country and the introduction of tax exceptions for a number of vulnerable population groups. A similar picture emerges for the share of recurrent property taxes in total household disposable income (gross of recurrent property taxes). Starting from close to 0% in 2006, households were called to pay a bit less than 4% of their disposable income a few years later, in 2014.





Graphs 8i, 8ii and 8iii depict the level of recurrent property taxes per capita for each decile, when the population members are ranked from the poorest to the richest. For the sake of brevity, we present estimates for three years out of the whole period under examination.

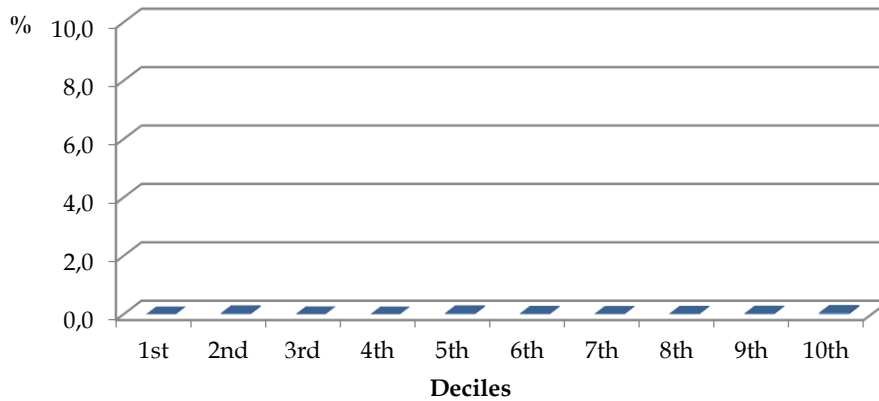
These years are 2007, 2012 and 2016 and are representative of the pre-crisis years and the years of “maturity” of EETHDE and ENFIA, respectively. For the majority of the population these taxes were zero in 2007. Even for the richest decile, the annual figure per capita was below 15 euro. On the contrary, in 2012 and 2016 all deciles pay substantial amounts and the mean payment per decile rises continuously as we move from the poorest to the richest decile (with minor exceptions between the fifth and the sixth decile in 2012 and second and the third decile in 2016). Mean per capita payments range between 84 (113) euro for the bottom decile to 361 (420) euro for the top decile in 2012 (2016).

Prima facie, the evidence of Graphs 8i, 8ii and 8iii could imply that the redistributive effect of the tax is progressive. However, to validate such a statement, we have to look at the tax as a share of distribution of disposable income per decile including the property tax (pre-tax distribution). The corresponding evidence is reported in Graphs 9i, 9ii and 9iii. The picture that emerges is anything but progressive, at least for 2012 and 2016. As expected, in 2007 the shares for all deciles are close to zero. In 2012, the share of the tax in the income of the bottom decile is 6.8%, declining almost progressively up to the top decile where it is 2.3%. The corresponding shares for 2016 are even higher; 8.5% and 2.9%, respectively. To some extent, these results may be attributed to the fact that during the crisis a number of property-owning households became jobless, while long-term unemployment soared. Unemployment protection in Greece is quite inadequate, for the long-term unemployed it is almost non-existent, while in the years under consideration there was no benefit of last resort in the form of a minimum income guarantee scheme. Hence, many households in the bottom decile had very limited monetary resources, while the taxable value of their real estate assets was not so low and, as a result, the decile ratio of taxes to disposable income was high. All in all, the evidence of these graphs provides a very strong indication that the incidence of the recurrent property taxes introduced during the crisis was regressive.<sup>9</sup>

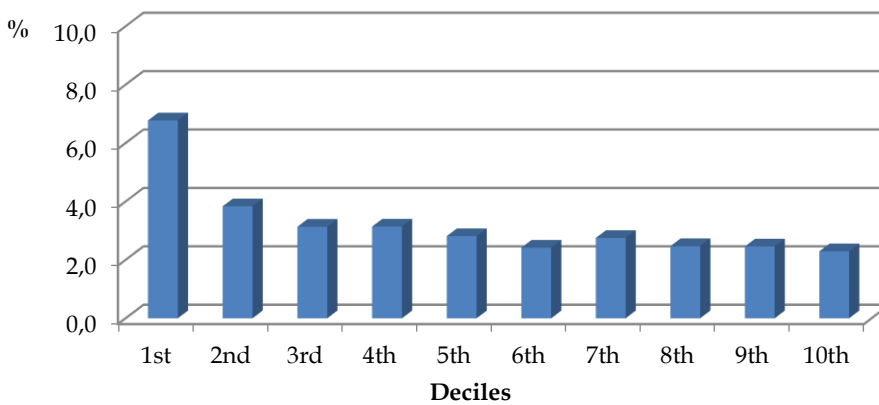
---

<sup>9</sup> This statement is in line with the vast majority of similar studies treating inequality and progressivity in relative terms. However, there is a strand of literature where inequality and progressivity remain unchanged if the incomes of all population members change by the same amount (instead of the same proportion), (Blackorby and Donaldson, 1980 and 1984). Using this approach, the evidence provided so far would point to the opposite direction, i.e. progressivity, since in absolute terms the property taxes paid by the rich are larger than those paid by the poor.

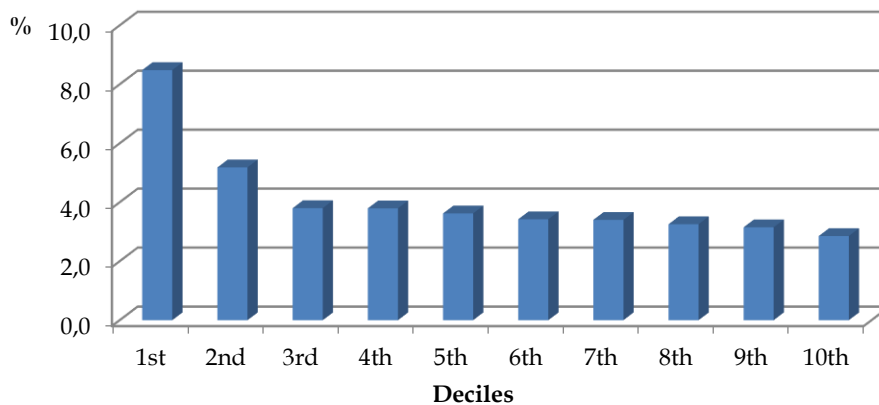
**Graph 9i. Property taxes as share of pre-tax disposable income by decile, 2007**



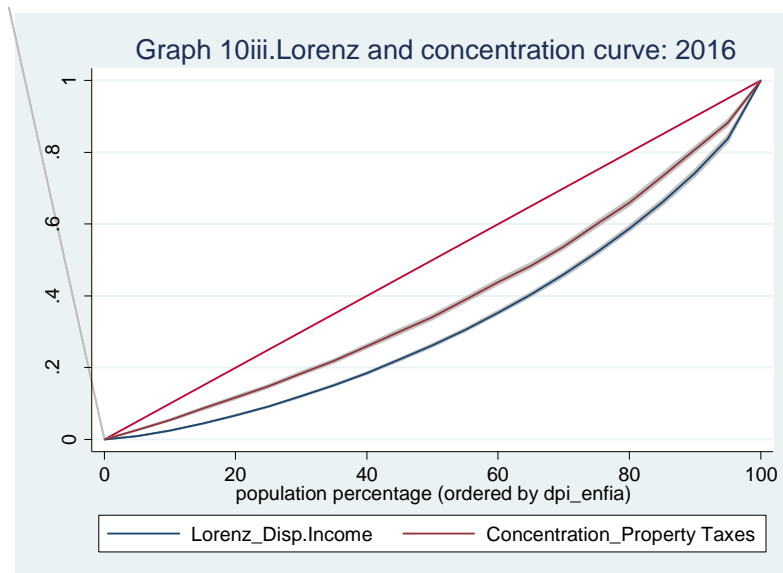
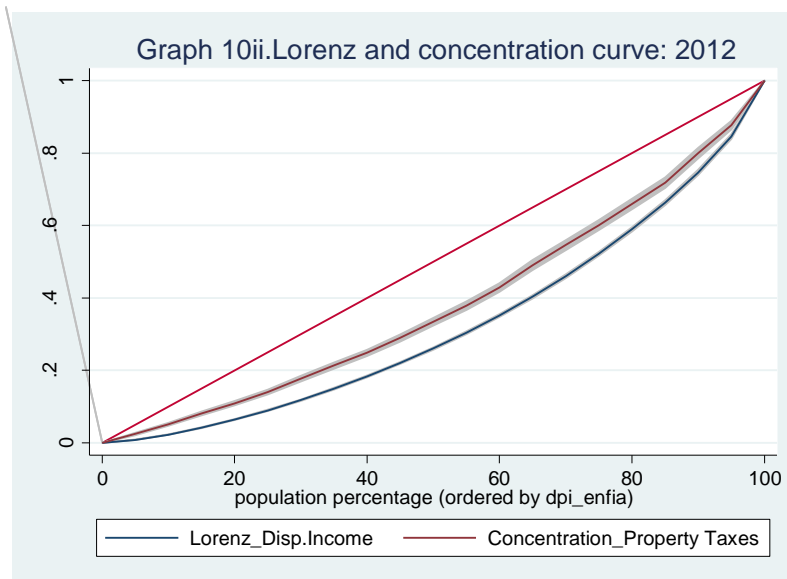
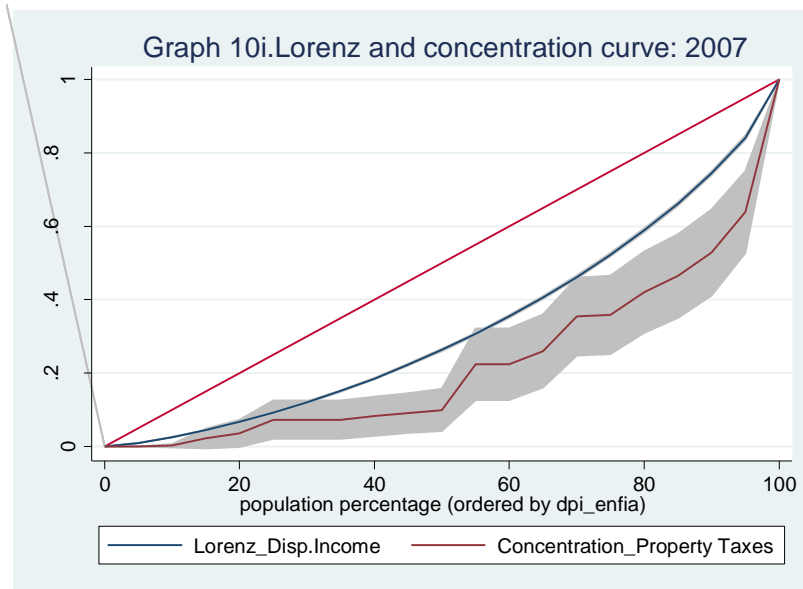
**Graph 9ii. Property taxes as share of pre-tax disposable income by decile, 2012**



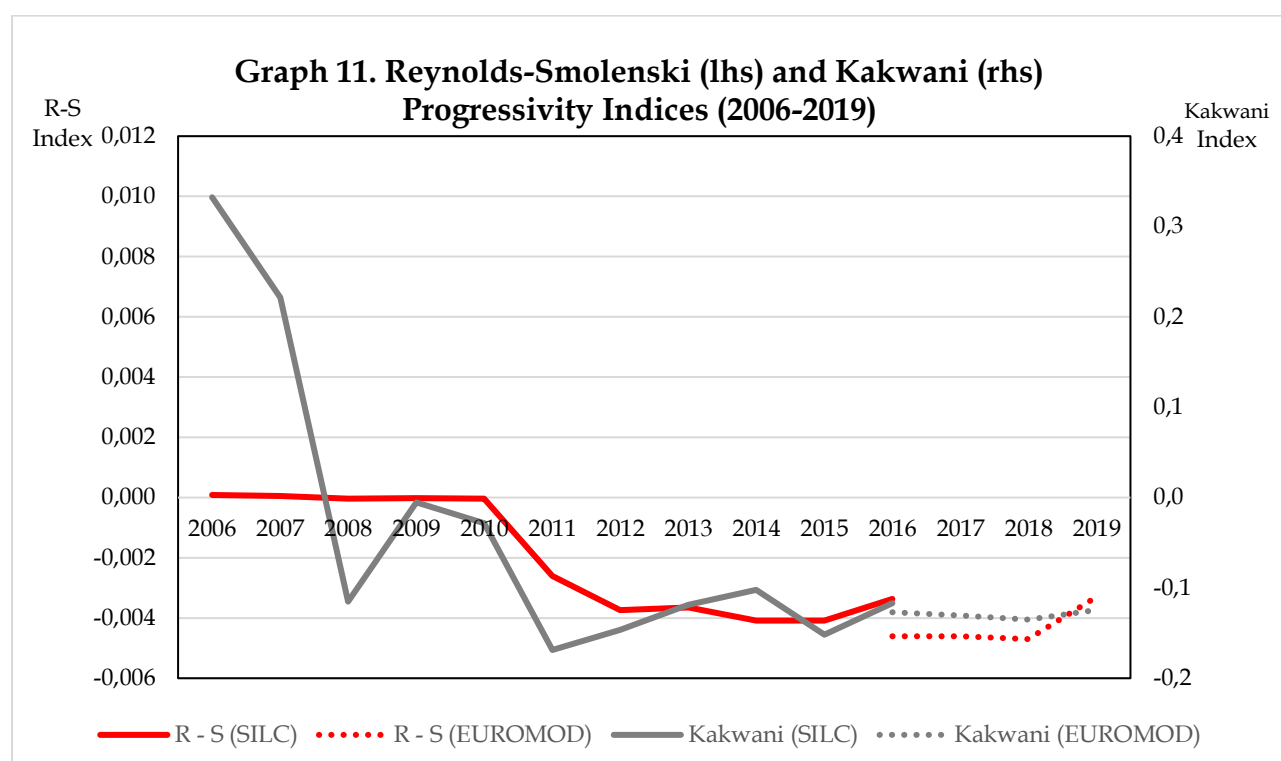
**Graph 9iii. Property taxes as share of pre-tax disposable income by decile, 2016**





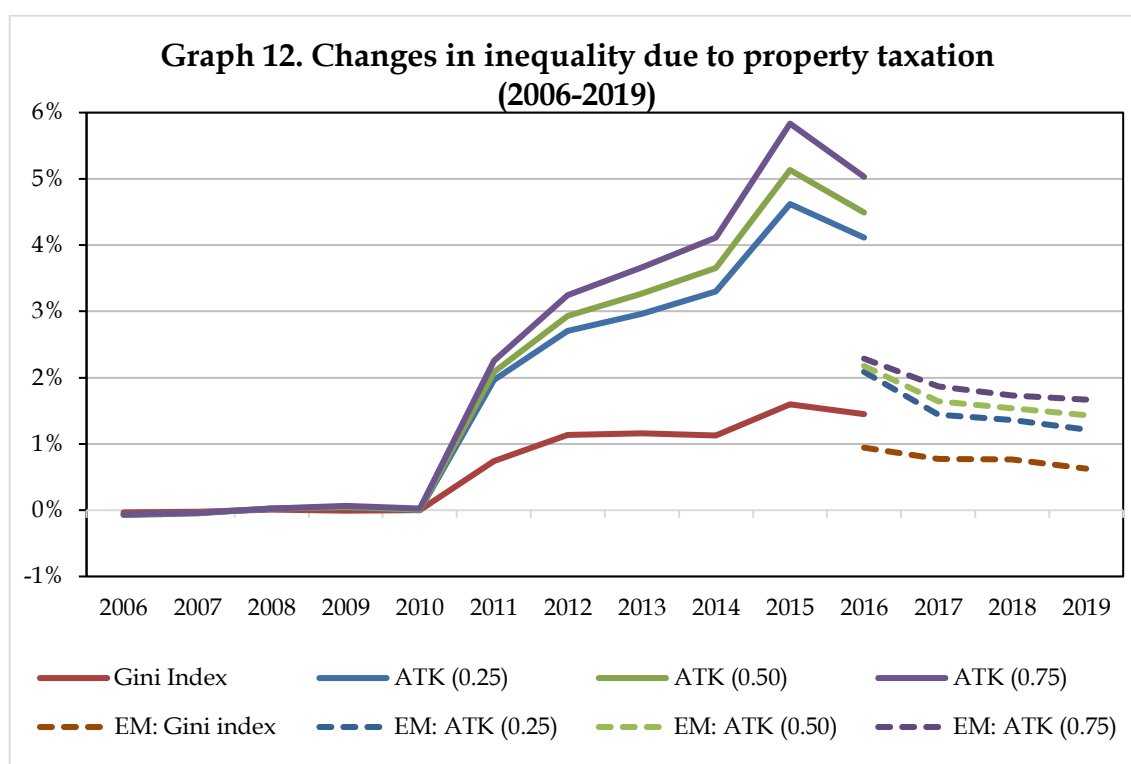


Graphs 10i, 10ii and 10iii go a step further and show the Lorenz curves of the distribution of pre-tax equivalized income and the concentration curves of recurrent property taxes for the three years under consideration. The grey area around the concentration curves is the 5% confidence interval for the corresponding points of the curves. In general, since tax is a negative income component, if the tax concentration curve lies above (below) the Lorenz curve of the pre-tax income distribution, the Lorenz curve of the post-tax income distribution is likely to lie below (above) the pre-tax Lorenz curve. Some interesting observations can be made. In 2007 the concentration curve lies below the Lorenz curve, implying that the property taxes of that year were progressive (the top 5% of the distribution paid almost 40% of the, admittedly very low, total amount of the tax). However, the wide band of the confidence interval implies that safe conclusions are hard to draw. On the contrary, in both 2012 and 2016 the concentration curves lie above the Lorenz curve and the confidence intervals are pretty narrow. This is another indication that the post-tax distribution of income is likely to be more unequal than the pre-tax distribution.



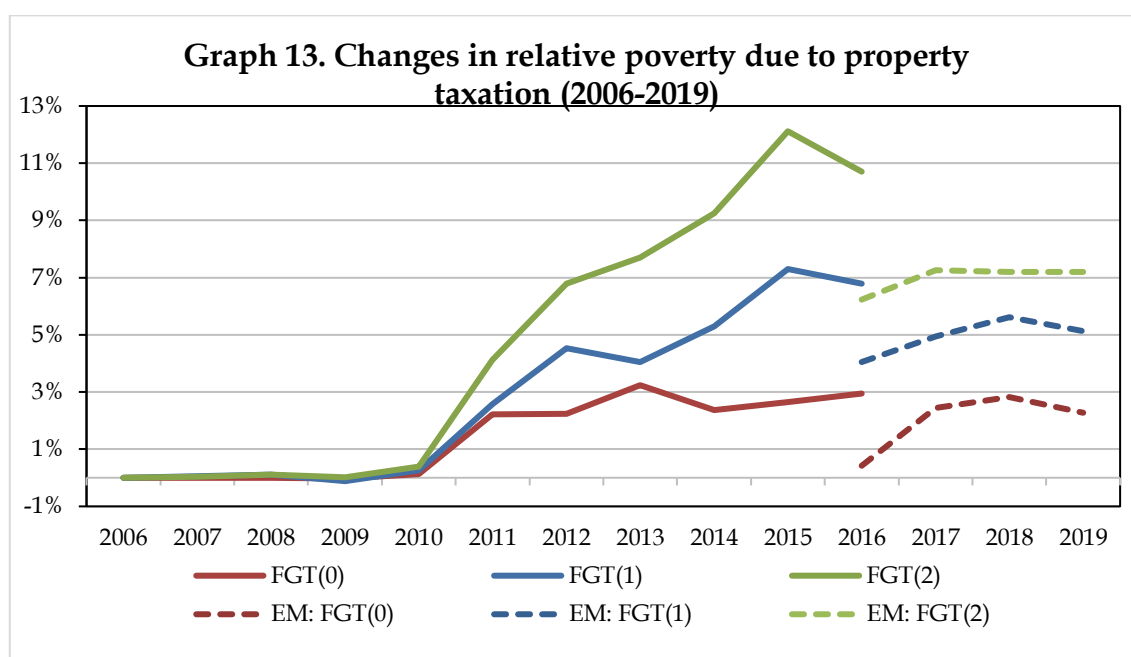
Graph 11 depicts progressivity indices for all the years under examination. Estimates for the period 2006-2016 are derived directly from SILC data, while EUROMOD-based estimates are provided for the years 2016-2019. Naturally, the simulated estimates of EUROMOD do not coincide with those observed in the sample in 2016, but the differences are quite low. Estimates of two indices of progressivity (and redistribution) are shown in the graph. The first

is the index of Kakwani (1977), which essentially measures departures from proportionality and takes values between -1 and 1; the larger the value of the index is, the more progressive is the social intervention. However, this index is not affected by the size of the corresponding transfer. Estimates of the index are reported on the right vertical axis of the graph. The second index is that of Reynolds and Smolensky (1977) which, essentially, measures the difference between the Gini coefficient of the pre-tax income distribution and the Gini coefficient of the post-tax income distribution. It also takes values between -1 and 1 and the larger its value, the higher the progressivity of the social intervention. Unlike the former index, this index is sensitive to the size of the transfer. The index of Kakwani has a rather erratic pattern until 2010 but, in general classifies the redistributive effects of the property taxes in the early years as progressive. On the contrary, the Reynolds-Smolensky index for the same period is always very close to zero, implying that the impact of the tax on measured inequality was negligible. For the period after the introduction of EETHDE and ENFIA, both indices move to negative territory, implying that the property tax reforms of that period were regressive. It is interesting to note that in the final year under consideration, when proportional cuts to ENFIA were introduced, the Kakwani index hardly moves, while the Reynolds-Smolensky index records a decline in regressivity (the estimated value of the index increases from -0.047 to -0.033).



Inequality indices were calculated both for the distribution of disposable income including property taxes (pre-tax distribution) and for the distribution of disposable income net of

property taxes (post-tax distribution). The corresponding proportional changes in the estimates of the inequality indices due to recurrent immovable property taxes for each year are depicted in Graph 12. For the purposes of the graph, we use the Gini index and three members of the parametric family of Atkinson (1970) indices. In comparison to other indices of inequality, the Gini index is relatively more sensitive to changes close to the middle of the income distribution (Cowell, 2000). In the case of the Atkinson index, the inequality-aversion parameter is, successively, set at 0.25, 0.50 and 0.75. Ceteris paribus, the higher the value of the inequality-aversion parameter, the more sensitive the index is to changes close to the bottom of the distribution. The evidence of Graph 12 shows that the effect of property taxation on the distribution of disposable income for the period 2006-2010 was very close to zero. In the following years the effect is negative and, in fact, the changes in inequality indices become increasingly larger between 2010 and 2015. In 2016 the impact is again inequality-increasing, but the effect is smaller than that of 2015. The change in the value of the Gini index as a result of the immovable property tax reforms (1.6% at the maximum) is smaller than the increase recorded in the Atkinson indices (between 4.6% and 5.8% at the peak). It is worth noting that the higher the inequality-aversion parameter of the Atkinson index the larger the proportional change in the value of the index. The changes in the estimates of inequality indices recorded using EUROMOD for 2016 are smaller than those recorded in the original SILC data, but the relative ranking of the indices remains the same. According to the evidence of Graph 12, for the period 2016-2019, the impact of recurrent property taxation remained regressive, but the policy changes introduced in these years moderated its inequality-increasing impact.



Finally, the effects of these taxes on relative poverty are assessed in Graph 13. For the purposes of this graph, the poverty line is not held constant but is always set at 60% of the median income of the corresponding income distribution. Three members of the parametric Foster-Greer-Thorbecke (1984) (FGT) family of poverty indices are exploited for the purposes of this graph: the headcount ratio, FGT(0), that measures the proportion of the population falling below the poverty line, but is not sensitive to the severity of their poverty; FGT(1) that is the product of the headcount ratio and the average poverty gap (distance between the poverty line and the mean income of the poor divided by the poverty line); and FGT(2) that measures the product of the head count ratio by the squared poverty gap and, thus, unlike FGT(0) and FGT(1), is sensitive to the distribution of income among the poor. The results reported in Graph 13 are largely similar to those of Graph 12. Minimal changes in the indices until 2010; in most cases increasingly larger rises in relative poverty between 2011 and 2015 and a smaller increase between 2015 and 2016 (at least for FGT(2) whose value in 2015 increases by more than 12% as a result of recurrent property taxes - the pattern of the other two is not entirely clear); the higher the poverty-aversion parameter of the index the larger the recorded proportional change in relative poverty; changes in the estimates of the poverty indices in 2016 lower when simulated data used instead of the original SILC data. However, the simulations of EUROMOD suggest that unlike the changes recorded in inequality indices for the period 2016-2018, the poverty-increasing impact of recurrent property taxes rose during this period. For the last year under examination, the poverty-increasing effect of property taxes declines according to FGT(0) and FGT(1) but remains stable according to FGT(2). Nevertheless, it is clear that the reforms in the field of recurrent property taxation in the years of the Economic Adjustment Programs increased relative poverty.

## **5. Conclusions**

The paper aimed to examine the distributional impact of recurrent property taxation in Greece. Until a few years ago, recurrent property taxation was playing a minimal role in the Greek tax system. In the middle of the recent severe crisis, a new scheme of recurrent property taxation was introduced, initially covering only buildings connected to the electricity grid, but later extended to all types of real estate. The new tax had high collectability, boosted public revenues and helped substantially the fiscal stabilization effort of the country. In line with the experience of several other countries, this tax was also hugely unpopular.

Our results show that the distributional effect of the tax was clearly regressive. Although, on average, in absolute terms richer households paid higher recurrent property taxes than poorer households, the ratio of the tax to the pre-tax disposable income was substantially higher in the case of poorer households. As a consequence, *ceteris paribus*, inequality and (relative) poverty indices rose after the imposition of the tax. The result was stronger in the case on inequality indices that are relatively more sensitive to changes close to the bottom of the distribution and poverty indices that are sensitive to the distribution of income among the poor. Recent policy changes proportionately reducing the tax mitigated these effects. However, carefully designed tax relief may be needed if the aim is to keep the amount of tax revenues collected constant and at the same time neutralize its adverse distributional impact. Yet, taking into account that the “grey economy” is extensive in Greece (Kelmanson et al., 2019), the link of property taxation with income criteria should be tackled with care in order to avoid increasing incentives for tax evasion.

## References

- Almy, R. (2014). Valuation and Assessment of Immovable Property. OECD Working Papers on Fiscal Federalism No. 19.
- Andriopoulou, E., Karakitsios, A., & Tsakloglou, P. (2018). Inequality and poverty in Greece: Changes in times of crisis. In Katsikas, D, Sotiropoulos, D. A. & Zafiropoulou, M. (eds) *Socioeconomic fragmentation and exclusion in Greece under the crisis Taxation Trends in the European Union, Publications Office of the European Union*, 23-54. Palgrave Macmillan, London.
- Andriopoulou, E., Kanavitsa, E., & Tsakloglou, P. (2020). "Decomposing poverty in hard times: Greece 2007-2016", *Revue d'économie du développement*, (forthcoming).
- Atkinson, A. B. (1970). On the measurement of inequality, *Journal of Economic Theory* 2(3), 244-263.
- Bank of Greece (2019). Bulletin of Conjunctural Indicators 189. Bank of Greece, Athens.
- Blackorby, C. & Donaldson, D. (1980). A Theoretical Treatment of Indices of Absolute Inequality, *International Economic Review* 21(1), 107-136.
- Blackorby, C. & Donaldson, D. (1984). Ethical social index numbers and the measurement of effective tax/benefit progressivity, *Canadian Journal of Economics* 17(4), 683-694.
- Cabral, M. & Hoxby, C. (2012). The Hated Property Tax: Salience, Tax Rates, and Tax Revolts, National Bureau of Economic Research Working Paper 18514.
- Chawla, R. K., & Wannell, T. (2003). Property taxes. *Perspectives, Statistics Canada*, July 4(7), 7-14.
- Cowell, F.A. (2000). Measurement of inequality. In Atkinson, A.B. & Bourguignon, F. (eds) *Handbook of Income Inequality I*, 87-166. North Holland, Amsterdam.
- Davis, C., Davis, K., Gardner, M., McIntyre, P. S., McLynch, J., & Sapozhnikova, A. (2009). *Who Pays? A Distributional Analysis of the Tax Systems in all 50 States*. Institute on Taxation and Economic Policy.
- Diamond, P. A., & Mirrlees, J. A. (1971). Optimal taxation and public production I: Production efficiency. *The American Economic Review*, 61(1), 8-27.
- European Commission (2019). *Taxation Trends in the European Union, Publications Office of the European Union*, Luxembourg.
- Figari, F., Paulus, A., & Sutherland, H. (2015). Microsimulation and policy analysis. In *Handbook of income distribution* (Vol. 2, pp. 2141-2221). Elsevier, Amsterdam.
- Foster J.E., Greer J. & Thorbecke E. (1984). A class of decomposable poverty measures, *Econometrica* 52(3), pp. 761-766.

- Ioannides, Y. M., & Pissarides, C. A. (2015). Is the Greek crisis one of supply or demand?. *Brookings Papers on Economic Activity*, 349-383.
- Jann, B. (2016). Estimating Lorenz and concentration curves. *The Stata Journal*, 16(4), 837-866.
- Journard, I., Pisu, M., & Bloch, D. (2012). Tackling income inequality. *OECD Journal: Economic Studies*, 2012(1), 37-70.
- Kakwani, N. C. (1977). Measurement of tax progressivity: an international comparison. *The Economic Journal*, 87(345), 71-80.
- Kelmanson, B., Kirabaeva, K., Medina, L., Mircheva, & Weiss J. (2019). Explaining the shadow economy in Europe: size, causes and policy options. IMF Working Paper WP/19/278.
- Kim, K., & Lambert, P. J. (2009). Redistributive effect of US taxes and public transfers, 1994-2004. *Public Finance Review*, 37(1), 3-26.
- Lyons, M. (2007). *Lyons Inquiry into Local Government – Place-Shaping: A Shared Ambition for the Future of Local Government*. The Stationery Office, London.
- Marical F. (2009). Les mécanismes de réduction des inégalités de revenus en 2008, in *France Portrait Social – Edition 2009*. INSEE, Paris.
- Meghir, C., Pissarides, C. A., Vayanos, D., & Vettas, N. (2017). *Beyond Austerity: Reforming the Greek Economy*. MIT Press, Boston.
- Mirrlees, J., Adam, S., Besley, T., Blundell, R., Bond, S., Chote, R., Gammie, M., Johnson, P., Myles, G. & Poterba, J.M. (2011). *Tax by design*. Oxford University Press, Oxford.
- Musgrave, R. A. & Musgrave, P. B., (1989). *Public finance in theory and practice* (5<sup>th</sup> edition). McGraw-Hill, New York.
- Norregaard, J. (2013). Taxing Immovable Property Revenue Potential and Implementation Challenges, IMF Working Paper WP/13/129.
- Palameta, B. & Macredie, I. (2005). Property taxes relative to income. *Perspectives, Statistics Canada*, March, 6(3), 14-24.
- Ramsey, F. P. (1927). A contribution to the theory of taxation. *The Economic Journal* 37(145), 47-61.
- Reynolds, M. & Smolensky, E. (1977). *Public expenditures, taxes, and the distribution of Income: The United States, 1950, 1961, 1970*. Academic Press, New York.
- Slack, E. & Bird, R. (2014). The political economy of property tax reform. OECD Working Papers on Fiscal Federalism, No. 18.
- Sutherland, H., & Figari, F. (2013). EUROMOD: the European Union tax-benefit microsimulation model. *International Journal of Microsimulation*, 6(1), 4-26.



Tammik, M. (2019). Baseline results from the EU28 EUROMOD: 2015-2018. EUROMOD Working Paper EM6/19, University of Essex.

Tsakloglou, P., Economides, G., Pagoulatos, G., Philippopoulos, A. & Triantopoulos, C. (2016). *A roadmap to exit the crisis: A new productive model for Greece*, diaNEOsis, Athens, (in Greek).