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Abstract

Greece is the country hit hardest in output terms by the crisis and subsequent fiscal consolidation strategies, suffering a cumulative output loss of about 30% since 2008. The present paper presents evidence that along with declining average living standards, consumption inequality has seriously grown, fueled primarily by a disproportionate drop in the consumption levels of what can be considered the middle class. Although poverty has not significantly risen in relative terms, it climbs to around 45% once the poverty threshold is anchored to pre-crisis levels. At the same time, significant indirect tax hikes have further increased inequality in consumption expenditure. The paper also shows that several reforms launched in the name of reducing labour costs, broadening the tax base or rationalizing the targeting of social benefits have had detrimental effects on one of the most vulnerable population groups, namely families with children. Even if growth picks up in the years to come, the social consequences of the crisis will be long lasting. The alarming increase of child poverty in Greece and the dramatic decline of the private and public resources most children currently live on is not only the most repulsive facet of the economic crisis, but also undermines future growth prospects and implies structural changes with regard to future social mobility and the equalization of the opportunity structure of the society.

JEL classification code: D63, E62, H23, H53, H50, H62, I38

Keywords: Greek crisis, fiscal consolidation; inequality; poverty; child poverty; indirect taxes

1. Introduction

Greece is the country hit hardest in output terms by the crisis and subsequent fiscal consolidation strategies, suffering a cumulative output loss of about 30% since 2008. Greek households cut back on their consumption expenditure by a commensurate percentage of almost 30%. The present study exploits several waves of Household Expenditure Survey (HES) data in order to document the consequences of the crisis and austerity policies in relation to evolutions in consumption inequality and poverty among the Greek population from the onset of the crisis until the end of 2013. It further analyses the distributional impact of major indirect tax hikes adopted as part of successive fiscal consolidation packages since 2009, building on the work of Kaplanoglou and Rapanos (2014) and Kaplanoglou (2014).

The Greek crisis is well documented.[1] The global financial crisis, the complete derailment of the 2009 public deficit and the exceedingly high, though until then seemingly manageable, public debt pushed the country into an insolvent financial position. The financial assistance finally provided by the European Commission, the European Central Bank and the International Monetary Fund was accompanied by an economic adjustment programme designed to put the fiscal house in order. Since then, fiscal policy has been severely restrictive, as the fiscal impulse, generally measured by the change in the structural fiscal balance, amounted to a cumulative -19.3% of GDP in the 2010-2013 period, compared to a Eurozone average of just -4.3% of GDP (OFCE et al, 2014). The cost of rapid fiscal consolidation in output terms has been high, since the volume index of GDP per capita in purchasing power standards (PPS), expressed in relation to the European Union (EU28) average set to equal 100, went down by almost 29 per cent between 2009 and 2013.[2] The economic crisis manifested itself in changes both to the labour market and wages and public policy changes to tax, transfer and public sector pay

[1] For two very recent comprehensive reviews, see Katseli (2015) and Karamessini (2014).
[2] Data from the AMECO database extracted on 13/3/2015.
http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tec00114&plugin=1

costs. Each of these changes have had quite heterogeneous impacts on the population and it is difficult to understand a priori who is impacted most by these changes. It is quite important therefore from a public perspective to understand the distributional impacts of these changes with respect to the evolution of overall inequality and poverty.

The present paper is novel in several ways. First, contrary to existing studies almost all of which analyse *income* inequality and poverty,[3] we focus on consumption expenditure, thus better capturing the impact of the crisis and austerity on the actual living standards of households. Second, we analyse poverty and inequality not based on simulations of current policies on micro databases of past years, but on current Household Expenditure Survey microdata gathered by the Hellenic Statistical Service by 2013 and released in November 2014. This is of crucial importance, given that 2013 is the trough year of the recession and hence captures the full extent of the consequences of prevailing consolidation strategies on Greek households. Finally, the paper also analyses the distributional impact of *indirect taxes* up to 2013, filling a gap in the literature since most similar papers take into account the reforms of income taxation. This is at clear odds with the importance of indirect taxes in revenue terms, since the latter yield a much higher percentage of public budget revenue compared to income and property taxes.

The results point to a significant rise of inequality of consumption expenditure among Greek households during the crisis, fueled primarily by a disproportionate drop in the consumption levels of what can be considered the "middle class". Although consumption poverty does not significantly rise in relative terms, it climbs to around 45% once the poverty threshold is anchored to 2008 in real terms. The paper also documents an extremely worrying outcome of the crisis that has not received proper attention so far. On top of the increase in unemployment rates and wage cuts among parents, a range of seemingly unrelated measures have had a dramatic cumulative impact on the well-being of one of the most vulnerable groups in society, i.e. children. There appears to be a massive move

[3] See for example, Duiella and Turinni (2014), OECD (2014a) and especially for Greece see Matsaganis and Leventi (2013), Mitrakos (2014).

of families with children towards the lowest end of the welfare distribution, with around half of Greek children now living as the "2008 poor". Consumption patterns of Greek households have also drastically changed as a result of the crisis and so did the extent of progressivity or regressivity of particular taxes. Despite the fact that poor households have substituted their consumption away from commodities mostly hit by indirect tax hikes, the distributional impact of such hikes is regressive. If the current system of indirect taxes were to be replaced by an equal-yield proportionate VAT, inequality would fall, suggesting that indirect taxes overall further increase consumption inequality.

The paper is organized as follows. The second section describes the data used in the study as well as methodological choices and caveats. The third section presents various facets of the evolution of inequality and poverty in Greece during the crisis, while the fourth section explores and compares the distribution of the indirect tax burden and of the major indirect tax increases adopted as part of recent fiscal consolidation packages, while it also assesses the effects of indirect taxes on welfare inequality. The fifth section concludes.

2. Methodology and Data

The assessment of consumption inequality and poverty, as well as the evaluation of the distributional effects of indirect taxes are based on Household Expenditure Survey (HES) microdata, collected by the Hellenic Statistical Authority (EL.STAT.). The survey covers a sample of around 3,500 households, while response rates (between 70% and 85%) are in general higher than those in other European Union countries (Eurostat, 2008). Household design weights are applied by EL.STAT in order to account for imperfections in the sample and non-response bias, following the Eurostat methodology (Eurostat, 2013).

Expenditure is recorded at a highly disaggregated level (covering several hundreds of commodity groups). The reliability of such data is an object of concern in many countries (e.g. Deaton, 2005, Edgar and Safir, 2011). The most common way of assessing the performance of household expenditure surveys is to calculate the ratio of total expenditures observed in the household survey, grossed up to the aggregate level, to the total expenditures taken from the national accounts. There are several reasons to expect this ratio not to be 100 percent, for example due to differences in population coverage (Meyer and Sullivan, 2009). In the Greek case, the coverage rate lies around 80%. This compares rather well to results for other countries; Barrett et al (2012), for example, report coverage rates between 67% and 77% for Australia, the UK and the United States for the period 2005-2010. Similarly, Smith (2007) reports that expenditure from the HES is between 80% and 84% of equivalent national account outlays for New Zealand. [4]

Assessing inequality and poverty requires a ranking of households in terms of welfare, which is not directly observable. The most obvious proxies on which information is provided in household surveys are income and consumption, the former focusing on the means available to purchase commodities and the latter on the goods and services actually consumed. We have chosen consumption over income as a better approximation of welfare both due to the practical limitation that income is severely under-reported in the Greek HES and on the basis of theoretical arguments. Such arguments suggest that consumption is a better measure of 'life-cycle' or 'permanent' income than current income, which may be subject to short-term fluctuations (Friedman, 1957, Browne and Levell, 2010). Moreover, while income would be a good measure of "command over resources", it "fails to represent the full amount of resources on which individuals rely to cope with the needs of everyday life and to face unexpected events" (Atkinson and Piketty, 2007, page 88).

This is particularly true during the present economic crisis for a number of reasons. First, consumption is more likely than income to capture the effects of saving and dissaving,[5] the ownership of durable goods such as houses and cars, and access to credit. Second, consumption is also more likely to reflect private and government transfers. Particularly in the Greek case, family cash or in-kind transfers constitute an

[4] The degree of underreporting is rather high for specific expenditure items, like alcohol and tobacco.
[5] Net household saving rate has plumped from -4% in 2008 to -14.6% in 2012 (OECD, 2014b), because, among other reasons, households were systematically drawing on their savings in order to at least partly maintain living standards. In this sense, consumption poverty is expected to provide a lower bound of income poverty.

informal social safety net. Finally, material hardship and other adverse family outcomes are more severe for those with low consumption than for those with low income, a matter of principal concern under conditions of economic crisis. Household consumption expenditure has been deflated and adjusted for differences in household size and composition using the modified OECD equivalence scale (Hagenaars et al, 1994), while the calculation of inequality and poverty measures is derived by assigning equivalent household expenditure to each equivalent member.[6]

Turning to the design of the indirect tax system, indirect tax payments are calculated by applying nominal tax rates (of e.g. VAT or excises) on household expenditure on the respective commodities.[7] This type of calculation assumes that indirect taxes are fully shifted to consumer prices. In theory, the degree of tax shifting could be of either side of 100% depending on the elasticities of demand and supply and the market structure (Lockwood, 1988). In a recent review of studies on the distributional impact of consumption taxes in OECD countries, Warren (2008, p.15) argues that "*all* tax shifting assumptions are controversial. As a result, simplistic assumptions are ultimately made about tax shifting: in the case of consumption taxes, the common assumption generally used is that they are shifted fully forward to the final consumer of the good or service." This assumption is backed by empirical evidence; see for example Besley and Rosen (1998) and Georgakopoulos (1991).

Imputing indirect tax burdens by applying nominal tax rates on recorded household expenditure implicitly further assumes complete compliance with the tax system. This is far from realistic. Precise estimates are not available for all indirect taxes and all years under consideration, nevertheless the European

[6] More specifically, inequality is calculated over households (not e.g. over individuals), each household is weighted by its number of equivalent adults and the expenditure level assigned to each household is total household expenditure divided by the number of equivalent adults present in the household.

[7] Indirect taxes on intermediate goods that are not rebated are not modelled in this paper. This suggests that certain indirect taxes, like excises on transportation fuels, are underestimated. Modelling the shifting of taxes on intermediate inputs on final demand involves several methodological alternatives with different researchers adopting quite varying approaches, while in many distributional studies such taxes are not taken into account (Warren, 2008). In the Greek case, available input-output data do not allow accurate modelling of taxes on business inputs.

Commission (2012) reports that the VAT 'compliance gap'[8] in Greece is estimated between 20% and 30% of theoretical VAT liability in the 2000-2006 period. Even if such indicators suggest that evasion is widespread, it is not safe to argue that the household indirect tax burden is reduced by the same amount. Under-reporting sales by not issuing an invoice and sharing the gain with the final consumer is only one among many ways in which VAT can be evaded –for a full list, see e.g. Keen and Smith (2007). Moreover, evasion patters can safely be assumed to vary by e.g. product sector or geographical location. Finally, the VAT compliance gap estimator includes tax arrears (i.e. tax assessed but not collected yet), which should not be part of tax evasion. The Greek Ministry of Finance estimates that tax arrears in June 2011 amounted to €41.1 bn or almost 20% of 2011 GDP. For all the above reasons, it is hard to devise a convincing strategy for accounting for the distribution of benefits from indirect tax evasion among households.

3. Evolutions of consumption inequality and poverty during the crisis, 2008-2013

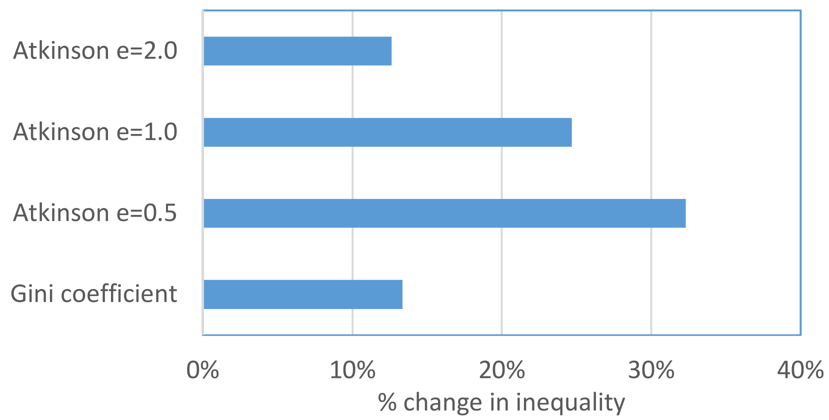
As documented by the Hellenic Statistical Authority (2014), average household consumption expenditure (at constant 2013 prices) went down by almost 32% since 2009. Such a decline may mask substantial variation across different groups of the population. One way to assess the effect of the crisis on household budgets is to measure relative inequality and check whether such inequality has increased since the onset of the crisis. We employ several inequality measures, i.e. the well-known Gini index, as well as the Atkinson index for values of the inequality aversion parameter (ε) of 0.5, 1 and 2. This is done because different inequality indices reflect different value judgments about the relative importance of the welfare of people in different parts of the distribution.[9] As is apparent from Figure 1,

[8] The VAT gap compares VAT receipts with a theoretical net VAT liability. The latter is calculated by identifying the categories of expenditure that give rise to irrecoverable VAT and combining them with appropriate VAT rates.

[9] For details of the calculation of summary statistics and a review of the voluminous literature on the comparison and ranking of different distributions, see Cowell (2011).

consumption inequality has substantially increased during the crisis according to all inequality measures.

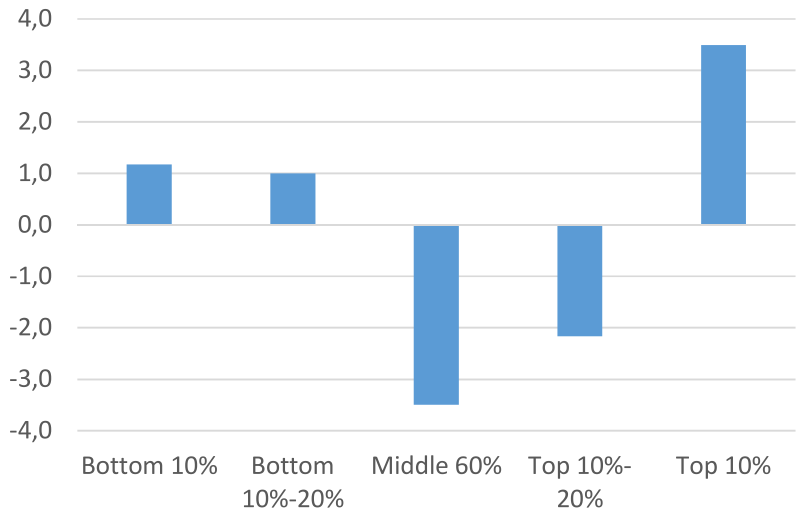
Figure 1. Change in household consumption inequality between 2008 and 2013 (in per cent)



Source: Household Expenditure Survey data, 2008 and 2013.

One would further like to know whether the inequality change is driven by the bottom or the top of the distribution and what has happened to the middle. As Atkinson and Brandolini (2011) point out, the European Union uses as its main inequality measure the ratio of the income share of the top 20 per cent to that of the bottom 20 per cent. Transfers away from the middle 60 per cent could, if made proportionally, leave the measured income inequality unchanged. Ignoring the "middle" comes in sharp contrast with the renewed interest in the middle class in view of the growth-related and political implications of its evolvement (e.g. Easterly, 2001, López-Calva and Ortiz-Juarez, 2014). Adjusting the methodology of Atkinson and Brandolini (2011), we present in Figure 2 the change in the expenditure shares of the middle 60 per cent of the population, ranked by increasing equivalised consumption expenditure, together with the shares of the bottom and top two deciles, in 2008 and 2013. The evidence is rather worrying, as it indicates that the impoverishment of the middle class lies behind the trend towards the increased inequality. The top 10 per cent experienced the lowest relative loss, improving its share in total consumption. The bottom 20 per cent broadly maintained its expenditure share, which perhaps explains the lower increase of overall inequality indicated by the Atkinson index if one adopts a higher value of the inequality aversion parameter.

Figure 2. Expenditure share of the bottom, middle and top expenditure groups, *change* between 2008 and 2013

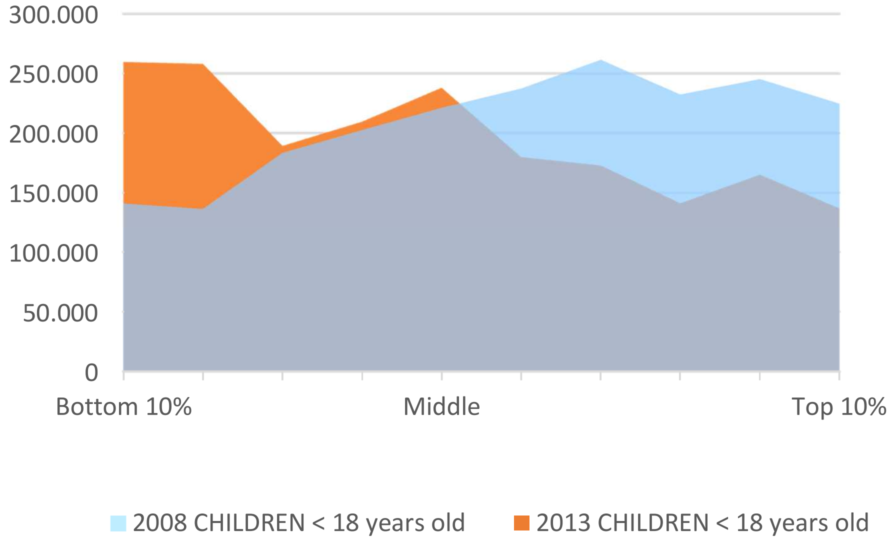


Source: Household Expenditure Survey data, 2008 and 2013.

The fact that the bottom 20 per cent maintained its expenditure share during the crisis is not particularly comforting for several reasons. First, maintaining such a share when total consumption expenditure has dropped by around 30% implies huge budget cuts anyway. Second, the bottom 20 per cent spends its budget on inelastic expenditure which cannot easily be curtailed. Thirdly, the composition of this group changed during the crisis, as families with children massively moved to the lower end of the distribution (see Figure 3), while it is evidently harder for such households to cut their expenses.

Another interesting facet of evolutions in inequality is the relative position of households at different occupational positions. This is especially interesting since the effects of the crisis and austerity involved most primarily job losses, wage cuts, pension cuts and tax hikes all of which impacted on consumption levels. Table 1 presents data on the distribution of households according to the occupational

Figure 3. Frequency distribution of children across deciles, 2008 and 2013



Source: Household Expenditure Survey data, 2008 and 2013.

status of its head and its members and the relative welfare level of such households in relation to the average, in 2008 and in 2013. The same data are presented for households with children. Around half of Greek households had head in employment in 2008, with the percentage falling to 42% by 2013 (columns 1 and 2). At the same time, while almost 90% of children lived in families with a head in employment, the same is true for only 70% of children by 2013 (columns 3 and 4). The proportion of households with head unemployed increased by a factor of five during the crisis and by a factor of seven among families with children.

Concentrating on the lower part of Table 1, the increase of the proportion of children living in families where both parents are working has dropped from 51% to 39%. Although wages substantially fell during the crisis, such households managed to slightly improve their consumption levels in relative terms, i.e. in comparison to the population average. At the same time, the proportion of families with children with at least one unemployed person shot up from 8.6% in 2008 to 33.8% in 2013, while the living standards of such households systematically lag significantly behind the population average. 8.4% of these families have two or more members in unemployment and live on just 55% of the resources available to the population average. One further notices that the number of families with children dependent on pension income has also increased from 8.8% to 13.8%, which corroborates recent findings that pension benefits constitute a significant share of income for households with children in certain countries including Greece (Diris, et al 2014).

Table 1. Relative position of households according to the occupational status of its members

	% of households		% of households with children		Expenditure as % of population average		Expenditure of households with children as % of population average	
	2008 (1)	2013 (2)	2008 (3)	2013 (4)	2008 (5)	2013 (6)	2008 (7)	2013 (8)
Households with head:								
Employed	48.8	42.1	87.9	69.8	116	115	111	110
Unemployed	2.3	10.9	2.7	18.3	75	77	64	68
Pensioner	37.6	36.2	5.0	8.4	83	91	93	95
Other	11.3	10.9	4.5	3.6	91	93	127	98
Households with:								
one person working	32.2	35.4	40.3	46.5	112	103	104	93
two or more persons working	30.0	21.9	50.7	39.2	116	121	116	124
one unemployed	6.4	20.0	7.4	25.4	84	85	78	87
two or more unemployed	0.9	5.6	1.2	8.4	72	66	66	55
one pensioner	28.3	29.0	7.1	9.3	88	92	89	94
Two or more pensioners	13.4	11.7	1.7	4.5	78	89	86	86

Source: Household Expenditure Survey data, 2008 and 2013.

Another indicator documenting the decline in living standards during the crisis is the risk-of-poverty rate. The standard relative poverty measure is unanchored and defined as the proportion of the population whose equalized expenditure is below 60 percent of the median expenditure. In the context of the crisis experienced in the particular country, however, sizeable GDP declines also turn into serious declines in median expenditure, so that the relative poverty measure masks the real impoverishment of Greek households. The preferred measure when analyzing changes in poverty during the crisis would therefore be the anchored risk-of-poverty rate, as the median expenditure is anchored in 2008. The anchored measure in this case is defined as the proportion of the households whose equivalised expenditure is below 60 percent of median equivalised expenditure in 2008 – adjusted for inflation.

Figure 4 shows the risk-of-poverty rate in 2008, in 2013 (unanchored) and in 2013 anchored in 2008. Relative poverty remained practically stable at around 20% during the crisis for the population as a whole (see blue bar of part (a) of Figure 4). If one includes imputed expenditure, like imputed rent and consumption of own agricultural production, relative poverty even decreases by little. This is not surprising considering the high home ownership rates also among low-income households, while consumption of privately produced animal and agricultural products is also higher among the poor. The mild picture on the evolution of poverty is totally reversed once we look at anchored poverty. The proportion of households in 2013 living as the "2008 poor" shoots up to 45% (and to just over 40% if we take into account imputed expenditure), which itself manifests the extent of impoverishment of Greek households during the crisis. Attention should be drawn to the fact that the comparison refers to living standards in real terms. This welfare measure has the dual advantage of encompassing the effects of disposable income cuts of any kind and of not being biased by widespread tax evasion that distorts any respective income measure.

The evolution of child poverty is truly alarming. Before the outbreak of the crisis, children seem to have been doing well in comparison to the average, since they were under-represented among those at-risk of poverty (see the marks in Figure 4). The relative position of children completely reversed within the next five years. Child poverty rates have literally shot up during the crisis. Almost half of children in Greece now reside in households with the living standards of the "2008 poor". Results remain qualitatively the same regardless of whether we take into account imputed expenditure and the situation is worse according to all measures for children under the age of 6. This result corroborates findings by OFCE et al (2014) of an almost 13pp increase in the proportion of children facing severe material deprivation according to SILC 2013 data.

Figure 4. Percent of population at risk-of-poverty 2008-2013

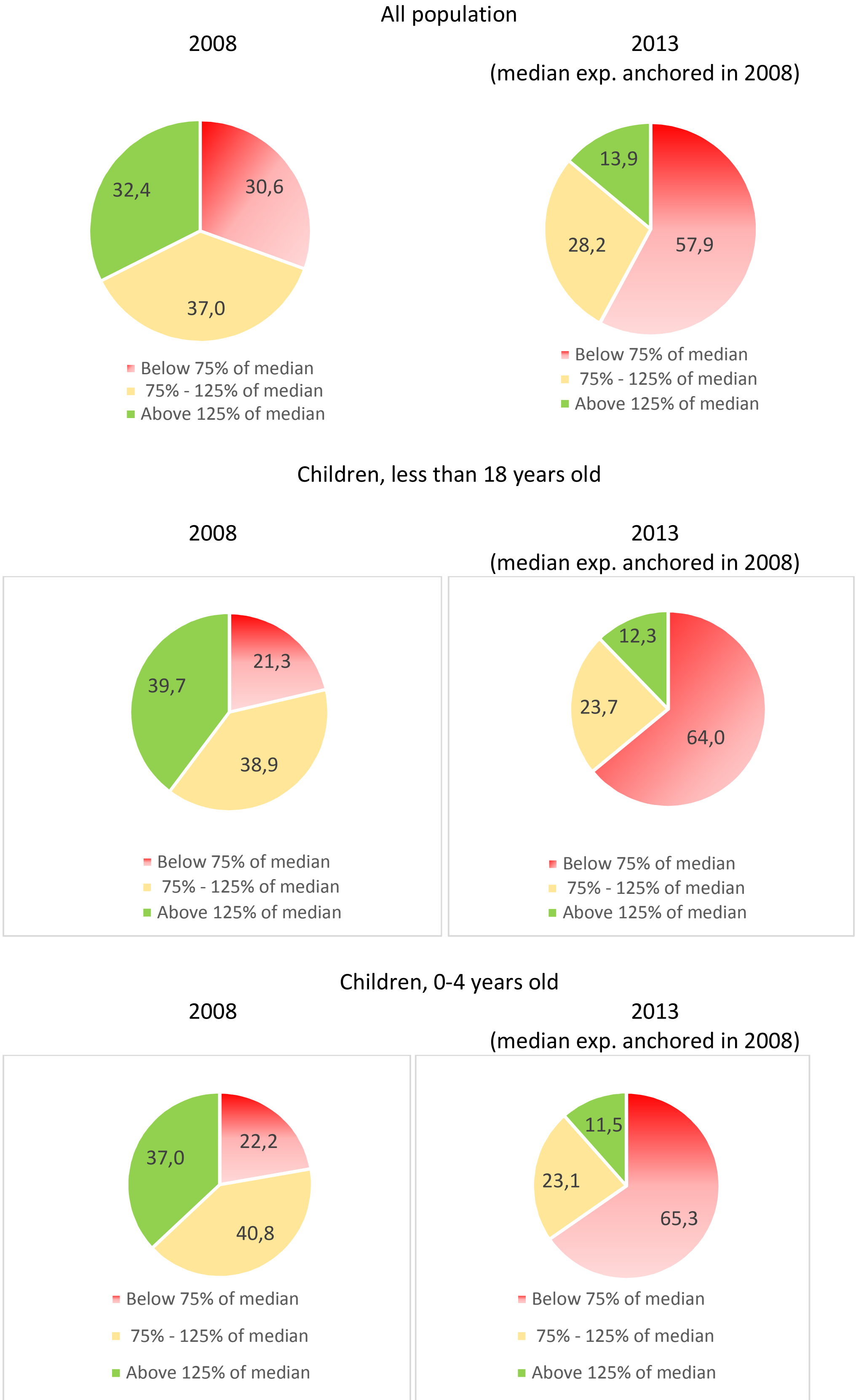
(a) household consumption expenditure (only purchases)

(b) household consumption expenditure (including imputed expenditure)

Source: Household Expenditure Survey data, 2008 and 2013.

Figure 5 follows the Atkinson and Brandolini (2011) approach of considering the entire distribution and identifying the population shares falling in the middle class, below and above it. We use the 75 and 125 per cent of median equivalised expenditure as cut-offs, so, for example, the middle class consists of households

Figure 5. Population shares of the bottom, middle and top consumption groups (%)



Source: Household Expenditure Survey data, 2008 and 2013.

with equivalised expenditure of 75-125 percent of median expenditure.[10] According to the top part of Figure 5, the middle class would include 37% of the population before the crisis, with the rest being almost equally distributed among the above- and below- middle class groups. If we anchor the middle class cut-offs at 2008 (in real terms), the middle class shrinks to 28 per cent by 2013, the upper expenditure group less than halves to almost 14 percent and more than half of the population (around 58 percent) now belongs to the low-expenditure group.

The data of Figure 5 verify the impoverishment of children in Greece during the crisis. In 2008, only 21% of children belonged to the low-expenditure group, while the rest were almost equally split among the middle and the above-middle groups. In 2013, the child population share belonging to low-expenditure households more than triples to 64 percent. The middle class would account for less than a quarter of children and the upper expenditure group for less than one eighth. The children born during the crisis (0 to 4 years old) are in an even worse situation (see bottom part of Figure 5). This unfavourable development is due to a combination of factors. As documented in Table 1, a growing percentage of children live in households with unemployed parent(s). Even parents in employment have faced substantial wage cuts, since the real wages per head in the whole economy fell by 25.6 per cent between 2009 and 2013 (Karamessini, 2014). At the same time, several reforms introduced in the tax and benefit system after 2012 on the basis of rationalizing the targeting of child benefits or expanding the income tax base have apparently had a big negative cumulative impact on families with children. Universal child benefits for families with three or more children were replaced in 2013 with means-tested child benefits, so that families belonging to the middle class were no longer entitled to such benefits. Even more importantly, by 2012 families with children were granted an additional tax allowance (its level depending on the number of children). This was abolished in 2013.

The decline in the living standards of children within their families comes at a time when the quality of education, health and social care services provided by the

[10] We have alternatively used different cut-offs, but the conclusions remain qualitatively the same.

state is deteriorating as well, putting pressure on the family as welfare provider. This is likely to create a child poverty trap with detrimental effects, since poverty has a direct or indirect negative impact on children's educational outcomes, health and future life opportunities (European Commission, 2008, OFCE et al 2013, 2014).

4. The distributional impact of indirect tax hikes during the crisis

a. The structure of indirect taxes: 2008-2013

Greece stands out among developed countries in its unusually high share of indirect taxes in total tax revenue. Consumption has been the primary tax base throughout the country's recent history, with the direct/indirect tax revenue ratio in 2011 standing at 1.5 compared to a Eurozone average of approximately 1. Recent tax reforms motivated primarily by the need for fiscal consolidation raised the overall tax-to-GDP ratio, with the largest part of the increase being financed by indirect taxes, whose share in GDP increased from 10.9% to approximately 13% between 2009 and 2013.

The indirect tax structure combines a multi-rate VAT system with several excise taxes and a progressive structure of car purchase taxes and transport dues. The VAT is applied in three rates, with the very low rate being applied to medicines, hotel services and several cultural items (books, newspapers, magazines and theatres), the low rate covering most food items, heating oil, medicines, transport services, etc., while the standard rate covers all the remaining goods and services. [11]

Table 2 summarizes the main indirect taxes and how they were reformed in the years under consideration in this paper. Fiscal consolidation measures adopted after 2009 as a response to the severe fiscal crisis involved major indirect tax hikes in all VAT rates and all excises, most of which more than doubled (see last column of Table 2). The most extreme increase regards heating oil, as in the fall of 2012 the government in an effort to contain evasion, aligned heating oil and transport fuel

[11] Certain services, like education or banking services are VAT exempt.

excises at 330€ per hl, which implied a 450% rise in the heating oil excise. Moreover, excise duties were introduced on electricity consumption in May 2010 and on natural gas in July 2011.

Table 2. Indirect Tax Structure, 2008-2013[1]

	2008	2013
VAT	standard rate: 19% reduced rate: 9% base rate: 4.5%	standard rate: 23% reduced rate: 13% base rate: 6.5%
Excise on Unleaded Petrol	350 eur/1,000 litres	670 eur/1,000 litres
Excise on Heating Gas Oil	21 eur/1,000 litres	330 eur/1,000 litres
Excise on Alcohol	1,090 eur/100 litres of pure alcohol	2,450 eur/100 litres of pure alcohol
Excise on Tobacco	57.5% of retail price	69.3 % of retail price
Excise on Electricity	-	2.2 euros / MWh
Excise on Natural Gas	-	5.4 euros /MWh
Special Excise on Cars	varies by car engine (e.g. 30% of producer price for 1800cc, progressive)	varies by car engine (e.g. 30% of producer price for 1800cc, progressive)
Transport Dues	vary by car engine (e.g. 168 euros for 1600cc)	vary by car engine (e.g. 265 euros for 1600cc)
Stamp Duties	1.8% on rents, 2.4% on insurance premiums	1.8% on rents

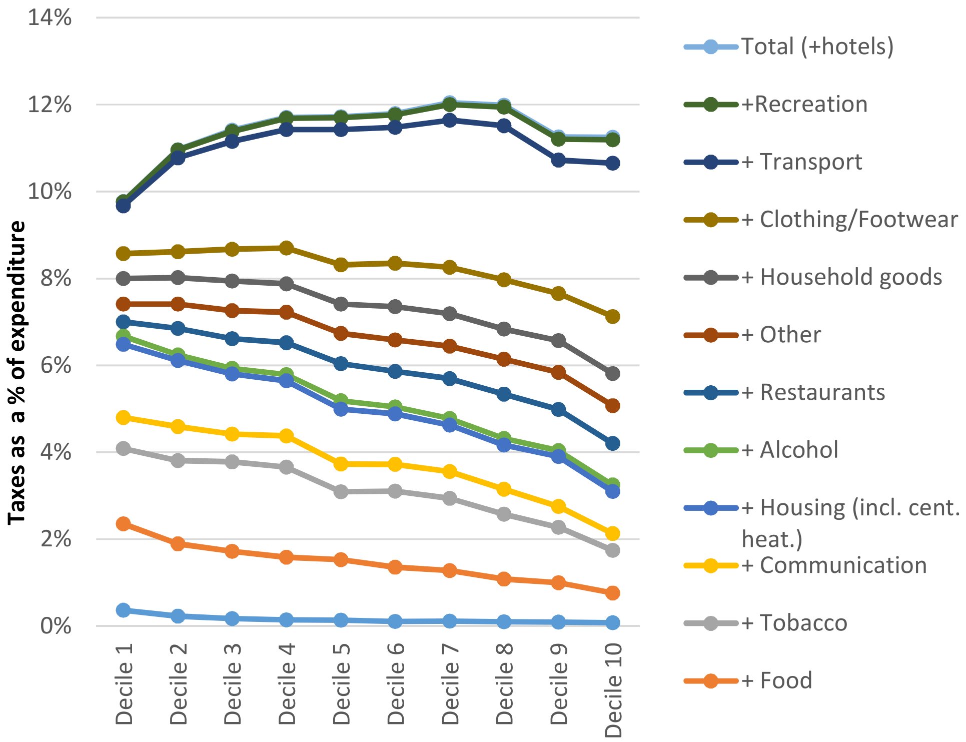
[1]A small number of taxes with very low yields are not presented in this Table.
Sources: http://ec.europa.eu/taxation_customs/taxation/excise_duties/energy_products/rates/index_en.htm, Bank of Greece, Governor 's Report (various issues), Confederacy of Tax Officials, Tax Report (various issues).

b. *Empirical results*

The fiscal crisis and associated austerity measures signify a drastic increase in the indirect tax burden, which in 2013 absorbed approximately 15% of total household expenditure, compared to less than 11.5% in 2008. The pattern of indirect tax payments by commodity group in these years appears in Figures 3a-3b. These figures show the cumulative distribution of tax payments in the two years under consideration at a commodity level, where taxes have been ranked in order of regressivity.[12] It becomes apparent that in 2008 there is a clear grouping of regressive taxes, namely those on food, tobacco, housing (which includes heating oil), health and communication. The pattern of regressivity is partly reversed when taxes on cars and their use are taken into account (for an extensive analysis of the redistributive properties of car taxes during the last 20 years in Greece, see Kaplanoglou, 2009). Strongly progressive car purchase taxes and transport dues, as well as high gasoline excises considerably increase the tax burden on the better-off households which have more and more-expensive cars.

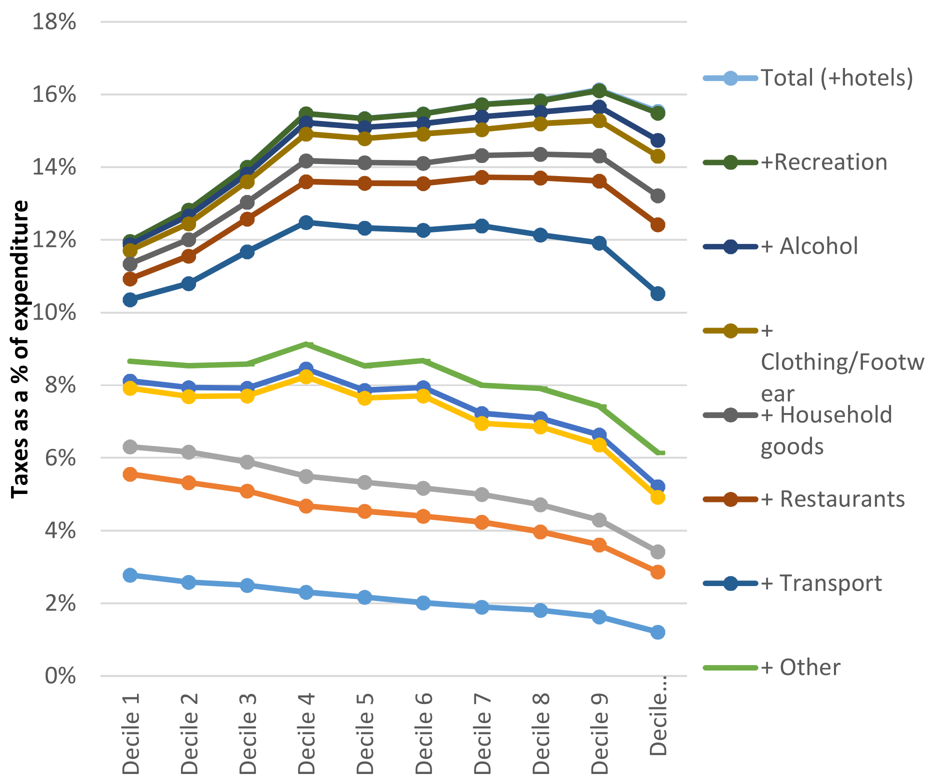
The distributional attributes of indirect taxes across various commodity groups considerably changed by 2013, reflecting major changes both in tax rates and in the consumption patterns of households as a result of the economic recession. The

FIGURE 6a. Cumulative Indirect Taxes by Deciles, 2008



[12] In assessing the distributional impact of indirect taxes, we rank households by equivalent expenditure on non-durables. Consumer durables are purchased infrequently and provide their services to a household for a time period much longer than the one covered in the HES. At the same time, many consumer durables. E.g. cars, are taxed much more heavily than other commodities. Including expenditure on durables in the household welfare indicator would, therefore, make the indirect tax system artificially progressive. In this case, we therefore measure welfare by equivalent household's expenditure on all non-durable items, as is the case in many similar studies (McGregor and Borooah, 1992, Newbery, 1995, Newbery and Révész, 2000).

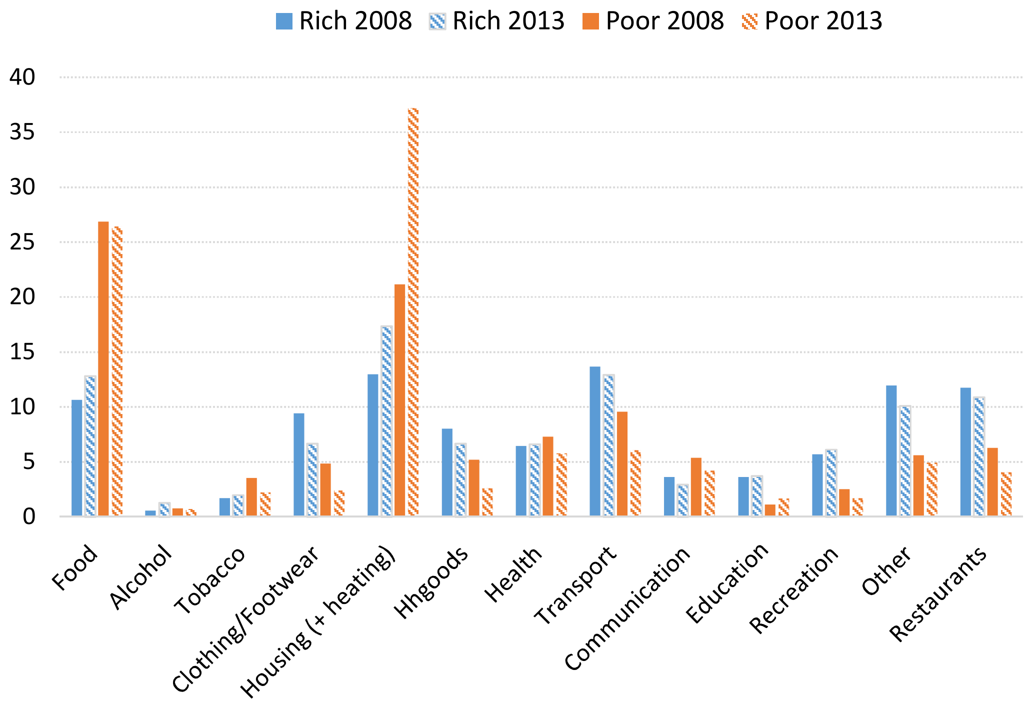
FIGURE 6b. Cumulative Indirect Taxes by Deciles, 2013



Source: Household Expenditure Survey data, 2008 and 2013.

indirect tax on food is the single most regressive tax, followed by indirect taxes on housing, communication and tobacco. Taxes on all other commodities now appear more or less progressive. This is primarily the result of poorer households spending almost their entire budget on inelastic expenditure like food and housing. For the lowest quintile of the household distribution, food and housing now add up to 65% of total expenditure (up from just 45% before the crisis, see Figure 7). At the same time, these households have halved or more than halved (in real terms) expenditure on household goods, tobacco, clothing and footwear, and alcohol. Spending on education is the only item moving upwards in real terms among the poorest 20% of households, apparently signifying the change in the composition of the poor, among whom families with children are over-represented.

Figure 7. Budget shares of poorest 20% and richest 20%



Source: Household Expenditure Survey data, 2008 and 2013.

Changes in the distributional pattern of indirect taxes are better understood if one considers changes in tax rates in conjunction with the way households reacted to the crisis and the drastic overall shrinking of their budgets. Indirect tax rates increased for all commodity groups, yet the increase was not uniform as documented in Table 3. Column (5) of this table shows the change in the tax component of the retail price of various commodity groups. Certain groups, such as clothing, household goods (durables and non-durables) and recreation, were affected just by the rise in VAT rates. The highest increases are recorded for alcoholic beverages, tobacco and transport (including transport fuel), the excises on all of which almost doubled between 2008 and 2013. Restaurants were moved from the reduced to the standard VAT rate, hence the sizeable increase in the respective tax component. The increase in the tax component of communication services is explained by the considerable rise in fees on cell phone bills. Hotels benefited from the government policy to boost tourism by

TABLE 3

The effect of indirect tax reforms since the crisis by commodity group

	Bud. share 2008 *(1)*	*Bud. share 2013* *(2)*	*Kakwani progressivity index 2008* *(3)*	*Kakwani progressivity index 2013* *(4)*	*Change in tax as a % of retail price (2008-2013)* *(5)*	*Change in tax payment as a % of household expenditure (2008-2013)* *(6)*
Food	15.9	18.2	-0.20 (2)	-0.19 (1)	3.4	0.79
Alcoholic beverages	0.6	1.0	-0.02 (6)	0.11 (11)	10.0	0.15
Tobacco	2.5	2.7	-0.14 (3)	-0.11 (4)	12.6	0.37
Clothing/Footwear	8.0	5.2	0.12 (10)	0.10 (10)	2.7	-0.21
Housing (+ heating oil)	14.5	22.8	-0.09 (5)	-0.15 (2)	1.0	1.08
of which heating oil	*2.5*	*2.1*	*-0.17*	*-0.10*	*28.9*	*0.44*
Household goods	6.9	5.0	0.09 (9)	0.09 (9)	2.4	-0.11
Health	6.5	6.2	-0.28 (1)	0.02 (5)	2.6	0.08
Transport	13.0	11.2	0.14 (11)	0.05 (7)	9.8	0.70
Communication	4.3	3.7	-0.13 (4)	-0.13 (3)	7.2	0.14
Education	3.0	4.1	-	-	0	0.00
Recreation	4.7	3.0	0.19 (12)	0.25 (12)	2.8	-0.01
Restaurants	9.9	8.1	0.07 (7)	0.09 (8)	10.2	0.45
Hotels	0.6	0.5	0.22 (13)	0.35 (13)	-2.1	-0.02
Other	9.7	8.3	0.08 (8)	0.04 (6)	1.5	0.02
TOTAL	100.0	100.0	0.01	-0.02	-	**3.44**

Source: Household Expenditure Survey data, 2008 and 2013.

transferring hotel services from the reduced to the base VAT rate, which explains the only negative figure in column (5) of Table 3.

The above increases in the tax component of the retail price of various commodity groups do not translate into analogous increases in the tax payments of households, as the latter adjusted their consumption patterns in reaction both to changes in relative prices of commodities and to the severe changes in their income. Looking at the budget shares of commodities in 2008 and 2013 (columns 1 and 2 of Table 3), it is clear that necessities like food and housing now occupy a higher share of the household budget. Households seem to have considerably cut back on expenditure in clothing/footwear, household goods and eating out. Demerit goods, like tobacco and alcohol, maintained their budget share.

Despite limited increases in the tax rate on food and housing, these two commodity groups account for more than half the increase in the household indirect tax burden between 2008 and 2013 (see column (6) of Table 3), apparently as a result of their high budget share. Another fifth of this increase is accounted for by transport, primarily the increase in transport fuel taxes.

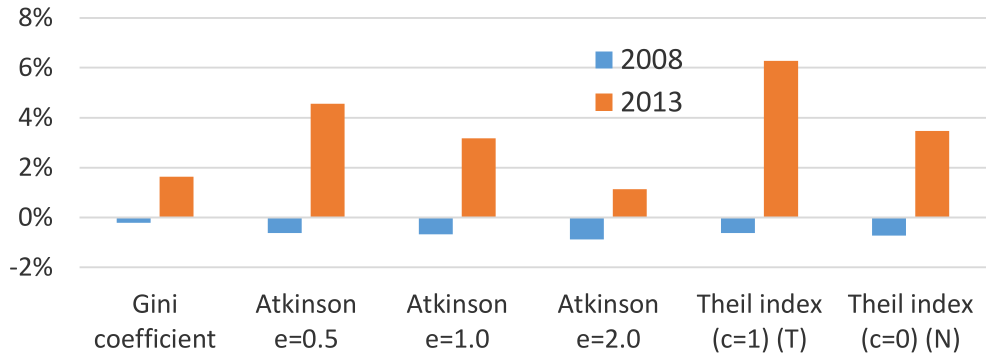
The distributional features of indirect taxes on different commodity groups (quantified by the Kakwani progressivity index) also considerably changed. As poorer households use up most of their resources to cover food and housing expenses, taxes on these two expenditure groups by 2013 have become the most regressive. Excises on demerit goods (alcohol and tobacco) now target less the poor, as the latter have apparently reduced their consumption on such goods, or perhaps have turned to the black market. Taxes on health (exclusively medicines) were the most regressive taxes in 2008. By 2013, they have turned progressive. This is the joint result of two factors. First, VAT was introduced in private hospital treatment and this is a profoundly progressive tax. Second, poor households have seriously cut back private health expenditure. This is particularly worrying, since it coincides with parallel attempts to reduce welfare state expenditure on health by increasing admission fees and co-payments for outpatient and diagnostic services in public hospitals, and by excluding many drugs and diagnostic tests from the list of those reimbursed by social security. The long-term effects of such policies on public health and healthcare are expected to be detrimental (Simou and Koutsogeorgou, 2014), but their analysis is beyond the scope of the current paper.

The value of the Kakwani progressivity index (Kakwani, 1977) has significantly increased for taxes on recreation, restaurants and hotels, suggesting that the consumption of the latter has acquired an even more luxury character during the economic crisis. At the same time, however, their budget share has declined, so that only expenditure on restaurants (moved from the reduced to the standard VAT rate) actually increased the overall indirect tax burden of households. Regarding taxes on transport and primarily on cars, gasoline and transport dues, the collapse of the car market (by 2013 new car purchases had fallen to 20% of the 2008 figure) seems to have deactivated a progressive part of the tax structure. The Kakwani progressivity index for this expenditure category is significantly lower in 2013 compared to 2008, while the increased tax payments do not match the quite substantial tax hikes. Turning to housing, heating oil is the single commodity mostly hit by tax hikes, as the tax component of its retail price increased by almost 30 percentage points. Despite being a necessity, its budget share fell, while the heating oil tax has become significantly less regressive, since poorer households switched to other heating means or were simply left without heating.

In the previous section an increase in consumption inequality between 2008 and 2013 was documented. Does the indirect tax system of 2008 and 2013 have an aggravating or an alleviating effect on such inequality? One way to address this question is to measure the change in inequality induced by the existing tax system vis-à-vis a tax system of uniform equal-yield tax applying to all goods and services. We employ several inequality measures, i.e. the well-known Gini index, the Atkinson index for values of the inequality aversion ε of 0.5, 1 and 2, and the two Theil indices, *T* and *N*.

Figure 8 shows by how much consumption inequality increases or decreases as a result of the indirect tax system in 2008 and 2013 compared with a distributionally-neutral uniform equal-yield tax. Inequality hardly changes if the 2008 tax system is replaced by a uniform tax, suggesting that strongly regressive taxes (e.g. on health or food) broadly balance quite progressive taxes (e.g. those on cars). The tax increases introduced since then had a clearly adverse distributional effect, with all indices suggesting that inequality would substantially increase if the 2013 indirect tax system replaced a uniform tax. This effect is even more worrying if one considers that it incorporates behavioural responses on part of households. Poor households substituted consumption away from commodities hit hardest by indirect tax hikes even if such goods were necessities (e.g. heating oil) and spend their budget mostly on low-taxed food and housing. This is why the increase in inequality induced by indirect taxes is lower for higher values of the inequality aversion parameter *e*.

Figure 8. Change in inequality induced by the actual indirect tax system vis-à-vis a uniform equal-yield tax



Source: Household Expenditure Survey data, 2008 and 2013

Summing up, Greek households faced an increase of their indirect tax burden of about 30% on average between 2008 and 2013. The average increase masks significant variations both across commodities and across household deciles. While the 2008 indirect tax system had a broadly neutral effect on expenditure inequality, by 2013 the system clearly increases inequality compared to a uniform equal-yield tax. At the same time, however, the rise in inequality is more moderate the more one cares for the poor (i.e. for higher values of the inequality aversion parameter). This at first sight paradoxical result is explained by the fact that the consumption patterns of households and the degree to which each household could or had to substitute consumption away from highly taxed commodities is the primary factor determining how much more tax it had to pay. Poor households substituted expenditure away from heavily taxed commodities whose relative price has sizably increased. This effect shifts overall tax payments towards wealthier households, who can still afford such commodities. In this context, however, taxes on even textbook necessities like heating oil or medicines are no longer particularly regressive, as poor households, faced with the need to slash their overall budget, seriously cut back expenditure on such items as well. Therefore, behavioural responses of households are expected to have a moderating effect on the *recorded* regressivity of the indirect tax system and partly mask the distributional impact of recent indirect tax hikes. This is an issue certainly worth to be taken up in future research.

5. Concluding remarks

After years of stepwise convergence of its per capita GDP to the European Union average, Greece has seriously diverged following the outbreak of the fiscal and economic crisis in 2009. The present paper presents evidence that along with declining average living standards, consumption inequality has seriously grown by all inequality indices employed. The rise in inequality is driven primarily by a weakening of the middle class, as the middle 60 per cent of the population lost expenditure shares to the benefit primarily of the richest. Perhaps even more worrying is the fact that families with children have massively moved to the lower end of the welfare distribution, with around half of Greek children now living as the "2008 poor". Looking at the distribution as a whole, the proportion of children living in the middle-class or upper middle groups has shrank from around 80 per cent in 2008 to 35 per cent by 2013.

Since the effects of the crisis and most tax and benefit reforms are in a way encompassed in the shrinking budgets of households, the paper further explores the distributional impact of *consumption* taxes and how this changed during the crisis. Successive indirect tax hikes have resulted in an increase of the indirect tax burden by 30 per cent for the average household. Despite the fact that there are evident distortions in the consumption patterns particularly of the least well-off away from highly-taxed commodities, indirect taxes overall exacerbate consumption inequality. Shrinking budgets and unequally-valenced tax hikes have also changed the progressivity/regressivity features of several taxes.

Even if growth picks up in the years to come, the social consequences of the crisis will be long-lasting. Unemployment has reached 27 per cent, 72 per cent of which is already long-term (Karamessini, 2014), so that Greece now records by far the highest level of long-term unemployment in the European Union (OFCE et al, 2014). The slow and yet unsteady speed of economic recovery in Greece suggests that the long-term unemployed bear the risk of getting marginalized and that inequality and poverty are likely to persist for long. High inequality and child poverty are connected with lower education outcomes (Wilkinson et al, 2010), while increases in inequality and poverty can put the political legitimacy at stake (Vandenbroucke et al, 2013).

The process under way in a sense serves as a counter example of the Nordic paradigm of the post 1960s where the income distribution was compressed through minimizing unemployment at the bottom of the social pyramid, instead of maximizing the welfare benefits to the poor (see Esping-Andersen, 2015). Boosting employment opportunities for both parents, in conjunction with a universally high quality school and pre-school system acted as effective guarantees against child poverty and enhanced the equality of opportunity. Seen under this light, the alarming increase of child poverty in Greece and the dramatic decline of the private and public resources most children currently live on is not only the most repulsive facet of the economic crisis, but also undermines future growth prospects and implies structural changes with regard to future social mobility and the equalization of the opportunity structure of the society.

In a climate of still severe financing problems of the public budget and continuing technical and political negotiations, concrete policy advice is hard to give. Yet, the policy conclusions of the present study are far fetching. Rapid fiscal consolidation of the kind implemented in Greece has seriously damaged social cohesion, has introduced major inequalities, especially regarding the shrinking of the middle class and the exacerbation of consumption poverty, and has impacted most severely on the most vulnerable population groups (like families with children). The Greek experience should therefore serve as a “don’t try it at home” experiment and foster the understanding at a European level that fiscal consolidation strategies should be more distributionally sensitive.

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