

EVOLUTIONS IN CONSUMPTION INEQUALITY AND POVERTY IN GREECE: THE IMPACT OF THE CRISIS AND AUSTERITY POLICIES

BY GEORGIA KAPLANOGLOU* and VASSILIS T. RAPANOS

National and Kapodistrian University of Athens and Academy of Athens

Greece is the country hit hardest by the crisis and subsequent fiscal consolidation strategies, suffering a cumulative output loss of about 30 percent 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 percent once the poverty threshold is anchored to pre-crisis levels. Furthermore, significant indirect tax hikes have further increased inequality in consumption expenditure. The paper also shows that several reforms launched in the name of reducing labor 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, thus implying that the social consequences of the crisis will be long-lasting.

JEL Codes: D63, H23, I30

Keywords: child poverty, Greek crisis, indirect taxes, inequality, poverty

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 percent since 2008. Greek households cut back on their consumption expenditure by a commensurate percentage of almost 30 percent. 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 (2015).

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

Note: The authors would like to thank Conchita D'Ambrosio (the editor) and two anonymous referees for helpful comments.

*Correspondence to: Georgia Kaplanoglou, Economics Department, National and Kapodistrian University of Athens, Gryparion Megaron, Sofokleous 1, Athens 105 59, Greece (gkaplanog@econ.uoa.gr).

¹For two very recent comprehensive reviews, see Katseli (2015) and Karamessini (2014).

Commission, the European Central Bank and the International Monetary Fund was accompanied by an economic adjustment program 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 percent of GDP in the 2010–13 period, compared to a Eurozone average of just -4.3 percent 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 percent between 2009 and 2013.² The economic crisis manifested itself in changes both to the labor market and wages and public policy changes to tax, transfer and public sector pay 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, it is the first study that focuses on consumption expenditure in order to analyze aspects of inequality and poverty in Greece during the crisis, whereas existing studies focus on *income*.³ We thus enrich the analysis of the impact of the crisis and austerity on the actual living standards of households.⁴ Second, we analyze 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.⁵

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 percent once the poverty threshold is anchored to 2008 in real terms. The paper also documents an extremely worrying outcome of the crisis

²Data from the AMECO database extracted on March 13, 2015.

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

⁴For recent studies that point out the importance of using household consumption expenditure data to complement the analysis of inequality and poverty, see among others Brewer *et al.* (2006) and Brewer and O’Dea (2012).

⁵A notable exception is Giannitsis and Zografakis (2015), who devote a part of their study on the incidence of indirect tax hikes. However, their results are not directly comparable to our paper since this study again uses income data as a household welfare indicator, while the incidence of tax hikes is examined by simulating both the 2008 and 2013 indirect tax systems (excluding motor vehicle excises) on 2013 consumption expenditure data.

that has been receiving increasing attention. 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 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 percent and 85 percent) 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 percent. This compares rather well to results for other countries; Barrett *et al.* (2012), for example, report coverage rates between 67 percent and 77 percent for Australia, the U.K. and the U.S. for the period 2005–10. Similarly, Smith (2007) reports that expenditure from the HES is between 80 percent and 84 percent of equivalent national account outlays for

New Zealand. The degree of underreporting is rather high for specific expenditure items, like alcohol and tobacco.

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, p. 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,⁶ 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 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.

A further complication arises from the fact that Household Expenditure Surveys record household expenditure on commodities, rather than their consumption. The two notions are substantially close for most commodity groups, the main exception being durable goods (e.g. cars, refrigerators). Consumer durables reflect an element of standard of living that may not be captured by current spending (as people buy them infrequently). Especially in the case of housing, the HES does not record purchases of real estate. Nevertheless, in the case of owner occupied housing, it records imputed rent. Furthermore, imputed expenditure is also recorded from own production (e.g. in the case of farmers) and from other households or organizations.⁷ When ranking households in terms of welfare, (e.g. in assessing the distributional consequences of indirect taxes), we include imputed expenditure, but subtract expenditure on durables due to its stochastic nature.⁸ When measuring inequality, on the other hand, one would be interested to the evolution of overall expenditure inequality, including expenditure on durables. In

⁶Net household saving rate has plummeted from -4 percent in 2008 to -14.6 percent 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.

⁷According to the 2008 HES imputed expenditure represents 17 percent of total household expenditure, while the respective figure in 2013 is 18.8 percent.

⁸This view is common in similar studies (e.g. Anand and Harris, 1990; McGregor and Borooh, 1992).

any case, the household welfare indicator is explicitly explained in the notes of figures or tables. Finally, household consumption expenditure is deflated and adjusted for differences in household size and composition using the modified OECD equivalence scale, while the calculation of inequality and poverty measures is derived by assigning equivalent household expenditure to each equivalent member.⁹

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.¹⁰ 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 percent 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 Georgakopoulos (1991) and Besley and Rosen (1998).

One could argue that in times of crisis and fall in aggregate expenditure, indirect tax hikes are harder to be passed on to consumers. Although the assumption of full tax shifting is, strictly speaking, an unrealistic one, available evidence suggests that the bias introduced is expected to be very small. According to Eurostat methodology,¹¹ official EL.STAT. estimates of the harmonized consumer price index at constant tax rates (HICP-CT) assume full tax shifting of indirect tax rate changes. Several Bank of Greece Governor’s Annual Reports provide similar estimates, backed by a Bank of Greece study (Karabalis and Kondelis, 2013), according to which, the degree of shifting of increases in excise taxes is estimated at 100 percent. VAT hikes are also estimated to have been shifted to consumer prices to a very large extent, owing to the market structure and lack of competition.¹² The

⁹More specifically, inequality is calculated over households (not 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.

¹⁰Indirect 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.

¹¹The Harmonised Index of Consumer Prices at constant tax rates is compiled by the Member States in the frame of the Commission Regulation (EU) No 119/2013, according to which the relative data has to be transmitted to Eurostat in a regular monthly basis, in parallel with HICP data (on the methodology see European Commission, 2009).

¹²Especially in the case of commodities with inelastic demand, Karabalis and Kondelis (2013) estimate that VAT shifting is almost full (approximately 95 percent in the case of energy and 81-87 percent in the case of processed food). On the contrary, the increase of VAT on non-alcoholic drinks and restaurants enacted in September 2011, had only partly been passed through by 2012 (the authors estimate a rate pass-through rate of 30 percent), perhaps because this increase had not fully worked into prices by then, as the authors point out. In any case, the budget share of these commodities is too small to affect overall results.

authors thus conclude that the El.STAT. estimates of HICP-CT are good and transparent. This evidence is also supported in IMF country reports on Greece (e.g. IMF, 2013).

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 Commission (2012) reports that the VAT “compliance gap”¹³ in Greece is estimated between 20 percent and 30 percent of theoretical VAT liability in the 2000–06 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 patterns 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 percent 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, 2008–13

As documented by the Hellenic Statistical Authority (2014), average household consumption expenditure (at constant 2013 prices) went down by almost 32 percent 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. As is apparent from Figure 1, the inequality of total household consumption expenditure has substantially increased during the crisis according to all inequality measures. The rise in consumption expenditure inequality parallels rises in income inequality during the same period, at least as documented by Matsaganis and Leventi (2014). Figure 1 also suggests that this increase is obviously driven primarily by expenditure on durables (so that more well-off households continued spending substantial amounts on durables), since inequality of consumption on non-durables has increased by markedly less.

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 percent to

¹³The 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.

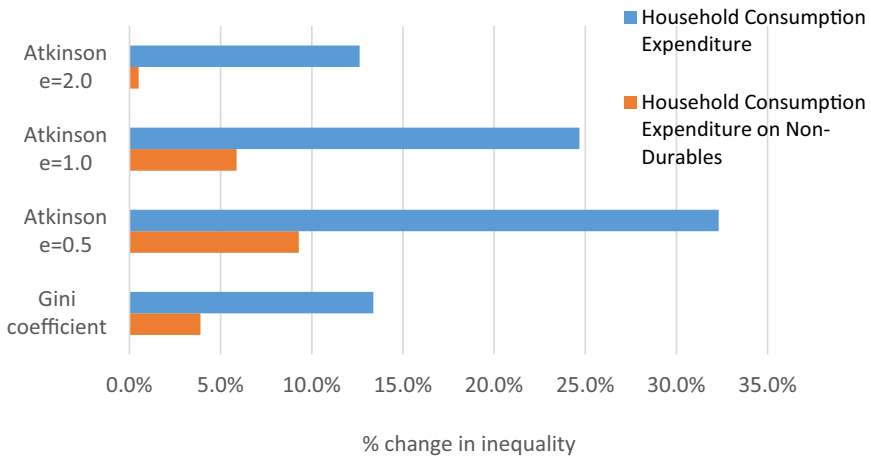


Figure 1. Change in Household Consumption Inequality between 2008 and 2013 (in per cent) [Colour figure can be viewed at wileyonlinelibrary.com]

Source: Household Expenditure Survey data, 2008 and 2013.

Note: Household consumption expenditure includes imputed expenditure.

that of the bottom 20 percent. 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 evolution (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

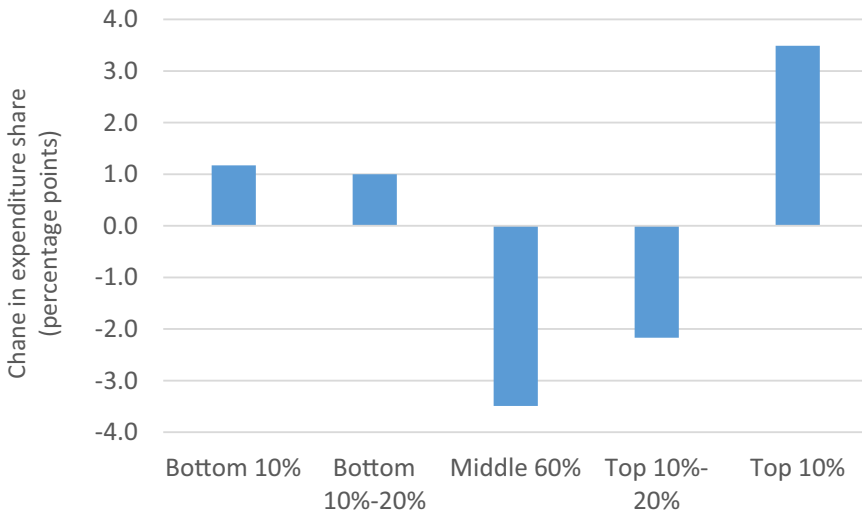


Figure 2. Expenditure Share of the Bottom, Middle and Top Expenditure Groups, *Change* between 2008 and 2013 [Colour figure can be viewed at wileyonlinelibrary.com]

Source: Household Expenditure Survey data, 2008 and 2013.

Note: Households are ranked by equivalent expenditure on non-durables, including imputed expenditure.

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.

Note: Expenditure refers to equivalent household consumption expenditure (including imputed expenditure).

the expenditure shares of the middle 60 percent of the population (deciles 4–8), ranked by increasing equivalized consumption expenditure, together with the shares of the bottom and top two deciles, in 2008 and 2013. Actual expenditure shares of these groups for 2008 and 2013 are presented in Table A1 in the appendix. 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 percent experienced the lowest relative loss, improving its share in total consumption. The bottom 20 percent 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.

The fact that the bottom 20 percent 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 percent implies huge budget cuts anyway. Second, the bottom 20 percent 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.

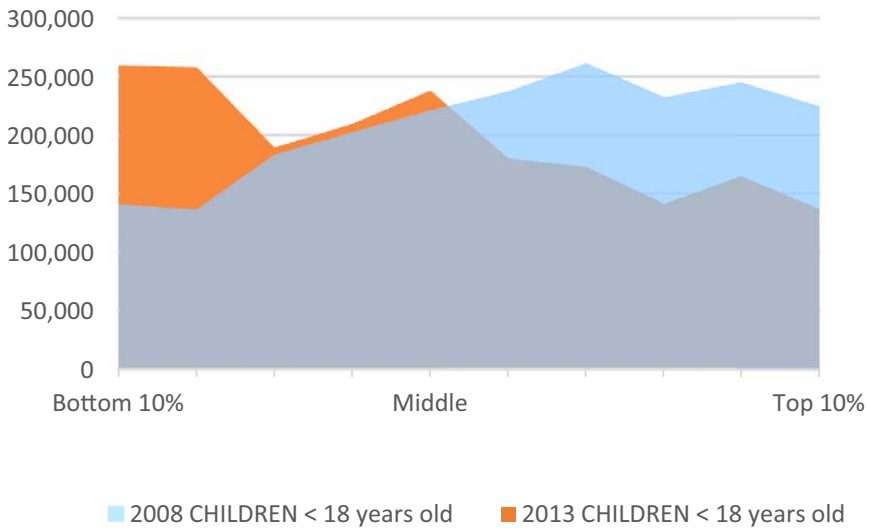


Figure 3. Frequency Distribution of Children across Deciles, 2008 and 2013 [Colour figure can be viewed at wileyonlinelibrary.com]

Source: Household Expenditure Survey data, 2008 and 2013.

Note: Households are ranked by equivalent expenditure on non-durables, including imputed expenditure.

Table 1 presents data on the distribution of households according to the occupational 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 percent by 2013 (columns 1 and 2). At the same time, while almost 90 percent of children lived in families with a head in employment, the same is true for only 70 percent 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 percent to 39 percent. 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 percent in 2008 to 33.8 percent in 2013, while the living standards of such households systematically lag significantly behind the population average. 8.4 percent of these families have two or more members in unemployment and live on just 55 percent 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 percent to 13.8 percent, 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). Nevertheless, with the data at hand, it is not clear whether children and parents avoid poverty by moving in with elders. Table 1

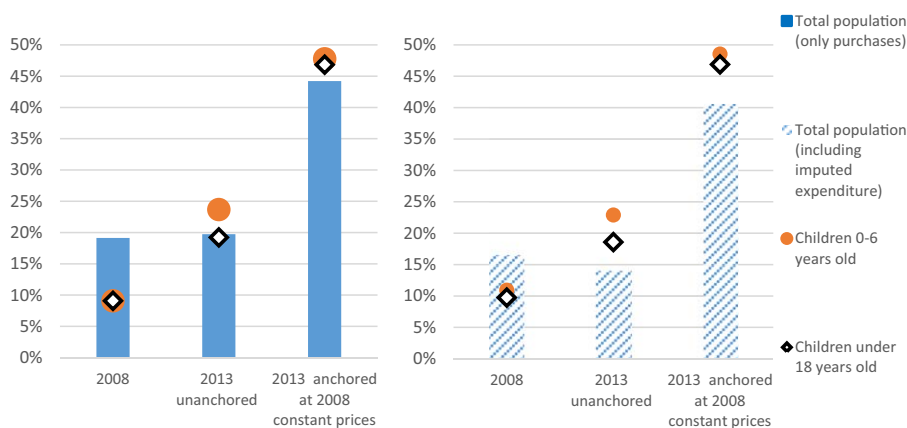


Figure 4. Percent of Population at Risk-of-Poverty 2008–13 [Colour figure can be viewed at wileyonlinelibrary.com]

Source: Household Expenditure Survey data, 2008 and 2013.

suggests that it would be hard to defend this case since relative living standards among these families increase only marginally (if at all) between 2008 and 2013 (compare two bottom lines of columns (7) and (8)).

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 equivalized 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 equivalized expenditure is below 60 percent of median equivalized 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 percent 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 percent (and to just over 40 percent 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. Matsaganis and Leventi (2014), based on income data, document similar changes in absolute poverty rates. Regarding relative poverty, they document a much smaller rise of around 3.5pp, which is slightly higher than the findings based on consumption expenditure data.

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 six. 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. Other studies based on income data alone document relatively smaller increases in child poverty rates (e.g. Matsaganis and Leventi, 2014). UNICEF (2014), based on SILC data, also presents evidence that child poverty increased from 23 percent to over 40 percent between 2008 and 2012, with the poverty threshold anchored to 2008. Gannitsis and Zografakis (2015) mention that child poverty has increased during the crisis, though no precise figures are presented, while Mitrakos (2014), covering the period up to 2011, also reports an increase in the relative child poverty rate.

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 percent of median equivalized expenditure as cut-offs, so, for example, the middle class consists of households with equivalized expenditure of 75–125 percent of median expenditure.¹⁴ According to the top part of Figure 5, the middle class would include 37 percent 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 percent 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 percent 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 unfavorable 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

¹⁴We have alternatively used different cut-offs, but the conclusions remain qualitatively the same.

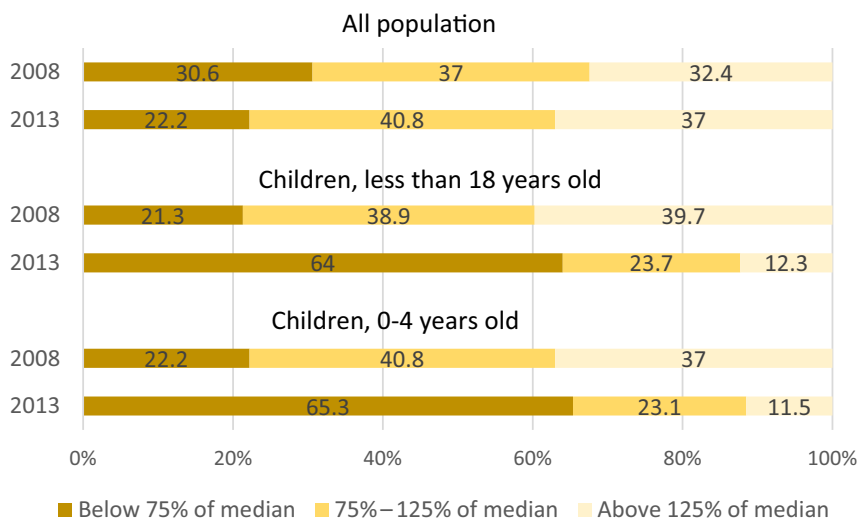


Figure 5. Population Shares of the Bottom, Middle and Top Consumption Groups (%) [Colour figure can be viewed at wileyonlinelibrary.com]

Source: Household Expenditure Survey data, 2008 and 2013.

Note: Household consumption expenditure includes imputed expenditure. For the calculation of 2013 figures, the median is anchored in 2008.

have faced substantial wage cuts, since the real wages per head in the whole economy fell by 25.6 percent 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 state is deteriorating as well, putting pressure on the family as welfare provider. Public expenditure on education, for example, has plummeted from 4.7 percent to 2.2 percent of 2008 GDP between 2008 and 2014 (KANEP, 2014). According to the OECD health expenditure indicators, per capita total expenditure on health has dropped by over 36% in real terms within the same period, while corresponding household out-of-pocket payments have almost halved. Social protection benefits for families and children, as reported by the Hellenic Statistical Authority, have also declined by over 25 percent between 2009 and 2012 (<http://www.statistics.gr/el/statistics/-/publication/SHE24/-/>).

Although coherent data on children are rather scarce, available evidence is worrying. Reports of international organizations rank Greece low in terms of

subjective well-being of children (OECD, 2015). Other studies (e.g. Kentikelenis *et al.*, 2014) document a 43 percent rise in infant mortality between 2008 and 2010, after a long term fall. On the educational front, the performance of 15-year-old Greek students in PISA scores in all three subjects (literacy, science and math) has already fallen between 2009 and the latest available year, namely 2012. Shrinking public and private resources directed to children are thus 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

4.1. *The Structure of Indirect Taxes: 2008–13*

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 percent to approximately 13 percent 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. Certain services, like education or banking services are VAT exempt.

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

4.2. *Empirical Results*

The fiscal crisis and associated austerity measures signify a drastic increase in the indirect tax burden, which in 2013 absorbed approximately 15 percent of total household expenditure, compared to less than 11.5 percent in 2008. The pattern of indirect tax payments by commodity group in these years appears in Figures A1 and A2 in the appendix. These figures show the cumulative distribution of tax payments in the two years under consideration at a commodity level, where taxes have

TABLE 2
INDIRECT TAX STRUCTURE, 2008–13¹

	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

¹A 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).

been ranked in order of regressivity.¹⁵ 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 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 percent of total expenditure (up from just 45

¹⁵In 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).

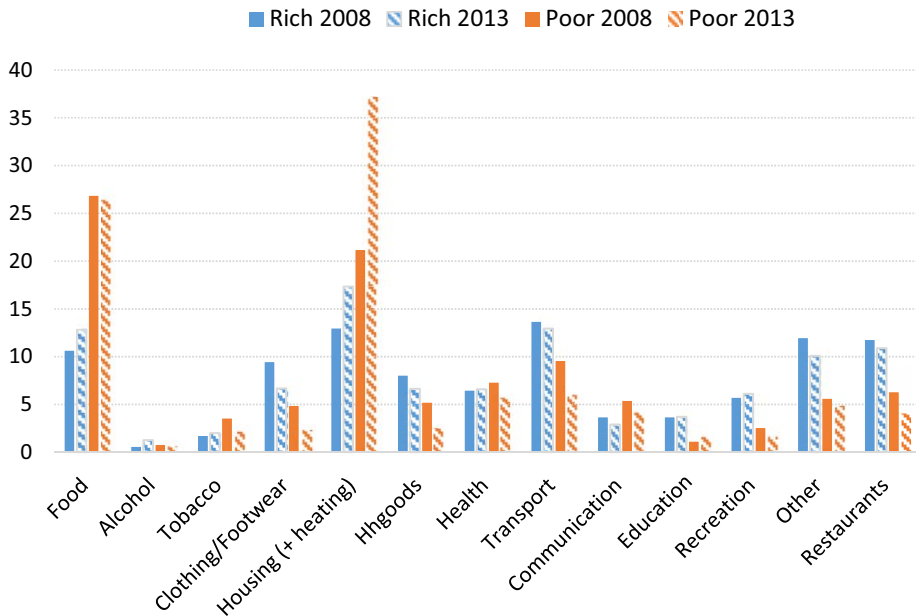


Figure 6. Budget Shares of Poorest 20% and Richest 20% [Colour figure can be viewed at wileyonlinelibrary.com]

Source: Household Expenditure Survey data, 2008 and 2013.

Note: Households are ranked by equivalent expenditure on non-durables, including imputed expenditure. Budget shares are calculated as a percentage of total *household purchases* (including mortgage payments).

percent before the crisis, see Figure 6). 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 percent of households, apparently signifying the change in the composition of the poor, among whom families with children are over-represented.

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 transferring hotel

TABLE 3
THE EFFECT OF INDIRECT TAX REFORMS SINCE THE CRISIS BY COMMODITY GROUP

	Bud. share 2008*	Bud. share 2013*	Kakwani progressivity index 2008	Kakwani progressivity index 2013	Change in tax as a % of retail price (2008–13)	Change in tax payment as a % of household expenditure (2008–13)
	(1)	(2)	(3)	(4)	(5)	(6)
Food	15.9 (15.2)	18.2 (19.0)	-0.20 (2)	-0.19 (1)	3.4	0.79
Alcoholic beverages	0.6 (0.6)	1.0 (1.0)	-0.02 (6)	0.11 (11)	10.0	0.15
Tobacco	2.5 (2.4)	2.7 (2.4)	-0.14 (3)	-0.11 (4)	12.6	0.37
Clothing/ Footwear	8.0 (8.9)	5.2 (5.4)	0.12 (10)	0.10 (10)	2.7	-0.21
Housing (+ heating oil)	14.5 (13.3)	22.8 (23.4)	-0.09 (5)	-0.15 (2)	1.0	1.08
<i>of which heating oil</i>	2.5	2.1	-0.17	-0.10	28.9	0.44
Household goods	6.9 (6.6)	5.0 (4.3)	0.09 (9)	0.09 (9)	2.4	-0.11
Health	6.5 (5.9)	6.2 (4.8)	-0.28 (1)	0.02 (5)	2.6	0.08
Transport	13.0 (12.7)	11.2 (10.6)	0.14 (11)	0.05 (7)	9.8	0.70
Communication	4.3 (4.0)	3.7 (3.3)	-0.13 (4)	-0.13 (3)	7.2	0.14
Education	3.0 (6.3)	4.1 (6.5)	-	-	0	0.00
Recreation	4.7 (5.4)	3.0 (4.5)	0.19 (12)	0.25 (12)	2.8	-0.01
Restaurants	9.9 (9.3)	8.1 (7.3)	0.07 (7)	0.09 (8)	10.2	0.45
Hotels	0.6 (0.7)	0.5 (0.4)	0.22 (13)	0.35 (13)	-2.1	-0.02
Other	9.7 (8.8)	8.3 (7.3)	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.

Note: Budget shares are calculated as a percentage of total *household purchases* (including mortgage payments). Imputed expenditure is not taken into account. Numbers in parentheses refer to budget shares of the population subgroup consisting of families with children.

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. The budget share of education has increased (from 3 percent to 4 percent). Families with children have similar consumption patterns with the rest of the population (see numbers in parenthesis in columns (1) and (2) of Table 3), but distinctively higher budget shares on housing, food and especially education, while spending relatively less on health and household goods.

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 percent 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.

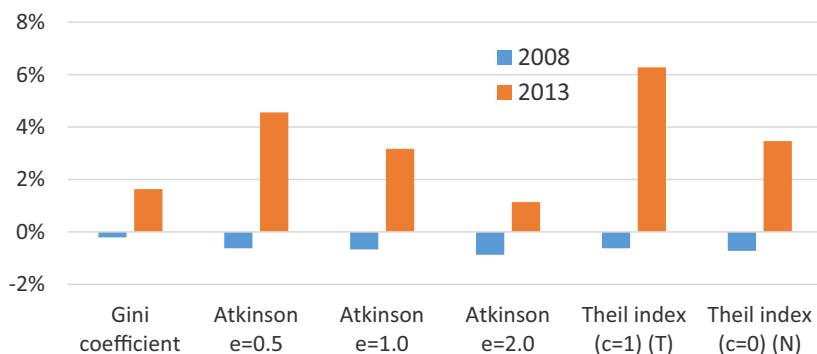


Figure 7. Change in Inequality Induced by the Actual Indirect Tax System vis-à-vis a Uniform Equal-Yield Tax [Colour figure can be viewed at wileyonlinelibrary.com]

Source: Household Expenditure Survey data, 2008 and 2013.

Note: Equivalent household consumption expenditure is used as a welfare indicator.

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 7 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 ϵ .

Summing up, Greek households faced an increase of their indirect tax burden of about 30 percent 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.¹⁶ 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 percent 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 percent in 2008 to 35 percent 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 percent 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 percent, 72 percent 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

¹⁶We have also modeled the 2013 indirect tax system on the 2008 HBS data, under the constant expenditure assumption (equivalent to price elasticity of -1), as a way of disregarding changes in consumption patterns due to behavioral responses. Such analysis suggests that indirect tax burden of the poorest 30 percent of households would be about 10pp higher. Detailed results are available upon request.

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.

REFERENCES

- Anand, S. and C. Harris, "Food and the Standard of Living: an Analysis Based on Sri Lankan Data," in J. Dréze and A. Sen (ed.), *The Political Economy of Hunger, Entitlement of Well-Being*, 1, 297–350, Oxford University Press, Oxford, 1990.
- Atkinson, A. B. and A. Brandolini, "On the Identification of the 'Middle Class'," in J. C. Gornick and M. Jaentti (ed.), *Inequality and the Status of the Middle Class*, 77–100, Stanford University Press, Stanford, CA, 2011.
- Atkinson, A. B. and T. Piketty, *Top Incomes over the 20th Century: a Contrast between Continental Europe and English-speaking Countries*, Oxford University Press, Oxford, 2007.
- Barrett, G., P. Levell, and K. Milligan, "A Comparison of Micro and Macro Expenditure Measures across Countries Using Differing Survey Methods," Paper prepared for "Conference on Improving the Measurement of Consumer Expenditures," National Bureau of Economic Research, 2012.
- Besley, T. and H. Rosen, "Sales Taxes and Prices: an Empirical Analysis," *National Tax Journal*, 52, 157–78, 1999.
- Brewer, M., A. Goodman, and A. Leicester, *Household Spending in Britain: What can it Teach us about Poverty?*, The Policy Press, Bristol, 2006.
- Brewer, M. and C. O'Dea, "Measuring Living Standards with Income and Consumption: Evidence from the UK," *IFS Working Paper W12/12*, Institute for Fiscal Studies, London, 2012.
- Browne, J. and P. Levell, "The Distributional Effect of Tax and Benefit Reforms to be Introduced between June 2010 and April 2014: a First Assessment," *IFS Briefing Note BN108*, Institute for Fiscal Studies, London, 2010.
- Deaton, A., "Measuring Poverty in a Growing World (or Measuring Growth in a Poor World)," *Review of Economics and Statistics*, 87, 1–19, 2005.
- Diris, R., F. Vandenbroucke, and G. Verbist (2014), "Child Poverty: What can Social Spending Explain in Europe?," *Discussion Paper DPS14.20*, Center for Economic Studies, KU Leuven, Belgium, 2014.
- Duiella, M. and A. Turrini, "Poverty Developments in the EU after the Crisis: a Look at Main Drivers," *ECFIN, Economic Brief, Issue 31*, Brussels, 2014.
- Easterly, W., "Middle Class Consensus and Economic Development," *Journal of Economic Growth*, 6, 317–36, 2001.
- Edgar, J. and A. Safir, "Gemini Project Overview," Consumer Expenditure Survey Anthology, US Bureau of Labor Statistics Report 1030, 2011.
- Esping-Andersen, G., "Welfare Regimes and Social Stratification," *Journal of European Social Policy*, 25, 124–34, 2015.

- European Commission, *Child Poverty and Well-being in the EU: Current Status and Way Forward*, The Social Protection Committee, Directorate-General for Employment, Social Affairs and Equal Opportunities, Brussels, 2008.
- , HICP-CT Manual, HCPI 09/547 rev. 3, Unit G-6: Price Statistics, Directorate G: Business Statistics, Eurostat, Luxembourg, 2009.
- , *Taxation Trends in the European Union: 2012 edition*, Directorate General Taxation and Customs Union, European Commission, 2012.
- Eurostat, *Quality Report of the 'Household Budget Surveys' 2005*, Directorate F: Social Statistics and Information Society, Luxembourg, 2008.
- , Consumption Expenditure of Private Households: Reference Metadata in Euro SDMX Metadata Structure (ESMS), http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/EN/hbs_esms.htm#accuracy, 2013.
- Friedman, M., *A Theory of the Consumption Function*, Princeton University Press, Princeton, N.J., 1957.
- Georgakopoulos, T. A., *Indirect Tax Harmonisation in Greece and the Value Added Tax: Effects on the Greek economy*, Stamoulis (in Greek), Piraeous, 1991.
- Giannitsis T. and S. Zografakis, *Greece: Solidarity and Adjustment in Time of Crisis*, Macroeconomic Policy Institute, March, 2015.
- Hellenic Statistical Authority, Household Budget Survey 2013, Press Release September 12, 2014.
- International Monetary Fund, *IMF Country Report: Greece*, No. 13/20, Washington DC, 2013.
- Kakwani N., "Measurement of Tax Progressivity: an International Comparison," *Economic Journal*, 87, 71–80, 1977.
- KANEP – GSEE, *Public and Private Expenditure on Education in Times of Crisis*, Centre for the Development of Education Policy, Greek General Confederation of Labour, Athens, 2014.
- Kaplanoglou G. and V. T. Rapanos, "Who Pays Indirect Taxes in Greece? Evidence from the Period of the Crisis," in Parliamentary Budget Office (ed.), *Fiscal Adjustment: How Fair is the Distribution of the Burdens*, 9–19, Athens, 2014.
- Kaplanoglou, G., "Inequality and Indirect Taxation in Greece," Paper presented at the Social Policy Association Conference "Policy Features: Learning from the Past", Edinburgh, June/July, 2009.
- , "Who Pays Indirect Taxes in Greece? From EU Entry to the Fiscal Crisis," *Public Finance Review*, 43, 529–56, 2015.
- Karabalis, N. and E. Kondelis, "Indirect Tax Increases and their Impact on Inflation over 2010–12," *Economic Bulletin*, 38, Bank of Greece, 7–20, 2013.
- Karamessini, M., "Greece as an International Test-Case: Economic Adjustment through Troika/State-Induced Depression and Social Catastrophe", in S. Lehdorff (ed.), *Divisive Integration: the Triumph of Failed Ideas in Europe–Revisited*, 95–126, European Trade Union Institute, Brussels, 2014.
- Katseli, L., "Why a Win-Win is Possible for Greece and the EU," World Economic Forum, March 12th 2015, available at <https://agenda.weforum.org/2015/03/why-a-win-win-is-possible-for-greece-and-the-eu/>, 2015.
- Keen, M. and S. Smith, "VAT Fraud and Evasion: What Do we Know, and What Can be Done?," Working Paper 07/31, International Monetary Fund, 2007.
- Kentikelenis, A., M. Karanikolos, A. Reeves, M. McKee, and D. Stuckler, "Greece's Health Crisis: from Austerity to Denialism," *Lancet*, 383, 748–53, 2014.
- Lockwood, B., "Tax Incidence, Market Power and Bargaining Structure," Birbeck College, London (mimeo), 1988.
- López-Calva, L. and E. Ortiz-Juarez, "A Vulnerability Approach to the Definition of the Middle Class," *Journal of Economic Inequality*, 12, 23–47, 2014.
- Matsaganis M. and C. Leventi, "The Distributional Impact of Austerity and the Recession in Southern Europe," *South European Society and Politics*, 19, 393–412, 2014.
- McGregor, P. P. L. and V. K. Borooah, "Is Low Spending or Low Income a Better Indicator of Whether or not a Household is Poor: Some Results from the 1985 Family Expenditure Survey," *Journal of Social Policy*, 21, 53–69, 1992.
- Meyer, B. D. and J. X. Sullivan, "Five Decades of Consumption and Income Poverty," National Bureau of Economic Research Working Paper 14827, 2009.
- Mitragos T., "Inequality, Poverty and Social Welfare in Greece: Distributional Effects of Austerity," Bank of Greece Working Paper 174, 2014.
- Newbery, D. M., "The Distributional Impact of Price Changes in Hungary and the UK," *Economic Journal*, 105, 847–63, 1995.
- Newbery, D. M. and T. Révész, "The Evolution of the Tax Structure of a Reforming Transitional Economy: Hungary 1988–98," *International Tax and Public Finance*, 7, 209–40, 2000.

- OECD, *Rising Inequality: Youth and Poor Fall Further Behind, Income Inequality Update, Insights from the OECD Income Distribution Database*, Directorate for Employment, Labour and Social Affairs, OECD, Paris, 2014a.
- , *National Accounts at a Glance, 2014*, Paris, 2014b.
- , *How's Life?*, Paris, 2015.
- OFCE, IMK and ECLM (2013) *Independent Annual Growth Survey 2015: Second Report*, (www.iags-project.org/documents/iags_report2014.pdf), 2013.
- , *Independent Annual Growth Survey 2015: Third Report*, (www.iags-project.org/documents/iags_report2015.pdf), 2014.
- Simou, E. and E. Koutsogeorgou, "Effects of the Economic Crisis on Health and Healthcare in Greece in the Literature from 2009 to 2013: a Systematic Review," *Health Policy*, 115, 111–19, 2014.
- Smith, M., "Microeconomic Analysis of Household Expenditures and their Relationship with House Prices," *Reserve Bank of New Zealand: Bulletin*, 70, 39–45, 2007.
- Vandenbroucke, F., R. Diris, and G. Verbist, "*Excessive Social Imbalances and the Performance of Welfare States in the EU*," *Policy Paper*, Euroforum KU Leuven, 2013.
- UNICEF, *Children of the Recession. The Impact of the Economic Crisis on Child Wellbeing in Rich Countries*, Innocenti Report Card 12. Florence: UNICEF, 2014.
- Warren, N., "A Review of Studies on the Distributional Impact of Consumption Taxes in OECD countries," *OECD Social, Employment and Migration Working Paper 64*, OECD Publishing, 2008.
- Wilkinson R. and K. Pickett, *The Spirit Level: Why Equality is Better for Everyone*, Penguin, London, 2010.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article at the publisher's web-site:

APPENDIX.

Table A1: Expenditure shares of the bottom, middle and top expenditure groups in 2008 and 2013

Figure A1: Cumulative Indirect Taxes by Deciles, 2008

Figure A2: Cumulative Indirect Taxes by Deciles, 2013