Ministry of Economy and Finance
Council of Economic Advisors

Eirini Andriopoulou & Lefteris Tserkezis

Distributional aspects of fiscal consolidation: the case of Greece

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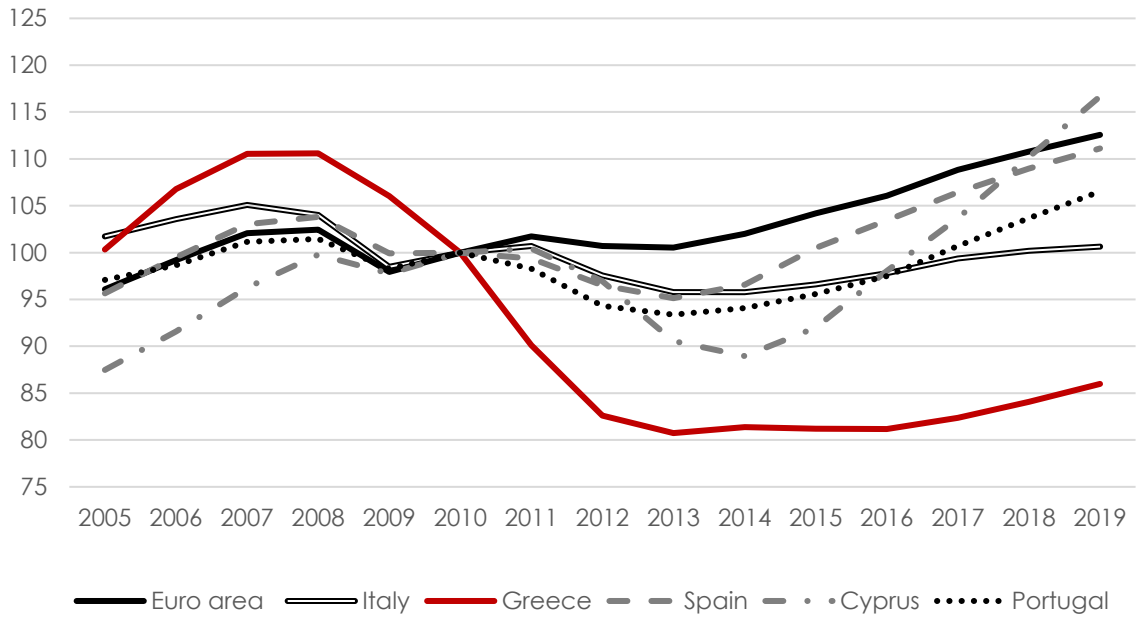
Contribution of the study

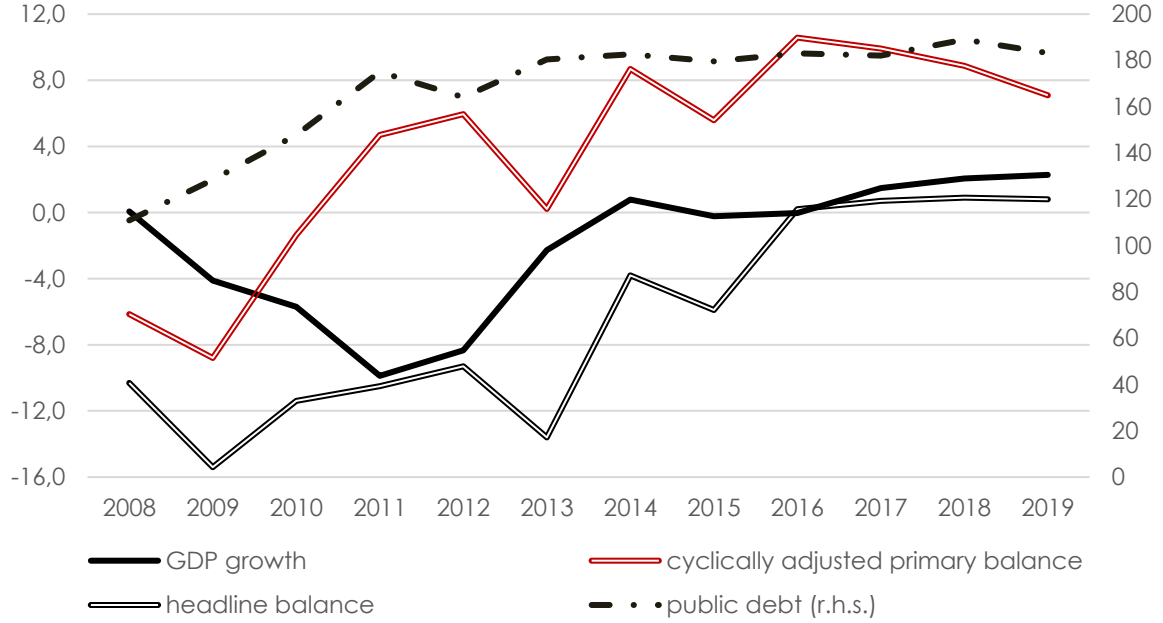
- **Dual contribution:** constructing a comprehensive database of discretionary fiscal consolidation measures and assessing their distributional effects on an annual basis using the EUROMOD tax-benefit microsimulation model.
- The Greek consolidation (2010–2018) provides an exceptional case study due to its unprecedented size, duration and evolving policy mix.
- **Research question:** *Does the Greek experience confirm the empirical evidence that revenue-based fiscal consolidations are more distributionally friendly than expenditure-based adjustments?*
- **Main finding:** *Overall, yes. More revenue-based consolidation episodes are associated with more progressive distributional outcomes.*
- **Additional insights:**
  - *Targeted social protection measures, particularly means-tested benefits, play a crucial role in mitigating—and in some cases reversing—the adverse distributional effects of fiscal consolidation (even in years with expenditure-based consolidation mix).*
  - *The composition of individual discretionary measures matters alongside the overall revenue/expenditure mix, highlighting the importance of analyzing fiscal policy at a granular level.*

Fiscal consolidation in Greece 2010-2018

Real GDP in selected euro area countries, 2005-2018 (2010=100)



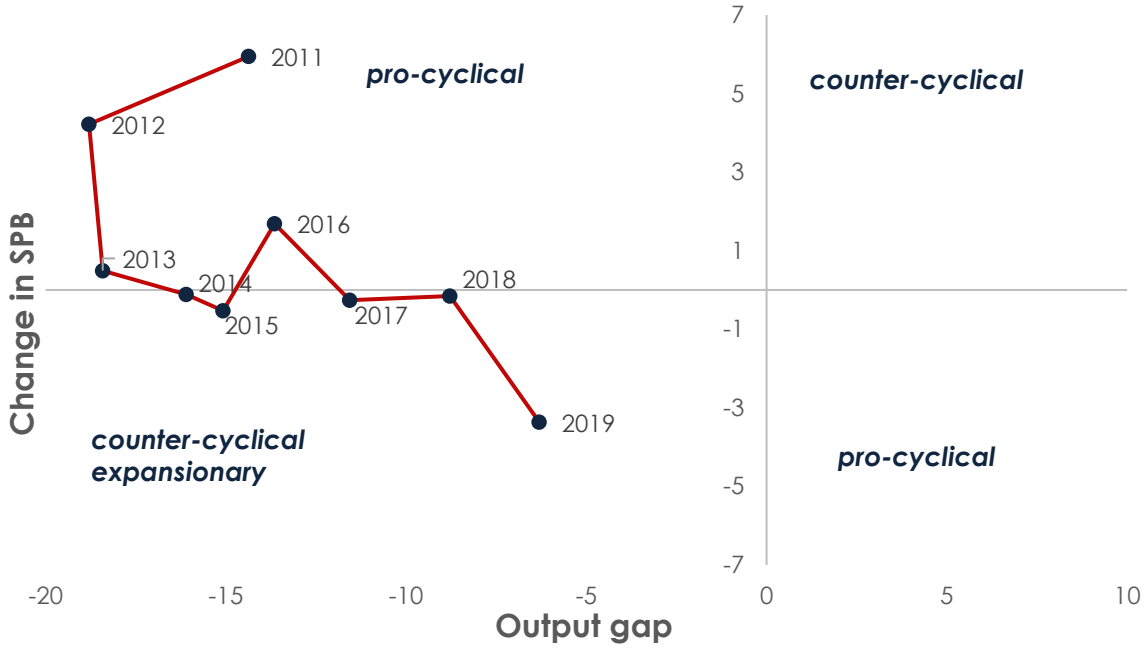
Fiscal consolidation and effect on output in Greece, 2008-2018



- Exceptionally long and sizeable consolidation in the context of three consecutive adjustment programmes.
- **The cyclically adjusted primary balance** improved from -8.8% of GDP to +8.9% between 2009-2018. 14 p.p. between 2009 and 2012.
- But **real GDP** fell by almost 27% between 2007-2016, the decline being more severe and persistent than in peer EU countries.

Fiscal policy stance in Greece during the consolidation

Fiscal stance in Greece 2011-2019



Data Source: EUROSTAT

- The fiscal stance is shown as the **annual change in the structural primary balance**.
- The output gap figures are based on the EU common methodology.
- The consolidation had a remarkable **strong adverse impact on output**, especially during the first wave of adjustment.
- The data show **a clearly pro-cyclical fiscal stance in approximately the first half of the consolidation, followed by a broadly neutral stance in the second half** while the output gap was still largely negative.
- A clearly **counter-cyclical stance was only achieved in 2019**, after the end of the adjustment programmes.

Literature review – the impact of fiscal consolidations

- **Standard approach** identifying discrete episodes of consolidations employing statistical methods on available time series and usually focusing on the cyclically adjusted primary balance *(Giavazzi & Pagano 1990, Alesina & Perotti 1995)*.
- Basic results include the relative **efficiency of expenditure-based consolidations** in the sense of a lasting decreasing impact on the debt ratio, as well as the possibility of **expansionary fiscal adjustments** *(Alesina & Perotti 1997, Alesina & Ardagna 1998, Alesina & Ardagna 2009, Barrios et al. 2010)*.
- Criticisms against this approach *(Heylen & Everaert 1998, Romer & Romer 2010, Guajardo et al. 2014)* include:
  - Sensitivity to the definition of fiscal consolidation episodes (multiple observations of the same adjustment episode).
  - Limited ability to account for the gradual exhaustion of feasible expenditure cuts during prolonged consolidations.
  - Identification of exogenous discretionary fiscal policy shocks.
  - Potential reverse causality between fiscal policy and macroeconomic conditions.
- **Historical (narrative) approach** *(Romer & Romer 2010)*, focusing on the analysis of official documentation in order to identify discretionary policy changes. This avoids problems of identification or the direction of causality, while it allows for a comprehensive recording of discretionary policy measures.

Literature review – distributional impact of consolidations

- Less attention has been paid to **distributional impact of consolidations**, although it was suggested early on that expenditure-based adjustments may have adverse effect *(Alesina & Perotti 1997)*.
- The empirical literature *(Mulas-Granados 2005, Agnello & Sousa 2012, Woo et al. 2013)* has found a **positive link between consolidations and inequality** and amplified when adjustment is taking place during periods of low growth.
- This effect **is stronger when adjustments are carried out primarily through spending cuts**, while revenue increases tend to have an equalizing effect and can even lead to reductions in inequality.
- Moreover, **progressive taxation and social benefits** have been shown to be able to offset some of the adverse effects of consolidation on inequality, with the impact of social benefits being stronger and operating both through direct transfers and through enhancement of human capital.

Literature review – microsimulation techniques

- **Tax-benefit microsimulation has become the standard approach** for evaluating the distributional effects of fiscal policy and tax-benefit reforms (Callan et al., 2011; Avram et al., 2013; Paulus et al., 2017; Sutherland & Figari, 2013).
- Most studies **rely on EUROMOD to assess changes in disposable income, inequality and redistribution** in Europe(Sutherland & Figari, 2013; Paulus et al., 2017).
- **For Greece, previous studies show that household disposable income declined by more than 40% during the crisis,** while income inequality increased during the early years of the adjustment (Matsaganis & Leventi, 2013; Andriopoulou et al., 2019).
- **Recent EUROMOD studies have mainly focused on the distributional effects of specific policy reforms, including personal income taxation, recurrent property taxation and inflation-support measures,** rather than on entire fiscal consolidation episodes (Leventi & Picos, 2019; Andriopoulou et al., 2020; Flevotomou, 2024; Amores et al., 2024).

Analysis of discretionary measures - methodology

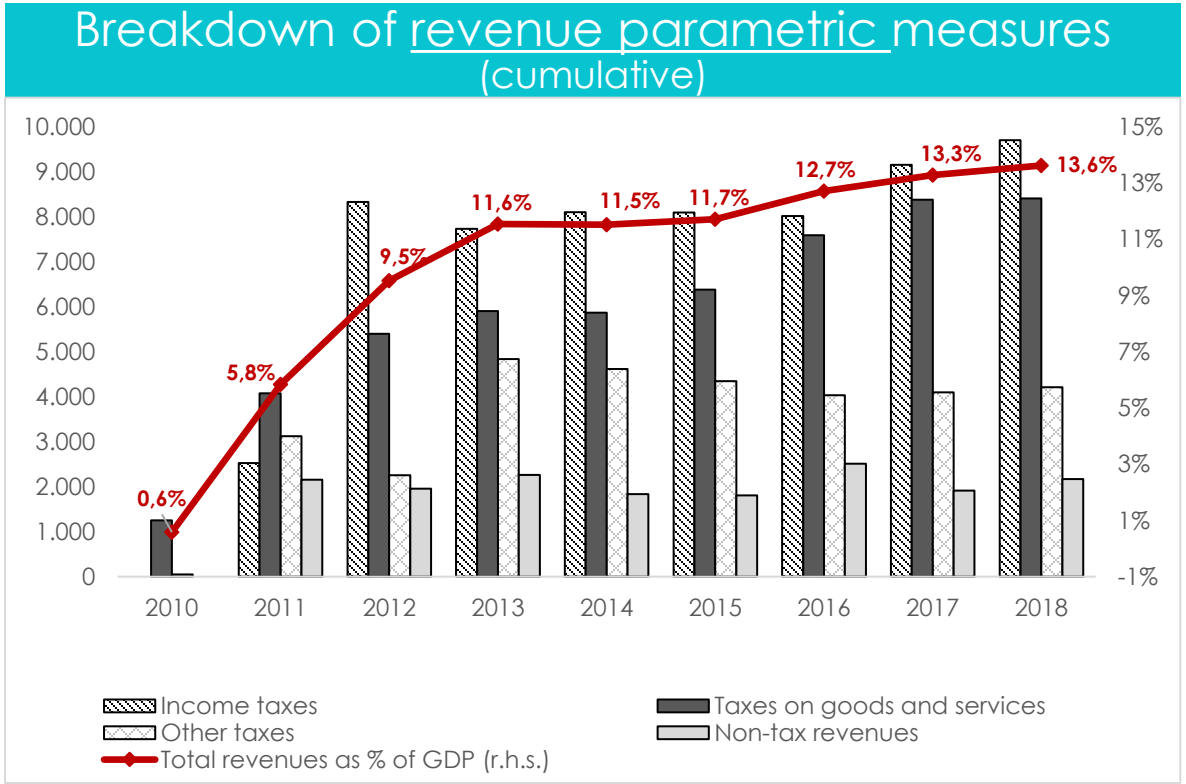
- The study incorporates all discretionary policy measures as presented in the official documentation of Greek **medium-term budgets (MTFS)**.
- **Estimates** of the fiscal impact of the measures are used, although in most cases these have been informed by *budgetary execution*, increasing the credibility of the figures.
- Reports of the European Commission on the implementation of the first adjustment programme have been used for the period prior to the first medium-term budget (2011: 2012-2015).
- **Net fiscal impact** is calculated, but also the **gross impact** of contractionary and expansionary measures.
- Classification according to specific revenue or expenditure category and government subsector
- Distinction between **parametric and non-parametric** measures.

Analysis of discretionary measures – results

	2010	2011	2012	2013	2014	2015	2016	2017	2018	total 2010-2018
Total measures (EUR million)	5.850	19.964	13.330	12.111	4.390	3.022	3.891	769	2.796	66.123
consolidation measures	*5.850*	*21.846*	*15.839*	*14.457*	*8.276*	*5.075*	*6.320*	*4.001*	*3.520*	*85.184*
expansionary measures	*0*	*-1.882*	*-2.509*	*-2.346*	*-3.886*	*-2.053*	*-2.429*	*-3.232*	*-724*	*-19.061*
Revenue measures (EUR million)	1.300	11.293	6.124	3.342	1.130	1.588	2.881	1.398	945	30.001
Expenditure measures (EUR million)	4.550	8.671	7.206	8.769	3.260	1.434	1.010	-629	1.851	36.122
% of revenue measures	22,2%	56,6%	45,9%	27,6%	25,7%	52,5%	74,0%	181,8%	33,8%	45,4%
% of expenditure measures	77,8%	43,4%	54,1%	72,4%	74,3%	47,5%	26,0%	-81,8%	66,2%	54,6%
Measures as a % of annual GDP										
Total measures (% of GDP)	2,6%	9,8%	7,1%	6,7%	2,5%	1,7%	2,2%	0,4%	1,6%	34,7%
Revenue measures (% of GDP)	0,6%	5,6%	3,3%	1,9%	0,6%	0,9%	1,7%	0,8%	0,5%	15,7%
Expenditure measures (% of GDP)	2,0%	4,3%	3,8%	4,9%	1,8%	0,8%	0,6%	-0,4%	1,0%	18,9%

- Impact of measures expressed in **marginal and net terms**.
- Signs correspond to the impact of measures on the balance.
- The results show the total size of consolidation at **EUR 66.1 billion** (85.2 billion consolidation - 19 billion expansionary) **or 34.7% of GDP**.
- Net size of consolidation reduced to EUR **55.3 billion or 28.7%** of GDP if **only parametric measures** are considered.
- Overall **balanced composition**, with 54.6% of expenditure measures and 45.4% of revenue measures.
- But shift in emphasis from spending cuts to revenue increases between the first and the second half of the period.

Analysis of discretionary measures – revenues



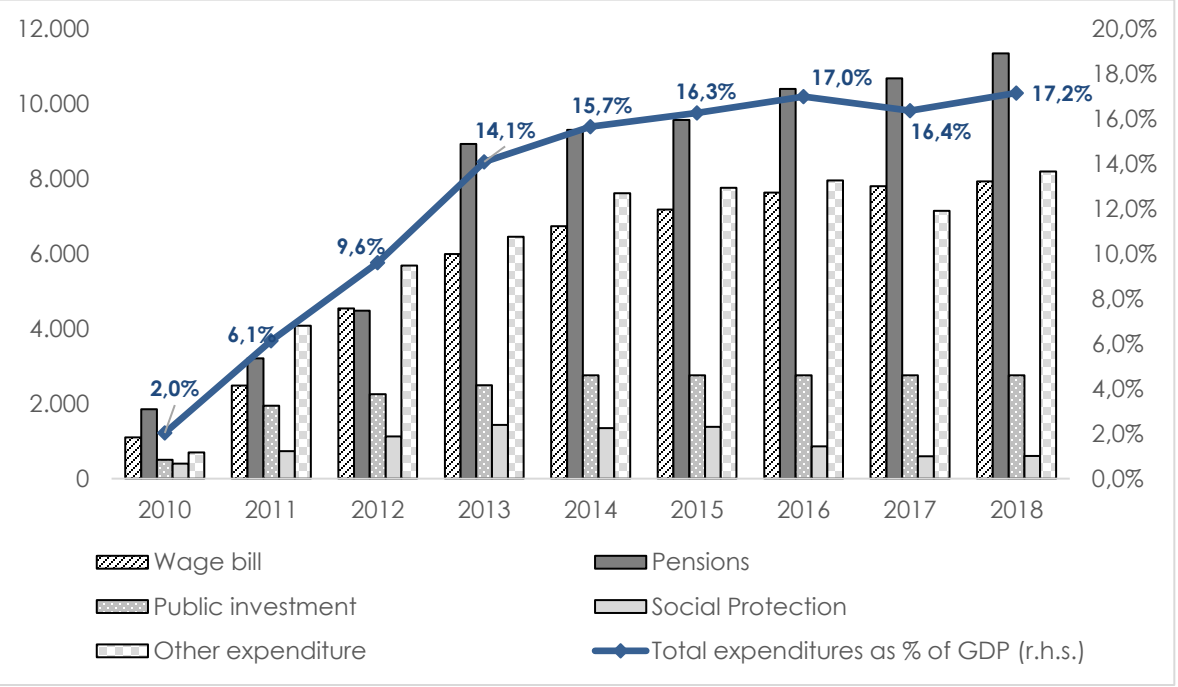
- Increases in **direct taxes** and in **taxes on goods and services** account for almost 75% of the total revenue-based consolidation.

- Increases in **property taxes** is the only category of the remaining ones that played a significant role, accounting for almost 10% of total parametric revenue measures.

- Improvements in **tax collection and compliance** make up 17% of total revenue measures.

Analysis of discretionary measures – expenditures

Breakdown of expenditure parametric measures (cumulative)



- Cuts in **pension spending** account for more than 1/3 of total expenditure measures and for more than 1/5 of the total consolidation.

- Cuts in the **public sector wage bill** and in **purchases of goods and services** correspond also to a substantial fraction of the total effort, amounting to about 26% and 12% of total expenditure measures respectively.

- Fiscal savings in these categories are **concentrated in the first half of the period**, which could also reflect the presence of "low hanging fruits".

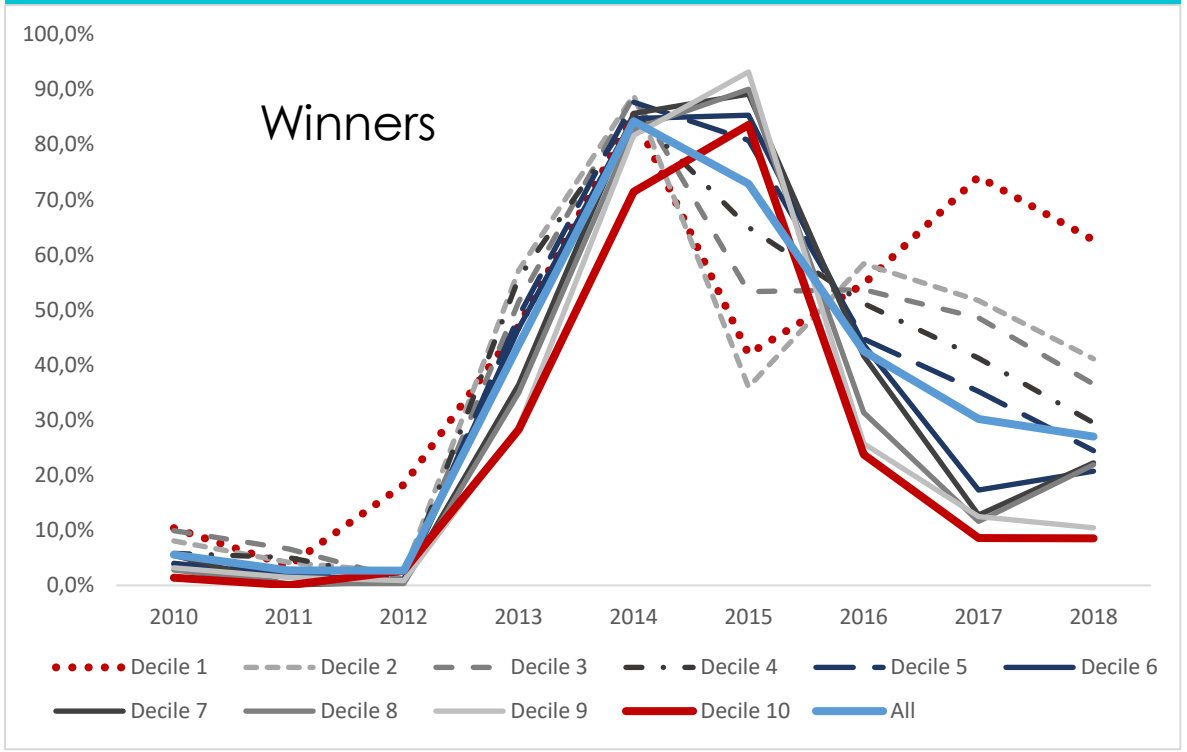
- **Public investment** spending was reduced significantly over 2010-2014, confirming the empirical literature result about consolidations in OECD countries usually involving a large drop in capital spending.

Distributional analysis - methodology

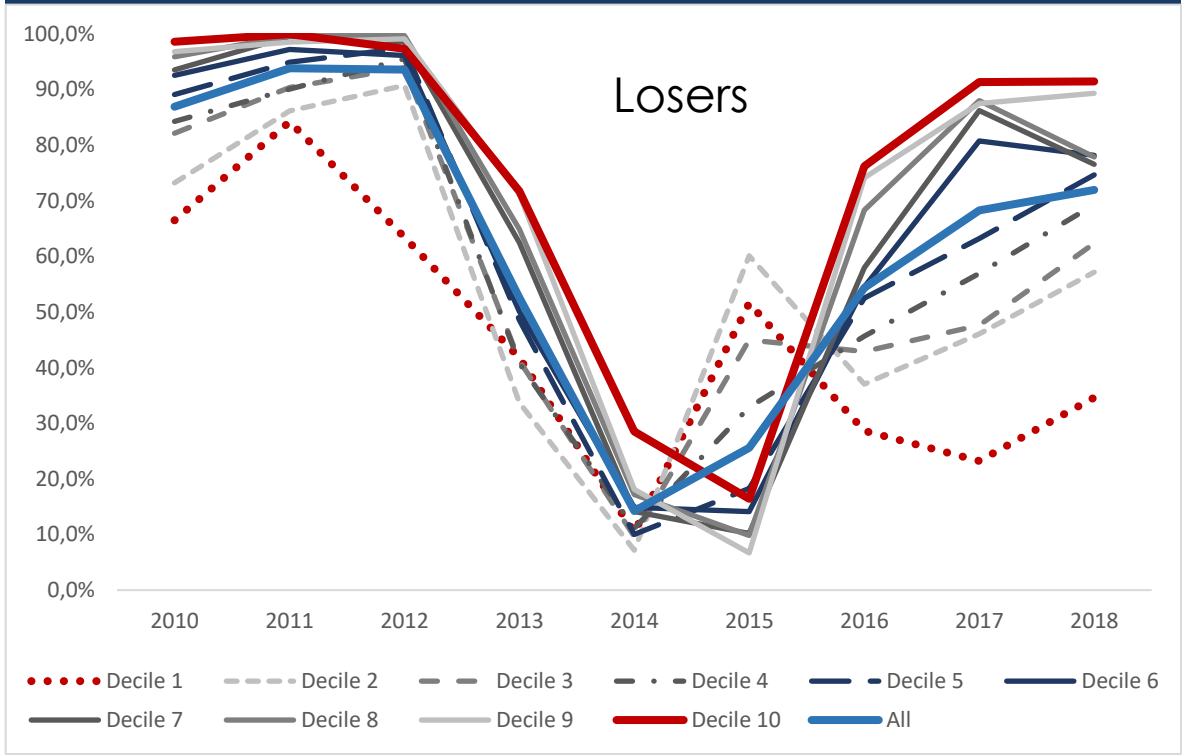
- The distributional analysis performed is based on the **EUROMOD** tax benefit microsimulation model, which simulates **personal tax** and **social insurance contribution** liabilities as well as **cash benefit entitlements** for all EU countries based on the national tax-benefit policy rules.
- We use the Greek EUROMOD model along with the relevant microdata of the Survey of Income and Living Conditions (SILC) of the Hellenic Statistical Authority.
- We use the **policy effect tool** when estimating distributional differences between two years. whereby the underlying microdata refer to the base year (no macroeconomic effect).
- We focus only on the **policy effect of reforms**. Thus, we do not use uprating factors for the different income sources.
- We use **equivalized household disposable income** with the OECD equivalence scale to rank of the members of the population and to calculate various distributional indices.
- Distributional effects are assessed using changes in **disposable income by income decile**, complemented by standard inequality (**Gini, S80/S20, Atkinson**) and progressivity (**Kakwani, Reynolds–Smolensky**) indices.

Distributional analysis – winners and losers

% of households per income decile whose disposable income rose per year as a result of the discretionary measures



% of households per income decile whose disposable income fell per year as a result of the discretionary measures

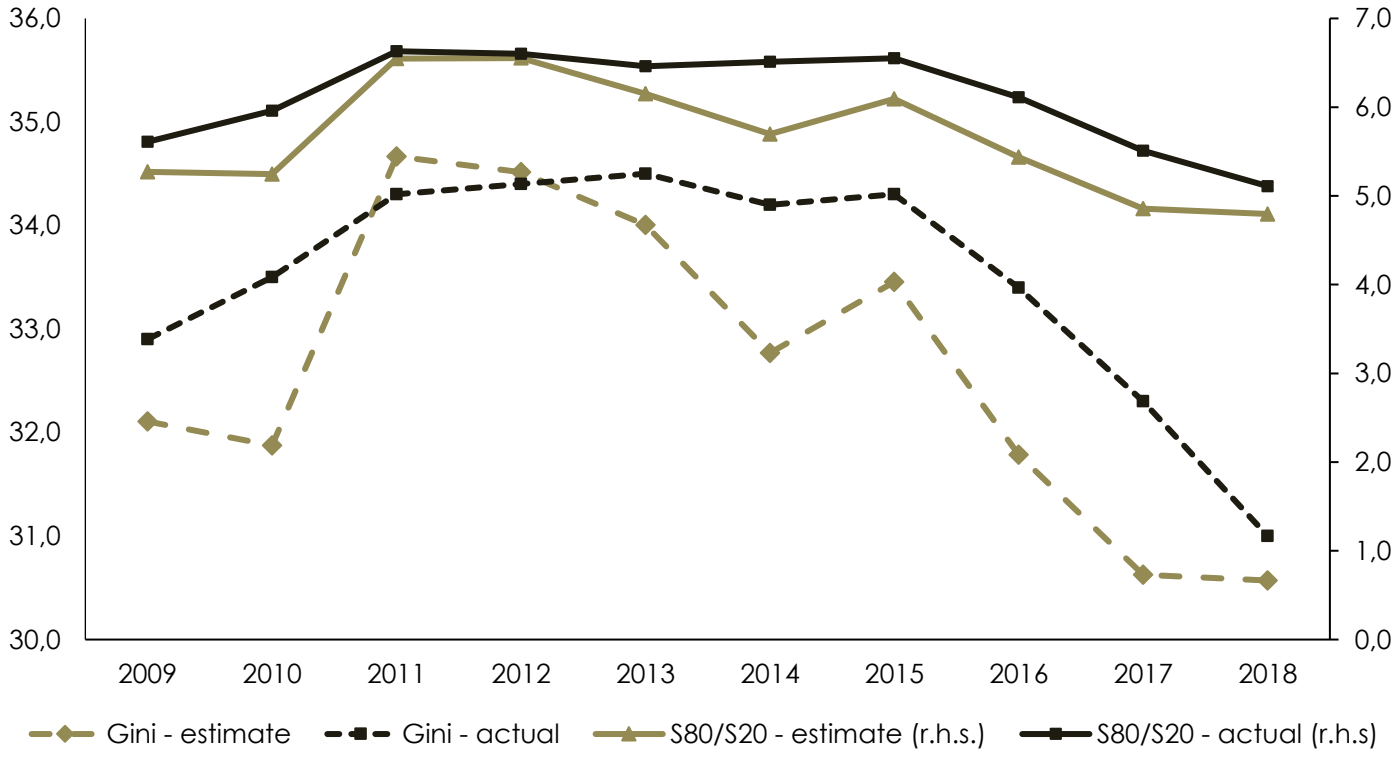


Data Source: ELSTAT, *SILC 2010-2018, EUROMOD*

- Measures seemed to have a protective effect only for the first decile in the first years of the crisis and up to 2012. Then between 2013-2015 the effect is mixed. While after 2015 there is a clearer progressive pattern in terms of winners and losers

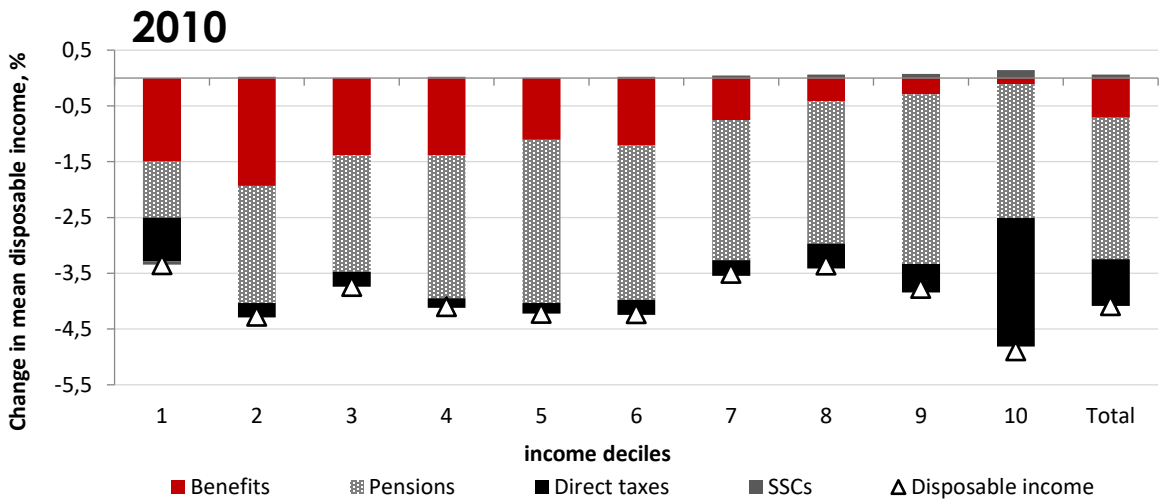
Distributional analysis - results

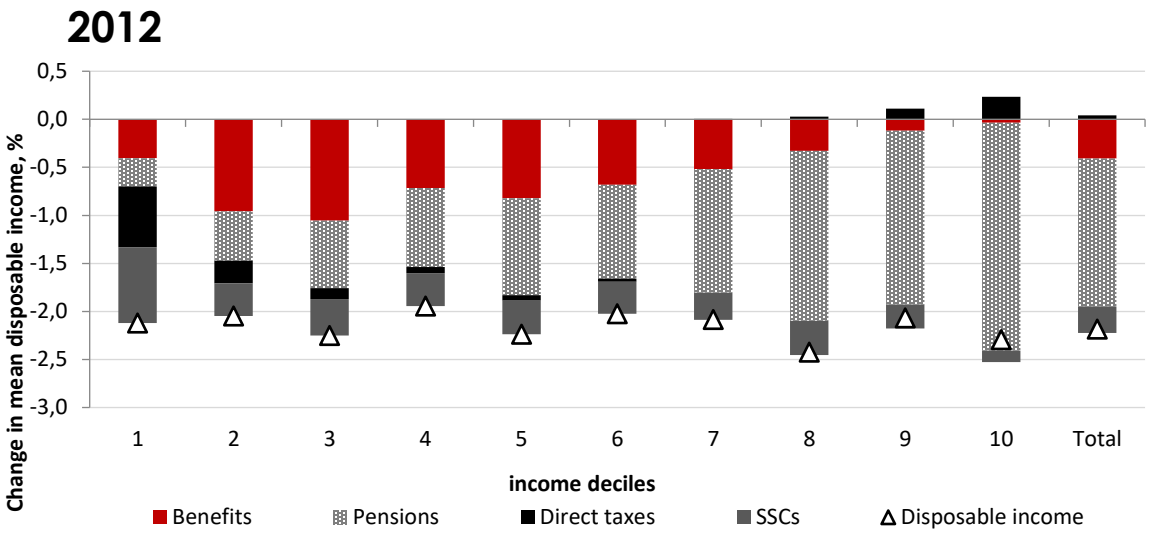
- The chart depicts official figures of the **Gini coefficient** and of the **S80/S20 ratio**, as well as **estimates produced by the EUROMOD**.
- By definition the two lines cannot be identical.
- The divergence is smaller in the first half of the period but increases afterwards.
- However, the direction is satisfactorily captured.
- The shifting pattern of inequality during the period is reproduced by the microsimulations.

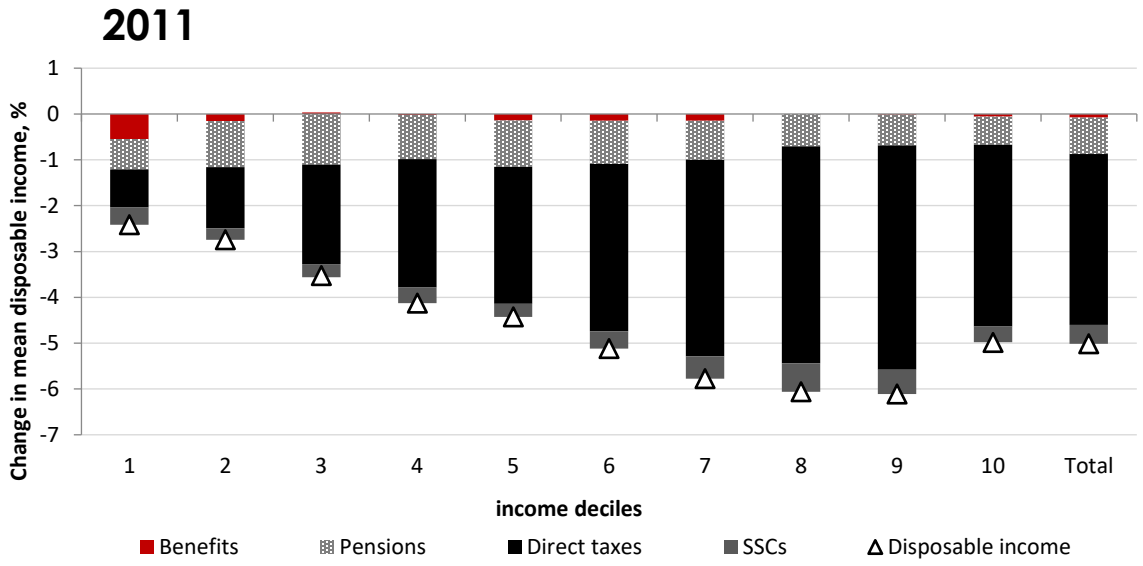


Data Source: ELSTAT, *SILC 2010-2018, EUROMOD*

Distributional analysis – analysis by type of measures





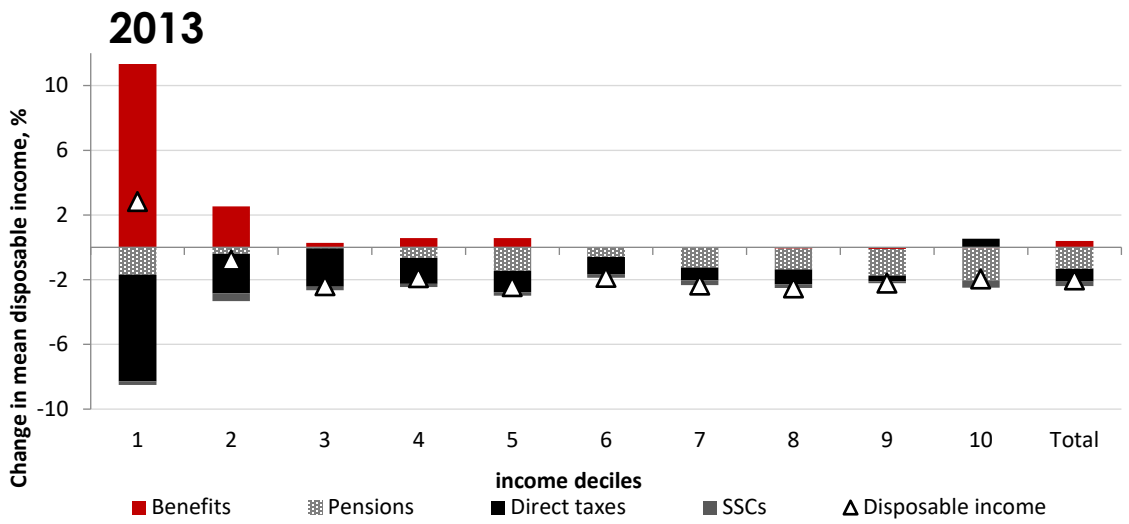


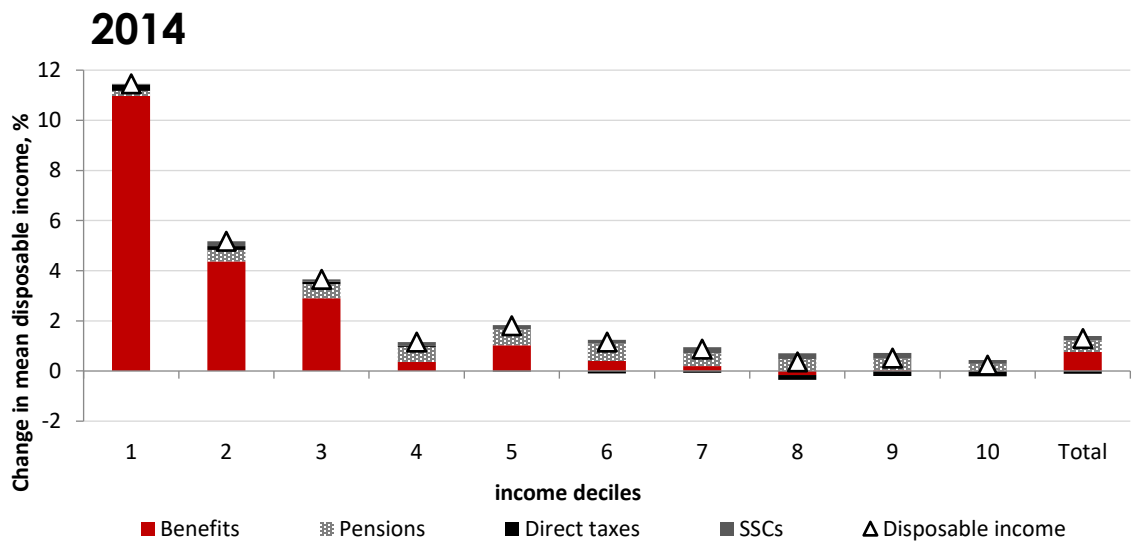
	2010	2011	2012
Gini coefficient	+	+	-
S80/S20 (r.h.s.)	+	+	-
Atkinson index (0.75)	+	+	-
Atkinson index (0.25)	+	+	-
Kawkani index	+	-	-
Reynolds-Smolensky index	+	+	-
Deciles	-	+	-
Disposable income of poorest decile	-3.35	-2.41	-2.12
Disposable income of richest decile	-4.89	-4.99	-2.29
Disposable income overall (%change)	-4.08	-5.01	-2.18
Distributional Result	*Slightly Progressive*	*Progressive*	*Regressive*
Revenue/expenditure based consolidation	*E (22%/78%)*	*R (57%/43%)*	*B (52%/48%)*

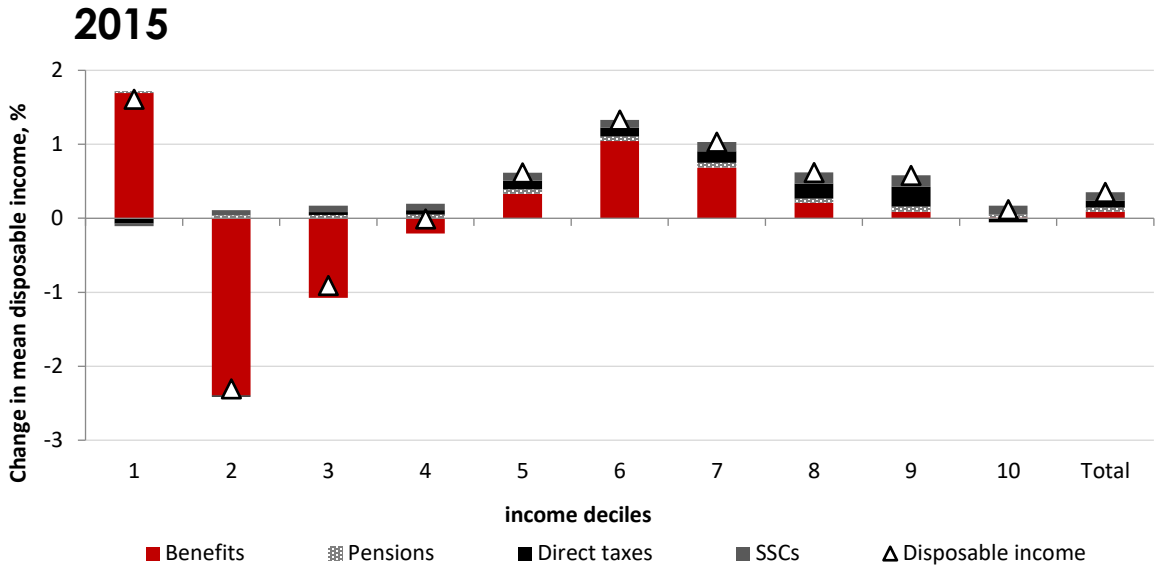
Data Source: ELSTAT, *SILC 2010-2018, EUROMOD*

Note: *+=positive effect thus decrease in inequality or increase in progressivity*

Distributional analysis – analysis by type of measures





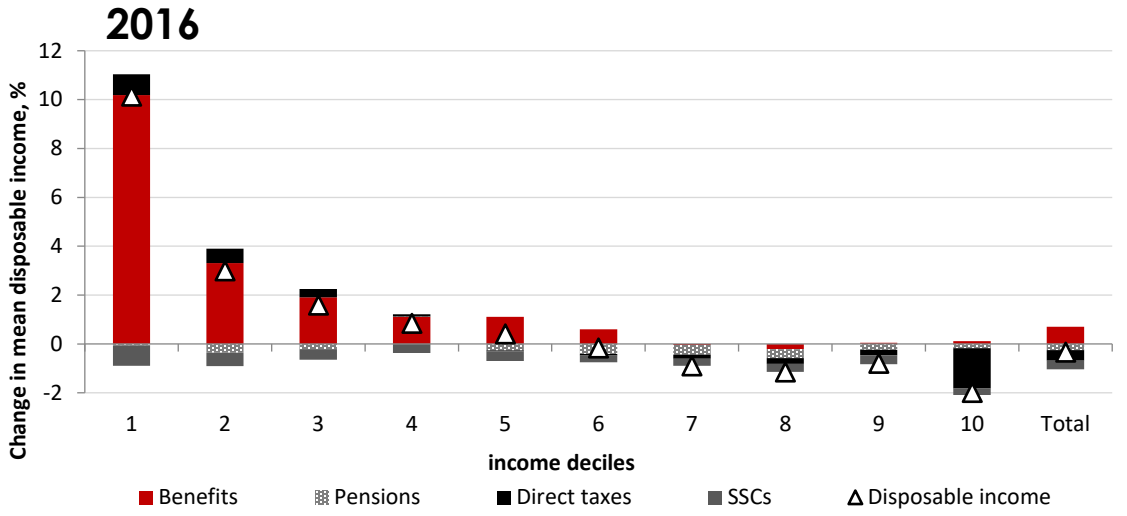


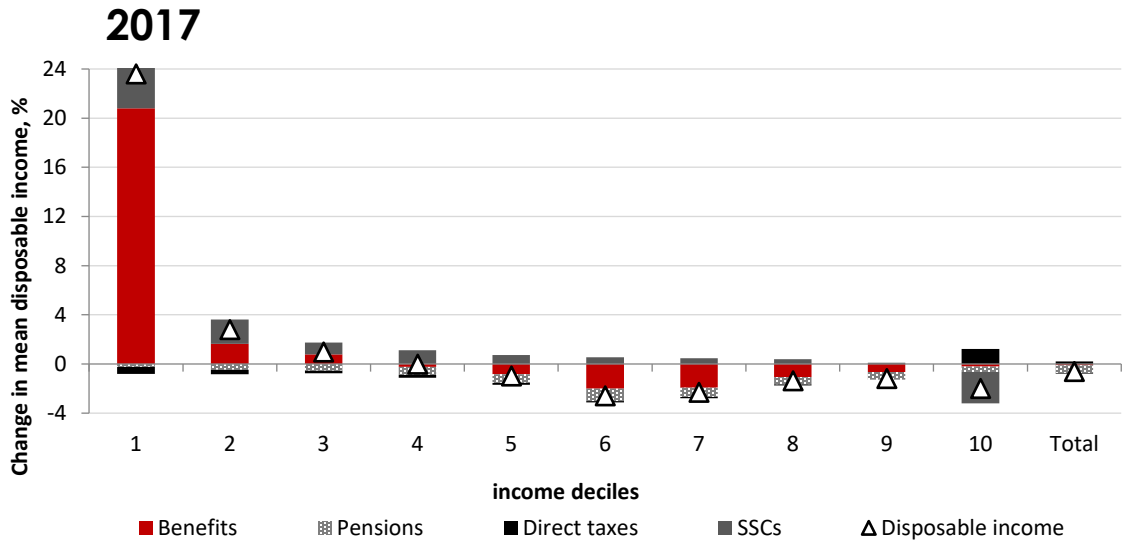
	2013	2014	2015
Gini coefficient	-	+	-
S80/S20 (r.h.s.)	+	+	-
Atkinson index (0.75)	+	+	-
Atkinson index (0.25)	+	+	-
Kawkani index	-	+	-
Reynolds-Smolensky index	-	+	-
Deciles	+	+	-
Disposable income of poorest decile *(%change)*	2.82	11.45	1.61
Disposable income of richest decile *(%change)*	-1.96	0.23	0.12
Disposable income overall *(%change)*	-2.01	1.30	0.35
Distributional Result	***Slightly Regressive***	***Progressive***	***Regressive***
Revenue/expenditure based consolidation	***E (28%/72%)***	***E (-15%/115%)***	***R (18%/82%)***

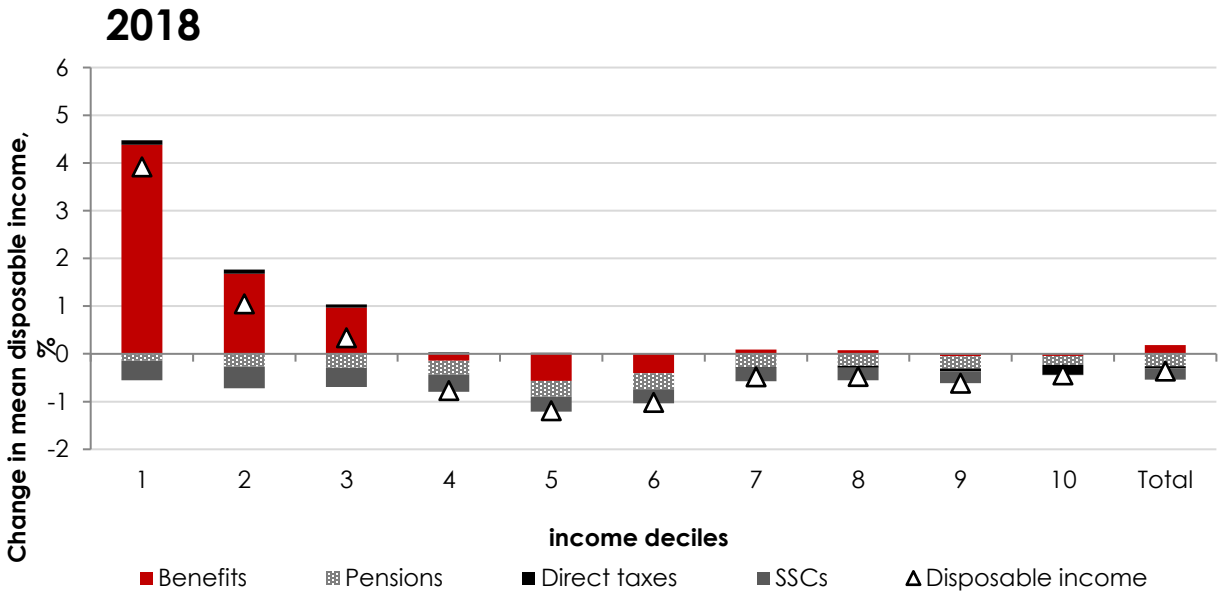
Data Source: ELSTAT, *SILC 2010-2018, EUROMOD*

Note: *+=positive effect thus decrease in inequality or increase in progressivity*

Distributional analysis – analysis by type of measures







	2016	2017	2018
Gini coefficient	+	+	+
S80/S20 (r.h.s.)	+	+	+
Atkinson index (0.75)	+	+	+
Atkinson index (0.25)	+	+	+
Kawkani index	+	+	+
Reynolds-Smolensky index	+	+	+
Deciles	+	+	+
Disposable income of poorest decile *(%change)*	10.14	19.10	3.92
Disposable income of richest decile *(%change)*	-1.99	-2.02	-0.44
Disposable income overall *(%change)*	-0.33	-0.61	-0.36
Distributional Result	***Progressive***	***Progressive***	***Progressive***
Revenue/expenditure based consolidation	***R (61%/39%)***	***R (182%/-82%)***	***E (34%/77%)***

Data Source: ELSTAT, *SILC 2010-2018, EUROMOD*

Note: *+=positive effect thus decrease in inequality or increase in progressivity*

Conclusions

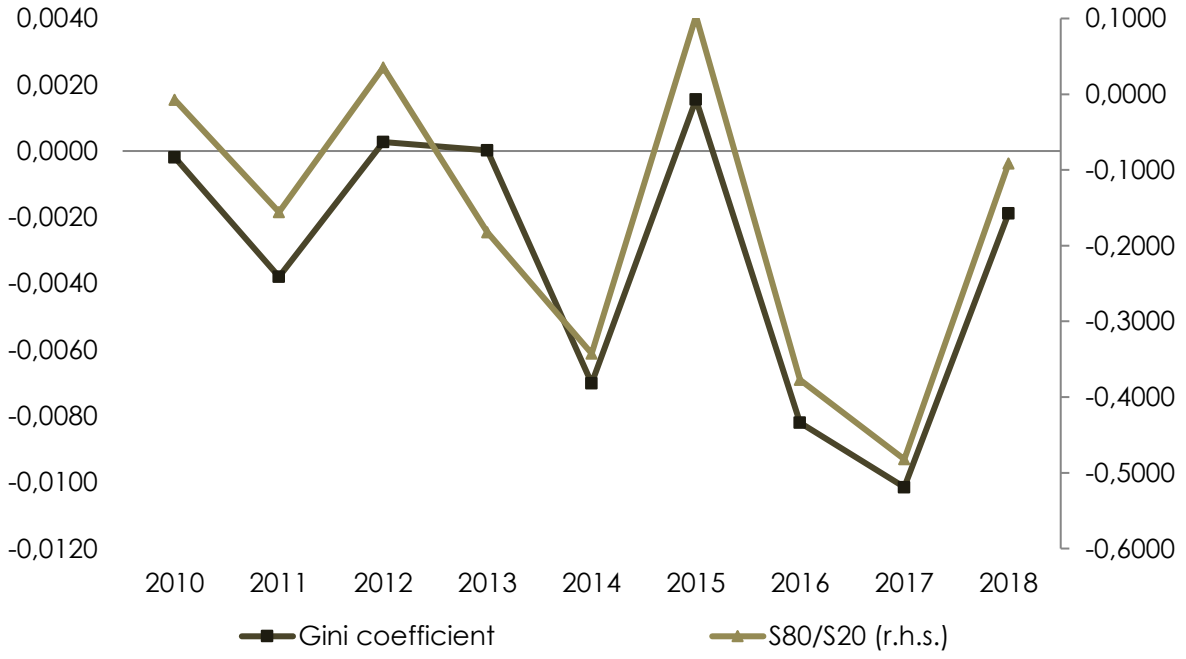
- **Balanced composition** of consolidation, with a broadly **shifting pattern** from expenditures to revenues, in line with observations in the literature about the gradually declining room for successful expenditure-based adjustments.
- Shift in the **factors accounting for the overall effect on income distribution**, from pension spending and direct taxes in the first years to an increasingly stronger effect of means-tested welfare benefits afterwards.
- **Impact of consolidation on income distribution** broadly in line with empirical findings about the more positive effects of revenue-based adjustments on income distribution.
  - Regressive distributional impact of measures at the peak of the crisis 2012, 2013 and 2015
  - Clearly progressive distributional impact in 2016-2018, with the improvement being much smaller in 2018, when expenditure measures were more pronounced.
  - Confirm results about the importance of expansionary social protection measures (particularly means-tested benefits) in containing and even reversing such negative effects.
- **Microsimulation analysis** through EUROMOD capable to capture the broad direction of standard inequality indices over an exceptionally long and sizeable consolidation episode, even when controlling for the broader macroeconomic developments.
- **Extensions - Robustness:** Remove Social Dividends, Bootstrap, Include Indirect measures in Distributional Analysis (Check Distributional Indices on Consumption).

THANK YOU

ANNEX

Distributional analysis – inequality indicators I

Distributional impact of discretionary measures – deviations from baseline



Data Source: ELSTAT, *SILC 2010-2018, EUROMOD*

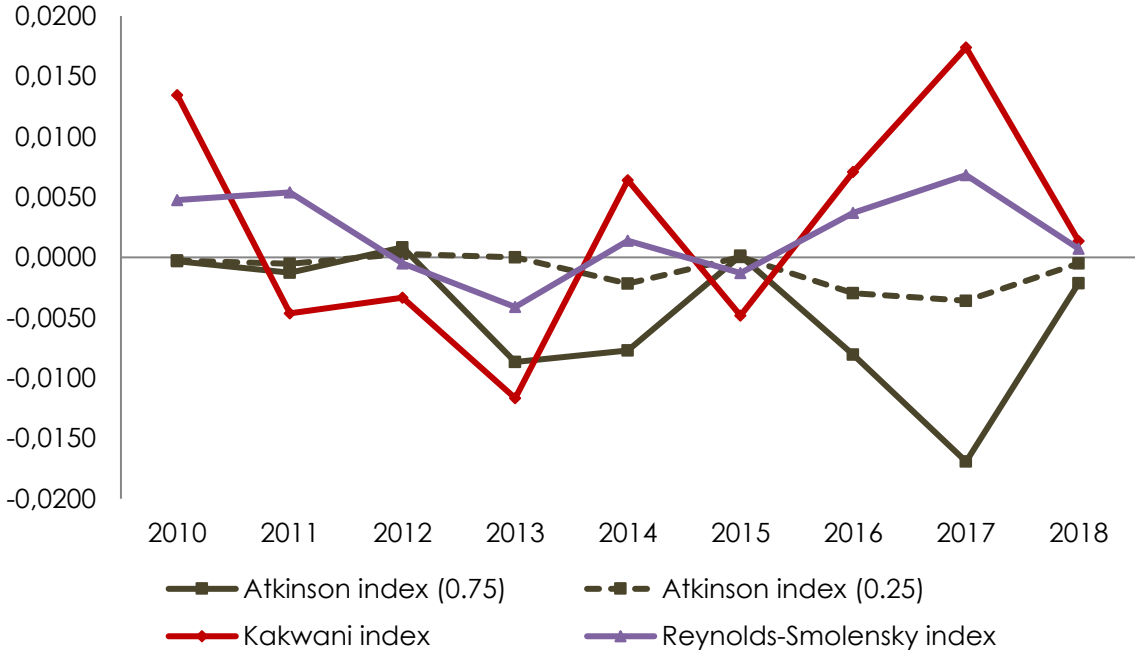
- The chart depicts **annual differences compared to the baseline value (previous year)** for the Gini coefficient and the S80/S20 ratio that can be attributed only to the policy effect (no growth effect and e.g. changes in unemployment).

- The Gini coefficient remains effectively constant in the first half of the period, fluctuates in 2014-2015 and displays clear reductions in 2016-2017 and increase in 2018.

- The S80/S20 ratio shows a similar pattern

Distributional analysis – inequality indicators II

Distributional impact of discretionary measures – deviations from baseline



Data Source: ELSTAT, *SILC 2010-2018, EUROMOD*

- The chart depicts **annual differences compared to the baseline value** (previous year) for one inequality indicator the **Atkinson index**, and two progressivity indicators the **Kakwani index** and the **Reynolds-Smolensky index**.

- The values for the Atkinson index have been calculated for an inequality aversion parameter of 0.75 and of 0.25, giving higher sensitivity to changes at the bottom and top of the income distribution respectively.

- Increase in Kakwani index and the Reynolds-Smolensky index depict increase in progressivity

- Increase in Atkinson equals an increase in inequality.

Summaries CVs

- **Eirini Andriopoulou** specializes in labour economics, applied microeconomic analysis and public policy making. She is the Head of the Unit of Experts at the Greek Ministry of Labour and Social Affairs. Her research work focuses on inequality of income distribution and poverty, as well as the design of social and tax policies.

- **Lefteris Tserkezis** works at the Council of Economic Advisors at the Greek Ministry of Finance and is the Head of Macroeconomic Policy and Forecast Division. His research focuses on fiscal policy, economic growth and business fluctuations.