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## Redistribution Policy and Inequality in Portugal (2008-2017)

### Desigualdade e Políticas Redistributivas em Portugal (2008-2017)

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#### **ABSTRACT**

The aim of this paper is to analyse in detail the redistributive effects of pensions, other social benefits, and taxes in Portugal during the 2008-17 period, which includes the economic crisis of 2010-13 and the recovery starting in 2014. It examines the successive income distributions and their transitions from Market to Disposable income. Pensions are analysed individually because of their growing importance, but they also make the highest contribution to the decrease in income inequality. The rise in the dimension, efficacy, and progressivity of taxes explains the relative stability of the Gini coefficient during the crisis. After 2014, Disposable income inequality decreased significantly, helped by the economic recovery, falling unemployment, and improving income policies.

Keywords: Income inequality; redistributive policies; tax-benefit system; Portugal.

**JEL Classification:** D31; H23; I38

#### **RESUMO**

O objetivo deste estudo é o de estudar em pormenor os efeitos redistributivos das pensões, outras transferências sociais e impostos em Portugal no período 2008-17, incluindo a crise de 2010-13 e a recuperação económica pós-2014. As sucessivas distribuições do rendimento e respetivas transições do rendimento de Mercado ao Disponível são analisadas. As pensões são objeto de atenção individual dada a sua importância crescente e serem elas que dão a maior contribuição para o decréscimo da desigualdade. A subida da dimensão, eficácia e progressividade dos impostos explica a relativa estabilidade do Gini durante a crise. Depois de 2014, a desigualdade do rendimento Disponível diminuiu significativamente devido à recuperação económica, quebra do desemprego e à alteração das políticas públicas. Palavras-chave: Desigualdade; políticas redistributivas; sistema de prestações sociais, sistema fiscal; Portugal.

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## 1. INTRODUCTION

More than 20 years after Atkinson's 1996 presidential address to the Royal Economic Society entitled "Bringing income distribution in from the cold", the study of income inequality and its reduction through the redistributive effects of public policy instruments, benefits and taxes is at the centre of the public debate. It features in both academic research and political discussions across the ideological divide, and enjoys widespread media attention.

The relationship between the tax-benefits system and income distribution inequality and the analysis of the redistributive impact of taxes and social transfers have long been discussed in the economic literature. In the nineties, a new approach emerged focussing on the analysis of the defining characteristics of the different types of welfare state and how these shape redistribution, as discussed in, for example, Esping-Andersen (1990), Castles and Mitchell (1992), and also in Esping-Andersen and Myles (2009). Their comparison of the different types of welfare state was still mainly based on macroeconomic indicators, such as the weight of taxes and social transfers in GDP. However, the availability of microdata, sourced from either administrative data or direct household surveys, has comprehensively transformed this topic by creating a more microeconomic approach based on the analysis of household income and the microsimulation of the impact of social and fiscal policies on inequality and social well-being.

In this context, a widely used methodology to analyse income inequality and redistribution relies on the identification of the impact of social benefits and taxes in the reduction of inequality, the relationship between the dimension and progressivity of the redistributive policies, suggested in Kakwani (1977) and Reynolds and Smolensky (1977), and the distinction between vertical and horizontal equity, discussed in Verbist (2004) and Urban (2014), for example. The redistribution effect of an instrument is defined as the change in income inequality achieved by its introduction. It considers both the expenditure side, through benefits, and the revenue side, through taxes. Vertical equity is achieved through the reduction of the difference between wealthier and poorer households, whereas horizontal equity measures whether households at the same level of income are treated equally.

Recent applications using microdata from different countries can be found in, for example, Astarita et al. (2018), Avram et al. (2014), Čok et al. (2013), Guillaud et al. (2019), Immervoll et al. (2006), Immervoll and Richardson (2011), Mantovani (2018), Orsetta and Hermansen (2018) and Verbist and Figari (2014). The results generally point to a greater redistribution efficacy of taxes and difficulties in targeting /means-testing of benefits. Substantially different and complex pensions (state and private) systems are often not included in the analysis, although they play an increasing role in countries with ageing populations. Furthermore, the recent international economic crisis led to widespread implementation of austerity policies and cuts in social spending, emphasising the importance of evaluating the efficacy of these policies when resources are scarce.

In a Portuguese context, Alves (2012) and Rodrigues and Andrade (2014) show that the introduction of social policies targeting the high levels of income inequality and the sustained expansion of the welfare state were successful in reducing inequality (and poverty) in Portugal, particularly before the crisis.

The aim of this paper is to analyse the changes in the redistributive capacity of the main public policy instruments in Portugal between 2008 and 2017. During this period, there were major changes in Portuguese public policies, driven by the deep economic crisis which led to a sharp fall in household incomes in 2010-13.

The 2008-17 period analysed in this paper can be divided into three distinctive sub-periods:

The first, before the economic crisis, is characterised by weak economic growth and an emphasis in public policies aimed at reducing inequality, poverty and social exclusion. The Gini coefficient fell from 0.381 in 2004 to 0.337 in 2009, as discussed in Rodrigues et al. (2012). This reduction is mainly explained by the higher relative growth of the lower household incomes: the share of the 10% lowest household incomes in the total income increased at an annual rate of 2.6% compared to a much lower 0.4% rate in average income.

The second corresponds to the economic crisis of 2010-13, characterized by high unemployment, falling household incomes, and the implementation of austerity measures and cuts in public spending. The unemployment rate rose from 7.6% in 2008 to 16.2% in 2013, and household incomes fell by more than 10% in real terms.

The third, after 2014, marks the start of the economic recovery process, with unemployment getting close to its pre-crisis levels, household incomes increasing by about 8% in real terms, but still not enough to recuperate their pre-crisis levels, and a significant reversal in public policies after 2015. Income inequality has also returned to its pre-crisis decreasing trend: in 2017, almost all inequality indicators attained their lowest level since they were first officially calculated.

One of the most heated debates about this period concerns the evolution of inequality during the economic crisis. Using only the Gini coefficient, it is undeniable that inequality fell both before the crisis and more recently, particularly since 2016. However, during 2010-13, the Gini coefficient remained nearly stable with a slight upward trend. Hence, some analysts and policy makers defend that the economic crisis did not lead to an increase in inequality, while acknowledging its negative impact on household incomes and poverty indicators. Therefore, it becomes essential to understand how inequality evolved during this period and the role played by the different redistributive policies in that evolution.

This paper is organised as follows: Section 2 briefly describes the main changes in redistributive policies in 2008-17; Section 3 introduces the data and income concepts and Section 4 defines the measures of inequality, redistribution and progressivity of pensions, other social benefits and taxes used in this paper; the main results are presented in Section 5 and Section 6 concludes this paper.

## 2. MAIN CHANGES IN REDISTRIBUTIVE POLICIES

A consequence of the economic and financial crisis was the implementation of a Financial Assistance Programme agreed by the Portuguese government, IMF, ECB, and European Commission in 2011. Measures such as the freezing of the national minimum wage and cuts in public sector wages and pensions, together with rising unemployment and decreasing levels of economic activity, all led to a severe reduction in household incomes.

Simultaneously, there was a reduction in the efficacy of the social benefits that target lower income households. The entitlement to child benefit was curtailed in 2010, and the access rules to the guaranteed minimum income (RSI) were significantly altered in 2010 and again in 2012. Rodrigues et al. (2016) show these alterations led to a decrease of more than 25% in the number of RSI recipients between 2009-13, coinciding with a period of growing poverty and worsening living conditions.

Income tax (IRS) was also substantially modified, particularly in 2013. The number of IRS brackets dropped from 8 to 5, and the marginal tax rates increased significantly. An “extraordinary surtax on income” and a special average surtax of 3.5% on IRS taxable income net of the annual value of the national minimum wage were applied in 2011 and again in 2013-15. In 2011 and 2015, an “extraordinary solidarity contribution” was applied to the highest pensions.

After 2014, these austerity policies started to be reversed and, together with the economic recovery, contributed to the (partial) recovery to pre-crisis household income levels. Although austerity income policies were progressively abandoned like, for example, an increase of 15% in the national minimum wage between 2014 and 2017, the more structural alterations in the tax system remained virtually unchanged until 2017.<sup>1</sup>

### 3. DATA

Using the microdata available in the Portuguese component of the European Union Statistics on Income and Living Conditions survey (EU-SILC), it is possible to analyse in detail the different distributions of household income and evaluate the redistributive impact of the social policy changes in Portugal in 2008-17.

The starting point in the evaluation of the resources available to each household is the definition of the concept of income. The EU-SILC adopts the concept of Disposable monetary income, which is defined as the monetary income received by the household and each of its members individually from work (employee wages and self-employment earnings), other private income sources (capital, property, and private transfers), pensions, and other social transfers. Then, it is possible to differentiate between gross and net income and estimate the impact of income taxes and social benefits.

Throughout this paper, the household’s Disposable income is the key variable in the analysis of household incomes and estimation of inequality indicators. However, the definition used here differs slightly from that used by Eurostat because it excludes the component “Regular interhousehold cash transfers paid”.

The role of benefits and taxes in the structure of household incomes and their equalising impact is revealed using four sequential income distributions:

Market income, which includes wages and salaries, plus self-employment, property, and other private incomes. It is the closest approximation to an economy without

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<sup>1</sup> The IRS extraordinary measures were progressively withdrawn and most terminated only in 2018-19. The number of income tax brackets increased to 7 in 2018.

- explicit state intervention but, by excluding all other incomes, it generates a large number of individuals and households with zero (Market) income;
- MarketP (Market + Pensions) income adds (gross) old-age pensions and survivors related benefits to Market income;
- Gross income is defined as MarketP income plus social security cash benefits: unemployment, housing, sickness, disability, maternity, and child benefits, plus the RSI and CSI (Solidarity supplement for older people);
- Disposable income is obtained from Gross income by deducting “Social Security Contributions” (SSC) and (direct) taxes.

Following the Eurostat methodology, all income distributions are transformed using the modified OECD equivalence scale to harmonise household data in terms of dimension and age structure, thus making comparisons possible.

The redistributive role of the tax system is determined by comparing Disposable and Gross income, and that of social benefits by comparing Gross and MarketP income. In this paper, pensions are analysed apart from Market income. This is a complex issue because Portuguese pensions are, in general, contributive and therefore should be seen as deferred compensation and not as social benefits. However, the separate analysis of pensions is justified by both their growing share in household incomes due to the ageing of the Portuguese population, and their being mostly state pensions hence strongly determined by public policies.

Although the EU-SILC microdata is very detailed, it still has limitations that prevent further analysis of the redistributive effects. One of its main drawbacks is the non-differentiation between means-tested and non means-tested benefits throughout the period under analysis.<sup>2</sup> Thus, it is not possible to discriminate between contributive and non-contributive pensions or between insurance unemployment and social unemployment benefits.

#### 4. MEASURES OF INEQUALITY, REDISTRIBUTION AND PROGRESSIVITY

The Redistributive Effect (RE) of a tax or a benefit can be measured by the difference between the pre-instrument income Gini coefficient,  $G_X$ , and the post-instrument income Gini,  $G_Y$ ,  $RE = G_X - G_Y$ . It measures the variation in income inequality produced by the introduction of the tax or benefit under analysis. A positive RE value implies a decrease in inequality, whereas a negative one reveals its increase.

However, this concept raises the issue of the re-ranking effect (RR), first discussed in Atkinson (1980). Receiving pensions, social transfers, and/or paying taxes generates changes in the households' income that can alter their ordering and positioning in subsequent income distribution percentiles. A good example is that of individuals whose sole income is their old-age pension: they are positioned at the bottom of Market income distribution but, once pensions are included in the analysis, they can be immediately re-ranked into the highest percentiles of the MarketP distribution. This effect can be substantial in countries with ageing populations, as found in Marx et al. (2013)'s re-ranking sensitivity analysis.

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<sup>2</sup> This information is only available since the 2013 survey.

The re-ranking effect can be measured by the difference between the Gini and concentration coefficients of the post-instrument income,  $RR = G_Y - C_Y$ , where  $C_Y$  is calculated like its Gini counterpart,  $G_Y$ , but with all incomes ranked by the pre-instrument income.

Then, the vertical effect (VE) of an instrument is equal to the difference between its redistributive and its re-ranking effects:  $VE = RE - RR$ . Hence, by definition, the VE can only capture the instrument vertical equity and not its full RE, as discussed in Atkinson (1980) and Plotnick (1981). The VE can also be calculated as the difference between the pre-instrument Gini and the post-instrument concentration coefficient,  $VE = G_X - C_Y$ .<sup>3</sup> The latter is often referred to as the Reynolds-Smolensky (1977) index.

The total RE of an instrument depends on three factors: its average rate, its progressivity level, and the RR size. Its average rate is given by  $t = \frac{T}{X}$ , where  $T$  is the total instrument amount. Its progressivity level is traditionally measured by the Kakwani (1977) index,  $K = C_T - G_X$ , *i.e.*, the difference between the instrument concentration coefficient,  $C_T$ , and the pre-instrument Gini. It is positive when the instrument is progressive, zero when it is proportional, and negative when it is regressive.<sup>4</sup> Finally, its total RE is given by:

$$RE = G_X - G_Y = \frac{t}{1-t} K - RR$$

and the instrument size equals its weight in the post-instrument income  $\frac{T}{Y} = \frac{t}{(1-t)}$ .

An alternative approach is suggested by Lerman and Yitzhaki (1985). Their methodology identifies the contribution of each type of income to the total inequality of Disposable income. They demonstrate that the Gini coefficient,  $G_Y$ , can be written as  $G_Y = \sum_{k=1}^K s_k G_k r_k$ , where  $s_k$  is the share of income  $k$  in Disposable income,  $G_k$  is its Gini, and  $r_k$  is the correlation between the two incomes. Income  $k$  relative contribution to Disposable income inequality is given by  $s_k G_k r_k / G_Y$ .

## 5. MAIN RESULTS

Table 1 shows the evolution of the Disposable income of the Portuguese population and the 1<sup>st</sup> and 5<sup>th</sup> quintiles of its distribution over the 2008-17 period.

The combined effects of the deep economic crisis and austerity public policies are clearly visible, with the Portuguese average Disposable income falling by about 13% between 2009 and 2013. However, this reduction hit the lower income households hardest: the 1<sup>st</sup> quintile households average Disposable income fell by 22%, whilst that of the 20% wealthiest households fell by less than the national average (12.6%).

In the post-crisis period (2014-17), falling unemployment, economic recovery, and changes in public policies led to an average increase in Disposable income of 7.9%, which still falls

<sup>3</sup> It should be noted that  $VE = RE$  when there is no re-ranking.

<sup>4</sup> It is expected that taxes are progressive (*i.e.*, the wealthier individuals pay higher tax rates than the poorer), but that benefits are regressive (*i.e.*, they are primarily aimed at lower income individuals). Thus,  $K$  should be positive for taxes and negative for benefits. However, some analysts prefer to apply the concept of targeting, rather than regressivity, to benefits. Hence, high negative Kakwani values reflect high levels of benefits targeting.



short of reinstating pre-crisis income levels. In fact, the 2017 average Disposable income corresponded to about 95% of its value in the last pre-crisis year. Furthermore, the Disposable income of the poorer households increased by 20.2% in real terms between 2014-17, 4.2 times the rate of growth of that of the 20% wealthiest households (4.9%).

Table 1: Evolution of Disposable income, 2008-17

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Population	11 453	11 700	11 415	10 830	10 221	10 168	10 332	10 875	11 109	11 147
	(222)	(162)	(156)	(134)	(119)	(114)	(114)	(107)	(107)	(95)
1st quintile	4 125	4 368	4 244	3 933	3 525	3 407	3 560	3 825	3 976	4 278
	(53)	(51)	(45)	(46)	(49)	(45)	(41)	(39)	(39)	(38)
5th quintile	24 769	24 294	24 106	22 928	21 309	21 235	21 411	22 543	22 918	22 453
	(821)	(462)	(476)	(413)	(319)	(291)	(334)	(294)	(313)	(256)

Note: Annual values in euros in 2017 prices. Standard errors in parentheses.

Source: INE, Statistics Portugal, EU-SILC 2009- 2018.

The complex evolution of Disposable household income is reflected on the inequality indicators given in Table 2, and traditionally published by INE.<sup>5</sup> Between 2009-13, the Disposable income Gini remained relatively stable, suggesting that the increasing distance between the incomes of the wealthiest and poorest households detected in Table 1 did not extend significantly to this indicator.<sup>6</sup> However, when indicators that are sensitive to the extremes of the income distribution are used, the results change noticeably. For example, the S80/S20 ratio, an indicator that compares the income share of the 20% wealthiest and poorest households, rose by about 12%, from 5.6 in 2009 to 6.2 in 2013.

In the post-crisis period, the (partial) recovery in income levels, fall in unemployment, and progressive removal of the austerity policies meant that practically all inequality indices return to their decreasing pre-crisis trends. They actually achieve their lowest ever INE published values in 2017.

<sup>5</sup> The values in Table 2 are marginally different from those published by INE because they are based on a slightly different definition of Disposable income (see above).

<sup>6</sup> The Gini values during the crisis and austerity policies period were actually lower than its 2008 value.

Table 2: Disposable income Inequality

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Gini	0.354	0.337	0.343	0.345	0.343	0.346	0.341	0.340	0.336	0.323
	(0.010)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
S90/S10	10.2	9.2	9.3	10.0	10.7	11.1	10.6	10.1	10.0	8.7
	(0.6)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.2)
S80/S20	6.0	5.6	5.7	5.8	6.0	6.2	6.0	5.9	5.8	5.2
	(0.25)	(0.15)	(0.16)	(0.16)	(0.17)	(0.16)	(0.15)	(0.13)	(0.13)	(0.10)

Note: Standard errors in parentheses.

Source: INE – Statistics Portugal, EU-SILC 2009- 2018.

An additional insight on how the distribution of Disposable income changed in this period is gained from analysing the evolution of its quintiles in Table 3. The share of the poorest 20% households (1<sup>st</sup> quintile) in Disposable income fell from 7.2% in 2009 to 6.7% in 2013, but this downward movement was sustainably reversed post-crisis: it reached 7.7% in 2017, its highest ever value. Conversely, the share of the wealthiest 20% households (5<sup>th</sup> quintile) rose slightly above its 2009 value at the beginning of the crisis and then stayed almost unchanged around 42% until it dropped to 40.3% in 2017. The evolution in the central part of the income distribution (2<sup>nd</sup> to 4<sup>th</sup> quintiles) is noteworthy: their share had a small increase during the crisis (50.3% in 2010 to 51.5% in 2013) and remained thereabouts until the 52% attained in 2017.<sup>7</sup>

<sup>7</sup> See Rodrigues et al. (2012, 2016) for a detailed study of the changes in income distribution in Portugal in the pre and crisis periods.

Table 3: Quintile shares of Disposable income

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1st quintile	7.2	7.5	7.4	7.3	6.9	6.7	6.9	7.0	7.2	7.7
	(0.17)	(0.14)	(0.13)	(0.13)	(0.14)	(0.13)	(0.12)	(0.11)	(0.11)	(0.10)
2nd quintile	12.0	12.3	12.2	12.3	12.4	12.2	12.4	12.4	12.6	12.8
	(0.22)	(0.15)	(0.16)	(0.14)	(0.14)	(0.13)	(0.13)	(0.11)	(0.12)	(0.10)
3rd quintile	16.0	16.5	16.2	16.3	16.6	16.7	16.8	16.6	16.7	16.9
	(0.27)	(0.18)	(0.18)	(0.16)	(0.15)	(0.14)	(0.14)	(0.13)	(0.13)	(0.11)
4th quintile	21.6	22.2	22.0	21.9	22.4	22.5	22.4	22.5	22.2	22.4
	(0.33)	(0.21)	(0.22)	(0.20)	(0.17)	(0.16)	(0.17)	(0.15)	(0.15)	(0.13)
5th quintile	43.3	41.5	42.3	42.4	41.7	41.8	41.4	41.5	41.3	40.3
	(0.87)	(0.53)	(0.54)	(0.49)	(0.43)	(0.40)	(0.43)	(0.36)	(0.38)	(0.32)

Note: Standard errors in parentheses.

Source: INE – Statistics Portugal, EU-SILC 2009- 2018.

These results shed further light on the behaviour of the inequality indices estimated in Table 2 and how income inequality changed in Portugal in this period. The near stability of the central quintiles shares is decisive to explain how the Gini, a coefficient that is particularly sensitive to changes in that part of the distribution, remained so stable during the crisis. Afterwards, and especially in 2017, the significant increase in the 1<sup>st</sup> quintile share, together with the small reduction in the share of the 5<sup>th</sup>, justify the clear decrease in all inequality indicators detected in Table 2.

The analysis of the evolution of household income over this period requires a more detailed study of the main components of Disposable income and distributions already described. The most important results in Table 4 are the fall in the relative importance of (gross) Market income during the crisis period (90.8% of Disposable income in 2012), which is closely connected to the increase in unemployment and decrease in economic activity in this period; and the continuous rise in the share of pensions in Disposable income, which increased by about 7% between 2008 and 2017.

The (relative) importance of social benefits is more complex to analyse, given its heterogeneity and data availability limitations already discussed. Throughout the economic crisis, the means-tested benefits targeting poverty and social exclusion suffered severe cuts, but these were more than offset by the increase in unemployment benefit triggered by the sharp rise in unemployment. This justifies that the maximum weight of ‘other benefits’ in Disposable income in this period is recorded in 2013 (6.2%) and coincides with the highest value of the unemployment rate in decades (16.2%).

Finally, Table 4 shows the substantial increase in the weight of taxes in Disposable income during the crisis, particularly after the changes to the tax system introduced in the

2013 Budget. Taxes were about 25% of Disposable income pre-crisis, rose to about 29% in 2011, falling in 2012 due to the slowing economic activity. The changes in the tax system lifted them to over 30%, where they have remained in the post-crisis period.

Table 4: Structure of Disposable income in %

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Market income	97.8	95.7	96.7	95.5	90.8	95.4	96.8	96.6	96.7	97.7
	(1.11)	(1.03)	(1.00)	(1.11)	(0.99)	(1.07)	(1.00)	(0.97)	(0.93)	(0.85)
Pensions	22.8	23.6	24.4	28.8	28.7	29.9	29.9	31.7	30.7	29.8
	(0.78)	(0.70)	(0.70)	(0.79)	(0.74)	(0.75)	(0.74)	(0.81)	(0.70)	(0.63)
Other benefits	4.3	5.3	5.2	4.8	5.3	6.2	5.2	4.6	4.1	3.9
	(0.20)	(0.24)	(0.24)	(0.21)	(0.21)	(0.28)	(0.27)	(0.18)	(0.20)	(0.16)
Taxes + SSC	-24.9	-24.6	-26.3	-29.1	-24.8	-31.5	-32.0	-32.9	-31.6	-31.3
	(0.42)	(0.42)	(0.40)	(0.48)	(0.42)	(0.48)	(0.43)	(0.46)	(0.43)	(0.39)
Disposable Income	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Standard errors in parentheses.  
Source: INE – Statistics Portugal, EU-SILC 2009- 2018.

Table 5 shows the estimated relative importance of each income component in total Disposable income inequality using the Lerman and Yitzhaki (1985) methodology.

Market income makes the highest relative contribution to inequality, as expected, explaining about 120% of the Disposable income Gini. This value clearly exceeds the share of Market income in Disposable income, which is always below 98% (see Table 4). Pensions also make a positive, and growing, contribution to the increase in inequality during this period. In 2008, pensions explained about 17% of total inequality, a value that had risen to 31.4% by 2017. The increase in the pensions contribution is also greater than the rise in its share, and reflects the growing heterogeneity of pensioners' incomes.

The relative contribution of the other social benefits to inequality is negative in most years, revealing their equalising character. The exception is the 2013-14 period, when their contribution is marginally positive, which may be explained by the increase in the weight of the contributive unemployment insurance in this period. However, the overall impact of other social benefits is very small and its estimated results are not significant, as demonstrated by the reported standard errors. Although 2016-2017 has promised some recovery, the equalising capacity of this component is still below its pre-crisis levels.

As expected, given their size, taxes and SSC have the most important, and significantly increasing, equalising contribution. This increasing equalising role is one of the most distinct characteristics of the alterations that have occurred in the Portuguese income distribution in this period. It is arguable that, without it, the increase in Disposable income Gini would

have been much more significant during the 2010-13 crisis, and the post-crisis fall in inequality may have been slower.

Table 5: Relative contribution to Disposable income inequality (%)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Market income	122.3	123.3	121.8	118.9	115.2	123.8	125.6	121.6	122.0	124.0
	(2.08)	(2.03)	(2.07)	(2.50)	(2.16)	(2.27)	(2.13)	(2.20)	(2.13)	(1.97)
Pensions	17.1	17.9	20.3	29.1	28.2	29.6	29.2	35.1	33.1	31.4
	(1.70)	(1.53)	(1.56)	(1.86)	(1.73)	(1.72)	(1.72)	(2.01)	(1.67)	(1.53)
Other benefits	-1.3	-2.1	-1.2	-1.2	-1.7	0.3	0.3	-0.1	-0.4	-0.6
	(0.26)	(0.36)	(0.40)	(0.35)	(0.34)	(0.61)	(0.67)	(0.39)	(0.52)	(0.38)
Taxes + SSC	-38.1	-39.1	-40.9	-46.7	-41.7	-53.7	-55.1	-56.6	-54.7	-54.8
	(0.86)	(0.83)	(0.85)	(1.05)	(0.83)	(0.93)	(0.83)	(0.90)	(0.87)	(0.80)
Disposable Income	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Standard errors in parentheses.

Source: INE – Statistics Portugal, EU-SILC 2009- 2018.

The Gini coefficients of the four income distributions, shown in Table 6 for 2008-17, can be used to analyse separate and sequentially the evolution of each component's inequality. Unlike Disposable income inequality, already discussed, Market income inequality increased noticeably during the crisis, when its Gini rose by about 8%, from 0.522 in 2009 to 0.563 in 2013. Therefore, the fall in both the level of Market income and in its weight in Disposable income, already discussed, was accompanied by an increase in its inequality. This increase spread to MarketP and Gross income inequality, with the latter rising by about 0.3 percentage points (p.p.) between 2009-13. The apparent immunity of Disposable income inequality is essentially justified by the increasing redistributive capacity of the tax system, as seen in Table 5 and discussed further in Table 7. Post-crisis, there was a reduction in the inequality of all income components, leading to lower 2017 inequality levels than before the crisis.

Table 6: Distribution of income components, Gini coefficient

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Market income	0.528	0.522	0.527	0.543	0.548	0.563	0.555	0.547	0.540	0.526
	(0.010)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
Market + Pensions	0.417	0.408	0.413	0.422	0.423	0.437	0.427	0.425	0.417	0.401
	(0.010)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Gross Income	0.395	0.379	0.386	0.397	0.393	0.408	0.404	0.405	0.398	0.384
	(0.010)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Disposable Income	0.354	0.337	0.343	0.345	0.343	0.346	0.341	0.340	0.336	0.323
	(0.010)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)

Note: Standard errors in parentheses.

Source: INE – Statistics Portugal, EU-SILC 2009-2018.

The total RE of each of the three types of policy instruments considered are presented in Table 7, making it possible to identify the individual contribution of pensions, other (social) benefits and taxes to lower income inequality.

The instrument with higher RE is undoubtedly pensions, reducing the Market income Gini by about 12 p.p. Although Portuguese pensions cannot be actually classified as an instrument of redistribution policy given that they there are mostly contributive, their relevance to reducing Market income inequality is easily explained. Pensions represent a very significant part of the total household income, as already discussed, and a substantial proportion of the households that get income from pensions have zero Market income.<sup>8</sup> Hence, they are strongly “regressive” in the transition from Market to MarketP income, *i.e.*, a considerable proportion of their recipients live in households with zero Market income, and thus pensions generate a large re-ranking effect, as discussed later.

The redistributive impact of other benefits is rather small, reducing the Gini by less than 3 p.p. throughout. Their highest RE is in 2012-13, during the crisis, explained by the role of automatic stabilisers, such as unemployment benefit, which naturally declined post-crisis and to values lower than those pre-crisis. The low redistributive efficacy of other benefits is largely due to their small weight in total household income which is, undoubtedly, one of the main weaknesses of the Portuguese redistributive policies.

The most important modification in the redistributive capacity of any instrument considered in this period is that of taxes, which greatly reduce inequality in the transition between Gross and Disposable income. Pre-crisis taxes RE was about 4 p.p., which more than doubled to 6.2 p.p. in 2013 as a result of the austerity policies and tax system changes. Post-crisis, their RE remained at about the same level, even after some of the crisis extraordinary tax measures were removed. Recognising this substantial increase in the RE of taxes

<sup>8</sup> Throughout this period, about 24% of the households have zero Market income, whilst 48% of the households that get pension income earn zero Market income.

is particularly relevant because it endorses the re-evaluation of the evolution of inequality in Portugal in this period. Increasing inequality in Market income during the crisis was not transmitted to Disposable income, or only very marginally, because of the increased redistributive efficacy of taxes. Post-crisis, this growing efficacy of taxes together with policy reversals and economic recovery led to a larger reduction in Disposable income inequality.

Table 7: Redistributive Effects of Cash Benefits and Household Taxes

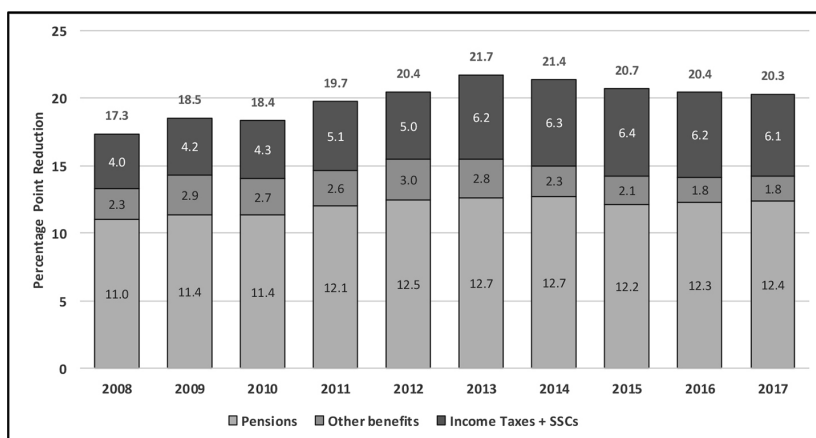
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Pensions	0.110	0.114	0.114	0.121	0.125	0.127	0.127	0.122	0.123	0.124
	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Other benefits	0.023	0.029	0.027	0.026	0.030	0.028	0.023	0.021	0.018	0.018
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Taxes + SSC	0.040	0.042	0.043	0.051	0.050	0.062	0.063	0.064	0.062	0.061
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Note: Standard errors in parentheses.

Source: INE – Statistics Portugal, EU-SILC 2009- 2018.

Figure 1 summarises the RE of all three instruments, and shows how their increased redistributive efficacy during the crisis was clearly linked to the higher taxes RE. Their joint RE is about 20 p.p., with a maximum of 21.7 p.p. in 2013. However, if pensions are excluded, this value drops to below 10 p.p.

Figure 1: Summary of the effects of benefits and taxes in reducing inequality



Source: INE, Statistics Portugal, EU-SILC 2009-2018.

Figure 1 gives a clear image of how the redistributive efficacy of pensions, other social transfers and direct taxes evolved in Portugal in recent years, particularly during the economic crisis. Nonetheless, it does not provide a comparison with that of other countries, namely those of the EU. Although much research on the redistributive efficacy of social transfers and taxes has been published recently, it remains difficult to find studies directly comparable to the present one, covering the same time period and specifically addressing the redistributive role of pensions. However, some comparisons are possible with, for example, Alves (2012) and Mantovani (2018) who estimate the redistributive effect of social transfers and taxes in 2009 and 2012, respectively. They conclude that social transfers (excluding pensions) have, in Portugal, a lower redistributive efficacy whilst the fiscal system has a higher than average redistributive efficacy compared to that of the other EU countries.

As discussed before, the progressivity of a tax, or the regressivity /targeting of a social benefit, is essential to ensure an increase in the RE of a given income component. As expected, Table 8 shows negative Kakwani values for pensions and other benefits, and positive values for taxes.

Table 8: Kakwani index of Benefit/Tax Progressivity

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Pensions	-0.938	-0.918	-0.929	-0.954	-0.929	-0.964	-0.970	-0.967	-0.959	-0.989
	(0.026)	(0.019)	(0.020)	(0.018)	(0.020)	(0.016)	(0.015)	(0.017)	(0.016)	(0.013)
Other benefits	-0.771	-0.785	-0.772	-0.796	-0.812	-0.755	-0.749	-0.730	-0.709	-0.731
	(0.025)	(0.025)	(0.030)	(0.030)	(0.024)	(0.030)	(0.038)	(0.028)	(0.036)	(0.032)
Taxes + SSC	0.173	0.184	0.177	0.189	0.213	0.209	0.208	0.206	0.207	0.205
	(0.005)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)

Note: Standard errors in parentheses.

Source: INE – Statistics Portugal, EU-SILC 2009-2018.

In absolute value, the instrument with highest Kakwani values is pensions, but this result needs to be interpreted with due care. The negative Kakwani values show that, when transferring from Market to MarketP income, a very significant part of pensions goes to households that have low or zero Market income, and therefore are placed in the lowest percentiles of the Market income distribution. If, instead, households were always ranked by Disposable income, the highest pensions would go to households placed on the highest percentiles of the Disposable income distribution, rather than to those close to its bottom.

The (absolute) Kakwani values for other benefits are also high, although decreasing in recent years. Given that its RR is minute (see Table 9), it can be argued that these values are accurate in showing that most of these benefits are paid to low income households and indicating a very high targeting level.



Finally, tax progressivity increased significantly since 2011 as a result of changes in the tax system and the introduction of extraordinary surtaxes. Together with the already discussed increase in the average tax rate, they explain the rise in the RE of taxes. Furthermore, it should be noted that taxes and SSC are analysed together because of data availability limitations. As most of the SSC that applies to employees are proportional and remained relatively constant throughout this period, income tax progressivity is underestimated by the Kakwani index.

The results on the level and evolution of tax progressivity are even more relevant given how high this progressivity was already in Portugal at the start of the period analysed, as indicated by the Kakwani index. Using a similar methodology, Verbist and Figari (2014) show how Portugal was one of the UE-15 countries with highest level of tax progressivity, but also a below average weight of direct taxes in Gross income.<sup>9</sup> The results in Table 8 emphasise how taxes progressivity and weight in income increased together in this period.

Table 9 shows the re-ranking effect (RR) associated with each of the three instruments analysed in this paper. Taxes and other benefits have virtually negligible RR throughout this period, which implies that their REs do not generate significant changes in the households' rankings on the income distribution. Conversely, and as already discussed, pensions generate very significant, and growing, RR in the transition from Market to MarketP income, reaching a maximum of 0.117 in 2015.

Table 9: Reranking effect (RR)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Pensions	0.067	0.068	0.074	0.100	0.098	0.103	0.102	0.117	0.108	0.107
	(0.004)	(0.004)	(0.004)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)
Other benefits	0.004	0.004	0.005	0.004	0.005	0.008	0.007	0.005	0.004	0.004
	(0.0004)	(0.0005)	(0.0005)	(0.0004)	(0.0004)	(0.0009)	(0.0013)	(0.0006)	(0.0005)	(0.0006)
Taxes + SSC	0.003	0.003	0.003	0.004	0.003	0.003	0.003	0.003	0.003	0.003
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)

Note: Standard errors in parentheses.

Source: INE – Statistics Portugal, EU-SILC 2009-2018.

The VE of each instrument are shown in Table 10. As discussed earlier, these are equal to the RE of each instrument when all RR is excluded. Given the negligible RR of both taxes and other benefits in Table 9, their VE are very similar to their total RE, but the large RR of pensions generate VE well above their total RE.

<sup>9</sup> Similar results can be found in Alves (2012) for 2009 and Mantovani (2018) for 2012.

Table 10: Vertical equity measure (VE)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Pensions	0.177	0.182	0.187	0.221	0.223	0.230	0.229	0.239	0.231	0.231
	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Other benefits	0.026	0.033	0.032	0.030	0.035	0.036	0.030	0.025	0.022	0.021
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Taxes + SSC	0.043	0.045	0.047	0.055	0.053	0.066	0.067	0.068	0.065	0.064
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Note: Standard errors in parentheses.

Source: INE – Statistics Portugal, EU-SILC 2009- 2018.

## 6. CONCLUDING REMARKS

This study furthers the understanding of the evolution of income inequality in Portugal, in 2008-17, and the role played by the redistribution policies. It analyses in detail the impact of pensions, other social benefits, and taxes plus SSC using a methodology that examines the successive income distributions and the transitions between them, from Market to Disposable income. Together, the three instruments made a significant and increasing contribution to lower the income inequality generated by Market income. Between 2008 and 2017, they reduced the Market income Gini coefficient by more than 20 p.p.

Unlike many other studies where the mostly contributive pensions are included in Market income, their effects on inequality and income distribution are analysed individually here. This decision is justified by the growing importance of pensions in household incomes and the fact they are mainly state pensions, although pensions are not strictly a redistributive policy instrument. Then, the highest reduction in inequality is detected in the transition between Market and MarketP income (about 12 p.p.), with pensions generating large re-ranking effects, unlike the small movements generated by the other policies. However, this result should be interpreted with due care: about a quarter of the Portuguese households do not earn any Market income and pensions are their largest, or even only, source of income. Moreover, in general, pensions do not have an equalising effect over Disposable income, and actually made an increasing contribution to total inequality in this period, from about 17% to 31.0% in 2017.

The ‘other benefits’ have a small redistributive effect, reflecting their low weight in Disposable income. However, their relative efficacy is more than proportional to their dimension because of the significant number of benefits that are means-tested, and their high targeting level is visibly detected by the Kakwani index. The small dimension of social benefits is one of the strongest limitations of the Portuguese redistribution system, particularly compared to other European countries.

The weight of taxes in Disposable income increased significantly during this period, while their redistributive effect increased by about 50%. As their re-ranking effect is negligible, their total redistributive effect is identical to their vertical effect.

During the hardest period of the economic crisis, the Disposable income Gini remained virtually unchanged, although the analysis of other inequality indicators reveals a significant increase in the distance between the bottom and top of the income distribution during this period. This relative stability of the Gini during the crisis is the result of two opposing processes: a large increase in Market income inequality (about 4 p.p.) and a strong increase in the dimension, efficacy and progressivity of taxes.

After 2014, Disposable income inequality decreased significantly, reaching one of its lowest ever values in 2017. This reflects the joint effects of economic recovery, falling unemployment, increases in the income of the poorest households, and improving social policies that had been seriously weakened during the austerity period. Nevertheless, the reduced magnitude of social policies, particularly those that are means-tested, remains a serious hindrance to the efficacy and efficiency of social policies to advance income redistribution in Portugal.

This paper also demonstrates the fundamental part played by the fiscal system in correcting the income distribution in Portugal. One of the biggest challenges to Portuguese public policies is how to keep, or even increase, the progressivity and redistributive efficacy of direct taxes structurally without resorting to extraordinary measures and/or increasing the average fiscal burden.

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