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Some issues on poverty measurement: a critical approach to the Eurostat at-risk-of-poverty measure

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Abstract

The official measurement of monetary poverty in the EU countries is made using the relative at-risk-of-poverty (AROP) measure, which currently accounts for different monetary income levels among EU countries but faces limitations in some relevant dimensions of poverty measurement. This paper is addressed to some of such limitations as a relative poverty measure: the scope of economic resources used by the households to face human needs (monetary *vs* total disposable income), the equivalence scale used to weight differently the household members to obtain the household economic size (OECD modified equivalence scale *vs* a MIS equivalence scale, supported in a consensual evaluation of the adequate household income), and the nature of the immediate material needs that should account to measure and to monitor poverty (total expenses *vs* total minus housing costs, as a contracted and inescapable need, with great regional variability). Additionally, the comparison of household economic resources with household needs can be made using, instead, an absolute approach, trough the elaboration of reference budgets and the estimation of household MIS (minimum income standard) (60% median equivalized income *vs* household MIS). The estimation of poverty incidence for Portugal using these alternative approaches with EU-SILC data (*) for the income reference period 2013-2019, elucidate about the "core" poor, that is, those that always account as poor whatever the approach used in measurement. A hybrid approach, combining absolute and relative approaches, will be considered, and a discussion of policy implications.

JEL Codes: I32

Keywords: relative poverty, absolute poverty, AROP, equivalence scales, minimum income standard.

(*) EU-SILC data were provided by INE under a Data Transfer Protocol for Scientific Purposes.

Some issues on poverty measurement: a critical approach to the Eurostat at-risk-of-poverty measure

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1. Introduction

Poverty is a multidimensional concept, but the measurement of the at-risk-of-poverty in the EU countries (AROP) is usually made indirectly as a one-dimensional relative approach concept, making use of household monetary income, the OECD modified equivalence scale and the 60% median income threshold. This is the official approach that supports the monitoring of poverty, the diagnosis of the poverty profiles, and for the design of social policies of social minima. These criteria are under criticism either considering its effects on the diagnosis of poverty or in the orientation of policy action (Decerf, B. *et al*, 2017; Goedemé *et al*, 2019; Jenkins, 2020).

The purpose of this paper is to contribute to this literature, by looking at some specific critical areas, to propose alternative measures and to investigate the differences in poverty incidence and the sociodemographic profiles of poor population that emerge from their use in poverty measurement. Such exercise makes use of the EU-SILC for Portuguese data for the income reference period 2014-2019, when Portugal initiated a new political cycle and the relative poverty AROP reduced, in a context of economic recovery.

Two groups of critical issues will be considered. On the one hand, some topics of policy measurement are discussed, and alternatives considered and estimated, while keeping the poverty as a relative concept. These topics will refer to the scope of the household economic resources to be used to account the economic possibilities of the households to meet their needs, the scope of the needs that are inescapable costs for the households, and the weighting system of the household members to compute the economic household size (economies of scale).

On another hand, a discussion will be made on the content and economic costs of the household needs supported in a consensual approach for identification and cost measurement of those economic goods required to generate human dignity to the household members. This means to make use of an absolute approach as an alternative to the relative AROP poverty measurement. This will recover the old debate on relative *vs* absolute poverty measurement, that came more recently to the academic and policy debate (Decerf, 2022; Menyhért, B. *et al*. 2021). A hybrid approach, combining relative and absolute poverty measurement, will be used in the analysis of poverty in this period for Portugal, as has also been recently suggested by some authors (Decerf, 2020; Goedemé *et al*, 2022).

This paper has the following structure. The **section 2** ("Relative AROP measurement: critical issues") is devoted to the identification of some critical issues of AROP measurement, as a relative poverty measure. **Section 3** ("Household economic resources") will compare the use of monetary disposable income or total disposable income to compute the economic resources the households can use to meet their needs, and the effect on poverty incidence and on the poverty profile of using these two income concepts, computing the poverty threshold as 60% equivalised total disposable income (alternative to monetary disposable income). In the **section 4** ("Alternative equivalence scales") will be analysed the effect of using alternative equivalence scales to compute the economic household size, with effects on the measurement of the equivalised total disposable household income, that will be used to analyse poverty and to compare to the results of the previous section. One of such equivalence scales is the "consensual" equivalence scale, which is implicit in the calculation of the MIS (minimum income standard) household income, using a consensual approach. The **section 5** ("Housing costs") deals with the consideration of the reported housing costs as a contracted expense of the households and, as such, may be considered as one of the inescapable cost of needs. A "modified consensual" equivalence scale is estimated and used for a total income which is calculated as total

disposable income minus the housing costs reported by the households. A poverty analysis is made and compared to the ones presented in the previous sections. **Section 6** ("Absolute, MIS-related approach") will introduce an absolute approach of poverty measurement, considering the calculated MIS household income for some family types in Portugal, and a comparison is made with the analysis presented in the previous sections. A hybrid approach, combining a relative and an absolute approach will be presented and computed in **Section 7** ("A hybrid poverty measure"). **Section 8** ("Conclusive remarks") concludes the paper, with some comments addressed to the policy action.

2. Relative AROP measurement: critical issues

In Europe, following the Council of the European Communities in 1975, poverty is generally understood as relative poverty, in which case a person or a household is poor when their income and resources are worse than what is thought to be adequate or socially acceptable in the society in which they live (Decancq *et al*., 2014). The monetary poverty in the EU countries is officially measured using the at-risk-of-poverty rate (AROP), that is the share of people with an equivalised disposable income (after social transfers) below the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income after social transfers. The equivalised disposable income is the total income of a household, after tax and other deductions, that is available for spending or saving (all monetary incomes received from any source by each member of a household are added up, including income from work, investment, and social benefits, plus any other household income). In order to reflect differences in a household's size and composition, the total (net) household income is divided by the number of 'equivalent adults', using a standard (equivalence) scale: the modified OECD scale, which gives a weight to all members of the household (and then adds these up to arrive at the equivalised household size): 1.0 to the first adult, 0.5 to the second and each subsequent person aged 14 and over, 0.3 to each child aged under 14. The resulting figure is called the equivalised disposable income and is attributed equally to each member of the household.

The use of some percentage of median income as a poverty threshold is a rough proxy to the concept of poverty in the EU as agreed by the European Council already in 1975: "People are said to be living in poverty if their income and resources are so inadequate as to preclude them from having a standard of living considered acceptable in the society in which they live" (Eurostat, 2013). In this sense, national median equivalized income is considered as a proxy of each country prosperity, and 60% that median as an indicator of the minimum income required to have an acceptable standard of living and then, avoid social exclusion in each country. But it faces some shortcomings as an approach for poverty measurement, which are critical issues to be discussed in this paper.

The first issue concerns the household economic resources: what should be the household resources to account for the satisfaction of material needs? In AROP only monetary disposable income is considered, but it is questionable if non-monetary income should also be included and then, to consider total household disposable income. Data for the Portuguese economy reports that the share of the non-monetary income in total disposable income declines with the household income level (Pereirinha & Pereira, 2021:434-435), what may be expected to have effects on poverty measurement if such extended income concept is used.

The second issue is how to count the economic size of the households, that is, which are the adequate weights of each member in the household (equivalence scales)? In AROP it is used the modified OECD equivalence scale, but it has been proved that to use a MIS ("minimum income standard") equivalence

scale is the most adequate, instead of the OECD modified equivalence scale. Such equivalence scale was calculated in our previous research on adequate income in Portugal (Pereirinha *et al*., 2020), using a method that combines a consensual approach with expert opinions on human needs. This alternative equivalence scale is justified due to the under-estimation, by the OECD scale, of the relative cost of children compared to adults (Hirsch, Concialdi *et al.*, 2020). Still related to this issue, and in addition to it, is the relevance for poverty measurement, of the intra-household distribution of resources, since the generally assumed assumption of equally shared resources may be unrealistic. Recent research (Fialová & Mysiková, 2021) has provided evidence that economies of scale are sensitive to the sharing rules of economic resources within the household.

The third issue is related to the distinct nature of the human needs regarding the rigidity of the expenses in face of income reduction, that is, the fact that some needs correspond to inescapable costs. This is the case of housing, where some expenses correspond to contracted costs (rents, water, and energy contracts). It is also the case that, contrary to many other expenses, housing costs greatly differs among Portuguese regions. Since they are inescapable in the short term, high housing costs may originate less resources available to meet other needs. Cantillon (2011) points out, as a shortcoming of the Eurostat approach, the fact that this method does not consider the increase in home ownerships occurring in many countries. Other expenses should be additionally considered with the same characteristics, like the expenses on childcare (SMC, 2018). It is then advisable to estimate poverty considering a stricter concept of income (disposable income minus housing costs). Additionally, this would require estimating a modified MIS equivalence scale considering this income concept.

Fourthly, it is questionable to use a relative poverty threshold without an explicit normative content and dependent on the value of the median household disposable income. The need of an absolute measure of poverty has been recently envisaged for the European Union countries, like the ABSPO poverty measure (Menyhért *et al,* 2021). A progress was made for Portugal by the construction of reference budgets and the estimation of MIS (minimum income standard) by family types with reference to 2014, although updated to 2016 and 2017 (Pereirinha et al, 2020), using a method that combined the consensual method of budgetary standards (which reflects what the *population thinks,* supported in discussion groups of population) with the normative approach of experts (which reflects what *science teaches* us) to estimate the adequate level of income, replicating, with some adaptations to the Portuguese reality, the methodology for determining a minimum standard income (MIS) used in the United Kingdom (Davis *et al*., 2015). This reference income has been used in Portugal to estimate the number of persons and households in "social deficit" that is, those with total disposable income below the MIS for a specific family type (Pereirinha & Pereira, 2019), and in the UK to originate the "low-income gap" indicator, that combines the incidence below MIS and the average depth of such shortfall (Hirsch, Padley *et al*., 2020).

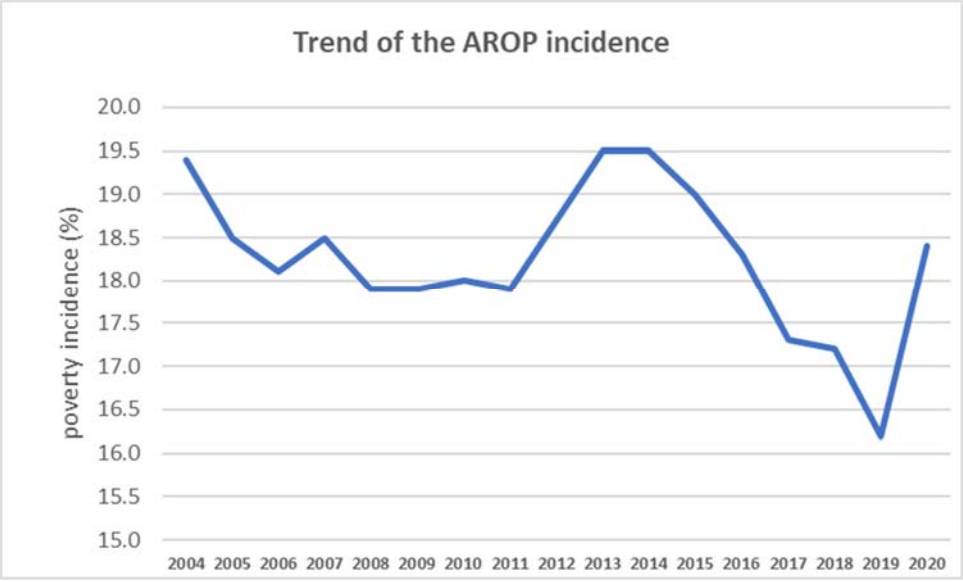
The critical issues of such different approaches originate two orientations in the empirical research on poverty measurement followed in this paper. One is to compare levels and trends of poverty using these distinct alternatives to poverty measurement, and to identify the "core" poor, that is, those that always account as poor whatever the approach used in measurement, and the socioeconomic characteristics of those that account differently as poor using different approaches. A "core" poverty estimation will be essayed combining all these alternatives and considering the population that always account as poor whatever the approach used.

Another is to formulate a “hybrid” poverty measure which combines two distinct poverty thresholds when such distinction makes sense to be jointly considered as complementary for analytical and policy purpose. This is the case of a combination of a relative and an absolute poverty line, following an approach already made by Decerf (2022). The construction of such an indicator is justified for its use to monitor poverty trends. Indeed, the annual updating of poverty thresholds follow different logics. While the relative poverty threshold changes according to the evolution of household disposable incomes, the absolute threshold changes according to the population perception of needs as it is captured by the consensual method for the calculation of the reference budgets which costs is considered as a reference income for poverty measurement. If in some period there is no inquiry about such perception changes, the updating variable will be the consumer price index for pricing annually the reference budgets. All these factors (household income, population perception of needs and consumer prices) are relevant factors to monitor poverty trends, what will be possible using a composite indicator of absolute and relative poverty measures (Hirsch, Padley *et al*., 2020). An essay will be made for Portugal in the period 2014-19, when relative poverty declined.

3. Household economic resources in poverty measurement

If we look at the recent trend of the relative poverty incidence in Portugal, using AROP measure after social transfers (**Figure 1**), one notices a consistent decline after the period of economic crisis (2008-2010) and the austerity of economic policy (2011-2014) until the COVID crisis in 2020. This period (2014 – 2019) will be our analytical focus in this paper. It is our purpose to analyse the sensitivity of this poverty measure to changes of the content of variables that account for such measurement as referred above (the scope of household resources, including non-monetary incomes in its computation, the use of alternative scales of equivalence, the consideration of housing costs in the human needs, the use of absolute poverty line supported on a computation of the cost of human needs).

Figure 1

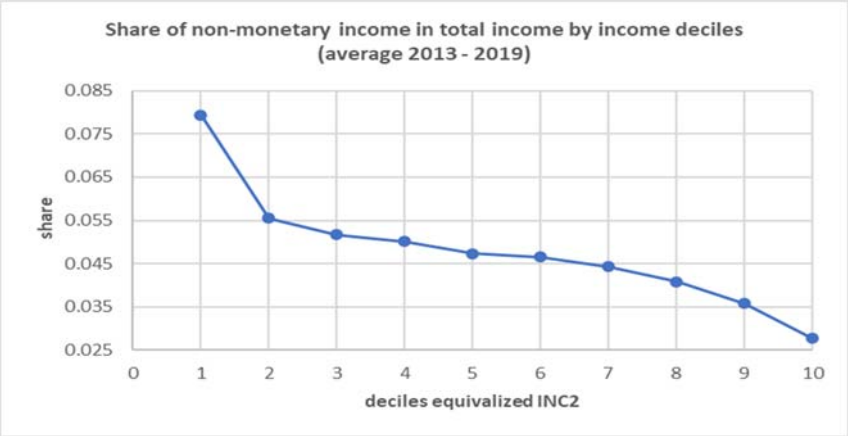


All the analysis in this paper is done for a sub-total of the Portuguese households in this period, using the EU-SILC for Portugal[1]. A disaggregation of the households was made taking into consideration relevant attributes to account for the above measurement issues, as evidenced in **Table 1**: the family types considered in this analysis distinguish the households by age of the household members (old age, working age and children below 14 years old), to live alone or in couple, and the number of children. Such distinction is relevant for the direct effect, on these family types, of different equivalence scales. These attributes also well distinguish the households according to the relevance of housing costs in the cost of human needs. In addition, it was a crucial distinction to construct reference budgets and the calculation of household minimum income standard (household adequate income) (Pereirinha *et al*, 2020) and then, to empirically support an absolute poverty line.

The first issue to be discussed is the concept of economic resources to be used in poverty measurement. In AROP, the household economic resources considered for the calculation of the monetary poverty threshold and the identification of the poor population is monetary disposable income (INC1)[2], that is different from total disposable income (INC2), that is obtained by adding up to the monetary income, the non-monetary component, in-kind income (IKINC)[3], that is, the net value of self-consumption plus the net value of imputed house rents for own occupied dwellings. It is rather defensible that total disposable income should be used, instead of monetary income, to account for the value of the resources that can be allocated to meet human needs.

Figure 2 shows the average share (in the period 2013-19) of the non-monetary income (that is, self-consumption and imputed rents) in total income by income deciles (of equivalized total disposable income). The average share in this period was 4.1%. And it looks evident the much bigger share of non-monetary income in the lowest income levels (1st decile). This has important implications for the poor population, who rely much more on this income source to meet their needs. This is an argument for the inclusion of this income source in the computation of the household economic resources for poverty measurement.

Figure 2



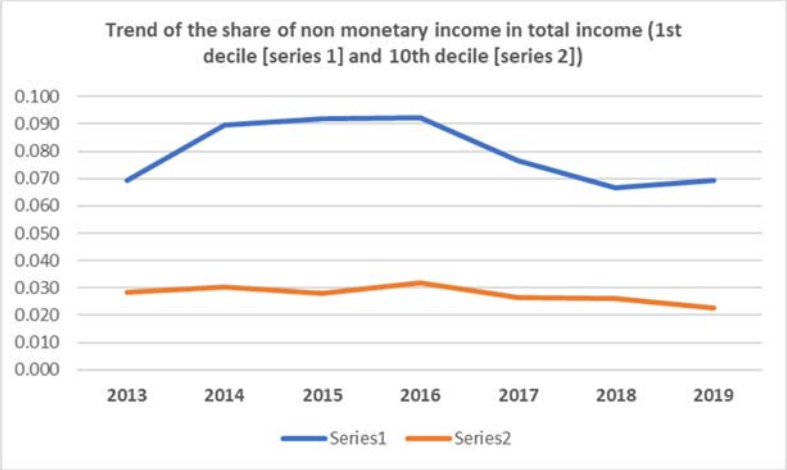
[1] EU-SILC data were provided by INE (Statistics Portugal) under a Data Transfer Protocol for Scientific Purposes.

[2] In the EU-SILC, INC1 corresponds to the variable HY020, that is calculated as HY010 (gross income, that includes market income and transfers from other economic agents, both public or private) – HY120G (taxes on wealth) - HY130G (transfers paid to other economic agents) – HY140G (income taxes and contributions to social security).

[3] In the EU-SILC, INC2 is calculated as HY020 + [HY170N (net value of self-consumption) + HY030N (net imputed rents) – HY100N (interests paid for housing credit), if HY030N > HY100N; 0 if HY030N ≤ HY100N].

An additional argument for the use of this larger content of economic resources comes from the trend of the share of the non-monetary component of total income, evidenced in the **Figure 3**, that compares such trends for the households of the 1st decile of the equivalized total income with that of the 10th decile. Such comparative trends evidence a rather stable share of the non-monetary component of the total income in the 10th decile (around 2.5 - 3.0%), while in the bottom of the income distribution such share is not constant, and it varies in this period in the range 6.7 - 9.2%. It should be remarked that for such variation highly accounts the change of the monetary component of total income, since the non-monetary component is more rigid. Such share declines after 2016, and it is the result of the economic recovery of wages and pensions as a new policy orientation of the government at that time. This means that the non-monetary component of total income may be considered as a safety net in case of risk of monetary income loss for the low-income population. This is then an additional argument for considering total income as an adequate concept for poverty measurement.

Figure 3



This will be our procedure from now in this paper. The sensitivity of poverty measure to this change of the concept of income will be analysed in two dimensions: the time dimension (which changes occur in the poverty trends with such change) and the family dimension (which changes occur in the poverty incidence by family types). **Table 1** describes, in such two dimensions, the share of the non-monetary income in total income.

The share of non-monetary income in total income is lower in the single-person households, with little differences among old age and working age single households, with little changes in this period. For the households that are couples (both old age and working age couples) such share is bigger, evidencing a decline after 2016, as in the national average, but that of the old age couples is bigger than that of the working age couples. The households with children evidenced the highest shares in 2013 and declines up to the average in the end of this period. Such profiles are expected to have some effects on the extent of poverty after changing the income concept to be used.

Table 1

Share of non-monetary income in total income by family types

	2013	2014	2015	2016	2017	2018	2019
Single Old Age	0.029	0.039	0.035	0.039	0.037	0.032	0.029
Single Working Age	0.032	0.034	0.035	0.038	0.032	0.031	0.030
Couple Old Age	0.032	0.049	0.045	0.049	0.045	0.040	0.038
Couple Working Age, no children	0.033	0.043	0.041	0.045	0.039	0.034	0.035
Single Parent, one child	0.044	0.051	0.043	0.047	0.041	0.034	0.034
Couple Working Age, one child	0.043	0.045	0.042	0.044	0.042	0.035	0.036
Couple Working Age, two children	0.040	0.042	0.043	0.048	0.039	0.036	0.034
Total	**0.035**	**0.043**	**0.041**	**0.045**	**0.040**	**0.035**	**0.034**

Source: INE, EU-SILC Portugal

Table 2 presents the poverty incidence by family types, using the strict income concept of disposable monetary equivalized income (AROP), and the trends in the period 2013 – 2019.

Table 2

AROP incidence rate in Portugal

	household size	Nr adult-equivalent modified OECD	2013	2014	2015	2016	2017	2018	2019
AROP threshold (euros/year)			4937	5061	5269	5443	5607	6014	6480
AROP rate (%) a)			19.5	19.5	19.0	18.3	17.3	17.2	16.2
			at-risk-of-poverty incidence rate by family types b)						
Single old age	1.00	1.00	22.7	26.7	28.0	25.9	27.7	26.7	27.9
Single working age	1.00	1.00	23.5	23.8	24.0	24.7	23.8	25.5	18.1
Couple old age	2.00	1.50	13.1	14.3	16.4	15.5	15.0	15.0	16.4
Couple working age	2.00	1.50	17.4	16.8	16.0	18.1	17.1	16.5	17.1
Single parent, one child	2.00	1.30	26.2	24.4	26.8	29.7	24.6	30.3	20.9
Couple working age, one child	3.00	1.80	15.4	13.7	15.0	12.4	12.4	12.0	12.3
Couple working age, two children	3.00	2.10	18.0	20.4	17.0	16.9	15.1	13.7	13.5
Total c)			18.1	18.9	19.3	18.9	18.5	18.4	17.8

Source: INE, EU-SILC Portugal

a) After social transfers

b) Author calculation using AROP threshold

c) It is a subtotal that corresponds to the above seven family types

Table 2 will be our reference table with which we compare all further calculations of poverty incidence using alternative approaches discussed in this paper. It evidences great differences among the family

types, both on the extent of the poverty incidence and trends in this period. The major characteristics are the following: single old-age households and single parent households with one child are the family types that evidence the highest poverty incidence; couple old-age and couple working age with no children evidence some stability in the poverty incidence in this period, but there is a tendency for reduction for those working age households with children.

The first alternative approach for poverty measurement, following our previous analysis, will consist of considering total disposable equivalized income. This will be named as AROP* measure, and the main results are presented in **Table 3**.

Table 3

Incidence rate in Portugal for alternative income concepts (AROP and AROP*)

	2013			2014			2015			2016			2017			2018			2019		
	AROP	AROP*	Δ	AROP	AROP*	Δ	AROP	AROP*	Δ	AROP	AROP*	Δ	AROP	AROP*	Δ	AROP	AROP*	Δ	AROP	AROP*	Δ
AROP threshold (euros/year)	4937	5128	**3.9%**	5061	5251	**3.8%**	5269	5440	**3.2%**	5443	5691	**4.6%**	5607	5795	**3.4%**	6014	6203	**3.1%**	6480	6675	**3.0%**
Incidence rate (%) a)	19.5	18.6	**-0.9**	19.5	18.1	**-1.4**	19.0	18.2	**-0.8**	18.3	17.8	**-0.5**	17.3	16.7	**-0.6**	17.2	17.1	**-0.1**	16.2	16.7	**0.5**
	at-risk-of-poverty incidence rate by family types b)																				
Single old age	22.7	24.2	**1.5**	26.7	26.1	**-0.6**	28.0	28.3	**0.3**	25.9	25.6	**-0.3**	27.7	27.5	**-0.2**	26.7	26.4	**-0.3**	27.9	28.0	**0.1**
Single working age	23.5	24.5	**0.9**	23.8	23.1	**-0.7**	24.0	23.5	**-0.5**	24.7	24.2	**-0.5**	23.8	23.0	**-0.8**	25.5	24.6	**-0.9**	18.1	16.9	**-1.2**
Couple old age	13.1	13.7	**0.6**	14.3	13.1	**-1.2**	16.4	14.5	**-1.9**	15.5	13.6	**-1.9**	15.0	12.4	**-2.6**	15.0	12.6	**-2.4**	16.4	15.7	**-0.7**
Couple working age	17.4	16.3	**-1.1**	16.8	15.2	**-1.6**	16.0	15.3	**-0.7**	18.1	16.4	**-1.7**	17.1	14.7	**-2.4**	16.5	15.1	**-1.4**	17.1	17.0	**-0.1**
Single parent, one child	26.2	25.9	**-0.4**	24.4	23.7	**-0.7**	26.8	24.3	**-2.5**	29.7	26.7	**-3.0**	24.6	22.6	**-2.0**	30.3	30.1	**-0.2**	20.9	20.8	**-0.1**
Couple working age, one child	15.4	14.8	**-0.6**	13.7	12.8	**-0.9**	15.0	13.8	**-1.2**	12.4	11.8	**-0.6**	12.4	10.9	**-1.5**	12.0	11.2	**-0.8**	12.3	11.6	**-0.7**
Couple working age, two children	18.0	17.2	**-0.8**	20.4	19.5	**-0.9**	17.0	15.1	**-1.9**	16.9	16.6	**-0.3**	15.1	13.4	**-1.7**	13.7	13.0	**-0.7**	13.5	13.7	**0.2**
Total c)	18.1	18.2	**0.1**	18.9	17.9	**-1.0**	19.3	18.3	**-1.0**	18.9	17.8	**-1.1**	18.5	16.9	**-1.6**	18.4	17.3	**-1.1**	17.8	17.3	**-0.5**

Source: INE, EU-SILC Portugal

a) After social transfers

b) Author calculation using AROP and AROP* thresholds

c) It is a subtotal that corresponds to the above seven family types

AROP Data from EUROSTAT, calculated as 60% median equivalized monetary disposable income (INC1)

AROP* Calculated by the authors as 60% median equivalized total disposable income (INC2)

In this table, the AROP* threshold is calculated as 60% the equivalized (using modified OECD equivalence scale) household total disposable income, that is, like the AROP threshold, except that we are considering total income (then including non-monetary income) and not monetary income.

The effect of considering additionally non-monetary income on the computation of the poverty incidence is evident from Table 3: it reduces of the poverty rate. But after 2015, the reduction of the poverty rate diminishes, and even has a little rise in 2019, since the share of non-monetary income on total income reduces in this period (Table 1).

Looking at the family types, some patterns come out in the table. For the single person households, the effect on the poverty rate is small and quite uniform in the whole period. The effect on the poverty of the couple households is bigger. It is on the single parent (one child) that occurs the bigger reduction on the poverty rate (2.0-3.0%). There is some similarity of this pattern of change with that of the share of non-monetary income in total income, as described above.

4. Alternative equivalence scales

The second issue to be discussed regards the choice of the equivalence scale used to equivalize the household incomes and then to become comparable among households (with different sizes and demographic compositions), and to allow the comparison with the poverty threshold calculated for one adult-equivalent and then, to calculate the incidence poverty rate, as we did in the last section.

The modified OECD equivalence scale, that is used in poverty analysis, does not have any normative content, and has no support on the observation of the consumption habits or on the perception of the material needs of the Portuguese population. An alternative approach, that is followed in this section, will be supported on the construction of reference budgets for the Portuguese households, that supports both the calculation of the adequate household income (Minimum Income Standard) , that will be used in the section 6, and the calculation of the consensual equivalence scales, that will be used as an alternative to the modified OECD equivalence scale. It should be noted that in Portugal, the only recent study known which gave rise to estimates, for different types of households, of adequate income levels that may originate to live with dignity, is the adequate income study in Portugal, whose results were published in Pereirinha et al. (2020). The method used in this study combined the consensus method of budgetary standards (which reflects what the *population thinks*) with the normative approach of experts (which reflects what *science teaches* us) to estimate the adequate level of income, replicating, with some adaptations to the Portuguese reality, the methodology for determining a minimum standard income (MIS) used in the United Kingdom (Davis *et al.*, 2015). It is a method widely stablished in the scientific literature and with a strong tradition in the United Kingdom and which, based on the original works of William Petty in the sec. XVII, had expression at the end of the XIX century with the works of Rowntree in the measurement that this author made of poverty in the city of York, which he considered to be representative of the living conditions of the cities of the province of the United Kingdom. It was these reference budgets, calculated by Rowntree (at the time, very frugal) that came to be used by W. Beveridge in the calculation of care benefits, and the influence of this method lasted until the 1980s. In 1985, the Family Budget Unit (FBU), established in the United Kingdom, linked to the University of York, and funded by the Joseph Rowntree Foundation, has continued the construction of reference budgets, based on family expenditure surveys and expert opinions. In the 1990s, the Centre for Research in Social Policy (CRSP) at Loughborough University developed the method used by that research unit and introduced, in the calculation of reference budgets, the participation of the population in focus groups with a view to obtain informed agreements on what constitutes an acceptable minimum in society from these groups. After the extinction of the FBU in 2011, the CRSP of Loughborough University gained precedence in estimating reference budgets, developing the MIS method that combines two sources of information to determine the normative value of adequate income: what the population thinks is necessary to live worthily in society (consensual approach) and, on the other hand, informed opinion of the experts.

This was the method used in the research on reference budgets and adequate income in Portugal (Pereirinha et al., 2020), conducted between November 2012 and November 2014, involving 31 discussion groups[4] and 212 voluntary participations of the population, with a diversified socio-

[4] These groups worked in different locations of the country: in the first stage, in which they spoke and consensualized the content of what is the decent standard of living, took place in Vila Franca de Xira, Vila Nova de Gaia and Beja. In the following stages these groups took place in Vila Franca de Xira, understood as a non-atypical place that, not seeking to be

economic profile that, in a consensual approach of opinions on needs (*needs*, and not *wants*), spoke in a first step about what is a decent standard of living and, then, on which goods should be acquired to reach it, the respective quantities and the form and place of acquisition, thus enabling information to be obtained to calculate the value of the minimum income considered sufficient to achieve this standard of living. In some key areas (nutrition, housing, and health) the opinion of experts informed the research team of adequate minimums, which were transmitted for discussion with the groups. These groups, with a composition reflecting the diversity of familiar types relevant to the analysis (those considered in the previous section, and which will be used again in this paper), considered this information from the experts to decide on the level of satisfaction of the needs corresponding to that decent standard of living.

To understand well the meaning of the adequate income calculated for Portugal, it is important to know the conception agreed by the initial discussion groups, and used later by all in the research, of what is a decent standard of living:

> A decent standard of living today in Portugal includes, in addition to food, housing and clothing, everything that is necessary for a person to be able to have health, feel safe, relate to others, and feel respected and integrated into society. It allows free and informed choices about practical things in life and forms of personal fulfillment, including access to education and work, culture, and leisure.

This being the concept of decent standard of living, the method described above allowed the construction of reference budgets and the calculation of the adequate income for the year 2014 for several family categories. These categories consider the type of families (single person or a couple), the age of the persons (old age or working age) and the number of children (no children, one child or two children). These are the categories used above in our analysis of poverty.

It is important to clarify that the construction of reference budgets required the mobilization of a vignette (imaginary case), assuming as assumptions a set of characteristics related to sex, age and health of individuals, housing, and place of residence, among others (see Pereirinha *et al.*, 2020), and correspond to *disposable income* values (after social security contributions and income taxes).

Also related to the estimation of adequate income for these family types is the estimation of equivalence scales. The method used in Pereirinha *et al*. (2020) to construct reference budgets and estimate adequate incomes for several family types also originated an equivalence scale for those households with a disposable income close to that adequate income. Such equivalence scale (that we name as *consensual* equivalence scale) evidence, for these households, an undervaluation of the economic costs of the second adult and of the children of the modified OECD equivalence scale usually used in poverty analyses. The underestimation of children costs is also observed in a comparative analysis made for Portugal and other European Union countries (Hirsch *et al*, 2020).

Table 4 presents the number of equivalent adults using the *consensual* equivalence scale and compared with the *modified OECD* scale. The calculation of the equivalence scale originates results that contrast with the OECD scales. One person aged 65 and over need a total disposable income to live with dignity that is less than that of a person in working age, the weighting factor being equal to 0,81. Another result is that the second adult in the household has economies of scale (weighting factor

representative of the national population, reflects characteristics that combine traces of rurality with those of an urban periphery of Lisbon, in whose metropolitan area is located.

equal to 0,67) very similar to that of the OECD (that is 0,7), but higher than that of the modified OECD scale (that is 0,5). This means that the modified OECD scale underestimates the additional household cost, required for living conditions with dignity, of the second adult in the household. The additional household costs required for facing the material needs of a child to live with dignity is 0,63 times that of an adult, what is above 0,50 (the OECD original scale) and much above 0,30 (the modified OECD scale). In the case of a single parent with one child, the estimated additional cost of the child is 0,79 times that of the adult. These are the results behind the number of equivalent adults in the consensual scale in Table 4.

A new AROP threshold (AROP**) was estimated using the total disposable household income equivalized using the consensual equivalence scale and calculating this threshold as 60% the median. For the subtotal of households corresponding to the set of the seven family types, this poverty threshold is below that of AROP* used in the previous section, and with amounts close to that of AROP (see Table 3).

Table 4

Incidence rate in Portugal for alternative income concepts (AROP* and AROP)**

	hous size	Nr adult-equival modified OECD	Nr adult equival consens scale	2013			2014			2015			2016			2017			2018			2019		
				AROP*	AROP**	Δ	AROP*	AROP**	Δ	AROP*	AROP**	Δ	AROP*	AROP**	Δ	AROP*	AROP**	Δ	AROP*	AROP**	Δ	AROP*	AROP**	Δ
AROP threshold (euros/year) a)				5176	4966	**-4.1%**	5255	5115	**-2.7%**	5438	5243	**-3.6%**	5680	5424	**-4.5%**	5758	5538	**-3.8%**	6182	5918	**-4.3%**	6595	6340	**-3.9%**
				at-risk-of-poverty incidence rate by family types b)																				
Single old age	1.00	1.00	0.81	24.2	10.6	**-13.6**	26.1	11.3	**-14.8**	28.3	12.0	**-16.4**	25.9	10.7	**-15.2**	27.5	13.0	**-14.5**	26.4	10.2	**-16.2**	28.0	13.2	**-14.8**
Single working age	1.00	1.00	1.00	24.5	23.2	**-1.2**	23.1	22.5	**-0.6**	23.5	22.4	**-1.1**	24.7	22.8	**-1.9**	23.0	22.2	**-0.9**	24.6	22.4	**-2.3**	16.9	15.7	**-1.2**
Couple old age	2.00	1.50	1.29	13.7	7.3	**-6.4**	13.1	6.3	**-6.8**	14.5	7.3	**-7.2**	15.5	6.4	**-9.1**	12.4	5.6	**-6.7**	12.6	6.2	**-6.4**	15.7	6.7	**-9.0**
Couple working age	2.00	1.50	1.67	16.3	17.8	**1.5**	15.2	19.1	**3.9**	15.3	16.8	**1.4**	18.1	18.7	**0.6**	14.7	16.6	**1.9**	15.1	17.1	**2.0**	17.0	19.0	**2.0**
Single parent, one child	2.00	1.30	1.79	25.9	36.1	**10.3**	23.7	42.6	**18.9**	24.3	42.7	**18.4**	29.7	42.8	**13.1**	22.6	39.2	**16.6**	30.1	45.8	**15.6**	20.8	34.5	**13.8**
Couple working age, one child	3.00	1.80	2.33	14.8	19.5	**4.6**	12.8	19.7	**6.9**	13.8	19.0	**5.1**	12.4	17.5	**5.1**	10.9	17.1	**6.2**	11.2	16.4	**5.2**	11.6	17.1	**5.5**
Couple working age, two children	4.00	2.10	2.92	17.2	29.2	**12.0**	19.5	29.4	**9.9**	15.1	26.0	**10.9**	16.9	23.8	**6.9**	13.4	23.9	**10.5**	13.0	24.2	**11.1**	13.7	21.7	**8.0**
Total b)				18.2	17.4	**-0.8**	17.9	17.8	**-0.2**	18.3	17.1	**-1.1**	18.9	16.4	**-2.5**	16.9	16.0	**-0.9**	17.3	15.9	**-1.3**	17.3	15.3	**-2.0**

Source: INE, EU-SILC Portugal

a) Calculation of 60% median equivalized income for the seven types of families, less than the total households

a) Author calculation using AROP** threshold

c) It is a subtotal that corresponds to the above seven family types

AROP Data from EUROSTAT, calculated as 60% median equivalized monetary disposable income (INC1)

AROP* Calculated by the authors as 60% median equivalized total disposable income (INC2)

AROP** Calculated by the authors as 60% median equivalized total disposable income (INC2), using the consensual scale (Pereirinha et al, 2020)

The effects of changing the equivalence scale on the poverty measurement are quite evident in **Table 4**. Firstly, it originates a reduction of the amount of the poverty threshold in a rather uniform way in the whole period, around 4%/year. Secondly, it originates a reduction on the rate of poverty incidence in all the years of this period, but such reduction is not uniform: in some years it is 2 pp or even more, while in others the change was smaller. Thirdly, the changes are quite different among family types, but it emerges a uniform pattern of change when looking at such changes along this period: for the single old age households, and to a lesser extent the old age couples, the rate of poverty incidence reduced, while the reduction effect on the single working age households was much smaller. The couple working age households had a small rising effect, but such rising effect was much larger in the single parents with one child. There also is an increasing effect on the incidence poverty rate for the couples with children and rising with the number of children. All such effects are quite evident and result for the correction that such equivalence scale makes of the overestimation of the economic cost of the single old-age households, when compared with the single working age households, and the

underestimation of the economic costs of the second adult in the household and, as well, of the children

5. How to account for housing costs

Housing costs correspond to the economic cost of the satisfaction of the need of adequate accommodation and includes several components: rent, or mortgage and interest payments to credit institutions, house insurance, payment of electricity, gas, and water, etc. Some of these costs differ among households depending on the tenure status of the dwellings and on their regional location. But all these costs share a common characteristic: all are contracted expenses, with little or no flexibility for consumption changes. This originates a constraint for the availability of economic resources that can be used to meet the other human needs. This gives some grounds to account for the effect of considering housing costs in the poverty measurement. This will be made by computing the value of the economic resources that are available after the satisfaction of accommodation needs (as it is made by the households with the observed housing expenses) and to assess the poverty rate considering the remaining economic resources. For that purpose, there are two main issues to consider. One is the content of the housing costs to consider and how to compute them. The other is the computation of the equivalence scales to equivalize the remaining economic resources.

Great differences are to be found among the Portuguese households regarding the housing tenure status, as can be seen in **Table 5** considering different income levels (deciles of equivalized total disposable income, using modified OECD scale). This is a factor of cost differentiation among households.

Table 5

Housing Tenure Status by deciles of equivalized total disposable income (modified OECD scale)

	outright owner		owner paying mortgage		tenant paying rent		reduced rent		housing free	
	2014	2020	2014	2020	2014	2020	2014	2020	2014	2020
1st decile	0.42	0.47	0.12	0.17	0.20	0.13	0.10	0.09	0.15	0.13
2nd decile	0.49	0.49	0.16	0.16	0.15	0.18	0.08	0.07	0.13	0.11
3rd decile	0.52	0.46	0.17	0.21	0.14	0.15	0.05	0.06	0.11	0.13
4th decile	0.47	0.37	0.24	0.29	0.13	0.20	0.06	0.05	0.10	0.09
5th decile	0.42	0.42	0.30	0.34	0.14	0.12	0.05	0.03	0.09	0.09
6th decile	0.42	0.40	0.32	0.39	0.15	0.10	0.04	0.03	0.08	0.08
7th decile	0.38	0.36	0.40	0.43	0.13	0.12	0.03	0.02	0.06	0.07
8th decile	0.39	0.39	0.43	0.44	0.10	0.10	0.02	0.02	0.07	0.05
9th decile	0.37	0.42	0.45	0.42	0.10	0.10	0.03	0.01	0.06	0.05
10th decile	0.46	0.50	0.45	0.39	0.06	0.07	0.00	0.01	0.02	0.03
Total	0.44	0.43	0.30	0.32	0.13	0.13	0.04	0.04	0.09	0.08

Source: INE, EU-SILC PT

There is some stability in the income profile of the regime of housing tenure status between 2014 and 2020. About 40-45% households are outright owner of their dwellings, a high percentage of the households, with a similar share over the whole income scale. For these households there are no direct costs, but the imputed rent of their homes was accounted in the amount of total disposable income. A corresponding amount of the rent should be accounted as a cost. The same applies to the case of the dwelling owner paying mortgage. This tenure status evidences a different profile, rising the share of the households with this tenure status with income, from about 16% in the bottom up to 40-45% in the top. Only 13% of the households are tenant paying rent for their dwellings, such share declining in the top three deciles.

Looking at the households by family types, clear distinctions come out regarding the tenure status (**Table 6**). The old age households are mostly outright owners, while the working are households with no children share equally the outright owner and the owner paying mortgage status facing, then, higher expenses to pay for their expenses. Households with children ate mostly mortgage paying owners, the share of households with this status rising with the number of children.

Table 6

Housing Tenure Status by family types

	outright owner		owner paying mortgage		tenant paying rent		reduced rent		housing free	
	2014	2020	2014	2020	2014	2020	2014	2020	2014	2020
Single old age	0.67	0.68	0.03	0.03	0.12	0.12	0.06	0.06	0.12	0.11
Single working age	0.29	0.25	0.32	0.32	0.20	0.23	0.05	0.04	0.14	0.15
Couple old age	0.74	0.74	0.06	0.06	0.10	0.10	0.05	0.05	0.05	0.05
Couple working age	0.40	0.32	0.32	0.39	0.16	0.17	0.03	0.03	0.09	0.09
Single parent, one child	0.14	0.19	0.49	0.46	0.18	0.18	0.03	0.03	0.17	0.14
Couple, 1 child	0.19	0.17	0.59	0.58	0.12	0.16	0.03	0.02	0.08	0.07
Couple, 2 children	0.15	0.14	0.64	0.71	0.11	0.06	0.01	0.01	0.09	0.08
Total	0.43	0.42	0.31	0.32	0.13	0.14	0.04	0.04	0.09	0.09

Source: INE, EU-SILC PT

Table 7 provides a synthetic view of the housing costs[5] separately by the regime of housing tenure status obtained from the survey EU-SILC PT. It refers to monthly costs connected with the household´s right to live in the accommodation, and only those that are actually paid are considered in its computation. For the owners it refers to mortgage interest payments, structural insurance, mandatory services and charges, regular maintenance and repairs, and the cost of utilities (water, electricity, gas, and heating). For the tenants it includes the rental payments, structural insurance, services and

[5] It refers to the variable HH070.

charges, taxes on dwelling, regular maintenance and repairs, and the cost of utilities (water, electricity, gas, and heating). Just for additional and more detailed information, other variables are included in the table[6] (rent paid, subjective rent[7], mortgage principal repayment and interest repayment on mortgage).

Table 7

Average monthly housing costs by regime of housing tenure

un: euros

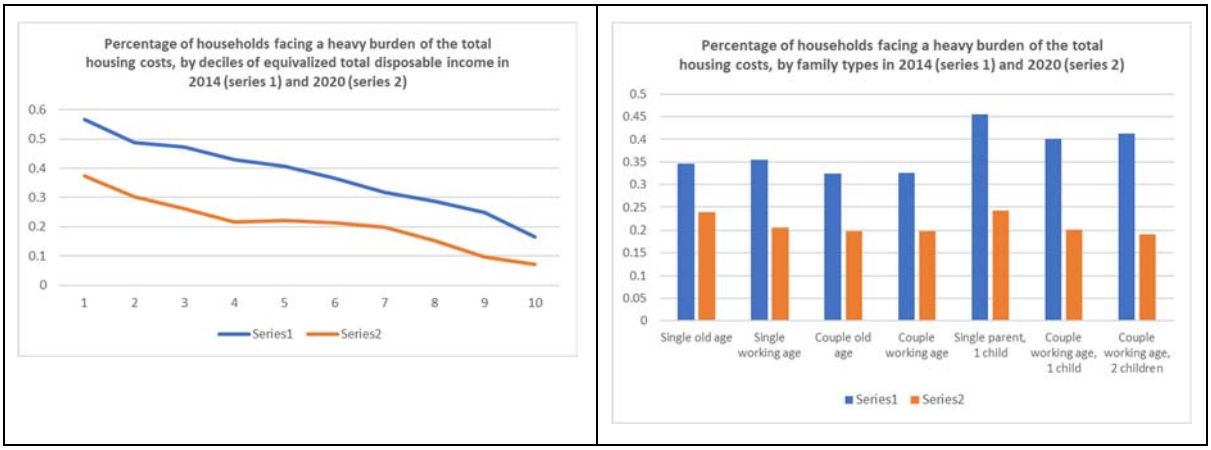
	total housing costs		rent		subjective rent		mortgage principal repayment		interest repayment on mortgage	
	2014	2020	2014	2020	2014	2020	2014	2020	2014	2020
Outright owner	130.1	139.1			349.2	476.9				
Owner paying mortgage	263.2	230.6			450.8	594.3	231.0	255.4	79.6	55.0
Tenant paying rent	351.8	392.6	254.0	298.2						
Reduced rent	161.2	191.4	62.1	95.0	270.7	318.5				
Free housing	111.8	120.6			324.1	431.4				

Source: INE, EU-SILC PT

The housing costs are higher for the tenant rent payers, and the average housing cost increased 11.6% in the period 2014-2020, while the housing costs of the owner mortgage payers reduced 12.3% in the same period, what reflects the reduction of the interest rates (see the variable on interest repayment on mortgage in Table 7).

Figure 4 elucidates about the feeling of the financial burden of the total housing cost as assessed by the survey respondents: it refers to the percentage of households that assess such cost as having a heavy burden.

Figure 4



[6] It refers to the following variables: current rent (HH060), subjective rent (HH061), mortgage principal repayment (HH071), and interest repayment on mortgage (HY100N, annual data).

[7] Subjective rent is the value of the rental of an unfurnished dwelling estimated by the survey respondents of the potential monthly market rent of their dwelling.

There was a general alleviation of the financial burden of the housing cost from 2014 to 2020, for all income levels and for all family type households. And the income profile remains the same: the financial burden decreases with income. The family type profile changed in this period: in 2014 the housing costs was felt as a heavy financial burden by the households with children, but in 2020 the percentage of households that felt the housing costs as a heavy financial burden became rather similar among the various family type households, but the single parent households and the single old-age households fell a heavier financial burden.

It is then expectable that such pattern of expenses on housing, differentiated among households (both on their income level and the family type), may originate changes on the poverty incidence, and even on the social profile of the poor, if we look now at those resources that each household has available to meet those needs that are not rigidly contracted (housing costs) and, so, face larger extent of adaptation to the total available resources and, then, may originate negative effects on the human dignity. That is our purpose in this section.

To do that we created the stricter concept of *available* income INC3, that is the total disposable income (monetary and non-monetary) that is available to make expenses on goods and services after paying the housing costs, which are contractually fixed for each household. In addition, to calculate the poverty threshold and to compare it with each household income it was required to calculate the equivalized available income using a equivalence scale that excludes, in its computation, the housing costs. This was made starting from the calculated reference budgets for all these family types in 2014 (Pereirinha *et al*., 2020) and calculating the total cost of the basket of needs excluding the housing costs (rents of the dwelling or equivalent plus the cost of utilities (water, electricity, gas, and heating). The equivalence scale was calculated for all family types considering again, as a reference adult, the single working-age person. We can compare with the other equivalence sales looking at the **Table 8**. As it was expected, the economies of scale are now lower, since housing expenses is one of the consumption items that mostly contribute to the consumption economies of scale (Pereirinha *et al*, 2020). AROP*** threshold was calculated as 60% the median of the equivalized (using such equivalence scale) *available* disposable income (in the sense described above). **Figure 5** compares the relative difference of this and the previous poverty threshold.

Figure 5

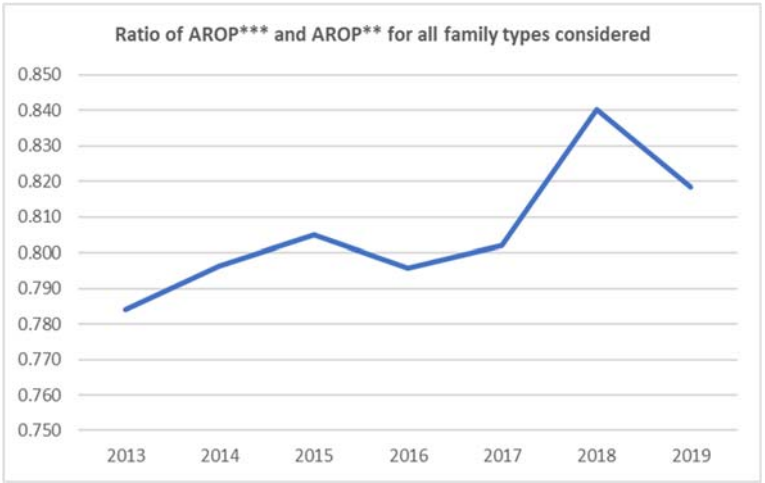


Table 8 describes, by family type households, the trends of the poverty incidence rates using AROP*** measure. If we compare with the use of the AROP** measure above, this change (excluding housing costs and using a modified consensual scale of equivalence) makes some changes in the poverty profiles of the households: there is a general effect of rising the poverty incidence rate in all the family categories. Such rising effects are very similar in all such categories along this period. The time trend, in this period, of the poverty incidence are both rather similar.

Table 8

Incidence rate in Portugal excluding housing costs (AROP*)**

	hous size	Nr adult-equival modified OECD	Nr adult equival consens scale	Nr adult equival modif consens scale a)	2013	2014	2015	2016	2017	2018	2019
AROP*** threshold (euros/year) b)					4058	4185	4378	4520	4617	5194	5397
					at-risk-of-poverty incidence rate by family types c) (%)						
Single old age	1.00	1.00	0.81	0.80	14.6	13.7	18.0	14.2	16.7	15.9	16.5
Single working age	1.00	1.00	1.00	1.00	30.5	30.2	31.1	30.1	29.9	31.8	23.6
Couple old age	2.00	1.50	1.29	1.31	8.9	7.8	8.3	7.6	7.0	8.4	8.7
Couple working age	2.00	1.50	1.67	1.71	22.7	22.5	21.6	22.0	20.3	22.0	21.4
Single parent, one child	2.00	1.30	1.79	1.82	41.5	52.8	50.2	51.1	49.3	52.8	39.3
Couple working age, one child	3.00	1.80	2.33	2.39	22.0	22.7	22.4	21.2	20.3	21.6	22.4
Couple working age, two children	4.00	2.10	2.92	3.04	34.1	30.9	29.5	27.0	27.5	28.0	22.4
Total d)					21.3	21.0	21.4	19.9	19.8	20.9	18.8

Source: INE, EU-SILC Portugal

a) Calculated for total expenses less housing costs

b) Calculation of 60% median equivalized income (INC 3 = INC2 - housing costs) for the seven types of families, less than the total households

c) Author calculation using AROP*** threshold

d) It is a subtotal that corresponds to the above seven family types

AROP* Calculated by the authors as 60% median equivalized total disposable income (INC23 = INC2 - housing costs), using the modified consensual scale (without housing costs).

6. Relative vs. Absolute, MIS-related approach

In the previous sections the poverty measurement was made following a relative approach, using AROP and three alternatives. The level of poverty incidence and, in some cases, the observed trends differ among these alternatives, for some or even for all the household groups. This means that the use of these different criteria may originate different classification of the households as poor. But all these criteria are defensible on different grounds, as was justified above. This led us to jointly consider all these criteria and to identify those households that may considered as poor by all them. That is what we may call the "core" poor households, although still following the relative approach of measurement. The result of this procedure is shown in the **Table 9**.

Table 9

Comparative trends of original AROP and the core of alternatives

	2013	2014	2015	2016	2017	2018	2019
at-risk-of-poverty thresholds (alternative AROPs) (euros/year)							
AROP (monetary disposable income; mod scale OECD)	4937	5061	5269	5443	5607	6014	6480
AROP* (total disposable income; mod scale OECD)	5128	5251	5440	5691	5795	6203	6675
AROP** (total disposable income, consen scale)	4966	5115	5243	5424	5538	5918	6340
AROP*** (*available* disposable income, modif consen scale)	4058	4185	4378	4520	4617	5194	5397
at-risk-of-poverty incidence cumulative of all AROPs (%)							
Single old age	9.9	10.0	11.7	10.0	12.4	9.9	12.7
Single working age	22.8	21.1	22.0	22.3	21.6	22.3	15.5
Couple old age	7.0	5.9	6.9	6.1	5.2	6.1	6.6
Couple working age	16.1	15.2	14.7	16.0	14.5	14.7	16.1
Single parent, one child	24.6	22.2	24.3	25.4	21.2	28.8	19.9
Couple working age, one child	14.6	12.6	13.8	11.5	10.7	10.7	10.7
Couple working age, two children	17.0	19.5	15.1	16.0	13.4	12.7	12.8
Total a)	14.1	13.4	13.6	13.1	12.4	12.5	12.0

Source: INE, EU-SILC PT

a) It refers to the subtotal of the above seven family types

The level of poverty incidence for the "core" poor, considering jointly the four criteria for poverty measurement, is lower that that of the original AROP, as **Figure 7** evidence for the total households for all family types. **Figure 8** describes such trends for all these household groups. There is, in general, a rather similarity of both indicators for all the household groups, except for the old age households (both the single person and the couple households).

Figure 7

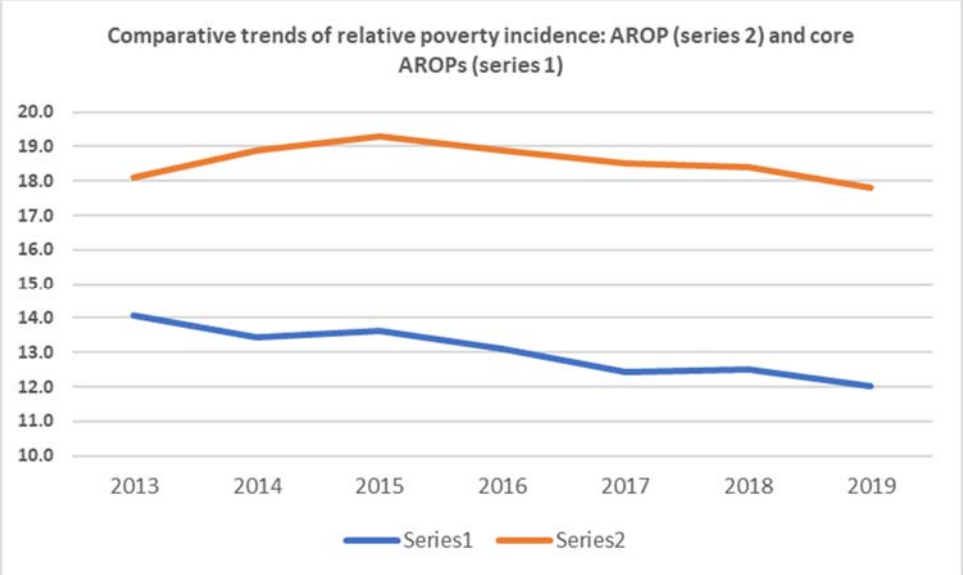


Figure 8

Comparative trends of AROPs: original AROP (series 1) and the core of alternatives (series 2)

This means that, except for the old age population, the AROP fits quite well the combination of all discussed alternatives for a relative approach measurement of poverty for the other household categories. The gap of both methods for all households is presented in the **Figure 7**.

Another issue is that of the absolute approach for poverty measurement. As it was said above (in section 4), the research work conducted for the reference budgets in Portugal (Pereirinha *et al*, 2020) originated the calculation of the minimum income standard (MIS), or adequate income, for Portugal in 2014, for all the categories of families considered in the present paper and presented in the **Table 10**. Although 2014 is the reference year for the estimation of the economic cost of the satisfaction of needs that can generate dignity in human life, the estimated values for the other years in this period was made using the Consumption Price Index applied to the 2014 reference budgets for these family categories by COICOP items of consumption. Then, the evolution of the MIS strictly reflects the inflation rate, and not the evolution of the household disposable income, as it is in AROP.

Table 10

Absolute (MIS) and relative (AROP) poverty measurement

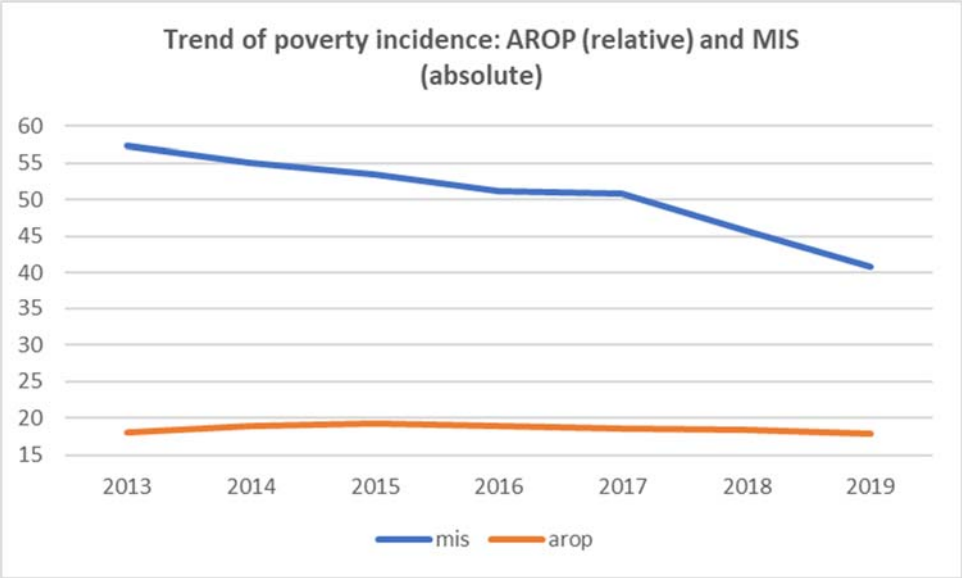
		2013	2014	2015	2016	2017	2018	2019
MIS (adequate) household income (euros/year)								
Single old age		7397	7405	7454	7501	7607	7651	7694
Single working age		9139	9115	9174	9209	9368	9417	9482
Couple old age		11784	11779	11848	11917	12091	12152	12220
Couple working age		15267	15187	15289	15358	15649	15714	15822
Single parent, one child		16100	16016	16121	16211	16484	16547	16661
Couple working age, one child		21086	20941	21073	21181	21563	21628	21772
Couple working age, two children		26704	26544	26685	26822	27259	27344	27523
Inflation rate		0.3	-0.3	0.5	0.6	1.4	1.0	0.3
incidence of absolute poverty (MIS) and at-risk-of-poverty (AROP) (%)								
Single old age	MIS	**59.9**	**55.4**	**57.0**	**50.7**	**51.1**	**43.4**	**38.2**
	AROP	22.7	26.7	28.0	25.9	27.7	26.7	27.9
Single working age	MIS	**52.9**	**51.9**	**53.8**	**49.5**	**50.7**	**48.8**	**40.8**
	AROP	23.5	23.8	24.0	24.7	23.8	25.5	18.1
Couple old age	MIS	**44.4**	**41.8**	**40.4**	**38.3**	**36.8**	**31.9**	**27.6**
	AROP	13.1	14.3	16.4	15.5	15.0	15.0	16.4
Couple working age	MIS	**55.5**	**49.8**	**45.5**	**43.7**	**43.0**	**37.7**	**36.6**
	AROP	17.4	16.8	16.0	18.1	17.1	16.5	17.1
Single parent, one child	MIS	**70.8**	**80.9**	**78.4**	**82.9**	**81.3**	**75.5**	**69.5**
	AROP	26.2	24.4	26.8	29.7	24.6	30.3	20.9
Couple working age, one child	MIS	**60.1**	**60.4**	**58.0**	**58.7**	**59.9**	**55.6**	**49.6**
	AROP	15.4	13.7	15.0	12.4	12.4	12.0	12.3
Couple working age, two children	MIS	**75.3**	**72.9**	**68.3**	**67.0**	**66.0**	**61.1**	**54.7**
	AROP	18.0	20.4	17.0	16.9	15.1	13.7	13.5
Total	MIS	**57.4**	**55.1**	**53.5**	**51.2**	**50.8**	**45.8**	**40.9**
	AROP	18.1	18.9	19.3	18.9	18.5	18.4	17.8

Sources: INE, EU-SILC PT; Pereirinha *et al*. (2020)

It is possible to compare MIS and AROP approaches looking at the MIS for a single working age household in 2014 (9115 euros) and the AROP for the same year (5061 euros), and to compare with the household equivalized median income in 2014 (8435 euros). MIS for that household category in 108% that median income, and it is 80% above the AROP monetary threshold. It is then not surprizing that the poverty incidence when considering the MIS-absolute approach (55.1%) is very much above the poverty incidence when using the AROP-relative approach (18.9%). The trend of such poverty incidences is shown in the **Figure 9**.

It is interesting to look at the same kind of exercise made for the UK 2016/17, and presented in Hirsch, D., Padley, M. *et al*. (2020). For this country, the official estimate of the individuals below 60% the median income (after housing costs) accounts for 22% in that year, while 29% of the population were living below MIS in that year (*op. cit*, p. 75), a lower difference when compared to Portugal (18.9% vs. 55.1%). For that country, MIS is around 70-85% of median income (after housing costs), while in Portugal it is 108%, as was said above.

Figure 9



The above results have important implications. Firstly, the difference of both approaches (absolute *vs*. relative) is very high when compared with the UK, a country with a higher per capita income. We are then comparing two countries that face economic costs of the needs which are more similar that the median household incomes, what explain such discrepancy. This recommends the use of an absolute approach in poverty measurement in Portugal and not only a relative one, and the use of the MIS as a reference income to evaluate the adequacy of social policy measures. Secondly, if it is acceptable to consider as officially poor (even for international comparisons) the population below 60% of the median household equivalized income, we should face the population below MIS as in "*social deficit*". This approach allows to identify those "*grey zone*" population (above the poverty line, but below the adequate income) (Pereirinha & Pereira, 2019) as deserving income support by social policies, thus preventing a simplistic dichotomous classification of poor and non-poor population.

7. A hybrid poverty measure

The use of a relative poverty line (AROP) or an absolute poverty line (MIS) are two distinctive approaches to the poverty measurement, either on their normative content (in the case of AROP as a mere parameter of the income distribution – 60% of the median; in the case of MIS as the income that originate the possibility of living with human dignity) or in the logic behind its time trend (in the case of AROP the evolution of the median household income; in the case of MIS the population´s new perceptions of population needs and their satisfiers, and the CPI). Their use in the poverty measurement originates different concepts (in the case of AROP, poor population; in the case of MIS, social deficit population and grey zone population) that reflect different (though complementary) analytical needs: in the case of AROP, the relevance of international comparisons with EU and, in the case of MIS, a reference for adequacy of social transfers in social policy.

It is convenient to use both in the social policy analysis. One way of considering this joint use is to adopt a solution like that by Atkinson (1998), and latter followed by Brandolini (2007) in the poverty measuring in the EU: to consider the poverty line as a geometric average of two poverty lines: the one reflecting the national reality and that reflecting the common EU lines. Although differently formulated, the extended headcount ratio (EHC), by Goedemé *et al*. (2022) also intends to combine into a single measure two different approaches of poverty measurement, thus originating a hybrid poverty index.

If AROP is the relative poverty threshold and MIS is the adequate (absolute) income for a single working age household, a poverty line combining both approaches can be formulated as a geometric average of both, as:

$$PL_\theta = AROP^\theta * MIS^{(1-\theta)}$$

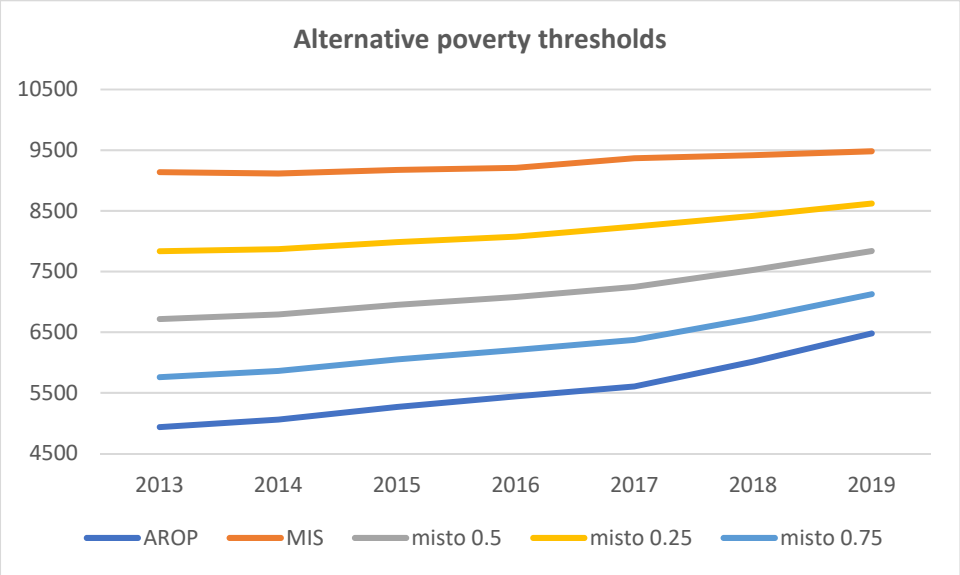
where θ is a parameter that reflects some normative position of closeness to the relative approach (with θ approaching 1) or to the absolute approach (with θ approaching 0).

The formula above is a flexible formulation of the poverty line determination and of the poverty measurement: if θ = 1, the poverty line is the (relative approach) AROP, and if θ = 0, the poverty line is the (absolute approach) MIS. It is then a form of incorporating the size of the *grey zone* into the poverty measurement, if we consider the Poverty Line (PL) and MIS: if θ = 1 such *grey zone* has the maximum size, and if θ = 0 such *grey zone* vanishes (since PL = MIS).

Figure 10 represents the pattern of shift of the poverty lines PL_θ for several values of θ, since θ = 1 (line AROP), up to θ = 1 (line MIS). Such pattern can be used as alternative reference lines for policy formulations and policy evaluations and, as such, supported for policy negotiation in some areas of policy, like minimum/living wage or social minima benefits.

We can exemplify the assessment of the adequacy, efficacy and efficiency of social minimum transfers considering the case when θ = 1, that is, assuming that the poverty line is AROP. We will do it for the following social transfers: 1) for elderly population: Social Pension, Solidarity Complement for Elderly (CSI) and the Minimum value of old pensions; 2) for working age population: GMI/Social Insertion Income (RSI), Social Unemployment Allowance and Family benefits.

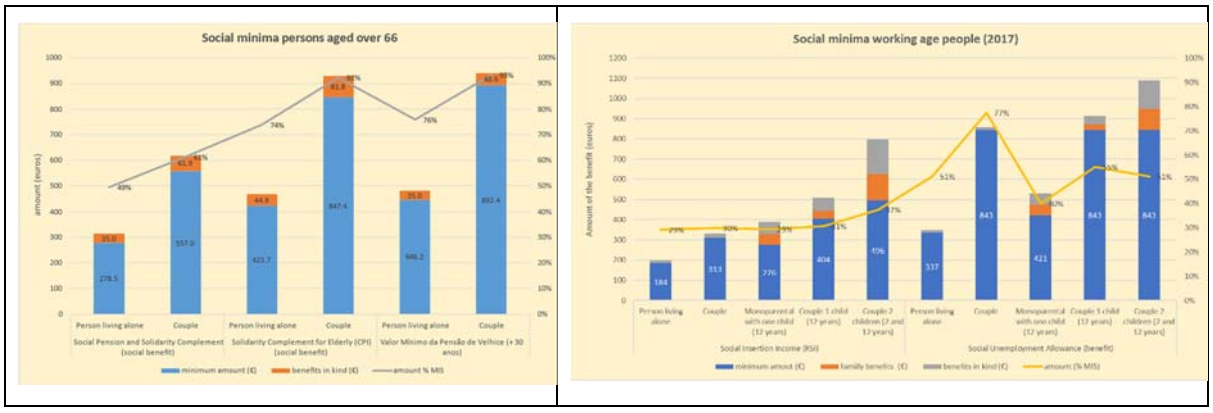
Figure 10



The assessment will be made using three criteria: a) adequacy (to what extent the amounts of such minima and their entitlement rules account for the rise of the incomes of the poor up to human dignity; b) efficacy (contribution of the RSM transfers to reach an adequate household income (to live with human dignity); c) efficiency (do such social transfers fully contribute to reduce household *social deficit* (income gap to ensure human dignity)?

Figure 11 presents data on **adequacy**, considering MIS as a reference income (for 2017).

Figure 11



The main conclusions are as follows, considering as a reference income the adequate (MIS) income for each of the household categories (the calculation was made using 2017 data, from Pereirinha & Pereira, 2021):

For the **elderly** population:

The amounts guaranteed by social benefits for this family category are between 43% and 93% of the value of the adequate income of these categories.

The level of adequacy of these social benefits is higher for people living as a couple compared to with individuals living alone (note: we are admitting that both receive their benefit).

The level of adequacy of the Social Pension is lower than that of other social benefits.

The level of adequacy of CSI (Solidarity Complement for Elderly) and minimum pension are similar for the same family category; in the case of the elderly living as a couple, these social benefits are close to the adequate income for these family categories.

For the **working age** population:

The amounts guaranteed by these social benefits are between 29% and 55% of the value of the adequate income for their family categories, except for the Social Unemployment Allowance for the childless couple, 77% of the adequate income of such households.

The level of adequacy of these social benefits for these family categories is generally lower than that of benefits for the population aged 65 and over.

The difference, among family categories, of the level of adequacy of these social benefits is greater in the case of the Social Unemployment Allowance when compared to the Social Insertion Income (RSI): in this case (RSI – Social Insertion Income) the level of adequacy is very similar to all family categories.

Table 11 presents data on the **efficacy** of all social transfers which are allocated to the various household categories.

Table 11

Social deficit and the effect of RSM* transfers by family types

	Deficit incidence before RSM*	Deficit intensity before RSM*	Change of incidence	Change of intensity
Person living alone, 65+	51.6	30.6	-0.3	-2.6
couple, 65+	37.2	26.7	-0.4	-2.8
Person working age living alone	50.0	41.7	-0.2	-3.5
Couple working age, no children	43.0	36.6	-0.3	-1.7
Person working age 1 child (monoparental)	80.9	44.5	0.0	-3.5
Couple working age, one child	60.8	31.1	-1.0	-1.5
Couple working age, two children	66.8	37.7	-0.8	-2.6

Source: EU-SILC 2018

The efficacy is evaluated according to two criteria: in terms of incidence (the reduction of the incidence of social deficit due to the transfers) and in terms of intensity (the reduction of the income gap due to these transfers). As before, the income reference to make such evaluation is the MIS for each of such household categories. It comes, from such calculations, that such transfers have very little effect of incidence, and have a little more on intensity.

Table 12 presents data on efficiency of such transfers, using the same MIS as reference income for such evaluation. It counts the share of such transfers in total household income for poor households, households above the MIS and the households in the *grey zone*. Here comes the relevance of using the poverty line (AROP) and the adequate income (MIS) for such assessment. The households in the *grey zone* are those who, not being officially poor, still receive some amount of such social minima transfers. They "deserve" it, since are below the MIS and, as such, the transfers allocated to them cannot be considered as a waste. It would be considered a waste of resources if only officially poor households were considered as deserving to receive them. The parameter θ would then be a matter of negotiation of the government with political representatives of such potential beneficiaries.

Table 12

Share of RSM* transfers in household income

%

	Households in Relative Poverty	Households in the *Grey Zone*	Households above the MIN (raP)
Persons 65+			
Person living alone, 65+	6.1	1.9	0.2
Couple 65+	4.5	3.2	0.3
Persons working age, no children			
Person working age living alone	18.9	0.3	0.2
Couple working age, no children	6.6	1.1	0.2
Persons working age, with children			
Person working age with one child (monoparental)	23.7	3.4	0.2
Couple working age, one child	8.6	1.6	0.2
Couple working age, two children	13.0	3.1	0.2

Source: EU-SILC 2018; Pereirinha et al. (2021)

8. Conclusive remarks

This paper was devoted to the discussion of some issues in the poverty measurement that arise from the use of the at-risk-of-poverty 60% (AROP) measure, by looking at some critical areas, and to assess the effects, on policy measurement and social policy analysis, of some alternatives which try to resolve some of these criticisms.

The crucial issue relates to the old and classical discussion of the poverty measurement using a relative approach (as is the Eurostat AROP measure) or, as an alternative, using an absolute approach. While the relative approach is normative free (AROP measure may be interpreted as a parameter of the household income distribution), the alternative absolute approach is supported on a consensual concept of human dignity and the minimum (adequate) income required to reach such dignity through the acquisition of needs satisfiers. These two alternatives also have distinct logics behind their time trends (national household income vs. change on the perception of human needs, their satisfiers and inflation rate), and may be justified on different grounds (international comparison *vs*. national design of social policies). For such reason one can justify the joint use of these two approaches, and a geometric average of both was proposed, dependent on a parameter that may be considered as a

policy variable with an interesting meaning, quite useful in policy evaluation. This was made using the Portuguese Regime of Social Minima.

But strictly looking at the relative approach of poverty measurement, some challenges are faced on three basic issues, what originated the creation of alternatives. The first one is the consideration of total income, and not only monetary income, for poverty measurement. The pattern of the share of in-kind income by income level and by family types originate a light decrease of overall poverty, but differences in the amount of such decline among family types. The second one is the inadequacy of the modified OECD equivalence scale that is proved to underestimate the economic costs of the second adult in the household and the economic cost of the children, being proposed and used an equivalence scale supported in a consensual method of estimation. The use of such scale also originates a decline of the overall household poverty, but also great disparities among family types, given the different household sizes and number of children (the poverty rate rising with the number of children). Thirdly, another challenge is the consideration of housing costs as a contractual (and then rigid) household expenses, what may justify considering the available disposable income (after housing costs) as a variable to count the household resources intended to measure poverty. There results a general effect of rising the poverty incidence, quite similar in all the household categories. The computation of the "core" monetary poverty (intersection of all set of poor households identified according to all the alternatives) originated a pattern quite like that of AROP, except for old age (single and couple) households, although reducing the overall poverty incidence when compared with AROP.

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