

Can reference budgets be used as a poverty line?

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Abstract

The most common indicator to measure and compare the extent of poverty within and across European countries is the well-known at-risk-of-poverty indicator. Although the relative income-based measure is widely used, over time it has been the target of considerable criticism. In this paper, reference budgets are introduced as a valuable complementary indicator, since they illustrate the cost of baskets of goods and services that are essential to participate adequately in society. When constructed in a comparable way, they show which standard of living can be achieved at the level of the at-risk-of-poverty threshold in different countries, taking account of out-of-pocket costs of public goods and services. In this paper, we draw on data from cross-nationally comparable reference budgets in three reference cities (Antwerp, Barcelona and Helsinki) to illustrate how RBs can be used to evaluate other poverty indicators and to construct complementary poverty thresholds. At the same time, we explain that there are important challenges to address, including (1) the limited number of specific household types for which reference budgets are developed, (2) problems of robustness and comparability, and (3) the lack of important information in the EU-SILC microdata for our purposes. Acknowledging these limitations, this paper provides a first illustrative attempt to estimate of the number of people with a disposable income below the RB threshold for densely populated areas in Belgium, Finland and Spain.

The results show how the at-risk-of-poverty threshold does not represent the same level of living standard across EU Member States, and probably underestimates the out-of-pocket cost of an adequate living standard in Spain. First estimates indicate that families renting on the private market, families with children and young people are relatively worse off when poverty is measured with the reference budget indicator as compared to the at-risk-of-poverty indicator. If these results are confirmed in future research, this may have important implications for anti-poverty policies.

Keywords: reference budgets, at-risk-of-poverty indicator, poverty, social participation, social inclusion

JEL codes: I31, I32

1 Introduction

In Europe, poverty is usually measured with the so-called ‘at-risk-of-poverty indicator’, which defines poverty as the share of people with an equivalised disposable income (after social transfers) below the at-risk-of-poverty threshold. The threshold is set at 60 % of the national median equivalised disposable income (Atkinson, et al., 2002). Due to large cross-national differences in living standards, the at-risk-of-poverty threshold is much higher in some countries than in others. This raises the question whether an income at the level of the at-risk-of-poverty threshold reflects the same level of adequacy across countries. For quite some time now, researchers have contested the validity of this indicator. In particular, it has been argued that the indicator is a measure of inequality rather than poverty, that it is unrelated to criteria of need and deprivation, and biased against benefits in kind and public services (Beblavy & Mizsei, 2006; Garfinkel, et al., 2006; Goedemé & Rottiers, 2011; Juhász, 2006; Sen, 1983; Smeeding et al., 1993; Whelan & Maitre, 2009). Some authors have argued that the picture should be completed by calculating a single pan-European poverty threshold (e.g. Brandolini, 2007; Fahey, 2007; Goedemé & Collado, forthcoming). However, it is not clear whether this results in a more valid indicator (Decancq, et al., 2014).

A very old and well-known approach to define a minimum acceptable living standard, is the budget standard approach. In budget standard, or reference budget research, priced baskets of goods and services are constructed, reflecting a given living standard for certain household types (Bradshaw, 1993; Saunders, 1998; Storms et al., 2014). These reference budgets (RBs) can reflect any standard of living, but most frequently they have been developed to represent ‘minimum adequate’ or ‘participation level’ standards. Reference budgets struggle with many challenges. Nonetheless, in principle, they can offer an empirical approach for defining an appropriate poverty threshold and, if constructed in a comparable way, they could offer a test for assessing to what extent the minimum resources for adequate social participation vary with national median income, as the at-risk-of-poverty threshold implies.

Although most European countries have experience with developing reference budgets, the budgets are usually not comparable, as they are developed for different targeted living standards and are based on various methods and information sources (Storms, et al., 2014). Recently, some important steps towards a comparative methodology have been taken in two related European projects, funded by the European Commission and coordinated by the Herman Deleeck Centre for Social Policy (Goedemé, Storms, Penne, & Van den Bosch, 2015; Goedemé, Storms, Stockman, Penne, & Van den Bosch, 2015; Goedemé, Storms, & Van den Bosch, 2015). Hence, for the first time, reference budgets are available for evaluating the adequacy of the at-risk-of-poverty threshold in a comparative setting. In this paper we make use of the reference budgets developed in a comparable way for three countries, covering three different types of welfare states: Belgium, Finland and Spain. The reference budgets have been developed within the framework of the ImPRovE project (Goedemé, Storms, Stockman, et al., 2015). The aim is to explore in more detail how reference budgets could offer a benchmark for assessing to what extent the at-risk-of-poverty threshold represents the same level of adequacy of incomes cross-nationally. In addition, we highlight several important challenges for using reference budgets as an alternative poverty threshold. Finally, we present some preliminary results that illustrate how reference budgets could enrich our understanding of poverty in Europe.

In this paper we: (1) briefly discuss the main shortcomings of the current poverty measures in Europe; (2) suggest what could be the added value of reference budgets with regard to the measurement of

poverty; (3) show how reference budgets can help to contextualise the at-risk-of-poverty threshold and better understand the represented living standard of an income at the level of the threshold; (4) explain the method we used to construct a poverty threshold based on reference budgets; (5) provide some preliminary results of a first comparative effort that estimates poverty rates on the basis of RBs; (6) discuss the limitations of reference budgets as poverty lines; (7) conclude with a discussion of the usefulness of RBs as a complementary poverty indicator, and the way forward.

2 Some limitations of current poverty measures in Europe

Each measurement of a social problem should be preceded by a clear definition of the problem. Unfortunately, there does not exist a single, unambiguous definition of poverty. Moreover, current poverty indicators often seem to lack theoretical underpinnings and a clear concept of poverty. Without presenting an overview of the existing patchwork of definitions, we generally notice that concepts of poverty contain both an absolute and a relative aspect. Various prominent authors (Rowntree, 1901; Sen, 1983; Townsend, 1979) have defined poverty as a lack of necessary resources or basic capabilities which, despite a core of absolute deprivation (Rowntree, 1901; Sen, 1981), also depends on the generally accepted living standard in society (for a discussion, see Goedemé & Rottiers, 2011). The European Union defines persons at risk of poverty as “individuals or families whose resources are so small as to exclude them from the minimum acceptable way of life of the member state in which they live” (Council of the European Communities, 1975). However, it is not clear to what extent the at-risk-of-poverty indicator and the severe material deprivation index refer to what is widely approved as a minimum in society (Goedemé & Rottiers, 2011; Van den Bosch, 2001).

As was mentioned in the introduction, the at-risk-of-poverty indicator is the most widely used indicator for measuring income poverty in the EU. Nevertheless, the indicator received many criticisms. First, by some it is argued that a relative income-based measure cannot be logically derived when poverty is defined in terms of consumption and deprivation (Ringen, 1987). Second, various authors argue that it rather measures inequality at the bottom of the income distribution and not necessarily poverty (Fahey, 2007; Förster, 2005; Guio, 2005; Storms, Goedemé, & Van den Bosch, 2011a). For instance, when the standard of living of the middle class sinks, poverty rates may decrease while the situation of the poor has not improved (or even worsened). Especially for Member States experiencing very low income levels per capita, a poverty line which is relative to the median income, will not capture the number of people with insufficient resources for having access to some basic capabilities (Fahey, 2007; Förster, 2005; Guio, 2005; Juhász, 2006; Ravallion & Chen, 2011). This is why Ravallion and colleagues propose a ‘weakly relative poverty line’ combining absolute and relative elements, since people also care about their own and others’ absolute standard of living and since the cost of adequate social participation is not decreasing proportionally with national median disposable household incomes (Ravallion & Chen, 2011). In short, there is no *ex ante* guarantee that the at-risk-of-poverty threshold corresponds to the minimum resources required for a minimum acceptable living standard in any one Member state; and refers to the same level of adequacy of living standards cross-nationally (or, for that matter, between households).

In order to make incomes comparable across households in terms of living standards, they are equivalised using the modified OECD equivalence scale. This scale assigns a value of 1 to the household head, 0.5 to each additional household member aged 14 and over, and of 0.3 to each child below the age of 14 (Atkinson, et al., 2002; OECD, 2013). By adding up all values, the equivalent household size

is obtained. Subsequently, disposable household incomes are divided by the equivalent household size. The idea behind this procedure is to take economies of scale into account (a couple arguably needs less than twice the amount of a single for achieving the same living standard, given the partners of the couple can share some costs, notably of housing). However, economies of scale are likely to vary across the income distribution; as well as between countries (Atkinson, 1992; Bargain & Donni, 2012; Brandolini, 2007; Förster, 2005; Nelson, 1993). In addition, household needs vary in more complex ways than suggested by the modified OECD equivalence scale. In particular, the health status of household members as well as their labour market states may strongly affect the economic resources that are required for obtaining a given living standard (Storms & Bogaerts, 2012; Storms, et al., 2011a). Not surprisingly, then, there is a long-standing debate regarding the appropriateness of various equivalence scales for measuring poverty in a national and cross-national context (Atkinson, 1992; Bargain & Donni, 2012; Buhmann, et al., 1988; Coulter, et al., 1992; de Vos & Zaidi, 1997)¹.

Another point of criticism is that the at-risk-of-poverty rate focuses on cash income of households without taking into account other non-cash resources or the capabilities of households to convert financial resources into a certain living standard, given their needs (Sen, 1985). Factors that are not taken into account include wealth (especially ownership of a dwelling) and benefits in kind, especially publicly-provided or subsidised goods (e.g. a dwelling at reduced rent, medicines at reduced cost) and services (e.g. education, health care and public transport). Some authors have argued that wealth such as homeownership should be taken into account when measuring poverty (Ritakallio, 2003; Smeeding et al., 1993; Verbist & Matsaganis, 2014). This can be partly solved by adding the monetary advantage of home ownership or renting at reduced cost to household income (Frick & Grabka, 2003; Smeeding, et al., 1993). Needless to say, this has a non-negligible effect on the composition of poverty: owner-occupiers appear to be much better off, whereas those renting in the private market are worse off when 'imputed rent' is taken into account (Frick, Grabka, Smeeding, & Tsakloglou, 2010). Alternatively, others have argued to look at actual expenditures of households, instead of income data. There is a methodological and conceptual argument for doing so (Brewer & O'De, 2012; Meyer, & Sullivan, 2012; Meyer & Sullivan, 2003): (1) the income of low income groups tend to be understated in income surveys due to under-reporting of transfers (Meyer & Mittag, 2015), while household expenses of low-income households seem to be better recorded; (2) income offers a short-term snapshot, given that households may save and borrow to smooth their consumption for maintaining their living standard, while income fluctuates more strongly across time. Nonetheless, also consumption data face important challenges. From a practical point of view, in Europe representative, household budget survey data are less accessible on a large scale as compared to income data, and are not subject to the same harmonisation standards as is the case of the EU Survey on Income and Living Conditions (EU-SILC).

Also the value of other non-cash incomes or services can be imputed to create a measure of so-called 'extended income' (Callan & Keane, 2009; Marical, et al., 2008; Smeeding, et al., 1993; Tsakloglou et al., 2009; Verbist & Matsaganis, 2014). The problem is that this extended income approach is mostly based on the production cost and the actual use of services, without considering the quality of the services provided, or the fact that the use of services often corresponds to an increased need for these services (Aaberge, et al., 2010; Garfinkel, et al., 2005). Most studies in the abovementioned extended income-approach have adopted similar equivalence scales to extended income as are applied to cash

¹ In addition, the scale is considered not to be very suitable for taking the impact of services and other non-cash income components into account (Aaberge, et al., 2010; Paulus, et al. 2010).

income, being mostly the modified OECD scale (Paulus, et al., 2010; Verbist & Matsaganis, 2012). This is problematic since we know services are often an answer to extra needs that vary across the life-cycle (e.g. chronic diseases) (Paulus, et al., 2010; Verbist & Matsaganis, 2014). This means that disabled people, elderly persons and families with children would be better off when including the benefits of health and education services in their 'extended income', if based on actual use without adjustment to their needs for medical care or education (Callan & Keane, 2009; Sefton, 2002; Tsakoglou, et al., 2009). It is worth pointing out that neglecting benefits in kind does not only undermine the validity of the at-risk-of-poverty indicator, but also its comparability across time and between countries. Insofar that the access, availability, and quality of publicly-provided goods and services varies across time and between countries, living with an income at 60 per cent of median disposable household incomes does not have the same consequences in each country. To make this point clearer, one could imagine two countries with exactly the same population characteristics and distribution of disposable household incomes. In one country education is free, whereas in the other there is only private education at high cost for private households. It is clear that for households with children the standard of living at 60% of the national median income is very different in both countries, even though the at-risk-of-poverty rate will be the same.

3 Reference budgets and their added value to other poverty indicators

Reference budgets are priced baskets of goods and services that reflect a certain living standard for specific household types (Bradshaw, 1993; Saunders, 1998; Storms et al., 2014). The targeted living standard illustrated by the reference budgets considered in this paper is defined as the minimum financial resources needed for adequate social participation (Goedemé, Storms, Penne, et al., 2015). In other words, we look at the minimum required disposable household income (the out-of-pocket payments) taking into account public goods and services that are for free or at reduced prices. Adequate social participation is further defined as "the ability of people to play the various social roles one should be able to play as a member of a particular society"² (Storms, 2012). Even though adequate social participation and poverty are not necessarily the same concept³, we are convinced that reference budgets could make a valuable contribution to the construction of poverty indicators, not least by contextualising the widely used at-risk-of-poverty indicator.

Potentially, reference budgets could offer a complementary approach, which accommodates to some extent some of the aforementioned limitations of the at-risk-of-poverty indicator or the extended income-approach. For instance, they start from a normative and empirical needs-based approach and build on a range of information sources to explicitly explore what a minimum acceptable living standard may look like, rather than making a very rough assumption about it. In other words, reference budgets do not depend on the national median income, but try to empirically assess the level of income that is needed at the minimum for adequate social participation. Consequently, they are not relative

² Being able to adequately play social roles, means that the material and other needs are fulfilled to take social positions in line with the dominant social expectations associated with them, as embodied by the institutions of the society in which one lives, and in such a way that it does not cause harm to one's possibilities to do so in the future. In addition, adequate social participation implies that people should also be able to contribute to society by having the opportunity to redefine their social roles (Goedemé, Storms, Penne, et al., 2015).

³ Even though relevant and interesting, this discussion is outside the scope of this paper.

ex ante, and explicitly try to identify what is minimally needed to participate adequately in a particular society, taking the social context as much as possible into account. When constructed in a cross-nationally comparable way, they help to understand how adequate living standards differ or rather converge across the EU (Goedemé & Rottiers, 2011; Storms, et al., 2011a; Storms, et al., 2014). In addition, by focusing on the out-of-pocket-cost of essential goods and services for adequate social participation, they can also show the impact of cost-reducing policy measures that improve the accessibility and affordability of (public) goods and services (Storms & Bogaerts, 2012; Storms, et al., 2011a; Storms, et al., 2013).

In addition, reference budgets can shed an alternative, empirically informed, light on economies of scale resulting from household size and composition. By constructing reference budgets for different household compositions, one can easily deduce the budget impact of an additional household member on the minimum required resources for adequate social participation. Various studies have tried to estimate the costs of adults or children based on real expenditure of households (Bargain & Donni, 2012). Compared to these expenditure-based approaches, RBs offer the advantage to derive needs-based equivalence scales without relying on expenditure data which are confronted with endogenous budget constraints. In addition, the equivalence scales derived from RBs take the availability of publicly-provided or subsidies goods and services fully into account. On the other hand, the problem with the RB-based equivalence scales is that they only apply to specific households living at the level of the reference budget, which makes it difficult to generalize the scale to the population as a whole.

From a policy perspective, reference budgets offer a more balanced evaluation of policy alternatives. When used as a policy tool, RBs indicate how governments can reduce poverty in two different ways: either by ensuring that low-income families have access to a higher income, or by lowering the costs low-income families face in order to have access to essential goods and services (Storms, 2012; Storms, et al., 2015).

Before we explain our method, we first give some more information on the cross-nationally comparable ImPRovE reference budgets and their underlying assumptions. Further it is shown how they relate to the at-risk-of-poverty indicator.

3.1 Reference budgets for specific hypothetical households

Obviously, there are important differences in the needs of households depending on their size and composition and related economies of scale, but also on other characteristics such as age, gender, living area, mental and physical health situation and social and economic resources. Consequently, when constructing a minimum budget that allows for adequate social participation, it is impossible to specify a concrete list of essential goods and services, without making rather detailed assumptions regarding the characteristics of households. Therefore, fully-specified reference budgets are constructed for so-called hypothetical households or model families. In the ImPRovE project, reference budgets were constructed for four hypothetical household types (Goedemé, Storms, Stockman, et al., 2015):

- A single person
- A single parent with one child
- A couple without children
- A couple with two children

All adults are assumed to be of active age. The child of the single parent is a boy of primary school age (about 10 years old) and for the couple with two children the second child is a girl of secondary school age (about 14 years old). Further, some important assumptions are made in order to construct a budget reflecting the minimum required resources for adequate social participation.

- First of all we assume that the family members are well-informed, self-reliant and have normal competences to manage their budget efficiently. This means that they are aware of price levels and social tariffs, that they can compare different prices and act in an economical way (e.g. not too much food waste, saving energy and water use).
- Secondly, all family members are assumed to be in a good health. This choice was made because there is such a wide variation in needs and related costs depending on the kind of health problem. Hence, being in a good health can be seen as a starting point. Arguably, many households will need more resources to access the same level of social participation, if they are confronted with severe health problems.
- Thirdly, we assume that the family members make use of existing public goods and services to the extent that they are accessible for low income households. For all goods and services, we included the out-of-pocket costs people need to pay in order to get access to the service.

These assumptions result in the estimation of a lower bound for the level of resources necessary for adequate social participation. If competences are lacking, if people are in bad health, or do not have access to publicly provided or subsidized goods and services, the minimum cost for an adequate living standard will be higher.

In addition, the hypothetical households are assumed to live at specific locations, namely in relatively large cities (Antwerp, Athens, Barcelona, Budapest, Helsinki and Milan) (Goedemé, Storms, Stockman, et al., 2015). Obviously this has some implications for the level of the reference budgets, which need to be taken under consideration when interpreting the results. There are two main reasons why the results may not be representative for people living in rural areas. Firstly, needs can be different because of a different institutional, cultural and geographical context. For instance, in some regions there is no access to adequate public transportation which means that the need of a car could be defensible in order to achieve adequate social participation. Secondly, prices and purchasing patterns can differ substantially across regions. Prices of goods at the market but also of public goods and services vary regionally. For instance, in Finland there is a large variation in prices for public transport (Kalenoja & Rissanen, 2014). Generally not much information can be found on regional price differences. Exceptionally, a Spanish study has made estimations of regional purchasing power parities for total expenditure in 2012 (Costa, et al., 2015). It was found that Madrid, Navarra, Catalonia and the Basque regions are confronted with higher price levels than the national average. A final remark is that people living at the country side may have other purchasing habits, and have more access to home-grown food.

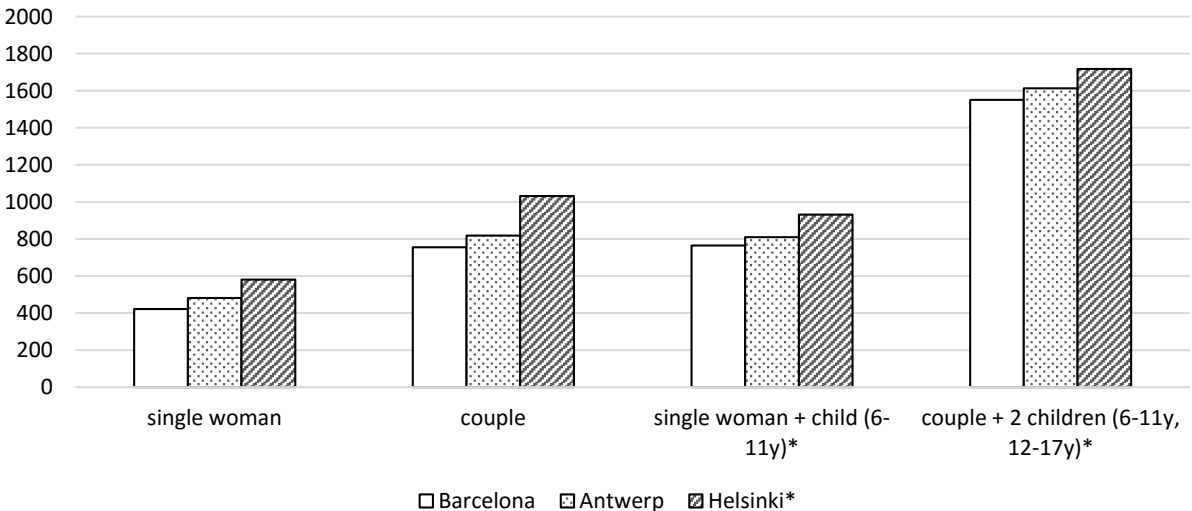
3.2 Comparable reference budgets for three large European cities

The targeted living standard to which the ImPRovE reference budgets refer, is based on a common theoretical framework inspired by the theory of human need (Doyal & Gough, 1991). In order to participate adequately in society, two universal needs are identified: 'autonomy' and 'health'. In addition, ten so-called 'intermediate needs' are singled out, namely: food, health, personal care,

clothing, mobility, leisure, rest, maintaining social relations, safety in childhood and housing. Guided by extensive international coordination, and based on various information sources such as international and national recommendations and guidelines (e.g. with regard to dietary guidelines, disease prevention, ...), survey data, national studies on the cost and accessibility of public goods and services, expert opinion, and focus group discussions (Goedemé, Storms, Stockman, et al., 2015), the intermediate needs are translated into a concrete set of priced baskets of goods and services.

Figure 1 below shows the level of the ImPRovE reference budgets for three countries Belgium, Finland and Spain, representing three different types of welfare states. The budgets are expressed in euro per month for four household types, without housing costs. It is clear that for all household types, the level of the budgets is the highest in Helsinki and the lowest in Barcelona, while Antwerp is situated somewhere in the middle. A single woman needs 421 EUR per month in Barcelona, while she needs about 160 euros per month more in Helsinki (580 EUR). This can be explained by differences in price levels but also by differences in the geographical, institutional and cultural context (for a more detailed review, see Goedemé, Storms, Stockman, et al., 2015). The gap between Helsinki and Barcelona is relatively smaller for families with children. This is partly due to the fact that the ages of the children in Finland deviate from the standard household types (about 4 and 10 years old instead of 10 and 14 years old). However, a part can also be assigned to the relatively lower costs of children in Helsinki, mainly because of the high public investments in education.

Figure 1. Total budgets (EUR/month) without housing costs for four family types in three EU cities. ImPRovE, 2014

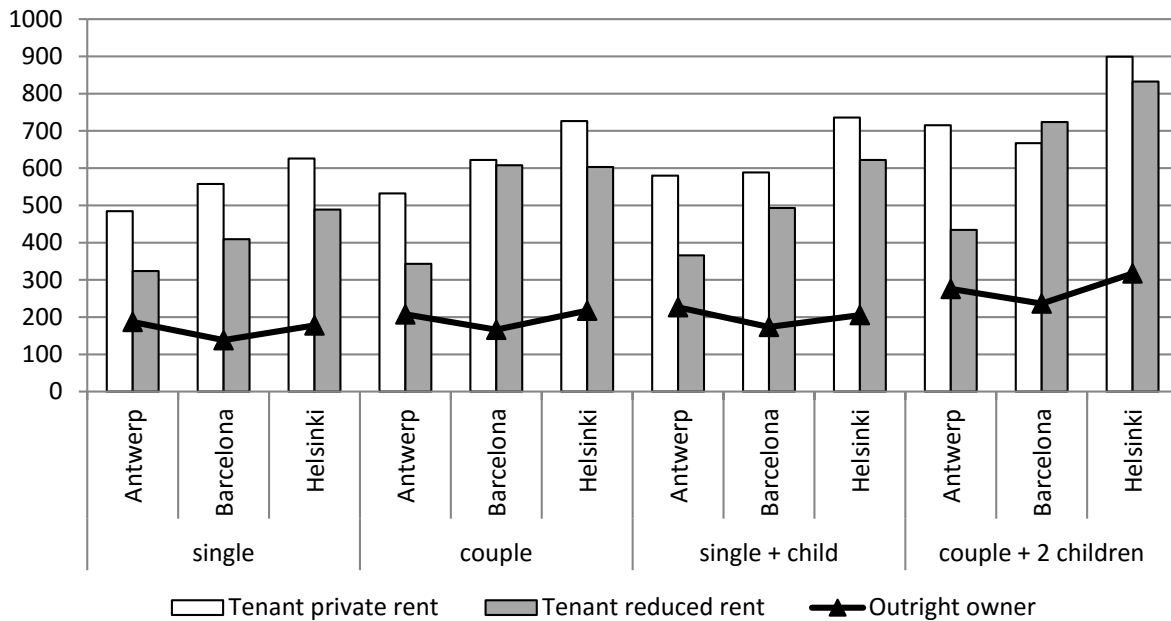


*For Helsinki the budgets are constructed for households with children of different ages: a child in pre-primary school (3-5y) and a child in primary school (6-11y)
 Source: ImPRovE budgets 2014 (Goedemé et al, 2015), excluding housing costs.

Obviously, housing costs can be very considerable. For the development of reference budgets, a particular challenge of housing costs is their heterogeneity. Not only from a cross-national perspective (housing markets differ substantially across Europe), but especially also within countries (and even within cities) dwellings differ in many respects, including their cost. Therefore, the cost of an adequate dwelling was estimated at the 30th percentile, differentiating across tenure status (Goedemé, Storms, Stockman, et al., 2015; Van den Bosch et al., forthcoming). Some minimum quality criteria for dwellings were used, mainly building upon EU housing indicators. The figure below depicts the results of the

housing budget for families renting at the private market, renting at reduced prices or owning a dwelling without paying mortgage. We can see that housing costs are the highest for tenants at the private market. The costs decrease when households have the possibility to rent at reduced prices, and especially when they own a dwelling without paying mortgage.

Figure 2. Housing costs (EUR/month) at the 30th percentile, for modest but adequate dwellings in three EU cities, 2014

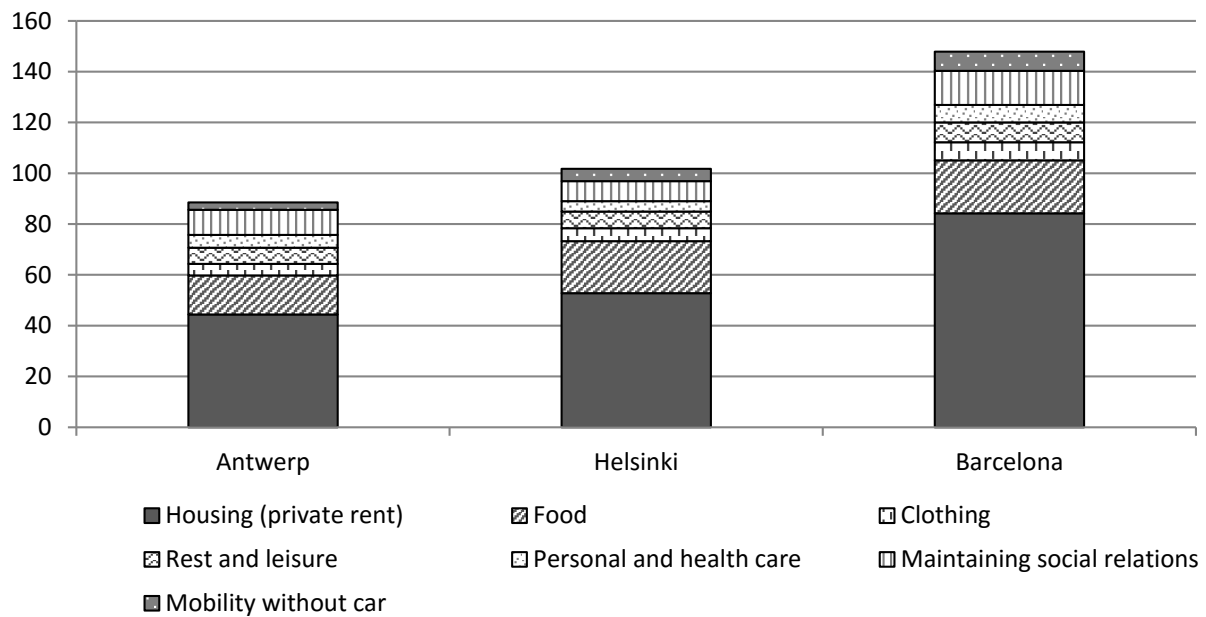


Source: Van den Bosch et al., forthcoming

3.3 How the reference budgets relate to the at-risk-of-poverty threshold

Figure 3 below shows the total reference budget for a single woman in Antwerp, Barcelona and Helsinki expressed as percentage of the at-risk-of-poverty rate. The budgets are adapted to the price level of 2013 (the latest income reference year of the at-risk-of-poverty indicator available from Eurostat). As explained before, it is important to keep in mind that the budgets are specifically developed within the context of reference cities for hypothetical family types, while the at-risk-of-poverty rate is calculated for the population as a whole. Housing costs for renting on the private market (as shown in Figure 2 above) are included, which substantially increases the level of the reference budgets. Expressed as percentage of the at-risk-of-poverty threshold, the lowest percentage can be found in Antwerp and the highest in Barcelona. In Antwerp and Helsinki, the level of the total reference budgets reaches (nearly) the poverty threshold. In other words, the comparison suggests that single persons living with an income around the at-risk-of poverty threshold in wealthier Member States, who live in an urban region and have no health problems, are financially able to participate adequately in society. By contrast, in Barcelona an income at the level of the poverty threshold does not seem to reflect the income that is needed for adequate social participation. Obviously, housing costs play a major role, and the prevalence of renting a dwelling on the private market varies strongly across countries and cities.

Figure 3. Total budget (EUR/month) expressed as percentage of the at-risk-of-poverty threshold in three cities, for a single woman, 2013



Source: *ImPRovE budgets 2014 (Goedemé et al, 2015) converted to price levels of 2013, making use of the overall HICP published by Eurostat. At-risk-of-poverty thresholds taken from Eurostat.*

Before explaining our method of how RBs can be adjusted in order to construct poverty thresholds, it is important to emphasize that RBs face particular problems of robustness. For a large scope of items the number, quality, brand, shop and lifespan have to be defined. This requires a continuously balancing exercise to reconcile sensitivity to the local context and cross-national comparability. The latter is mainly challenged by the elusiveness of the targeted living standard, the limited robustness in the procedures and the lack of internationally comparable data on the needs and expenses of households and on the prices and lifespans of items (Goedemé, Storms, Penne, et al., 2015; Goedemé, Storms, & Van den Bosch, 2015).

4 Method: reference budgets as a poverty indicator

In this section the aim is to explore how the RB data can be used for the measurement of poverty and to elaborate on the preparatory steps that need to be taken. The use of RBs as a poverty threshold involves several steps: (1) calculating the cost of additional household members (adults and children of different ages); (2) extrapolating the RBs to the entire population; (3) application of the RBs to a representative survey (in this case, EU-SILC) to estimate the number of persons with an income below the threshold.

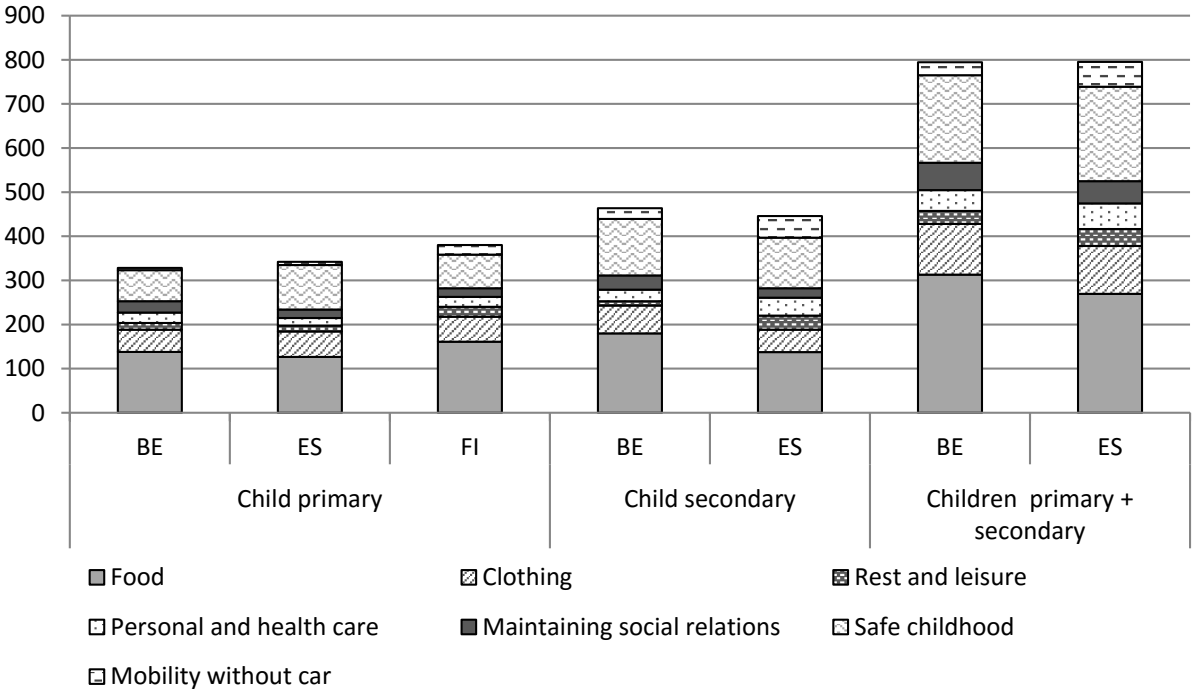
4.1 Calculating the cost of an additional adult or child of different ages

As mentioned earlier (section 3.1), an important limitation of the ImPRovE reference budgets is that they are constructed for hypothetical persons with specific characteristics (e.g. regarding their age and health status) and for specific household constellations. As a result, equivalence scales cannot be estimated for other household compositions, or for persons confronted with other (health)

circumstances, without making additional assumptions about the generalisability of the reference budgets. On the basis of the existing reference budgets we have information on the costs of the first and the second adult, a child in primary school (a boy) and a child in secondary school (a girl). As mentioned above, RBs for Helsinki are developed for household types including children of different ages. This means that in the case of Helsinki, the cost of children in pre-primary and in primary school can be calculated, but there is no information about the specific needs and costs of a child above the age of 12.

Based on the total budgets of the abovementioned family types, the costs of a second adult and children of different ages are derived, taking the budget of a single person as a reference. In order to do this, we deduct the total cost of a childless family from that of a family with children (cf. Oldfield & Bradshaw, 2011). The graph below shows the cost of a child in primary and in secondary education in a single parent household across the three cities.

Figure 4. Comparison of the costs (without housing) of children at the age of primary and secondary education, living in single parent families in Antwerp, Barcelona and Helsinki*, 2014



* In Helsinki only the cost of children in primary education is available
 Source: ImPROvE budgets 2014 (Goedemé et al, 2015), excluding housing costs.

In line with other studies, it can be observed that the cost of a child generally increases with age (Oldfield & Bradshaw, 2011; Storms, et al., 2015). The costs that increase most with age concern the baskets food, safety in childhood, personal and health care and mobility. However, there are also a few costs that decrease with age such as babysitting costs included in the leisure basket. Importantly, we did not include childcare costs. The real costs of younger children will be underestimated when families make use of child care services, which probably would also increase differences across countries.

For families with two children, economies of scale may reduce the costs, particularly with respect to housing and utility costs (which are not included in the graph above) and furniture. Regarding the other costs, economies of scale are rather negligible at the level of what is minimally necessary for adequate social participation. However, we did not take account of practices related to “passing on” of materials such as clothes and toys, which are probably an important source of savings in the daily reality of most households.

The figure above illustrates important cross-national variations in the costs of children of different ages. These differences can be explained by differences in price levels, but also by differences in socio-cultural and institutional contexts. Especially the different public investment in goods and services has an important impact on the variation across cities. For instance, when we look at health care, the cost of younger children is higher in Antwerp since it is the only city of the three where people need to pay a fee for a visit to the GP. On the other hand, the health care costs of teenage girls are lower in Antwerp, since the cost of contraceptives (pill) is fully covered by the state. We also observe a high budget of ‘safety in childhood’ for Barcelona. This can be explained by the high costs of education⁴ compared to the other cities. In Antwerp the maximum billing regulation that puts a ceiling on parents’ costs in primary education is not applied in secondary education, which raises the costs of older children when they move on from primary to secondary education. A final example are the differences between countries in child reductions for public transport. In Antwerp and Barcelona, children below the age of 12 travel (nearly) for free, while in Helsinki the same price is charged for all children between the ages of 7 and 16. In Barcelona the cost of public transport increases considerably for children in secondary education, but in Antwerp children below 25 years old can still travel at reduced prices.

4.2 The level of the threshold without housing costs

In this section we illustratively derive an equivalence scale, based on the ImPRovE reference budgets for Antwerp, Barcelona and Helsinki. As stressed before, this equivalence scale only applies to an income (and consumption pattern) at the level of the reference budgets.

The first step for deriving an equivalence scale includes the calculation of the cost of an additional adult or child in the household, as illustrated in the previous subsection. Second, for calculating the number of households with an income below the level of reference budgets, the equivalence scale should be generalized to the entire population. For doing so, we made some rough assumptions. Firstly, we take the average budget for males and females, although the reference budgets for men/boys and women/girls vary slightly because of the different needs with regard to food intake, health care, personal care and clothing. Nonetheless, the gender status does not result in significant differences in total costs. Also, we make no distinction between persons in paid employment and those not in paid employment. Importantly, the ImPRovE budgets do not contain information on the costs of students in higher education (>18 years). Belgian reference budget research indicates that the minimum required resources for a student in higher education may exceed those of a single adult (Bogaerts, et al., 2014; Storms, et al., 2015; Van Thielen, et al., 2010). When students keep on living at home their cost is slightly higher than the cost of a teenager, but for students in need of student

⁴ All direct and indirect costs of education are taken into account (registration fees, equipment, lunches, books, uniforms, insurances, excursions,...). For secondary school attendance it includes the average costs that are accompanied with studying a general discipline (no specific specialization).

housing the costs rise sharply. As an approximation we allocate students the same budget as for single persons in all cities, which means that the level of the reference budget doubles when a student is added to a single person household. Similarly, there is no information for Antwerp and Barcelona on the cost of a child aged less than 6 years. National reference budgets research shows that the cost of children in pre-school is lower than the associated costs of older children, when child care is not needed (Lehtinen & Aalto, 2014; Mäkinen, 2015; Oldfield & Bradshaw, 2011; Storms, et al., 2015). Hence, for Antwerp and Barcelona it is assumed that the cost of children younger than six is two thirds of the budget of children of primary school age.

Finally, there is no cross-national information about the specific needs and costs for elderly people who are retired. Also in this case, Belgian reference budgets research suggests that the minimum required resources for elderly who live independently, without serious health problems, do not deviate much from those for adults at working age (Storms, et al., 2015; Van Thielen, et al., 2010). For this illustrative exercise all adults older than 18 years, who are not studying, are assigned to the same minimum budget. As explained before, this will most likely result in an underestimation of poverty for people in a bad health situation, given their specific needs.

The budgets for different age categories are used to calculate ratio factors taking as a reference the budget of a single person. The resulting equivalence scales can subsequently be used to estimate reference budgets for household types that do not strictly meet the descriptions of the original hypothetical households. In sum, we extrapolate the RBs to the complete population as follows:

- 1) The base line is the reference cost of a single person without housing costs. In order to define this base line, the average cost of a man and a woman is calculated. The following budgets (expressed in EUR/month) are taken as starting point for the three cities:
 - Antwerp: 489 EUR (F=481; M=497)
 - Barcelona: 437 EUR (F=422; M=453)
 - Helsinki: 575 EUR (F=580; M=570)
- 2) In order to be in line with the year of income data in EUSILC 2012, the reference budgets of 2014 are converted to prices of 2011 using the harmonized consumer price index (HCPI) available from Eurostat.
- 3) Based on the RBs for different household types, a separate budget is derived for individual household members with different age profiles. Because of the limited number of household types, several assumptions are made in order to generalize to the broader population.
 - In Antwerp and Barcelona, the cost of children <6 years old is equal to 2/3 of the cost of children between 6-11 years old.
 - In Helsinki, the cost of children between 12-17 years equals the cost of a second adult
 - The cost of students between 18-25 years old is similar to the budget of a single person household.
 - The cost of a second adult is assigned to every additional person in a household who is 18+ years old and who is not studying, independent of differences in gender and labour market situation.

- 4) Finally, the cost of various additional family members is set in proportion to the base line. In this way “equivalence scales” are obtained at the level of reference budgets without housing costs.

Table 1. Equivalence scales at the level of the reference budgets with variation of housing costs for Antwerp, Barcelona and Finland compared to the modified OECD scales

	Modified OECD scales	Equivalence scales without housing costs			Equivalence scales with housing costs (private tenant)			Equivalence scales with housing costs (outright owner)		
		BE	ES	FI	BE	ES	FI	BE	ES	FI
1st Adult	1	1	1	1	1	1	1	1	1	1
2nd Adult	0,5	0,67	0,73	0,79	0,43	0,37	0,48	0,56	0,62	0,64
Child (<6y)	0,3	0,44	0,50	0,62	0,29	0,29	0,48	0,35	0,44	0,56
Child (6-11y)	0,3	0,66	0,75	0,67	0,44	0,43	0,50	0,52	0,66	0,60
Child (12-17y)	0,5	0,93	0,98	0,79 ⁵	0,58	0,54	0,48	0,72	0,84	0,64
Student (18-25y)	0,5	1	1	1						

Source: ImPRovE budgets 2014 (Goedemé et al, 2015). The factors in italic are based on interpolations from other budgets or other studies.

Table 1 shows the derived equivalence scale at the level of the reference budgets for three different housing situations in Antwerp, Barcelona and Helsinki, compared to the modified OECD scale. In order to illustrate the housing costs of private tenants and outright owners, we used the housing budget of qualitative dwellings as estimated in the ImPRovE project, as explained above in section 3.2 (Goedemé, Storms, Stockman, et al., 2015). Some factors (*in italic*) could not be derived directly from the ImPRovE budgets and rely on the additional assumptions described above. Some significant differences across countries can be observed. In Barcelona the equivalence scales are steeper compared to the other two cities when no housing costs are included or in the case of low housing costs (outright owners). When comparing the factors for private tenants the reverse is true and equivalence scales are the flattest for Barcelona due to the higher housing costs.

The table mainly illustrates the important role of the (shared) housing costs in economies of scale. When housing costs are added, equivalence scales become less steep due to the large shared cost. It is also shown that economies of scale strongly depend on the tenure status, even though this is usually neglected. The possibility to calculate different equivalence factors for different housing situations is a clear advantage of the reference budgets. Also the needs of children of different ages are better reflected, since the modified OECD scale takes the same factor (0,5) for adults and children of 14 years

⁵ As the household types for Helsinki do not include the cost of a teenager it is, based on national RBs research, assumed that this cost is similar to the cost of a second adult. The Finnish RBs estimated an equivalence scale of 0,7 for a teenager and 0,75 for the second adult without housing costs (Lehtinen, A. R., & Aalto, K., 2014). However, as they did not have the full data at use, the cost of a teenager does not take into account the commodities that the household uses jointly. This approach probably underestimates the cost of teenagers.

and older and a lower factor (0,3) for younger children (<14). Reference budget research finds that the cost of children is generally higher, increases with the age of the child, and even exceeds the cost of a second adult in the case of teenagers and students. In other words, the modified OECD scale probably underestimates the cost of children, especially for families with low housing costs (outright owners or subsidized rent).

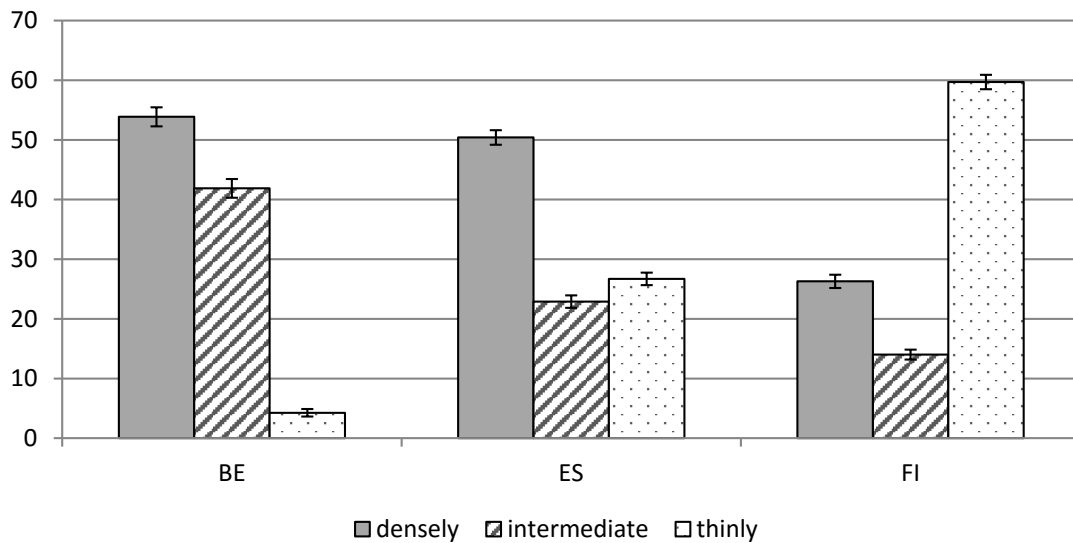
4.3 Application of the thresholds to EU-SILC and the treatment of housing costs

In a last step, we calculate the number of persons with an income below the level of reference budgets. For doing so, we make use of the EU Survey on Income and Living Conditions (EU-SILC), which contains a representative sample of private households (e.g. Marlier, et al., 2007). More in particular, we make use of EU-SILC 2012 (version 3). The sample contains information on 5.817 households in Belgium, 10.307 in Finland and 12.714 in Spain. Since the RBs refer to the out-of-pocket-costs of essential goods and services, we compare their level to the total disposable household income, assuming that household members share equally in the incomes and costs of all household members. Disposable household income includes taxes, benefits and allowances, and is measured in the representative and cross-nationally comparable European Survey of Income and Living Conditions (EU-SILC) (Goedemé, 2013; Marlier, et al., 2007).

Subsequently, a first illustrative attempt can be done to estimate the number of people with a net disposable income below the level of the reference budgets for Belgium, Spain and Finland. The estimations are based on the EU-SILC data for the year 2012. The income reference year is the year before the survey year. Therefore, the ImPRovE reference budgets constructed for the year 2014 are converted to the year 2011 using the harmonised consumer price index (HCPI) available from EUROSTAT. We calculate 95% confidence intervals, taking as much as possible the complex sample design of EU-SILC into account (cf. Goedemé, 2013).

A significant challenge is that the reference budgets are constructed for reference cities (Antwerp, Barcelona and Helsinki) which cannot be considered representative for the country as a whole due to the regional differences in prices and needs (see above). Because of lacking information on the regional level for Belgium we were not able to make use of the NUTS-2 level variable in EU-SILC. In contrast, we restrict for all three countries the sample to households living in densely populated areas. Many cultural and institutional (e.g. public transport) differences are related to the degree of urbanization, but regional variation may be important as well. When interpreting the results, it is important to keep in mind that the proportion of people living in densely populated areas is not the same across countries. The figure below shows that in Belgium and Spain more than half of the people live in densely populated areas. In contrast, only 26% of the households in Finland live in densely populated areas. It is clear that one should not infer the results presented below to the broader population.

Figure 5. The proportion of people living in densely populated areas for Belgium, Finland and Spain



Note: 95% confidence intervals, sample design taken into account (Goedemé, 2013).

Source: EU-SILC 2012 version 3.

A particular challenge for this exercise, is the treatment of housing costs. There are at least two different ways of including housing costs:

- 1) The first option is to start from reference housing costs, which reflect the cost for different tenure statuses of renting an adequate dwelling at the 30th percentile (cf. Goedemé, Storms, Penne, & Van den Bosch, 2015; Van den Bosch et al., forthcoming). Unfortunately, due to data limitations this exercise can take only to a limited extent regional variations in housing prices into account. In addition, it is not very clear whether all households with higher housing costs would be able to find an adequate dwelling at that cost, if they wanted to.
- 2) The second option is to add actual housing costs to the household-specific reference budget, before comparing it to the disposable income of the household⁶. More precisely, EU-SILC contains a variable (HH070) which contains the monthly rent or mortgage and the additional utility costs and other housing-related charges that households need to pay at the moment of the survey. Housing benefits are directly paid to the landlord and not deducted from the total housing cost which means they might be somewhat overestimated. By simply adding real housing costs to the reference budget, we assume that these housing costs correspond to the minimum necessary for adequate social participation, given the current situation of households. Obviously this is a strong assumption: quite a few households may be spending more than what is strictly necessary, whereas others may live in inadequate housing situations.

In this paper, we stick to the second option. It is important to keep in mind that real housing costs do not give information on the quality of the dwelling which means that people living in poor but low cost housing conditions may not be identified as living in poverty. On the other hand people, with excessive housing costs could be identified as poor while their housing conditions are high above the minimum. To limit the latter factor, we have top-coded housing costs at the 99th percentile. In the future it would

⁶ This is equivalent to comparing the RBs without housing costs to disposable income after housing costs.

be interesting to explore also the normative approach, and compare both results to gain more insight on the relation between housing costs, housing conditions and poverty.

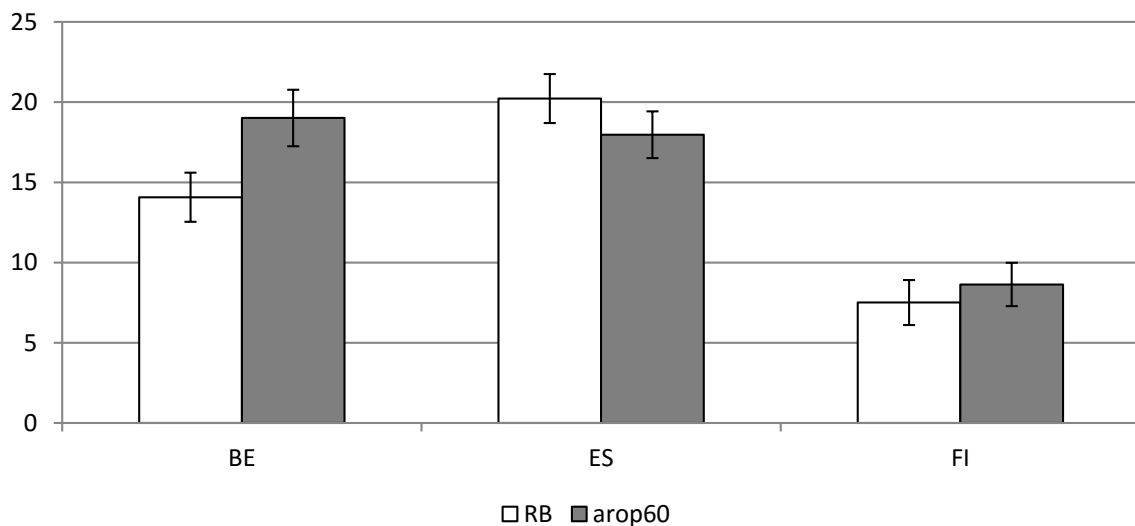
In principle, as is the case for housing costs, we would like to take account of other large costs that people may face, and which are not covered by the reference budgets, in particular child care and health care. However, in contrast to housing costs, information on the out-of-pocket costs for these services is not available in EU-SILC.

5 Results

The starting point for each country are the reference budgets without housing costs, developed for specific cities. By multiplying this budget in every country with the equivalence scale (without housing costs) for each household member of different ages, a reference budget is allocated to all families in the sample. Then, as explained in the previous section, the real housing costs of each household are included which results in household-specific poverty thresholds taking into account differences in household composition and housing costs.

Figure 6 below shows the proportion of people in densely populated areas, whose net disposable household income after housing costs is below the level of the RBs for Belgium, Spain and Finland. The white bars illustrate the results when using reference budget thresholds including real housing costs as explained above, the grey bars show the results of the at-risk-of-poverty rate.

Figure 6. The percentage of people living in a household with a net disposable income below the RB threshold or the at-risk-of-poverty threshold in Belgium, Finland and Spain, densely populated areas.



Note: 95% confidence intervals, sample design taken into account (Goedemé, 2013).

Source: EU-SILC 2012 version 3.

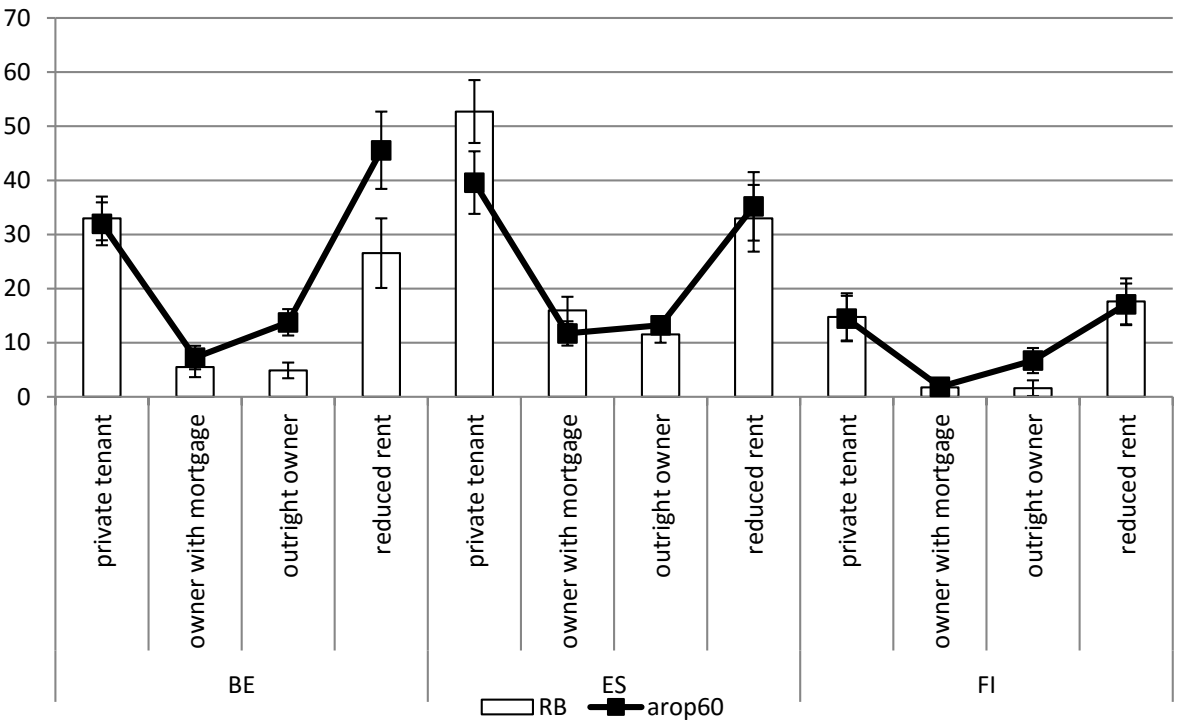
In Spain the percentage of people in densely populated areas with inadequate income to achieve the level of the reference budgets is the highest (20%), followed by Belgium (14%) and Finland (8%). When measured with the at-risk-of-poverty rate, the poverty percentage reaches a higher level for Belgium (19%) and Finland (9%), but in Spain the estimates end up lower (18%). As we illustrated above, the RB

indicator suggests that in Spain an income at the level of the poverty threshold is too low to participate adequately in society.

As mentioned earlier, we must keep in mind that reference budgets are developed for specific household types reflecting a lower bound. In many cases, more financial resources are needed to participate adequately in society. As is the case with the at-risk-of-poverty indicator, poverty rates are probably underestimated for people with limited competences, problems with budgeting, with a limited social network, bad access to information resources, with severe health problems or disabilities, inadequate housing or no access to public services.

More importantly, the question is whether both the RBs-based measure and the at-risk-of-poverty measure result in the identification of the same groups at risk. We discuss poverty by tenure status, household type and age groups.

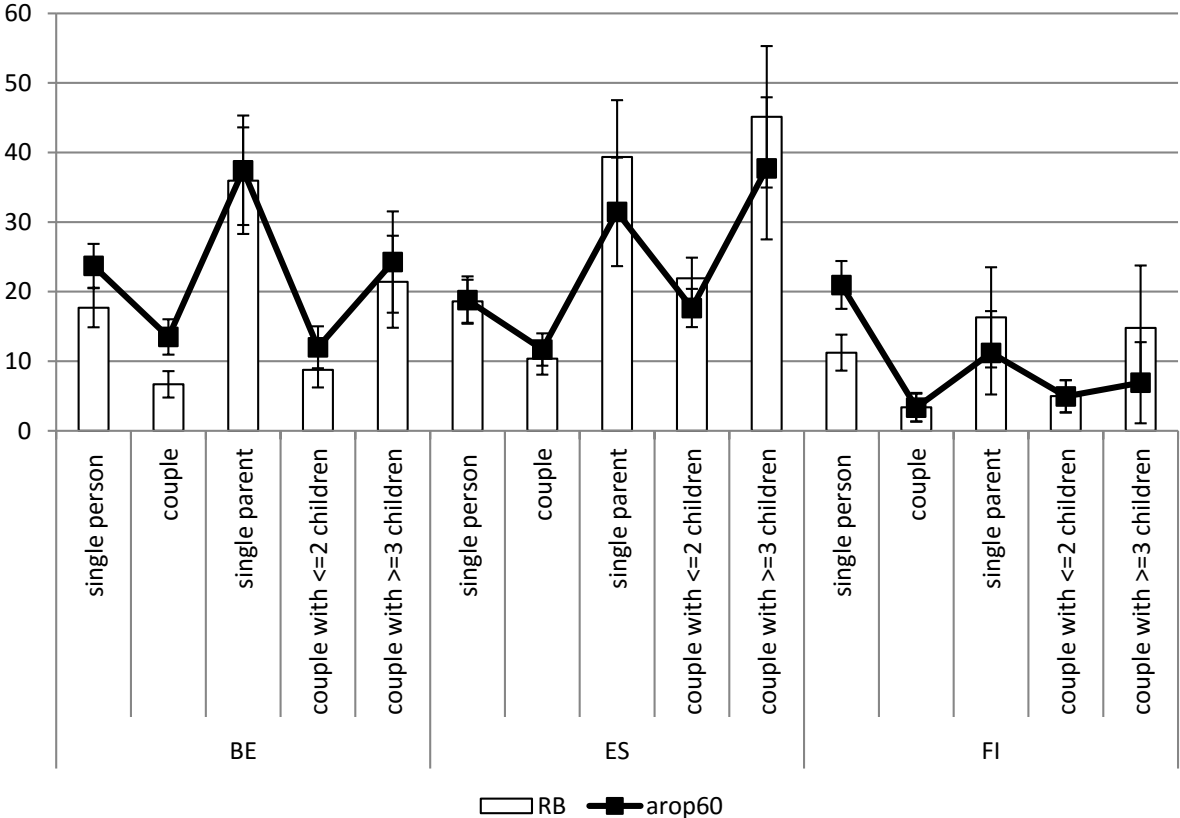
Figure 7. Proportion of people with a net disposable income below the thresholds for densely populated areas, by tenure status



Note: 95% confidence intervals, sample design taken into account (cf. Goedemé, 2013).
Source: EU-SILC 2012 version 3.

The graph above illustrates that even though those who pay a reduced rent tend to have low incomes (their at-risk-of-poverty rate is relatively high), the fact that they have reduced housing costs helps to raise their remaining income above the level of reference budgets. In particular, the relative risk of those renting on the private market and those paying reduced rent is assessed considerably differently in Belgium and Spain when comparing both approaches to poverty measurement. For both countries, the RB indicator shows that governments should be at least as concerned about households renting on the private market as about those renting in the reduced rent sector. In Belgium and Finland outright owners, and in Belgium also tenants who pay reduced rent, face a significantly lower poverty risk when this is measured using the RB threshold in comparison with the at-risk-of-poverty rate.

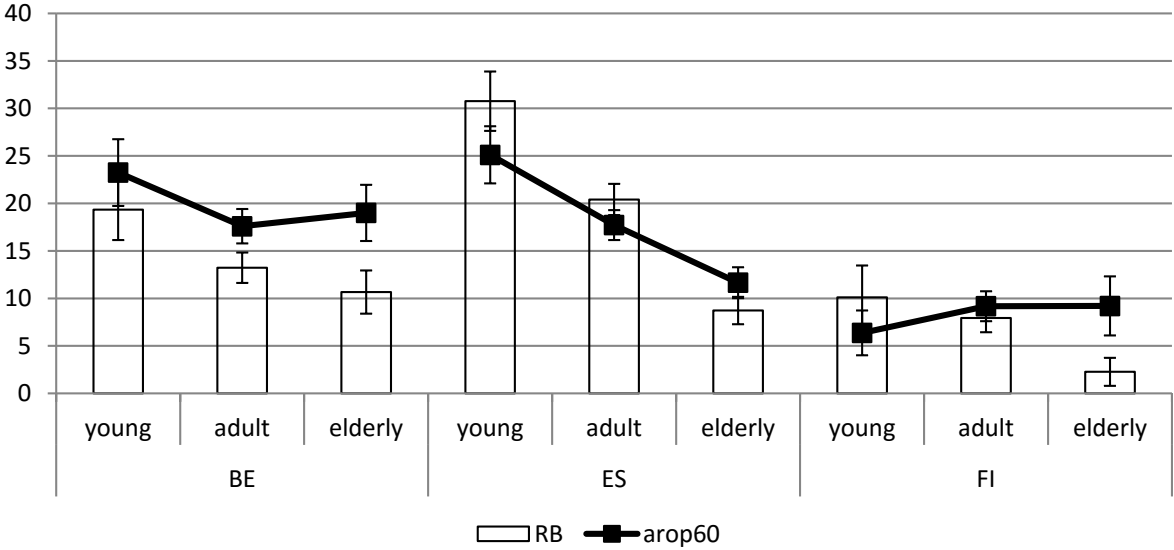
Figure 8. Proportion of people with a net disposable income below the thresholds for densely populated areas, by household types



*Note: 95% confidence intervals, sample design taken into account (cf. Goedemé, 2013).
Source: EU-SILC 2012 version 3.*

When we differentiate the poverty rates by household types, both the at-risk-of-poverty indicator and the RBs identify the same groups as those with the highest level of poverty. With both indicators, single parent families are generally the most vulnerable household type. In Belgium and Finland, the at-risk-of-poverty threshold seems to over-emphasise poverty among single persons (and in Belgium also among couples) without children compared to the RB threshold. In Spain and Finland poverty rates for single parent families and couples with more than three children increase when the RB threshold is used.

Figure 9. Proportion of people with a net disposable income below the threshold for densely populated areas, by age groups



Note: 95% confidence intervals, sample design taken into account (cf. Goedemé, 2013).
 Source: EU-SILC 2012 version 3.

The last graph shows the proportion of people with a net disposable household income below the RBs or the at-risk-of-poverty threshold for different age groups. When measured with the RB indicator, poverty rates are the highest for people below the age of 18 in the densely populated areas of all three countries. In Spain a similar result is obtained when measured with the at-risk-of-poverty indicator, but in Belgium and Finland poverty is significantly higher for elderly persons (over 65 years old), resulting in an (almost) inverse picture compared to the RB indicator. This is most likely mainly the result of taking housing costs into account: many elderly persons have a relatively low income (at least in Belgium and Finland), but at the same time they have a higher likelihood of low housing costs due to full ownership of the dwelling. As a result, they do rather poorly when housing costs are ignored, and relatively well if housing costs are taken into account.

6 Discussion: the limitations of reference budgets as a poverty indicator

In the previous section we have illustrated how reference budgets could be used as poverty thresholds and complement the at-risk-of-poverty indicator. More in particular, reference budgets illustrate how the at-risk-of-poverty threshold does not represent the same living standard across different EU Member States and different subgroups in the population. At the same time, the results should be interpreted with caution. The original purpose of reference budgets is not to estimate poverty rates but to create a benchmark against which an adequate living standard can be assessed. As such, reference budgets do not provide information on the number of people with insufficient financial resources to acquire an adequate living standard. When RBs are used as poverty lines, we identified three main challenges. Firstly, as indicated above, reference budgets face problems of robustness because of their concrete and detailed character and the lack of cross-nationally comparable expenditure data and price and lifespan information. Secondly, we pointed at the limitations of the EU-SILC dataset which lacks microdata containing information on the needs and essential expenditures

of households. And last but not least, reference budgets are developed for a limited range of hypothetical households on the basis of specific assumptions. Many of these assumptions do not generally apply to the broader population, and in particular not to households living on low incomes. In order to be able to better apprehend the implications of these assumptions, in what follows we briefly review the literature on the discrepancies between the abovementioned characteristics of the household types and the observed characteristics and circumstances of real households. In addition, we explore how these discrepancies affect the level of the reference budgets and their use as a poverty line. Consecutively, we discuss assumptions with regard to: (1) being well informed and having 'normal' competences; (2) being in good health; (3) making use of available public goods and services; (4) living in an adequate dwelling.

6.1 *Informed people with normal competences*

An important assumption is that households are aware of correct information about requirements of adequate social participation (e.g. healthy living patterns, their entitlements to public goods and services) and the cost of goods and services, and, moreover, have the capacities to use this information to act economically. This might not be self-evident for everyone. Comparing different prices, mastering one's budget and taking up all social rights require specific resources such as time, reliable information, social networks, access to institutions and skills such as being literate or even higher educated. In addition, continuously making economic choices takes time, energy and long-term budget strategies. Recent psychological research shows that scarcity of income (but also of other goods such as time) limits people's cognitive capacities, leading to more impulsive purchases and less budget control (Mullainathan & Shafir, 2013).

Access to information and the ability to compare prices is increasingly related to digital literacy, which is not distributed equally. In particular people living on low incomes, elderly and low educated lag behind because of limited financial and psycho-social capacities (Hargittai, 2010; Mariën & Van Audenhove, 2011; Selwyn, 2004). In this case a budget that fulfils material needs for internet use will not suffice, as also extensive training and support are necessary to strengthen the competences of people with different backgrounds (Hargittai, 2010; Mariën & Van Audenhove, 2011). If people lack the assumed competences the level of the reference budget threshold will not allow for adequate social participation, which means poverty rates could be underestimated.

6.2 *Being in a good health*

Many people are confronted with health problems for which they need additional (financial) resources. This is particularly problematic as a wide variety of studies has shown a strong correlation between (self-reported) health status and a low socio-economic background (van Doorslaer, et al., 2004; Hernández-Quevedo, et al., 2006; Knoop & van den Brakel, 2010; Lynch, et al., 2000; Mackenbach et al., 2008; Wilkinson & Marmot, 2003). Comparative research also reveals substantial differences in health inequalities between countries (Hernández-Quevedo, et al., 2006; Mackenbach, et al., 2008; Marmot, et al., 2012). Studies confirm that countries with a low GDP, low accessibility of services and higher levels of inequality perform worse with regard to socio-economic inequalities in health (van Doorslaer, et al., 2004; Kawachi & Subramanian, 2014; Lynch, et al., 2000; Mackenbach, et al., 2008; Marmot, 2002; Marmot, et al., 2012).

The income-based inequalities in health are a result of three main processes that work in different directions (Hernández-Quevedo, et al., 2006; Marmot, 2002; Muennig, 2008). First of all, health problems can result in a loss of income due to the extra costs caused by conditions of sickness or disability or to the decreased possibilities to gain income from work (Decock, et al., 2001; Hill, et al., 2015; Pacolet, et al., 2011; Van Thielen et al., 2010; Vermeulen & Hermans, 2013; Zaidi & Burchardt, 2005). Secondly, in addition to the direct and indirect costs related to health problems, people with chronic diseases or disabilities need additional resources to overcome barriers in order to participate adequately in other domains (Mithen, et al., 2015; Van Thielen, et al., 2010; Vermeulen & Hermans, 2013). Thirdly, the underlying explanatory factor is the harmful effect of low income on health status (Hernández-Quevedo, et al., 2006; Marmot, 2002; Muennig, 2008). First of all, this can be explained by the effects of inadequate food intake, bad sanitation and low quality housing conditions. Secondly, low income is related to low levels of education, low quality jobs, unemployment and social exclusion, which are known to have a negative impact on health (Marmot, 2002; Wilkinson & Marmot, 2003). Further, also long-term psycho-social effects of living in poverty can increase the risk of physical and mental health problems (Lynch, et al., 2000). Finally, people with lower socio-economic status may have unequal access to health care due to financial or social barriers, which can result in a procrastination of medical treatment (Després, et al., 2011; van Doorslaer, et al., 2004; Mackenbach, et al., 2008; van Doorslaer, et al., 2006). It is an empirical question whether the level of reference budgets allows for sufficient budget space to avoid mental and physical health problems in the long term. Given that we have ignored the additional financial means that sick and disabled persons need to enable adequate social participation, poverty rates will most certainly be underestimated.

6.3 Accessible public goods and services

Another assumption implies that families make use of accessible public goods and services, such as health care services, education and public transport. The reference budgets take account of the out-of-pocket costs that are needed to make use of these services, but no additional monetary or non-monetary costs are included in the case people do not have full access. The problem is that we cannot assume that public goods and services are equally used (Cantillon & Van Lancker, 2013; Ghysels & Van Lancker, 2011). There exists indeed evidence of low-income families making limited use of universal childcare (Ghysels & Van Lancker, 2011; Van Lancker, 2013), participating less in higher education (Marical, et al., 2008; Verbergt, et al., 2009) and refraining from visiting medical specialists (Després, et al., 2011; Morris, et al., 2005; van Doorslaer, et al., 2006). Various factors are mentioned in literature, among which are financial and cultural barriers, attitudes and beliefs, inadequate information and spatial segregation. If people receive an income at the level of the reference budgets, the problem of affordability should disappear but other psycho-social forms of exclusion may persist. Consequently, if we do not take account of this limited accessibility of services for low income families, an important aspect of poverty may be neglected.

In many countries low-income families have the right to pay reduced tariffs for making use of publicly provided services such as health care and education. The question is to what extent these price advantages should be taken into account in order not to overestimate poverty. Even if means-tested benefits, cost-compensating measures or public goods such as social housing are specifically targeted at people in poverty, there are problems with restricted eligibility, accessibility and information which results in non-take up (Ditch, et al., 2001; Eeman & Van Regenmortel, 2013; Hernanz, et al., 2004;

Winters & Heylen, 2008). Hence, some cost-reducing measures are not taken into account for the construction of the ImPRovE reference budgets because of the lack of information on the implementation and take-up of social tariffs such as rent premiums, public transport and health care reductions or a maximum tariff for electricity and gas. Also, eligibility may depend on the income that people have, which in the case of reference budgets depends on their out of pocket costs. In other words, assumptions regarding hypothetical households' income are endogenous. Nonetheless, it would be interesting to repeat the exercise taking account of the most important cost reductions to which low-income families are entitled. In this paper, only the effects of social rent are to a certain extent included.

6.4 Adequate housing

Finally, assumptions were made in order to estimate what families need at the minimum for adequate housing. There is a large variation in national and regional housing policies which determines differences in housing costs and in the predominant tenure status between and within countries (Ball, 2005; Fahey, et al., 2004; Heylen & Winters, 2014; Rybkowska & Schneider, 2011). Not only housing costs and tenure status but also the related housing conditions differ largely across countries, regions and socio-economic groups. In 2009, 30 million people in the EU suffered from severe housing deprivation (Rybkowska & Schneider, 2011). Differences in housing quality can be explained by differences in general wealth, housing policies, the rate of homeownership and the role of family support in housing provision (Mandic & Cirman, 2012). Especially in the Eastern European Member States the problem of poor housing conditions is frequently occurring. Many dwellings are in disrepair since families lack the financial means for renovation. Moreover, due to a lack of investments the housing options are very limited for new households (Ball, 2005; Lelkes & Zólyomi, 2010; Mandic & Cirman, 2012; Rybkowska & Schneider, 2011). But also in more wealthy EU Member States many families with a low socio-economic status face poor housing conditions. In all countries, people with an income below the at-risk-of-poverty threshold report more often problems with inadequate or lacking basic facilities, leaking roofs and lack of space (Lelkes & Zólyomi, 2010; Rybkowska & Schneider, 2011).

As we have explained (see above 4.3) housing costs can be calculated in two different ways, starting from different assumptions. By including real housing costs, we take account of the limitations of the housing market and demonstrate concrete differences across countries and different socio economic groups. However, we do not know how the costs relate to the quality of the housing. Possibly, housing costs are affordable and people are not classified as poor, although they are confronted with bad housing conditions or lacking basic facilities. Moreover, adequate housing is not only a need by itself, it is also strongly interlinked with other needs such as health situation, social networks, access to facilities, security and mobility. If the assumption of adequate housing is not fulfilled, this will interfere with the cost of other baskets of goods and services in the reference budgets.

7 Conclusions and lessons

In this paper we have explored how cross-nationally comparable reference budgets could be useful instruments for measuring income poverty within a European context. Reference budgets are priced baskets of goods and services, reflecting the resources that people need at the minimum to adequately

participate in society. When constructed in a cross-nationally comparable way, they show how adequate living standards differ across the EU, and, as a consequence, contribute to the discussion on poverty concepts and poverty measurement. In two recent EU-funded projects, a first attempt has been made to construct such cross-nationally comparable RBs, based on a common theoretical and methodological framework. We have argued that these rich and comparable data have the potential to contextualise other poverty indicators as well as to develop an empirically needs-based poverty threshold, which combines the income and expenditure side of household budgets.

The data used in this paper are derived from the reference budgets developed within the ImPRovE project for three reference cities: Antwerp, Helsinki and Barcelona. The process to derive poverty thresholds involved three steps. Typically, reference budgets are developed only for a limited number of household types. Therefore, a first step was to estimate the costs of additional household members of different ages and subsequently derive equivalence scales. The results show how various institutional, cultural, and geographical differences between countries influence the level of the budget that adults and children need at the minimum to adequately participate in society. For instance, the necessary costs of children are relatively high in Barcelona compared to the other two cities, which is mainly due to the higher education costs. Taking account of the differences in needs and economies of scales across countries and household constellations, the results suggest that the adequacy of the frequently used modified OECD scale seems to depend largely on the housing situation (in all three countries, in situations where housing costs are low, the equivalence scales are much steeper), and underestimates the costs of older children (even in the context of high housing costs).

Because of its dominant share in the total budget of households, housing costs are an essential element of adequate poverty measurement. The usual approach is to calculate imputed rent (that is, the 'benefit' that people derive from owning a house or paying sub-market level rent), and add this amount to disposable incomes. In contrast, in the RB approach the cost of housing is included in the poverty threshold. Due to the large variation of housing costs across households it is important to explore different options to impute housing costs in the level of the threshold. In this paper, for illustrative purposes we simply added (top-coded) actual housing costs to the poverty threshold, as measured for each household in EU-SILC. Clearly, more sophisticated approaches should be explored. Ideally, real expenditure data should also be taken into account for other needs-based costs that differ significantly across households and regions such as health care, education, child care and mobility costs. However, within a context of severe data constraints this was not considered feasible for the purposes of this paper.

Finally, we illustrate how RB thresholds can be used to estimate the number of people with a net disposable income below the threshold for Belgium, Finland and Spain; and how this compares to the usual poverty estimates on the basis of the at-risk-of-poverty indicator. Estimations are based on representative income data available in the EU-SILC for the year 2012, restricting the sample to densely populated areas (given that the reference budgets were developed for large cities). We have seen that poverty rates are the highest for Spain and the lowest for Finland, being in line with the conclusions based on the at-risk-of-poverty rate. However, when poverty is measured with the reference budget indicator, there are some important differences compared to traditional poverty outcomes. In Spain, poverty figures end up higher compared to poverty rates based on the at-risk-of-poverty indicator, while it is the other way around for Belgium and Finland. Supported by earlier findings, this leads to the conclusion that the at-risk-of-poverty threshold does not represent the same level of living

standard across different EU Member States. The difference between both indicators becomes even clearer when the characteristics of those who are identified as poor according to both thresholds are compared. We can generally say that those renting on the private market, families with children and young people are relatively worse off when poverty is measured with the reference budget indicator compared to the at-risk-of-poverty rate.

Even though reference budgets may provide useful complementary information on poverty, there are various barriers to be overcome before reference budgets data can be used to construct a more valid poverty line. We have indicated three main limitations (1) current EU-reference budgets are not fully comparable, are challenged by issues of robustness and can be improved further, especially with regard to data collection, pricing and lifespan assumptions, (2) the use of a RB methodology for poverty measurement requires detailed microdata with information on economic resources, as well as the needs and essential expenditures of households -in this paper we made use of EU-SILC, that does not entirely comply with these data requirements-, (3) RBs are constructed for a limited number of well-defined household types and cannot easily be extrapolated to the population as a whole. Acknowledging these limitations, the purpose of this paper is exploring and illustrating the possibilities of how RBs could be used as an informative benchmark for the European 'at-risk-of poverty' threshold, rather than developing an alternative poverty indicator.

Regarding the third limitation, it is crucial to emphasise that RBs refer to a lower bound of income that specific hypothetical households need for adequate social participation. The assumptions underlying the minimum cost of adequate social participation deviate most from the reality of households situated at the bottom of the income distribution. This means that poverty rates are probably underestimated for people with severe health problems or disabilities, limited competences (e.g. regarding efficient budgeting), deficient social networks, information resources, inadequate housing or no access to public services. It is also worth repeating that in this paper we have used RBs constructed for specific reference cities to estimate poverty levels at the country-level. Hence, even if we restricted the sample to densely populated areas, we can assume that regional differences in price and social context can bias the results to a certain extent. However, it should be noted that information on regional price variations within European countries is not directly accessible. It would be extremely useful to have regional price level indices, in addition to the national price level indices published by Eurostat.

The analyses presented in this paper could be improved in many ways. First of all, the quality and robustness of reference budgets could be enhanced as suggested by Goedemé, Storms, Penne and Van den Bosch (2015). In addition, we should consider constructing RBs for a broader range of household types. Second, in order to improve estimates of those with an income below the level of reference budgets, an enhanced micro-dataset with information on needs and expenditure across households and regions would be very useful. To some extent, household budget survey data could be used for this purpose, even though in contrast to EU-SILC, these data are not comparable across countries. Furthermore, it would be interesting to explore alternative ways of including housing costs. Finally, regional data on price differences as well as on cultural and institutional differences are indispensable to estimate poverty in a more accurate way across regions.

To conclude, this paper illustrates how RBs can be used for the contextualisation of other poverty indicators and how they could potentially enrich poverty studies. At the same time, it is clear that

considerable methodological improvements are possible, and required. In our view, this offers a fruitful and rich agenda for future research, which could substantially contribute to a more accurate picture of poverty in Europe.

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ImPRovE: Poverty Reduction in Europe. Social Policy and Innovation

Poverty Reduction in Europe: Social Policy and Innovation (ImPRovE) is an international research project that brings together ten outstanding research institutes and a broad network of researchers in a concerted effort to study poverty, social policy and social innovation in Europe. The ImPRovE project aims to improve the basis for evidence-based policy making in Europe, both in the short and in the long term. In the short term, this is done by carrying out research that is directly relevant for policymakers. At the same time however, ImPRovE invests in improving the long-term capacity for evidence-based policy making by upgrading the available research infrastructure, by combining both applied and fundamental research, and by optimising the information flow of research results to relevant policy makers and the civil society at large.

The two central questions driving the ImPRovE project are:

How can social cohesion be achieved in Europe?

How can social innovation complement, reinforce and modify macro-level policies and vice versa?

The project runs from March 2012 till February 2016 and receives EU research support to the amount of Euro 2.7 million under the 7th Framework Programme. The output of ImPRovE will include over 55 research papers, about 16 policy briefs and at least 3 scientific books. The ImPRovE Consortium will organise two international conferences (Spring 2014 and Winter 2015). In addition, ImPRovE will develop a new database of local projects of social innovation in Europe, cross-national comparable reference budgets for 6 countries (Belgium, Finland, Greece, Hungary, Italy and Spain) and will strongly expand the available policy scenarios in the European microsimulation model EUROMOD.

More detailed information is available on the website <http://improve-research.eu>.

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