



## Reference Housing Costs for Adequate Dwellings in Ten European Capitals

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**Abstract:** *Providing adequate housing at affordable prices remains a challenge for all welfare states. As part of a pilot project for developing a common methodology for reference budgets in the European Union, reference rents and other housing costs (energy, taxes, maintenance) corresponding to adequate dwellings for four hypothetical households living in nine capital regions of the EU were estimated. In this paper, we discuss the approach that we have taken. Quality criteria for adequate housing were derived from EU indicators of housing deprivation, and the recent UK Housing Standards Review. We used data from the Study of Income and Living Conditions (EU-SILC) of 2012. Unsurprisingly, the estimates of reference rents vary strongly across capitals, reflecting cross-national differences in the level of the average rent. By contrast, other housing costs, which mainly reflect energy costs, vary much less.*

**Keywords:** Housing costs; Reference budgets; EU-SILC.



## Introduction

Housing is generally recognised as a basic need. Adequate housing should provide adequate protection, be safe and have enough space to live decently. The question this paper addresses is how much such housing costs in various capital regions of the EU.

The study on which this paper is based is part of a pilot project funded by the European Commission, on developing a common methodology for comparable reference budgets in Europe (Goedemé, Storms, Penne and Van den Bosch, 2015)<sup>1</sup>. Reference budgets are illustrative priced baskets of goods and services that represent a certain living standard. The results reported here also build on work performed within the international research project “Poverty Reduction in Europe: Social Policy and Innovation (ImPRovE)” (Goedemé, Storms, Stockman et al., 2015)<sup>2</sup>.

Reference budgets can be used for a variety of purposes. First, they help to develop benchmarks of what an adequate income is. Second, they help to better understand cross-national differences in the cost of living, and how governments affect the cost of essential goods and services for households. Third, as follows from the second purpose, they help to contextualise other social indicators, in particular the at-risk-of-poverty threshold. In addition, there are many other potential applications that have been documented elsewhere (cf. Storms et al., 2014).

The standard approach for constructing a basket in reference budgets is to specify the nature, number and quality of the necessary items in that basket, and then to price those items. However, the housing market is very heterogeneous. For dwellings with a given set of basic characteristics, the price range is usually large. Therefore, we have used a different approach for calculating reference values for housing costs. As for other baskets, the approach starts from by defining quality criteria for adequate housing in contemporary Europe. In contrast to the procedure for constructing other baskets, estimations of reference housing costs are based on a representative household survey, see EU-SILC, wave 2012. The estimation of reference housing costs is no exact science. Therefore, in this paper we present the approach that we have followed and proposed to the European Commission. We hope to provoke some discussion about how it can be improved further.

Reference housing costs were determined for four hypothetical households: a single person, a one-parent family with 2 children (girl 14, boy 10), a childless couple, and a couple with 2 children (girl 14, boy 10). In accordance with the project brief from the European Commission, the hypothetical households were assumed to live in capital regions of EU countries: Athens, Budapest, Helsinki, Luxembourg, Madrid, Rome, and Vienna, as well as urban regions of Belgium and the complete territory of the Netherlands. In this paper we illustrate the approach for estimating the cost of adequate housing for tenants in the private sector.

This paper is structured as follows. In the next section, we describe a set of criteria that we used for identifying dwellings of minimum acceptable quality. Subsequently, we explain how

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<sup>1</sup> See also <http://www.referencebudgets.eu/>

<sup>2</sup> See [http://improve-research.eu/?page\\_id=174](http://improve-research.eu/?page_id=174)



the reference housing costs were derived from the EU-SILC 2012 data, distinguishing between rent and other housing costs. In section four we present the results. We conclude in section five.

## Quality criteria

The purpose of the project was to estimate reference values for housing costs that are as much as possible comparable across countries in terms of their adequacy for social participation, which implies that we applied the same criteria of housing adequacy in all countries. A review of national and international guidelines and quality criteria revealed that these generally mention three principles: housing should provide protection against communicable diseases, and also against injuries and other diseases, and should reduce psychological and social stresses to a minimum (e.g. WHO, 1989; UN Committee on Economic Social and Cultural Rights, 1991; Kenna, 2012). However, these do not offer sufficient guidance for calculating a reference value for housing costs, either because they are too vague with regard to essential characteristics, or because they refer to characteristics for which we have no information in the survey data. Therefore, we derived suitable quality criteria from European indicators of housing adequacy, as well as a recent British study on housing quality requirements.

First, two of the EU indicators of housing deprivation implicitly provide clear minimum criteria for acceptable housing: the overcrowding indicator and a composite indicator on housing deprivation which comprises four separate items (Social Protection Committee - Indicators Sub-Group, 2015: 24). Second, three criteria were suggested by their inclusion in the EU-SILC questionnaire housing module (as well as by common sense), adequate electrical installations, adequate plumbing/water installations and the ability to keep the home adequately warm. Third, we used a standard defined by the UK Department for Communities and Local Government (2013, 2015), which is designed to provide enough space to accommodate a minimum specified amount of furniture, fittings, activity and circulation space considered necessary to carry out a typical range of daily activities. Table 1 lists the criteria that we applied.

## Data and method

We use EU-SILC data from wave 2012 which at the time of analysis were the most recently available, and which, fortuitously, contain additional data from a special housing module. We distinguish between rent and other housing costs; the latter are determined by subtracting rent from total housing costs. Given the heterogeneity of the housing market, we do not focus on the lowest cost of adequate housing, but on a price for which we can expect that a reasonable number of dwellings is available on the market. More specifically, we try to establish what households actually pay at the 30th percentile for dwellings that conform to the quality requirements mentioned (for a broadly similar approach, see U.S. Department of Housing & Urban Development, 2007). As the EU-SILC database released by Eurostat does not allow to select only those households living in the capital city, we limit the sample to densely



populated areas in the region in which the reference cities are located (Vienna, Brussels<sup>3</sup>, Athens, Madrid, Helsinki, Budapest, Rome and Luxembourg), as well as to the full population of the Netherlands by lack of more detailed information on region and degree of urbanisation. While the full report (Goedemé, Storms, Penne and Van den Bosch, 2015) also contains results for tenants in the reduced-rent sector, and for outright owners, in this article we illustrate the approach only for tenants in the private sector.

**Table 1: Quality criteria and other variables used in the calculation of reference housing costs**

Criterion / variable	Reference values				Selection Criterion or Regression Variable	Source**
	Single person	One-parent, 2 children	Couple	Couple, 2 children		
<b>QUALITY CRITERIA</b>						
Overcrowding: # of bedrooms***	1	3	1	3	Regression	A
Leaking roof, damp walls/floors/foundations, or rot in window frames or floors	No	No	No	No	Selection	A
Bath or shower in the dwelling	Yes	Yes	Yes	Yes	Selection	A
Indoor flushing toilet for the sole use of the household	Yes	Yes	Yes	Yes	Selection	A
Ability to keep the home adequately warm *	Yes	Yes	Yes	Yes	Selection	B
Adequate electrical installations	Yes	Yes	Yes	Yes	Selection	B
Adequate plumbing/water installations	Yes	Yes	Yes	Yes	Selection	B
Sufficient space	38	64	47	73	Regression	C
<b>OTHER VARIABLES USED</b>						
Central heating	Yes	Yes	Yes	Yes	Regression	
Type of dwelling (free-standing, semi-detached, apartment )	Apartment in building with more than 10 dwellings				Regression	
Number of years current contract has been running	6	6	6	6	Regression	
Region	Region of capital city				Regression	
Population density	Densely populated				Regression	
Single or couple *	Single	Single	Couple	Couple	Regression	
Number of children (0, 1, 2, 3+) *	0	2	0	2	Regression	
Age category of oldest person *	40-49	40-49	40-49	40-49	Regression	

Notes: \* criterion / variable used only for housing costs other than rent

\*\* Sources: A: EU indicator of housing deprivation; B: EU-SILC 2012 housing module; C: UK Housing Standards Review

\*\*\* for families with children: one bedroom for each child, as they are of different sex, and the girl is aged 14

Source: compilation by authors

<sup>3</sup> Brussels in fact comprises all urbanized areas in Belgium, as information on region was lacking in the EU-SILC data for Belgium.



We estimated quantile log-linear regression models of the form (1) with either rent or other housing costs as the dependent variable  $Y_h$ , and continuous variables  $X_h$  and dummy characteristics  $D_h$  as the independent variables (the subscript  $h$  refers to households, while  $a$ ,  $b_1$ ,  $b_2$  and  $b_3$  are coefficients to be estimated, and  $e_h$  is an error term with the usual properties.

$$\ln Y_h = a + b_1 \ln X_{1h} + b_2 \ln X_{2h} + b_3 D_{3h} + \dots + e_h \quad (1)$$

Quantile regression allows to estimate various conditional quantiles of the dependent variable, unlike ordinary regression which targets the conditional mean. As motivated above, we aimed at the 30<sup>th</sup> percentile. Also, quantile regression estimates are more robust against outliers in the dependent variable. A log-linear specification has been chosen, as we regarded the implicit assumption that the impact of characteristics on rent and other housing costs is proportional rather than absolute, as more plausible. The unit of analysis is the household, which is assumed to correspond in a one-to-one relationship to a dwelling. All regressions were run for each country separately. The regression for rent was run only on households renting in the private sector, while for other costs, households in the reduced-rent sector were also included (an indicator variable for this sector was added to the independent variables).

Table 1 indicates which variables were entered into the regression, and which ones were imposed as selection criteria, i.e. only cases which met these requirements were included in the regressions. Between 18 per cent (Athens) and 37 per cent (Brussels, Rome) of cases were excluded because they did not meet these requirements.<sup>4</sup> Table 1 also lists a number of additional characteristics that were included in the regressions as independent variables, even though they are not quality criteria. The reason for their inclusion is that they turned out to have a substantial impact on the rent or the other housing costs. The reference values were chosen because they correspond to the characteristics of the reference households (region, population density, single or couple, number of children, age of the oldest household member), or because they correspond to the most common or median situation (type of dwelling, presence of central heating, number of years current tenancy contract has been running).

Given estimates of the coefficients in equation (1), and reference values for the independent variables ( $X^*$  and  $D^*$ ), reference rents and other housing costs ( $Y^*$ ) can be calculated using equation (2):

$$Y^* = \text{EXP}(a + b_1 \log X^*_1 + b_2 \log X^*_2 + b_3 D^*_3 + \dots) \quad (2)$$

## Results: reference rents and other housing costs for tenants

Figure 1 shows that reference rents in the private sector vary considerably across the selected capital regions. Obviously, there is a strong correlation between reference rents and the median actual rents, though it is not perfect. In Athens, Madrid, Budapest, Rome and The

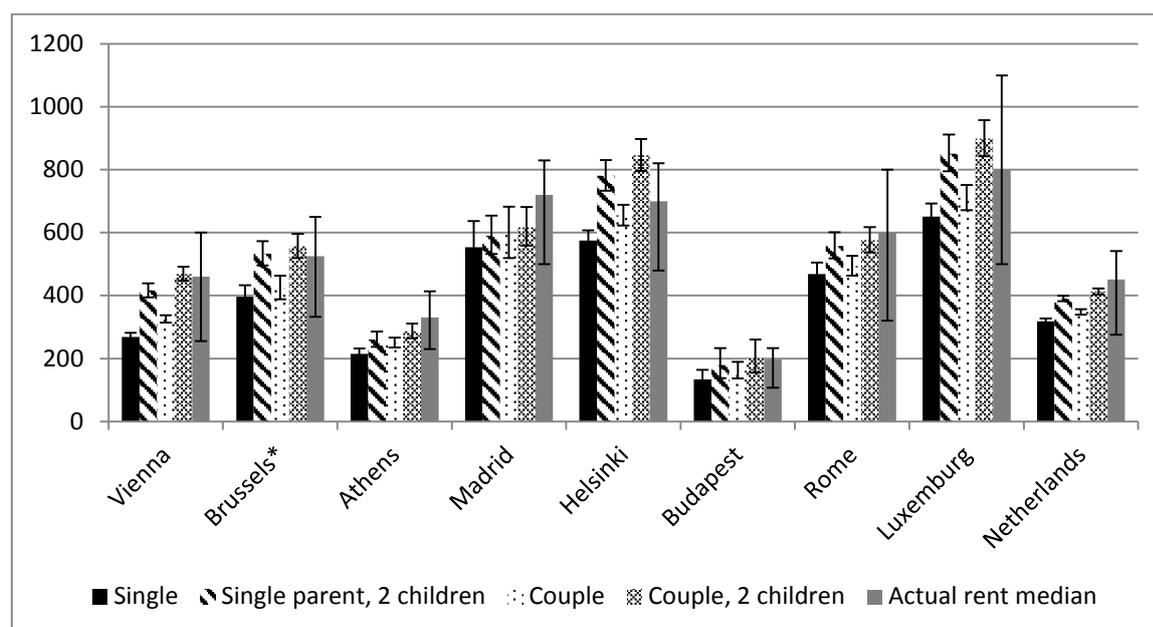
<sup>4</sup> This of course reduced the number of observations for the regressions. We could also have included these criteria in the regressions as independent variables. However, a sensitivity analysis showed that this led to larger standard errors for the estimates of reference rents, presumably because the exclusion of these cases also reduced the (unexplained) variation in observed rents.



Netherlands, all reference rents are below the median rent, in most other capital regions, the median rent is above the reference rent for childless singles and couples, but below that for families with children. Nearly everywhere reference rents are within the interval bounded by the 10<sup>th</sup> and 75<sup>th</sup> percentile of actual rents of dwellings, which suggests that these rents are not unrealistic. However, the distribution of rents refers to all rented dwellings, not to those that are offered on the market at any moment in time. In addition, we assume that the contract has been running for six years. So for a particular family looking for a space to live, it may be difficult to find an adequate dwelling at the reference rent.

There are important differences between capital regions in the degree to which rents increase with the needs of the reference household in terms of size and number of rooms. In Vienna, the implicit “rent equivalence scale” is relatively steep, as the reference rent for a couple with two children is 69% higher than for a single person. By contrast, in Rome and Madrid reference rents do not vary much by reference household type. These differences are largely explained by the elasticity of rent with respect to size in square meters, which is quite high in Austria, and low in Italy and Spain, and presumably reflects the housing markets in those countries.

**Figure 1: Reference rents in private sector, compared with actual rents**



Notes: for reference rents, error bars indicate 95 % confidence interval; for the actual rent, the bottom error bar shows the 10<sup>th</sup> percentile and the top bar the 75<sup>th</sup> percentile. Actual rents of dwellings satisfying the quality selection criteria only.

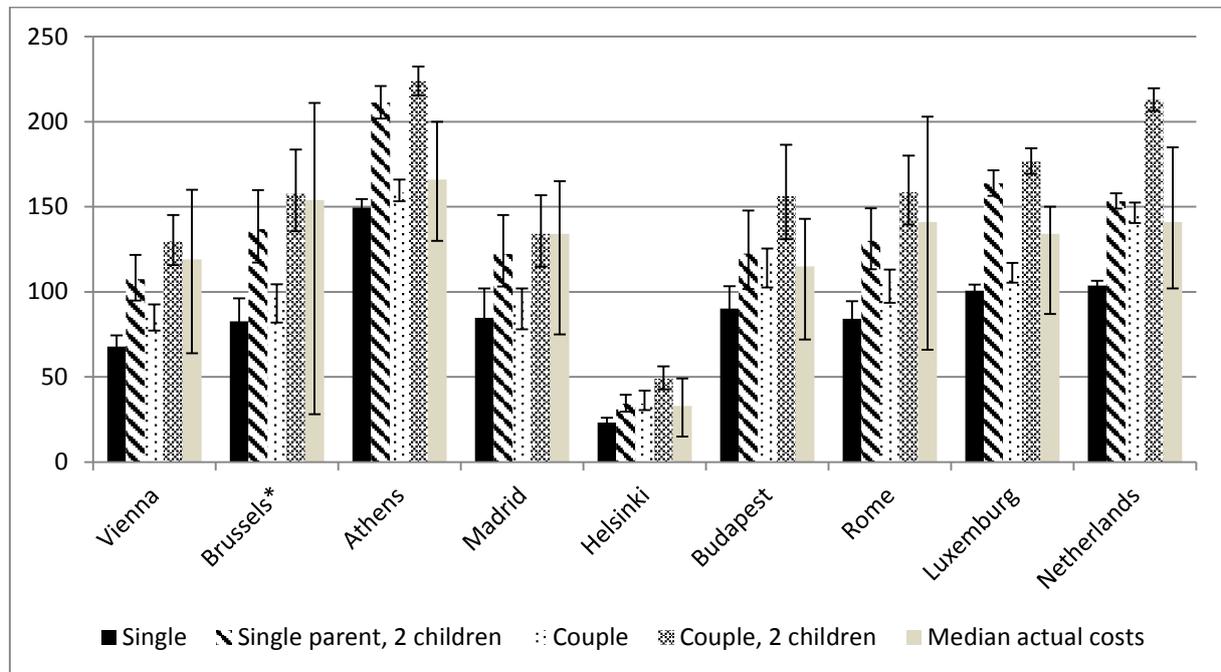
Source: EU-SILC 2012, authors’s calculations.

Other housing costs refer to monthly costs connected with the household’s right to live in the accommodation, other than the rent itself. The costs of utilities represent the biggest parts of these costs, but taxes on housing, insurance, maintenance and repairs are also included, when they are paid by the tenant. Figure 2 shows that generally, reference amounts for housing costs other than rent are within the actual distribution of these costs. It is striking that these amounts vary much less across cities and countries than reference rents. Perhaps surprisingly, reference amounts (at the 30<sup>th</sup> percentile) for tenants are highest in Athens; the same is true



for actual costs, though to a lesser extent. Reference costs other than rent for tenants are quite low in Helsinki, as are actual costs. This is due to the fact that heating costs are often included in the rent, which is relatively high in that capital.

**Figure 2: Reference housing costs other than rent for tenants, compared with actual costs**



Notes: for reference rents, error bars indicate 95 % confidence interval; for the actual rent, the bottom error bar shows the 10<sup>th</sup> percentile and the top bar the 75<sup>th</sup> percentile. Actual rents of dwellings satisfying the quality selection criteria only.

Source: EU-SILC 2012, author's calculations.

## Conclusion

As part of a pilot project for developing a common methodology for reference budgets in the European Union, reference housing costs in the private renting sector corresponding to adequate dwellings for four hypothetical households were determined for ten capital regions of the EU. Reference budgets aim to define the income level that a hypothetical household should have in order to participate adequately in society. Quality criteria for adequate housing were derived from the EU indicators of housing deprivation, the recent UK Housing Standards Review, as well as common sense. We used data from the Study of Income and Living Conditions (EU-SILC) of 2012, which included a special module on housing. Unsurprisingly, the estimates of reference rents for adequate dwellings vary strongly across capitals, reflecting cross-national differences in the level of the average rent. By contrast, other housing costs, which mainly reflect energy costs, vary much less across the capitals studied.

Obviously, estimates of reference housing costs are essential when constructing reference budgets which show the costs of adequate social participation, as housing accounts for a large



share of household expenditures. We refer to the literature on reference budgets (e.g. Bradshaw, 1993; Goedemé, Storms, Penne and Van den Bosch, 2015; Storms et al., 2014) for discussions of the uses and relevance of reference budgets. Using representative survey data when calculating reference housing costs may enhance the validity of the estimates. Reference housing costs may also be of relevance for the development of indicators of housing deprivation, and for housing research generally. For instance, they might complement the current indicators on the housing costs overburden rate (which does not take into account whether housing is of adequate quality), and housing deprivation (which ignores the costs of adequate housing). Clearly, further work has to be done to explore this potential.

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