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Income Concept.  
Estimates and  
Distribution Effects  
for Belgium**

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# **The Inclusion of Non-cash Housing Advantages in the Income Concept. Estimates and Distribution Effects for Belgium<sup>1</sup>**

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## **ABSTRACT**

As pointed out by the Expert Group on Household Income Statistics (Canberra Group, 2001), the way in which is dealt with the income value of home ownership is crucial for distribution analyses. Home-ownership can have a large impact on a household's expenditure structure. Because of the large proportion of home-owners in Belgium, a serious attempt to estimate the economic well-being of households should take the non-cash advantage derived of home-ownership, the so-called 'imputed rent' into account. Also tenants who benefit from below-market rent or rent-free accommodation can be considered as beneficiaries of imputed rent. In this paper we explore different techniques to estimate imputed rent for Belgium, based on the methodology presented by Frick & Grabka (2003). We apply two methods for estimating imputed rent, namely 1) the self-assessment approach, and 2) the opportunity cost approach. Calculations are performed on the micro-data of the Belgian EU-SILC of the survey year 2004 (with income data referring to 2003). These estimates allow us to assess the distribution effect of including imputed rent in the income concept.

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## 1. Introduction

The focus of Belgian housing policy over the past decades has been more on home acquisition than on the provision of social housing. As a result, a large majority of Belgian households live in their own property (around 70%), while only a small percentage lives in a social rented home (less than 10%). Home-ownership has a large impact on a household's expenditure structure. Firstly, mortgage-free owner-occupiers are much better off than renters with comparable cash incomes. Secondly, the impact of mortgage payments can lower a household's disposable income considerably. Because of the large proportion of home-owners in Belgium, a serious attempt to estimate the economic well-being of households should take the non-cash advantage derived from home-ownership, the so-called 'imputed rent' (IR), into account. Also tenants who benefit from below-market rent or rent-free accommodation can be considered as beneficiaries of IR. As pointed out by the Canberra Group (2001), the way in which is dealt with the income value of home ownership is crucial for distribution analyses. Empirical evidence shows that inequality is reduced when a value for imputed rent is included in the income concept (see e.g. Smeeding et al., 1993; Cantillon & Meulemans, 1993; Frick & Grabka, 2003; Frick et al., 2006). The method used to estimate a value for imputed rent has an impact on the results and requires careful consideration.

This paper provides an estimate of the monetary value of IR in Belgium for home-owners and tenants who benefit from below-market or free rents. We explore different techniques to account for housing costs that are applicable on the data of the 2004 wave of the Survey of Income and Living Conditions (SILC). We use the so-called self-assessment approach and the opportunity cost approach to provide estimates of IR. These estimates are used to calculate the effects on inequality and poverty of incorporating IR in the income concept. Our paper is structured as follows. After the introduction, we present a short overview of federal and regional housing policies in Belgium, as well as the current situation on the housing market. Next, we briefly discuss the data and the methods used to estimate IR. The following section deals with the distribution effects of including IR in the income concept. We present our results using a range of inequality and poverty indicators. The last section concludes and tries to formulate some policy insights and recommendations.

## 2. The housing market and housing policy instruments in Belgium

### 2.1. The housing market

Ever since the Second World War, efforts to support families in the acquisition of a private dwelling have been the core of Belgian housing policies. This resulted in a housing market where owner-occupied dwellings are dominant. About 68% of Belgian households live in a private home they own (European Commission 2003). The impact of social housing on the total market remains limited: only 5.7% of households are renters of social housing, which is below the European average. The remaining part of the housing market, about 26%, is a private rental market, which provides accommodation for many low-income households.

Table 1. Tenure status of households in Belgium, 2001.

	Belgium	Flanders	Walloon Region	Brussels Capital Region
Number of dwellings (*)	3,872,563 (100%)	2,244,512 (100%)	1,252,321 (100%)	375,730 (100%)
- owner occupation	2,715,228 (70.1%)	1,668,886 (74.4%)	883,328 (70.5%)	163,014 (43.4%)
- renting	1,157,335 (29.9%)	575,626 (25.6%)	368,993 (29.5%)	212,716 (56.6%)
Social renting (2004)**)	273,000 (7%)	135,000 (6%)	38,000 (9.5%)	100,000 (8%)

(\*) based on National Institute of Statistics (Census 2001)

(\*\*) approximate figures, derived from various regional sources

Source: De Decker (2006).

Information from the Census for 2001 and a housing survey for 2005 (Heylen e.a. 2007) gives a similar picture as the commission's ECHP-based figures (see Table 1). The census reveals significant regional differences in tenure structure. Owner occupation is most frequent in Flanders (74%), against only 43% in Brussels. The Walloon Region is similar to Flanders with 70% owner occupiers. Regional differences in social renting are much smaller, despite large differences in the size of the rental market. The Walloon Region has the largest proportion of social renters (9%). In Brussels, where the rental market accounts for the shelter of more than half of all households, only 8% of households are social renters.

During the last decade, prices on the Belgian housing market witnessed a boom comparable to what happened in most other European countries. The average house price doubled from 1995 to 2005. As Belgians are said to have a "brick in the stomach", this caused concern regarding access to home ownership. Up to the mid-nineties, most research pointed out that

low income groups are facing increased difficulty in property acquisition (e.g. Meulemans et al., 1996).

## **2.2. Housing policy**

Housing policy is a mixture of federal, regional and local policies. The federal level provides important tax advantages for home ownership. Following state reforms in the eighties, part of housing policy has become a responsibility of the regions. Consequently, Brussels, Flanders and the Walloon Region each have their own housing policies. Although the support of home acquisition remains the dominant policy track, the regions are increasingly investing in the provision of social rent housing (see e.g. Vlaams Minister van Binnenlands Bestuur, Stedenbeleid, Wonen en Inburgering (2004)).

### **2.2.1. Promotion of home-ownership through the tax system<sup>2</sup>**

From 2005 onwards, the tax treatment of the dwelling one owns has changed considerably. Before 2005 'cadastral income' was part of taxable income. 'Cadastral income' (CI) is the average normal net income that real estate provides to its owner. This corresponds to an estimation of the average normal net rent value of the property for one year (at the reference time, which is 1 January 1975). CI is subject to annual *indexing* (the index for tax year 2004 is 1.3391). There were 4 possibilities of tax relief an owner could apply for:

- (a) The *normal interest deduction*: interest payments on mortgages for purchasing or renovating a home can be deducted from income from real estate, if the loan has a term of at least 10 years. This deduction cannot exceed CI.
- (b) The *dwelling allowance*: part of CI is exempt from taxes, which is known as the dwelling allowance. This amount is increased for each dependent person (incl. spouses), for disabled heads or partner, and for widow(er)s with dependent children. Depending on the level of the taxable income, owner-occupiers can be entitled to a so-called

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<sup>2</sup> Apart from the tax treatment in the federal tax system, regional and local taxes also play a role in housing policy in the form of the *withholding tax on property income* (WTPI). It is calculated on the basis of the CI net of interest payments. It has three components: a regional, a provincial (= surcharge on the regional WTPI) and a municipal (= surcharge on the regional WTPI), and can be considered as an extra tax on the dwelling. Moreover, transaction costs for purchasing a house are considerable in Belgium (even among the highest in Europe) due to registration rights, which belong to regional competences (Catte et al., 2004). Transaction costs are the lowest in Flanders (amounting 10% of the house price, 5% for small houses), plus 1-2% additional transaction costs regardless the region of purchase.

additional dwelling allowance. The deductible amount of both the dwelling and the additional dwelling allowance may not exceed income from real estate.

- (c) The *additional interest deduction*: the interest that remains after the normal deduction of interest may likewise be deducted from total income on condition that the mortgage was raised in order to build, purchase or renovate a home in Belgium, and that the loan was contracted after 30 April 1986 for a term of at least 10 years. This additional interest deduction is restricted in function of the number of years that the rental value income of the real property in question has been included in the taxable income. For the first five taxable years, the deduction amounts to 80%, and for the next seven years it diminishes by 10% yearly, ending with a deduction of 10% in the seventh year.
- (d) The *tax credit for capital redemption payments*: the capital redemption for a mortgage loan with a term of at least 10 years entitles an owner-occupier to an extra tax reduction (in the form of a tax credit). This reduction is calculated on a maximum limit of the initial loan, which is comparable to that applied for the additional interest reduction

For mortgage loans that started before 2005, measures (a), (c) and (d) still apply.

From 2005 onwards, the dwelling allowance has been abolished, and the CI of the only self-occupied dwelling has become tax exempt in the personal income tax system. For owners with a mortgage loan that is contracted after 1 January 2005, the three other tax advantages (interest deduction, additional interest deduction, tax credit for capital redemption payments) have been replaced by the so-called 'dwelling bonus', which is only applicable for mortgages contracted for the own, self-occupied and only dwelling and that have a term of at least 10 years. When these conditions are fulfilled, the tax payer can deduct each year a basic amount of 1,500 Euro from his taxable income (indexed to 1,950 Euro for tax year 2007). The tax advantage is thus applied at the marginal tax rate. This basic amount can be increased with (a) 500 Euro (650 for 2007) during the first 10 years of the term of the mortgage and with (b) 50 Euro (70 Euro for 2007) when there are three or more children in the household.

### **2.2.2. Social housing policies**

Social housing policies are entirely part of regional competences. The differences between regions relate to generosity and eligibility criteria. Local authorities have considerable freedom in the implementation of regional regulations, and hence differentiation stems mainly from local policies. To stimulate ownership, social loans are available from local government institutions and municipal social renting organizations.

Conditions vary but, depending on the target group, relate mainly to income, number of children and value of the purchased dwelling.

Rental subsidies are virtually non-existent. In Flanders, a small system of rental subsidies exists for emergency cases; in practice, this belongs rather to welfare than to general housing policies. This subsidy is means tested and only applies to occupants of 'unhealthy' homes, renters who are forced out of their home in so-called 'housing emergency areas' or homeless people.

### **3. Data**

#### ***3.1. The dataset: SILC-Belgium***

The **Belgian EU-SILC of the survey year 2004** (with income data referring to 2003) provides the micro data (Federale Overheidsdienst Economie, 2006). We have used the Belgian dataset, which apart from the variables provided to EUROSTAT also contains extra information on some crucial variables (e.g. more details on housing costs, cf. infra). The Belgian SILC-2004 has 5,275 households and 12,971 individuals. For the distribution analysis households with a negative or zero household income were excluded, leaving us with 5,248 households and 12,930 individuals.

The data allow us to distinguish households who own their home outright and those who are paying off a mortgage. Among tenants we can distinguish three categories: 1) tenants at the private, non-subsidized market, 2) tenants who rent at a reduced rate, and 3) those who rent for free. For tenants with reduced rent the data do not allow to differentiate between beneficiaries from social housing and those whose reduced rent is granted by their landlord (employer, local authorities, relatives etc.).

Table 2 presents tenure status of households and individuals. In line with other sources (cf. supra), the SILC-data show a high share of home owners: about two thirds of all households live in an owner-occupied house, which corresponds to 72% of all individuals. Somewhat less than half of these own outright, whereas a majority of owners has an outstanding mortgage. Around a quarter of households (and 22% of the population) lives in a dwelling that is rented in the private non-subsidized market. Consequently, the share of tenants at reduced rate or rent-free is very small in Belgium (around 5% resp. 2%).

Table 2. Tenure status in the Belgian SILC, 2003.

	% of households	% of individuals living in a household of ...	N (=number of unweighted individuals)
Owners	66.5%	72.3%	9,236
- owner outright	37.5%	33.9%	4,205
- owner with mortgage	29.0%	38.4%	5,031
Renters	33.5%	17.7%	3,689
- private market	26.5%	21.6%	2,878
- reduced rent	5.2%	4.5%	596
- rent-free	1.8%	1.6%	215

Source: own calculations on SILC-Belgium 2004.

Table 3 presents some basic socio-demographic indicators for the different categories of tenure status. Outright owners and rent-free tenants are significantly older than owners on mortgage and tenants on the private market. This is also reflected in the average duration of occupancy to date: outright owners occupy their house on average for 25 years, whereas for tenants on the private market this is only 6 years. According to household type, outright owners are dominant among elder singles and couples. Owners on mortgage, on the contrary, are very prominent among couples with dependent children. Tenants on the private market and reduced-rent tenants are mainly singles or couples younger than 65 (without children) and lone parents.

Table 3. Socio-demographic characteristics per tenure status, Belgium 2003.

	Outright owners	Owners on mortgage	Tenants - private market	Tenants - reduced rent	Tenants rent-free	Total
<b>Age reference person</b>						
below 25	15.6	41.1	30.1	32.4	23.2	29.4
25-64	48.1	57.9	57.1	48.9	54.8	54.0
65+	36.3	1.0	12.8	18.7	22.0	16.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>Occupancy in years (avg.)</b>						
	25.5	9.9	6.0	9.4	15.0	14.2
<b>Type of household</b>						
Single persons / couples (65+)	33.7	0.7	12.8	18.4	17.1	15.5
Single persons / couples (none 65+)	21.0	16.3	36.4	27.4	23.8	22.8
Couple with children up to 18	16.7	63.7	25.7	33.2	30.4	37.7
Mono-parental household	1.8	4.5	12.4	14.6	(4.9)*	5.8
Other	26.9	14.8	12.6	6.4	23.9	18.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

\* less than 20 individuals

Source: own calculations on SILC-Belgium 2004.



### **3.2. Data on housing costs in SILC-Belgium**

In order to derive *net* IR, we need information on housing costs. The variable 'Total housing cost' includes monthly costs connected with the household's right to live in the accommodation. According to the EUROSTAT-instructions for the construction of the EU-SILC variables, this variable should include:

- for owners: mortgage interest payments, structural insurance, mandatory services and charges (sewage removal, refuse removal etc.), regular maintenance and repairs, taxes, cost of utilities (water, electricity, gas and heating);
- for tenants at market price: rent payments (including housing benefits), structural insurance (if paid for), mandatory services and charges (sewage removal, refuse removal etc.), regular maintenance and repairs, taxes (if paid for the tenants), cost of utilities (water, electricity, gas and heating);
- for tenants at reduced price or rent free: imputed rent (including housing benefits), structural insurance (if paid for), mandatory services and charges (sewage removal, refuse removal etc.)(if paid for), taxes on dwelling (if applicable), regular maintenance and repairs, cost of utilities (water, electricity, gas and heating).

Using the country-specific variables in the dataset, we split this 'Total housing cost' into four different categories:

- rent payments;
- operating costs;
- maintenance costs/depreciation and property taxes;
- interest on outstanding mortgages.

*Rent payments* are included in the variable 'Current rent related to occupied dwelling', which asks respondents to give the rent without costs. On average a household pays 410 Euro per month for renting a dwelling on the private market. For reduced-rent tenants, this amount is substantially lower (see Table 4). SILC- Belgium provides a variable that includes payments for water, electricity, gas, fuel oil, coal, wood, maintenance of common space or lift; these various components cannot be distinguished, and as most components refer to *operating costs*, we have labeled this variable as such. Another Belgium-specific variable includes payments for insurance, refuse removal, maintenance, waste water taxes, withholding tax on real estate, and other costs (asked for tenants only); we have labeled this variable '*Maintenance costs and taxes*' (though some of the cost would probably be more in place in the category of operating costs, but unfortunately also here no distinction can be made between the various components; this also explains why this variable is not confined to owners only, see Table 4). Frick et al. (2007) propose to use for Germany 1.60 Euro per m<sup>2</sup> for the total of operating and maintenance costs, but as we have no information on the surface of the dwelling, we do not know how close the amounts in the SILC-data are to these estimates. *Interest repayments on mortgage* of owners have been

calculated by the national data provider on the basis of the survey data, following EUROSTAT instructions (Federale Overheidsdienst Economie – Algemene Directie Statistiek en Economische Informatie 2006). These are, however, gross interest payments and not net (i.e. after taking account of tax deductions). At present, net interest payments are not available. Unfortunately, they cannot be calculated due to lack of information on cadastral income in SILC-2004. Consequently, for this group housing costs will suffer from a certain degree of overestimation.

Table 4. Housing costs per month per household according to tenure status, 2003.

	Rent payments	Operating costs	Maintenance costs & taxes	Interest repayments	Total housing cost
Owners	-	162	126	97	385
- <i>owner outright</i>	-	158	123	-	281
- <i>owner with mortgage</i>	-	169	129	222	520
Tenants	381	82	36	-	500
- <i>tenants (private market)</i>	404	103	46	-	553
- <i>reduced rent</i>	263	-	-	-	263
- <i>rent-free</i>	-	-	-	-	-

Source: own calculations on SILC-Belgium 2004.

#### 4. Methods to calculate net imputed rent<sup>3</sup>

Three groups of potential beneficiaries of IR can be identified, namely owner-occupiers, rent-free tenants and tenants with below-market rent. For a general description of the various approaches to calculate IR on the basis of micro data, we refer to Frick & Grabka (2003), Frick et al. (2006) and Frick et al. (2007). They propose three methods: 1) the opportunity cost approach; 2) the capital market approach; and 3) the self-assessment approach. From these methods we were able to apply two for Belgium on the basis of the data of SILC 2004, namely the opportunity cost (OC) and the self-assessment (SA) approach. We could not use the capital market approach due to lack of information on the market value of the owner-occupied dwelling. As we have seen, CI is used for tax purposes as an estimation of the normal net rent value of a property for one year. Hence, it can also be considered as an indicator for IR. CI in Belgium is, however, not a good measure for IR as it systematically underestimates the rental value of the property: normally there should be a 'perequation' (i.e. a general re-estimation) of CI every 10 years, but this has not been done since the seventies. Nevertheless, it would be

<sup>3</sup> We are very grateful to Markus Grabka and Karel Van den Bosch for useful comments and help when applying the various methods.

interesting to compare the estimates of IR calculated in this paper with current CI, in order to have an idea of the extent of this underestimation. Unfortunately, this is not possible as the value of the CI is not asked in SILC-2004.

#### **4.1. The self-assessment approach**

In the SA approach respondents are asked to make an assessment of the rental value of their home. In SILC 2004 the following question is asked to owners and rent-free tenants: "Can you make an estimate of the monthly rent you would have to pay for your dwelling if you would have to rent it?"<sup>4</sup>. The SA approach is only applicable to owners and rent-free tenants, as the question is not asked to reduced-rent tenants. The response on this question is reasonably good. Of all 'eligible' households (3,572), only 73 report a missing value (42 outright owners; 22 owners with mortgage; 7 rent-free tenants; 2 missing on tenure status). The amount answered on the self-assessment question is taken to be the value for IR. From this amount owner specific costs (i.e. maintenance costs, taxes and interest payments) are deducted in order to arrive at net IR. Negative IR amounts were put to zero. Table 6 presents (monthly) IR for the different tenure status categories for which this method is applied.

#### **4.2. The opportunity cost approach**

The OC approach estimates the opportunity cost of housing in a non-subsidized rental market (see Frick & Grabka, 2003). To apply this approach to Belgium we rely on a hedonic regression estimation of the logarithm of rent (excluding all costs) actually paid by main tenants on the private housing market (so excluding social housing and any reduced rent payments). We apply a two-step Heckmann procedure to predict the logarithm of rent:

- step 1: running a semi-logarithmic regression model with  $\log(\text{rent})$  as dependent variable based on the population of tenants in the private market. The covariates used refer to type and size of the dwelling, quality of dwelling and neighbourhood, occupancy in years, geographical location (region and degree of urbanization) and household income (see Table 5). Most of the independent variables

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<sup>4</sup> It is not entirely clear whether this monthly rent refers to net or gross amounts (before or after deduction of housing costs). In the question asked to renters, the amount asked however is 'net' i.e. excluding all costs. Consequently, we assume that the same applies to self-assessed rent.

were recoded into dummy variables. A Heckman selection correction is applied to correct for potential selectivity into the owner status.

- Step 2: application of the resulting coefficients to otherwise similar owner-occupiers as well as rent-free and reduced-rent tenants.

After these two steps a randomly chosen error term from the true distribution of tenants on the private housing market is added in order to maintain variation in the resulting estimates of IR. We end up with an annual measure of IR by taking the antilog of the estimated monthly fictitious rent and by multiplying it by 12. In order to obtain net IR we deduct maintenance costs and taxes for all owner occupiers and interest payments for owners with interest payments on mortgage. Negative IR is put to zero.

Table 5. Covariates used in the two-step Heckmann estimation (opportunity cost approach), Belgium 2003.

Variable	Mean	Std. Dev.	Code
Detached house	.322501	.4674779	No=0; yes=1
Semi-detached house	.40897	.4916904	No=0; yes=1
Appartment/flat in building with <10 dwellings	.1860509	.3891847	No=0; yes=1
Appartment/flat in building with =10 dwellings	.0697453	.2547416	No=0; yes=1
1 room in house	.0197643	.1392027	No=0; yes=1
2 rooms	.0520715	.2221923	No=0; yes=1
3 rooms	.1263778	.3323062	No=0; yes=1
4 rooms	.2166477	.4119996	No=0; yes=1
5 rooms	.2253896	.4178783	No=0; yes=1
6 or more rooms	.359179	.4798054	No=0; yes=1
Moisture free?	.1415811	.3486532	yes=0; no=1
Possible to keep home adequately warm?	.0716458	.257925	yes=0; no=1
Modern comfort present? (bath / shower / indoor flushing toilet / hot current water)	.0414291	.1992995	No=0; yes=1
Dwelling too dark?	.1176359	.3222071	yes=0; no=1
Central heating?	.1940327	.3954918	yes=0; no=1
Noise from neighbours / street?	.254466	.435602	No=0; yes=1
Pollution, grime or other environmental problem?	.1685671	.3744047	No=0; yes=1
Crime, violence or vandalism in the area?	.2067655	.4050243	No=0; yes=1
Difficult to reach?	.2004941	.4004082	No=0; yes=1
Dirty neighbourhood?	.163626	.369971	No=0; yes=1
Brussels capital region	.1377803	.344702	No=0; yes=1
Flanders - Densely populated area	.2869631	.4523872	No=0; yes=1
Flanders - Intermediate area	.2356518	.4244459	No=0; yes=1
Walloon Region - Densely populated area	.1351197	.3418839	No=0; yes=1
Walloon Region - Intermediate area	.154504	.3614655	No=0; yes=1
Walloon Region - Thinly populated area	.049981	.2179264	No=0; yes=1
Occupancy in years	15.13322	14.25832	Continuous
Household disposable income	27024.54	18469.11	Continuous

Source: Own calculations on the basis of SILC-Belgium 2004.

### 4.3. Comparison of both approaches

According to the OC approach IR is on average much lower than with the SA approach (see Table 6). Apparently, there is a discrepancy between the assessment of owners of the rental value of their home and the IR based on prevailing private market rents. The correlation between the two measures of net IR is, though statistically significant, not very high with 0.2502 (calculated over owners and rent-free tenants only).

Table 6. Average amount of imputed rent (IR) per month per household according to the self assessment (SA) and the opportunity cost (OC) approach, Belgium 2003.

	IR before deduction of costs		Net IR (*)	
	SA	OC	SA	OC
Owners outright	660	330	530	220
Owners with mortgage	720	480	380	170
Tenants reduced rent	-	370	-	120
Tenants rent-free	540	360	540	360

(\*) Negative net IR is set to zero. Hence, average net IR will not match exactly gross IR minus costs.

Source: own calculations on SILC-Belgium 2004.

As there is no other benchmark against which we can evaluate the value of IR, it is difficult to say which method is preferable. Table 7 shows that the discrepancy between the two methods is stronger among owners, especially outright owners, in Brussels, and in households where the reference person is older than 65+ and/or has a degree of higher education. The SA approach yields apparently higher estimates of IR among lower incomes in the case of owners. For years of occupancy, the discrepancy increases with time, though owners on mortgage clearly do not follow this pattern.

Table 7. Ratio of average amount of net imputed rent according to the self-assessment approach and according to the opportunity cost approach, Belgium 2003.

	Owners and rent-free tenants	Owners outright	Owners with mortgage	Rent-free tenants
<b>All</b>	2.25	2.41	2.15	1.37
<b>Per region</b>				
- Brussels capital region	3.07	3.26	3.16	1.60
- Flanders	2.15	2.33	2.01	1.15
- Walloon region	2.26	2.35	2.25	1.49
<b>Occupancy in years</b>				
<1	1.66	1.52	3.94	1.55
1-9	1.92	1.62	2.10	1.14
10 - 19	2.14	2.20	2.12	1.42
20- 29	2.28	2.23	2.57	1.85
30+	3.55	3.64	1.85	1.95
<b>Age reference person</b>				
-65	2.10	2.11	2.15	1.32
65+	3.09	3.17	3.28	1.59
<b>Education level ref. person</b>				
- less than higher educ.	2.11	2.29	1.96	1.25
- higher education	2.54	2.73	2.45	1.70
<b>Income quintile</b>				
bottom	2.64	3.01	2.38	1.14
2	2.43	2.60	2.23	1.68
3	2.32	2.50	2.22	1.47
4	2.11	2.18	2.08	1.46
top	2.07	2.07	2.10	1.28

Source: own calculations on SILC-Belgium 2004.

One can think of various reasons why the OC approach yields substantially lower amounts than the SA approach. Even though we try to correct for selection bias in the OC approach, it is not sure that we capture this entirely due to the fact that there are fewer high-rent observations among tenants. This may result in a degree of underestimation of IR according to the OC approach, also after correction for selection bias. But there are also indications that the SA approach overestimates the rental value of the own property: the discrepancy is e.g. highest among outright owners who have a longer occupancy, or among older households, and are thus probably less aware of current market prices. There is less agreement to what extent owners overrate their home. Venti & Wise (2004), who have studied home equity for two decades, conclude that the difference between the self-assessed value and an econometrically estimated value is substantial. There are indications that the overestimation of home value differs for socio-economic characteristics of owners, as well as house characteristics (Kain & Quigley 1972). An overview of (American) literature by Kiel & Zabel (1999) shows that overestimation can be large in specific surveys, but is on overall within reasonable boundaries (8.4%

overestimation on average). This can partially be explained by the so-called endowment effect, which was formulated by Thaler (1980) in the field of financial economics and which states that people value a good more when it is their property.

## **5. Results**

We now present the impact on income inequality of including net IR in the income concept. As explained above, we use two methods for measuring IR, namely the SA approach and the OC approach. We present results for owners and tenants separately. Owners are further divided into those who own outright and those who still have a mortgage burden; tenants are further divided into private market tenants, reduced-rent tenants and rent-free tenants (with of course no IR measure for private market tenants)<sup>5</sup>. Results for rent-free tenants are more of an indicative nature, as the number of cases is relatively small.

Baseline income is household disposable income on a yearly basis. The income advantage of IR, using the two approaches, is compared to the baseline in both absolute and relative terms. Both disposable income and the income advantage from IR are equivalised in order to take account of family size and composition. The equivalence scale used is the modified OECD-scale, which attributes a value 1 to the first adult, 0.5 to each other adult and 0.3 to each child.

### ***5.1. Housing tenure and imputed rent***

In Table 8 we present the proportion of individuals living in a household with a positive IR-measure. For the entire population this amounts to 63.4% according to the OC approach and to 68.7% according to the SA approach. The share of IR-beneficiaries is very high among owner-occupiers (SA: 81.2%, OC: 93%), and especially among those who own outright (SA: 90.9%, OC: 96.2%). For owners with a mortgage the share is much lower according to the OC approach (72.7%): for almost one third housing costs outweigh the benefit of IR, mainly because of outstanding mortgage interest payments. According to the OC approach, 16.8% of all tenants enjoy a positive IR, which can be attributed to rent-free tenants (100%) and to a lesser extent to reduced rent tenants (68.2%); this indicates that even though rents are at a reduced rate, the rent payments outweigh net IR for 31.8% of the individuals in this group. With the SA

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<sup>5</sup> Results for subgroups of rent-free tenants are rather of an indicative nature, as the number of cases is relatively small (cfr. Table 2).

approach however we only have a value for rent-free tenants, as the question was not asked to rent-reduced tenants.

Table 8. Housing tenure and income advantages from IR (opportunity cost approach (OC) and self-assessment approach (SA)) by tenure status, Belgium 2003.

Tenure status	Share with IR>0 according to OC	Share with IR>0 according to SA
Owner occupiers	81.2	93.0
<i>outright owner</i>	90.9	96.2
<i>with outstanding mortgage</i>	72.7	90.2
Tenants	16.8	5.2
<i>in private market (non-subsidized)</i>	0.0	0.0
<i>rent-reduced</i>	68.2	0.0
<i>rent-free</i>	100	32.2
Total	63.4	68.7

Source: own calculations on SILC-Belgium 2004.

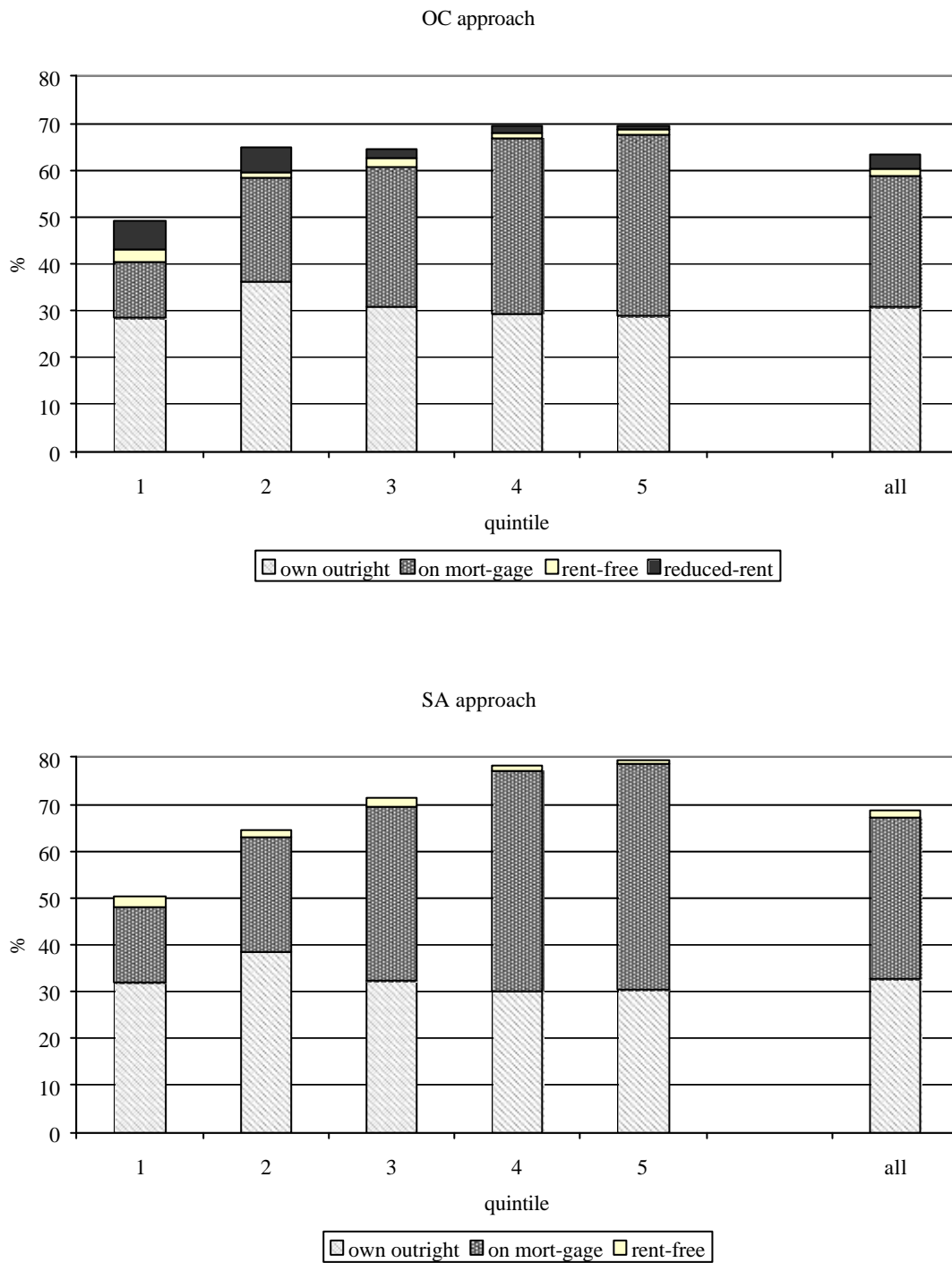
## **5.2. Population share of beneficiaries**

The share of beneficiaries (OC approach) increases with income level: in the bottom quintile 49.1% of individuals benefits from IR against 69.4% in the top quintile (see Figure 1).

The increase is most pronounced for owners on mortgage; for owners outright the share is almost stable around 30% (with a somewhat higher share in the second quintile). For tenants a reverse pattern can be distinguished: beneficiaries (both for rent-free and reduced-rent tenants) make up a higher share in the bottom quintile than in the top quintile. The pattern is similar when using the self-assessment approach. In general the share of beneficiaries is somewhat higher with the self-assessment approach than with the opportunity cost approach, which is striking as no IR could be calculated in the self-assessment approach for reduced-rent tenants.



Figure 1. Share of beneficiaries per quintile and per tenure status according to opportunity cost (OC) and self-assessment (SA) approach, Belgium 2003.



Source: own calculations on SILC-Belgium 2004.

### **5.3. Income advantages from imputed rent**

Average income advantages from IR per quintile and per tenure status are presented in Table 9. The upper part of the table shows that the average amount of imputed rent increases with income. This illustrates that richer people, tend to live in dwellings of greater value. This is the case both for home-owners and tenants.

The income share per quintile is hardly affected by the inclusion of IR in the income concept, and this is the case for both the self-assessment and the opportunity cost approach. Given the wide spread of IR beneficiaries over the cash income distribution (cf. supra), this result is not surprising. However, this does not mean that including IR will not affect the income distribution. As is shown in the lower part of Table 9 relative income increases in disposable income are not negligible: with the opportunity cost approach disposable income increases on average with 6%, and according to the self-assessment approach even with almost 13%. Income increases are more important at the bottom of the income distribution: 8.7% for the opportunity cost measure, and even 20.8% for the self-assessment approach in the bottom quintile, against only 4.9% and 10% respectively, in the top quintile. The proportion of IR in disposable income tends to decrease with income level for all groups, except for owners on mortgage. This indicates that, even though the amount of IR increases in general with income, it increases less steeply than cash disposable income. For owners on mortgage this is not the case, because housing costs, and more particularly the burden of interest payments, are relatively more heavy at the bottom of the income distribution.

Table 9. Income advantages from IR by tenure status, quintile distribution, Belgium 2003.

Baseline	Opportunity-cost-approach							Self-assessment-Approach					
	Total	Owner-occupiers			Tenants			Total	Owner-occupiers			Tenants	
	Total	own outright	on mortgage	Total	rent-free	reduced-rent	Total	own outright	on mortgage	Total	rent-free		
<b>Quintile</b>	<b>Income advantage from IR (beneficiaries only, equivalized amounts)</b>												
1 (bottom)	1307	1255	1338	1059	1552	2400	1203	3034	3018	3623	1831	3397	3397
2	1363	1330	1463	1111	1656	2420	1456	3157	3136	3703	2245	4145	4145
3	1479	1454	1636	1263	1859	2302	1436	3095	3083	4095	2206	3510	3510
4	1551	1531	1644	1442	2102	2903	1350	2834	2810	3567	2324	4420	4420
5 (top)	2072	2047	2285	1869	3034	3596	2379	3675	3652	4577	3074	6247	6247
All	1574	1556	1663	1438	1803	2597	1393	3172	3154	3902	2451	3999	3999
<b>Quintile</b>	<b>in %</b>	<b>Income Share</b>											
1 (bottom)	8.8	9.0	8.9	9.0	8.8	8.9	8.9	9.0	8.9	9.0	8.6	8.9	8.9
2	14.2	14.3	14.2	14.3	14.1	14.2	14.2	14.4	14.4	14.5	14.0	14.2	14.2
3	18.4	18.5	18.4	18.4	18.4	18.4	18.4	18.6	18.6	18.6	18.4	18.4	18.4
4	23.4	23.3	23.4	23.3	23.4	23.4	23.4	23.3	23.3	23.2	23.6	23.4	23.4
5 (top)	35.2	35.0	35.1	35.0	35.4	35.1	35.2	34.8	34.8	34.7	35.5	35.2	35.2
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Quintile</b>	<b>% Increase in disposable income</b>												
1 (bottom)	8.7	6.9	5.2	1.7	1.8	0.8	1.0	20.8	19.8	15.7	4.1	1.0	1.0
2	7.5	6.6	4.5	2.1	0.9	0.3	0.6	17.3	16.8	12.1	4.7	0.5	0.5
3	6.2	5.8	3.3	2.4	0.5	0.3	0.2	14.5	14.0	8.7	5.4	0.4	0.4
4	5.5	5.3	2.5	2.8	0.3	0.2	0.1	11.4	11.2	5.5	5.6	0.3	0.3
5 (top)	4.9	4.7	2.3	2.5	0.2	0.1	0.1	10.0	9.8	4.7	5.1	0.1	0.1
All	6.0	5.5	3.1	2.4	0.5	0.2	0.3	13.1	12.8	7.7	5.1	0.3	0.3

Source: own calculations on SILC-Belgium 2004.

#### **5.4. Effect on income inequality and poverty**

The effect of including IR in the income concept on income inequality and poverty is measured by calculating a series of commonly used inequality and poverty measures for both baseline income and baseline income plus IR. The inequality measures used are the Gini index; the Atkinson index for inequality aversion parameters 0.5 and 1.5; the mean log deviation (MLD); the half squared coefficient of variation (Half SCV); and three percentile ratios (90/10; 90/50 and 50/10). The poverty measures are those from the FGT family with parameters 0 (head count), 1 (normalized poverty gap) and 2 (average squared normalized poverty gap)(see Foster et al., 1984).

As can be expected from our analysis on the basis of quintile distributions, inclusion of IR in the income concept reduces inequality and poverty in general (see Table 10). The Gini coefficient decreases with 1.3% (opportunity cost measure), resp. 2.7% (self-assessment). Inequality indicators that are more sensitive to changes at the bottom of the distribution, namely the MLD and especially the Atkinson 1.5, report a markedly higher decrease in inequality (5.7% and 16.7% respectively with the OC approach and 8.1% and 18.2% respectively with the SA approach). The results of the poverty measures confirm these results: the decrease in poverty is strongest for FGT2, which attaches more weight to poverty than the other two poverty measures.

Inequality is reduced when including IR for outright owners and when including IR for tenants. The inequality reducing effect for tenants points into the direction that social housing may play a role here, but as we cannot distinguish reduced rent tenants in social housing from other categories, this results is only indicative. The strong effect for low-income sensitive measures (MLD, Atkinson 1.5, FGT2) is apparently to a very large extent due to IR for outright owners. This is probably due to the fact that these owners are mainly elderly, single individuals that are found relatively more at the bottom of the income distribution and that are important beneficiaries of IR. Including IR for owners on mortgage increases inequality; this is consistent with our previous finding that the share of IR increases with disposable income.

Table 10. Inequality and poverty indices by tenure status, Belgium 2003.

Inequality indices	Baseline	Proportional change in %												
		Total	Opportunity-cost-approach				Tenants			Self-assessment-Approach				
			Owner-occupiers		Tenants		rent-free	reduced-rent	Owner-occupiers		Tenants			
Total	own outright	on mortgage	Total	rent-free	reduced-rent	Total			own outright	on mortgage	Total	rent-free		
Gini	0.266	-1.3	-0.6	-1.2	0.9	-0.7	-0.2	-0.5	-2.7	-2.4	-3.0	2.1	-0.2	-0.2
Atkinson 0.5	0.060	-3.4	-1.8	-2.7	1.4	-1.4	-0.5	-0.9	-5.9	-5.3	-5.9	3.2	-0.4	-0.4
Atkinson 1.5	0.241	-16.7	-15.2	-15.9	1.2	-1.3	-0.5	-0.8	-18.2	-17.5	-18.1	2.5	-0.4	-0.4
MLD	0.134	-5.7	-3.9	-4.9	1.5	-1.6	-0.6	-1.0	-8.1	-7.3	-8.1	3.3	-0.5	-0.5
Half SCV	0.144	-3.3	-2.0	-2.1	0.6	-1.2	-0.4	-0.7	-8.0	-7.6	-6.7	1.4	-0.2	-0.2
DR: 90/10	3.361	-1.0	0.5	-0.9	2.1	-1.4	-0.7	-1.0	-0.9	-0.7	-2.1	3.6	-0.6	-0.6
DR: 90/50	1.724	0.1	-0.2	1.0	-0.3	-0.1	-0.2	-1.8	-1.6	-1.4	1.6	-0.2	-0.2	0.0
DR: 50/10	1.949	-0.9	0.4	-0.7	1.1	-1.1	-0.6	-0.7	0.9	0.9	-0.7	2.0	-0.4	-0.4
FGT0	0.154	-1.1	0.6	-1.1	1.9	-2.3	0.5	-1.6	0.2	0.4	-2.4	5.0	-0.9	-0.9
FGT1	0.042	-3.8	-0.7	-3.0	1.7	-2.5	-1.1	-1.4	-1.3	-0.3	-3.8	5.4	-0.9	-0.9
FGT2	0.019	-6.3	-2.4	-4.4	1.5	-3.1	-1.6	-1.5	-5.1	-3.5	-5.8	4.1	-1.4	-1.4

Source: own calculations on SILC-Belgium 2004.

## **5.5. Breakdowns for characteristics of the household**

Table 11 presents the increase in average income due to inclusion of IR (opportunity cost approach only, in order to limit the burden of tables; results with the SA-approach point in the same direction) broken down for household characteristics, as well as the decomposable MLD, which allows to distinguish within- and between-groups inequality. The household characteristics considered are: household type; educational level of the reference person; age of the household member; and housing tenure status. The highest increase in income is experienced by the elderly. This group is characterised by a relatively low education and a high share of singles and couples without children, hence explaining the higher income increase for these groups. According to tenure status we see that home-owners without mortgage and rent-free tenants experience the highest increase in disposable income (9.3% and even 17.9%, respectively). Inequality is most strongly reduced within these groups (e.g. 15% for outright owners; 29% for rent-free tenants; 13.2% for 65+ old individuals). Also reduced rent tenants experience a strong reduction in inequality within their group. Inclusion of IR increases inequality between owners and tenants, which is not surprising as the large majority of tenants cannot benefit from IR, and their income position is initially already weaker than that of owners. The increase of between-group inequality is smaller when we take the finer breakdown of tenure status, but still considerable with almost 20%. Consequently, the contribution of between-group inequality to total inequality amounts to 7.2% after inclusion of IR.

Decomposing the FGT-poverty measures for these characteristics yields results that are consistent with our findings for inequality (see Table 12). Poverty decreases mainly for the elderly and for home-owners who own outright. The poverty measures that are most sensitive to changes for the poor decrease the most (e.g. for outright owners FGT0 decreases with 14.5%, FGT1 with 21.4% and FGT with 26%). As the poverty line is variable, tenants on the private market (who do not benefit from IR) see a considerable increase in their poverty rates (around 16% for all three poverty measures).

Table 11. Inequality decomposition by household characteristics, Belgium 2003.

Characteristic of household or household head	Pop. share in %	% increase in mean eq. inc. Including IR	Mean Log Deviation (MLD)		% change in inequality	% contribution to aggregate inequality	
			Baseline	Including IR	Including IR	Baseline	Including IR
<b>Household type</b>							
Single persons / couples (65+)	15.5	8.4	0.1052	0.0897	-14.8	12.2	11.1
Single persons / couples (none 65+)	22.7	6.3	0.1689	0.1580	-6.5	28.6	28.4
Couple with children up to 18	37.8	5.4	0.1133	0.1080	-4.7	32.1	32.4
Mono-parental household	5.8	5.6	0.1092	0.1092	-0.1	4.7	5.0
Other household types	18.3	5.4	0.1177	0.1165	-1.0	16.1	16.9
% Within groups inequality	./.	./.	0.1252	0.1181	-5.7	93.7	93.7
% Between groups inequality	./.	./.	0.0084	0.0079	-6.2	6.3	6.3
<b>Educational level of HH head</b>							
Tertiary education	29.7	5.1	0.1155	0.1122	-2.9	25.7	26.4
Upper secondary education	35.4	6.2	0.1077	0.1031	-4.3	28.5	28.9
Lower secondary education	15.6	7.0	0.1282	0.1225	-4.4	15.0	15.2
Primary education or less	19.4	6.9	0.1115	0.0980	-12.1	16.2	15.1
% Within groups inequality	./.	./.	0.0114	0.1079	-5.4	85.3	85.6
% Between groups inequality	./.	./.	0.0187	0.0175	-6.6	14.0	13.9
<b>Age of HH member</b>							
Below 25	29.5	5.3	0.1273	0.1244	-2.3	28.1	29.1
25-64	53.9	5.8	0.1354	0.1283	-5.3	54.7	54.9
Over 64	16.6	8.2	0.1083	0.0939	-13.2	24.0	22.1
% Within groups inequality	./.	./.	0.1285	0.1214	-5.5	96.2	96.4
% Between groups inequality	./.	./.	0.0051	0.0046	-10.2	3.8	3.6
<b>Housing tenure</b>							
Owners, total	72.4	7.2	0.1159	0.1039	-10.4	62.8	59.6
Tenants, total	27.7	2.2	0.1609	0.1565	-2.7	33.3	34.3
% Within groups inequality	./.	./.	0.1283	0.1184	-7.7	96.1	94.0
% Between groups inequality	./.	./.	0.0053	0.0076	44.1	3.9	6.0
Owner: own outright	33.9	9.3	0.1338	0.1137	-15.0	27.7	25.0
Owner: on mortgage	38.4	5.6	0.0953	0.0923	-3.1	27.4	28.2
Tenant: private market (non-subsidized)	21.6	0.0	0.1678	0.1678	0.0	27.1	28.8
Tenant: reduced-rent	4.5	7.8	0.1223	0.1112	-9.1	4.1	4.0
Tenant: rent-free	1.6	17.9	0.1466	0.1041	-29.0	1.7	1.3
% Within groups inequality	./.	./.	0.1260	0.1169	-7.2	94.3	92.8
% Between groups inequality	./.	./.	0.0076	0.0091	19.8	5.7	7.2
<b>ALL</b>	100.0	6.0	0.1336	0.1260	-5.7	100.0	100.0

Source: own calculations on SILC-Belgium 2004.

Table 12. Poverty decomposition by household characteristics, Belgium 2003.

Characteristic of household or household head	Pop. share in %	FGT0			FGT1			FGT2		
		Baseline	Including IR	% change including IR	Baseline	Including IR	% change including IR	Baseline	Including IR	% change including IR
<b>Household type</b>										
Single persons / couples (65+)	15.5	20.0	18.1	-9.8	4.4	3.5	-20.4	1.7	1.3	-23.4
Single persons / couples (none 65+)	22.7	12.9	13.1	1.2	4.0	3.8	-6.1	2.1	1.8	-12.2
Couple with children up to 18	37.8	12.4	12.1	-3.0	3.6	3.6	0.6	1.7	1.7	-0.6
Mono-parental household	5.8	33.9	36.1	6.2	8.0	8.4	5.5	3.4	3.5	1.4
Other household types	18.3	14.9	15.5	4.5	4.4	4.5	0.3	1.9	1.9	0.1
<b>Educational level of HH head</b>										
Tertiary education	29.7	6.2	6.4	2.9	2.1	2.1	-0.7	1.2	1.2	-4.2
Upper secondary education	35.4	13.2	13.0	-1.2	3.4	3.3	-3.1	1.5	1.4	-5.4
Lower secondary education	15.6	20.2	19.5	-3.8	5.9	5.6	-5.6	2.7	2.5	-6.3
Primary education or less	19.4	28.2	28.4	1.0	7.1	6.8	-4.3	3.0	2.7	-7.7
<b>Age of HH member</b>										
Below 25	29.5	18.1	18.3	0.8	5.1	5.2	2.5	2.4	2.4	1.7
25-64	53.9	12.5	12.6	1.1	3.6	3.5	-3.3	1.7	1.6	-7.2
Over 64	16.6	20.2	18.4	-8.5	4.6	3.8	-17.9	1.8	1.4	-21.4
<b>Housing tenure</b>										
Owners, total	72.4	11.0	9.8	-10.7	3.0	2.5	-15.9	1.3	1.1	-18.7
Tenants, total	27.7	27.0	24.9	-7.5	7.5	8.1	8.2	3.4	3.7	6.1
Owner: own outright	33.9	14.7	12.6	-14.5	3.9	3.1	-21.4	1.8	1.3	-26.0
Owner: on mortgage	38.4	7.7	7.4	-4.0	2.1	2.0	-6.2	1.0	0.9	-6.2
Tenant: private market	21.6	26.6	30.7	15.5	7.5	8.7	16.6	3.4	3.9	15.9
Tenant: reduced-rent	4.5	29.4	27.5	-6.4	7.8	7.1	-9.3	3.7	3.2	-12.1
Tenant: rent-free	1.6	25.9	17.5	-32.3	7.0	3.1	-55.4	3.4	1.0	-71.8
<b>ALL</b>	100.0	15.4	15.2	-1.1	4.2	4.1	-3.9	1.9	1.8	-6.4

Source: own calculations on SILC-Belgium 2004.



## 6. Conclusion

We explored two methods to account for housing costs in the household income in Belgium. For our analysis we used the Belgian dataset of 2004 wave of the EU-SILC. We adopted two approaches: first, we looked at the self-assessed value of houses and second, we used an opportunity cost approach. Although we found that the correlation of the two estimates is rather low, they both yield similar distributive consequences. Poverty, poverty gap and overall inequality go down after we incorporate IR in the income concept. These findings are in line with most research on the income value of housing in other countries (e.g. Frick & Grabka, 2003), independent of the datasets used<sup>6</sup>.

The IR causes an increase of disposable income in all quintiles, but the relative increase is the highest in the bottom quintiles and the lowest in the top quintile. The interdecile ranges show that accounting for IR lifts the income of the lower deciles while it has little effect on the higher deciles. The interdecile range between top and median incomes remains constant, while both the range between top and bottom as the range between median and bottom drop to the same extent. The drop in inequality is due to the relation between ownership and age, and income and age. At old age, when income is lower, many households own their homes outright. At active age, when income is higher, large mortgage payments are putting a weight on disposable income.

The post-war Belgian housing policy has always emphasized the stimulation of home ownership. In particular, the acquiring of modest housing has been stimulated. Below market interest rates for loans, below market prices for social housing and renovation subsidies - all with means tested eligibility - and major fiscal incentives, made ownership of a small family home possible for many Belgian households. Overall inequality does not rise after controlling for home ownership by including IR- it declines. Since the positive effect of IR is the largest in lower income households, the Belgian housing policy is indirectly achieving its goal of bringing home-ownership in the reach of lower income groups.

Although the effect of IR on the total income distribution is known by now, the policy consequences are less clear. It is often claimed that owning a house is a protection against poverty or financial stress. Our results show that this is true as far as pensioners are concerned, but it is much harder to examine the exact causality of home-ownership. Exactly those who are in need of protection against poverty due to housing costs, are often

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<sup>6</sup> Our analyses are based on EU-SILC; Frick & Grabka used SOEP for Germany, PSID for USA and BHSP for UK.

unable to acquire a house. The increasing policy attention for social housing seems justified, as the house-poor and the income-poor are often the same.

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