A ratio or budget benchmark for comparing affordability across countries?

Kristof Heylen · Marietta Haffner

Received: 29 September 2011 / Accepted: 12 October 2012 / Published online: 31 October 2012
© Springer Science+Business Media Dordrecht 2012

Abstract In this article, the methodological strengths and weaknesses of two common housing affordability indicators—the expenditure-to-income ratio and the residual income—are discussed, using data for the Belgian region of Flanders and the Netherlands. Affordability standards are used in order to distinguish the group facing affordability problems. In case of residual income, we use minimum budget standards—excluding housing—that allow for decent participation in society. For the expenditure-to-income ratio, we apply the internationally frequently used 30 % benchmark. Our comparison of the two methods results in a preference for the budget approach. Consequently, we explore the possibilities of applying the budget approach in a comparative context. We conclude by making recommendations for future research.

Keywords Affordability · Residual income · Budget standards · Flanders · The Netherlands

1 Introduction

In recent years, the traditional approach for analysing housing affordability—the expenditure-to-income or ratio approach—has been subjected to continuous criticism for its limitations, more particularly its methodological weakness. However, in comparative research the ratio approach along with the popular 30 % benchmark keeps being used, partly because of a lack of suitable alternatives. The most recommended alternative in literature—the budget approach for residual income—has in general been overlooked in a

K. Heylen (✉)

Research Institute for Work and Society (HIVA), Catholic University of Leuven, Parkstraat 47,
3000 Leuven, Belgium
e-mail: kristof.heylen@hiva.kuleuven.be

M. Haffner

OTB Research Institute for the Built Environment, TU Delft, Jaffalaan 9, 2628 BX Delft,
The Netherlands
e-mail: m.e.a.haffner@tudelft.nl

comparative context. With the budget standard, the after-housing income is compared with budgets needed for minimal participation in society. The approach originated in the context of poverty research but is getting more established in housing affordability studies as well (Bradshaw 1993; Saunders 1998; Stone 2006a; Waite and Henman 2005; Bramley, forthcoming).

The minimum budgets are generally constructed by experts together with data on average spending behaviour, for each possible household type. Often they are based on normative guidelines. When a household's income 'after housing' is lower than the budget standard 'after housing', housing is regarded 'unaffordable'. The budget standards are always drawn for a particular society and lose their relevance in another time or place. Therefore, in a comparative context, each country should have its own distinct standards needed for minimal societal participation. Since there is no standard way, the budgets are calculated differently between studies and hence between countries (Saunders 1998; Storms and Van den Bosch 2009; Bradshaw 1993; Burke et al. 2011).

Our study outlines the possibilities of the standard budget compared to the ratio approach as a benchmark in the comparison of housing affordability across countries. In order to achieve this aim, the first section of this contribution discusses the most commonly used affordability indicators, stressing the added value of the budget approach. In the methodological part, the application of budget standards in two countries is presented, followed by the description of the data sources and concepts at stake. In the fourth section, the results are presented. The fifth section presents the effects of housing quality consumption (as indicated by number of rooms) on housing affordability. The quality aspect is an aspect that generally is not operationalised, even though recognised (Stone 2006b). For our cross-country analyses, the neighbouring 'countries' Flanders (Belgian region) and the Netherlands will be our cases, as both have similar welfare levels and a budget standard available to do the exercise.

Table 1 presents the distribution of the housing market sectors in Flanders and the Netherlands. In Flanders, 74 % were homeowners in 2005, whereas the private rental sector includes 18.5 % of households. The social housing sector only represents 5.6 %. On the contrary, the Dutch social housing sector is one of the largest in Europe, including 35 % of households. The private rented sector has got a market share of 9 %, while 56 % of households are homeowners. Only 7.3 % of the Dutch households do not have a mortgage, compared to 41 % in Flanders. This relatively low percentage in the Netherlands partly will follow from the tax relief regarding mortgage interest. These housing market figures are presented as background in order to more easily interpret the results. Yet, the focus of the article is on the methodological possibilities of comparing countries using the budget benchmark.

2 Measuring housing affordability

There are many concepts with which the affordability of housing is measured (Gabriel et al. 2005; Freeman et al. 2000; Quigley and Raphael 2004). In our approach, affordability will be regarded as the ongoing commitment to housing costs, in which the cash flow spent on (the financing) of housing consumption is the central concept. According to Hancock (1993), this is the affordability of housing in the short run. When the user cost is applied to housing, affordability is analysed in the long run. It is about the cost of housing consumption, which may be different from the financing of housing consumption as considered with the short-term approach. In the former approach, the opportunity cost of owner's equity and the capital gains (or losses) are included in the cost of housing (Hancock 1993;

Table 1 Housing market sectors in Flanders (2005) and the Netherlands (2006)

	Flanders	The Netherlands	
Rental sector	24.1	44.2	
Social rental sector		5.6	35.2
Private rental sector		18.5	9.0
Owner-occupied sector	74.4	55.8	
With a mortgage		33.6	48.5
Without a mortgage		40.9	7.3
Residents free of charge	1.5	0	
Total	100	100	

Source Woonsurvey 2005 (Flanders), WoON 2006 (the Netherlands)

see also Quigley and Raphael 2004). Hence, in our study, the approach to affordability is partial, and overlooks the equity aspect of housing and the risk associated with it.

However, if affordability is concerned with the short term, it is about the daily accessibility of a dwelling in financial terms, it is about the recurrent out-of-pocket expenses or cash flows of a household necessary to finance housing consumption out of income (Hancock 1993; Yates and Milligan 2012; Stone 2006a, p. 151):

Affordability expresses the challenge each household faces in balancing the cost of its actual or potential housing, on the one hand, and its non-housing expenditure on the other, within the constraints of its income.

Among others, Hancock (1993) en Freeman et al. (2000) argue that the definition of affordability cannot be constrained to the link between expenses and income, but that also standards (norms) for quality or reasonableness could be included. In some parts of the housing market, a dwelling that is too small or lacks necessary comfort may not be a free choice but a necessity. A suitable dwelling of minimum quality against an affordable benchmark is often out of reach. MacLennan and Williams (1990, p.9) include these aspects in their definition:

Affordability is concerned with securing some given standard of housing (or different standards) at a price or a rent which does not impose, in the eyes of some third party (usually government) an unreasonable burden on household incomes.

Despite the attention that this quality element gets in literature, it remains out of the scope of most studies on housing affordability. For a theoretical elucidation on the aspect of housing quality related to affordability, we refer to the work of Hancock (1993), Thalmann (2003). The measurement of affordability ‘in the short run’ thus generally includes two elements: a measure for the relationship between housing expenditure (the indicator) and a standard in relation to income (Stone 2006a).

In the following paragraphs, the two most applied and well-known affordability indicators will be discussed: the ratio and the residual income. For the sake of clarity, we focus on these two indicators. We are yet aware of the fact that many other affordability indicators exist, such as measures that relate the price of typical dwellings to disposable income or measures that involve poverty lines (Stone 2006a; Gabriel et al. 2005).

The oldest and most well-known indicator for housing affordability is the ratio approach, which expresses the ratio of the housing expenses to the available household income. In general, this approach includes an affordability standard (norm) varying

between 20 and 30 %. When a households ratio exceeds this threshold, housing is assumed to be ‘not affordable’. Figure 1 illustrates the logic of this affordability approach, in a diagram showing the expenses for non-housing consumption on the vertical axis and the housing expenses on the horizontal axis. The line *or* illustrates the ratio norm, which in this diagram is set at 30 %. Any point below this line represents a combination of residual income (non-housing consumption) and housing expenses (housing consumption), with housing expenses higher than 30 % of disposable income. This area (B + D) represents the group for whom housing is regarded unaffordable. All combinations above this line represent a housing expenditure-to-income rate lower than 30 %. For these households, housing is regarded affordable.

Besides the use in housing research, the ratio is also often applied in the banking and social housing sector (Hulchanski 1995). In the financial sector, the ratio is applied to evaluate the liquidity of a potential mortgagor, in the form of borrowing constraints. In many countries, it is used as an admission criterion for social housing, as an element in the rent calculation or as an element in the calculation of housing allowances (De Decker and Van Dam 2005). In research, the ratio will generally be used to compare means between different groups, to evaluate an evolution over time, or to calculate the size of the group for whom housing is not affordable (Haffner and Boumeester 2010; Quigley and Raphael 2004).

The residual income (RI) is calculated by subtracting the housing expenses from the available or disposable household income. Hence, this indicator expresses the consumption possibilities in absolute terms after paying for housing (Hancock 1993). The housing situation will be ‘not affordable’, if the residual income is too low for the consumption of other necessary goods and services. This reasoning is rooted in the notion that housing expenses have a different nature than expenses for, for example, food and clothing. It is for instance less easy—or in the short run even impossible—to cut back fixed housing expenditure than most other expenditure. Because housing expenses usually make the biggest and least flexible claim on the household budget, it makes it logical to analyse the income after deduction of rent or mortgage payment with the residual being the amount available for consumption (Freeman et al. 2000; De Decker and Van Dam 2005). The budget standard approach is often used for drawing RI-standards. With this approach—per

Fig. 1 Affordability of housing: ratio and budget standard approach. *Source:* Gabriel et al. (2005); axes reversed

household type—a basket of minimal necessary goods and services is determined that allows for minimal participation in society. Once the content of the basket is fixed, prices are calculated and added to draw up the standards. When housing costs are taken out of this basket, norms for non-housing consumption are generated. If the residual income is below this norm, housing is regarded as ‘unaffordable’ (Stone 2006a; Hancock 1993; Freeman et al. 2000). In Fig. 1, the standard for residual income is noted as nh^* , which is the non-housing consumption needed for a decent living standard. Any point above the nh^*b line represents a situation where housing expenses are considered affordable. Any point below this line represents a residual income which is considered to be insufficient.

As the diagram illustrates, households may have more left after their housing expenses than nh^* , but still spend more than 30 % of their income on housing (area D). This group will most likely include households with a middle or high income with a strong preference for housing. The higher the income for non-housing consumption, the more a position in area D signals a choice for large or luxury dwellings. On the other hand, households may fall below the 30 % expenditure-to-income ratio, while having no sufficient income left for reaching a decent living standard (area A). This group will mostly include households with a lower income and relatively low housing expenses. In this group, chances are higher that housing consumption does not meet minimal standards (e.g. overcrowding, lack of basic comfort). The situation where housing is considered unaffordable by both methods is illustrated by area B. For these households housing consumption is more than 30 % of disposable income, while the income left for non-housing consumption is lower than the standard ($nh < nh^*$). Finally, in area C, housing expenses are lower than 30 % of income while residual income is higher than nh^* . This is the group for whom housing is affordable according to both approaches.

Households with a strong preference for housing may spend a lot of money on it (over-consume), which might cause them to fall below the residual income standard or the 30 % norm. If these people lived in a smaller or less luxurious dwelling, housing expenses would be affordable. On the other hand, as already mentioned, households may live in an affordable way—not trespassing an affordability standard—while living in a house that is too small or lacks basic comfort. Figure 2 illustrates this logic for the budget standard approach. Non-housing consumption is considered to be insufficient below nh^* , whereas the standard for housing consumption is noted as h^* on the horizontal axis. The latter can be operationalised as a standard for comfort or housing size compared to family size (overcrowding). The group for whom housing is affordable ($nh > nh^*$), while having sufficient housing consumption ($h > h^*$) is represented by area 4. When housing is affordable, but housing consumption is below the standard ($h < h^*$), the household will be in area 3. A part of this group is likely to have affordability problems, if they try to meet the housing standard (h^*). Households that fall below the budget standard ($nh < nh^*$), but still have a decent housing standard are symbolised by area 2. A certain part of this group might surpass the residual income standard by cutting their housing consumption, without falling below the housing standard. Finally, area 1 represents the situation in which both the residual income standard and housing standard are not met. Families in this situation have a lack of basic comfort or space and are also unable to achieve a basic level of other consumption.

During the past two decades, many researchers have expressed their preference for the residual income approach instead of the ratio approach.¹ The latter has been severely

¹ Bramley (2012) however concludes that the ratio is probably the better single measure and the residual income measures are to be used in a supporting role. This statement needs to be regarded in the context of predicting self-reported payment problems of households. Also, the residual income measures that are tested are measures that are expressed relative to income, instead of absolute budgets, as are relevant in this study.

Fig. 2 Housing and non-housing standards in the budget standard approach. *Source:* Hancock (1993)

criticised. A first criticism is that the ratio—since it is a relative measure—is not related to the absolute level of consumption. It does not take into account what households have left to spend on other necessary goods and services. As a result, the same ratio does not have the same meaning for different income levels. When a percentage is applied as an affordability norm, it would mean that the lower the income, the less one needs to finance the necessary goods and services to participate in society, possibly not being able to pay the full price of housing consumption (Hancock 1993; Freeman et al. 2000; Yip and Lau 2002).

The latter comment highlights another often expressed criticism, namely that the ratio does not have a normative basic assumption. The applied standard (between 20 and 30 %) is chosen arbitrarily or is coming from non-scientific studies of expenditure patterns at the end of the nineteenth and the beginning of the twentieth century. The share that on average was spent on housing through the years became the norm for what people ‘reasonably’ can spend (Hancock 1993; Stone 2006a).

A third criticism is that the ratio—using only one standard—does not account for expenditure and income differences between different household types (Waite and Henman 2005; Chaplin and Freeman 1999). These drawbacks of the ratio call for cautiousness in applying the method. It does not mean, however, that the approach should be totally abandoned. For instance, it can be suitable to compare means or to analyse trends over time, without making an estimate about the relative size of the ‘groups for whom housing is not affordable’.

The residual income approach overcomes the criticism on the ratio approach to a large extent. In contrast to the ratio, the residual income can be applied using meaningful affordability standards. Clearly, this is an exercise demanding certain normative assumptions, which are influenced by the society one lives in (Bourassa 1996). The minimum budget approach originated in the United Kingdom in the 1940s. Already in 1942, Beveridge applied budget standards from a study of Rowntree to determine the minimum levels of ‘national assistance’. In 1985, several prominent researchers of the York University carried out an extensive and influential study on the methods of minimum budgets, resulting in budget standards for six family types. In a following phase, a difference was introduced between a ‘low cost’ and a ‘modest’ norm (Bradshaw 1993).

The budget standard—if applied as amount or absolute budget, not relative to income—has several advantages compared to the ratio for analysing affordability: it makes the link

between housing and non-housing expenses explicit; it allows for more accurate differences across household types and it is more useful to study the position of low-income households, as by definition it focuses on that group. In case of a 30 % ratio, also high-income families might be classified as having an affordability problem. Waite and Henman (2005), who compared the ratio (with the 30 % norm) with the budget approach for income support recipients in Australia, concluded that the 'housing need' estimates of the budget standard better fit with households 'poverty experience' than the results from the ratio approach.

The budget standard approach yet also is not perfect, as it does not unambiguously allow for determining whether a household has affordability problems just because their income is (very) low or because the income is too low to finance decent housing. Welfare will not only be determined by income, but also by other components, such as the extent of deprivation from goods and services considered normal in society (Bradshaw and Mayhew 2010a, b). Furthermore, the budget standard approach is rather labour intensive in case the minimum budgets are not available from other research. In addition, it requires a number of normative judgements which cannot always count on an unanimous vote.

Another possibility for generating residual income standards is using norms that governments apply in the field of poverty or housing policy. This approach is used in the United Kingdom, where the levels of the income support scheme represent minimum budgets for a decent living, excluding the costs for housing. The housing costs are met by the 'housing benefits' or 'local housing allowances' for eligible poor households (Freeman et al. 2000). In Flanders and the Netherlands, however, the allowances of the social assistance schemes are drawn to finance all costs [including (a minimum) for housing] and hence cannot be used as norms for residual income. To specify, in the Netherlands, this concerns a minimum for housing, as the housing allowance scheme covers costs above the minimum (Kemp 2007).

Despite the strong set of arguments in favour of the residual income approach, the ratio approach yet remains popular as a policy and practice rule of thumb. Partly, this can be explained by familiarity with the method and disinterest in seeking better approaches, but also by the significantly greater methodological challenges entailed in the residual income approach based on budget standards. Sometimes the ratio approach is adopted to part of the criticism. According to Wood and Ong (2011), it will not be unusual that in cross-sectional studies the 30 % benchmark will be applied to the lower 40 % of the income distribution. These will be mostly Australian studies, as can be derived from Gabriel et al. (2005).

3 Methodology

3.1 Definition of ratio and residual income

Table 2 shows how the expenditure-to-income ratio and residual income are calculated. In our study, we analyse the cash flow of households in order to finance their housing consumption. Therefore, in our study, we analyse housing expenses and disregard the cost for housing services in terms of user cost (see previous section). In the rental sector, housing expenses are equal to rent, which may be expressed in a gross or net way. Gross rent represents the amount of rent that is paid to the landlord. The net rent is calculated by subtracting the housing allowances that a tenant receives from gross rent. In the owner-occupied sector, gross housing expenses include the monthly mortgage expenses (both capital and interest payments). Furthermore, the gross expenses also include owners' costs,

such as owner's share of maintenance costs and property tax. These costs are included in order to make expenses of homeowners better comparable with expenses in the rental sector. For tenants, these costs are being paid for by the landlord and are being passed on to the tenant in the gross rent. Net housing expenses for owner-occupiers are calculated after income tax deductions. When it comes to interpreting the results, it is important to keep in mind that homeowners contribute to their wealth by making mortgage capital repayments, which are a significant part of the housing expenses. Moreover, wealth of homeowners may change, in case house prices rise or fall; homeowners run risk. In contrast, tenants do not run the investment risk and pay net rent which finances the consumption of housing services.

The income concept in our study is the 'disposable household income' or as it also called the after-tax household income. The income of all household members is included, after taxes (except in the case where income taxation is relevant for the expenses of owner-occupiers) and social security contributions. Next to income from work, also social security benefits (pensions, sickness, unemployment and child benefits) and social assistance are taken into account. As housing allowances are deducted from expenses, they will not be included as household income.

The income-to-expenditure ratio is defined as the share of income that is spent on housing. For owner-occupiers the ratio has also been called a debt-service ratio (Brounen et al. 2006; following Bourassa 1996). Residual income is defined as the difference between disposable household income and net rent or net housing expenses. In our exercise, the energy consumption costs (for heating, water and electricity) are not taken into consideration.

We apply the χ^2 -test in order to determine whether there is a statistically significant relationship between 'being in a state of unaffordable housing' on the one hand and tenure status or socio-economic household characteristics on the other hand.

We used the Housing Survey 2005 for Flanders, which is a detailed survey on the housing situation of 5.216 Flemish households. A face-to-face method was used, whereas a weighting factor was applied to correct the distribution according to region and dwelling

Table 2 Components of housing expenses in relation to the income of the tenant and the owner-occupier

Tenant	Owner-occupier
Gross rent ^a	Gross housing expenses ^b
– Housing allowances	– Fiscal effect income tax
= Net rent	= Net housing expenses
Income-to-expenditure ratio	Income-to-expenditure ratio
= Net rent	= Net housing expenses
/Disposable income ^c	/Disposable income ^c
Residual income	Residual income
= Disposable income	= Disposable income
– Net rent	– Net housing expenses

^a Gross rent includes any costs that the landlord will include in the rent calculation, also for maintenance, property tax, etc

^b Gross housing expenses include the amounts for financing, property tax and other property owner expenses, such as home insurance fees, ground lease charges, property tax and owner's share of maintenance

^c Disposable income includes housing expenditure + other consumption expenditure (e.g. energy costs) + savings

Table 3 Budget standards for disposable income, in euros per month, according to household type, Flanders and the Netherlands, 2005

Household type	Flanders	The Netherlands, SCP, basic needs	The Netherlands, SCP, modest but adequate
Single	916 (man) 919 (woman)	770	870
Couple	1,216	1,050	1,190

Sources Storms and Van den Bosch (2009), Soede and Vrooman (2008)

type. In order to be able to compare at a point in time, for the Netherlands, we used the WoON 2006 Housing Survey, conducted by the Department of Housing. The income data from the tax records for 2005 were linked to the survey data.² About 64,000 households were interviewed face-to-face, approximately 54,000 of whom lived in independent units.

3.2 Determination of budget norms

Crafting operational residual income standards is a complex exercise that we did not attempt, as other researchers in Flanders and the Netherlands have already created relevant standards, as Table 3 shows. The ‘countries’ used different pathways to derive these norms. In a recent minimum budget study for Flanders, the researchers took ‘A theory of human need’ of Doyal and Gough as a starting point (Storms and Van den Bosch 2009). This theory allows for a uniform and well thought out drawing of budget standards and is one of the most well-known ‘need theories’. The study was performed in several phases. In a first phase, the real expenditure of poor Flemish households was studied, by performing data analyses, a literature study, a case study and several focus groups with poor people. In the second phase of the study, experts designed normative budgets for the different aspects of the total budget standard. Normative amounts were drawn for the costs of food, housing, health care, personal care, clothes and leisure time. When the total budget standards per household type were drawn by the experts, a final round of interviews with poor families was held, to evaluate whether the amounts were reasonable within the framework of ‘minimal decent societal participation’. In our study, we apply the budget standards of the Flemish study with exclusion of the normative budget for the housing costs. These amounts we will use as thresholds for the residual income.

In the Netherlands, for 2000, minimum budget norms were determined by the SCP (*Sociaal Cultureel Planbureau*) on the basis of budgets drawn up by the Dutch National Institute for Budgetary Information (Nibud). The Nibud norms are calculated by opinions of experts, the availability of goods and actual consumption patterns at the bottom of the income distribution. Per type of expenditure (clothing, food, transportation, ...) minimum amounts were determined.³ SCP applied the Nibud data in order to draw up two variants of the poverty line: a ‘basic needs’ and a ‘modest but adequate’ threshold. The basic needs approach is a minimal one and does not allow for many ‘extras’. The ‘modest but adequate’ variant is broader and includes normative costs for recreation, membership of library, sports or hobby club, a subscription to a newspaper or a pet. In this study, we will apply the Dutch norms of 2000, with indexation for 2005. As mentioned before, social

² We realise that registration data on income are more reliable than surveyed data.

³ Bradshaw and Mayhew (2010a, b) apply the Dutch NIBUD-norms to all EU-countries as an alternative to the Eurostat at risk-of-poverty measure.

norms change over time, which might distort the theoretical content of the concepts when 5-year-old norms are applied. SCP, therefore, reconsiders the content of the minimum budget each year, while linking the indexation to the evolution of median prices (Soede and Vrooman 2008).

The SCP method differs from the Flemish method in a few ways: first, there is no normative theory as a starting point. Nibud applies normative ideas, yet without a theoretical reference framework as in the Flemish study. Second, in Flanders, the minimum budgets are calculated separately for 16 possible family types, whereas for the Dutch situation we applied an equivalence scale to the budget for a single person. Third, whereas in both studies the opinion of experts was hired, only in the Flemish study the opinion of the people at the bottom of the income distribution was heard.

The Flemish budget is conceived as a minimum budget in order to decently participate in society and is, therefore, more in line with the Dutch ‘modest but adequate’ than the ‘basic’ variant. This is also shown by the content of the Flemish budget, which includes amounts for recreation, membership of sports or hobby clubs, modest travels, DVD and television.

The budget standards are shown in Table 3. The minimum for a single person in the Flemish study amounts to 916 euros for a man and 917 for a woman, whereas this amount is almost at the same level for the Dutch modest variant (870 euros). The minimum for a single in the Dutch basic variant is much lower (770 euros). Also for couples, the Flemish minimum and the Dutch modest minimum are almost alike (1,216 vs. 1,190 euros), whereas the basic variant ends up considerably lower (1,050 euros). A comparison between the two countries is thus from a theoretical point of view preferably carried out using the Dutch ‘modest but adequate’ approach. Given the fact, prices for many goods and services do not differ much between Flanders and the Netherlands, the Flemish budget standard and the Dutch modest budget standard should allow for a considerable similar living standard.

It is essential to take into account that the definition of affordable housing is relative to the society one lives in. In our study, the living standard of the two cases is similar. When the living standard of the countries is highly different, the normative budgets will strongly vary. A comparative analysis across countries will be possible, because the comparison will be based on concepts of affordable housing and ‘decent participation in society’ within the countries’ contexts. A comparison of the relative position of groups across countries will be possible and useful here, as it will be in the situation where the budget standards are drawn up differently in the countries under study.

4 Comparison of ratio and budget benchmark between Flanders and the Netherlands

The aim of this section is to compare the affordability outcome of the budget approach with the results of the expenditure-to-income method in an international context, using Flanders and the Netherlands as cases. More specifically, we search for mechanisms that are present in both countries.

Table 4 shows the shares of households with a housing-to-income ratio above 30 % and a residual income below the minimum threshold. In Flanders, according to the budget benchmark, housing is not affordable for 14.6 % of Flemish households compared to 15.8 % using the ratio. These figures are quite similar, but according to tenure the differences are remarkable. Following the budget approach, social housing is the most problematic tenure in terms of affordability, as around 39 % of social tenants fall below the RI-standard. Oppositely, according to the ratio, social housing is the least problematic

segment (12.2 %). Since in Flanders social rent is related to income, and in 2005, the maximum rent was set at 20 % of taxable income, it is logic that relatively few social tenants fall above the 30 % norm. The private rented sector has relatively the most affordability problems according to the ratio, with 39 % above the 30 % standard. The share of private tenants below the RI-norm is considerably lower (27 %). Further, the affordability for owner-occupiers with a mortgage has a better outcome with the budget method (11 %) than the ratio (23 %). In contrast, affordability for outright homeowners turns out worse when the budget method is applied. More than two-thirds of this group are pensioners, whose disposable income has decreased. Moreover, the largest part of this group has a lower residual income than the threshold even without subtracting the owner's share of maintenance costs and property tax. It becomes clear that—to a certain extent—the budget standard reflects a poverty problem in terms of disposable income. It should yet be noted that outright homeowners possess the dwelling they live in and possibly other assets. Research points out that in the mid 2000s Flemish elderly have relatively low pensions, but high consumption patterns compared to other West and North European countries (Cantillon et al. 2009; Capéau and Pacolet 2009).

As in Flanders, in the Netherlands the ratio classifies relatively more households having an affordability problem than the 'modest' budget standard, but the difference between both is bigger than in Flanders. This comes about as the homeownership based on the RI-norm is more affordable (difference of 13 % points) than based on the ratio norm. Like in Flanders, the relative position of homeowners with a mortgage compared to tenants improves when the ratio is replaced with the budget standard. As housing is not affordable for 24 % of homeowners with a mortgage according to the 30 % ratio, this share falls to 8 % when the modest budget standard is applied. For the outright owners, the share of affordability problems is higher with the modest budget standard than with the ratio. This implies that the relative position of outright owners is worse according to the budget benchmark than according to the ratio.

This also applies to social tenants in the Netherlands, but to a lesser extent than to those in Flanders. And as in Flanders, when the budget standard is applied, the relative position

Table 4 Household with a residual income below the RI-norm and housing expenditure-to-income ratio above 30 %, according to tenure, Flanders and the Netherlands, 2005/2006

	Flanders		The Netherlands	
	Ratio >30 %	RI < RI-norm	Ratio >30 %	RI < RI-norm modest budget
Total	15.8	14.6	21.3	13.9
Owner-occupation	10.4	9.6	21.5	8.2
With a mortgage	23.3	11.3	24.1	8.4
Without a mortgage	0.5	8.2	4.5	6.4
Rented sector	33.0	30.0	21.2	21.2
Private rented	39.2	27.4	29.4	19.6
Social rented	12.2	38.6	19.0	21.6
Test	***	***	***	***
N total ^a	4,736	4,531	54,272	54,272/3

Sources Woonsurvey 2005 (Flanders); WoON 2006, OTB/TU Delft calculations (the Netherlands)

χ^2 -test: *** $p < 0.01$

^a Weights were applied to the Dutch and Flemish samples to obtain results for all households

of private tenants improves, with a mere 20 % below the RI-norm instead of 29 % that have a higher expenditure-to-income ratio than 30 %.

In sum, in both 'countries', compared to the ratio, the relative position of homeowners with a mortgage and tenants on the private market is better with the budget standard. On the other side of the coin, it is logical then that the relative position of tenants on the social-rented market and of outright homeowners is worse.

How can the remarkable difference between the two methods be explained? The percentages for whom housing is unaffordable per income quintile and tenure will help the explanation, for both countries. First, the situation for Flanders in Table 5. When all households are considered, 25 % belonging to the first income quintile are having an affordability problem according to the ratio. This percentage is somewhat lower for the second and third quintile, but is still at a level of 13 and 8 % in the fourth and fifth quintile, respectively. In the rental market, even 18 % belonging to the fourth quintile exceeds the 30 % threshold. When the budget standard is applied, 59 % of households in the first income quintile are presumed to have an affordability problem. For the rental sector separately, this share rises to 86 %. In the third quintile, the overall share below the RI-norm is not more than 2 %, whereas (almost) no household in the fourth and fifth quintile is having a residual income below the norm.

For the Netherlands the figures are similar (Table 5). According to the ratio, 39 % of households in the first quintile and still 17 % in the fourth quintile fall above the 30 % threshold. Using the budget standard, 57 % of households in the first quintile are supposed to have an affordability problem, while this share drops to respectively 3 and 1 % in the third and fourth quintile.

These figures indicate that the budget standard primarily identifies lower-income households as having an affordability problem, whereas with the ratio standard also classifies higher-income households in the group with affordability problems. The focus of the budget approach is hence more on the income side—as can be expected from an approach that can be used to identify households in poverty (risk)—whereas the ratio approach focuses more on the housing expenses.

The differences between the tenures resulting from the different methods stem from these income effects. In the Netherlands and especially in Flanders, the tenants in the social-rented sector are overrepresented among the lower-income groups (Heylen and Haffner 2009), which results in a worse affordability score when the budget benchmark is applied. On the other hand, homeowners with a mortgage are overrepresented in the higher-income quintiles, resulting in better affordability when the budget benchmark is used instead of a ratio benchmark.

These results suggest in line with the discussion of Fig. 1 that the households will partly be classified the same and partly differently when both methods are considered. This is what Table 6 shows: the distribution of households according to both affordability indicators. As Table 6 points out, in both 'countries' the majority of households do not have an affordability problem, neither by the budget standard nor by the ratio approach. This group is represented by area C in Fig. 1 and consists of respectively 77 and 74 % of households in Flanders and the Netherlands. Their housing expenses are less than 30 % of disposable income, while residual income exceeds the standard for decent living. The group whose housing is affordable according to the 30 % ratio but has insufficient income left, reaches 7 % in Flanders and 5 % in the Netherlands (area A in Fig. 1). Poor households will be overrepresented in this group. Moreover, housing expenses are relatively low—otherwise they would exceed the 30 % threshold—which might cause them to live in below-standard dwellings. In contrast respectively 8 and 12 % of households in Flanders and the

Table 5 Households with a housing expenditure-to income ratio >30 % and a residual income below the RI-norm (in %), according to tenure and income quintiles, Flanders and the Netherlands, 2005/2006

Quintiles of equivalent income ^a	Flanders			The Netherlands		
	All households	Owner-occupation	Rented sector	All households	Owner-occupation	Rented sector
Housing expenditure-to-income ratio >30 %						
1	25.1	11.4	50.6	39.4	38.3	39.6
2	19.2	10.5	40.9	22.6	31.4	17.8
3	14.6	10.8	24.8	17.2	25.4	6.1
4	13.1	12.0	18.2	16.5	20.6	2.2
5	8.0	8.3	6.8	10.9	12.0	2.3
Total	15.8	10.4	33.0	21.3	21.5	21.2
Test	***	***	***	***	***	***
Budget standard: RI < RI-norm						
1	59.0	45.3	85.5	57.4	52.7	59.1
2	11.5	7.5	21.9	7.7	12.1	4.6
3	2.1	1.6	3.5	3.0	4.9	0.5
4	0.9	0.9	0.8	1.0	1.3	0.1
5	0.3	0.3	0	0.4	0.4	0
Total	14.6	9.6	30.0	13.9	8.2	21.2
Test	***	***	***	***	***	***
N ^b	4,530	3,364	1,099	54,272	30,299	23,972

Sources Woonsurvey 2005; WoON 2006, OTB/TU Delft calculations

χ^2 -test: *** $p < 0.01$

^a Calculated for all households

^b Weights were applied to the Flemish and Dutch samples to obtain results for all households

Netherlands have sufficient income left for non-housing consumption, whereas their housing expenses surpass 30 % of disposable income (area D). This group will include middle- and high-income households with a preference for housing consumption who 'choose' to spend more than 30 % on housing, because they can afford it. Finally, about 8–9 % of households in both 'countries' is dealing with unaffordable housing expenses, both according to the ratio and budget standard approach. In this group, a high expenditure-to-income ratio is not a choice, but rather an unavoidable outcome.

5 The budget benchmark outcomes for household type and activity status

In this section, more outcomes of the budget standard approach calculations are presented: according to tenure and two household characteristics, the activity status of the head of household and the household type.

Table 7 shows the percentage of households below the residual income (RI-)norm according to activity status of the head of household. The results are similar for Flanders and the Netherlands, regarding the position of the different groups. Employment appears to be a crucial factor. In case of an unemployed head of household, the share that lives 'not

Table 6 Share of households according to two measures of affordability, according to tenure, Flanders and the Netherlands, 2005/2006

	Flanders		The Netherlands	
	Ratio $\leq$ 30 %	Ratio > 30 %	Ratio $\leq$ 30 %	Ratio > 30 %
Total				
RI $\geq$ RI-norm	77.3	8.1	73.6	12.5
RI < RI-norm	6.9	7.7	5.1	8.8
N total ^a	631	3,781	7,546	46,727

Sources Woonsurvey 2005; WoON 2006, OTB/TU Delft calculations

^a Weights were applied to the Flemish and Dutch samples to obtain results for all households

Table 7 Households with a residual income below the modest RI-norm (in %), according to tenure and activity status of the head of household, Flanders and the Netherlands, 2005/2006

Activity status head of household	All households	Owner-occupation	Rented sector
<i>Flanders</i>			
Working	8.5	6.7	14.7
(Early) retired	15.5	10.5	34.4
Unemployed	55.6	38.7	70.6
Sick/disabled	32.2	21.1	46.4
Test	***	***	***
N	4,530	3,364	1,099
<i>The Netherlands</i>			
Working	9.5	7.6	13.3
(Early) retired	11.2	7.4	14.2
Unemployed	58.7	25.7	63.2
Sick/disabled	32.7	20.4	36.6
Test	***	***	***
N ^a	54,272	30,300	23,972

Sources Woonsurvey 2005; WoON 2006, OTB/TU Delft calculations

χ^2 -test: *** $p < 0.01$

^a Weights were applied to the Dutch and Flemish samples to obtain results for all households

affordable' is highest in both Flanders and the Netherlands, with respectively 56 and 59 %. In case of employment, the share below the RI-threshold is the lowest in both 'countries'.

Tenancy, or being a tenant also seems to be a crucial factor. Almost in all cases for twice the share of tenants than for owner-occupiers, housing is unaffordable according to the RI-norm. The unemployed tenants are the groups for whom the affordability is worst, with a share below the RI-standard of 71 % in Flanders and 63 % in the Netherlands. Furthermore, the share below the RI-norm is relatively high for sick and disabled people, reaching a level of 36 % in the Netherlands and 46 % in Flanders. Thus, the results suggest that the replacement income for the sick and disabled is often not high enough for worthy participation in society.

The relative position of (early) pensioners is shown to be better in the Netherlands than in Flanders, in particular in the rented sector. In Flanders, the share of retired tenants below the RI-threshold is 20 % point higher than the share of working tenants below the standard.

Table 8 Households with a residual income below the modest RI-norm (in %), according to tenure and household type, Flanders and the Netherlands, 2005/2006

Household type	All households	Owner-occupation	Rented sector
<i>Flanders</i>			
Single	16.1	6.3	31.3
Lone parent	36.3	29.4	45.7
Couple, no child	8.5	7.0	14.7
Couple with child(ren)	14.5	4.2	37.0
Test	***	***	***
Total	4,530	3,364	1,099
<i>The Netherlands</i>			
Single	21.1	11.8	25.8
Lone parent	25.4	19.0	28.4
Couple, no child	6.2	4.8	8.7
Couple with child(ren)	10.4	7.9	18.6
Test	***	***	***
N ^a	54,273	30,298	23,974

Sources Woonsurvey 2005; WoON 2006, OTB/TU Delft calculations

χ^2 -test: *** $p < 0.01$

^a Weights were applied to the Dutch and Flemish samples to obtain results for all households

In the Netherlands, this gap is only 1 % point. The gap between the working and retired households is bigger in Flanders than in the Netherlands; especially also because there is no gap between these groups in owner occupation.

A similar exercise as the one with activity status can be performed for affordability according to household type which is shown in Table 8. Not surprisingly, in both ‘countries’ the couples—and especially those without children—do better than the singles and lone parents. The lone parents are the group for whom affordability is most under pressure, with a percentage amounting to 36 and 25 % for Flanders and the Netherlands, respectively. These results imply that the household income of couples generally will be relatively higher than for singles and lone parents.

As in the analyses on the activity status, tenure is an important indicator of affordability problems. In Flanders, 46 % of lone parents in the rental sector fall below the RI-threshold which is almost 9 % points higher than for couples with at least one child. In the Netherlands, this gap is about 10 % points. Furthermore, on both the Flemish and Dutch rental markets, the position of couples with children is weaker than for couples without children.

For homeowners, however, the results differ. In Flanders—as opposed to the Netherlands—housing is relatively more unaffordable for couples without children than for couples with children. This can be explained by the relatively high share of elderly among the couples with no children among the Flemish homeowners.

6 Influence of overcrowding and overhousing on outcomes

The aim of this section is to show the effect that housing quality may have on housing affordability. As the databases that are used do not contain comprehensive measures of

housing quality, the exercise is performed with a variable that indicates the space available for households. As information about the surface of the dwelling (expressed in square metre) is not available in both databases, we use the second best in this case, being the number of rooms available. When a dwelling has less than a combination of one living room, one bedroom per couple/single and child and one hobby/working room, the housing situation is classified as 'overcrowded'. In case the dwelling consists of more rooms than specified in the previous sentence, the situation is categorised as 'overhousing'.

In Table 9, figures are presented of the households that exceed the RI-standard, but who fail to meet a certain housing standard, operationalised as a norm for overcrowding. This housing situation is illustrated by area 3 in Fig. 2. Also, results are shown of the households that fall below the RI- threshold, but whose dwelling is too large according to our housing indicator (area 2 in Fig. 2). This situation is called 'overhousing'. In Table 9, these figures are also compared to the results of the standard budget approach, in order to get an impression of the size of the problem. In addition, the results are presented for different tenures.

About 8 % of Flemish households do not face affordability problems according to the budget approach, but live in an overcrowded dwelling. Again, this figure is significantly higher in the rental than owner-occupied sector (18 % compared to 5 %). In particular, the outright owners have a relatively small share of overcrowded dwellings, which is a consequence of the overrepresentation of pensioners in this group. Their children most likely already left the parental home, resulting in a number of 'empty' rooms. In the Netherlands 12 % surpasses the RI-threshold while living in an overcrowded dwelling. As in Flanders, the situation is better for owner-occupiers (11 %) than in the rental market (13 %). These figures indicate that in both 'countries' the affordability problem might increase significantly, if these families would move to a suitable and probably more expensive dwelling.

Table 9 Households with a residual income below the RI-norm (and 'overhoused') and with a residual income above the RI-norm and 'overcrowded', in percentage, according to tenure, Flanders and the Netherlands, 2005/2006

	Flanders			The Netherlands		
	RI < RI-norm	RI < RI-norm + overhoused	RI ≥ RI-norm + overcrowded	RI < RI-norm ^a	RI < RI-norm ^a + overhoused	RI ≥ RI-norm ^a + overcrowded
Total	14.6	7.1	7.9	13.9	7.3	11.9
Owner-occupation	9.6	6.0	4.7	8.2	5.0	9.5
With a mortgage	11.3	6.2	7.5	8.4	5.0	11.7
Without a mortgage	8.2	5.9	2.5	6.4	5.2	3.2
Rented sector	30.0	10.5	17.8	21.2	10.1	13.6
Private rented	27.4	11.2	18.3	19.6	10.4	12.7
Social rented	38.6	8.2	16.0	21.6	10.0	13.8
Test	***	***	***	***	***	***
N total	4,531			54,272		

Sources Woonsurvey 2005; WoON 2006, OTB/TU Delft calculations

χ^2 -test: *** $p < 0.01$

^a Modest budget

Finally, in both ‘countries’ about half of group with an affordability problem (7 %) appears to be ‘overhoused’. In the owner-occupied sector—and especially for the outright owners—the combination of affordability problems and overhousing is relatively widespread, in Flanders as well as the Netherlands. It is logical that overhousing appears most frequently in relative terms among outright homeowners, since more than two-thirds of this group are pensioners. But also in the rental sector, a substantial part of the households that fall below the RI-norm live in a ‘overhoused’ manner, both in Flanders and the Netherlands. These results point out that the share that has a residual income below the RI-threshold might substantially decrease if each household would choose to live in a dwelling that exactly fits their family size. Of course, due to future family expectations, recent changes in family composition (children leaving) or preferences for large dwellings, an exact fit between family and dwelling size will not always be achieved.

7 Conclusions

The aim of this contribution was to analyse the usefulness of the budget approach in comparison with the ratio approach for comparing housing affordability across households and across countries. We discussed the advantages of the budget approach in comparison with the ratio approach for a single country analysis. From the discussion of the ways of measuring the price or rent of housing consumption, it follows that a ratio approach—for example 30 % of income spent on housing is considered affordable—regardless of income level or household size can never be a very precise indicator of whether households can afford the access to their dwelling. It can, however, be used to observe whether households in due course are needing to pay more or less over time for their housing, for example.

A residual income approach based on budget standards starts from the other end, determining first what cash amounts different household types need minimally for their ‘other’ consumption next to housing. Then it determines whether residual income, the disposable income left after housing expenses are deducted, is sufficient for this other consumption. If not, housing is considered unaffordable for a household. From a methodological point of view, the budget standard thus must be considered superior to a rule of thumb of for instance 30 %. It is also more precise than the ratio and would be more useful in the case of determining norms for housing allowances and mortgage loans.

Despite its methodological advantages for single country analyses, affordability comparisons across countries using the budget standard, especially based on absolute amounts of budget needed, are yet not found in literature. When applying the budget standard to Flemish and Dutch housing expenses in 2005, we find that in both ‘countries’ these results differ from the results based on the affordability ratio. Especially, for the rental sector—which often policy makers focus on, especially the social sector—these results are relevant. With the ratio approach, housing consumption is considered unaffordable for larger shares of private tenants than social tenants, while with the budget approach, it is the other way around. This effect is stronger in Flanders than the Netherlands, as the residents of the social-rented sector in Flanders are relatively poorer. More in general, the budget standard will define the situation of the poorer groups—such as the social tenants in case of housing tenure—more problematic than the ratio. As the budget approach is more precise in signalling which households cannot afford their housing consumption in terms of other consumption needs, it would seem that this result has certain policy consequences.

Regarding analyses across countries, we suggest that the budget standard offers interesting possibilities in pinpointing households that really can be considered having troubles

in financing their housing consumption. In such an analysis, it is yet necessary to take into account that the definition of housing that is considered affordable is relative to the society one lives in. In our example, the two ‘countries’—Flanders and the Netherlands—have a similar living standard, which is reflected in similar budget norms. In case the living standard is strongly different, the budgets that are needed for a decent participation in society will differ to a large extent. A comparison using budget norms will still be possible when these differences in living standard are thoroughly discussed. The comparison will then be carried out relatively to the living standards of the countries at stake. This also will be a useful approach when the methods for drawing the budget standards differ between the countries; therefore, the budget approach for residual income will still be useful in a comparative setting. As shown in our analysis for Flanders and the Netherlands, the comparison can focus on the differences in relative position of groups of households, such as tenure status, activity status of the head of household or household type.

Furthermore, an affordability comparison between countries using the budget standards may inform us about the way the income support systems perform. In our study, Flanders and the Netherlands are at the same level regarding the percentage of unemployed and sick/disabled that fall below the residual income standard. Concerning the (early) retired, the Netherlands performs significantly better than Flanders.

Affordability, however, is not only about the price of housing consumption and a threshold of reasonableness in relation to income, it ideally should also be about the quality of housing being consumed in relation to needs. It would show whether the price and income thresholds are related to the same or different level of quality that is being consumed. Our analysis pointed out that the use of a housing standard in a comparative budget approach analysis is feasible and adds interesting points to the results. We pointed out that in both ‘countries’, the group falling below the RI-threshold might significantly increase, if households would choose not to live in overcrowded dwellings. On the other hand, about half of the group below the RI-standard lives in a dwelling that is larger than strictly needed. Here, there is a chance for reducing the group with affordability problems. To some extent, the ‘overconsumption’ of housing in terms of room numbers is a temporary phenomenon, as families anticipate future children. But on the other hand, many older families still live in a dwelling that was initially chosen for raising a family.

Acknowledgments We would like to thank Gust Mariën (OTB-TU Delft) for calculating the results for the Netherlands.

References

- Bourassa, S. C. (1996). Measuring the affordability of home-ownership. *Urban Studies*, 33(10), 1867–1877.
- Bradshaw, J. (Ed.). (1993). *Budget standards for the United Kingdom*. Aldershot: Avebury.
- Bradshaw, J., & Mayhew, E. (2010a). *The measurement of extreme poverty*, Second Draft Final Report. York, The University of York: Social Policy Research Unit.
- Bradshaw, J., & Mayhew, E. (2010b). Understanding extreme poverty in the European Union. *European Journal of Homelessness*, 4(December), 172–186.
- Bramley, G. (2012). Affordability, poverty and housing need: triangulating measures and standards. *Journal of Housing and the Built Environment*, 27(2), 133–151.
- Brounen, D., Neuteboom, P., & van Dijkhuizen, A. (2006). *House prices and affordability—a first and second look across countries*. Working paper, Amsterdam: DNB.
- Burke, T., Stone, M., & Ralston, L. (2011). *The residual income method: A new lens on housing affordability and market behaviour*. Final Report, Melbourne: AHURI.

- Cantillon, B., Lefebure, S., & Van den Bosch, K. (2009). De materiële levensomstandigheden van ouderen in Vlaanderen: Lessen uit Europa. In B. Cantillon, K. Van den Bosch, & S. Lefebure (Eds.), *Ouderen in Vlaanderen en Europa. Tussen vermogen en afhankelijkheid*. Leuven/Den Haag: Acco.
- Capéau, B., & Pacolet, J. (2009). Vertel me niet hoe rijk je bent, ik zie de kleren die je draagt. In B. Cantillon, K. Van den Bosch, & S. Lefebure (Eds.), *Ouderen in Vlaanderen en Europa. Tussen vermogen en afhankelijkheid*. Leuven/Den Haag: Acco.
- Chaplin, R., & Freeman, A. (1999). Towards an accurate description of affordability. *Urban Studies*, 36(11), 1949–1957.
- De Decker, P., & Van Dam, R. (2005). De huisvestingsval, of wat huishoudens overhouden na het betalen van hun woonkosten. In: De Decker, P., Goossens, L., & Pannecoucke, I. (Eds.), *Wonen aan de onderkant*. Antwerpen, Apeldoorn: Garant, pp. 93–112.
- Freeman, A., Kiddle, C., & Whitehead, C. (2000). Defining affordability. In S. Monk & C. Whitehead (Eds.), *Restructuring housing systems: From social to affordable housing?* (pp. 100–105). York: Joseph Rowntree Foundation.
- Gabriel, M., Jacobs, K., Arthurson, K., Burke, T., & Yates, J. (2005). *Conceptualising and measuring the housing affordability problem*. Research Paper 1, Australian Housing and Urban Research Institute (AHURI), National research Venture 3.
- Haffner, M. E. A., & Boumeester, H. J. F. M. (2010). The affordability of housing in the Netherlands: An increasing income gap between owning and renting? *Housing Studies*, 25(6), 799–820.
- Hancock, K. E. (1993). Can pay? Won't pay? or economic principles of 'affordability'. *Urban Studies*, 30(1), 127–145.
- Heylen, K., & Haffner, M. (2009). Inkomensongelijkheid en woonuitgaven in Vlaanderen en Nederland. *Tijdschrift voor Sociologie*, 30(2), 143–175.
- Hulchanski, D. J. (1995). The concept of housing affordability: Six contemporary uses of the housing expenditure-to-income ratio. *Housing Studies*, 10(4), 471–492.
- Kemp, P. (2007). Housing allowances in the advanced welfare states. In Kemp, P. A. (Ed.) *Housing allowances in comparative perspective*. Bristol: The Policy Press, pp. 265–287.
- MacLennan, D., & Williams, R. (Eds.). (1990). *Affordable housing in Britain and the United States*. York: Joseph Rowntree Foundation.
- Quigley, J. M., & Raphael, S. (2004). Is housing unaffordable? Why isn't it more affordable? *Journal of Economic Perspectives*, 18(1), 191–214.
- Saunders, P. (1998). *Using budget standards to assess the well-being of families*. Discussion Paper No. 93, Australia: Social Policy Research Centre (SPRC).
- Soede, A., & Vrooman, C. (2008). *Beyond the breadline. A poverty threshold based on a generalised budget approach*. The Hague: The Netherlands Institute for Social Research SCP.
- Stone, M. E. (2006a). What is housing affordability? The case for the residual income approach. *Housing Policy Debate*, 17(1), 151–184.
- Stone, M. E. (2006b). A housing affordability standard for the UK. *Housing Studies*, 21(4), 453–476.
- Storms, B., & Van den Bosch, K. (Eds.). (2009). *Wat heeft een gezin minimaal nodig? Een budgetstandaard voor Vlaanderen*. Leuven/Den Haag: Acco.
- Thalmann, P. (2003). 'House poor' or simply 'poor'? *Journal of Housing Economics*, 12, 291–317.
- Waite, G., & Henman, P. (2005). *Applying budget standards to assess housing affordability*. In Paper presented at the national housing conference, Australia: Perth.
- Wood, G. & Ong, R. (2011). Factors shaping the dynamics of housing affordability in Australia 2001–2006. *Housing Studies*, 26(7–8), 1105–1127.
- Yates, J., & Milligan, V. (2012). Policies to support access and affordability of housing. In Smith, S. J., Elsinga, M., O'Mahony, L. F., Eng, O. S., Wachter, S., & Wood, G. (Eds.) *International encyclopedia of housing and home*, Vol. 5, Oxford: Elsevier, pp. 293–305.
- Yip, N. M., & Lau, K. Y. (2002). Setting rent with reference to tenants' affordability: public housing rent setting in Hong Kong. *Journal of Housing and the Built Environment*, 17, 409–418.