Cambridge Centre for Housing & Planning Research

Market-pegged social rents & local income distributions

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Table of Contents

Index of Tables

1 Introduction

The Spending Review, in October 2010, introduced a new Affordable Rent regime for the delivery of affordable housing from 2011 to 2015. From 2011, registered providers (RPs) of social housing are allowed to raise rents on new and re-let properties to up to 80 per cent of local market levels to fund development. The new Affordable Rent regime is likely to bring significant challenges to RPs on maintaining the supply of affordable housing, but at rents people can actually afford. This becomes a particular issue for London, especially in the more expensive areas in both inner and outer London.

With over 55,000 homes and more than 161,000 residents, Affinity Sutton is one of the largest RPs in the country. As one step in setting affordable social rents, Affinity Sutton has commissioned the Cambridge Centre for Housing and Planning Research (CCHPR) to design a model to estimate the affordability of market-pegged social rents for potential tenants.

This report sets out the findings from five local authority case studies in southern England using the CCHPR approach. The aims are to:

- set out the possible bases for determining affordable rents in relation to income, using net income and residual income criteria; and
- clarify the household composition and related income distribution of potential tenants within the new affordable rents regime.

The report contains 7 sections. Following this introduction, Section 2 gives an overview of how to measure affordability and the relative strengths and weaknesses of these measures. Section 3 compares the affordability ratios in the social and private rented sectors. Section 4 provides a brief background of the five local authority case study areas. Section 5 describes how local housing market areas are defined in existing literature and explains our methodology and the limitations of data sources. Section 6 describes our model and the results of the five case studies. The final section provides bibliographic details for works referenced in the text.

2 Measuring affordability

There is an extensive literature on identifying households facing affordability problems and the means by which affordability should be measured (Hancock, 1993; Hulchanski, 1995; Chaplin and Freeman, 1999; Stone, 2006). The starting point for affordability analysis requires a normative judgement about the appropriate relationship between the costs of provision of an 'acceptable' standard of housing and the income that needs to be left over to pay for other basic non-housing requirements.

There are two broad types of affordability measures used: one is based on the ratio of housing costs (rent in private and social rental housing) to income and the other on the residual income remaining after meeting these housing costs. The former allows the researcher to identify the proportion of income that should not be exceeded when paying for a home of adequate size and quality. The latter is tied to an assessment of whether the income left over after paying for a decent home is sufficient to allow a 'reasonable' standard of living.

2.1 Rent-to-income ratio

The rent-to-income ratio is the oldest and the most commonly used affordability measure. Conventionally, 25 per cent of net income was accepted as the maximum rent that should be regarded as affordable, irrespective of the type of household and its total budget or other costs. This standard originated in the 19th century studies of household budgets and was based more upon notions of common sense than on scientifically developed expertise (Malpass and Murie, 1999). In both Canada and the USA, a 30 per cent ratio is used extensively (Quigley and Raphael, 2004; Gabriel *et al*., 2005; Newman, 2007; Jewkes and Delgadillo, 2010). In Australia, benchmark ratios are set at 25 per cent for public renters and 30 per cent for private renters (Hulse, 2007). It should be noted that rents in the private sector is included other charges, such as service charges, property taxes, etc.

In the UK, there has been no official definition of housing affordability. In the absence of a government definition, the National Housing Federation (NHF) (which represents 1,200 HAs in England) has taken the lead in formulating a definition of affordability in the social housing sector. The Federation defines affordability as a 25 per cent rent-to-income ratio for new tenant households in work (NHF, 1999). In using this ratio, it is assumed that the allocation to social housing will ensure an adequate housing standard.

Strengths: One obvious advantage of using a ratio to define affordability is its simplicity. It is very easy to calculate and understand. Because the measure is a ratio, it can be easily compared across areas and nations, and over time.

Weaknesses: A common weakness of the ratio is the failure to account for the diversity of household types and the influential factor of household size in household expenditure (see Lerman and Reeder, 1987; Stone, 1990; Whitehead, 1991; Fallis, 1993; Hancock, 1993; Bramley, 1994, 2006; Hulchanski, 1995; Chaplin and Freeman, 1999; Thalmann, 2003; Gabriel *et al.*, 2005). The ratio also does not distinguish between households with very different income levels (Chaplin and Freeman, 1999). For example, Stone (1990) challenges that many of the lowest income households cannot afford to pay even 25 per cent of their meagre incomes for housing. The ratio approach does not encompass any measure of the quality of the housing. By focusing on actual payments, no allowance is made for differences in quality between households. A low ratio for a particular household may seem satisfactory, but this data tells us nothing about the standard of their housing. Fallis (1993) also points out that the underlying issue of the housing affordability problem is the inadequate consumption of all necessities due to inadequate income, not the allocation of more than a prescribed ratio of income to housing. Such weakness in the traditional ratio standard of affordability has led to a strong argument to use an alternative measure of affordability, residual income.

2.2 Residual income

The residual income approach is often used by policy makers to quantify government income assistance and has been influential in determining the eligibility and levels of housing subsidies in Hong Kong, New Zealand and the USA (Ho and Chiu, 2002; Gabriel *et al.*, 2005; Robinson, Scobie and Hallinan, 2006). It recognises that low income people do not have enough resources to meet their needs; needs not only for shelter, but also for food and clothing. It attempts to address some of the basic problems of the rent-to-income measure by taking account of the household's capacity to maintain an acceptable standard of living with the income remaining after paying for housing costs. It is most relevant for analysing the affordability of housing for the poorest households. This approach requires the measurement of the minimum levels of disposable income to achieve minimum acceptable standards of living. It also forms the basis of the traditional Housing Benefit (HB) formula. There are two generally acceptable ways of setting an affordable residual income standard: the poverty line standard and a budget standard, with the former the more common.

2.2.1 The poverty line standard

The poverty-line standard is commonly used to define the level of income necessary to afford a certain minimum standard of living. In Australia, the Henderson poverty-line is used to identify families with after-tax incomes that are below a set poverty-line, which varies according to family type (Landt and Bray, 1997). In UK, the threshold measure of poverty since at least the late 1990s is 60 per cent of the contemporary median household income

(see Brewer, Goodman and Leicester, 2006; Palmer and Kenway, 2007; Kenway, 2008; McKendrick *et al*., 2008), which is the agreed international measure used throughout OECD countries (Seymour, 2009). This measure looks at the gap between the poorest and the middle, not the poorest and the richest. Each year, the Department for Work and Pension's (DWP) survey of Households Below Average Income (HBAI) determines 60 per cent of contemporary median incomes for a range of different family types, adjusted for household size and composition, before and after housing costs. Those having incomes below this threshold are regarded as in *relative* income poverty (or poverty for short); i.e., households are so short of resources that they are unable to attain the minimum norm for the society in which they live. The UK government tends to use incomes before housing costs to classify households living in poverty, particularly for international comparison as the number is lower. However, many researchers and poverty campaigners prefer to use income figures after housing costs because this is a more effective measure of disposable income, particularly given the relatively high housing costs (mortgage and rent payments) in the UK (Seymour, 2009).

2.2.2 Budget standard

The budget standard approach determines the acceptable minimum standard of expenditure in a particular place at a particular point in time. This approach assumes that housing programmes should be designed to reduce housing costs to an amount that leaves sufficient income left to pay for the other necessities of life (Whitehead, 1991; Burke, 2003). Whereas many countries have poverty-line thresholds, very few countries have official budget standards. In the US, some work has been carried out using income standards as a residual income measure for housing affordability, e.g., the 'shelter-poverty' scale of poverty suggested by Stone (1990), or house poverty of Kutty (2005). In UK, the HB system is designed to protect residual income (Stephens, 2005), which is to ensure that, in general, households at or below the official Income Support standard have all their housing costs met and are brought up to that level. Households above that level have their HB withdrawn at a fairly steep rate. Under such circumstance, Hancock (1993) used the Income Support Applicable Amounts (ISAM) to derive acceptable residual income standards for social rental housing in Glasgow.

$$\textit{Residual income} = \textit{income} - \textit{rent} - \textit{ISAM} + \textit{HB}$$

For housing to be affordable, income should not in principle fall below ISAM even if income support is the only income, and therefore residual income should always be greater than zero. The higher the residual income, the more affordable the housing, in the sense of

having some income left over to buy other items. Where residual income is negative, there is a serious problem of affordability.

Strengths: Residual income measures have higher sensitivity to the diversity of household types then rent-to-income ratios. They focus on non-housing costs, which are more applicable on measuring poverty after housing costs for low income households.

Weaknesses: The most obvious weakness is that residual incomes require income data, which are not commonly available. Also, the income data require adjustment to take account of the different household sizes on the disposable income. While addressing the problem of rent-to-income ratio on the diversity of household types and the influential factor of household size in household expenditure, residual income measures also suffer from all the other flaws of ratios, likely the quality of housing. The fact that a household may be able to "afford" a house in a given region might simply be due to its lower quality or relative inaccessibility. That is, differing affordability values may simply reflect accessibility premiums and different neighbourhoods.

2.3 Combination of rent-to-income ratio and residual income

While the rent-to-income ratio compares the actual ratio (and actual housing expenditure) with the normative maximum (such as 25 or 30 per cent), residual income compares income after housing costs with either the budget required to sustain minimum non-housing consumption as set in the poverty line definition, or with the levels set by the social security system in the UK (such as the ISAM). There is no *a priori* way of deciding which approach is the better for assessing housing affordability. To the extent that housing affordability is largely a problem for low-income households, "the concern is not the percentage, but rather the joint incidence of a high rent-to-income ratio *and* low income" (italics original; Fallis, 1993, p. 86). This implies that the housing cost (rent-to-income ratio) and the non-housing cost (residual income) measures should be brought together, not used separately.

It should be noted that relative differences in rent-to-income ratio or residual income may not reflect differing levels of affordability, but rather differing preferences. Housing is a consumer good, and it is reasonable to expect people to have varying preferences for trading-off housing and other expenditure items. Similarly, people may have a relatively unaffordable housing position by choice due to their life cycle position. A good example is current or recent students, who are not earning very much at present, but have large amounts of human capital and reasonably expect to have high future income streams. The point-in-time measure shows them being in a state of relative un-affordability, but they have chosen this position since they believe they can afford it over the medium to long term.

3 Affordability in the RP sector

This section examines how affordability in the RP sector has developed over the period 2002/03 to 2008/09. It looks at the spatial distribution of affordability in the RP sector by rent to income ratios in the sector and by residual income measures. It also compares rents with lower quartile earnings by region to give some ideas of the position of potential tenants. Finally, it compares the position of RP tenants with those in the private rented sector.

3.1 Rent-to-income ratios in the RP sector

Table 1 shows rent-to-income ratios in the RP sector. The RP rents data were taken from CORE (COntinuous REcording system) and were average general needs rents for all assured lets (new lets and re-lets), excluding sheltered housing. RP incomes data were taken from CORE and were average general needs net weekly household incomes. Incomes related only to tenants in new let and re-let tenancies in the RP sector (excludes sheltered and warden assisted units). Two income measures were used in this analysis: one measuring income before HB and one measuring income plus HB, which reflects the overall income from which rent is paid. CORE is a summary of in-flows from 1st April to 31st March.

Table 1 and Table 2 show that London was the least affordable region, including and excluding HB. Affordability in the capital worsened between 2002/03 and 2007/08. Outside London, the differences in rent-to-income ratios between other regions seem to be quite minor. The national ratios and ratios in other regions were more or less unchanged over the six years, both with and without HB. This was because RP entrant's incomes rose faster than rents across the country except in the capital.

Table 1: Rent-to-income (excluding HB) ratios in the RP sector by region, 2002/03 to 2008/09

Region	2002/03	2007/08	2008/09
East Midlands	0.36	0.34	0.35
Eastern	0.35	0.34	0.36
London	0.44	0.50	0.49
North East	0.35	0.33	0.33
North West	0.36	0.36	0.36
South East	0.37	0.38	0.38
South West	0.36	0.34	0.35
West Midlands	0.36	0.36	0.38

Yorkshire and the Humber	0.35	0.33	0.34
ENGLAND	**0.37**	**0.37**	**0.38**

Notes: RP rent is the average general needs rents for all assured lets (new lets and re-lets). RP income is the average general needs net weekly household incomes which are related only to tenants in new let and relet tenancies in the RP sector.

Source: 2002/03, 2007/08 and 2008/09 CORE.

Table 2: Rent-to-income (including HB) ratios in the RP sector by region, 2002/03 to 2008/09

Region	2002/03	2007/08	2008/09
East Midlands	0.30	0.29	0.29
Eastern	0.30	0.29	0.31
London	0.35	0.38	0.37
North East	0.30	0.29	0.28
North West	0.31	0.30	0.30
South East	0.31	0.32	0.32
South West	0.31	0.29	0.30
West Midlands	0.31	0.30	0.32
Yorkshire and the Humber	0.30	0.29	0.29
ENGLAND	**0.31**	**0.31**	**0.31**

Notes: RP rent is the average general needs rents for all assured lets (new lets and re-lets). RP income is the average general needs net weekly household incomes which are related only to tenants in new let and relet tenancies in the RP sector.

Source: 2002/03, 2007/08 and 2008/09 CORE

What is clear and unsurprising is that HB improves affordability by a significant amount, and again has the greatest effect in London. Without HB, new entrants would have been paying consistently well over 40 per cent of their incomes in rent (Table 1) whilst including HB as income, the percentage fell to around 35 per cent (Table 2). HB is taking the strain of both higher rents and higher increases in rents in the capital.

3.2 Residual income in the RP sector

Two different residual income standards are used to define RP tenants with residual incomes that are below the minimum income standards. For existing tenants, the residual income standard is 60 per cent of the current year median (equivalised) household income. There are two variants of the 60 per cent thresholds for low-income: Before Housing Costs (BHC)

and After Housing Costs (AHC). Housing costs include gross rents (rents and service charges), sewerage charges and water rates. HBAI dataset provides numbers and characteristics of people in 'low income' households when their equivalised disposable household incomes are below the 60 per cent thresholds on BHC and AHC basis. In the case of new tenants, based on details of household composition and net weekly income (which includes take home pay, child benefit, occupational pension, tax credits and other incomes, but excludes HB, council tax credit, interest from savings and Income Support), CORE calculated the residual income remaining after the rent to compare this with the ISAM. It is generally acceptable that households should have minimum residual incomes at the level of 120 per cent of ISAM so that there is adequate income left over to buy other items.

Table 3 shows average regional proportions of existing and new RP tenants with residual incomes below minimum income standards in the years 2005/06 to 2007/08. First, for existing tenants, the proportion of tenants in England having disposable incomes below 60 per cent of contemporary median income, the poverty-line, was 26 per cent on a BHC basis, and 43 per cent on an AHC basis. Proportions of existing tenants below the BHC's poverty-line were higher in central and northern regions, with Yorkshire and the Humber having the highest proportion at 32 per cent. But compared with the BHC, London, the South East and the Eastern region experienced much greater proportions of households falling below the AHC's poverty-line. London had the greatest difference in proportions of existing tenants below the poverty-line between the BHC (24%) and AHC bases (49%). In no other region in the country do housing costs make such a big difference. This suggests that the smaller proportion of existing tenants below the BHC's poverty-line may overstate the relative higher living standards for low-income households in London, who receive HB and whose HA rents are the highest in England. HB offsets the higher rents and is counted as an income, thus, there is an associated increase in the proportion of households having income falling below the AHC's poverty-line.

For new tenants, Table 3 shows that over half of households entering the RP sector had residual incomes that were below the 120 per cent of ISAM. London, once again, had the highest proportion of new tenants (62%) with residual incomes below this standard. The North East and the South East, on the other hand, had the lowest proportions (both 51%).

Table 3: Proportions of existing and new tenants below residual income standards by region, 2005/06–2007/08 (three year average)

	Existing tenants			New tenants
	Before Housing Costs	After Housing Costs		120% Income Support standard
North East	28%	42%		51%
North West	31%	42%		54%
Yorkshire and the Humber	32%	41%		52%
East Midlands	27%	39%		54%
West Midlands	29%	42%		56%
Eastern	24%	43%		55%
South West	25%	38%		54%
South East	20%	41%		51%
London	24%	49%		62%
ENGLAND	**26%**	**43%**		**54%**

Note: Housing costs include gross rents (rents and service charges), sewerage charges and water rates.

Sources: 2005/06–2007/08 HBAI and 2005/06–2007/08 CORE.

3.3 Rent-to-income ratios in the private and RP sectors

Table 4 compares RP rents with lower quartile (LQ) earnings obtained from the Annual Survey of Hours and Earnings (ASHE). The ASHE is a one per cent sample of employees in the HM Revenue and Customs PAYE records as at April, providing information about the levels, distribution and make-up of earnings and hours worked for employees within industries, occupations and regions. The data used in this analysis are based on place of residence.

Table 4 shows a different picture of RP rental affordability to that depicted in Table 1. This is because RP rents have risen more slowly than income and were based on the Retail Price Index (RPI) + ½ per cent constraint on annual increase. The national ratio increased by two percentage points over the six years, making RP rents slightly less affordable by 2008/09. London was the most affordable in 2002/03 but had become the third least affordable by 2008/09; because of the relatively low increases in earnings in lower paid employment.

Table 4: RP rent vs LQ ASHE earnings by region, 2002/03 to 2008/09

Region	2002/03	2007/08	2008/09
East Midlands	0.30	0.31	0.31
Eastern	0.31	0.32	0.33
London	0.28	0.31	0.33
North East	0.30	0.29	0.29
North West	0.29	0.29	0.30
South East	0.31	0.34	0.35
South West	0.34	0.34	0.34
West Midlands	0.30	0.31	0.32
Yorkshire and the Humber	0.31	0.29	0.30
ENGLAND	**0.30**	**0.31**	**0.32**

Sources: 2002/03, 2007/08 and 2008/09 ASHE datasets, 2002/03, 2007/08 and 2008/09 CORE.

Table 5: Private rent/LQ ASHE earnings by region, 2002/03 to 2008/09

Region	2002/03	2007/08	2008/09
East Midlands	0.40	0.45	0.45
Eastern	0.47	0.55	0.53
London	0.58	0.64	0.72
North East	0.43	0.41	0.45
North West	0.41	0.43	0.48
South East	0.49	0.55	0.59
South West	0.53	0.54	0.56
West Midlands	0.43	0.47	0.49
Yorkshire and the Humber	0.45	0.41	0.49
ENGLAND	**0.49**	**0.54**	**0.58**

Notes: Private rents in 2007/08 are Valuation Office Agency (VOA) referred rents. 2008/09 private rents were imputations using 2008/09 Hometrack lower quartiles and rent/stock relativities from 2007/08 VOA referred rents.

Sources:2002/03, 2007/08 and 2008/09 ASHE datasets, VOA and Hometrack.

In the private rented sector, all rent-to-income ratios based on LQ earnings were 40 per cent and above (Table 5), reflecting major problems of affordability for private tenants who were just above the HB eligibility level or do not take up HB. The national ratios increased by nine percentage points over the six years, making private rents even less affordable by 2008/09. London was by far the least affordable, followed by the surrounding regions.

3.4 The overall picture of affordability in the RP sector

The overall picture suggests that the RP sector is generally far more affordable than private sector housing across the country. It also suggests that HB ensures that RP tenants have lower rent-to-income ratios than those in the private sector.

London stands out as particularly problematic with both higher rent-to-income ratios and higher proportions of RP tenants having residual incomes below the minimum income standards (for both poverty line and ISAM). RP tenants in London appear to come from further down the income scale, resulting in the worsening affordability in the capital.

4 The five local authority case study areas

The five case studies chosen were all located in the southern part of England: Brighton and Hove, Bromley, Hertsmere, Mid Sussex and Plymouth. Table 6 gives a summary of population characteristics of these five local authority areas. Brighton and Hove had a higher proportion of 16–59 year olds because of the high proportion of university students who lived in this area. In contrast, Mid Sussex had a lower proportion of 16–59 year olds because of a higher population of pensioners than the national average.

Table 6: Population and households in the five local authority case study areas

	Mid–2009 population		2001 Census households		
	Total	16–59	Total	Single person	Single parent
Brighton & Hove	256,300	65.4%	118,953	37.8%	6.8%
Bromley	310,200	60.2%	125,866	30.8%	9.2%
Hertsmere	98,900	59.3%	37,869	27.2%	9.2%
Mid Sussex	131,600	58.4%	51,969	26.9%	6.8%
Plymouth	256,700	64.0%	102,540	32.1%	10.2%

Sources: Mid-year population estimates; 2001 UK Census of Population

Also, Mid Sussex had the highest employment rate of 81 per cent, while Plymouth had the lowest of 70 per cent (Table 7). In general, there is a notable disparity of average earnings between those who live in the area and those who work in the area. In Brighton and Hove, Bromley and Mid Sussex, the average gross annual earning of those working within the area was significantly lower than those who were residents in the area.

Table 7: Employment and earnings in the five local authority case-study areas

	Employment rate	2010 Median Gross Weekly Pay	
	Oct 09-Sep 10	By residence	By workplace
Brighton & Hove	70%	£522.60	£479.20
Bromley	74%	£652.10	£530.60
Hertsmere	76%	£573.40	£595.80
Mid Sussex	81%	£574.70	£512.60

Plymouth	70%	£458.80	£485.20

Sources: Annual Population Survey; Annual Survey of Hours and Earnings

Table 8 and Table 9 show the three-year average of 2007/09 to 2009/10 rent-to-income ratios of RP tenants in new let General Needs tenancies in these five case study areas.[1] Plymouth had the lowest average rent-to-income ratio (27%) in new lets while Bromley had the highest (45%). Table 8 shows that household with only one adult (1 elder, 1 adult and 1 adult & 1+ children) were more likely to have higher rent-to-income ratios than couple households whether with or without children. Such pattern reflects a probable effect of household size on the level of income as households with only one adult tend to have lower household incomes than households with two or more adults. On the other hand, there is a possible additional effect of high rents on rent-to-income ratios. For example, single parents have to pay higher rents for living in larger size properties which can accommodate their children. The combination of their low income and the average higher rent contributed to the relatively high rent-to-income ratios.

Table 8: Rent-to-income ratios of the RP sector in the case study areas, by household type, average 2007/08–2009/10,

	Brighton & Hove	Bromley	Hertsmere	Mid Sussex	Plymouth
1 elder	58%	53%	n.a.	68%	31%
2 elders	10%	22%	n.a.	15%	22%
1 adult	49%	53%	41%	43%	35%
1 adult & 1+ children	46%	52%	48%	46%	33%
2 adults	26%	37%	26%	26%	19%
2+ adults & 1+ children	26%	32%	22%	29%	20%
Other	48%	52%	39%	50%	33%
Total	43%	45%	33%	34%	27%

Source: 2007/08–2009/10 CORE General Needs Housing

Table 9 shows that RP new lets rents were general affordable for tenants who were working full-time, the rent-to-income ratios were within the range of 30 per cent.

1 Even with the aggregate of three years data, the total numbers of new lets for each local authority area were still very small, less than 350. In some cases, less than 100, for example, 87 in Mid Sussex.

Table 9: Rent-to-income ratios of the RP sector in the case study areas, by economic status, average 2007/08–2009/10,

	Brighton & Hove	Bromley	Hertsmere	Mid Sussex	Plymouth
Other > 16	38%	n.a.	n.a.	n.a.	43%
Working full-time	30%	29%	24%	26%	18%
Working part-time	23%	38%	34%	38%	30%
Govt training/New Deal	n.a.	54%	n.a.	n.a.	n.a.
Unemployed	40%	51%	133%	88%	38%
Retired	54%	58%	20%	52%	30%
Home/not seeking work	49%	54%	56%	47%	34%
Student	35%	52%	n.a.	55%	31%
Sick or disabled	47%	56%	85%	63%	33%
Total	43%	45%	33%	34%	27%

Source: 2007/08–2009/10 CORE General Needs Housing

5 Research methods

The core of the research involves estimating the income distributions for different groups of households at the local level. These can then be compared against the minimum income income levels required to meet given rents whilst satisfying specified affordability criteria as described earlier in this paper.

Wilcox and Bramely (2010) develop a multi-stage procedure to produce model-based estimates of average incomes and the distribution of incomes for all households and key sub-groups of younger households. This starts from the main official data source on incomes, the Family Resources Survey (FRS). The typical error margin would be of the order of five per cent or less; smaller for larger authorities or sub-regions, larger for smaller units or smaller sub-groups of households. Our model uses a similar set of sources, but a different estimation method. It separates working from non-working households at an early stage, and uses income predictors that are closely aligned to the DCLG household projection categories.

5.1 The household projections

DCLG has published new 2008-based household projections. These use a new method, and produce results that are more detailed in their estimation of the number of dependent children and adults within household types. These are set out in Table 10.

Table 10: Household types used in the DCLG projections and their equivalents in the modelling exercise

DCLG projection household types		Modelled household types	
Code	**Description**	**Code**	**Description**
OPM	One person, male	**OPM**	One person, male
OPF	One person, female	**OPF**	One person, female
OCZZP	Couple, no children	**CP**	Couple, no children
OC1P	Couple, 1 child	**CP1K**	Couple, 1 child
OC2P	Couple, 2 children	**CP2K**	Couple, 2 children
OC3P	Couple, 3+ children	**CP3K**	Couple, 3+ children
OL1P	Lone parent, 1 child	**LP1K**	Lone parent, 1 child
OL2P	Lone parent, 2 children	**LP2K**	Lone parent, 2+ children
OL3P	Lone parent, 3+ children	**LP2K**	Lone parent, 2+ children
MCZDP	A couple, 1+ other adults, no children	**MA**	Multi-adult
MC1P	Couple, 1+ other adults, 1 child	**MAK**	Multi-adult with children
MC2P	Couple, 1+ other adults, 2 children	**MAK**	Multi-adult with children
MC3P	Couple, 1+ other adults, 3+ children	**MAK**	Multi-adult with children

ML1P	Lone parent, 1+ other adults, 1 child	**MAK**	Multi-adult with children
ML2P	Lone parent, 1+ other adults, 2 children	**MAK**	Multi-adult with children
ML3P	Lone parent, 1+ other adults, 3+ children	**MAK**	Multi-adult with children
OTAP	Other household	**MA**	Multi-adult

It is worth noting that the projections include a large number of distinct household types with multiple adults, which, in national survey data, are individually relatively rare. These are therefore compressed into a more limited set of types in order to provide more robust estimates of their income distributions.

Alongside this categorisation by household type, the projections also distinguish units by the age of the household reference person (HRP). These are generally done by ten-year age groups (for example, 35 to 44), with more detail around the age of retirement for men and women (distinguishing 55 to 59 from 60 to 64). The modelling is only concerned with households headed by someone under 65.

The household projections are available in an unrounded form with estimated numbers of households in each local authority under these two headings (type and age of HRP). These two classifications of age and composition together provide the main predictors used in modelling in order to estimate the proportion of working households and their income within each group.

5.2 Estimation of employment propensity

The first stage of modelling is to estimate the proportion of households in each small group that have someone in employment. This was done using data the Annual Population Survey, and fitting a binomial model that predicts whether or not there is one or more employed person in the household. This, as well as the models described in the next section, was carried out using the *svyglm* (Generalised Linear Models for Survey Data) package within R-statistics. This allows correct estimation from sample survey designs with grossing factors. The probit link function was used since this enables easier conversion of the derived parameters into probability density functions within Excel.

To allow estimation of local values, dummies for regional differences in employment propensities were replaced by administrative data on the age-specific rate of out-of-work benefit claims, reflecting spatial differences in employment. Since the input value for this parameter can be calculated at local as well as regional level, it can be re-used to estimate local values.

The final model parameters are shown in Table 11. The values do not have a straightforward interpretation, but a negative value indicates a lower probability of being in employment.

Thus, a higher claimant rate, lone parents and households headed by someone aged 16 to 24 have the lowest propensity to be in work. Couples with two children, and those aged 35 to 44 have the highest propensities.

Table 11: Model parameters for household employment propensities

	Predictor	Parameter estimate
	Intercept [base]	1.1475
	Claimant rate	-2.5365
Household types	CP	0.0000
	CP1K	0.0518
	CP2K	0.0984
	CP3K	-0.4802
	LP1K	-1.2811
	LP2K	-1.6113
	MA	0.0562
	MAK	-0.6051
	OPF	-0.9815
	OPM	-1.1013
Age of HRP groups	15_24	0.0000
	25_34	0.8388
	35_44	1.0192
	45_54	0.9219
	55_59	0.7159
	60_64	0.1647

5.3 Estimation of income distribution of working households

The next step is estimate the distribution of incomes of each unit of the household projections, for those households with a person in employment. This was done using the Family Resources Survey. Income distributions are skewed (there is a long tail of higher incomes) and somewhat bimodal for some household types (there is clustering around two levels, one representing average income for non-working households). However, treating employed households only, and applying a logarithmic transformation, an approximately nomal distribution can be derived. Such a distribution can be described by two values, its mean (centre point) and standard deviation.

The modelling of the FRS estimates parameters by which these values can be derived for a given household type in a given locale. This is conventional multiple linear regression. It

uses a similar set of predictors to the employment model to estimate the aggregated group means and group standard deviations of total net household income of each type and age combination in each region. The regional dummies are then replaced with data from the Annual Survey of Hours and Earnings to capture the underlying regional differences in average earnings. The parameter estimates for mean log(income) are given in Table 12.

Table 12: Model parameters for total net household income

	Predictor	Parameter estimate
	Intercept [base]	5.9118
	Median gross hourly pay	0.0352
Household types	CP	0.0000
	CP1K	-0.0463
	CP2K	0.0272
	CP3K	-0.0451
	LP1K	-0.6691
	LP2K	-0.5448
	MA	0.2092
	MAK	0.1136
	OPF	-0.6306
	OPM	-0.4970
Age of HRP groups	15_24	0.0000
	25_34	0.3079
	35_44	0.3621
	45_54	0.3354
	55_59	0.2350
	60_64	0.1460

The model shows that average earnings are highest for couples with two children, and lowest for lone parents. They are highest for households headed by someone aged 35 to 44, and lowest for someone aged 15 to 24. This is consistent with expectations. The model of standard deviations of income by household type and age of HRP has an identical form, using the inter-quartile range of gross hourly pay to capture spatial variation in rewards from employment.

5.4 Allocation to property size and type

A requirement of the model is that households be allocated to a property of exactly the size they are deemed to require by the bedroom standard used for the administration of Housing

Benefit. Some of the household types can unambiguously be allocated to a single property size (leaving aside special provisions for disability). Single persons and childless couples always require one bedroom; lone parents or couples with a single child always require two bedrooms.

Other households, such as those with two children, might be deemed to need a varying number of bedrooms, depending on the age and sex of the children. This information is not provided directly by the household projections. Therefore, to allocate households to properties of different sizes, data from the Annual Population Survey is again used. This is used to calculate the exact requirement of each household according to the rules, and the distribution of requirements is then calculated for each of the household types used in the modelling.

Table 13: Proportions of households requiring various sizes of dwelling, by household type

	1 bedroom	2 bedroom	3 bedroom	4 bedroom	5 or more
CP	1.00	0.00	0.00	0.00	0.00
CP1K	0.00	1.00	0.00	0.00	0.00
CP2K	0.00	0.64	0.36	0.00	0.00
CP3K	0.00	0.00	0.75	0.22	0.03
LP1K	0.00	1.00	0.00	0.00	0.00
LP2K	0.00	0.34	0.56	0.09	0.01
MA	0.00	0.51	0.33	0.12	0.04
MAK	0.00	0.00	0.46	0.32	0.22
OPF	1.00	0.00	0.00	0.00	0.00
OPM	1.00	0.00	0.00	0.00	0.00

This table is used to allocate each unit of the household projections to a particular size of dwelling. It is taken that households with children may be allocated to flatted dwellings.

5.5 Application of affordability criteria

At this point it is possible to estimate for each unit of the household projections in each local authority the proportion that are in employment, the average and range of their incomes, and the size of dwelling that is required. A gross market rent supplied by Affinity Sutton is used to derive potential sub-market rent levels. This is done by first taking the desired proportion of the gross market rent (for example, 80%) and then subtracting the average service charge for that size and type of dwelling in that locale to get a net rent.

For each household type and property size, a minimum income is calculated that satisfies both an affordability ratio of 35% net rent to net income, and a residual income of at least 100% of the relevant income support levels. Where the income support levels are not

straightforward (for example, multi-adult household types that include multiple benefit units) a common specific type of that household is assumed.

These minimum incomes for market and sub-market rents are tested against the income distribution for each element of the household projections to effect a division into

1. Households who can afford a market rent
2. Households who cannot afford a market rent, but could afford a sub-market rent at the given proportion of market rents
3. Households who cannot afford a market rent and could not afford a sub-market at the given proportion of market rents

Households who were identified as having no person in employment are also recorded by the property size they require; they may be interpreted as potentially in need but always requiring the assistance of Housing Benefit to pay the rent.

5.6 Definition of wider markets

The estimates of affordability look primarily at the local market: the match between the incomes of existing households already resident in the local authority of interest and the rent levels that might be offered in that local authority. It is possible that demand for sub-market rents might also come from households in a somewhat wider area. Therefore, figures for a wider housing sub-market area are provided.

For the wider housing market area, there are three sources of information that can be used:

- House prices and rates of change in house prices, which reflect household demand and preferences for different sizes and types of housing in different locations.
- Household migration and search patterns, reflecting preferences and the trade-offs made when choosing housing with different characteristics.
- Contextual data, such as travel to work areas, which reflect the functional relationships between places where people work and live.

Whichever source of information is used, there is likely to be some overlap between functional housing market areas identified. **A pragmatic approach is to group local authority administrative areas together as an approximation for functional sub-regional housing market areas** (emphasis original; DCLG 2007, p.6). This approach is followed: a combination of straightforward adjacency and commonality in housing markets described in local housing strategies is used to identify which authorities should be considered the 'wider market' for each of the case study authorities.

6 Some policy implications

The broad purpose of the estimates is as described: to estimate the number of households who cannot afford local market rents but who might find a sub-market rent affordable, with or without the assistance of Housing Benefit. The detailed results are as set out in the accompanying documents. There are a number of specific policy implications which might also be noted.

6.1 The total benefit cap

The government has proposed a cap on the total amount of state benefits that a household may receive in one year. It has stated that it would like to set this at £26,000 a year, one measure of average household income. The cap makes no allowance for variations between household sizes and between regions in the cost of living or average income. As discussed in some detail in a recent paper by the Chartered Institute of Housing, the risk that households find their benefits capped and thus their housing unaffordable is greatest for larger households in areas where housing costs are high (Lister, Reynolds & Webb 2011). Housing Benefit is a major component of the total benefits received by many households. Thus increasing the amount of rent against which this is paid by raising rents towards market levels inevitably increases the risk that households will be caught and punished by the proposed cap. An assessment of the potential effects is provided in Table 14.

Table 14: Potential effects of the total benefits cap on households with children, rents at 80% of market rents

	Couple and one child		Couple and three children	
	Two-bed house		Three-bed house	
JSA/IS	£105.95		£105.95	
CTB	£24.00		£27.00	
Child Tax Credits	£59.62		£157.88	
Child Benefit	£20.30		£47.10	
Total	£209.87		£337.93	
Remainder for HB	**£290.13**		**£162.07**	
	Net rent at 80%	**Cushion or (shortfall)**	**Net rent at 80%**	**Cushion or (shortfall)**
Brighton & Hove	£172.38	£117.75	£196.55	(£34.48)
Bromley	£144.22	£145.91	£174.70	(£12.63)
Hertsmere	£175.52	£114.61	£218.25	(£56.18)
Mid Sussex	£144.71	£145.42	£164.52	(£2.45)
Plymouth	£93.24	£196.89	£104.39	£57.68

Sources: Income components from Lister, Reynolds & Webb (2011); rents from CCHPR modelling.

This works through two examples, a couple and one child occupying a two-bedroom house, and a couple with three children in a three-bedroom house. In each case, the income is derived from state benefits, with the components set out in the upper half of the table. The weekly total of these non-housing benefits is then subtracted from the weekly cap of £500 to give a maximum amount remaining for Housing Benefit. The lower half of the table compares this amount against the potential rents if set at 80% of market values in each of the case studies. The difference between the maximum amount and the potential rent is either a cushion (where the maximum is sufficient to pay all the rent through Housing Benefit) or a shortfall (where the maximum is less than the net rent which would need to be paid). A shortfall implies the household would be penalised by that amount.

The table suggests that whilst no smaller households, with a single child, would be penalised by the total benefits cap initially, in all but one of the case study local authorities, rents set at 80% of market rents would cause the total benefits cap to be breached. The degree of the shortfall in Brighton (£34/week) and Hertsmere (£56/week) suggests that such tenancies would likely be unsustainable, since tenants would have to draw on large amounts of their other income to pay their rent. Even where the shortfall is less severe, it nonetheless implies that setting 'affordable' rents at 80% would increase income poverty among tenants whose rent was to be met in full by HB.

6.2 Affordable Rents and Local Housing Allowance

The HCA in its framework document indicated that whilst 'affordable' rents would be treated as Housing Benefit is for the RP sector at present, rather than as Local Housing Allowance (LHA) for private tenancies. At the same time, however, the HCA noted that it was expected that 'affordable' rents would not exceed the prevailing LHA rates, which have since April 2011 been set at the 30th percentile of local rents as assessed by the Valuation Office Agency.

In Table 15, we compare the current April 2011 LHA rates which might apply in the case study local authorities with the potential rents if set at 80% of market rents. In some cases, the local authorities are covered by multiple Broad Rental Market Areas (BRMAs), the areas for which LHA rates are set. This shows that in most areas and for most property sizes there is a reasonably large margin above the potential rent to the current maximum rates at which LHA will be paid for new tenancies. For two and three bedroom houses in Hertsmere (marked ** in the Table), a rent at 80% of market values would already exceed the prevailing LHA rates.

Table 15: Comparison of rents @ 80% of market values and April 2011 LHA rates

		1 bed flat	2 bed flat	2 bed house	3 bed house	4 bed house
Brighton & Hove	rent @80%	£106.40	£129.93	£172.38	£196.55	£225.24
	LHA rate	£143.08	£178.85	£178.85	£219.23	£316.15
	difference	**£36.68**	**£48.92**	**£6.47**	**£22.68**	**£90.91**
Bromley	rent @80%	£104.38	£128.75	£144.22	£174.70	£205.44
	LHA rate	£150.00	£184.62	£184.62	£216.23	£276.92
	difference	**£45.62**	**£55.87**	**£40.40**	**£41.53**	**£71.48**
Hertsmere	rent @80%	£115.90	£136.15	£175.52	£218.25	£246.70
	LHA rate	£137.31	£173.08	£173.08	£207.69	£276.92
	difference	**£21.41**	**£36.93**	**(£2.44)****	**(£10.56)****	**£30.22**
Mid Sussex	rent @80%	£104.31	£129.26	£144.71	£164.52	£198.26
	LHA rate	£143.08	£178.85	£178.85	£219.23	£316.15
	difference	**£38.77**	**£49.59**	**£34.14**	**£54.71**	**£117.89**
Plymouth	rent @80%	£69.03	£73.90	£93.24	£104.39	£122.59
	LHA rate	£92.31	£115.38	£115.38	£137.31	£173.08
	difference	**£23.28**	**£41.48**	**£22.14**	**£32.92**	**£50.49**

Sources: CCHPR affordable rents assessment; Valuation Office Agency LHA rates for April 2011: Brighton and Hove BRMA (Brighton & Hove and Mid Sussex), Outer South-East London BRMA (Bromley), South-East Hertfordshire BRMA (Hertsmere) and Plymouth BRMA (Plymouth).

6.2.1 Future value of LHA

From 2013, the government has decided that Local Housing Allowance rates will no longer be tied to actual market rents, but will instead simply be uprated by the CPI measure of inflation. CPI inflation has for more than a decade consistently been lower than market rent inflation. This implies that the real value of LHA will decline relative to market rents. The HCA has indicated that rents in ongoing 'affordable' rent tenancies will be constrained to rise no faster than 1% above RPI (an alternate measure of inflation which is by its technical derivation is necessarily higher than CPI). However, the HCA's framework document also

states that new affordable tenancies in re-lets should be re-based to current market values, which may well be higher. Taken together, these suggest that 'affordable' rents which at present do not exceed LHA rates may come to do so in the future, especially but not only at the moment of re-letting. How exactly this would be resolved is not clear at present, but there is a potential policy risk to income from HB-supported tenants in the resolution.

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