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The distribution of housing association rents within local authority areas in the first year of rent restructuring

Rents Briefing Paper 1

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This Briefing Paper describes the spatial pattern of housing association rents across England in the first year of the rent-restructuring regime. It examines the extent to which housing associations' current average rents for given property sizes differ within each local authority area; whether there is a geographical pattern in these differences across the country; whether rents within each property size are converging; and whether the observed pattern of rents is directly related to a number of other factors unaffected by the rent restructuring formula.

Key Findings

- The general pattern is of moderate variation in average rents between housing associations (HAs) within local authority areas (LAs).
- In over 70% of all LAs the difference between the highest rent and the lowest rent, within each property size, is less than half of the average rent.
- The extent of variation is not the same within each property size. Average rent variations for bed-sits and four-plus bedroom properties tend to be less than for other sizes of dwelling. Thus:
    - In approximately half of all LAs the difference between the highest and lowest rent for bed sit and four-plus bedroom properties is less than a quarter of the average rent;
    - In approximately a quarter of all LAs the difference between the highest and lowest rent for three bedroom properties is less than a quarter of the average rent; and
    - In fewer than 15% of all LAs the difference between the highest and lowest rent for one and two bedroom properties is less than a quarter of the average rent.
- Variation in average rents is greatest in London. Across the rest of England there is no clear geographical pattern - LAs with high variations are scattered across the country.
- Data for the period 1999/00 to 2001/02 for two bedroom properties suggest that rents are converging in many areas. For England as a whole, in each year the range of rents decreased in 61% of LAs (but not necessarily the same LAs). In just over a third of LAs the range of rents decreased for two consecutive years, compared to 13% of LAs that experienced an increase.
- Data show that changes are not consistent year on year within each region. However between regions there is a pattern. During the period 1999/00 to

2000/01 high proportions of LAs in the northern regions experienced a reduction in the range of rents. Over the period 2000/01 to 2001/02 the southern regions tended to have higher proportions of LAs where the range of rents decreased.

- A higher proportion of LAs (over 40%) in the North East, North West and Merseyside experienced a sustained reduction in rent variation over a two-year period than in the rest of the country.
- Variations in rents within LAs are related to the number and relative size of housing associations, as well as to the total size of the housing association sector in the LA.
- Around half of housing associations have target rents that differ by less than £5 per week from their actual rents. Achieving target rents will therefore have a limited impact on currently observed variations.

Introduction

Prior to the introduction of the rent setting formula for restructuring rents proposed in the Housing Green Paper (DETR 2000) each housing association calculated their own rents, aiming to maintain a balance between their financial and business plan constraints and their role as a social landlord offering affordable accommodation. The 1988 Housing Act gave housing associations the power to set their own rents but also the responsibility to accept a greater share of the risk in housing development and to approach private lending institutions for part of their capital costs. At the same time subsidy levels were reduced. This, together with the scale of their development programme and the need to build reserves to facilitate the use of private finance, determined the extent of the need to increase rents overall - while continuing to ensure that rents remained both below market levels and affordable.

The Housing Corporation's Performance Standards required housing associations to set rents at levels appropriate to remain financially viable, that were approximately in line with the regional average, and that were comparable across similar stock. Furthermore the annual increase in the average rental income was restricted to RPI+1 percent (until April 2002).

The current rent restructuring regime

Current concern focuses on the variety of rent setting practices that have built up over time and the subsequent lack of coherence in rents between the HA and LA sector and between similar properties in similar areas that are owned by different HAs. The rent restructuring regime outlined in the Housing Green Paper (DETR, 2000) aims to limit the differences between rents for similar properties, while retaining links between rents and the qualities that tenants value in properties, thus promoting tenant choice.

The rent influencing regime will still allow HAs to set rents that enable financial and functional viability, but it will continue to seek to bear down on rent increases and influence rent levels. The guideline limit was restricted to RPI +0.5 percent from April 2002. Furthermore, individual rents should only increase by the guideline limit, so it is no longer appropriate for HAs to calculate a 'rent envelope'.

Given the concerns about harmonising rents, this Briefing Paper looks at the following issues:

- The extent to which housing associations' current average rents for given property sizes differ within each local authority;
- Whether there is a geographical pattern in these differences across the country;
- Whether rents within each property size are converging within LAs; and
- Whether the observed pattern of rents is directly related to a number of other factors unaffected by the rent restructuring formula.

Method

Data for this analysis comes from the 2001/02 Regulatory and Statistical Return (RSR) and from the 1999/2000 and 2000/01 RSR for comparison over time. It is limited to those housing associations that completed the long version of the RSR and made a valid return. (In general those HAs that own or manage more than 250 homes and/or bed spaces, including shared ownership dwellings, complete the long version of the RSR.). The HAs included in the analysis own or manage over 90% of all HA general needs stock (units and bed spaces)[1].

In line with current Government policy on rent restructuring and as indicated by ODPM guidelines, the analysis uses net rather than gross rents i.e. exclusive of service charges.

Ideally individual rents for each of the properties owned by an HA would be considered, however the RSR only collects the average rent by property size, for each housing association. Depending on the degree of rental variation an HA has within each property size, this may or may not be an accurate reflection of all their rents. Nevertheless, working with the distribution of averages some distinct patterns emerge.

Use of the standardised range statistic to compare rent variations

To compare the extent of variation between LAs the range of rents need to be measured in relative terms to standardise for the different rent levels between LAs. For example, a £10 range between the highest and lowest rent where the average rent is £30 per week represents a higher variation than a £20 per week range where the average rent is £100, even though £20 is the higher absolute figure.

The standardised range for each LA can be calculated by taking the range (the highest average housing association rent in the local authority area minus the lowest average rent) and dividing it by the mean average housing association rent in the area.

For each LA the standardised range is:

$$\frac{\text{Highest average HA rent} - \text{lowest average HA rent}}{\text{Mean average HA rent}}$$

The standardised range is a measure of dispersion that is not influenced by the level of rent. The higher the value of the standardised range, the greater the difference in the average net rents charged by the different housing associations

[1] On average the percentage of stock owned by the HAs included in this analysis in each LA is 94.7% (median = 96.6%; minimum = 62.4%; maximum = 100%).

within a given LA. A standardised range of zero would indicate that all rents within a local authority were exactly the same and would probably indicate that only one housing association operates within the LA. In the 2001/02 RSR dataset it is, in fact, the case that a standardised range of zero indicates that only one HA operates within a given property size and LA.

Note:
It may be helpful to think of the standardised range in terms of a multiple of the average rent. For example, a standardised range of 0.5 means that the difference between the highest and lowest average housing association rent within a local authority (the range) is half the average rent for the LA.

Variation between housing association rents in the same local authority area in 2001/02

Table 1 shows the number and proportion of LAs that fall into each of four categories of variation in rent levels (shown by the standardised range figure), by property size. Sixteen LAs do not have data for bed sits and seven LAs do not have data for four-plus bedroom properties. On average, housing associations own considerably more units of stock that are one-bedroom, two-bedroom, and three-bedroom, compared to bed sits and four-plus bedroom properties (see final row of Table 1). No single LA falls within the same standardised range category for all property sizes.

Table 1: Number and percentage of LAs falling within each standardised range category by property size

Value of standardised range	Bed sit No. LAs (% LAs)	1 bed No. LAs (% LAs)	2 bed No. LAs (% LAs)	3 bed No. LAs (% LAs)	4+ bed No. LAs (% LAs)
0 - 0.25	174 (51.5%)	44 (12.4%)	52 (14.7%)	90 (25.4%)	168 (48.4%)
0.251 - 0.5	119 (35.2%)	228 (64.4%)	202 (57.1%)	184 (52.0%)	138 (39.8%)
0.51 - 0.75	32 (9.5%)	65 (18.4%)	73 (20.6%)	58 (16.4%)	27 (7.8%)
>0.75 up to maximum value	13 (3.8%)	17 (4.8%)	27 (7.6%)	22 (6.2%)	14 (4.0%)
Total number LAs[1]	338 (100%)	354 (100%)	354 (100%)	354 (100%)	347 (100%)
Maximum value	1.46	2.49	1.32	1.83	1.70
Average number of units owned by HAs ('000s)	149.5	1,158.9	1,303.3	1,142.3	118.6

Notes

1. Total number of LAs is less than 354 for bed sits and 4+ bedroom properties as some LAs do not have any HA stock for these property sizes.

Within each property size the majority (more than 70%) of LAs fall within the lowest two categories (i.e., the range of rents is less than a half the average rent). However, the extent of variation is not the same within each property size. Average rents for bed sits and four-plus bedroom properties tend to be more narrowly dispersed than average rents for other sizes of dwelling. One and two bedroom properties tend to have the widest dispersion of rents.

In the case of bed sits and four-plus bedroom properties, around half of the LAs have a standardised range of 0.25 or less, indicating a high degree of similarity between HA rents in many LAs for these sized properties. For the one, two and three bed property sizes more than half of the LAs have a standardised range between 0.25 and 0.5 (i.e., the range of rents is more than a quarter, but less than a half the average rent).

It should be noted that within 57 LAs all bed-sit properties are owned/managed by a single HA and, likewise, a single HA owns/manages all four-plus bedroom properties within 36 LAs. If only one HA operates within an LA (for a given property size) there is no variation in the average HA rent and the standardised range is zero. By comparison, within the one, two, and three bedroom categories there are only one or two LAs where only one HA owns/manages such stock. This partly explains why there is less variation in average rents observed for bed sits and four-plus bedroom properties. Further explanation may lie in the fact that, on average, there is less stock of bed sits and four-plus bedroom properties and fewer HAs owning/managing such stock compared to the other property sizes. This hypothesis will be explored further in the section below that considers which factors may be associated with the degree of rent variation.

Is there a geographical pattern?

Table 2 indicates which regions have the highest proportion of LAs with a standardised range of 0.25 or less (the lowest category of variation) within each property size.

Within London average rents for all property sizes, are more dispersed as compared to the other regions. There is a strikingly low proportion of London boroughs in which the difference between the highest and lowest rent is less than quarter of the average rent. In many ways this is not surprising as the potential variation in the attributes of dwellings of a given size is far greater in London than elsewhere in the country.

Outside London there is no clear pattern whereby, for instance, the more pressured southern regions can be distinguished from regions to the north of the country. It should be noted that although the North East region had no LAs falling within the lowest category for two bedroom properties, 96% of its LAs fell in the second lowest category (a very high proportion compared to the other LAs) and none fell in the highest category.

Table 2: Percentage of LAs falling in the lowest category of variation, by region and property size

HC investment area	Bed sit %	1 bed %	2 bed %	3 bed %	4+ bed %	Total no. LAs[1]
London	9.1	3.0	6.1	6.1	3.1	33
South East	56.7	16.4	11.9	26.9	52.2	67
South West	52.4	13.3	15.6	33.3	50.0	45
East Midlands	76.3	20.0	30.0	40.0	78.9	40
East of England	60.0	10.4	14.6	18.8	45.8	48
West Midlands	55.9	17.6	20.6	26.5	44.1	34
Yorkshire & the Humber	26.3	4.8	14.3	28.6	50.0	21
North East	60.0	8.7	0	30.4	66.7	23
North West	43.8	11.8	17.6	20.6	44.1	34
Merseyside	62.5	0	0	11.1	44.4	9
Total HC investment areas	51.5	12.4	14.7	25.4	48.4	354

Notes

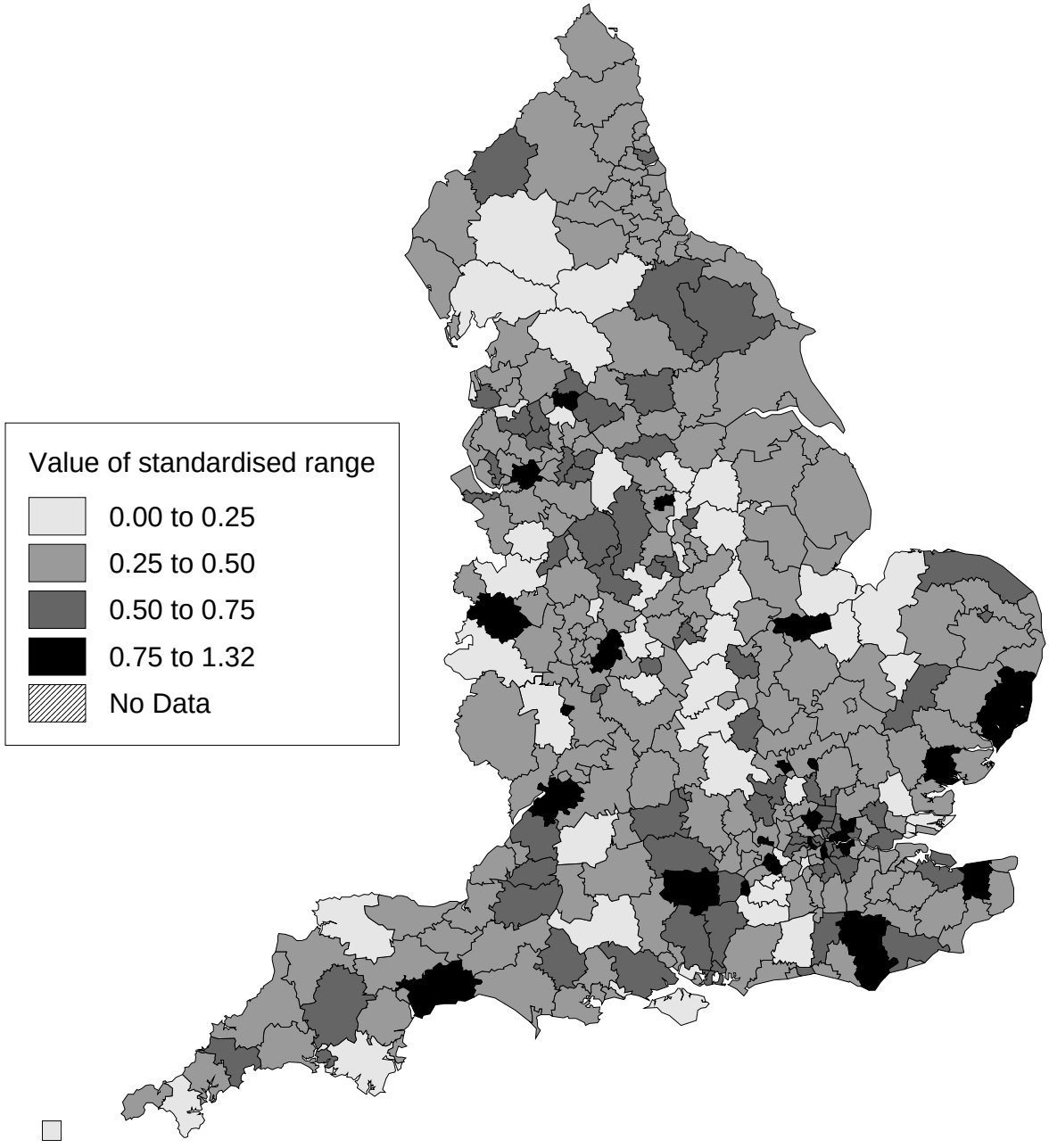
1. Total number of LAs is less than 354 for bed sits (338) and 4-plus bedroom (347) since some LAs do not have any HA stock for these property sizes.

Maps 1 and 2 show the spatial pattern of rent variation for two sizes of property. They suggest that no clear geographical pattern of the level of rent dispersion emerges from the analysis.

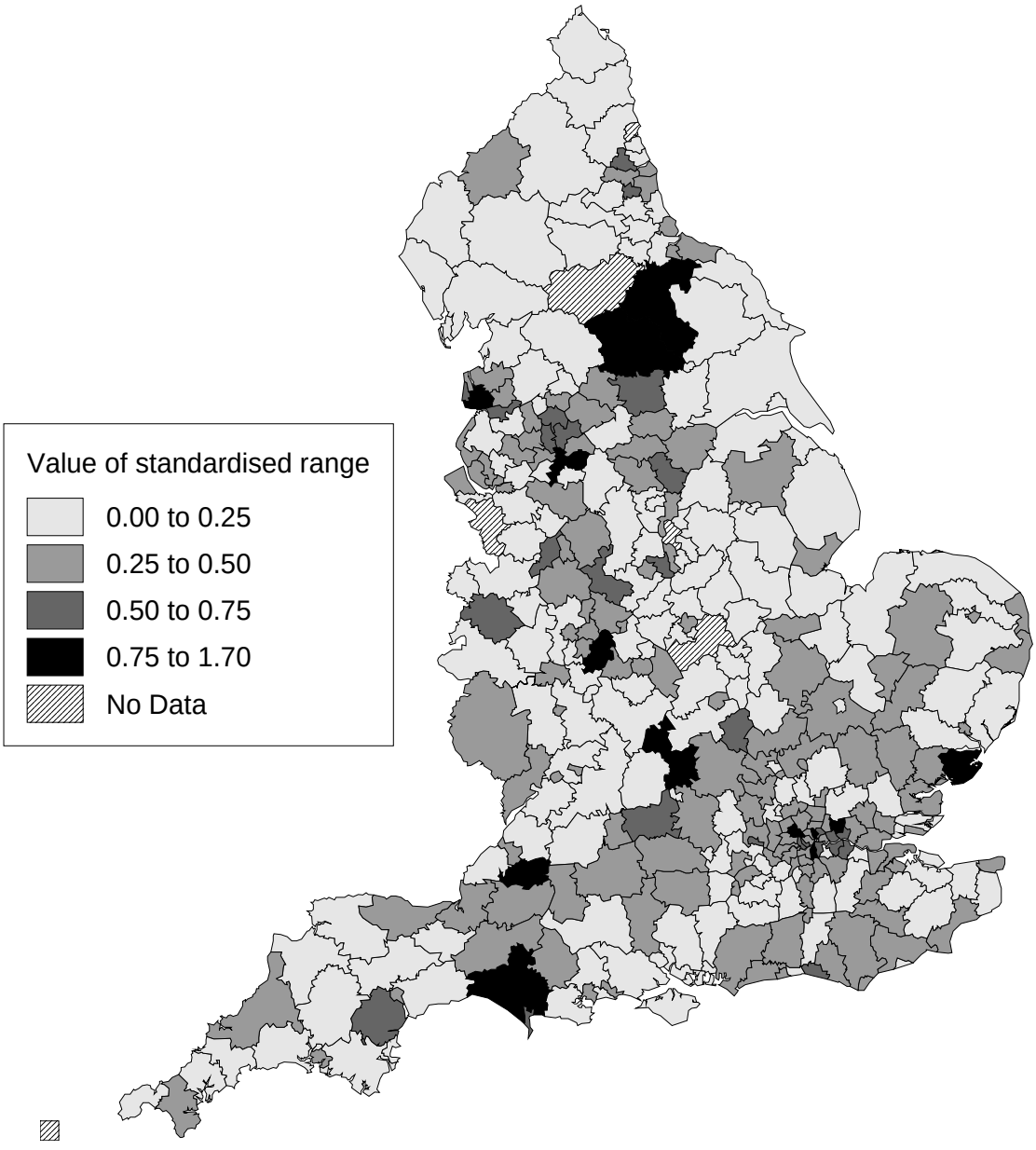
Map 1 shows the spatial pattern of rent variation across England for two bedroom properties - the most numerous property size across the housing association sector.

Map 2 gives the same information for four-plus bedroom properties and reflects the fact that for larger sizes the range is less dispersed.

Map 1: Rent variation for two-bed property, 2001/02



Map 2: Rent variation for four-bed or more property, 2001/02



Are rents converging over time?

Convergence of rents may be considered in a number of ways:

1. Are the proportions of LAs that fall within the narrowest category of rent variation (a standardised range of less than 0.25) increasing over time?

2. Are the proportions of LAs where the range of rents is narrowing (measured by a decrease in the standardised range) increasing over time?

3. Is there a regional pattern to the changes observed in the range of rents to be found in LAs?

Two bedroom properties are used as an example, as they are the most numerous property size, and can therefore provide more information about the amount by which average HA rents differ from one another across the country at the local authority level.

Table 3 shows the proportions of LAs that fall within each category of rent variation for the three-year period 1999/00 to 2001/02. There was an increase in the proportion of LAs that fall within the narrowest category of rent variation (standardised range <0.25), from 12.7% in 1999/2000 to 14.7% in 2001/02. However, there was also a small increase in the proportion of LAs with a relatively wide range of rents (standardised range >0.75) from 6.2% to 7.6%, although the maximum standardised range remained constant at 1.3 throughout the period.

Table 3: Changes in the proportions of LAs within each category of standardised range for two bedroom properties, 1999/00 to 2001/02

Value of standardised range	1999/00 No. LAs (% Total)	2000/01 No. LAs (% Total)	2001/02 No. LAs (% Total)
0 0.25	45 (12.7%)	57 (16.1%)	52 (14.7%)
0.251 - 0.5	209 (59.0%)	194 (54.8%)	202 (57.1%)
0.51 - 0.75	78 (22.0%)	75 (21.2%)	73 (20.6%)
>0.75 up to maximum value	22 (6.2%)	28 (7.9%)	27 (7.6%)
Maximum value for each year	1.32	1.31	1.32

Note: In all years the total number of LAs was 354.

Table 4 gives data for two-bedroom properties by region, showing the numbers of LAs with a standardised range of 0.25 or less. In London, the North East and Merseyside, the proportion of LAs falling in this category has consistently been below 10%, whereas in the East Midlands and the West Midlands the proportion has been consistently above 20%.

In London, the South East, the South West, the East Midlands, the East of England and the North West there has been a modest increase in the number of LAs where the standardised range is less than 0.25. In the West Midlands, Yorkshire and the Humber, the North East and Merseyside, there has either been no change or a small decrease in the numbers of LAs with this reasonably narrow range of rents. It should be noted that the pattern of change in many of the regions is not consistent year on year.

Table 4 Two-bedroom properties: percentage of LAs with a standardised range of 0.25 or less, by region, 1999/00 to 2001/02

HC investment area	1999/00		2000/01		2001/02	
	No. of LAs	% of all LAs in region	No. of LAs	% of all LAs in region	No. of LAs	% of all LAs in region
London	1	3.0	1	3.0	2	6.1
South East	6	9.0	9	13.4	8	11.9
South West	6	13.3	3	6.7	7	15.6
East Midlands	11	27.5	12	30.0	12	30.0
East of England	5	10.4	6	12.5	7	14.6
West Midlands	9	26.5	9	26.5	7	20.6
Yorkshire & the Humber	3	14.3	6	28.6	3	14.3
North East	1	4.3	1	4.3	0	0
North West	3	8.8	10	29.4	6	17.6
Merseyside	0	0	0	0	0	0
Total LAs	45	12.7	57	16.1	52	14.7

Table 5 shows the proportions of LAs in each region where the variation in rents for two bedroom properties (measured by change in the standardised range) have decreased and increased.

Over the period 1999/2000 to 2000/01 the regions with the highest proportions of LAs experiencing a reduction in rent tended to be in the north - Yorkshire and the Humber, North East, North West, and Merseyside. Over the period 2000/01 to 2001/02 the pattern reversed and mainly the southern regions– London, South East, South West and the East of England – (but also the North West) had relatively high proportions of LAs where variation in rents decreased. The proportions for the East Midlands and the West Midlands remained below the national average for both years.

In terms of overall movement, the standardised range decreased in 60.7% of LAs over 1999/2000 to 2000/01 and in 61.0% of LAs over 2000/01 to 2001/02. Just over a third (34.7%) of LAs experienced a reduction over both periods, whilst in 13.0% of LAs the standardised range increased over both periods.

At the regional level, there is a spatial pattern in the proportion of LAs where the range of rents continued to reduce over both periods. The proportions for the

North East, North West and Merseyside are all well above the national average of 34.7%, suggesting that market forces are bearing down in these low pressure areas. However, there is no distinct spatial pattern in the proportions of LAs where the range of rents continued to increase over both periods.

Table 5 Regional patterns in rent variation[1] over time, 1999/2000 to 2000/01 and 2000/01 to 2001/02

HC investment area	1999/00 to 2000/01 Rent variation decreased % LAs	2000/01 to 2001/02 Rent variation decreased % LAs	Rent variation decreased in both years % LAs	Rent variation increased in both years % LAs	Total no. LAs N
London	54.5	63.6	33.3	12.1	33
South East	55.2	61.2	35.8	19.4	67
South West	55.6	73.3	37.8	6.7	45
East Midlands	60.0	57.5	32.5	15.0	40
East of England	56.3	62.5	29.2	10.4	48
West Midlands	58.8	52.9	26.5	14.7	34
Yorkshire & the Humber	66.7	57.1	28.6	4.8	21
North East	78.3	52.2	43.5	13.0	23
North West	70.6	61.8	41.2	8.8	34
Merseyside	88.9	55.6	55.6	11.1	9
Total	60.7	61.0	34.7	13.0	354

Notes
1. Variation in rents measured by changes in the standardised range.
In both the City of London (London) and the Isles of Scilly (South West) a single HA owned/managed stock of two bedroom properties. Therefore the standardised range for these two was zero and there was no change throughout 1999/00 to 2001/02.

Rents in relation to property size

Another aspect of rent restructuring is the proposed rent gradient between different sized properties. Housing associations calculate the target rent for each property using the formula and data set out in the *Guide to Social Rent Reforms (*DTLR, December 2000*)* as follows:

70% of the average rent for the HA sector
Multiplied by the relative county earnings
Multiplied by bedroom weighting

Plus

30% of the average rent for the HA sector
Multiplied by relative property value

Table 6 describes the actual ratios of rents between different property sizes, using two bedroom rents as the base (set at 1). It then compares the existing ratios with

the bed-size ratios (or bedroom weighting) to be applied to the earnings term in the rent restructuring formula.

Table 6: Ratio of bed sits, one bedroom, three bedroom and four-plus bedroom average net rents to two bedroom rents.

	Bed sit	One bedroom	Three bedroom	Four+ bedroom
ODPM weighting[1]	0.80	0.90	1.05	1.10
Mean	0.68	0.84	1.11	1.23
Median	0.68	0.84	1.11	1.24
Minimum	0.47	0.68	0.92	0.93
Maximum	1.01	1.23	1.31	1.58
% within +/- 0.5 of suggested ratio	18.3%	43.8%	40.9%	17.0%
% less than –0.5 of suggested ratio	78.1%	53.1%	2.0%	4.6%
% greater than +0.5 of suggested ratio	3.6%	3.1%	57.1%	78.4%

Notes
1. The ODPM bedroom weights applied to the earnings term in the rent restructuring formula (Appendix C, **Rent influencing regime: implementing the rent restructuring framework**, Housing Corporation, 2001). Two bedroom units are given a weighting of 1.0.

The observed distribution of the actual ratios across bed-sizes is steeper than specified by the ODPM weighting. This is reflected in both the average values and the distribution (indicated by the proportions of LAs falling above and below the OPDM ratio). This result is to be expected, as the bed-size weighting is only one component of the restructuring formula. The inclusion of the element reflecting property values (which are in turn affected by bed-size) will serve to steepen the rent gradient between bed-sizes within the ODPM formula, making it more consistent with current ratios.

What helps to determine rent variations within local authorities?

This section considers whether there is there a relationship, or correlation, between the variation of average rents (as measured by the standardised range) within each LA and a number of other factors that might be expected to have a relationship with rent dispersion.

- **The number of housing associations operating within an LA** - In LAs where there are more housing associations, the standardised range would be expected to be higher. For example, there is more likely to be greater variety in the type of housing association – some will be older with a higher proportion of old stock, others may have a wider presence nationally, allowing for cross-subsidisation of rents. Restructuring is seeking to address these differences.

- **The amount of stock owned by housing associations** - In LAs where there are a greater number of units owned by housing associations the standardised range would be expected to be higher since there is a greater likelihood of variation in the quality and location of stock.

- **The percentage of social housing stock owned by housing associations** - In LAs where housing associations own a higher proportion of the social housing stock the standardised range would be expected to be higher.

- **The extent of market concentration within the housing association sector** - In LAs with a small number of housing associations owning a disproportionately large share of the social housing stock the standardised range would be expected to be lower because rents are being set by a fewer housing associations, each with a large market share[2].

- Each of these factors would be expected to be related to the others.

Table 7 describes the mean values of the factors included in the analysis. It should be noted that these are averages for the whole of the HA sector and that the data will vary for any given LA.

On average:

- Housing associations own considerably more units that are one-bedroom, two-bedroom, and three-bedroom, compared to bed sits and four-plus bedroom properties;

- The percentage of social housing owned by housing associations is highest for bed sits (63%) and around 50% for the other property sizes;

- The standardised range varies with property size; and

- The number of housing associations operating within the market for one-bedroom, two-bedroom, and three-bedroom properties is higher (around ten to twelve) compared to the market for bed sits and four-plus properties (4.3 and 5.7, respectively). This is reflected in the average values for the Herfindahl Index (HI), which is higher for bed sits (0.56) and four-plus bedroom properties (0.49) compared to one-bedroom, two-bedroom, and three-bedroom properties (HI varies from 0.34 to 0.40)[3].

Table 7: Mean values of factors, by property size

	Bed sit	1 bed	2 bed	3 bed	4+ bed
Mean number of units owned by HAs ('000s)	149.5	1158.9	1303.3	1142.3	118.6
Mean % social housing owned by HAs	62.7%	51.8%	51.0%	47.4%	50.7%
Mean No HAs in LA	4.3	11.2	11.8	10.3	5.7
Mean Herfindahl Index	0.56	0.34	0.36	0.40	0.49
Mean standardised range for HA rent	0.27	0.42	0.43	0.39	0.28

[2] Market concentration is measured using the Herfindahl Index. A detailed explanation of this is given in the Appendix.

[3] As a rule of thumb, a market where the HI is between 0.1 and 0.18 is moderately concentrated and a value in excess of 0.18 is considered to be concentrated, i.e., relatively few housing associations have a disproportionately high share of the market.

Simple relationships between the factors can be explained by means of correlations (see the Appendix for an explanation of the Pearson correlation statistic and for a summary of the correlations, Table A1). In the case of the two variables, 'percentage of social housing owned by HAs' and the Herfindahl Index, LAs where housing associations owned more than 99 percent of the general needs social housing stock were excluded from the analysis. This is because the relationship between these two variables and the standardised range are more complicated to model (i.e., non-linear) when LSVT LAs are included.

The main findings are:

- The larger the number of housing associations operating within an LA, the higher the standardised range of rents tends to be;
- The larger the amount of stock owned by housing associations, the higher the standardised range of rents tends to be;
- The higher the percentage of social housing stock owned by housing associations within an LA (excluding LSVTs), the higher the standardised range of rents tends to be;
- The higher the sector concentration (excluding LSVTs), the lower the standardised range of rents tends to be – i.e. where the larger housing associations own a higher proportion of the stock in the LA the range is smaller; and
- The number of housing associations operating in a local authority is significantly correlated with the amount of stock owned (positive relationship), the percentage of social housing owned by housing associations (positive relationship) and the extent of concentration (negative relationship).

Conclusions

The introduction of the rent harmonising regime aims to bring greater coherence to rents between similar properties among different landlords.

This Briefing Paper seeks to clarify the position in the first year of rent restructuring with respect to rent variation across HAs within local authority areas. It demonstrates the extent to which convergence is taking place and whether a consistent pattern is developing across rent levels for similar sized properties in different parts of the country.

The analysis suggests that there has been some movement towards convergence over the last three years – even before the introduction of the rent restructuring policy. For two years running the trends show that in just over a third of all LAs there has been a reduction in the range of rents for two bedroom properties. On the other hand, the range was still increasing in 13% of all LAs.

The range is associated with a number of factors that do not fall within the influence of the rent setting formula. For example, the range tends to be higher

where there are more housing associations operating in the LA and where the size of the sector is larger. The results also suggest that partial LSVT in an LA (where LA stock has been transferred to more than one HA) could be associated with an increase in the range of rents as the number of HAs increases.

For a significant majority (over 70%) of LAs the range of HA rents within each property size is quite moderate. In some other areas, the greater ranges of rents observed are likely to be associated with the nature of the stock. Other differences are associated with, for instance, the history of housing development in each HA and with the number of local authorities in which the HA operates.

Within London the differences in rents within a given authority are generally greater than elsewhere in the country. Outside London there appears to be no obvious spatial pattern in a given year. However, looking over time, data for the period 1999/00 to 2001/02 for two bedroom properties suggest that there is a spatial pattern in the extent of convergence. In over 40% of LAs in the less pressured areas of the North East, North West and Merseyside the range of rents decreased for two consecutive years – suggesting that where there is less excess demand there are pressures to increase coherence.

Across the country the differentials in rents between property sizes show a steeper rent gradient than implied by the bed-size related element of the ODPM formula. This is consistent with the inclusion of a property value element in that formula.

Evidence from the last three years suggests that there are pressures towards convergence in HA rents within LAs – and that these existed before the policy of rent restructuring was formally introduced. The evidence in Sector Study 20 'Housing associations and changes in rent 2002', which showed that around half of HAs to which target rents apply had target rents that differ by less than £5 from actual rents, suggests that achieving target rents, as specified, is therefore likely to make a limited impact on currently observed variations. However, to clarify this would require considerably more analysis, relating target to actual rents by HA within each local authority.

Appendix

Data source

Table B3 in **The Guide to Local Rents Part II** provides information on rent levels as at 31 March 2002 for individual housing associations in each local authority area (LA, unitary authority and London borough). It covers general needs, self-contained stock owned by housing associations, including sheltered stock. Supported housing is excluded.

Herfindahl Index

The simplest way to measure concentration is by comparing the proportions of each HA's units in each LA. However, this does not permit national comparisons, as there are different numbers of HAs and HA units in each LA. The Herfindahl Index (HI) takes into account the number and share of all the HAs in an LA. The HI is a commonly accepted measure of market concentration, calculated by squaring the market share (proportion) of each organisation competing in the market area and then summing the resulting numbers. The index varies between zero (indicating a large number of equally sized HAs in a district) and one (where there is just one HA). The HI increases as both the number of HAs in the LA decreases and the disparity in size between the HAs increases.

For example:

If there are four housing associations operating within an LA, each owning the following percentages of stock: 30%, 30%, 20% and 20%, the HI is calculated thus:

$0.3^2 + 0.3^2 + 0.2^2 + 0.2^2 =$ **0.26**

If the proportions owned are changed to reflect greater disparity: 70%, 10%, 10% and 10%, the HI rises:

$0.7^2 + 0.1^2 + 0.1^2 + 0.1^2 =$ **0.52**

If the number of housing associations is increased to seven, each owning the same proportion of stock, the HI falls:

$0.125^2 + 0.125^2 + 0.125^2 + 0.125^2 + 0.125^2 + 0.125^2 + 0.125^2 =$ **0.109**

Pearson Correlation

The Pearson Correlation Coefficient *(r)* expresses quantitatively the magnitude and direction of a linear relationship between two variables; for example, the number of housing associations operating within a local authority areas and the standardised range. The correlation coefficient varies from +1 to -1. A correlation of 1 (either positive or negative) indicates a perfect correlation while 0 indicates there is no relationship between the variables.

Description of the correlations between the variables

Table A1 summarises the correlations (the Pearson Correlation Coefficient) between the standardised range and other variables, by bed-size. All correlations given in the table are highly significant[4]. In the case of the two variables, 'percentage of social housing owned by HAs' and the Herfindahl Index, LAs where housing associations owned more than 99 percent of the general needs social housing stock were excluded from the analysis. This is because the relationship between these two variables and the standardised range are more complicated to model (i.e., non-linear) when LSVT LAs are included.

Table A1: Correlations (r value, Pearson Correlation Coefficient) between the standardised range and other variables by bed-size

Variable	Bed sit	1 bed	2 bed	3 bed	4+ bed
Number of units owned by HAs	0.376	0.199	0.242	0.263	0.385
% Social housing owned by HAs excluding LAs where > 99% of social housing owned	0.269	0.213	0.192	0.233	0.374
Number of HAs in LA	0.601	0.371	0.45	0.477	0.571
Herfindahl Index excluding LAs where > 99% of social housing owned	-0.635	-0.246	-0.307	-0.359	-0.558

[4] All correlations significant at the 1%level ($p<0.0005$).

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