ANALYSIS ON THE USE OF BASIC ALLOWANCE FOR HOUSING SURVEY DATA IN THE FAIR MARKET RENT ESTIMATION PROCESS

Introduction

HUD's Fair Market Rents (FMRs) are estimated for all areas of the United States and its territories. Fair Market Rents (FMRs) are primarily used to determine payment standard amounts for the Housing Choice Voucher program, to determine initial renewal rents for some expiring project-based Section 8 contracts, to determine initial rents for housing assistance payment (HAP) contracts in the Moderate Rehabilitation Single Room Occupancy program (Mod Rehab), and to serve as a rent ceiling in the HOME rental assistance program. HUD annually estimates FMRs for all metropolitan and non-metropolitan areas of the country. The comparison FMRs for this study, based on 2000 decennial census data, were generated for 354 metropolitan and 2,350 nonmetropolitan county areas. Approximately two million voucher holders participate in this program.

The Department of Defense established the Basic Allowance for Housing (BAH) in 1998 to compensate all uniformed service members with permanent duty status in the United States. BAH is determined for each service member and is based on their geographic location, pay grade, and dependency status. The intent of BAH is to provide equitable housing compensation based on housing costs in the local civilian housing market, and is payable when government quarters are not available. In 2006, over 930,000 members of the military received the BAH. The BAH is calculated for approximately 370 geographic areas serving a military installation.

FMR Calculation

FMRs are gross rent estimates. They include the shelter rent plus the cost of all tenant-paid utilities, except telephone, cable or satellite television service, and Internet service. HUD sets FMRs to assure that a sufficient supply of rental housing is available to program participants. To accomplish this objective, FMRs must be both high enough to permit a selection of units and neighborhoods and low enough to serve as many low-income families as possible. The level at which FMRs are set is expressed as a percentile point within the rent distribution of standard-quality rental housing units. The definition is the 40th percentile rent, the dollar amount below which 40 percent of the standard-quality rental housing units are rented. The 40th percentile rent is drawn from the distribution of rents of all units occupied by recent movers (renter households who moved to their present residence within the past 15 months). In order to ensure that HUD's FMR estimates are based on market-rate units, public housing units, units less than 2 years old, units rented from relatives, and units where the tenant supplies more than basic maintenance services, are excluded. FMR are calculated and published for all structure types based on the number of bedrooms a unit contains (i.e., 0, 1, 2, 3, and 4 bedroom units).

Data Sources -- For this analysis, FMRs are calculated using standard quality, recent mover gross rents from the 2000 decennial Census. Only 2-bedroom units are evaluated, as they represent the largest percentage of rental units. All housing types (garden apartments, high-rise apartments, townhouses, duplexes and single family homes) are included. Utility amounts are based on responses provided in the census.

HUD uses recent mover rents from the 2000 Census for an FMR area where there are at least 200 weighted-up 2-bedroom cases in the tabulation. This implies an underlying sample of about 33 units. Nonmetropolitan counties where there are fewer than 200 weighted-up 2-bedroom recent mover units in the tabulations use a county group recent mover rent.

HUD currently updates FMRs from the base year of the decennial census using Consumer Price Index (CPI) changes for rents and utilities for approximately 100 FMR areas that are part of the much larger CPI areas. Beginning in Fiscal Year (FY) 2006, regional CPIs for rent and utilities based on the 4 Census Regions are applied to the remaining areas. Before FY 2006 regional random digit dialing (RDD) longitudinal surveys were conducted of the metropolitan (exclusive of the CPI areas) and nonmetropolitan areas of each of the 10 HUD regions. RDD surveys were also conducted of specific areas to provide a new base estimate for FMRs, if significantly different when compared with the FMR estimate.

FMR Areas -- HUD defines FMR areas as metropolitan areas and nonmetropolitan counties. With a few exceptions, the most current Office of Management and Budget (OMB) definitions of metropolitan areas are used. HUD uses the OMB definitions because of the generally close correspondence between them and housing market areas. For this analysis, the metropolitan area definitions in use in 2000 (the FY 2000 FMRs) are used. HUD FMR area definitions may differ from OMB definitions, but the differences tend to be very minor and only affect small, peripheral counties of large metropolitan areas.

Dept. of Defense Base Allowances for Housing (BAHs) Calculation

BAHs are established by the Department of Defense (DoD) as the housing support payment for military personnel not provided with on-base housing. They are based on a survey and data collection process developed and implemented by Runzheimer International. Median rent (50^{th} percentile) is estimated for different housing structure types and for differing numbers of bedrooms for areas surrounding military bases. At the discretion of the base commander, some neighborhoods and submarkets may be excluded because they are not considered good housing resources.

The DoD Under-Secretary of Defense, Personnel and Readiness entered into a contract with Runzheimer International to collect and analyze rental, utility, and rental insurance costs for up to 400 Military Housing Areas (MHAs) located throughout the United States. The DoD uses Runzheimer's findings to determine housing allowances. The study

directly affects the ability of the United States government to provide proper housing allowances to military personnel and to operate efficiently and effectively.

Utility amounts are added to the contract rent amounts based on current utility data for the MHA, compared with historical utility data from the American Housing Survey (AHS). Each MHA is associated with an AHS location based on Heating Degree-Days (HDD) and Cooling Degree-Days (CDD). The AHS data is used to distinguish among three levels of utility costs for each area covered by the AHS (47 areas):

- Buildings with two or more apartments
- One-unit buildings attached to one or more other buildings
- Detached unit

The average utility cost for a specific area by structure type is added to the median contract rent to calculate a gross rent.

For this analysis, Runzheimer used the 2-bedroom rents it collected in 1999, as the gross rents most directly comparable HUD's FMR derived from recent mover rents from the 15-month period ending in April, 2000. Runzheimer collects contract rents for 2-bedroom apartments and townhouses, separately for each area. An average utility amount is added to each contract rent. The utility amount is greater for the townhouse than the apartment in all cases. Runzheimer then combines the gross rents of the 2-bedroom apartment and 2-bedroom townhouse to come up with a 2-bedroom gross rent to compare with the HUD 2-bedroom gross rent from the 2000 Census.

Two different approaches are used to combine the apartment and townhouse gross rents. First, Runzheimer weights the gross rents for apartments and townhouses by their representation in the decennial Census. The census shows that the share of 2-bedroom townhouses ranges from 8 percent in Las Vegas to 53 percent in Buffalo. (See Appendix A.) The second method uses a single distribution of the apartment and townhouse gross rents to determine the median gross rent. The sample sizes of townhouses range from a low of 3 units surveyed in St. Cloud, MN, to 66 units in Philadelphia.

Data Sources – Runzheimer uses a combination of sources to collect rent data. Information from the Military Housing Offices (MHOs) is the primary source of rental data. Runzheimer also incorporates rent data from classified advertising in current, local newspapers, and from the Internet. Listings for apartments in a national phone book directory database and opinions from real estate professionals supplement this data.

Runzheimer selects potential data points from the information provided and enters all pertinent information into an electronic storage system. From this electronic data, an automated system randomly selects prospective rental units and calls to verify the adequacy and the price of the unit. The units are those that are currently available for rent, or that have been rented in the last 4-6 weeks.

MHOs are encouraged to develop their own criteria to establish adequacy of the unit and may exclude census tracts from consideration by Runzheimer if the housing is predominately unsafe, crime-ridden, or run-down. Runzheimer reviews all data anomalies and eliminates outlier observations. Target sample sizes are determined by examining the variation in the sample for the previous several years and range from 15 to 75. Runzheimer intentionally includes properties that were contacted in the previous year's survey to increase sample stability. Typically the "stable" portion of the sample accounts for approximately 40-45 percent of the database.

BAH Areas – BAH areas typically reflect the commuting distances around military installations. Runzheimer collects and stores BAH information on the basis of ZIP Code. Because there is no direct correlation between Census Bureau data and ZIP Code data, Runzheimer used a third party data set (from Claritas) to create a cross-reference between HUD's area definitions and BAH's ZIP Code based data.

Comparison of HUD (Census) and Runzheimer Rents

Runzheimer was able to match its data to 323 HUD areas, using a threshold of 15 sample cases. The 15 unit sample size, however, was not based on an analysis of providing a statistical sample. For this study, HUD increased the minimum sample size to 33 cases, which is the smallest number of completed surveys from the 2000 Census that was considered for the FMRs; leaving only 200 areas for comparison. HUD uses the recent mover rent as the census base rent for an FMR area when there are at least 200 weighted-up 2-bedroom cases in the census tabulation, implying an underlying sample of about 33 units (this is in contrast to HUD's general requirement for random digit dialing (RDD) surveys of 200 valid 1- and 2-bedroom unit responses). While the 33 responses is also not a statistically representative number to consider, there could be no meaningful comparisons for areas with 100 or more completed surveys, because there are too few.

In HUD's subsequent analysis into the use of the 2005 American Community Survey (ACS), it was determined that reliance upon such a small sample size is not optimal in a smaller overall survey. The annual ACS is only one-fifth the size of the decennial census long form sample, so that 200 weighted-up cases in the ACS is equivalent to a sample size of only 7 units, as compared with 33 units for the decennial census. This is unacceptably small. The 200 sample 1- and 2-bedroom unit required in RDD surveys is considered a better minimum sample size. Additionally, a maximum standard for the ratio of the margin of error to the estimate value (margin of error ratio, or MoER) was established. For RDD surveys, HUD generally attempts to achieve a MoER of less than 5 percent, usually by increasing the RDD sample size above the 200 minimum.

This analysis could not be limited to areas with 200 or more cases, however, because only one area meets this minimum sample size, Washington, DC, (See Appendix B). Only 12 additional areas have more than 100 cases: Chicago, IL (144), Philadelphia, PA (155), Boston, MA (145), Detroit, MI (129), Baltimore, MD (158), Virginia Beach, VA (102), Eugene, OR (108), San Diego, CA (130) Seattle, WA (148), Fort Lauderdale, FL

(116), Riverside, CA (174), and Los Angeles, CA (127). Since this results in too few of areas for comparison, we will continue to use the 33 cases as the limit considered for the BAH estimates, which gives us 200 areas for comparison purposes.

Instead of, or in addition to, having a minimum number of cases for a sample, a maximum standard for the ratio of the margin of error to the estimate value (margin of error ratio, or MoER) was established. For RDD surveys, HUD generally attempts to achieve a MoER of less than 5 percent, usually by increasing the RDD sample size above the 200 minimum. The MoER is above 5 percent for 126 of the 200 areas, but only 4 areas have a MoER of more than 10 percent: Ann Arbor, MI (33 cases); West Palm Beach, FL (40 cases); La Cross, WI-MN (35 cases); and, Los Angeles, CA (127 cases). (See Appendix C.)

For the 200 areas with more than 33 cases, there are 155 areas where the Runzheimer weighted gross rent is greater than the HUD gross rent, 3 areas where the two rents are the same and 42 areas where the Runzheimer gross rent is the lower rent (see Appendix D). The area with the highest Runzheimer gross rent is a small area with relatively few cases, Western Worcester County, MA with 35 cases, while the area with the comparable lowest Runzheimer gross rent is a large area with a greater number of cases, Los Angeles, CA, with a sample size of 127. On a weighted 2-bedroom basis, the Runzheimer median gross rents are between 63 percent higher and 27 percent lower than the HUD FMR gross rents. Using the distribution method (hereinafter called the ”un-weighted” method) the Runzheimer gross rents range from 63 percent higher to 25 percent lower. (See Appendix E)

A. GROSS RENTS VERSUS CONTRACT RENTS

Both the FMR and BAH are gross rents, but the source of the utility information for each is very different. Utility amounts used in the BAH estimation process, are estimated using the AHS utility information updated with current rate information; therefore, they are based on a model. HUD’s utility amounts are based on tenant responses from the decennial census. There is no reason to expect that the utility amounts from these very different sources will be the same, and, as shown on Appendix F, they are not. The differences in the utility amounts range from 118 percent higher in Hawaii County, HI to 42 percent lower in Duluth, MN when comparing the Runzheimer utility amount to the HUD utility amount. There are only 71 areas where the Runzheimer utility estimates are within 10 percent of the HUD utility estimate. Consequently to eliminate the noise introduced by Runzheimer’s utility calculation, comparisons of contract rent estimates are the best basis for comparison and all further discussions will be of contract rents only.

B. WEIGHTED SAMPLE

1. What is the similarity for areas with higher Runzheimer weighted contract rents?

Out of the 200 areas with sufficient sample size, there are 99 areas where the Runzheimer contract rents are within 10 percent of (greater or less than) the HUD contract rent; 53 of these areas are within 5 percent (See Appendix G). There are several major metropolitan areas with relatively large sample sizes, (defined as near or over 100 cases), that have a difference in gross rent of more than 10 percent: Chicago, IL (28%), Houston, TX (21%), St. Louis, MO (20%), Philadelphia, PA (20%), Boston, MA (11%), Washington, DC (-12%), Riverside, CA (-5%), and Los Angeles, CA (-27%).

The methodology used by Runzheimer admittedly ignores center city rents, so the higher Runzheimer (BAH) rents for areas like Chicago and Philadelphia may be explained; however, this does not explain the lower Los Angeles gross rents. For Los Angeles, CA, the BAH survey does capture rents along the coast which are generally higher, but the BAH rent is significantly lower.

The majority of BAH contract rents are higher than the HUD contract rents and by a greater margin. Eight of the highest 10 areas on a weighted contract rent basis, as shown on Table 1, are in New England: Western Worcester County, MA; Lowell, MA; Fitchburg-Leominster, MA; Worcester, MA, Penobscot County (part), ME, Waterbury, Ct; Brockton, MA and Hillsborough County, NJ (part).

Table 1

TOP TEN AREAS WITH WEIGHTED CONTRACT RENTS FOR BAH GREATER THAN HUD

Area name	HUD Contract Rent	BAH Contract Rent	Percent difference	Sample size
Western Worcester County, MA HUD Metro FMR Area	$ 417.00	$ 772.00	85.13%	35
Lowell, MA HUD Metro FMR Area	$ 681.00	$ 1,144.00	67.99%	38
Pittsburgh, PA HUD Metro FMR Area	$ 406.00	$ 624.00	53.69%	42
Fitchburg-Leominster, MA HUD Metro FMR Area	$ 506.00	$ 775.00	53.16%	35
Worcester, MA HUD Metro FMR Area	$ 538.00	$ 776.00	44.24%	35
Nassau-Suffolk, NY HUD Metro FMR Area	$ 871.00	$ 1,244.00	42.82%	47
Penobscot County, ME (part) HUD Metro FMR Area	$ 330.00	$ 471.00	42.73%	37
Waterbury, CT HUD Metro FMR Area	$ 505.00	$ 709.00	40.40%	39
Brockton, MA HUD Metro FMR Area	$ 631.00	$ 881.00	39.62%	36
Hillsborough County, NH (part) HUD Metro FMR Area	$ 524.00	$ 731.00	39.50%	45

The key to explaining the large differences between the BAH estimates and FMR estimates appears to lie in the sample sizes in the weighted sample used to generate the BAH estimates. All 10 areas have sample sizes that ranged from 35 to 47. All of the areas in Table 1 have substantial differences between the comparison estimates and have relatively small BAH sample sizes. There are few areas that have a large percentage difference with sample sizes over 100. Chicago, which has the 20th largest difference, is based on 144 cases.

Perhaps even more important than the total number of cases in an area is whether or not the number of cases is proportional to the size of an area, in terms of population or rental market. Pittsburgh, PA is significantly larger than Las Cruces, NM, Rockford, IL, or Humboldt County, CA; yet the BAH sample sizes are comparable. This key difference, however, is that Pittsburgh has a much smaller military presence. This may explain why the BAH contract rent for Pittsburgh is so much greater than the HUD contract rent. It is hard to get a statistically representative distribution of rents with such a small sample.

2. What was the similarity for areas with lower Runzheimer weighted contract rents?

As shown on Table 2, BAH contract rents were lower by 10 percent or more in only 6 areas. Los Angeles, CA and Hawaii County, HI are the only areas with BAH gross rent estimates more than 20 percent below the HUD estimates. Six of the 10 areas where the Runzheimer weighted gross rents were comparatively the lowest are in the Pacific region: Los Angeles, CA; Hawaii County, HI; Reno-Sparks, NV; Riverside-San Bernardino-Ontario, CA Las Vegas-Paradise, NV; and Seattle-Bellevue, WA. The remaining four areas are Washington-Arlington-Alexandria, DC; Denver-Aurora, CO; Shelby County, KY; and Columbus, OH.

Table 2
TOP TEN AREAS WITH CONTRACT RENTS LESS FOR BAH THAN HUD

Area name	HUD Contract Rent	BAH Contract Rent	Percent difference	Sample size
Los Angeles-Long Beach, CA HUD Metro FMR Area	$ 776.00	$567.00	-26.93%	127
Hawaii County, HI	$ 570.00	$446.00	-21.75%	36
Reno-Sparks, NV MSA	$ 644.00	$538.00	-16.46%	36
Riverside-San Bernardino-Ontario, CA MSA	$ 567.00	$483.00	-14.81%	174
Las Vegas-Paradise, NV MSA	$ 688.00	$599.00	-12.94%	52
Washington-Arlington-Alexandria, DC-VA-MD HUD Metro FMR Area	$ 795.00	$702.00	-11.70%	216
Denver-Aurora, CO MSA	$ 718.00	$651.00	-9.33%	83
Seattle-Bellevue, WA HUD Metro FMR Area	$ 764.00	$700.00	-8.38%	148
Shelby County, KY HUD Metro FMR Area	$ 449.00	$413.00	-8.02%	35
Columbus, OH HUD Metro FMR Area	$ 532.00	$495.00	-6.95%	66

For those areas where the BAH estimates are lower than HUD's estimates, sample sizes range from 35 to 216 for both gross rents and contract rents. Sample size appears to play a lesser role in explaining differences where BAH estimates are lower than HUD.

C. UN-WEIGHTED SAMPLE

1. What was the similarity for areas with higher Runzheimer un-weighted contract rents?

There was little difference in the contract rent results between the weighted and un-weighted Runzheimer samples. As can be seen in Table 3, most of the areas with high rent differences in the weighted sample continue to be in the top ten for un-weighted sample differences, but there are some areas where the percent difference is different. Chicago, with the largest sample size in the group, moved up from a ranking of 20th in the weighted contract rent sample, to 13th in the un-weighted sample. Chicago's relatively low weighting for townhouses, less than 20 percent, may explain this change in ranking. There are slightly more areas that have BAH contract rents greater than the HUD rents by more than 10 percent on an un-weighted basis, 100 cases, compared with 95 cases for the weighted sample. (See Appendix H.)

Table 3
TOP TEN AREAS WITH CONTRACT RENTS FOR BAH GREATER THAN HUD

Area	HUD Contract Rent	BAH Contract Rent	Percent Difference	Sample
Western Worcester County, MA HUD Metro FMR Area	$417.00	$ 775.00	85.85%	35
Lowell, MA HUD Metro FMR Area	$681.00	$1,102.50	61.89%	38
Fitchburg-Leominster, MA HUD Metro FMR Area	$506.00	$ 775.00	53.16%	35
Pittsburgh, PA HUD Metro FMR Area	$406.00	$ 595.09	46.57%	42
Worcester, MA HUD Metro FMR Area	$538.00	$ 775.00	44.05%	35
Waterbury, CT HUD Metro FMR Area	$505.00	$ 700.00	38.61%	39
Duluth, MN-WI MSA	$383.00	$ 527.90	37.83%	38
Nassau-Suffolk, NY HUD Metro FMR Area	$871.00	$1,200.00	37.77%	47
Brockton, MA HUD Metro FMR Area	$631.00	$ 868.33	37.61%	36
Anniston-Oxford, AL MSA	$311.00	$ 425.00	36.66%	39

While Table 3 shows a few new areas in this un-weighted top-ten table, when compared with Table 1, these new areas just missed making Table 1 of the weighted sample. For example, Duluth, MN had the same percent difference in the weighted and un-weighted samples; there were just more areas with greater differences in the weighted sample. Although there are 8 areas on a weighted basis that have a percent difference of more than 40 percent, compared with 5 on an un-weighted basis, there are an additional 7 areas with percent differences of more than 10 percent for the un-weighted sample.

2. What was the similarity for areas with lower Runzheimer un-weighted contract rents?

Table 4 shows that there are few changes in the areas where BAH contract rents are less than HUD contract rents, when compared with the weighted sample; Ann Arbor, MI and Bakersfield, CA come in as new top-ten areas, and Shelby County, KY and Columbus, OH fall out of the top ten. Ann Arbor, MI shows a lower BAH contract rent than for the weighted sample, but the BAH contract rent is still below than the HUD contract rent (-6%) in the weighted sample. The weighting for the townhouses is lower than the proportion of the sample (15 percent weighting compared with 21 percent of the sample), so it is surprising to show a greater differential from the HUD rent on an un-weighted basis.

Table 4
TOP TEN AREAS WITH CONTRACT RENTS FOR BAH LESS THAN HUD

Area	HUD Contract Rent	BAH Contract Rent	Percent Difference	Sample
Los Angeles-Long Beach, CA HUD Metro FMR Area	$776.00	$575.00	-25.90%	127
Hawaii County, HI	$570.00	$458.61	-19.54%	33
Reno-Sparks, NV MSA	$644.00	$545.00	-15.37%	36
Ann Arbor, MI MSA	$714.00	$605.00	-15.27%	33
Riverside-San Bernardino-Ontario, CA MSA	$567.00	$482.88	-14.84%	174
Washington-Arlington-Alexandria, DC-VA-MD HUD Metro FMR Area	$795.00	$702.76	-11.60%	216
Las Vegas-Paradise, NV MSA	$688.00	$618.28	-10.13%	52
Denver-Aurora, CO MSA	$718.00	$658.70	-8.26%	83
Seattle-Bellevue, WA HUD Metro FMR Area	$764.00	$711.70	-6.85%	148
Bakersfield, CA MSA	$429.00	$401.29	-6.46%	91

What are the differences in the Data Used?

The HUD FMRs are based on rents for occupied units. Units that do not meet standard quality housing guidelines are removed from the distribution. Removal is based on housing quality questions in the 2000 Census survey. Additionally, units that have rents below the regional average amount spent on public housing rents, as determined by HUD administrative data, are removed. The decennial Census provides a statistically representative sample of rents and utilities at a point in time. To ensure rents used in HUD's processes reflect current market activity, the sample is further limited to those units occupied in the 15 months prior to the survey.

Runzheimer does not collect rents for occupied units; it collects rents for units that are currently available. At most, they may have been rented in the past 4-6 weeks. If the rental market is tight, the advertised amounts that Runzheimer collects are appropriate;

however, their collection methodology can overstate area rents in a sluggish market. Runzheimer does not include incentives in determining rents.

Runzheimer has a stable database of area management companies and landlords that it randomly selects a sample from each year. The database is originally formed using MHO information on rental units, as supplemented by newspaper ads. This differs significantly from the decennial census sample used by HUD because it is not a statistically valid representation of the housing market for an area. While Runzheimer randomly selects units to verify rents from its database, its database is not representative of the rental market. If this bias were consistent, the data could be used in some form; however, the bias generated from the factors noted above varies by area, without any plausible explanation.

How can the Runzheimer data be used?

The Runzheimer data is not a statistically representative database. The variations from Census data, which forms the basis of the HUD FMR, appear to be random. While the Runzheimer calculation results in higher rents for most areas, the range of the difference is great; furthermore, there are some areas with substantially lower Runzheimer estimated rents.

Runzheimer's estimates are based on sample sizes that are extremely small and inconsistent across metropolitan areas. One third of the areas have sample sizes below 33 cases. Only one area has more than 200 cases. Less than one-third of the remaining areas with over 33 cases (201 areas) would meet the MoER standard for RDD surveys, of less than 5 percent (see Appendix C). The statistical significance of meeting even this MoER standard is in question because the estimates are generated from a distribution that is not randomly generated. The fact that Runzheimer's sample is stable over time does not imply it follows a normal distribution. Randomly selecting units to call about rents does not make this a random sample if the underlying population from which the sample is selected is not representative of the area.

The Runzheimer database cannot be used in the FMR estimation process. The Runzheimer estimates cannot be incorporated into the FMR process; the estimates add a bias that is not measurable or predictable.