American Housing Survey

Rental Market Dynamics: 2003-2005

March 2007

Econometrica, Inc.
under contract to:

U.S. Department of Housing
and Urban Development
Office of Policy Development
and Research

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Overview

This paper answers two questions:

- Did the number of rental units affordable to lower income households grow or decline between 2003 and 2005?
  and
- What factors caused the number of affordable rental units to grow or decline during this period?

The first section provides background on these issues and deals with methodological and data concerns. The American Housing Survey (AHS) provides the data but the analysis employs different weights than the regular AHS weights. For this reason, the first issue is whether the regular AHS weights and the weights used in this analysis tell the same story about changes in affordable rental housing between 2003 and 2005. Tables 1 and 2 compare the stories and conclude that they are similar enough to continue with the analysis. Tables 3 and 4 paint a precise picture, by affordability category, of what happened between 2003 and 2005 to the rental units available in 2003. This picture answers the posed questions only partially, because Tables 3 and 4 provide information on only those 2005 rental units that were also rental units in 2003; they contain no information on newly constructed rental units or units that are rental in 2005 but were not rental in 2003. Tables 6 and 7 contain information on new construction and the movement of units from non-rental status in 2003 to rental status in 2005. They paint a precise picture, by affordability category, of where the units available for rent in 2005 came from in terms of their status in 2003. However, this picture also answers the posed questions only partially because it depicts only part of the 2003 rental stock; it does not provide information on units that were rental in 2003 but ceased to be part of the rental stock in 2005.

This paper then combines the two pictures even though the weights used in the separate pictures are not consistent. Tables 9 and 10 present two different combinations of the earlier analyses and explain how the combinations were constructed. Table 11 gathers information from Tables 1, 2, 9, and 10 to answer the two questions. Because weights are not fully consistent, Table 11 cannot measure precisely the increase or decrease in affordable units or how much of the increase or decrease is due to factors such as the movement of units from one affordability category to another. However, there is enough consistency in the various analyses to draw reasonable conclusions about the direction and magnitude of changes in the number of units in most of the affordability categories, the relative contribution to these changes of the movement of units across affordability categories, and the gain or loss of units from the rental stock.

Background and Methodology

Rental market dynamics focuses on the supply of rental housing and how that supply changes over time. Rental dynamics analysis has many of the features of components of inventory change (CINCH) analysis, which seeks to explain how units change characteristics, e.g., high rent or low rent, or change status, e.g., in the stock or out of the stock. Like CINCH, rental dynamics traces where units come from and where they go to, but with an emphasis on low rent units. This paper is part of a larger research project that includes several research studies using the AHS. One of these studies, *Components of Inventory Change: 2003-2005*, undertook a CINCH analysis using the 2003 and 2005 national AHS surveys.[1] This paper is another of the research studies; the earlier companion piece made the work of this paper easier.

A key step in rental dynamics analysis is separating the rental stock into classes or strata based on how affordable they are. This paper uses eight categories:

- non-market – either no cash rent or a subsidized rent,
- extremely low rent (affordable to renters with incomes less than or equal to 30 percent of local area median income),
- very low rent (affordable to renters with incomes greater than 30 percent but less than or equal to 50 percent of local area median income),
- low rent (affordable to renters with incomes greater than 50 percent but less than or equal to 60 percent of local area median income),
- moderate rent (affordable to renters with incomes greater than 60 percent but less than or equal to 80 percent of local area median income),
- high rent (affordable to renters with incomes greater than 80 percent but less than or equal to 100 percent of local area median income),
- very high rent (affordable to renters with incomes greater than 100 percent but less than or equal to 120 percent of local area median income), and
- extremely high rent (affordable to renters with incomes greater than 120 percent of local area median income).

For each category, "affordable" is defined as a rent-to-income ratio of 30 percent or less for the higher of the incomes that define the boundaries for that category. The categories are defined relative to area median income, and therefore the boundaries of the categories will change as area median income changes. For example, if area median income increases between 2003 and 2005, then the upper boundaries of each category will also increase between 2003 and 2005.[2]

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[1] *Components of Inventory Change: 2003-2005*, Frederick J. Eggers and Fouad Moumen, a report prepared for the Department of Housing and Urban Development by Econometrica, Inc., March 2007. This report is available at http://www.huduser.org/datasets/cinch.html.

[2] This means that rental costs and affordability do not always move in the same direction. For example, if the costs of renting a unit are $610 in 2003 and $640 in 2005, while the upper boundary of the low-income category changes from $600 to $650 between 2003 and 2005, then the unit that was classified as moderate income in 2003 will be classified as low income in 2005 despite higher rental costs.

The AHS provided the data used in this analysis. The AHS is well suited for this purpose. It is a large, nationally representative sample of the housing stock. The AHS gathers information on the same housing units at 2-year intervals. Following the same unit over time allows the analysis to track changes in how units serve the housing market.

This paper also used two related data sets that greatly facilitated the analysis:

- Housing Affordability Data System (HADS)[3]
- 2003-2005 CINCH variables and weights.[4]

HADS is a housing-unit-level data set that measures the affordability of housing units and the housing cost burdens of households relative to area median incomes, poverty level incomes, and HUD Fair Market Rents. HADS contains two important variables not available in the regular AHS data set. The first is OWNRENT, which classifies units as either owned or rented.[5] It differs from the AHS variable TENURE in two respects. First, OWNRENT has two states: owned or rented. TENURE has three states: owned, rent for cash, or rented for no cash rent. More importantly, OWNRENT applies to all occupied or vacant units, whereas TENURE does not apply to vacant units.[6,7] HADS also contains variables that classify all units by the cost of the unit relative to adjusted median income in the locality where the unit is located. From this set of variables, this paper uses COST07RELAMICAT in 2003 and COST08RELAMICAT in 2005, which put the unit into one of seven categories based on the ratio of total monthly housing costs to monthly adjusted median income for the locality.[8] Except for the non-market classification, these seven categories match the eight categories used in this paper.

The CINCH variables and weights data set was a product of the companion research report. For all AHS units, the data set contains (1) a set of forward-looking CINCH weights (FLCINCHWT) that allow one to track from 2003 to 2005 those units that were part of the 2003 housing stock, and (2) a set of backward-looking CINCH weights (BLCINCHWT) that allow one to track from 2005 to 2003 those units that were part of the 2005 housing stock. This paper uses these weights for the rental dynamics analysis.

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[3] HADS is a data system developed by the Office of Policy Development and Research, U.S. Department of Housing and Urban Development. The HADS files and documentation are now online, at http://www.huduser.org/datasets/hads/hads.html.

[4] The data set and documentation are available at http://www.huduser.org/datasets/ahs/ahsReports.html#2.

[5] Here and elsewhere in this paper, words printed with all capital letters are the names of variables in different data sets. Exceptions include abbreviations such as AHS, CINCH, and HADS.

[6] OWNRENT counts vacant units with VACANCY values of 1, 2, or 4 as rental, and those with VACANCY values of 3 or 5 as owned. No-cash-rent units are classified as rental.

[7] TENURE also does not apply to units whose occupants usually reside somewhere else, or units that were not interviewed because they were temporarily or permanently out of the housing stock. OWNRENT does not apply to these units as well.

[8] The set of variables with "COSTXXRELAMICAT" apply to both owner-occupied and rental units. The XX refers to the interest rate applied to a hypothetical mortgage on owner-occupied properties. HADS databases usually provide four alternative COSTXXRELAMICAT variables based on four different values for the interest rate on the hypothetical mortgage. The interest rate choices changed between the 2003 HADS and the 2005 HADS. This change does not affect our analysis, because interest rate is not used to determine the affordability category of rental units.

The CINCH variables and weights data set also contains other variables that are important for the rental dynamics analysis and that are not found in the regular AHS data set. FLSTATUS indicates whether a 2003 housing unit was also in the 2005 housing stock or whether it had been lost to the stock for one of six reasons. BLSTATUS indicates whether a 2005 housing unit was also in the 2003 housing stock or whether it had been added to the stock for one of five reasons. The CINCH data set includes four additional variables that were constructed from OWNRENT and COSTXXRELAMICAT in HADS. These variables (FLRENT, BLRENT, FLAFFORD, and BLAFFORD) classify rental units into one of the eight categories used in this paper.

Affordability Changes in the Rental Stock

This paper will use the CINCH weights discussed in the Background and Methodology section to analyze changes in the affordability of the rental stock. The paper uses the CINCH weights instead of the regular AHS weights because the analysis uses mainly units that were interviewed in both years. Excluding units that were not interviewed requires adjustments to the regular AHS weights.

Before presenting the results using CINCH weights, this paper investigates whether the CINCH weights and the AHS weights depict similar changes in the rental stock between 2003 and 2005. The companion CINCH report compared CINCH estimates to published AHS totals. Almost all of the CINCH estimates are within 5 percent of the AHS published totals, and many are very close to the AHS estimates.[9] There are some important exceptions relevant to the topic of this paper. The CINCH weights underestimate the number of rental units with no cash rents by 16.6 percent in 2003 and 14.2 percent in 2005, and overestimate the number of rental units with monthly housing costs less than $350 by 6.7 percent in 2003 and 5.3 percent in 2005. Therefore, despite the general good performance of the CINCH weights, this data check is necessary because rental dynamics analysis requires accurate measurement of changes in totals between years—a more difficult feat than accurately measuring totals in a given year.

Using regular AHS weights, Table 1 counts the number of occupied or vacant rental units in 2003 and 2005 and classifies them into one of eight affordability categories. The regular AHS weights provide a benchmark for the rental dynamics analysis. According to the regular AHS weights, the rental stock—including both occupied and vacant units—increased by 348,000 units between 2003 and 2005, which is a 0.9-percent increase.[10]

[9] There were three areas where the CINCH weights appeared to vary systematically from the regular AHS weights. The CINCH weights overestimate the number of units outside of metropolitan areas by 10 percent in 2003 and 15 percent in 2005; overestimate units with an elderly householder over age 65 by 6 percent in 2003 and 4-5 percent in 2005; and underestimate Blacks by about 8 percent in both years.

[10] Throughout the paper, sums and differences of counts or percentages may not equal the reported sums and differences or percentages because of rounding.

Table 1: Rental Units by Affordability Class, 2003-2005, using regular AHS weights (all counts in thousands)

Rent Groups	Rental in 2003 from HADS	Rental in 2005 from HADS	Change	Percent Change
Non-market	8,038	8,382	343	4.3%
Extremely Low Rent	2,666	2,255	-410	-15.4%
Very Low Rent	11,076	10,565	-512	-4.6%
Low Rent	5,939	5,906	-32	-0.5%
Moderate Rent	6,131	6,534	402	6.6%
High Rent	1,729	1,915	186	10.7%
Very High Rent	878	897	19	2.2%
Extremely High Rent	1,119	1,471	352	31.5%
Total	37,577	37,924	348	0.9%

Table 2 counts the number of occupied or vacant rental units in 2003 and 2005 and classifies them into one of eight affordability categories based on the CINCH weights. The rental dynamics analysis in the remainder of this paper will focus on the changes identified in Table 2. According to the CINCH weights, the rental stock—including both occupied and vacant units—increased by 428,000 units between 2003 and 2005, a 1.1-percent increase. These changes are larger than those recorded by the regular AHS weights.

Table 2: Rental Units by Affordability Class, 2003-2005, using CINCH weights (all counts in thousands)

Rent Groups	Rental in 2003 from forward-looking analysis	Rental in 2005 from backward-looking analysis	Change	Percent Change
Non-market	8,220	8,519	299	3.6%
Extremely Low Rent	2,853	2,387	-466	-16.3%
Very Low Rent	11,055	10,703	-352	-3.2%
Low Rent	5,933	6,028	95	1.6%
Moderate Rent	6,228	6,543	315	5.1%
High Rent	1,741	2,015	274	15.7%
Very High Rent	862	935	73	8.5%
Extremely High Rent	1,279	1,469	190	14.9%
Total	38,171	38,599	428	1.1%

The CINCH weights also count more rental units: 38,171,000 in 2003 compared to 37,577,000 from the AHS weights, and 38,599,000 in 2005 compared to 37,924,000. The differences in total counts are small. Relative to the regular AHS weights, the CINCH weights count 1.6 percent more units in 2003 and 1.8 percent more units in 2005. The CINCH weights are crafted to produce estimates of the occupied rental stock that equal published Census Bureau estimates, and to produce estimates of total vacant units that equal published Census Bureau estimates. The observed differences appear to result from the CINCH weights overestimating vacant rental units and underestimating vacant owner units compared to the regular AHS weights.

The pattern of changes recorded in Table 2 parallels the changes in Table 1 closely, including the following:

- Both tables record a large absolute and percentage decrease in extremely low rent units.
- Both tables record large absolute and modest percentage declines in very low rent units.
- Both tables record large absolute and modest percentage increases in non-market and moderate rent units.
- Both tables record large absolute and percentage increases among high rent units and extremely high rent units.

The regular AHS weights and the CINCH weights differ in reporting both affordability and changes in affordability in the following ways:

- The AHS weights show a small absolute and percentage decrease in low rent units, while the CINCH weights show a small absolute and percentage gain.
- The AHS weights show a small absolute and percentage increase in very high rent units, while the CINCH weights show a small absolute gain and a modest percentage gain.

None of these differences seriously diminishes the legitimacy of the rental dynamics analysis reported in the remainder of this paper. The AHS and CINCH weights produce changes in the same direction for all of the affordability categories with the exception of low rent units where the percentage change was small by either measure. The overall picture is a decline in units affordable to extremely low income and very low income households, while less affordable units increased in number between 2003 and 2005.

Rental Dynamics Tables

An ideal rental dynamics analysis would provide an exact accounting of the following form for each of the eight rental affordability categories:

2005 rental stock in category *x* = 2003 rental stock in category *x*
– 2003 rental units in category *x* that moved to another category
– 2003 rental units in category *x* that are lost to the stock or become non-rental
+ 2003 rental units not in *x* that moved to category *x*
+ newly constructed rental units in category *x*
+ other additions to the rental stock in category *x.*

This accounting is an expanded form of the standard CINCH problem. Experience in CINCH analysis has shown that it is difficult to create a set of weights that accomplishes

such an accounting.[11] The solution in CINCH has been to split the problem in two: forward-looking CINCH analysis takes the 2003 housing stock and explains what happens to those units by 2005, while backward-looking CINCH analysis takes the 2005 housing stock and explains where those units came from in terms of the 2003 housing stock. This paper will follow the same approach.

Forward-Looking Rental Dynamics

Table 3 tracks how the 38,171,000 rental units in the 2003 housing stock from Table 2 relate to the 2005 housing stock. Columns B through L explain where the 2003 rental units fit into the 2005 housing stock.

- If the units are still rental in 2005, they will be counted in columns B through I, depending upon how affordable they are in 2005.
- If the units have become owner-occupied, they will be counted in column J.
- Seasonal units, units that are not the primary residence of their occupants, units used for migratory workers, and units that are vacant but not for rent or sale are counted in column K.
- Column L counts 2003 units that are not in the 2005 housing stock; these can be either temporary or permanent losses to the stock.
- The sum of columns B through L equals column A, except for rounding.

Table 4 presents the same information as Table 3, but columns B through L are now percentages of column A. Columns B through L sum to 100 percent in each row.

Non-market rental units show much greater stability than units in the other seven affordability categories. Over 70 percent of the 2003 non-market units are non-market in 2005 as well. Units renting for cash show greater movement across categories. Among units that were extremely low rent in 2003, only 28.5 percent were extremely low rent in 2005, and 39.0 percent of the units that were extremely high rent in 2003 are still extremely high rent in 2005.

[11] See *Weighting Strategy for 2003-2005 CINCH Analysis*, available at http://www.huduser.org/datasets/cinch.html.

Table 3: Forward-Looking Rental Dynamics Analysis, Counts: 2003-2005 (all numbers in thousands)

Rent Groups	A Total in 2003	B Non-Market in 2005	C Extremely Low Rent in 2005	D Very Low Rent in 2005	E Low Rent in 2005	F Moderate Rent in 2005	G High Rent in 2005	H Very High Rent in 2005	I Extremely High Rent in 2005	J Owner Occupied in 2005	K Seasonal or Related Vacant in 2005	L Lost to Stock in 2005
Non-market	8,220	5,867	91	456	242	249	83	29	62	715	294	132
Extremely Low Rent	2,853	152	813	703	196	177	54	19	85	363	169	122
Very Low Rent	11,055	440	545	6,131	1,438	632	129	41	106	890	469	234
Low Rent	5,933	204	152	1,392	2,272	1,049	110	24	66	403	186	75
Moderate Rent	6,228	266	199	477	984	2,825	431	115	110	530	189	102
High Rent	1,741	66	36	113	82	413	507	119	43	250	81	31
Very High Rent	862	28	25	51	33	110	133	221	122	90	46	4
Extremely High Rent	1,279	39	42	104	53	91	126	105	499	120	81	19
Total	38,171	7,062	1,903	9,428	5,299	5,547	1,574	672	1,093	3,360	1,515	717

Table 4: Forward-Looking Rental Dynamics Analysis, Row Percentages: 2003-2005

Rent Groups	A Total in 2003 (thousands)	B Non-Market in 2005	C Extremely Low Rent in 2005	D Very Low Rent in 2005	E Low Rent in 2005	F Moderate Rent in 2005	G High Rent in 2005	H Very High Rent in 2005	I Extremely High Rent in 2005	J Owner Occupied in 2005	K Seasonal or Related Vacant in 2005	L Lost to Stock in 2005
Non-market	8,220	71.4%	1.1%	5.6%	2.9%	3.0%	1.0%	0.4%	0.8%	8.7%	3.6%	1.6%
Extremely Low Rent	2,853	5.3%	28.5%	24.6%	6.9%	6.2%	1.9%	0.7%	3.0%	12.7%	5.9%	4.3%
Very Low Rent	11,055	4.0%	4.9%	55.5%	13.0%	5.7%	1.2%	0.4%	1.0%	8.0%	4.2%	2.1%
Low Rent	5,933	3.4%	2.6%	23.5%	38.3%	17.7%	1.9%	0.4%	1.1%	6.8%	3.1%	1.3%
Moderate Rent	6,228	4.3%	3.2%	7.7%	15.8%	45.4%	6.9%	1.8%	1.8%	8.5%	3.0%	1.6%
High Rent	1,741	3.8%	2.1%	6.5%	4.7%	23.7%	29.1%	6.8%	2.4%	14.4%	4.7%	1.8%
Very High Rent	862	3.2%	3.0%	5.9%	3.8%	12.8%	15.5%	25.6%	14.1%	10.4%	5.3%	0.4%
Extremely High Rent	1,279	3.1%	3.3%	8.2%	4.1%	7.1%	9.9%	8.2%	39.0%	9.4%	6.3%	1.5%
Total	38,171	18.5%	5.0%	24.7%	13.9%	14.5%	4.1%	1.8%	2.9%	8.8%	4.0%	1.9%

The numbers in Tables 3 and 4 suggest that some rental units move far from their initial category. For example, 3.2 percent of the units that were moderate rent in 2003 became extremely low rent in 2005, while 1.8 percent became extremely high rent. Although sizeable movements both up and down are possible, the tables probably overestimate the range of movement. The HADS variables used in this paper rely on AHS variables that are subject to allocation, a process by which the Census Bureau assigns values to variables if respondents fail to answer questions. Previous analysis has shown that using data without allocations produces less movement out of an affordability category and fewer changes of more than one category.[12]

Table 5 summarizes what happened to the 2003 rental units by affordability category.

Table 5: Summary of Forward-Looking Rental Dynamics

Rent Groups	2003 Rental Units (thousands)	To More Affordable Categories in 2005	In Same Affordability Category in Both Years	To Less Affordable Categories in 2005	2003 Rental Units Non-Rental in 2005
Non-market	8,220	NA	71.4%	14.7%	13.9%
Extremely Low Rent	2,853	5.3%	28.5%	43.3%	22.9%
Very Low Rent	11,055	8.9%	55.5%	21.2%	14.4%
Low Rent	5,933	29.5%	38.3%	21.1%	11.2%
Moderate Rent	6,228	30.9%	45.4%	10.5%	13.2%
High Rent	1,741	40.8%	29.1%	9.2%	20.8%
Very High Rent	862	44.1%	25.6%	14.2%	16.2%
Extremely High Rent	1,279	43.9%	39.0%	NA	17.1%
Total	38,171	16.9%	50.1%	18.3%	14.7%

Overall, more rental units moved to less affordable categories than moved to more affordable categories—18.3 percent versus 16.9 percent. The pattern by affordable categories is distinctive. The focus here is on the middle six categories, because units in the non-market and extremely high rent categories can change affordability categories in only one direction. Among the top four of these six middle categories, a higher proportion of units became more affordable than less affordable. This is the classic filtering model—that is, as units age there is a tendency for their rents to decline in relative terms. Among very low rent and extremely low rent units, a higher proportion became less affordable than became more affordable. Over 40 percent of the extremely low rent units became less affordable. This may be the consequence of efforts to upgrade older, less desirable units to make them more competitive, or to respond to gentrifying activity in older neighborhoods. In viewing all of these trends, it is important to remember that the allocation process does create the appearance of more movement among affordable categories than is probably taking place.

Of the 38,171,000 rental units in 2003, 5,593,000 (or 14.7 percent) were no longer in the rental stock in 2005. More than half of these losses were due to changes in tenure, with 3,360,000 rental units becoming owner-occupied in 2005. Another 1,515,000 units

[12] See page 10 of *Rental Market Dynamics: Is Affordable Housing for the Poor an Endangered Species?*

became seasonal units, units occupied by persons with usual residence elsewhere, or units used for migratory workers. Finally, 717,000 rental units were no longer in the housing stock in 2005. Some of these losses were permanent, that is, the units were demolished or destroyed; some losses were potentially reversible, for example, units being used for nonresidential purposes.

Movement into owner-occupancy occurred for 8.8 percent of all rental units. The percentage of movement across the categories ranged from a high of 14.4 percent for high rent units to a low of 6.8 percent for low rent units. While units in the highest rent categories were more likely to become owner-occupied, there was substantial movement in this direction among extremely low rent units, with 12.7 percent becoming owner-occupied. Among 2003 rental units, 4.0 percent were seasonal or related vacant in 2005. Again, units in the highest rent categories were more likely to move out of the rental stock for this reason. However, extremely low rent units displayed a high rate of movement into this status. Of the 2003 rental units, 1.9 percent was lost to the housing stock by 2005. Extremely low rent units were more than twice as likely to be lost (4.3 percent); very low rent units were the only other category to have an above average loss rate (2.1 percent).

Backward-Looking Rental Dynamics

Table 6 tracks how the 38,599,000 rental units in the 2005 housing stock from Table 2 relate to the 2003 housing stock. Columns B through M explain where the 2005 rental units fit into the 2003 housing stock.

- If the units were also rental in 2003, they will be counted in columns B through I, depending upon how affordable they are in 2003.
- If the units were owner-occupied, they will be counted in column J.
- Seasonal units, units that were not the primary residence of their occupants, units used for migratory workers, and units that were vacant but not for rent or sale are counted in column K.
- Column L counts units that were newly constructed between 2003 and 2005.
- Column M counts units that were temporary losses to the housing stock in 2003 or were added for other reasons.

The sum of columns B through M equals column A, except for rounding.

Table 7 presents the same information as Table 6, but columns B through M are now percentages of column A. Columns B through M sum to 100 percent in each row.

Table 6: Backward-Looking Rental Dynamics Analysis, Counts: 2003-2005 (all numbers in thousands)

Rent Groups	A Total in 2005	B Non-Market in 2003	C Extremely Low Rent in 2003	D Very Low Rent in 2003	E Low Rent in 2003	F Moderate Rent in 2003	G High Rent in 2003	H Very High Rent in 2003	I Extremely High Rent in 2003	J Owner Occupied in 2003	K Seasonal or Related Vacant in 2003	L New Construc -tion	M Other Addition
Non-market	8,519	5,862	156	486	223	296	71	30	45	742	265	176	167
Extremely Low Rent	2,387	89	815	543	149	198	37	26	42	282	147	9	51
Very Low Rent	10,703	411	694	6,112	1,405	483	119	52	109	685	385	78	171
Low Rent	6,028	221	192	1,406	2,268	998	86	36	56	463	179	72	50
Moderate Rent	6,543	223	177	622	1,039	2,819	419	111	95	612	223	139	66
High Rent	2,015	75	56	130	109	424	508	131	122	263	73	98	26
Very High Rent	935	28	19	41	19	112	120	227	108	143	28	80	10
Extremely High Rent	1,469	54	84	105	63	109	40	124	503	177	66	64	81
Total	38,599	6,963	2,191	9,445	5,276	5,439	1,400	737	1,080	3,366	1,364	715	623

Table 7: Backward-Looking Rental Dynamics Analysis, Row Percentages: 2003-2005

Rent Groups	A Total in 2005 (thousands)	B Non-Market in 2003	C Extremely Low Rent in 2003	D Very Low Rent in 2003	E Low Rent in 2003	F Moderate Rent in 2003	G High Rent in 2003	H Very High Rent in 2003	I Extremely High Rent in 2003	J Owner Occupied in 2003	K Seasonal or Related Vacant in 2003	L New Construc -tion	M Other Addition
Non-market	8,519	68.8%	1.8%	5.7%	2.6%	3.5%	0.8%	0.3%	0.5%	8.7%	3.1%	2.1%	2.0%
Extremely Low Rent	2,387	3.7%	34.1%	22.7%	6.2%	8.3%	1.5%	1.1%	1.8%	11.8%	6.1%	0.4%	2.1%
Very Low Rent	10,703	3.8%	6.5%	57.1%	13.1%	4.5%	1.1%	0.5%	1.0%	6.4%	3.6%	0.7%	1.6%
Low Rent	6,028	3.7%	3.2%	23.3%	37.6%	16.6%	1.4%	0.6%	0.9%	7.7%	3.0%	1.2%	0.8%
Moderate Rent	6,543	3.4%	2.7%	9.5%	15.9%	43.1%	6.4%	1.7%	1.4%	9.3%	3.4%	2.1%	1.0%
High Rent	2,015	3.7%	2.8%	6.5%	5.4%	21.0%	25.2%	6.5%	6.0%	13.1%	3.6%	4.9%	1.3%
Very High Rent	935	2.9%	2.0%	4.4%	2.1%	12.0%	12.8%	24.3%	11.6%	15.3%	3.0%	8.6%	1.1%
Extremely High Rent	1,469	3.7%	5.7%	7.1%	4.3%	7.4%	2.7%	8.4%	34.3%	12.0%	4.5%	4.3%	5.5%
Total	38,599	18.0%	5.7%	24.5%	13.7%	14.1%	3.6%	1.9%	2.8%	8.7%	3.5%	1.9%	1.6%

As was the case in the forward-looking analysis, non-market rental units show greater stability than units in the other seven affordability categories. Of the 2005 non-market units, 68.8 percent were non-market in 2003 as well. Very low rent units were also stable with 57.1 percent of the 2005 very low rent units being very low rent in 2003. Among units in the other affordability categories, the proportion of units from a 2005 category that were in the same category in 2003 ranged from 24.3 percent (very high rent) to 43.1 percent (moderate rent).

Table 8 summarizes where the 2005 rental units came from by affordability category.

Table 8: Summary of Backward-Looking Rental Dynamics

Rent Groups	2005 Rental Units (thousands)	From Less Affordable Category in 2003	In Same Affordability Category in Both Years	From More Affordable Category in 2003	2005 Rental Units Non-Rental in 2003
Non-market	8,519	15.4%	68.8%	NA	15.8%
Extremely Low Rent	2,387	41.7%	34.1%	3.7%	20.4%
Very Low Rent	10,703	20.3%	57.1%	10.3%	12.3%
Low Rent	6,028	19.5%	37.6%	30.2%	12.7%
Moderate Rent	6,543	9.5%	43.1%	31.5%	15.9%
High Rent	2,015	12.6%	25.2%	39.4%	22.8%
Very High Rent	935	11.6%	24.3%	36.1%	28.0%
Extremely High Rent	1,469	NA	34.2%	39.4%	26.3%
Total	38,599	17.2%	49.5%	17.6%	15.7%

Overall, more rental units came from more affordable categories than from less affordable categories—17.6 percent versus 17.2 percent. Table 5 showed downward filtering at the top of the rental affordability scale and upgrading at the bottom; Table 8 shows the consequences of those changes.[13] Among the top four of these six middle categories, a higher proportion of units came from more affordable categories than from less affordable categories. Among very low rent and extremely low rent units, a higher proportion came from the less affordable categories than from the more affordable categories.

Of the 38,599,000 rental units in 2005, 6,068,000 (or 15.7 percent) were not in the rental stock in 2003. More than half of these gains were due to changes in tenure, with 3,366,000 rental units having been owner-occupied in 2003. Another 1,364,000 units had been seasonal units, units occupied by persons with usual residence elsewhere, or units used for migratory workers. New construction added 715,000 rental units. Finally, 623,000 rental units were other additions to the housing stock since 2003. These include mobile home move-ins, units created by mergers and conversions, and units that had been used for nonresidential purposes.

[13] Table 5 describes what happened to units that moved out of each affordability category after 2003; Table 8 describes where the units came from that moved into each affordability category between 2003 and 2005. Table 5 sums counts in the rows of Table 3; Table 8 sums counts in the rows of Table 6. One could construct an alternative estimate of Table 5 using the counts in the columns of Table 6, and an alternative estimate of Table 8 using counts in the columns of Table 3. This approach produces numbers very close to those in Tables 5 and 8.

Movement from owner-occupancy occurred for 8.7 percent of all rental units. The percentage of movement across the categories ranged from a high of 15.3 percent for very high rent units to a low of 6.4 percent for very low rent units. Units in the highest rent categories were more likely to have been owner-occupied, but extremely low rent units had a higher than average propensity to have been owner-occupied.

Among 2005 rental units, 3.5 percent were seasonal or related vacant in 2003. Extremely low rent units had the highest proportion of units that were previously seasonal or vacant (6.1 percent); the second highest proportion belonged to extremely high rent units (4.5 percent).

Of all 2005 rental units, 1.9 percent came from new construction. The three highest rent categories had substantially higher than average rates of new construction, ranging from 4.3 to 8.6 percent. Another 1.6 percent came from other additions. Extremely high rent units had, by far, the highest rate of other additions (5.5 percent).

Taking all outside sources into account, movement into the rental stock is greatest at the high end of the affordability spectrum. Combining columns J, K, L, and M, 15.7 percent of 2005 rental units were not rental in 2003. The rates by category are: non-market (15.8 percent), extremely low rent (20.5 percent), very low rent (12.3 percent), low rent (12.7 percent), moderate rent (15.9 percent), high rent (22.8 percent), very high rent (28.0 percent), and extremely high rent (26.4 percent).

Combining Forward-Looking and Backward-Looking Analyses

By themselves, forward-looking and backward-looking rental dynamics analyses leave an important question unanswered: Has the supply of affordable rental housing been growing or declining? Each type of analysis lacks a key piece of the puzzle. Forward-looking analysis does not produce data on the movement of units into rental housing, while backward-looking analysis does not produce data on the movement of units out of rental housing. This section combines the two types of analyses to answer this question.

The combination process is simple but potentially dangerous. One can start with the 2003 rental stock and estimate the 2005 rental stock by (1) using forward-looking analysis to track the 2003 rental stock to 2005 and then (2) adding additions to the rental stock since 2003 from the backward-looking analysis. Alternatively, one can start with the 2005 rental stock and estimate the 2003 rental stock by (1) using backward-looking analysis to project the 2005 rental stock back to 2003 and then (2) adding rental units that were lost to the rental stock between 2003 and 2005 from the forward-looking analysis. Table 9 in effect performs the first of these combinations while Table 10 performs the second.

The danger arises because the two analyses combine weights created for different purposes and could produce misleading answers. To illustrate the need for caution, the discussion of Tables 9 and 10 begins with two inconsistencies between the tables:

- Table 9 starts with the forward-looking estimate of the 2003 rental stock and produces an estimate of the 2005 rental stock that is 50,000 greater than the estimate from the backward-looking analysis. Table 10 starts with the backward-looking estimate of the 2005 rental stock and produces an estimate of the 2003 rental stock that is 48,000 less than the forward-looking estimate.[14]

- Table 9 estimates that 19,135,000 units were in the same affordability category in both 2003 and 2005; Table 10 estimates this number as 19,114,000. These estimates are based on the same AHS sample units and differ only because the weights applied to the sample units differ.

These inconsistencies point out the need for caution in using Tables 9 and 10. This paper looks at these tables for information on the direction and magnitude of changes in affordability and for estimates of the relative magnitude of the underlying causes.

In Table 9, the estimation process runs from left to right. The calculations begin with the 2003 rental stock in 2003 (column A). The forward-looking analysis tracks movement of these units either out of the rental stock (column C) or to other affordability categories (columns D and E). Column F counts the number of units that were rental in 2003, remained rental in 2005, and were in the same affordability category in both years. Column F equals column A minus the sum of columns C, D, and E. At this point, for each affordability category, the table has taken the count of units in that category in 2003 and stripped out all the units that are not in that category in 2005. Now the table adds in units that are in the category in 2005 but did not start out in that category in 2003. Columns G and H add units that came from other affordability categories and column I adds units that were non-rental in 2003. Column J is the estimate for 2005 of the number of units in each affordability category produced by this process. For comparison, column K contains the estimates for 2005 from the backward-looking analysis.

In Table 10, the estimation process runs from right to left. The calculations begin with the 2005 rental stock (column K). The backward-looking analysis removes units that were not rental in 2003 (column I) and units that came from other affordability categories (columns G and H). Column F counts the number of units that were rental in 2005, were also rental in 2003, and were in the same affordability category in both years. Column F is column K minus the sum of columns G, H, and I. At this point, for each affordability category, the table has taken the count of units in that category in 2005 and stripped out all the units that were not in that category in 2003. Now the table adds in units that are in the category in 2003 but did not continue in that category in 2005. Columns D and E add units that had moved out of the affordability class since 2003, and column C adds units that had moved out of the rental stock since 2003. Column B is the estimate for 2003 of the number of units in each affordability category produced by this process. For comparison, column A contains the forward-looking estimate for the 2003 rental stock.

[14] The difference is approximately 50,000 in both cases because of the symmetry in the estimation procedure. The difference between columns A and K is 428,000 in both tables. The movement among affordability categories netted across all categories must be zero. So the only source of net gain or loss is the difference between columns I and C, which is 477,000 in both tables. 428,000 = 477,000 – 49,000. The differences in the tables are 50,000 and 48,000 instead of 49,000 because of rounding.

Table 9: Tracking the Rental Stock Forward (all counts in thousands, source of estimates in parentheses)

Rent Groups	A 2003 Rental Units (forward)	B Not Applicable	C 2003 Rental Units Non-Rental in 2005 (forward)	D In Less Affordable Categories in 2005 (forward)	E In More Affordable Categories in 2005 (forward)	F In Same Affordability Category in Both Years (forward)	G In More Affordable Category in 2003 (forward)	H In Less Affordable Category in 2003 (forward)	I 2005 Rental Units Non-rental in 2003 (backward)	J Estimated 2005 Rental Stock (combined)	K 2005 Rental Units (backward)
Non-market	8,220		1,141	1,212	NA	5,867	1,196	NA	1,349	8,412	8,519
Extremely Low Rent	2,853		654	1,234	152	813	999	91	488	2,391	2,387
Very Low Rent	11,055		1,592	2,347	985	6,131	2,138	1,159	1,318	10,746	10,703
Low Rent	5,933		664	1,249	1748	2,272	1,151	1,876	765	6,064	6,028
Moderate Rent	6,228		820	657	1926	2,825	614	2,108	1,040	6,587	6,543
High Rent	1,741		362	161	711	507	260	808	460	2,035	2,015
Very High Rent	862		140	122	380	221	105	347	262	935	935
Extremely High Rent	1,279		219	NA	561	499	NA	593	387	1,479	1,469
Total	38,171	0	5,592	6,982	6,463	19,135	6,463	6,982	6,069	38,649	38,599

Table 10: Tracking the Rental Stock Backward (all counts in thousands, source of estimates in parentheses)

Rent Groups	A 2003 Rental Units (forward)	B Estimated 2003 Rental Stock (combined)	C 2003 Rental Units Non-Rental in 2005 (forward)	D In Less Affordable Categories in 2005 (backward)	E In More Affordable Categories in 2005 (backward)	F In Same Affordability Category in Both Years (backward)	G In More Affordable Category in 2003 (backward)	H In Less Affordable Category in 2003 (backward)	I 2005 Rental Units Non-rental in 2003 (backward)	J Not Applicable	K 2005 Rental Units (backward)
Non-market	8,220	8,104	1,141	1,101	NA	5,862	1,308	NA	1,349		8,519
Extremely Low Rent	2,853	2,845	654	1,220	156	815	995	89	488		2,387
Very Low Rent	11,055	11,036	1,592	2,303	1,029	6,112	2,168	1105	1,318		10,703
Low Rent	5,933	5,940	664	1,231	1,777	2,268	1,176	1820	765		6,028
Moderate Rent	6,228	6,260	820	645	1,976	2,819	624	2061	1,040		6,543
High Rent	1,741	1,762	362	160	732	508	253	794	460		2,015
Very High Rent	862	877	140	124	386	227	108	338	262		935
Extremely High Rent	1,279	1,299	219	NA	577	503	NA	579	387		1,469
Total	38,171	38,123	5,592	6,784	6,633	19,114	6,632	6,786	6,069		38,599

Columns A and K are the same in both tables; these columns come from Table 2. This paper uses the difference between column K and column A as the CINCH estimate of change in the size of each category over the period. Table 9 estimates the change in the size of each category by subtracting column A from column J, while Table 10 estimates the change by subtracting column B from column K.

Columns C and I are identical in both tables. The difference between column I and column C is an estimate for each affordability category of the net gain between 2003 and 2005 from outside the rental stock.

Columns D, E, G, and H measure movement of rental units between affordability categories. For each category, the gain from these movements between 2003 and 2005 is:

column G + column H - column D - column E.

This sum for each affordability category will differ between Table 9 and Table 10. However, the sum over all categories must equal zero in both tables.

To facilitate the discussion, Table 11 collects the information from Tables 9 and 10. Table 11 also contains the estimates using AHS weights from Table 1. Using Table 11, the paper discusses each affordability category separately.

Table 11: Changes in the Rental Stock by Affordability Category, Combined Analysis (all counts in thousands)

Rent Groups	AHS estimates of 2003-2005 change (Table 1)	CINCH estimate of 2003-2005 change (column K - column A and Table 2)	Table 9 estimate of 2003-2005 change (column J - column A)	Table 10 estimate of 2003-2005 change (column K - column B)	Net Gain from non-rental sources (column I - column C)	Table 9 estimate of net gain from movement across categories	Table 10 estimate of net gain from movement across categories
Non-market	343	299	192	415	208	-16	207
Extremely Low Rent	-410	-466	-462	-458	-166	-296	-292
Very Low Rent	-512	-352	-309	-333	-274	-35	-59
Low Rent	-32	95	131	88	101	30	-12
Moderate Rent	402	315	359	283	220	139	64
High Rent	186	274	294	253	98	196	155
Very High Rent	19	73	73	58	122	-50	-64
Extremely High Rent	352	190	200	170	168	32	2
Total	348	428	478	476	477	0	1

- Non-market units:
  - The number of non-market units increased between 2003 and 2005. Table 9 shows a smaller increase than either the CINCH or AHS weights, while Table 10 shows a larger increase.
  - Table 10 shows a substantial net gain from movement among the affordability categories, while Table 9 shows a small net loss.

- Extremely low rent units
  - All four estimates show a substantial decline in the number of extremely low rent units.
  - Both tables report a net loss of approximately 300,000 due to movement among affordability categories. The loss due to changes in affordability is slightly less than twice the loss due to the net of movement into and out of the rental stock.

- Very low rent units
  - All four measures show a substantial decline in the number of very low rent units.
  - The decline appears to come mainly from a net movement out of the rental stock. Both tables show a modest loss of units due to movement into and out of other affordability categories.

- Low rent units
  - The CINCH estimate and the AHS estimate show virtually no change in the count of low rent units. The AHS estimates show a 0.5 percent loss between 2003 and 2005, while the CINCH estimates show a 1.6 percent increase. Both Table 9 and Table 10 report small increases in percentage terms.
  - The tables describe a modest net increase from movement into and out of the rental stock, but disagree on the effect of movement among affordability categories. Table 9 reports a small gain from this source, while Table 10 indicates a small loss.

- Moderate rent units
  - All four sources tell of a sizable increase in the number of moderate rent units.
  - More than half the increase results from net movement into rental housing. Table 9 reports roughly twice the gain from movement among affordability categories as Table 10.

- High rent units
  - All four estimates show a gain in the number of high rent units.
  - While net movement into rental housing was positive for this affordability category, the largest contributor to the growth in high rent units was a net gain from movement among affordability categories.

- Very high rent units
  - All four methods indicate a modest increase in the number of very high rent units.
  - The tables suggest the increase resulted from a net inflow of units from non-rental sources that more than offset the net loss of units to other affordability categories.

- Extremely high rent units
    - All four methods show a substantial gain in the number of extremely high rent units. The AHS estimate is roughly twice the estimates from CINCH.
    - In both Tables 9 and 10, a net increase in rental units accounts for almost all the gain. Movement among affordability categories made a positive net contribution but a minor one.

Conclusion

This paper began with two questions that can now be answered:

- Did the number of rental units affordable to lower income households grow or decline between 2003 and 2005?

  The two most affordable categories—the extremely low rent and very low rent categories—posted large decreases in the number of units between 2003 and 2005. In percentage terms, the losses were greatest for extremely low rent units. Taking the two categories together, the AHS estimates a loss of 922,000 units; the CINCH estimates range from a loss of 771,000 to 818,000.

- What factors caused the number of affordable rental units to grow or decline during this period?

  The extremely low rent category declined mainly because of a loss of units to other affordability categories, but this category also experienced a sizable loss as units left the rental stock. The very low rent category declined mainly because units left the rental stock; there were minor losses to other affordability categories.