

American Housing Survey

Listing of Programs and Variables Used in CINCH and Rental Dynamics Analysis for the 2011 American Housing Survey

Prepared For:

**U.S. Department of Housing & Urban Development
Office of Policy Development & Research**

Prepared By:

**Fouad Moumen
Econometrica, Inc.
Bethesda, MD**

**Contract No. C-CHI-01030
Order No. CHI-T0002
Project No. 1053-002**

June 2015

Listing of Programs and Variables Used in CINCH and Rental Dynamics Analysis for the 2011 American Housing Survey

Overview

This paper defines the variables used for Components of Inventory Change (CINCH) and rental dynamics analysis involving both the national and metropolitan components of the 2011 American Housing Survey (AHS). It also lists the related programs and data sets created as part of that analysis.

National Data and Programs

The following 11 programs and 1 data set were used to produce the CINCH and rental dynamics analysis at the national level involving the 2009 and 2011 AHS surveys. They have been posted on the AHS Web site:

- `cinch_forward_backward_09_11`: For each control number, this SAS DATA SET file contains the weights used in the forward-looking CINCH analysis (FLCINCHWT), along with the variables used to identify CINCH status and rental affordability status. These variables are defined in this document. One can replicate the rental dynamics tables using this file only. To replicate the CINCH tables, one has to use the following SAS codes along with data from the 2009 and 2011 AHS files.
- `FORWARD_WEIGHTS_09_11`: the program used to create FLCINCHWT.
- `FORWARD_TABLE_A`: the program used to generate Forward-Looking Table A.
- `FORWARD_TABLE_B`: the program used to generate Forward-Looking Table B.
- `FORWARD_TABLE_C`: the program used to generate Forward-Looking Table C.
- `FORWARD_TABLE_D`: the program used to generate Forward-Looking Table D.
- `BACKWARD_WEIGHTS_09_11`: the program used to create BLCINCHWT.
- `BACKWARD_TABLE_A`: the program used to generate Backward-Looking Table A.
- `BACKWARD_TABLE_B`: the program used to generate Backward-Looking Table B.
- `BACKWARD_TABLE_C`: the program used to generate Backward-Looking Table C.
- `BACKWARD_TABLE_D`: the program used to generate Backward-Looking Table D.
- `RENT_DYNAMICS_11_09`: the program used to generate the rental dynamics core tables.

Metropolitan Data and Programs

The following 12 programs and 2 data sets were used to produce the CINCH and rental dynamics analysis at the metropolitan level involving the 2011 AHS survey and previous AHS surveys. They have been posted on the AHS Web site. Because the metropolitan analysis uses four metropolitan AHS surveys (1998, 2002, 2004, and 2009), the term “PREVIOUS” is used instead of a specific survey year.

- metro_f_cinch_2011_previous: For each control number, this SAS DATA SET file contains the weights used in the forward-looking CINCH analysis (FLCINCHWT), along with the variables used to identify CINCH status and rental affordability status.
- metro_b_cinch_2011_previous: For each control number, this SAS DATA SET file contains the weights used in the backward-looking CINCH analysis (BLCINCHWT), along with the variables used to identify CINCH status and rental affordability status.
- Metro_Forward_2011_PREVIOUS_WEIGHTS: the program used to create FLCINCHWT.
- Metro_Backward_11_PREVIOUS_WEIGHTS: the program used to create BLCINCHWT.
- Metro_Forward_PREVIOUS_2011_TABLE_A: the program used to generate Forward-Looking Table A.
- Metro_Forward_PREVIOUS_2011_TABLE_B: the program used to generate Forward-Looking Table B.
- Metro_Forward_PREVIOUS_2011_TABLE_C: the program used to generate Forward-Looking Table C.
- Metro_Forward_PREVIOUS_2011_TABLE_D: the program used to generate Forward-Looking Table D.
- Metro_Backward_2011_PREVIOUS_Table_A: the program used to generate Backward-Looking Table A.
- Metro_Backward_2011_PREVIOUS_Table_B: the program used to generate Backward-Looking Table B.
- Metro_Backward_2011_PREVIOUS_Table_C: the program used to generate Backward-Looking Table C.
- Metro_Backward_2011_PREVIOUS_Table_D: the program used to generate Backward-Looking Table D.
- F_METRO_RENTAL_DYNAMICS_PREVIOUS_2011: the program used to generate the Forward-Looking rental dynamics core tables.
- B_METRO_2011_PREVIOUS_RENTAL: the program used to generate the Backward-Looking rental dynamics core tables.

Definition of Created Variables

The following pages define the variables that were used to generate the CINCH and rental dynamics tables. The data files listed above contain these variables.

Each of the variables defined below is calculated using variables defined elsewhere. Definitions for SAME, INTLOSS, etc., can be found in the companion documents, *Weighting Strategy for 2009–2011 CINCH Analysis* and *Weighting Strategy for 2011 Metropolitan CINCH Analysis*.¹ These documents also explain how the weights were derived.

Definitions for NOINT, OWNRENT, and other variables with IN09_ or IN11_ prefixes can be found in the AHS Codebook or the Housing Affordability Data System documentation.² The IN09_ and IN11_ prefixes indicate which AHS survey (2009 or 2011) was used for the value of that particular variable in the national analysis. For the metropolitan-level analysis, substitute the previous survey year for 2009; i.e., IN09_ becomes IN98_, IN02_, IN04_, or IN09_ depending upon the metropolitan area being studied.

CONTROL = Control number. This is the scrambled control number from the AHS master file. It is used to preserve confidentiality and to enable longitudinal matches to earlier files. It is a character variable of 12 spaces in length.

IN11_REUAD = Reason unit got added to sample—see AHS Codebook for definition.

IN11_SAMEDU = Same housing unit as last enumeration—see AHS Codebook for a definition of this variable, and see the AHS_FAQ for an explanation of the variable.

IN11_SAMEDU2 = A “revised” version of SAMEDU that attempts to determine why the unit is not same housing unit; SAMEDU2 is numeric whereas SAMEDU is a character variable. SAMEDU2 is used only in the national level analysis.

The logic used for the code is presented first, and then the interpretation for the various values of SAMEDU2 is given. The code is sequential—that is, later lines will overwrite earlier lines.

```
IN11_SAMEDU2 = B
```

```
IF IN11_SAMEDIU = '2', IN11_SAMEDU2 = 1
```

```
IF (IN11_SAMEDIU = '2' AND (((IN07_NUNIT2 = IN11_NUNIT2) AND  
(IN09_NUNIT2 NE IN11_NUNIT2)) OR ((IN07_ROOMS = IN11_ROOMS) AND  
(IN09_ROOMS NE IN11_ROOMS)))) THEN IN11_SAMEDU2 = 2
```

```
IF (IN11_SAMEDIU = '2' AND ((IN09_NOINT = “B” OR IN09_NOINT LT 30) AND  
IN11_NOINT GE 30)) THEN IN11_SAMEDU2 = 3
```

¹ Found on the HUD AHS Web site under CINCH files: <http://www.huduser.org/portal/datasets/cinch.html>.

² Found at <http://www.huduser.org/portal/datasets/ahs/ahsprev.html#codebooks> and at <http://www.huduser.org/portal/datasets/hads/hads.html>.

IF (IN11_SAMEDU = '2' AND (IN09_NUNIT2 = 4 AND IN11_NOINT = 13)) THEN
IN11_SAMEDU2 = 4

IF (IN11_SAMEDU = 2 AND IN11_SAMEDU2 NE 2 AND (IN11_NUNIT2 = 4 AND
(IN09_NUNIT2 = B OR (IN09_NUNIT2 = 4 AND (IN09_BUILT NE IN11_BUILT))
OR IN09_NUNIT2 LT 4))) THEN IN11_SAMEDU = 5

IF (IN11_SAMEDU = '2' AND IN11_NUNIT2 NE 4 AND (IN11_BUILT LT 2009
AND ((IN07_ROOMS = IN09_ROOMS) AND (IN09_ROOMS LT IN11_ROOMS)))
AND IN11_NOINT = B) THEN IN11_SAMEDU2 = 6

IF (IN11_SAMEDU = '2' AND IN11_NUNIT2 NE 4 AND (IN11_BUILT LT 2009
AND ((IN07_ROOMS = IN09_ROOMS) AND (IN09_ROOMS GT IN11_ROOMS)))
AND IN11_NOINT = B) THEN IN11_SAMEDU2 = 7

IF (IN11_SAMEDU = '2' AND IN11_NUNIT2 NE 4 AND (IN11_BUILT LT 2009
AND ((IN07_ROOMS = IN09_ROOMS) AND (IN09_ROOMS NE IN11_ROOMS)))
AND 1 LE IN11_NOINT LE 12) THEN IN11_SAMEDU2 = 8

Interpret SAMEDU2 as follows:

IN11_SAMEDU2 = B Not applicable

IN11_SAMEDU2 = 1 Not clear why SAMEDIU = '2'

IN11_SAMEDU2 = 2 Possibly the wrong unit was interviewed in 2009

IN11_SAMEDU2 = 3 A new type C non-interview

IN11_SAMEDU2 = 4 Vacant mobile home lot that was occupied in 2009

IN11_SAMEDU2 = 5 Mobile home move in (to a vacant lot, replacing an old
mobile home, or replacing a non-mobile home structure)—note that if
IN09_NOINT NE B, this implies either a mobile home move out or a demolition
of another structure type

IN11_SAMEDU2 = 6 Possible merger

IN11_SAMEDU2 = 7 Possible split

IN11_SAMEDU2 = 8 Possible merger or split—we cannot tell because the work
has not been completed or the unit was not interviewed

BLCINCHWT = Backward-looking CINCH weight

This is the weight applied to 2011 cases in backward-looking CINCH analysis.

00000-99999

FLCINCHWT = Forward-looking CINCH weight

This is the weight applied to 2009 cases in forward-looking CINCH analysis.

00000-99999

IN09 = Observation used in the forward-looking analysis
1 = a unit that is part of the 2009 housing stock and is used in the forward-looking analysis. This variable has a missing value for all other cases.

IN11 = Observation used in the backward-looking analysis
1 = a unit that is part of the 2011 housing stock and is used in the backward-looking analysis. This variable has a missing value for all other cases.

IN09_WEIGHT = Final 2009 AHS weight based on 1980 Census geography
00000-99999

IN11_WEIGHT = Final 2011 AHS weight based on 1980 Census geography
00000-99999

IN09_WGT90GEO = Final 2009 AHS weight based on 1990 Census geography
00000-99999

IN11_WGT90GEO2011 = Final 2011 AHS weight for national sample units based on 1990 Census geography
00000-99999

FLSTATUS = Forward status = status of a 2009 unit in 2011

1 = in 2009 stock and in 2011 stock:

IF SAME=1 THEN FLSTATUS=1

2 = in 2009 stock but a loss in 2011 due to conversion or merger:

IF INTLOSS=1 AND ((32 LE IN11_NOINT LE 33) OR (IN11_SAMEDU2=6
OR IN11_SAMEDU2=7 OR IN11_SAMEDU2=8)) THEN FLSTATUS=2

3 = in 2009 stock but a loss in 2011 due to house or mobile home move out:

IF INTLOSS=1 AND (IN11_NOINT=31 OR IN11_SAMEDU2=4 OR
(IN09_NUNIT2 = '4' AND IN11_SAMEDU2 = 5)) THEN FLSTATUS=3

4 = in 2009 stock but a loss in 2011 due to nonresidential use:

IF INTLOSS=1 AND (IN11_NOINT=12 OR IN11_NOINT=14) THEN
FLSTATUS=4

5 = in 2009 stock but a loss in 2011 due to demolition or disaster:

IF INTLOSS=1 AND (IN11_NOINT=30 OR (1 LE IN09_NUNIT2 LE 3 AND
(IN11_NOINT = 13 OR IN11_SAMEDU2 = 5)) OR (IN09_NUNIT2 =
'4' AND IN11_NOINT = 13)) THEN FLSTATUS=5

6 = in 2009 stock but a loss in 2011 due to damage or condemnation:
IF INTLOSS=1 AND (15 LE IN11_NOINT LE 16) THEN FLSTATUS=6

7 = in 2009 stock but a loss in 2011 for other reason:
IF INTLOSS=1 AND ((10 LE IN11_NOINT LE 11 AND IN11_SAMEDU2 NE
8) OR IN11_NOINT=17 OR (36 LE IN11_NOINT LE 37)) THEN
FLSTATUS=7

BLSTATUS = Backward status = status of a 2011 unit in 2009

1 = in 2011 stock and in 2009 stock:
IF SAME=1 THEN BLSTATUS=1

2 = in 2011 stock but not in 2009 stock; added by conversion or merger:
IF INTADD=1 AND ((6 LE IN11_REUAD LE 8) OR (IN11_SAMEDU2=6 OR
IN11_SAMEDU2=7 OR IN11_SAMEDU2=8)) THEN BLSTATUS=2

3 = in 2011 stock but not in 2009 stock; added by house or mobile home move in:
IF INTADD=1 AND (IN09_NOINT=13 OR (4 LE IN11_REUAD LE 5) OR
IN11_SAMEDU2 =5) THEN BLSTATUS=3

4 = in 2011 stock but not in 2009 stock; added from nonresidential use:
IF INTADD=1 AND ((IN09_NOINT=12 OR IN09_NOINT=14) OR
IN11_REUAD=9) THEN BLSTATUS=4

5 = in 2011 stock but not in 2009 stock; added by new construction:
IF INTNC=1 THEN BLSTATUS=5

6 = in 2011 stock but not in 2009 stock; added from temporary losses in 2009 stock:
IF INTADD=1 AND ((15 LE IN09_NOINT LE 16) AND
NOT(IN11_SAMEDU2=5 OR IN11_SAMEDU2=6 OR IN11_SAMEDU2=7 OR
IN11_SAMEDU2=8)) THEN BLSTATUS=6

7 = in 2011 stock but not in 2009 stock; added from other sources:
IF INTADD=1 AND (IN11_REUAD = 10 OR IN09_NOINT = 17) THEN
BLSTATUS=7

The last four variables deal with the concept of rental affordability. Previous rental dynamics studies have classified rents into eight categories based on the ratio of the unit's rent to various income levels. The U.S. Department of Housing and Urban Development (HUD) has created a group of data sets called the Housing Affordability Data System (HADS) that provides various types of affordability-related information on AHS units for different survey years. The eight categories are derived from the HADS documentation, and HADS variables are used to define the remaining four variables. Definitions of the variables from the HADS data set are found in *Housing Affordability Data System*.³

³ Located at http://www.huduser.org/intercept.asp?loc=/Datasets/hads/HADS_doc.pdf.

A unit is considered affordable to the members of a class if the rent of the unit is no greater than 30 percent of the highest monthly income for that class. The eight categories are:

- 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).
- Extremely high rent (affordable to renters with incomes greater than 120 percent of local area median income).

FLRENT = 2009 rent category

1 = a non-market rental unit in 2009:

IF IN09_OWNRENT='2' AND (IN09_TENURE='3' OR IN09_Assisted=1 OR IN09_RENT=1) THEN FLRENT=1

2 = an extremely low-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1 OR IN09_RENT=1) AND IN09_COST08RELAMICAT=1 THEN FLRENT=2

3 = a very low-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1 OR IN09_RENT=1) AND IN09_COST08RELAMICAT=2 THEN FLRENT=3

4 = a low-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1 OR IN09_RENT=1) AND IN09_COST08RELAMICAT=3 THEN FLRENT=4

5 = a moderate-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1 OR IN09_RENT=1) AND IN09_COST08RELAMICAT=4 THEN FLRENT=5

6 = a high-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1 OR IN09_RENT=1) AND IN09_COST08RELAMICAT=5 THEN FLRENT=6

7 = a very high-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1 OR IN09_RENT=1) AND IN09_COST08RELAMICAT=6 THEN FLRENT=7

8 = an extremely high-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1 OR IN09_RENT=1) AND IN09_COST08RELAMICAT=7 THEN FLRENT=8

. = missing

BLRENT = Current year (2011) rent category

1 = a non-market rental unit in 2011:

IF IN11_OWNRENT='2' AND (IN11_TENURE='3' OR IN11_Assisted=1 OR IN11_RENT=1) THEN BLRENT=1

2 = an extremely low-rent rental unit in 2011:

IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1 OR IN11_RENT=1) AND IN11_COST08RELAMICAT =1 THEN BLRENT=2

3 = a very low-rent rental unit in 2011:

IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1 OR IN11_RENT=1) AND IN11_COST08RELAMICAT =2 THEN BLRENT=3

4 = a low-rent rental unit in 2011:

IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1 OR IN11_RENT=1) AND IN11_COST08RELAMICAT =3 THEN BLRENT=4

5 = a moderate-rent rental unit in 2011:

IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1 OR IN11_RENT=1) AND IN11_COST08RELAMICAT =4 THEN BLRENT=5

6 = a high-rent rental unit in 2011:

IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1 OR IN11_RENT=1) AND IN11_COST08RELAMICAT =5 THEN BLRENT=6

7 = a very high-rent rental unit in 2011:

IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1 OR IN11_RENT=1) AND IN11_COST08RELAMICAT =6 THEN BLRENT=7

8 = an extremely high-rent rental unit in 2011:
IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1
OR IN11_RENT=1) AND IN11_COST08RELAMICAT =7 THEN BLRENT=8

. = missing

FLAFFORD = Forward rental affordability = affordability status in 2011 of 2009 rental unit

1 = a non-market rental unit in 2011:
IF IN11_OWNRENT='2' AND (IN11_TENURE='3' OR IN11_Assisted=1 OR
IN11_RENT=1) THEN FLAFFORD=1

2 = an extremely low-rent rental unit in 2011:
IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1
OR IN11_RENT=1) AND IN11_COST08RELAMICAT =1 THEN
FLAFFORD=2

3 = a very low-rent rental unit in 2011:
IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1
OR IN11_RENT=1) AND IN11_COST08RELAMICAT =2 THEN
FLAFFORD=3

4 = a low-rent rental unit in 2011:
IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1
OR IN11_RENT=1) AND IN11_COST08RELAMICAT =3 THEN
FLAFFORD=4

5 = a moderate-rent rental unit in 2011:
IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1
OR IN11_RENT=1) AND IN11_COST08RELAMICAT =4 THEN
FLAFFORD=5

6 = a high-rent rental unit in 2011:
IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1
OR IN11_RENT=1) AND IN11_COST08RELAMICAT =5 THEN
FLAFFORD=6

7 = a very high-rent rental unit in 2011:
IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1
OR IN11_RENT=1) AND IN11_COST08RELAMICAT =6 THEN
FLAFFORD=7

8 = an extremely high-rent rental unit in 2011:
IF IN11_OWNRENT='2' AND NOT (IN11_TENURE='3' OR IN11_Assisted=1
OR IN11_RENT=1) AND IN11_COST08RELAMICAT =7 THEN
FLAFFORD=8

9 = an owner-occupied unit in 2011:

IF (IN11_OWNRENT='1') THEN FLAFFORD=9

10 = a vacant or seasonal unit in 2011:

IF (IN11_VACANCY GE 6) OR (IN11_OWNRENT=. AND IN11_VACANCY
LE 5) THEN FLAFFORD=10

11 = a unit not in the 2011 stock:

IF (INTLOSS = 1) THEN FLAFFORD=11

. = missing

BLAFFORD = Backward rental affordability = affordability status in 2009 of a 2011 rental unit

1 = a non-market rental unit in 2009:

IF IN09_OWNRENT='2' AND (IN09_TENURE='3' OR IN09_Assisted=1 OR
IN09_RENT=1) THEN BLAFFORD=1

2 = an extremely low-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1
OR IN09_RENT=1) AND IN09_COST08RELAMICAT=1 THEN
BLAFFORD=2

3 = a very low-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1
OR IN09_RENT=1) AND IN09_COST08RELAMICAT=2 THEN
BLAFFORD=3

4 = a low-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1
OR IN09_RENT=1) AND IN09_COST08RELAMICAT=3 THEN
BLAFFORD=4

5 = a moderate-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1
OR IN09_RENT=1) AND IN09_COST08RELAMICAT=4 THEN
BLAFFORD=5

6 = a high-rent rental unit in 2009:

IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1
OR IN09_RENT=1) AND IN09_COST08RELAMICAT=5 THEN
BLAFFORD=6

7 = a very high-rent rental unit in 2009:

```
IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1
OR IN09_RENT=1) AND IN09_COST08RELAMICAT=6 THEN
BLAFFORD=7
```

8 = an extremely high-rent rental unit in 2009:

```
IF IN09_OWNRENT='2' AND NOT (IN09_TENURE='3' OR IN09_Assisted=1
OR IN09_RENT=1) AND IN09_COST08RELAMICAT=7 THEN
BLAFFORD=8
```

9 = an owner-occupied unit in 2009:

```
IF IN09_OWNRENT='1' THEN BLAFFORD=9
```

10 = a vacant or seasonal unit in 2009:

```
IF (IN09_VACANCY GE 6) OR (IN09_OWNRENT=. AND IN09_VACANCY
LE 5) THEN BLAFFORD=10
```

11 = a unit added by new construction:

```
IF INTNC=1 THEN BLAFFORD=11
```

12 = a unit not in the 2009 stock but not added through new construction:

```
IF INTADD=1 THEN BLAFFORD=12
```

. = missing