

Supplemental Poverty Measurement (SPM) Thresholds and a Missing Data Problem

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June 6, 2016

6th Annual BLS-Census Workshop on
Empirical Research using BLS-Census data

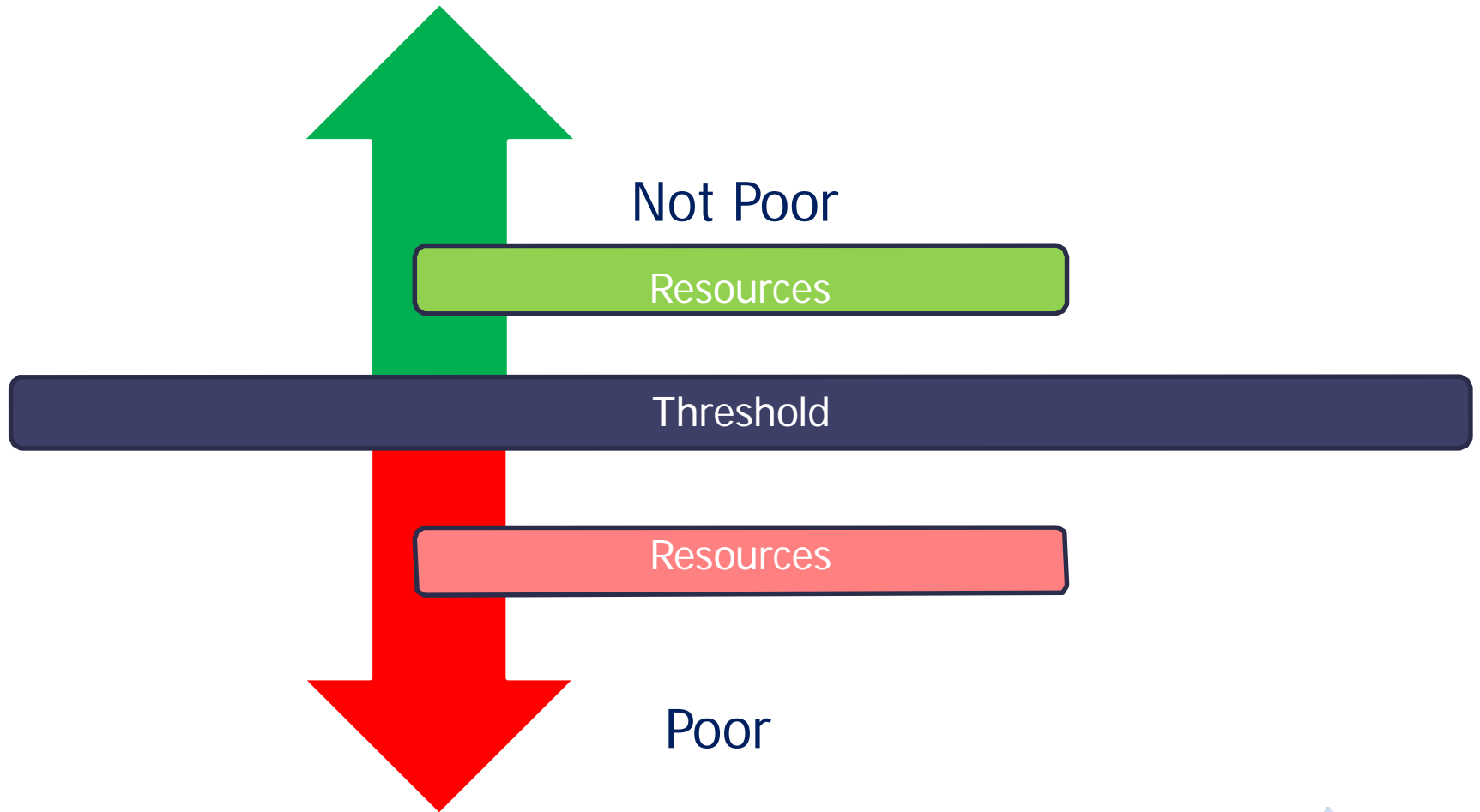
Bureau of Labor Statistics
Washington, DC

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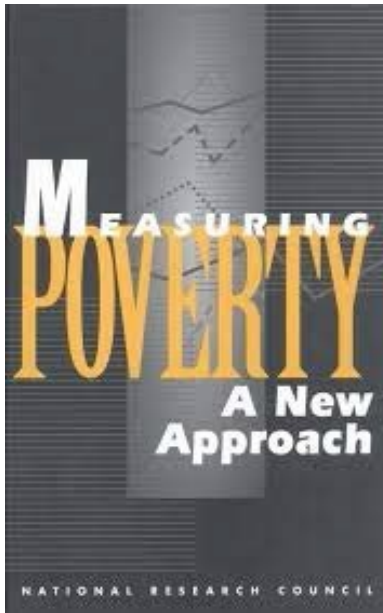


All Poverty Measures



National Academy of Sciences Panel on Poverty and Family Assistance

May 1995 report, *Measuring Poverty: A New Approach*



The official measure does not account for

- Higher standards and levels of living since 1965
- Provision of noncash benefits (food benefits, housing subsidies, energy assistance)
- Necessary expenses (taxes, work-related, health care)

Recommended Changes to Improve the Measure of Poverty in the U.S.

- Thresholds: Bureau of Labor Statistics (BLS)
- Resources and poverty statistics: Census Bureau



Supplemental Poverty Measures (SPM)

Interagency Technical Working Group - March 2, 2010

- Will not replace the official poverty measure
- Will not be used for resource allocation or program eligibility
- Justification:** Evaluate impact of benefit programs on poverty
- Based on National Academy of Sciences expert panel recommendations *Measuring Poverty: A New Approach* (Citro and Michael, 1995)

BLS: Research Experimental SPM Thresholds

The screenshot shows the Bureau of Labor Statistics website. The main heading is 'Price and Index Number Research'. Below it, there's a section titled 'Research Experimental Poverty Thresholds'. The text explains that since 1955, the BLS has been conducting research on developing experimental expenditure-based poverty thresholds. It mentions the 1995 National Academy of Sciences (NAS) report 'Measuring Poverty: A New Approach' and the 2010 Interagency Technical Working Group (ITWG) report 'Measuring Poverty: A New Approach'. The ITWG recommended the development of a Supplemental Poverty Measure (SPM). The BLS is currently developing this measure, and the thresholds are being tested. The page also includes a disclaimer that the authors' views do not necessarily reflect those of the BLS.

Census Bureau: Resources and Poverty Statistics

The screenshot shows the Census Bureau website. The main heading is 'The Supplemental Poverty Measure: 2014'. Below it, there's a section titled 'Current Population Reports'. The text explains that the SPM is a new measure of poverty that is based on the official poverty measure but includes additional resources such as food, clothing, shelter, and utilities. The report also discusses the challenges of measuring poverty and the need for a new measure. The page includes a disclaimer that the authors' views do not necessarily reflect those of the Census Bureau.

SPM and Concepts

■ Poverty Concept, based on NAS recommendations

- ▶ *“...proposed thresholds, although developed in somewhat different ways, reflect concept of budget for **consumption needs**” (NAS Report, 1995, pp. 66-67) ...*
- ▶ *“Hence, ... resources should add to money income the value of **near-money in-kind benefits that are intended to support consumption**” (pp. 67)*

■ Measurement concept for thresholds assumed

- ▶ *Expenditures are a good proxy for consumption (with the exception of owner shelter)*

■ Interagency Technical Working Group (ITWG) placed value on:

- ▶ **Consistency** between threshold and resource definitions in terms of poverty concept
- ▶ **Data availability, simplicity in estimation, stability of the measure over time, and ease in explaining the methodology**

Threshold Estimation... *thus far...*

- Food, clothing, shelter, and utilities (*FCSU*) expenditures
- Consumer Expenditure Interview Survey data: 5 years of data
- *FCSU* “expenditures” in constant year dollars
- Estimation sample: Consumer Units (CUs) with 2 children
- Reference sample: 2 adults with 2 children (3-parameter equivalence scale applied to +2 children *FCSU* expenditures)
- Rank CUs by their *FCSU* “expenditures”
 - ▶ Identify 33rd percentile represented by 30th to 36th percentile range
 - ▶ Produce means of *FCSU* and *SU* by housing status
 - ▶ Estimate thresholds by housing tenure
- ❖ Send to Census Bureau to derive other CU thresholds and make geographic adjustment

Housing Status Thresholds

- Housing Status Groups, j
 - ▶ Owners with mortgages
 - ▶ Owners without mortgages
 - ▶ Renters

- *SPM Threshold $_j$*

$$= (1.2 * FCSU_A) - SU_A + SU_j$$

$FCSU_A$, SU_A , SU_j are means within 30th to 36th percentile range of $FCSU_A$ for reference CUs

In addition to owner-occupied housing...

Expenditures \neq Consumption

*when in-kind benefits not
accounted for
in spending*

This Research

■ Purpose

- ▶ Highlight poverty concept underlying SPM and issue of consistency
- ▶ Examine options to value consumption needs when data are missing
- ▶ Produce 2012 SPM thresholds that reflect the “consumption” of FCSU, with exception of owner-occupied housing

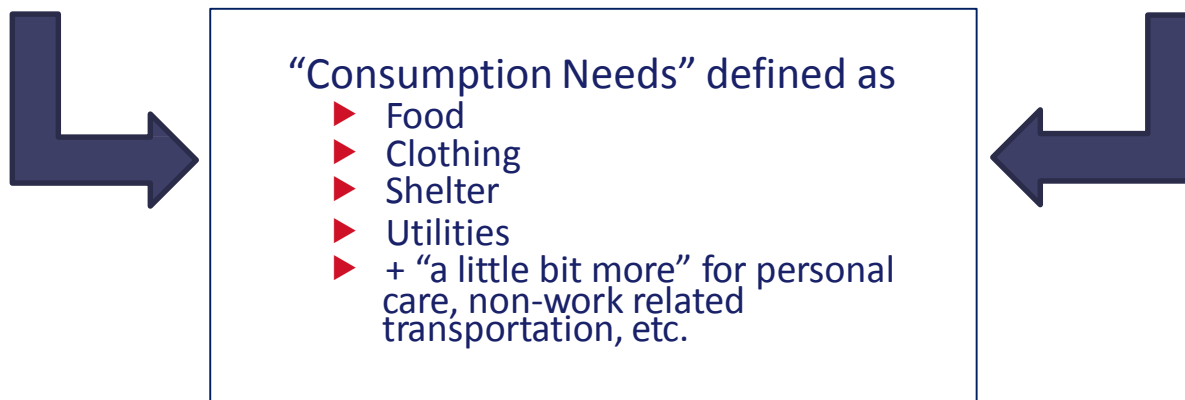
■ Contribution

- ▶ Improved SPM thresholds that more nearly reflect consumption value of FCSU basic needs
- ▶ Improve overall SPM to better evaluate impact of in-kind benefit programs considered in resources

Poverty Concept: Economic Deprivation

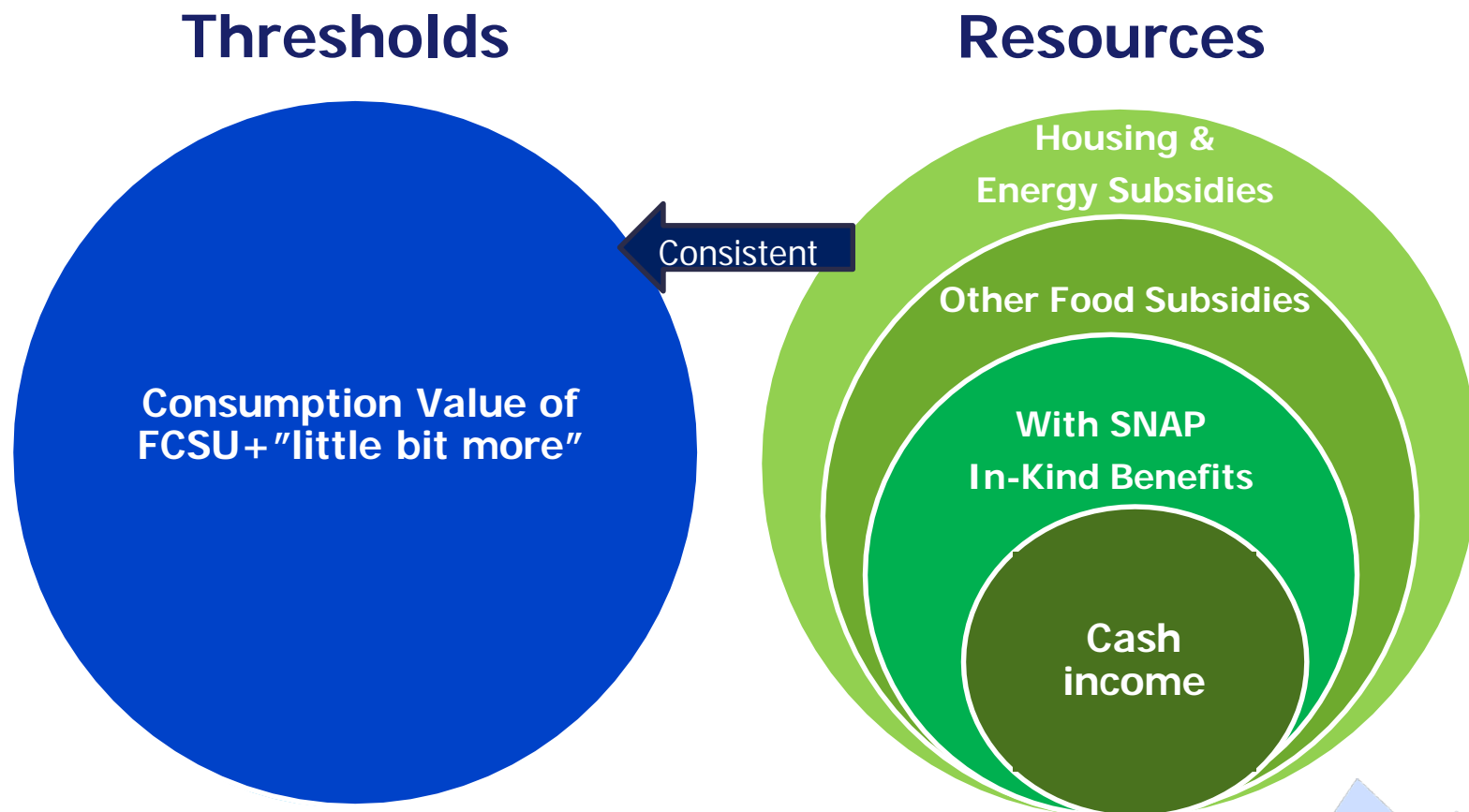
■ Thresholds represent “needs”

■ Resources meet “needs”



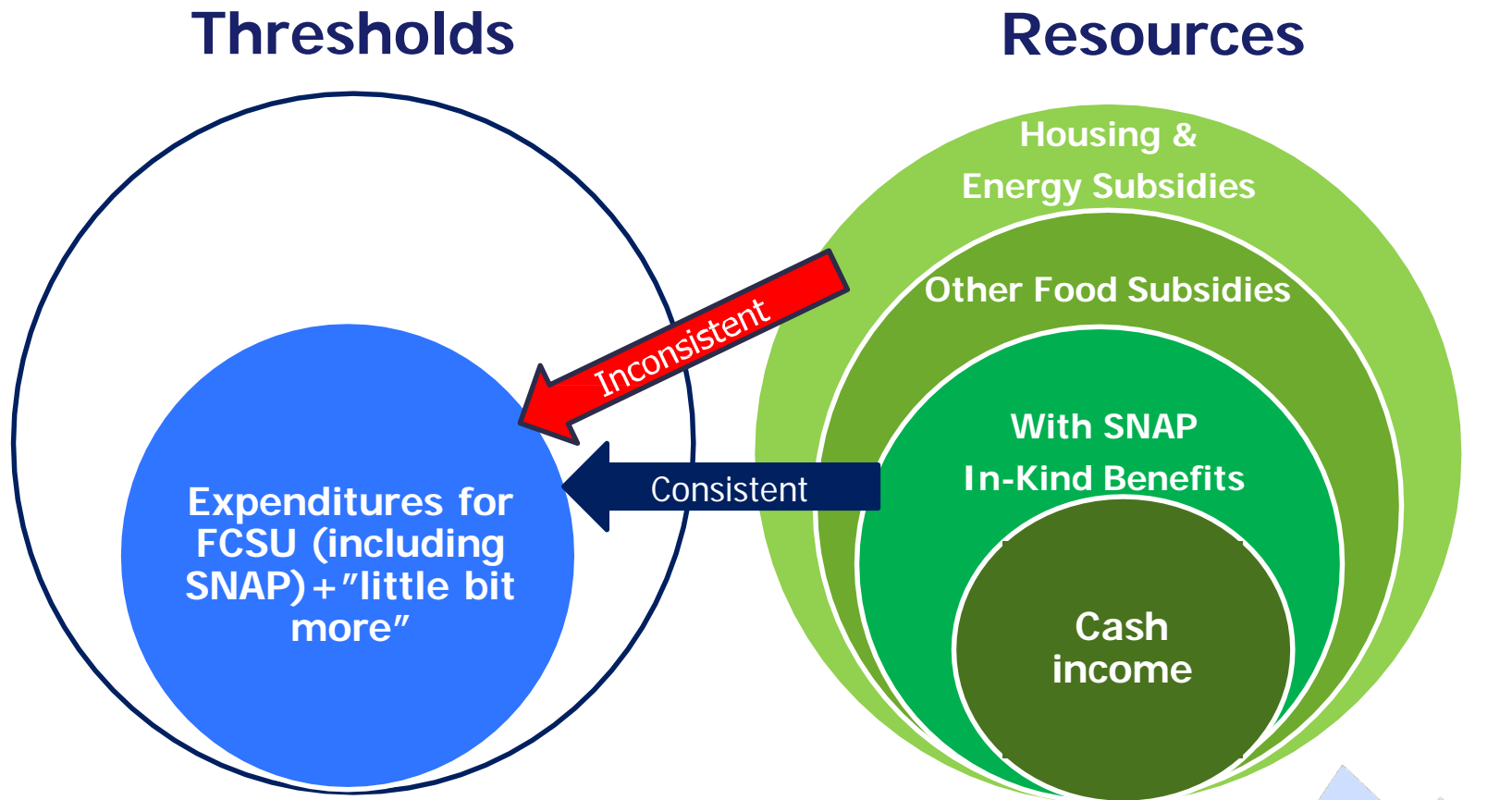
- **Poverty Concept:** deprivation based on comparison of resources and consumption “needs”
- **Consumption “needs” proxied by spending (or expenditures)**
 - ▶ NAS Panel assumption: “CE expenditures include housing assistance subsidies (rent and utilities)” ... and “benefits from food stamps and other meals provided free” (paraphrase of NAS Report, 1995, pp. 393-394)
 - ▶ **BUT: CE expenditures only account for food stamps or SNAP**

Consistency in Poverty Concept: Resources to Meet FCSU and Evaluate In-Kind

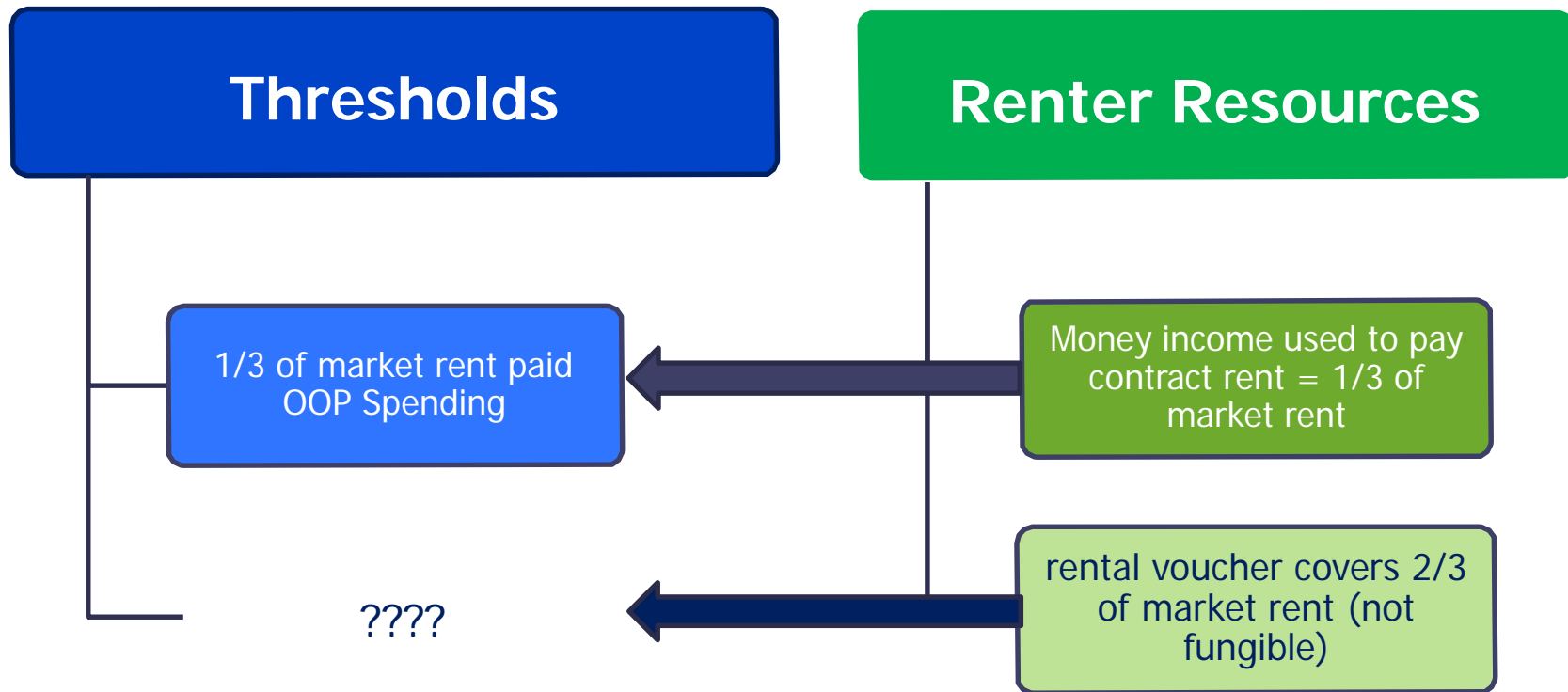


Missing Data Problem in Thresholds Leads to Inconsistency in Poverty Measure

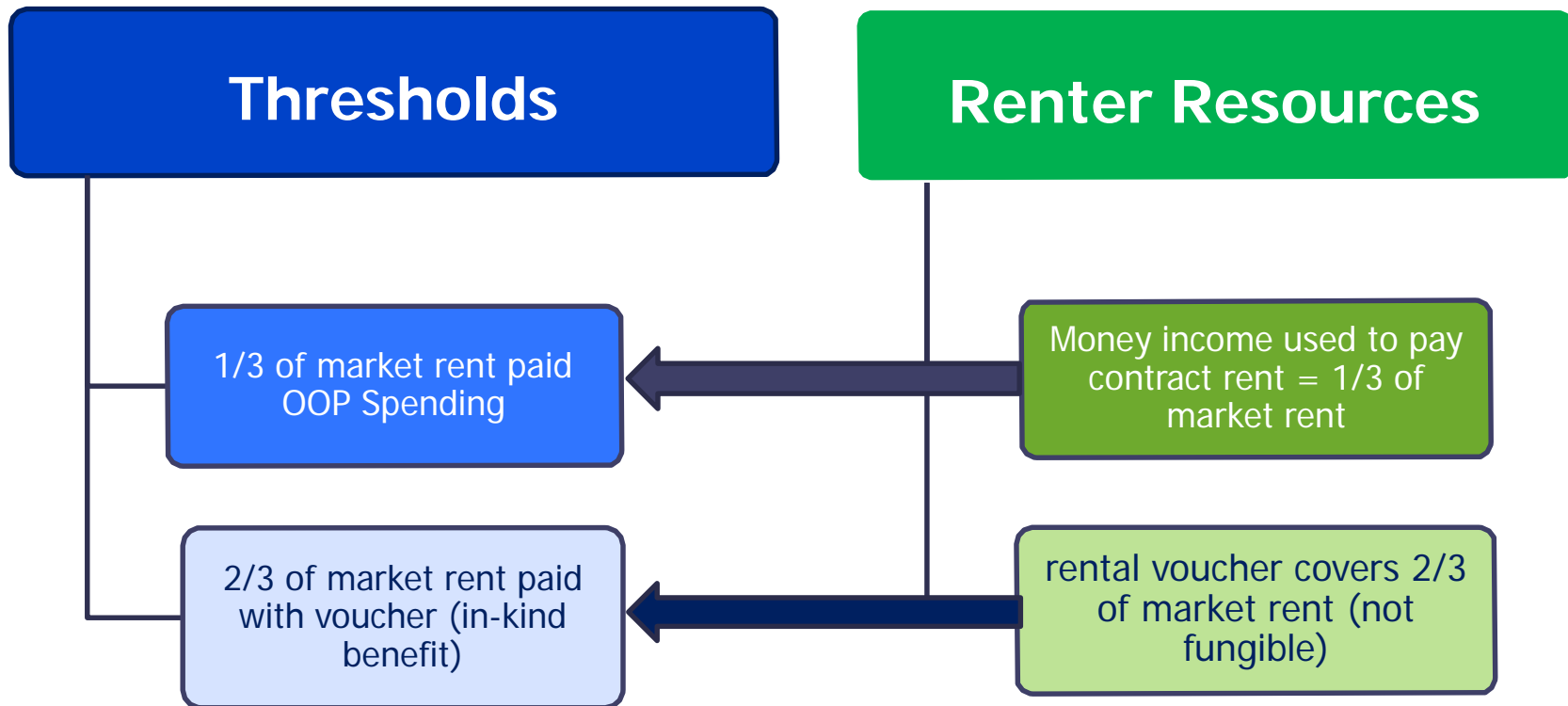
(current measure)



Example of Subsidized Renter: the Case of Rent Spending in Thresholds



Example of Subsidized Renter: Consumption Rent Value in Thresholds



Challenges in Using U.S. Consumer Expenditure Interview Survey for SPM

- Expenditures collected: out-of-pocket
- Limited data on Rental Assistance Programs
 - ▶ Indicator variables for rented living quarters
 - Is this house a public housing project, that is, it is owned by a local housing authority or other local public agency? (CE variable: pub_hous)
 - Are your housing costs lower because the Federal, State, or local government is paying part of the cost? (CE variable: govtcost)
 - ▶ Total rent payments for each of last 3 months (do not include direct payments by local, state, or federal agencies)
 - ▶ Expenditures for utilities
- No data on programs but data on potential participants
 - ▶ National School Lunch Program (NSLP)
 - ▶ Supplemental Nutrition Program for Women, Infants, and Children (WIC)
 - ▶ Low income Home Energy Assistance (LIHEAP)
- SNAP implicitly included in reported food expenditures

Acknowledged CE Measurement Issue: ITWG (2010) Guidelines for SPM Thresholds

➤ ITWG stated ...

- ▶ *“so far as possible with available data, the calculation of FCSU should include any in-kind benefits that are counted on the resource side for food, shelter, clothing and utilities. **This is necessary for consistency of the threshold and resource definitions.**”*
(March 2010)

FCSU = sum (food, clothing, shelter, utilities) at micro-level

SPM Threshold = FCSU + little bit more

Supplemental Nutrition Assistance Program (SNAP)

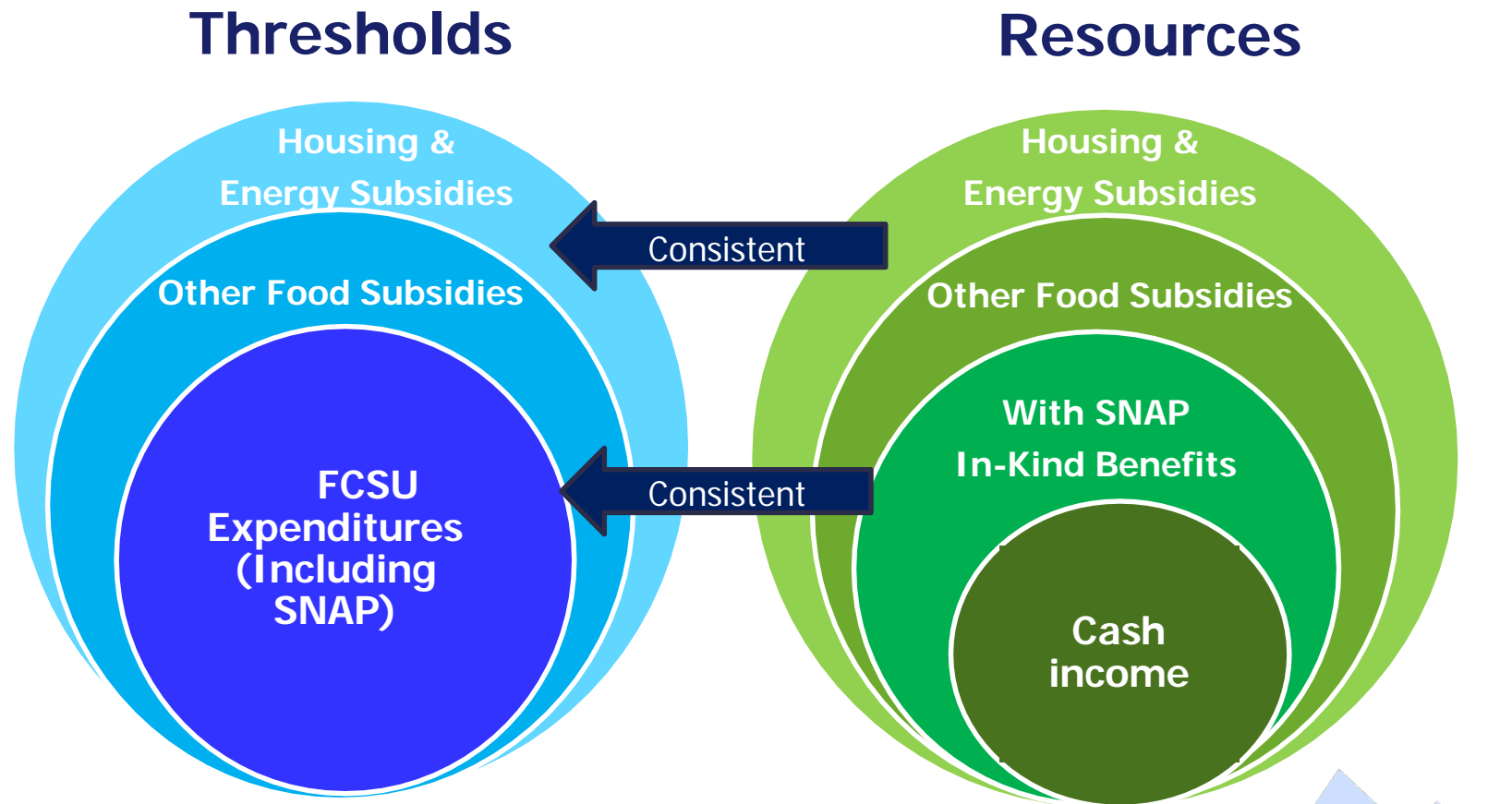
Housing Subsidies

National School Lunch Program (NSLP)

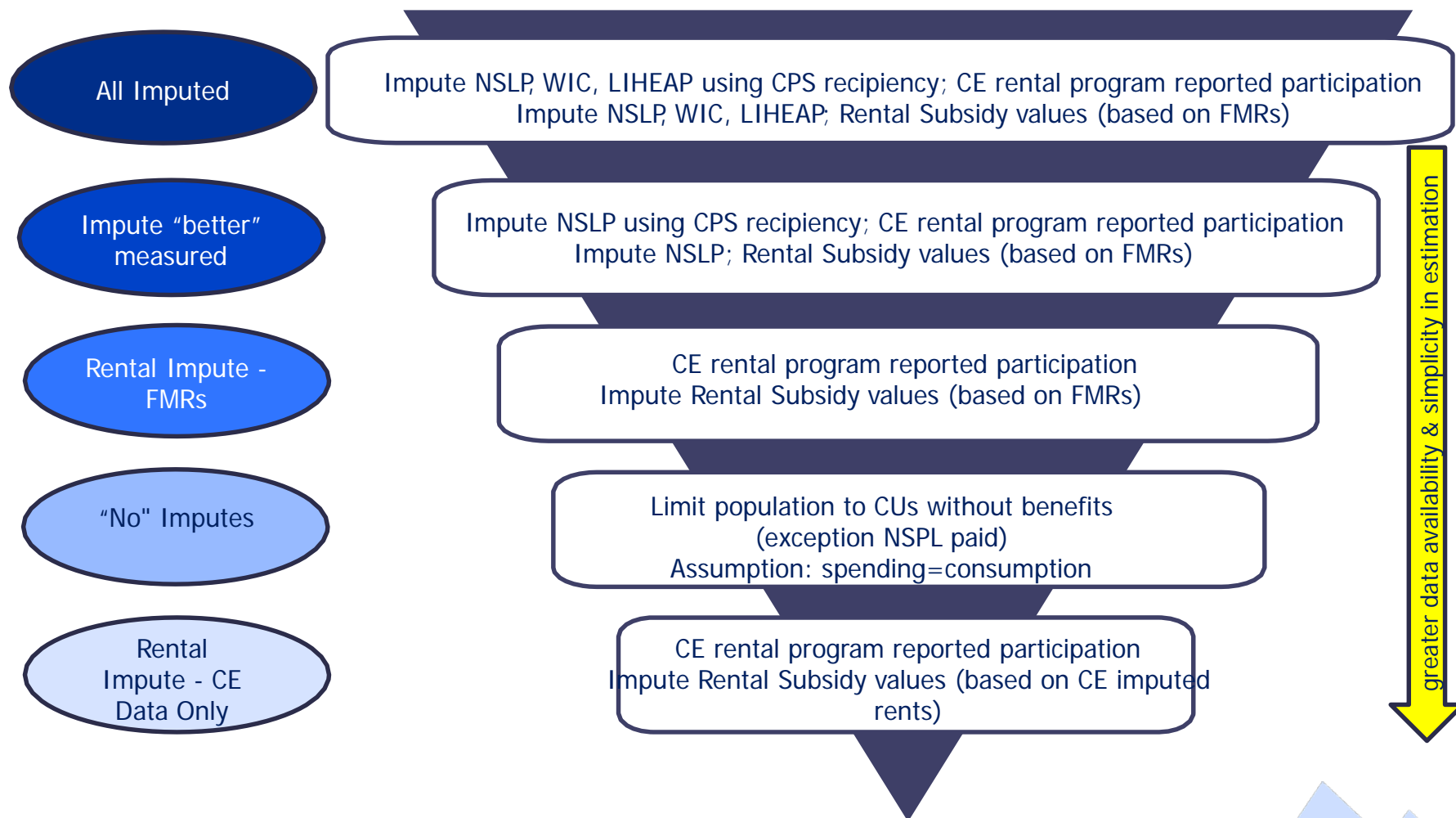
Supplemental Nutrition Program for Women, Infants, and Children (WIC)

Low-Income Home Energy Assistance (LIHEAP)

ITWG Solution to CE Missing Data Problem



Options: Valuing “Needs” when Data Are Missing



In-Kind Benefits, Expenditures, and Resources

Benefit	Form of Benefit	Value of Commodity or Service in CE Reported Expenditures?	SPM Resources Include
SNAP	EBT cash-value to CU	Yes, food expenditures= food consumption	yes
NSLP	Direct payment to school	No, < consumption	yes
WIC	Voucher paper or EBT for commodities to CU	No, < consumption	yes
LIHEAP	Direct payment to vendor	No, < consumption	yes
Rental Subsidies	Landlord accepts voucher or CU lives in public housing	No, < consumption	yes

EBT: Electronic benefit transfers
Consumption value could be at recipient or market value



Impute for Missing In-Kind Benefit Program Participation: NSLP, WIC, & LIHEAP

- Impute reciprocity to CE from U.S. Current Population Survey Annual Social and Economic Supplement (CPS ASEC) reported reciprocity
- Data
 - ▶ Household level data with household and member characteristics
 - ▶ Same years as in CE: collected 2009-2013 refers to 2008-2012
 - ▶ CPS ASEC public use data accessed from NBER
- Method
 - ▶ Treat CE as having missing data so combine CPS and CE into one data file to impute from CPS to CE
 - ▶ SAS Proc MI
 - Logistic regression method when the classification variable has binary response (assuming monotone missing pattern for classification variable)
 - Renter with subsidy (=1)
 - Renter without subsidy (=2)
 - Draw random uniform error between 0 and 1 to impute reciprocity= 1 or = 2 for each observation

Impute for Missing NSLP, WIC, & LIHEAP Benefits

- NSLP: U.S. Department of Agriculture for 2008-2012
 - ▶ Average per school lunch payment rates for 180
 - Over 48 contiguous states plus Hawaii and Alaska
 - Rates for schools in which less than 60% of lunches served were free or reduced price for all but District of Columbia Louisiana, Mississippi, and New Mexico (60% or more with free or reduced, USDEd)
 - ▶ Different values (same values for commodities' subsidy)
 - Free
 - Reduced
 - Student paid full price for lunch (=commodities subsidy)
- WIC: U.S. Department of Agriculture for 2008-2012
 - ▶ Average national monthly value per person
- LIHEAP: U.S. Department of Health and Human Services for 2009
 - ▶ Average annual benefit levels per household per state
 - ▶ Benefits assigned based reference months in CE
 - Heating (October to March) – all states
 - Cooling (April to September) - not all states offer this benefit

Impute Missing Market Rents for Subsidized Renters

- Need market rent for consumption of rental services
 - ▶ $\text{Market rent} = (\text{rent paid} + \text{rental subsidy})$
 - ▶ Do not need rental subsidies for thresholds (produce for data comparison)
- Market values assigned to subsidized rental units, approaches:
 1. Imputed market rents from CE data using 2-stage regression model
 - Stage 1: Logit regression of subsidized renters versus non-subsidized renters (CU sample selection)
 - Stage 2: Market rents paid controlling for sample selection, rental unit characteristics, and geography
 2. U.S. Department of Housing and Urban Development 2008-2012 Fair Market Rents (FMRs) matched to CE by Census tract and number of bedrooms

RESULTS



Results

- U.S. Population Comparisons
 - ▶ Aggregates
 - ▶ Program participation
 - ▶ Annual average benefits
- SPM Threshold Estimation Sample (within FCSU 30th-36th percentiles of FCSU+IK) compared to all CUs
 - ▶ Aggregate shares
 - ▶ Shares of in-kind benefits by participate type
 - ▶ Distribution of CUs with in-kind benefits by housing tenure group
- Thresholds with and without in-kind benefits imputed

CE-Imputed In-Kind Benefits for U.S.: Aggregates

Data Source	NSLP	WIC ²	LIHEAP	Rent Subsidies	
				FMR	CE imputed rent
CE Imputed Participation (5 years of data) with ...	\$11.0	\$4.6	\$1.0	\$35.1	\$45.3
	free=\$4.2 reduced=\$4.8 paid=\$2.0	children=\$2.7 infants=\$1.5 women=\$0.4			
CPS 2012	\$10.7	\$3.1	\$1.6	\$40.4	
USDA 2012 (9 months Jan.-May, Sept.-Dec.)	\$10.5-\$10.6 ¹				
USDA Calendar Year 2012		\$6.2			
HHS FY2010 in 2012\$			\$3.1		
Heating			\$2.8		
Cooling			\$0.3		
HUD & USDA 2012				\$36.6	
<i>HUD 2012</i>					\$35.5
<i>Public Housing</i>					\$6.6
<i>Voucher and other</i>					\$28.9
<i>USDA 2012</i>					\$1.1

¹ Lower value assumes all schools less than 60% free/reduced lunch; higher value assumes all school 60% or higher free/reduced lunch

² WIC: CE estimates and USDA based on pre-rebate values for infant food; CPS values based on cost to USDA, not benefit value.

CE-Imputed In-Kind Benefits for U.S.: CU/HH Participation

Data Source	NSLP	WIC*	LIHEAP	Rent Subsidies	
				FMR	CE imputed rent
CE Imputed Participation (5 years of data) with ...	19.0%	2.8%	2.2%	4.2%	4.5%
	free=3.2% reduced=4.6% paid=11.2%	children=1.8% infants=0.5% women=0.6%			
CPS 2012	17.5%	2.8%	3.3%	4.0%	
HHS 2010**					
Heating			6.3%		
Cooling			0.8%		
HUD & USDA 2012				4.25% (if use CE total =4%)	
<i>HUD 2012</i>					4.0%
<i>Public Housing</i>					0.9%
<i>Voucher and other</i>					3.1%
<i>USDA 2012</i>					0.2%

*WIC: CE estimates based on pre-rebate values for infant food

**HUD 2010 latest data available; 34% of all housing units received heating and cooling assistance in FY2010.



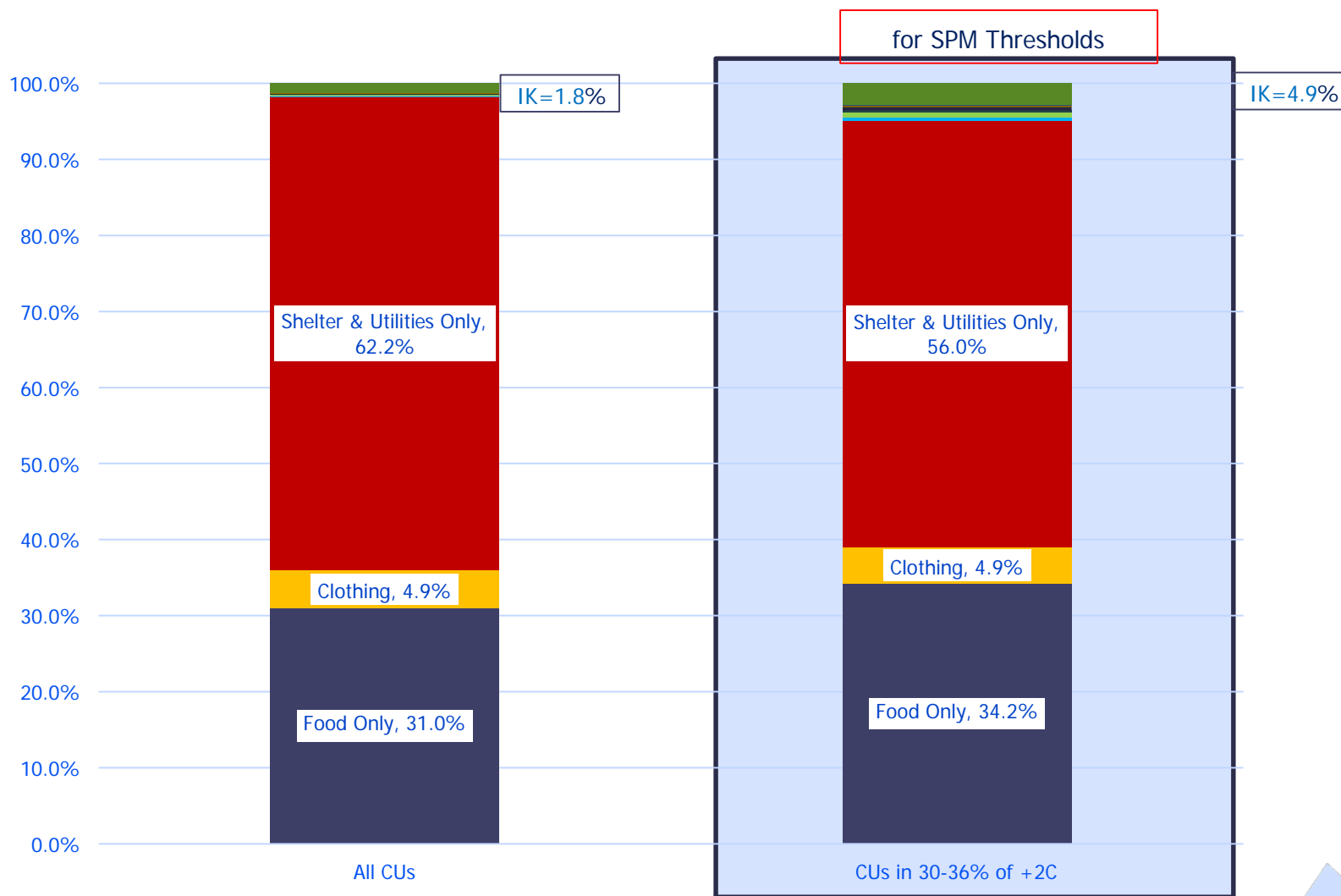
CE-Imputed In-Kind Benefits for U.S.:

Annual Average Benefit per CU/HH

Data Source	NSLP	WIC*	LIHEAP	Rent Subsidies	
				FMR	CE imputed rent
CE Imputed Participation (5 years of data) with ...	\$475	\$1,334	\$367	\$6,926	\$8,279
	free=\$1,073 reduced=\$861 paid=\$147	children=\$1,269 infants=\$2,389 women=\$557			
CPS 2012	\$478	\$861	\$383	\$7,675	
HHS FY2010 in 2012\$					
Heating			\$382		
Cooling			\$312		
HUD & USDA 2012				\$7,475	
HUD 2012				\$7,674	
Public Housing				\$6,141	
Voucher and other				\$8,155	
USDA 2012				\$4,008	

*WIC: CE estimates based on pre-rebate values for infant food.

Percent of 2012 Aggregate Dollars Using 5 Years of CE Data

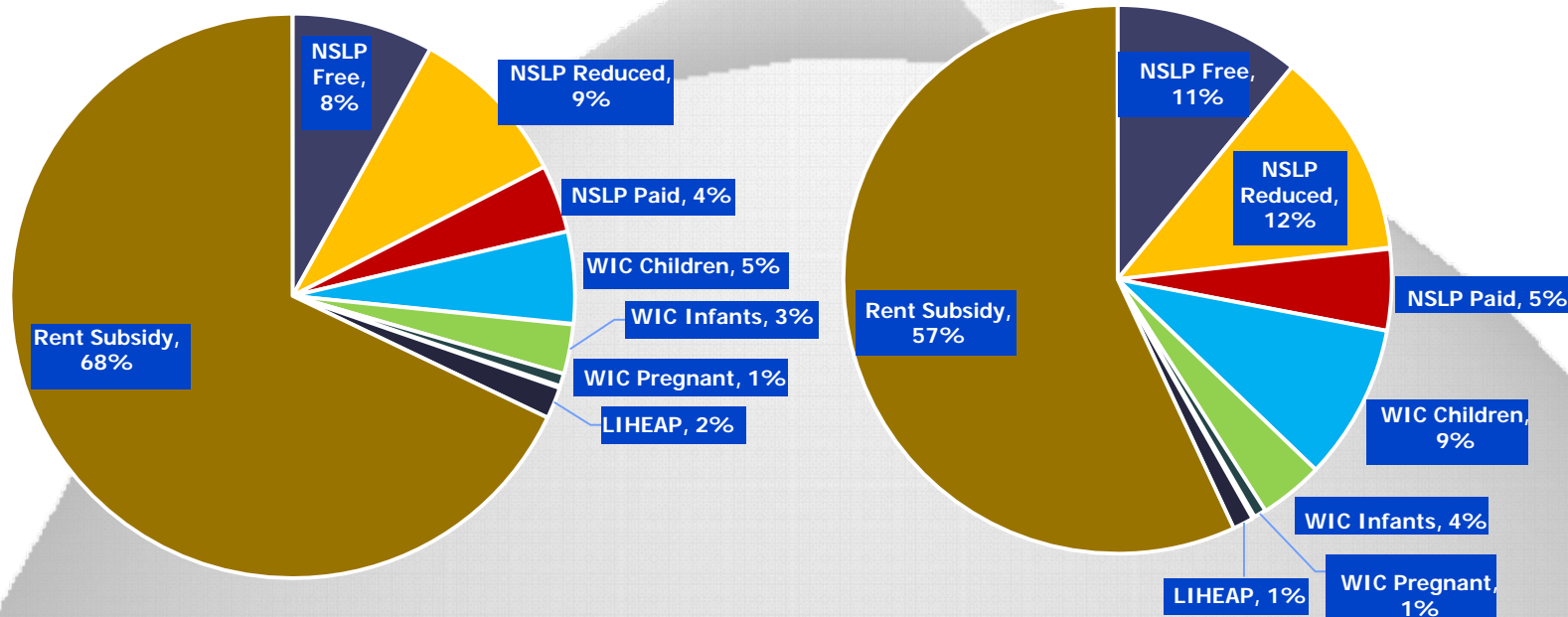


Aggregates based on CE imputed rent subsidies

Aggregate Shares of In-kind Benefits by Participant Type

All Cus: IK=1.8% of Aggregate

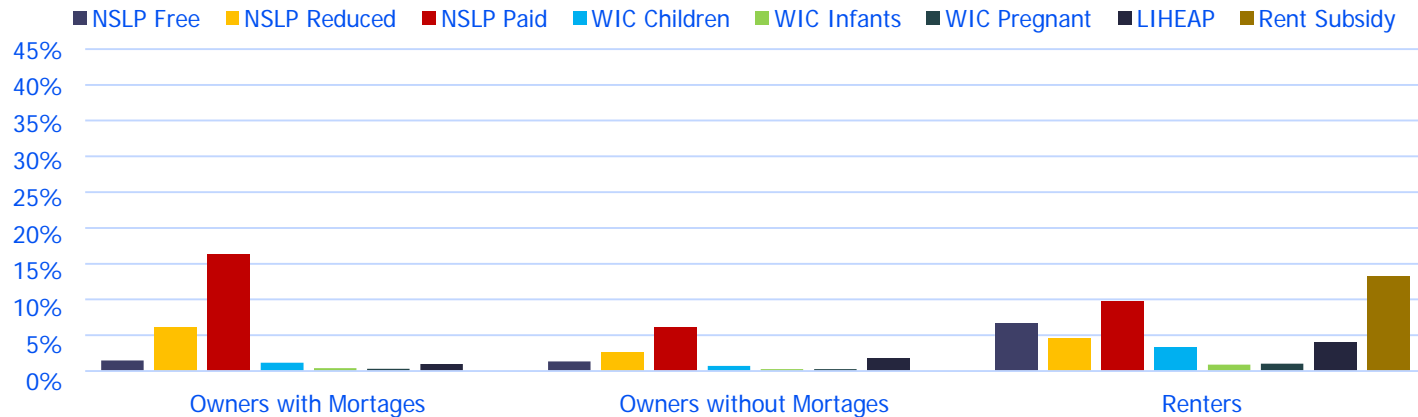
CUs in 30-36th Percentile "2+2":
4.9% of Aggregate



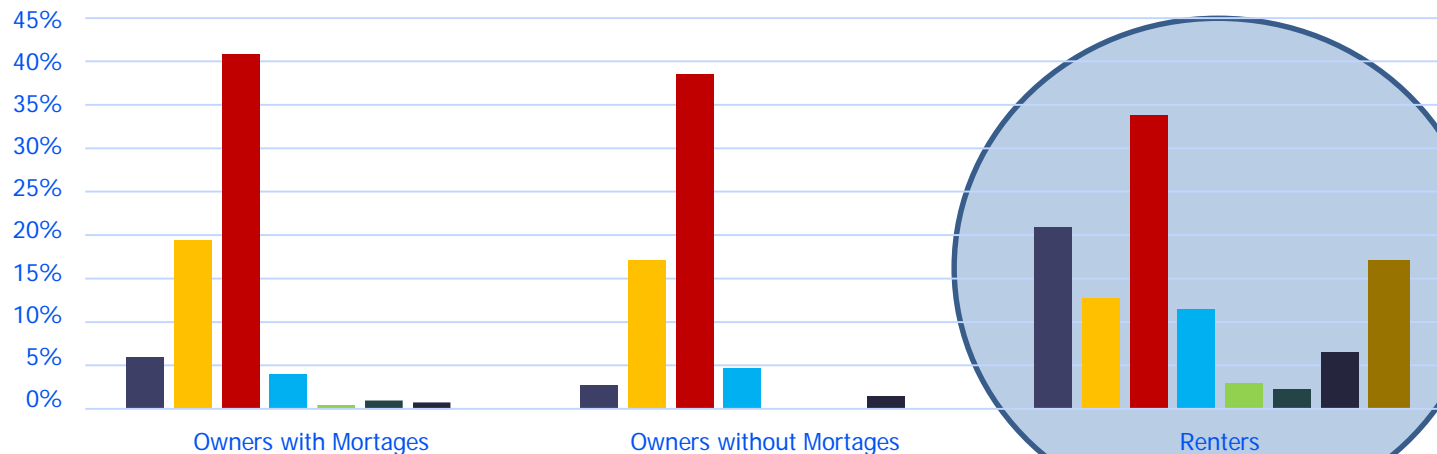
Aggregates based on FMRs for rent subsidies

Distribution of CUs with In-kind Benefits

All CUs



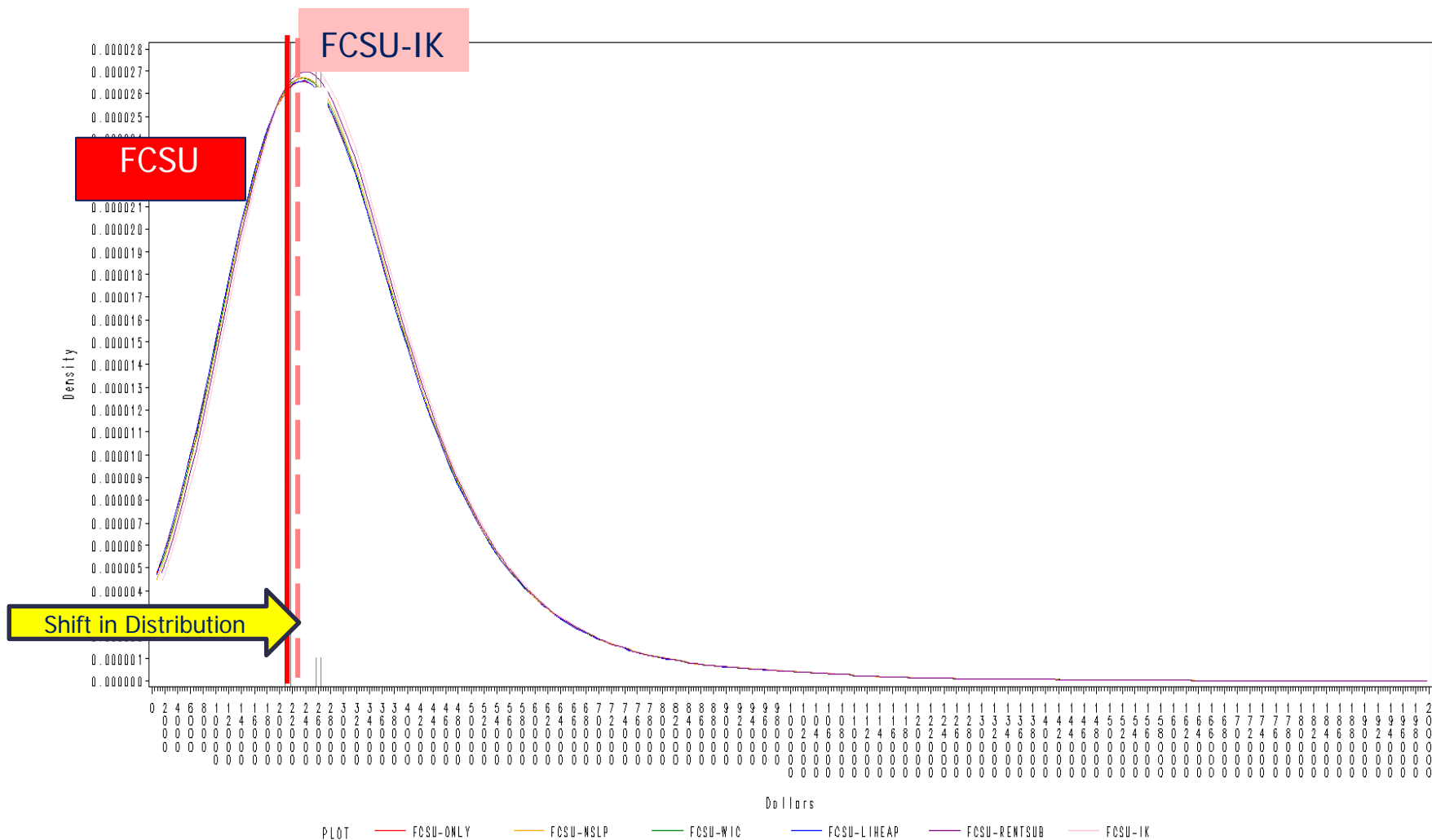
CUs with
2 children
in 30-36th



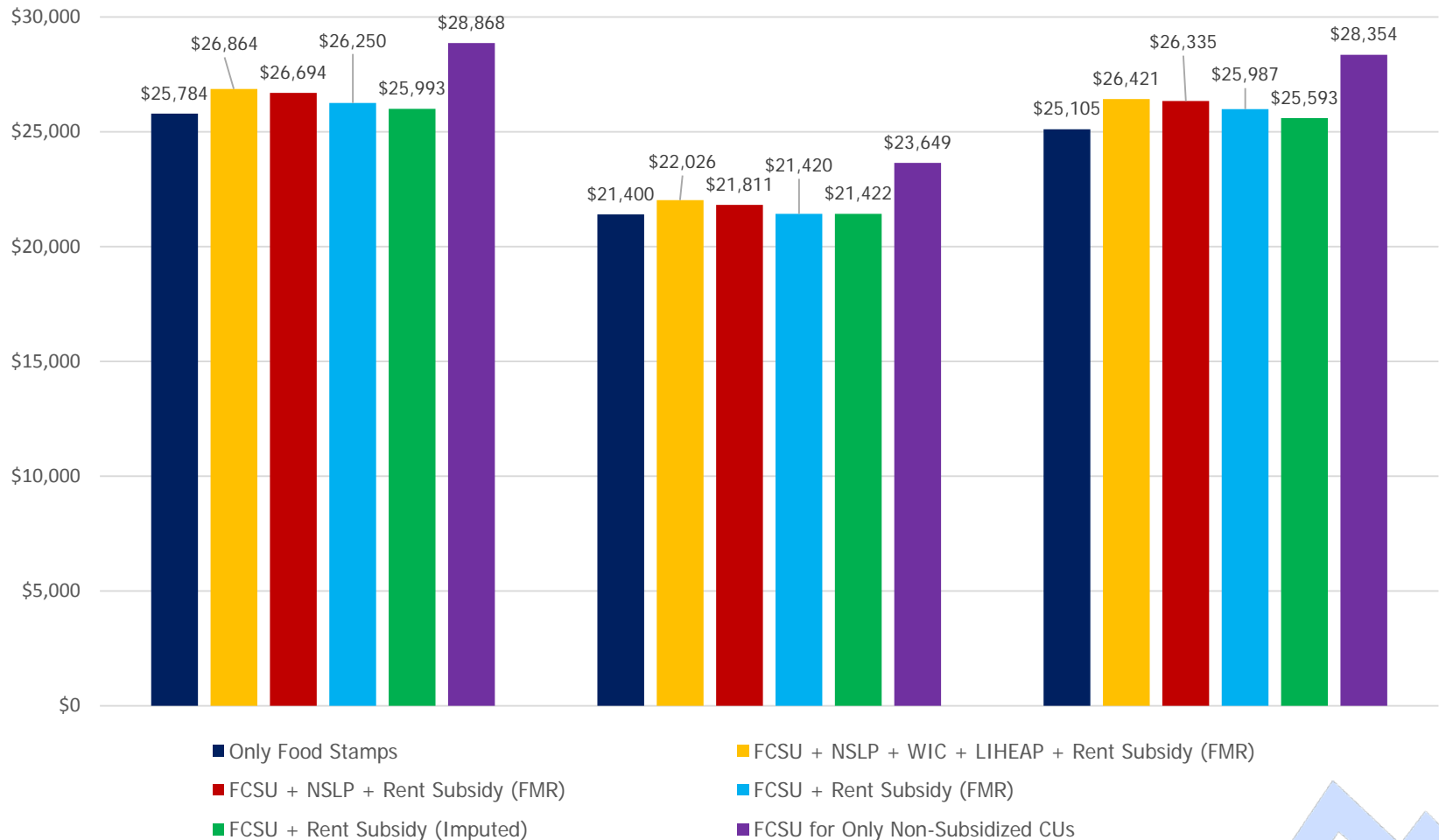
Going from FCSU to FCSU-IK in Thresholds



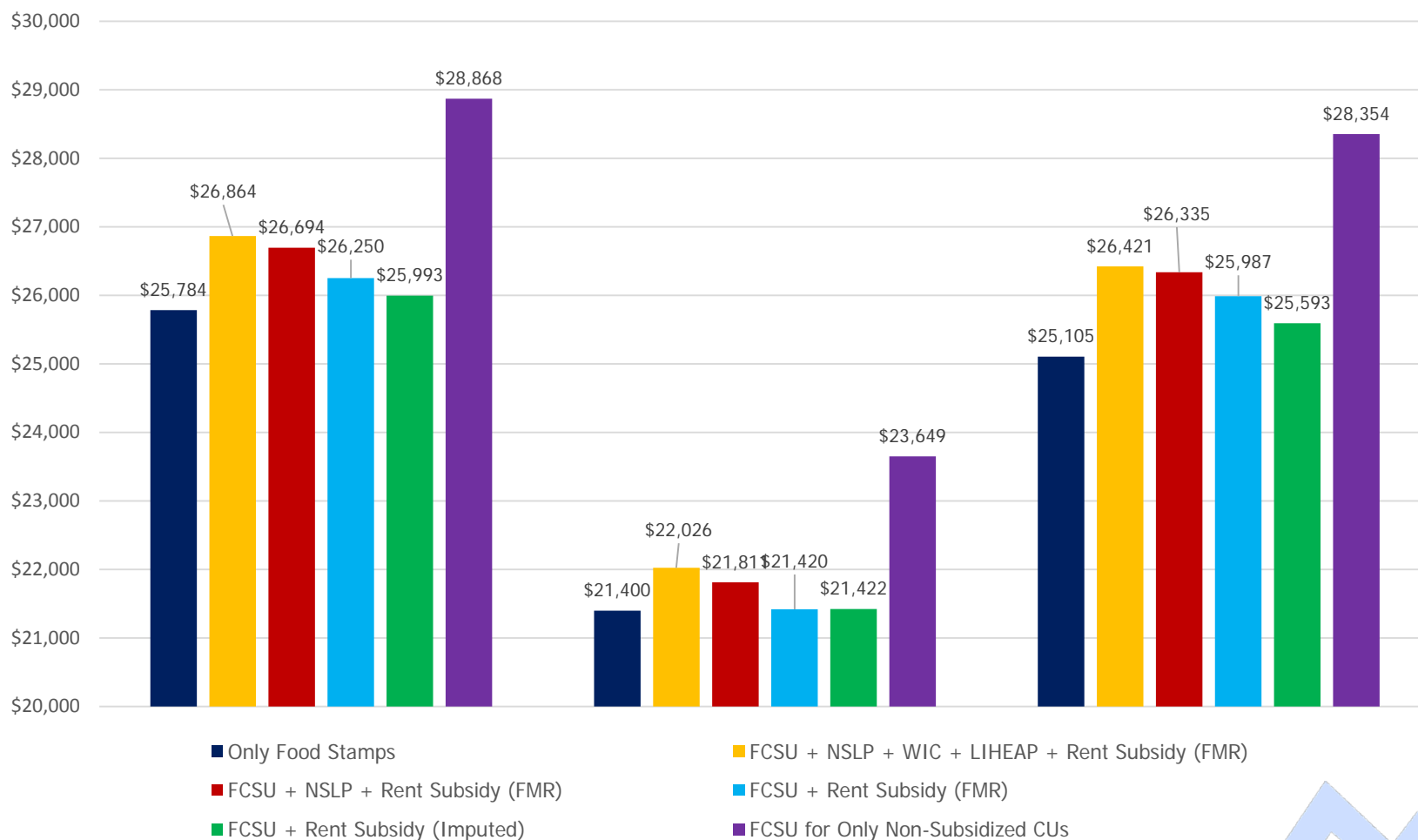
Density of FCSU and FCSU-IK for 2A+2C around “33rd” Percentile



2012 SPM Thresholds with and without In-Kind Imputed Benefits: 2 Adults with 2 Children (“2A+2C”)



2012 SPM Thresholds with and without In-Kind Imputed Benefits: 2 Adults with 2 Children (“2A+2C”)



Summary

- Expenditures \neq Consumption in the presence of in-kind benefits
- Examined impact of different options to deal with missing data in the CE, imputing participation (with exception of subsidized rental housing) and benefits
- Estimating consumption of FCSU, when benefits present, results in better measure of “needs”

- Questions remain
 - To what source should consumption values be compared?
 - Administrative data
 - CPS reports
 - Other CUs
 - Should two thresholds for renters be produced (renters with and renters without subsidies) like the treatment of owners?
 - Are benefit valuations sufficient to estimate consumption needs?

Conclusions

1. Spending \neq Consumption in the presence of in-kind benefit participation
2. Estimating consumption of FCSU, when benefits present, results in better measure of “needs”
 - Improved SPM thresholds that reflect values of FCSU “purchased by/made available to” CUs (*consumption* for all but owner-occupied housing)
 - Consistency in threshold and resource concepts: resources to meet “needs”
3. Imputing for missing data in CE for in-kind benefit recipients -- one approach to value consumption
4. Questions remain
 1. To what should consumption values be targeted?
 - Administrative data
 - CPS statistics
5. **Continue research to address missing data problem in the CE**
 1. Explore possibility of 2 renter thresholds (with and without subsidies)

Contact Information

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