

# CPI Housing Initiative

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**BLS**

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# Presentation Overview

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- Original housing sample (introduced January 1999)
- Housing Initiative - July 2010 & ongoing
- Future work

# CPI Housing Survey

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- Relative Importance
  - ▶ Rent - 6.5%
  - ▶ Owners' Equivalent Rent (OER) - 24%
- Housing units contribute to both Rent and OER indexes

# 1999 Housing Revision

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- Frame drawn from 1990 Census
- Sample introduced in 1999
- Target sample 50,000 units
- Actual sample 25,000 units
- Most shortfall – high owner occupied areas:  
target 29,000 actual 11,000 (37%)

# 1999 continued

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- Special augmentation in 2000
  - ▶ Drawn from existing segments
  - ▶ Yielded an additional 12,000 units
- New construction survey until 2006
  - ▶ Frame from Census new construction permit data
  - ▶ Yield about 150 units per year

# 1999-2010

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- Sample becomes less representative
  - ▶ 1990 frame becomes less representative of 2010 housing universe
  - ▶ Rent change may differ by neighborhood
  - ▶ No opportunity for newly built units to enter the sample
  - ▶ Rent change for newer units may be different from that of older units

# 1999-2010

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- Sample decreases
  - ▶ Renter units become owner units or non-residential
  - ▶ Respondent burden accumulates and leads to more refusals
  - ▶ Housing units demolished
- Sample size in 2010 was 29,000

# Initial Housing Revision Plan

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- CPI began requesting funding in 2005 to replace the housing sample:
  - ▶ Replace sample over a 6-year period
  - ▶ Increase sample size to 50,000 units
  - ▶ Continuously update 1/6<sup>th</sup> of sample units annually thereafter
- Plan was modified due to budget cuts and funding delays



# 2007 CPI Housing Initiative

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- Improve accuracy and reduce costs by using private sector data as an alternative to former BLS method
- Improve weight calculations
- Update weights based on 2000 Census instead of 1990 Census
- Reduce average age of the housing sample
- Increase sample size
- Update rental unit samples on a continuous rather than decennial basis

# Addressing Yield Problems and Reducing Costs

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- ▶ Purchased private sector address lists
  - Replaces BLS data collectors listing in-person
  - Eliminates units with a high likelihood of owner occupancy
- ▶ Mail prescreening survey
  - Further reduces in-person screening by 20%
- ▶ Initiation cost half of previous approach and outlet yield is 40% higher

# Weighting Improvements

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- Updated sampling and weighting based on 2000 Decennial Census information
- Improved the model used to estimate OER expenditures used in sampling and weighting
- Added dynamic reweighting process
  - Weights for under-performing segments are increased
  - Weights for over-performing segments are reduced

# Housing Initiative

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- 3 stage effort
  - ▶ Augmentation
  - ▶ Replacement
  - ▶ Rotation

# Augmentation / Replacement

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- Entirely new sample drawn and compared to existing sample
- “Holes” in percent renter and county dimensions filled in during augmentation
- Remaining segments rotated in during replacement

# Augmentation

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- 4 six month waves over a two year period
- Adding new segments without dropping existing ones
- Original sample mapped into 2000 Census geographies to update weights
- Target 16,000 units

# Augmentation

- Yield as of October 2013

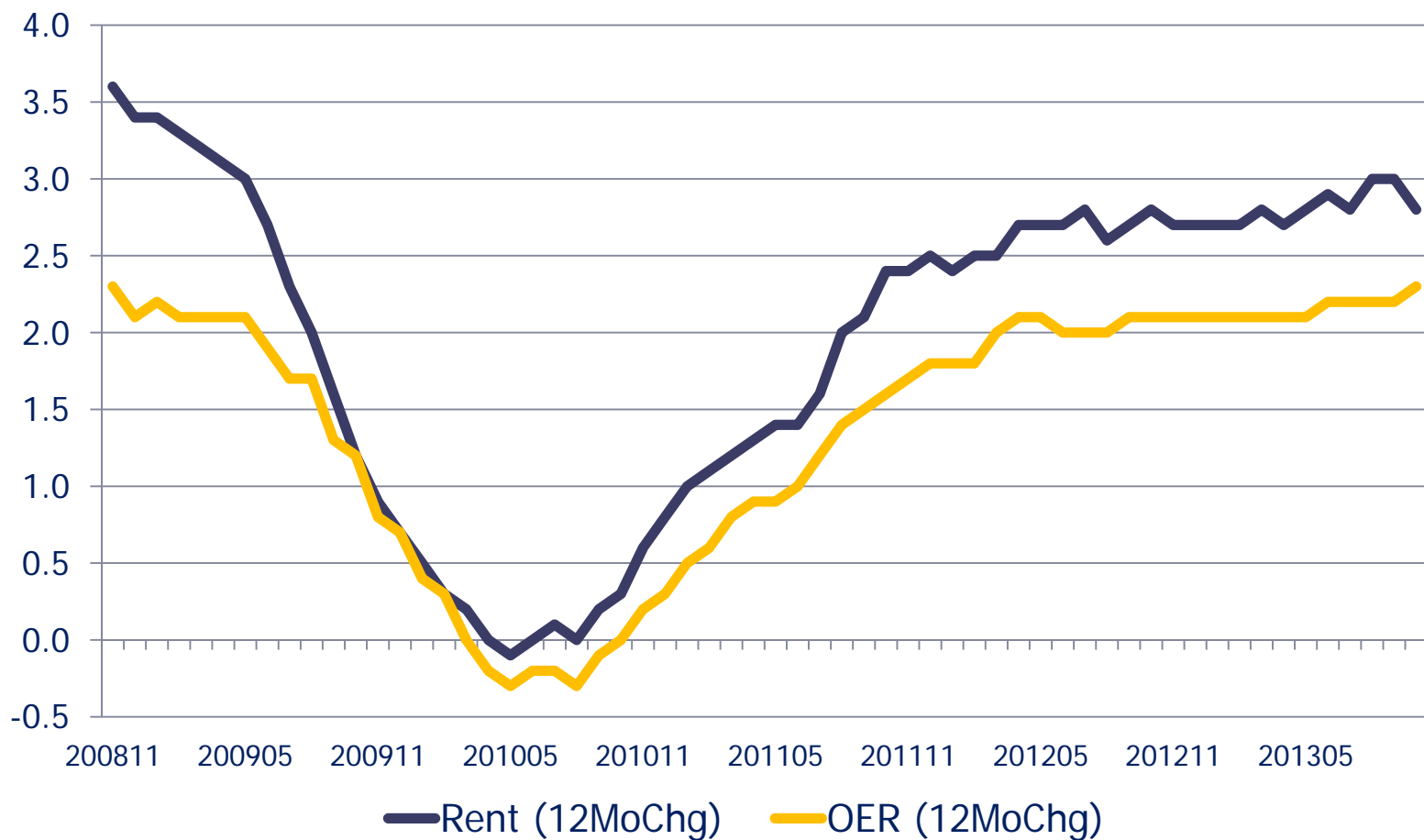
<u>Augmentation Wave</u>	<u>First Production Use</u>	<u>Used in estimation</u>
1A	July 2010	4,421
2A	January 2011	4,961
3A	July 2011	4,632
4A	January 2012	<u>4,294</u>
		18,308

# Price Movements

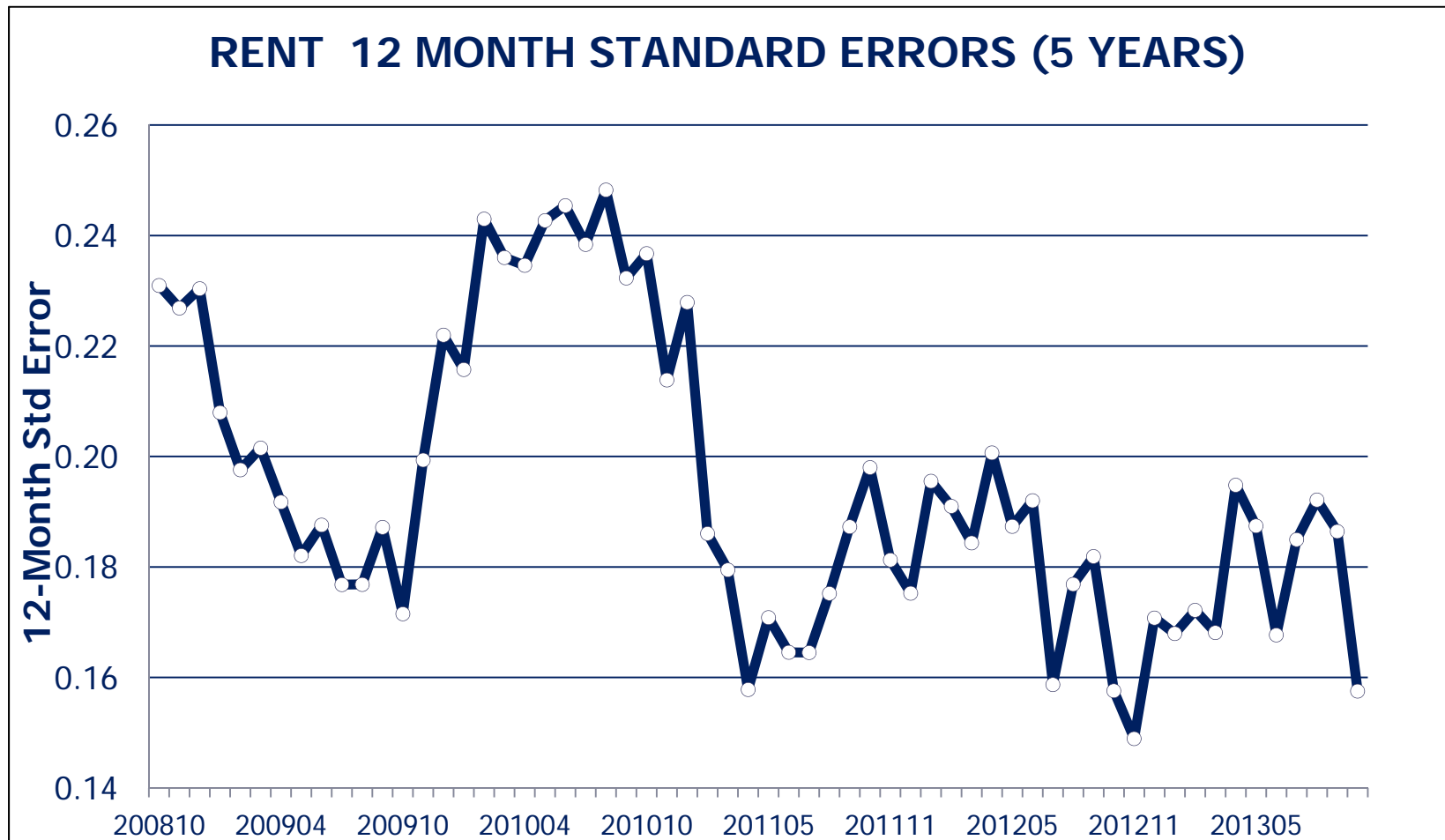
- Looking at 24 month price relatives for the original and augmentation samples:
  - ▶ Results: in 85% of the comparisons, the augmentation sample relatives were lower than the original sample relatives.
  - ▶ Augmentation has a higher concentration of OER important units and this result is consistent with overall RENT and OER differences.



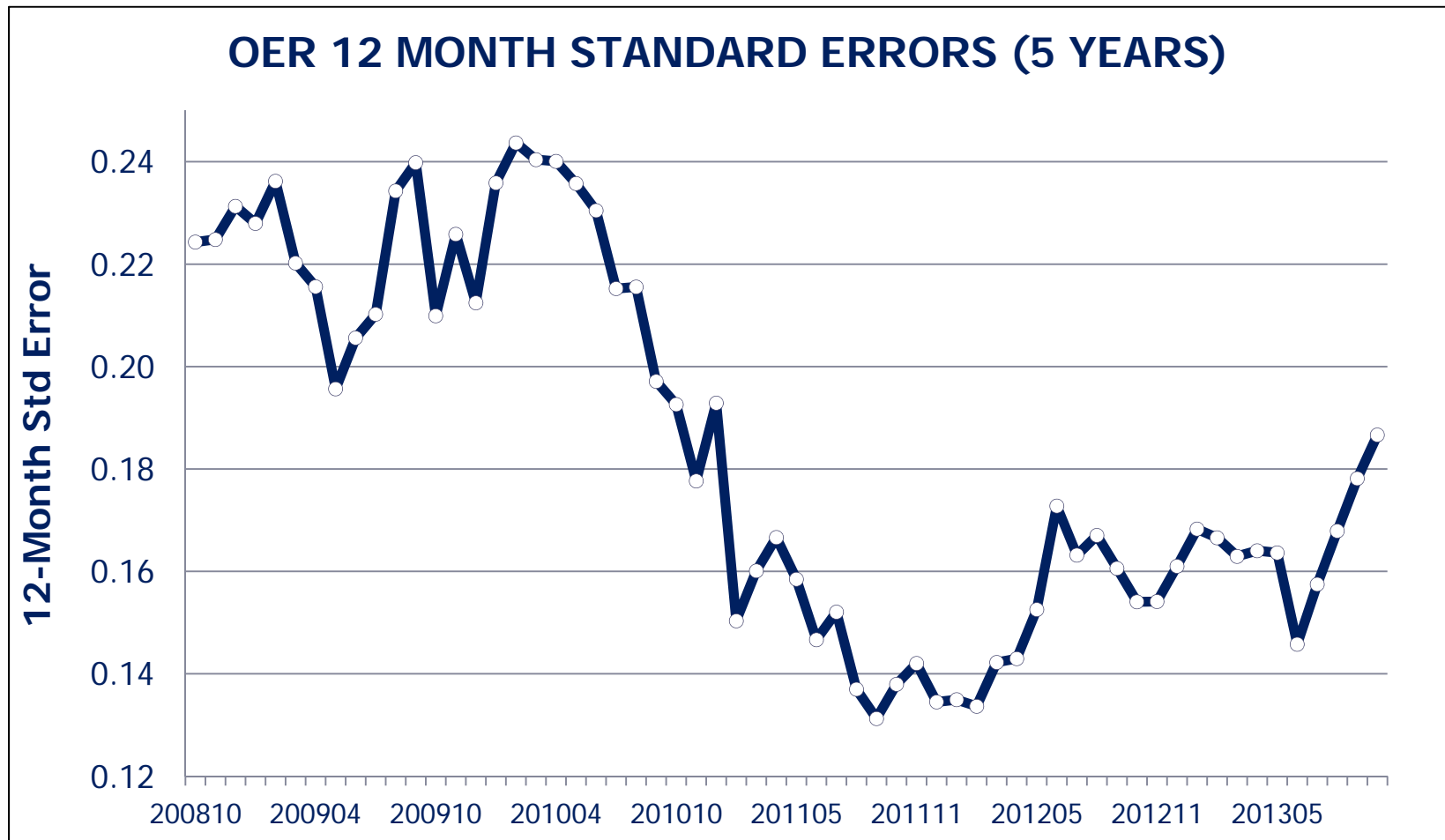
# Consumer Price Indexes



# Standard Errors



# Standard Errors



# Replacement

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- 8 six month waves over a four year period
- As new sample is introduced, old sample is dropped
- Completed July 2016- all original sample quotes will be gone

# Replacement

Replacement Waves	First Use	Used in Estimation	Rotated out
1R	November 2012	5,093	3,681
2R	May 2013	4,163	3,728
3R	November 2013		
4R	May 2014		
5R	January 2015		
6R	July 2015		
7R	January 2016		
8R	July 2016		

(As of October 2013)

# October 2013 production

Sample source	Number used in estimation
Original	21,364
Augmentation	18,308
Replacement	9,256
Total	48,928

Sample will continue to grow because replacement segments tend to have more units than the original sample segments they are replacing

# Age of Housing Sample

Fiscal Year	Average Age
2010	10.3
2011	9.3
2012	8.7
2013	7.4
2014	est 6.4
2015	est 5.1
2016	est 3.8

# Rotation

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- Using 2010 Decennial Census definitions and latest 5 year American Community Survey
- Beginning 2016
- 6 year rotation
- Continuous process of updating CPI Housing survey



# Future Work

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- Investigating ACS data
- Investigating rent websites for secondary source data
- Investigating further improvements to OER expenditure estimation
- Improving tools to optimize sample allocation

# Contact Information

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