

Inflation at the Household Level

Greg Kaplan and Sam Schulhofer-Wohl

Discussion by Pete Klenow

Macroeconomics & Monetary Conference

Federal Reserve Bank of San Francisco

March 2017

- 50,000 households per quarter
- rotating panel
- 2004 – 2013
- 1.4 million UPCs
- 500 million transactions
- prices and quantities

Advantages of AC Nielsen Homescan data

- household-merchant match (not so in CPI or BPP)
- household-UPC match (not in CPI or BPP)
- quantities (not in CPI or BPP)
- breadth (compared to a single grocery or drug chain)

For items bought by the same household in both quarters t and $t + 4$:

- big dispersion in household inflation
 - ▶ 6 to 9 % point interquartile range
 - ▶ mostly due to price paid for a given UPC (2/3)
 - ▶ not persistent (serial correlation ~ -0.1)
- almost 1 % point per year *lower* inflation for rich
 - ▶ 25% cumulative inflation for incomes $> \$100k$
 - ▶ 33% for incomes $< \$20k$

External Validity?

AC Nielsen store coverage in 2011

Type of store	% of Nielsen stores	% of sales covered for stores of this type
Drug	35	55
Food	29	53
Mass merchandise	30	32
Convenience	6	2
Liquor	1	1

Source: Baker and Kueng (2016)

Baker and Kueng (2016):

\$4,200 annual spending *per AC Nielsen household*

BEA and Census Bureau:

\$85,800 in consumption per U.S. household

So AC Nielsen Homescan covers \sim **4.9%** of consumption

Repeat UPCs purchased by the same household \sim **1.1%**

AC Nielsen category distribution

Category	% of the CPI	% of all KNCP	% matched KNCP
Food	15	61	74
Miscellany	17	22	21
Rest of CPI	68	17	5

Source: Kaplan and Schulhofer-Wohl (2017)

Let's look at some complementary datasets

1 CPI-RDB 1998–2005

- ▶ all items other than housing ($\sim 70\%$ of U.S. consumption)

2 Adobe Analytics 2014–2016

- ▶ $\sim 75\%$ of online spending ($\sim 3.9\%$ of all C)

Temporary price discounts in the CPI

	% of price quotes that are sales	% of price <i>changes</i> due to sales
Food	17	50
Home furnishings	21	67
Apparel	35	87
Rest of CPI	3	6

Source: Nakamura and Steinsson (2008)

The size of price changes in the CPI

	Median absolute % change
Food	27
Home furnishings	21
Apparel	30
Rest of CPI	9

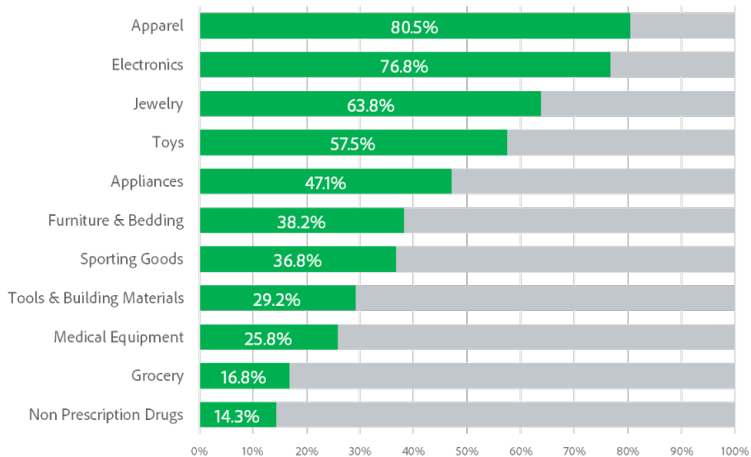
Source: Nakamura and Steinsson (2008)

Product exit in the CPI

	Monthly exit rate in %
Food	1.3
Home furnishings	5.0
Apparel	9.9
Rest of CPI	2.2

Source: Nakamura and Steinsson (2008)

% of online spending on products introduced in the last year



Source: Adobe Analytics data for 2015

Does AC Nielsen capture online spending?

In principle, yes for products with barcodes

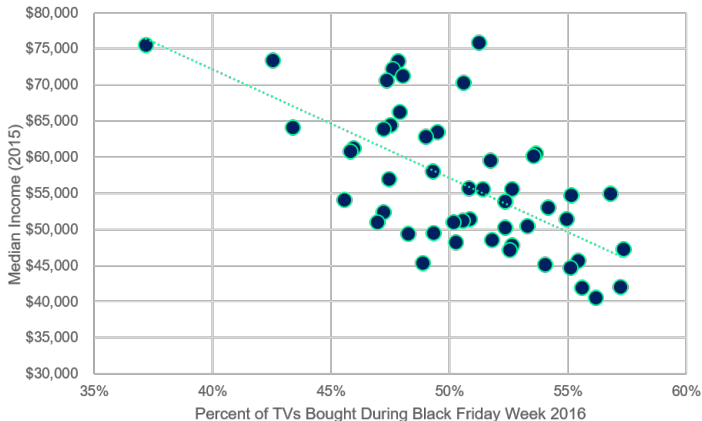
But compliance may be low, especially for households making frequent, small purchases online (Amazon?)

Let's look at Adobe Analytics data for online patterns

Is e-commerce a Great Equalizer or a Digital Divide?

TVs sold online in Nov-Dec 2016

State median income vs. % of TVs bought Black Friday week



Source: Adobe Analytics

- Great dataset to look at household inflation
- Fascinating findings
- But might not generalize
 - ▶ to other categories
 - ▶ or to online spending