

Consumption Heterogeneity: Micro Drivers and Macro Implications

Edmund Crawley

Andreas Kuchler

Federal Reserve Board

Danmarks Nationalbank

CFPB Research Conference
December 12, 2019

Viewpoints and conclusions stated in this paper are the responsibility of the authors alone and do not necessarily reflect the viewpoints of the Federal Reserve Board or Danmarks Nationalbank.

We estimate the **consumption response**
to permanent and transitory **shocks to income**
for **different groups** of households

Hasn't This Been Done Before?

Yes, but...

Our **method** addresses bias in previous results

Our **data** allows sharp focus on household heterogeneity

Hasn't This Been Done Before?

Time Aggregation Problem

Yes, but...



Our **method** addresses bias in previous results

Our **data** allows sharp focus on household heterogeneity

Hasn't This Been Done Before?

Time Aggregation Problem

Yes, but...



Our **method** addresses bias in previous results

Our **data** allows sharp focus on household heterogeneity



Sample size in millions
Detailed balance sheet

How Do We Do This? Reduced Form Approach

Identifying Restrictions on

Income

and

Consumption

In **Continuous** Time

How Do We Do This? Reduced Form Approach

Identifying Restrictions on

Income  Permanent (random walk) shocks
Transitory (<2 years) shocks


and

Consumption

In **Continuous** Time

How Do We Do This? Reduced Form Approach

Identifying Restrictions on

Income  Permanent (random walk) shocks
Transitory (<2 years) shocks

and

Consumption  Permanent (random walk) response
Transitory (<2 years) response

In Continuous Time

How Do We Do This? Reduced Form Approach

Identifying Restrictions on

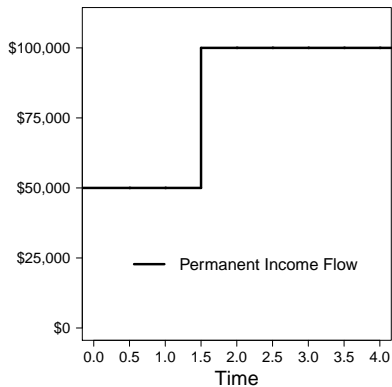
Income  Permanent (random walk) shocks
Transitory (<2 years) shocks

and

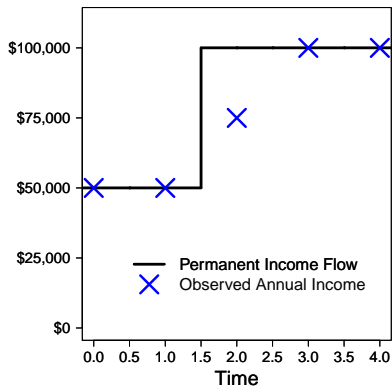
Consumption  Permanent (random walk) response
Transitory (<2 years) response

In **Continuous** Time  Time Aggregation Bias

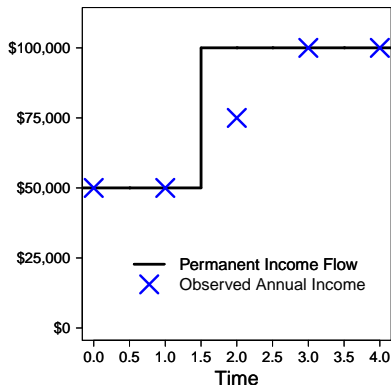
Time Aggregation Problem



Time Aggregation Problem



Time Aggregation Problem



Time Aggregation Bias is large:

Our average MPC \approx **0.5**

Blundell, Pistaferri and Preston
(2008) MPC \approx **0.13**

MPC: Marginal Propensity to
Consume

What we need:

- Panel Data on **Income** and **Expenditure**
- Household **Balance Sheets**

What we need:

- Panel Data on **Income** and **Expenditure**
- Household **Balance Sheets**

What we have: Registry data for all Danish households

- **Income**
Third party reported
- **Balance Sheet**
Wealth on 31 Dec
Asset category, mortgage tenure
- **Expenditure**
No *direct* measure of spending

Household budget constraint

$$\text{Expenditure} = \text{Income} - \text{Saving}$$

Household budget constraint

$$\text{Expenditure} = \text{Income} - \text{Saving}$$

↓

$$= \text{Change in Net Worth (adj. for capital gains)}$$

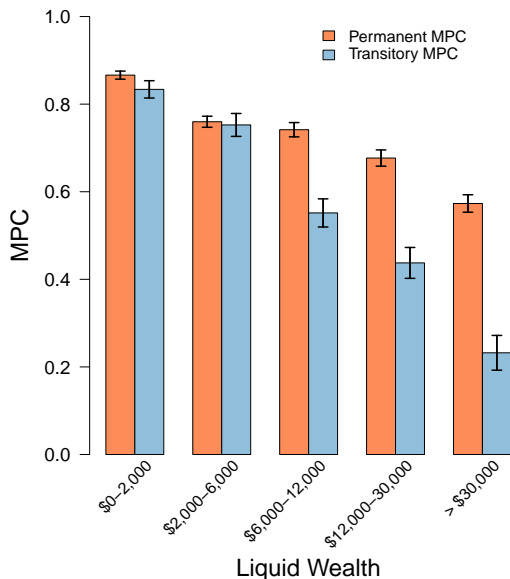
Household budget constraint

$$\text{Expenditure} = \text{Income} - \text{Saving}$$

↓
= Change in Net Worth
(adj. for capital gains)

- Works well for households with simple financial lives
- Problem: Capital gains
 - Houses off balance sheet (exclude transaction years)
 - Exclude business owners
 - Capital gains based on a diversified index
- Noisy, but perhaps better than surveys (Kuchler et al. 2018)
- Huge sample size advantage: sample covers 7.6 million observations over 2004-2015

MPC by Liquid Wealth Quintile



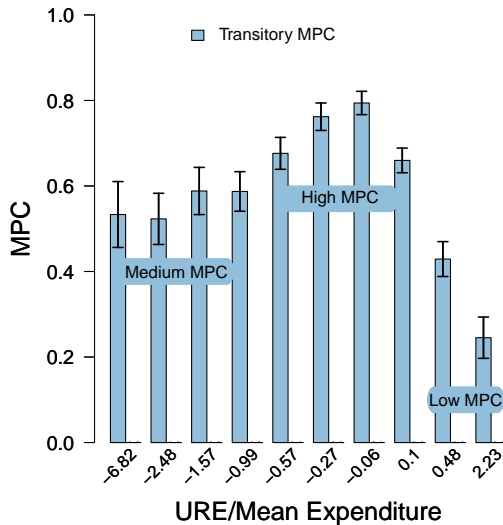
Monetary Policy: Interest Rate Exposure Channel



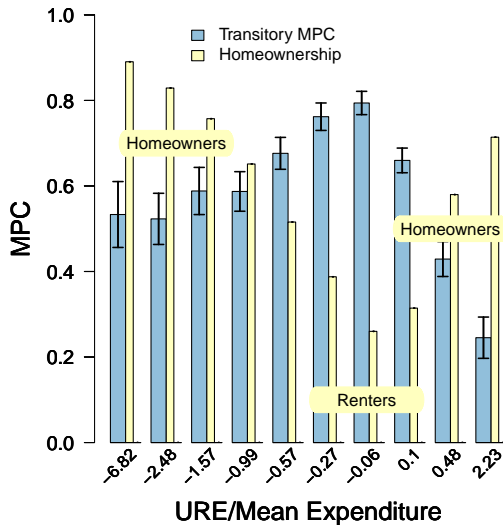
Monetary Policy: Interest Rate Exposure Channel



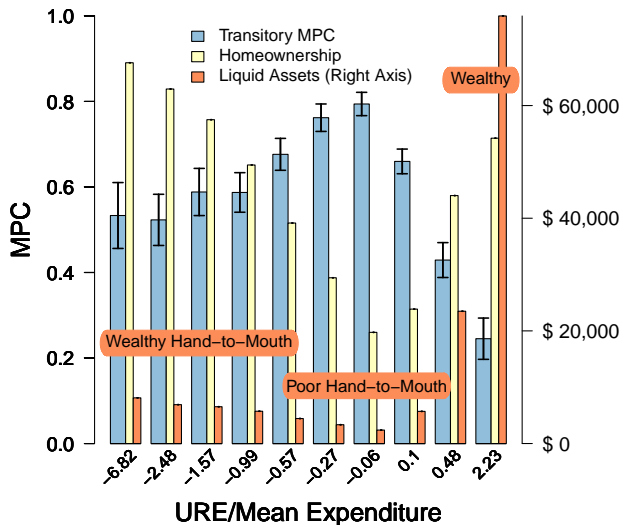
MPC by Unhedged Interest Rate Exposure



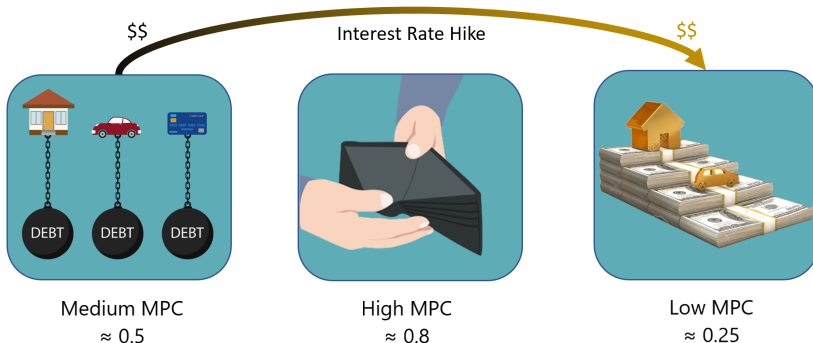
MPC by Unhedged Interest Rate Exposure



MPC by Unhedged Interest Rate Exposure



Monetary Policy: Interest Rate Exposure Channel



1yr rate \uparrow 1%

Aggregate Spending \downarrow 26 basis points



Through this redistribution channel *alone*

New Method to Estimate Consumption Behavior

- Corrects for Time Aggregation Bias
- Estimates align with natural experiment literature
- Potential to use on a wide variety of datasets and applications

Applied to Danish Registry Data

- Sample Size \implies Sharp Focus on Heterogeneity
- High MPC from transitory shocks, Low MPC from Permanent shocks
- Quantify Monetary Policy Transmission Channels

Thank you!