Discussion of "Cyclical Demand Shifts and Inflation Inequality"

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A great paper! Very polished and it illustrates a wider issue

✓ Premise: High- and low-income households consume different proportions of luxuries and necessities

✓ Extensive data, empirical and modelling work to conclude that this has macro consequences.

✓ All the robustness tests a heart desires

(A lot of) **data work**: micro CEX data and ELI-level price rigidity cross-walked to 148 category-level PCE indices, and BEA input-output tables

Stylised facts: The *relative* consumption share and *relative* inflation (conditional on oil prices) of necessities and luxury goods are counter-cyclical

Two models:
- Static partial equilibrium for *qualitative* supporting evidence of non-homothetic preferences
- New Keynesian model for *quantitative* explanation of relative consumption share and prices and welfare analysis

Punch line: Recessions hit the poor with a double whammy!

Static model for simple test of non-homothetic preferences

- Representative household has *non-homothetic preferences* over necessities and luxuries
- *Concave production function over labor* → if the necessity sector expands, its relative cost will rise
- N.B. Differential productivity shocks have ambiguous effect
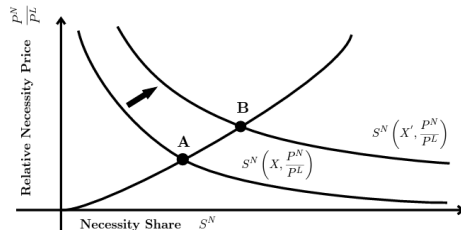
Empirical test using panel local projections on oil news and monetary policy shocks:

- Also conditional on oil content, durability, typical price change frequency:
    - Does aggregate *relative* expenditure shift after a demand or supply shock? ✓
    - Is the *relative* supply curve upward sloping, → relative price rises? ✓
    - N.B. the oil price shock has both a direct and an indirect effect on relative prices

# New Keynesian model for quantitative results and welfare analysis

- Two sectors (luxuries, necessities), common technology concave in labour, sticky wages, flexible prices, perfect competition - added supply shocks in new version
- AIDS to model non-homothetic preferences: common subsistence consumption plus different share of luxury, rising with expenditure
  - this allows aggregating to a representative household
  - but the representative household is not the "aggregate" household!
- CB sets interest rate following Taylor rule
- Calibrated to USA 2005-06 data - match degree of non-homotheticity by different share of luxury and necessity by rich and poor
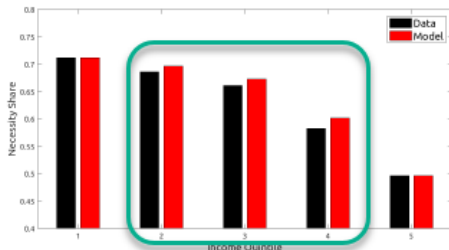
- The calibration matches the shares of the top and bottom 20% by design
- It does a good job at capturing the shares of the middle quintiles

Historical simulation of relative shares and prices and welfare results

- The calibration matches the aggregate expenditure share by design
- The model and data time series of relative expenditure shares and relative prices are correlated
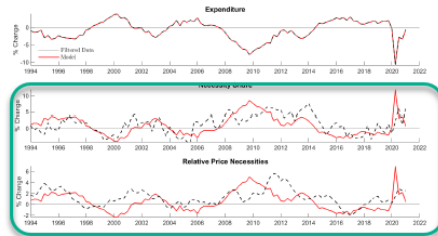
The model allows to compute the **expenditure equivalent welfare loss of the Great Recession**:

- around 22% higher for the poor in the calibrated model
- same for rich and poor if the non-homotheticity parameter is set to 0

The contribution: from stylised facts to clear model implication

The stylised facts on USA are in tune with work on European inflation differentials over time:

- Unconditional inflation differentials:
  - Across households: Kiss and Strasser (2024): shopping behaviour explains micro-level HH inflation differential
  - Across income classes (and its impact on households) ECB EB box in 2022 and article in 2023, Ferreira et al (2024), Pallotti et al (2024)
- Different inflation response to monetary policy shock: Ampudia et al (JME 2024) find opposite channels of differential response of inflation by high-income households: via consumption shares and via shopping behaviour.

This paper's contribution is to develop a framework to model these mechanisms in a way that also yields a preference-consistent aggregate COLI!

Why the results matter way beyond the scope of the paper

The paper makes **a very strong case for modelling preferences as non-homothetic**.
This has strong consequences!

- For measuring inflation and deflating nominal expenditures
- For evaluating welfare losses (in recession, in inflation surge)
- As a consequence also for evaluating optimal monetary policy!

On measuring inflation: Cost of Living Indices (COLI) derive from demand structure
$\rightarrow$ If preferences are not homothetic:

- The properties of common indices such as PCE break down
- The substitution bias of Laspeyres-based indices like CPI cannot be measured against superlative indices (like Fisher)
- The measurement error of deflated quantities arguably increases with income/expenditure inequality

# What could be done better: 1) More clarity on price indices

Clarify what price index is used when, and what is a COLI.

- CPI is not a COLI that derives from a utility function (the revised paper uses PCE)
- In the empirical exercises, are nominal expenditures deflated by PCE or by model-consistent price indices?
- The geometric price index of old eq 3.3. was not a COLI

Old version: geometric price index
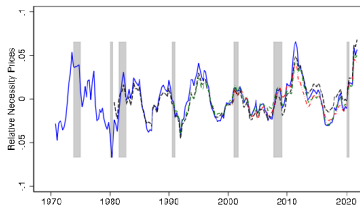
New version: relative Fisher index
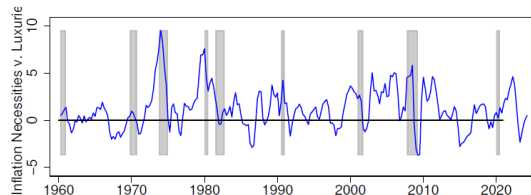
- Some papers derive superlative indices valid under non-homothetic preferences, see e.g., Hochmuth et al (2022)

What could be done better: 2) Rents and welfare!

While the BLS constructs an imputed owners' equivalent rent series, homeowners do not actually pay this price. When rent prices change, homeowners can still consume at their initial endowment point and are shielded from increases in home prices.

But **dwelling is the ultimate necessity**: excluding it undermines the credibility of the welfare results.
See Pallotti et al (2024) for the EA: *"rigid rents served as a hedge for the poor"*

| Product	Weight	Category
Rents	62	Service
Restaurants etc	56	Service
New motor cars	27	NEIG
Electricity	27	Energy
Car maint.	25	Service
Petrol	22	Energy

- Important to look at robustness when including actual and imputed rents
- Could look at sensitivity setting imputed owner's price to 0?
- Excluding imputed prices also goes against the logic of COLI vs COGI principle (utility vs monetary expenditure)

What could be done next: Take heterogeneity even more seriously

- Zoom in to individual products bought by the rich and poor:
  - Many different varieties - e.g. in German GfK data 2013-2018: on average 360 kinds of wine and 187 kinds of shower gel per week
  - Different elasticity of substitution across income classes (trading down)
  - Wide price range within each category

Regression of unit price on income class for top category in Germany

(x-axis: income class, y-axis: mean value per volume)
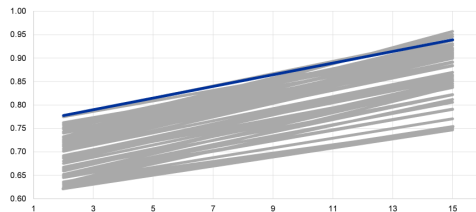
Sources: Gfk and PRISMA staff calculations.

- Look at new product introduction
  - Love for variety affects utility and COLI measurement (Feenstra 1994)
  - Does new product introduction target the rich and poor differentially? Anecdotally yes, favouring the rich

Conclusions

- Very convincing evidence of non-homotheticity in consumer preferences
- $\rightarrow$ input to renewed modelling and measurement research!
- A very polished paper, especially post-review
- Including rents might reinforce or weaken the results, depending on the stickiness of rents
- For future research: zoom in to product level, to study both inflation dynamics and welfare impacts of shocks

Are the poor hit not by a double, but a triple whammy?