Distributional National Accounts at work: measuring changes in material living standards by income quintile

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CESS, Paris, 15-16 October 2024

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Introduction

- The assumption of a representative consumer is not a good vehicle to measure welfare

- Significant progress by Eurostat-OECD and Member countries developing Distributional National Accounts:
  - Socio-economic breakdown of household accounts
  - Coverage of Social Transfers in Kind (STiKs): consumption that is not explicitly paid for but received in kind
  - SNA consistency – adjusted disposable income and Actual Individual Consumption

- So far, focus on results in current prices

- Monitoring changes in material well-being requires measures in real terms (or deflators) that are group-specific

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This paper:

- Operationalises the notion of material well-being/material living standards through AIC, i.e. market consumption (HFCE) plus STiKs

- Develops volume changes in material well-being by income group

- Examines the economic theory of index numbers for volume indexes of AIC – two methods emerge

- Implements one of the methods for Australia, Canada and the Netherlands

- Concludes the measurement agenda ahead

Dealing with STiKs

STiK characteristics:

- Consumers do not in general choose the quantity of services supplied by government to minimise expenditure

- Rather, STiKs act as exogenous factors that add to material well-being, akin to other 'environmental' variables such as infrastructure, safety or clean air

- This suggests deriving a volume measure of AIC, that reflects volume changes of market products, 'quality'-adjusted for changes in STiK

- Consumers attach value to these services, depending on their preferences => there is a household-specific shadow price for each service

- In principle, this shadow price should be used to value and weight STiK in the quality adjustment of the volume index of household consumption (or, alternatively the cost-of-living index)

First approach: STiKs as 'environmental variables'

- Volume change in STiK is treated as an adjustment to the standard volume index of market products

$$Q_{ALh} \approx \frac{p^0 \cdot q_h^1 + \tilde{p}_{zh}^1 \cdot [z_h^1 - z_h^0]}{p^0 \cdot q_h^0}$$

$p^t \equiv [p_1^t, ... p_N^t]$ prices of market products

$q_h^t \equiv [q_{h1}^t, ... q_{hN}^t]$ quantities of market products consumed by household type h

$\tilde{p}_{zh}^t \equiv [p_1^t, ... p_N^t]$ shadow prices of STiKs for household type h

$z_h^t \equiv [z_{h1}^t, ... z_{hM}^t]$ quantities of STiKs consumed by household type h

- Note: *any* growth in STiKs will be recorded as improved material well-being

- Big challenge: how to measure shadow price?

- *And*: while meaningful from well-being perspective, would we introduce inconsistency with market products?

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Second approach: STiKs as 'market variables'

- Ignores the particular nature of STiK and treats quantities as if they were subject to choice under a market situation

- Assumption: consumers face 'prices' (unit costs) for STiKs and chose the observed quantity

- Normal index number practice applies

$$Q_{Lh} \approx \frac{p^0 \cdot q_h^1 + p_z^0 \cdot z_h^1}{p^0 \cdot q_h^0 + p_z^0 \cdot z_h^0}$$

$$p_z^t \equiv \left[p_{z1}^t, \ldots p_{zM}^t \right] \qquad \text{unit costs of STiKs}$$

- Note: volume index of material well-being (AIC) will only exceed HFCE if STiKs quantities grow faster than HFCE quantities

- But no need to capture shadow prices, 'only' unit costs that are not household specific

- Preferences of household type h 'only' enter through consumption patterns

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Which (unit cost) deflator for STiKs?

- Three options considered to deflate government-supplied education, health care and other:

  A: Deflators of equivalent COICOP categories

  – Straightforward for education and health care; for 'other' we used COICOP category ' Housing, water, electricity, gas and other fuels'

  – Good concordance with products, but likely not reflective of actual unit cost of producing and delivering the corresponding STiK

  B: Deflator of government consumption expenditure

  – Reflective of unit cost of delivery, but not broken down by type of STiK

  – Also different deflation methods across countries and often input-based

  Also explored: data collected through Eurostat-OECD PPP program

  – Internationally comparable output-based unit costs for health, education and housing, but patchy time series and confidential information

  => No single preferred solution. We implement Options A and B

Experimental results for Australia, Canada, Netherlands

- Computation of **volume indexes** of AIC and of corresponding cost-of-living indexes for

  – Australia (2009-17)

  – Canada (2008-2022)

  – Netherlands (2015-21)

- Direct comparisons between beginning and end periods, using Fisher volume and price indexes

- **Data sources:**

  – Household market consumption and STiKs per income group in nominal terms from OECD's distributional national accounts database

  – Deflators for HFCE categories and General Government Consumption from OECD National Accounts Database

Growth of material well-being by country and income group – a mixed picture

Average annual percentage change

Australia 2009-17

			Household income quintile			
	Total	Q1	Q2	Q3	Q4	Q5
Real AIC computed with STiKs deflator based on:						
Household final consumption expenditure (Option A)	2,70	2,36	1,73	2,42	2,42	4,01
Government consumption expenditure (Option B)	2,89	2,60	1,98	2,63	2,59	4,14
For comparison						
Real HFCE using national accounts deflator	2,74	2,21	1,65	2,23	2,24	4,12

Ambiguous effect on measured growth in AIC

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Growth of material well-being by country and income group – a mixed picture

Canada, 2008-22						
	Household income quintile					
	Total	Q1	Q2	Q3	Q4	Q5
Real AIC computed with STiKs deflator based on:						
Household final consumption expenditure (Option A)	2,14	2,78	2,21	2,45	1,96	1,70
Government consumption expenditure (Option B)	2,06	2,68	2,11	2,37	1,89	1,65
For comparison						
Real HFCE using national accounts deflator	2,09	2,79	2,17	2,49	1,90	1,66

Ambiguous effect on measured growth in AIC, also for Canada

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Growth of material well-being by country and income group – a mixed picture

Netherlands 2015-21						
	Household income quintile					
	Total	Q1	Q2	Q3	Q4	Q5
Real AIC computed with STiKs deflator based on:						
Household final consumption expenditure (Option A)	1,39	0,79	1,46	1,41	1,56	1,51
Government consumption expenditure (Option B)	1,06	0,37	1,08	1,04	1,24	1,29
For comparison						
Real HFCE using national accounts deflator	0,69	0,13	0,57	0,71	0,79	0,86

...but significant rise in measured growth of AIC for the Netherlands

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Growth of material well-being by country and income group – a mixed picture

Average annual percentage change

Australia 2009-17						

	Household income quintile					
	Total	Q1	Q2	Q3	Q4	Q5
Real AIC computed with STiKs deflator based on:						
Household final consumption expenditure (Option A)	2,70	2,36	1,73	2,42	2,42	4,01
Government consumption expenditure (Option B)	2,89	2,60	1,98	2,63	2,59	4,14
For comparison						
Real HFCE using national accounts deflator	2,74	2,21	1,65	2,23	2,24	4,12

No discernable effect on gradient for Australia and the same holds for Canada and the Netherlands

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...confirmed by a more systematic check: on average, material well-being rises with the inclusion of STiKs but without discernable gradient

	Dependent variable:
	Difference in growth rates AIC-HFCE
Dummy variable for CAN	-0.220^{***} (0.071)
Dummy variable for NLD	0.364^{***} (0.071)
Dummy variable for Option B	-0.074 (0.058)
Income quintile	-0.009 (0.021)
Constant	0.261^{***} (0.085)
Observations	30
R^2	0.738
Adjusted R^2	0.696
Residual Std. Error	0.159 (df = 25)
F Statistic	17.634^{***} (df = 4; 25)
Note:	Panel regression $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

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Interesting: the effects of STiKs during the COVID period in Canada

Average annual percentage change

Canada, 2020-22

	Household income quintile					
	Total	Q1	Q2	Q3	Q4	Q5
Real AIC computed with STiKs deflator from:						
Household final consumption expenditure (Option A)	4,73	5,15	4,67	5,02	4,40	4,59
Government consumption expenditure (Option B)	4,63	5,03	4,54	4,91	4,31	4,54
For comparison						
Real HFCE using national accounts deflator	4,64	4,11	4,40	5,33	4,60	4,60

Strong growth of AIC for lowest income quintile, little effects elsewhere

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...the dual side: change in the measured cost-of-living

Average annual percentage change						
Australia 2009-17						
			Household income quintile			
	Total	Q1	Q2	Q3	Q4	Q5
Cost of living computed with STiKs deflators based on:						
Household final consumption expenditure (Option A)	1,98	2,12	2,12	2,03	4,91	1,83
Government consumption expenditure (Option B)	1,79	1,88	1,87	1,82	1,74	1,71
For comparison						
HFCE national accounts deflator	1,66	1,69	1,70	1,68	1,62	1,63

AIC price index rises faster than HFCE price index in Australia but also in Canada and the Netherlands

Quantity *and* unit costs of STiKs have outpaced HFCE - consistent with rising share of government consumption in GDP

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Conclusions and work ahead

- Moving from HFCE to material well-being (AIC) is useful to reflect important role of STiKs

- Methodology matters – 'environmental variables' vs 'market variables' approach likely produce different answers (but also respond to somewhat different questions)
    - Environmental variable: *any* volume increase will raise growth of AIC (lower the cost-of-living)
    - Market variable: Cost-of-living declines if Δ shadow price of STiK < Δ Average price of HFCE

- Robust deflators for STiKs at a reasonable level of disaggregation and, preferably, internationally comparable are vital but scarce. More work is needed.

- Research on shadow prices (willingness to pay studies) for STiKs will also be most useful.

- Extension of work to more countries and more recent time periods.

THANK YOU!

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