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The Impact of Telescoping Bias on Income and Price Elasticities

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Introduction

- No “gold standard” for measuring consumption¹
- Differences in survey methods have significant impact on measurement of consumption^{1,2}
- Mis-measurement of consumption can lead to mis-estimation of other metrics^{3,4}
- Telescoping Bias occurs when survey participants report consumption outside of the recall window
 - Can happen on the intensive & extensive margin
- Intensive: a consuming household overreports consumption
 - Affects commonly consumed staples (i.e., cereals)
- Extensive: a non-consuming household reports consumption
 - Affects goods consumed occasionally (i.e., meat)

Objectives

- How does telescoping bias impact income and price elasticities?
- Do intensive and extensive mismeasurement have different effects?

Methods

- Quadratic Almost Ideal Demand System⁵ for control and treatment group
 - Used^{6,7} and suggested⁸ in prior literature
- Demographic characteristics included in constant term
- Quantity weighted sub-city level LSMS prices used to create price index

Data

- Replication data from a RCT conducted in Addis Ababa, Ethiopia²
 - Included 930 households from six sub-cities
- Household was randomly assigned:
 - Treatment: Recall window was bookended with salient event (uniformed supervisor visiting household)
 - Control: No bookending, business as usual consumption module
- Weekly Consumption Summary Statistics:

	ALL OBSERVATIONS		NON-ZERO OBSERVATIONS	
	Bounded Treatment Group	Unbounded Control Group	Bounded Treatment Group	Unbounded Control Group
CEREALS	11.967	13.019**	11.967	13.019**
MEAT	1.416	2.077**	2.459	3.058
EGGS	0.130	0.163**	0.276	0.306*

*, **, *** indicates statistical difference from the control group at the 10%, 5%, 1% significance level

Income Elasticities

Good	Treatment Group	Unbounded Control Group
Cereals	0.645*** (0.032)	0.754*** (0.022)
Tubers & Roots	0.877*** (0.109)	0.500*** (0.092)
Vegetables	0.882*** (0.040)	0.841*** (0.029)
Fruits	1.523*** (0.105)	1.221*** (0.071)
Meat	2.116*** (0.133)	1.792*** (0.070)
Eggs	1.510*** (0.182)	1.255*** (0.109)
Legumes	0.839*** (0.064)	0.845*** (0.045)
Dairy	1.461*** (0.148)	1.216*** (0.097)
Oil	0.828*** (0.048)	0.813*** (0.038)
Sweets	0.732*** (0.076)	0.825*** (0.044)

* p<0.05, ** p<0.01, *** p<0.001

- Cereals, roots & tubers, vegetables, legumes, oil, and sweets are normal goods
- Fruit, meat, eggs, and dairy are luxury goods
- Intensive mismeasurement leads to overstated income elasticity (cereals)
- Vegetables (no mismeasurement or censoring) very similar
- Eggs and Meat (extensive mismeasurement) are understated by control group

Discussion

- Intensive mismeasurement overestimates income elasticity and underestimates own price elasticity
- Extensive mismeasurement is often ambiguous
- Limitation: Not accounting for censoring (true non-consuming households) makes disentangling extensive mismeasurement from censoring bias difficult
 - Addressing censoring bias is ongoing
- Despite differences in magnitude, significance and sign and therefore the conclusion about the type of good was unaffected
- The value of more accurate data collection is still uncertain

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