



Measuring Consumption



ROME | CENTER FOR DEVELOPMENT DATA

May 2019


Introduction


2

Broad objective of this course

- Improve the **quality** of household survey **data** used for measuring living standards (poverty and inequality measurement)
- **Data quality**: many definitions, but some criteria are recurrent:

▪ Relevance	meeting user goals	clear definition of the research objective
▪ Accuracy	no mistakes	
▪ Timeliness	punctuality in disseminating results	
▪ Comparability	consistency across time and space	
▪ Accessibility	easy access for users	


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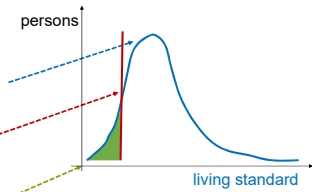
Specific objectives

- Provide a **conceptual framework** for the measurement of living standards.
- Provide **guidelines** for **survey design** and **data collection**, in the specific context of household consumption and expenditure modules.

Inequality and poverty measurement

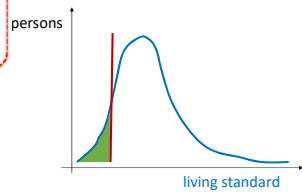
five building blocks

- 1) a **measure of living standards**
- 2) **high-quality data** on households' living standards
- 3) a **distribution of living standards** (inequality)
- 4) a **critical level (poverty line)** below which individuals are classified as "poor"
- 5) one or more **poverty measures**



Focus of this course

- 1) a **measure of living standards**
- 2) **high-quality data** on households' living standards
- 3) a distribution of living standards (inequality)
- 4) a critical level (a poverty line) below which individuals are classified as "poor"
- 5) one or more poverty measures



Course overview

fifteen two-hour lectures

1. Measuring living standards: a conceptual framework
2. The consumption aggregate
3. Understanding household surveys
4. Principles of questionnaire design
5. Measuring Food Consumption – I
6. Measuring Food Consumption – II
7. Measuring Food Consumption – III
8. Measuring consumption of non-durable non-food items
9. Durable goods
10. Housing
11. Data validation and diagnostics
12. Outlier detection and treatment
13. Measuring inequality
14. Measuring poverty
15. Describing data

Practical instructions

1. **Breaks**
Expect a 15-minute break for each lecture
2. **Readings**
Some compulsory, some optional (reading package available)
3. **Homework**
No stars is basic, one star (*) is difficult, two stars (**) is very difficult
4. **Final exam**
Take-home assignment

Contacts

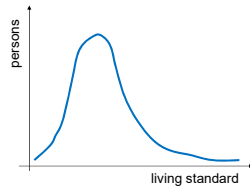
Please add the instructor's email address, office hours, etc.

Measuring living standards: a conceptual framework

LECTURE 1

Lectures 1 and 2

- Today's focus is on one question:
What are we to measure, exactly?
- The rest of the course focuses on a second question: **How** to best measure it?
- So, lectures 1 and 2 are about **concepts**, and the rest of the course will be on **measurement** (methods and data).



1. What is the standard of living?

A foundational question

- What is the “standard of living”?
- It is a profound question, that (apparently) defies simplification
- Our aim is to provide a **quantifiable** answer

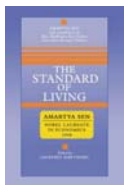
Amartya Sen
(1933 -)



- 1998 Nobel Prize in Economics
- Why?
- “(...) for his contributions to welfare economics”

Amartya Sen

The standard of living, 1987, p. 2.

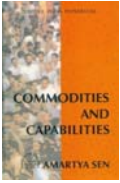


A clear admonition:

«The **living standard** cannot be defined completely afresh by us ‘professionals’, and **we must not sacrifice all the richness of the idea** of the living standard to get something nicely neat and agreeably simple»

Amartya Sen

Commodities and Capabilities, 1987, p. 1.



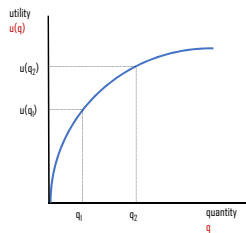
«There are many different approaches (...) to judging whether the person is doing well (...): Is he well off? Is she **happy**? Does he feel **fulfilled**? Does she have much **freedom**? Can he get what he **wants**? Can she do what she would like to do? Is **society** being good to him? Is she having a good life? These distinct questions have their own peculiar relevance in particular contexts and each has an importance of its own.»

How to narrow Sen's list down?

- Happiness
 - Fulfillment
 - Money
 - Health
 - Freedom
 - ...
- **Q.** How did mainstream economics eschew this complexity?
- **A.** They introduced one more concept: 'utility'.

Mainstream economists

- Economists assume that the standard of living derives from the **consumption of goods and services**.
- Any given basket of goods and services gives a certain '**utility**' to the consumer.
- They assume that utility depends on **q**.
- The simplest case is with one good; this is how the utility $u(q)$ varies with **q**.
- 'Utility' is clearly **not observable**, but provides the foundation for much of the conceptual framework that poverty analysts use.



The link between 'utility' and the standard of living

- Consumers are assumed to **maximize utility**
- To do so, the consumer chooses an **optimal bundle** of goods and services: 'optimal' depends on a) her **tastes** (preferences), b) the **prices** she faces on the market, and c) her **budget**.
- Let us denote the optimal bundle with q^* .
- Maximum utility is then $u(q^*)$.

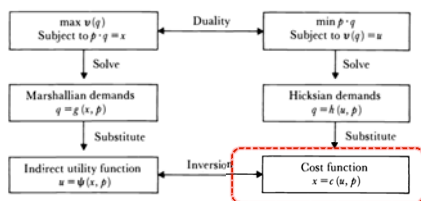


'Utility' in concrete terms

- Maximum utility is $u(q^*)$.
- Q.** How much is $u(q^*)$?
- A.** We cannot tell – **utility is not observable**.
- Q.** Alternatively, we can ask: how much does q^* cost?
- A.** $x = p \times q^*$
this is the **cost of the optimal bundle**, the one that gives the maximum utility to the consumer
- Welfare analysts follow **Deaton and Zaidi (2002)**, a paper that shows how to calculate the value of utility $u(q^*)$, given the cost of the bundle $x = p \times q^*$

*The consumer's problem and (solution)

Deaton and Muellbauer, 1980, p. 28.



A utility-consistent definition of standard of living

Deaton and Zaidi 2002, p. 9, eq. (2.6)

- D&Z show that the value of the utility associated to the optimal bundle can be calculated as household expenditure (x) adjusted for purchasing power. Either:

$$u = x/P \quad (\text{P is a Paasche price index})$$

or

$$u = x/L \quad (\text{L is a Laspeyres price index})$$

- Economists refer to x/P as to **money metric utility (MMU) function**.
- The ratio x/L is called **welfare ratio (WR)**.
- D&Z argue that for poverty measurement the best choice is x/P (eq. 2.6).

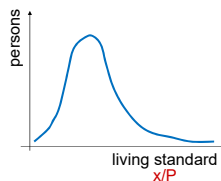
Deaton and Zaidi (2002)



- The *Guidelines* have been downloaded 2,716 times in the last 5 years alone; Doemeland and Trevino (2014) find that only 2% of World Bank “knowledge products” surpass 1,000 downloads over a 5-year period.
- **Must read**
- A review of the *Guidelines* in light of recent literature is forthcoming: Mancini and Vecchi (2019)

The living standard in practice

- Unlike the utility $u(q)$, the MMU $u = x/P$ is **observable** and can be calculated based on household budget and price data.
- This is what underlies a key decision: “deriving total **consumption expenditure** and dividing it by a price index is our basic strategy to measure welfare” (D&Z, p. 10)
- Standards of living can be proxied by x/P , that is using total consumption expenditure adjusted with a Paasche price index.



*More on the theoretical foundations of standard of living measurement

Welfare ratios: definition, pros and cons
Blackorby and Donaldson (1987)

Journal of Public Economics 24 (1987) 1-16

WELFARE RATIOS AND INTERPERSONALLY SENSITIVE COST-BENEFIT ANALYSIS

Charles BLACKORBY and David DONALDSON*

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Received May 1986, revised October 1986, accepted August 1987

We consider a class of interpersonally sensitive cost-benefit analysis. We show that the standard of living ratios proposed by Blackorby and Donaldson (1987) are the only ratios that satisfy the axioms of interpersonally sensitive cost-benefit analysis. We also show that these ratios are the only ratios that satisfy the axioms of interpersonally sensitive cost-benefit analysis and the axioms of interpersonally sensitive cost-benefit analysis.

1. Introduction

In this paper we consider and analyze a class of interpersonally sensitive cost-benefit analysis and general welfare analysis. Blackorby

Why is MMU preferable to welfare ratios?
(Deaton 2003)

Journal of Public Economics 74 (2003) 2-10

Measuring Well-Being: A New Approach to the Measurement of Poverty

UNIVERSITY OF OXFORD

Abstract: This paper discusses the measurement of poverty and the measurement of well-being. It shows that the measurement of poverty is a difficult task and that the measurement of well-being is a more difficult task. It also shows that the measurement of poverty is a more difficult task than the measurement of well-being.

1. Introduction

The World Bank's Living Standards Measurement Survey (LSMS) uses a new method of measuring poverty and well-being. This method is based on the measurement of consumption expenditure and is known as the Measurement of Well-being (MWB) method.

Expenditure, consumption, and consumption expenditure
Browning, Crossley and Winter (2014: 477)

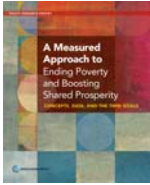
- We define household **expenditure** as the nominal money outlay of the household.
- Household **consumption** is the **quantity** of goods and services that the household enjoys in a given period.
- Household **consumption expenditure** is those money outlays directed toward consumption (e.g., it excludes outlays for investment purposes).

Recap

- There are a number of approaches to measuring living standards
- Economists seek to measure **utility**, which they approximate by **consumption expenditure, adjusted for purchasing power: x/P**
- This consumption-based measure is a simple (remember Sen's critique) but strong candidate to proxy the **concept** of living standard.

This explains why ...

World Bank, 2015, p. 31



“Consumption per capita is the preferred welfare indicator for the World Bank’s analysis of global poverty.”

*Multidimensional poverty measurement

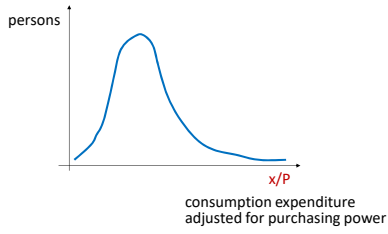
Alkire et al (2015)

- The multi faceted nature of standard of living has prompted a second approach, **multidimensional poverty measurement**.
- This builds on Amartya Sen’s **functionings and capabilities** approach.
- **Functionings** are the beings and doings that people value, e.g. being well fed.
- **Capabilities** are the freedoms to achieve valuable functionings.
- Alkire et al. have developed a method to deal with a multi-dimensional definition of standard of living

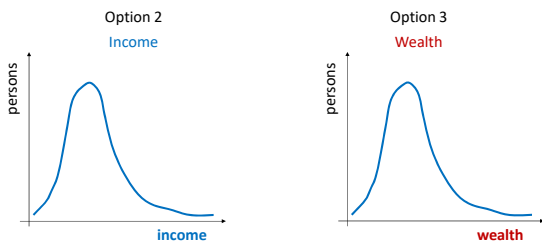


2. Choosing a measure of living standards

Option 1: consumption expenditure



Are there other options?



Option 3: Wealth

- Wealth contributes to the standard of living. It does so indirectly, but it certainly does it.
- Economic theory says that wealth is a **stock** of resources. It is accumulated via **past** choices, and it may or may not be used to generate consumption in the **present**, which is what we care about.
- Conclusion: we put wealth aside.

Option 2: Income

- «Among economic measures of living standards, the **main competitor** to a consumption based measure is a measure based on income» (Deaton and Zaidi 2002: 13)
- «In some countries, notably in Latin America, income is the only available indicator of economic welfare.» (World Bank 2015: 32)

Two identical households: A and B

Example

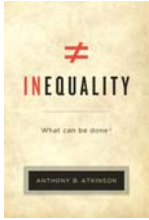
- **Household A** has a monthly **income** of \$1,000. This month, members of the household have consumed goods and services for a total value of \$900. The leftover \$100 is saved.
 - **Household B** runs a family business, which did not do too well this month: income has been \$0. However, members of the household have financed their needs by using past savings, so they also have consumed goods for a total value of \$900.
 - If we used **consumption** for measuring living standard, A and B would be equally well-off.
 - If we used **income**, A would be better off than B.
- **Which of these conclusions is correct?**

An answer

- The use of **consumption** is justified by the concept of standard of living that was covered earlier: it captures the value of **use** of commodities (money-metric utility function).
- The use of **income** fits a slightly different concept of standard of living, where the emphasis is on **potential** rather than **actual** consumption
- We saw that when it comes to measuring **poverty**, microeconomic theory suggests to use (price-adjusted) **consumption** expenditure.
- What if interest were on **inequality**?

Sir Anthony B. Atkinson

2015, p. 37



- “I continue to focus on income as an indicator of potential control over resources. The use of **income** is indeed recognition that the use of resources **goes beyond consumption**.”
- “When measuring **inequality**, we are concerned not only with the consumption but also with the **power** that wealth can convey.”

Income vs. consumption: which one to choose?

- The choice of the measure depends on:
 - 1) the **question** one is addressing
 - 2) a number of **practical considerations**
- The next few slides summarize some **advantages** (▲) and **disadvantages** (▼) of each measure.

Income

Advantages

- ▲ Limited number of **sources** of income (less than items for consumption); in principle, easier to collect the information
- ▲ It is often possible to **assign** certain **sources** of income to specific **members** of the households
- ▲ Measures the **potential command over resources** (an advantage if this is the concept of interest)

Income

Disadvantages

- ▼ May be affected by **short-term fluctuations** (e.g. seasonal fluctuations in rural areas)
- ▼ **Under-reporting** (forgetting, reluctance to disclose, difficult to measure, etc.)
- ▼ Some income components are **difficult to observe** (e.g., income from informal labor activity, from home agricultural production)

Consumption expenditure

Advantages

- ▲ Sound **theoretical foundations** (utility theory)
- ▲ Shows **long-term average well-being**, taking both consumption smoothing and insurance opportunities into account
- ▲ Measures the **use of resources** (an advantage if this is the concept of interest)

Consumption expenditure

Disadvantages

- ▼ Households may **not be able to smooth consumption** (e.g. borrowing, insurance, social networks)
- ▼ Some expenses are **not made regularly**, which adds **noise** to the data
- ▼ Some components (durable goods and housing rents) are **difficult to capture**

What is the balance of the pros and cons?

- There is no hard-and-fast rule: the choice ultimately depends on the **type of analysis**, and the **context**.
- If the focus is on poverty measurement, analysts consider one last and important dimension, **time**.
- We define as **reference period** the period over which we want to measure welfare.

Time matters

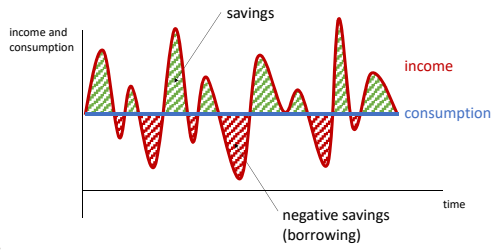
- In the simplest models of **textbook economics**, time does not exist. Individuals spend all money, and they consume all goods. Hence, the choice of the indicator does not matter:
income = consumption expenditure.
- In **real life**, time exists and matters (as in other models in textbook economics). If we assume a reference period equal to, say, a year, then income and consumption expenditure can differ:
income = consumption expenditure + savings.

The question then is ...

Deaton and Zaidi, 2002, p. 14

- We must decide whether it is consumption, income, or wealth, or some combination of all three, that permits **the best measure of living standards over a year**.
- **Uncertainty** is a key player: both income and consumption are subject to short-term fluctuations, and fluctuations can mislead living standard measurement
- The empirical evidence suggests that consumption is **smoother** over time than income

So, income or consumption expenditure?



In conclusion

- Smoothing gives **consumption** a **practical advantage** over income in the measurement of living standards.
- Observing consumption over a relatively short period – even a week or two – tells us a great deal more about annual (or even longer period) living standards than income can tell.

The international practice

- Where do countries around the world fall when choosing between income and consumption expenditure as the preferred indicator of living standards?

East Asia & Pacific



Surveys	Consumption vs Income
Cambodia 2011	Consumption
Indonesia 2016	Consumption
Lao PDR 2012	Consumption
Malaysia 2016	Income
Mongolia 2016	Consumption
Myanmar 2015	Consumption
Philippines 2015	Income
Timor-Leste 2014	Consumption
Vietnam 2016	Consumption

Europe and Central Asia



Surveys	Consumption vs Income
Armenia 2015	Consumption
Bosnia and Herzegovina 2004	Income
Kosovo 2015	Consumption
Kyrgyz Republic 2013	Consumption
Macedonia 2017	Income
Moldova 2013	Consumption
Russian Federation 2008	Consumption
Tajikistan 2014	Consumption

Latin America & Caribbean



Surveys	Consumption vs Income
Argentina 2016	Income
Bolivia 2015	Income
Colombia 2017	Income
Ecuador 2013	Consumption
Ecuador 2018	Income
El Salvador 2015	Income
Guatemala 2014	Consumption
Haiti 2012	Consumption
Honduras 2018	Income
Mexico 2016	Income
Nicaragua 2014	Consumption
Panama 2008	Consumption
Paraguay 2017	Income
Peru 2017	Consumption

Middle East & North Africa



Surveys	Consumption vs Income
Egypt 2008	Consumption
Iraq 2012	Consumption
Jordan 2010	Consumption
Lebanon 2011	Consumption
Djibouti 2017	Consumption
Morocco 2013	Consumption
West Bank and Gaza 2011	Consumption
Yemen 2005	Consumption

South Asia



Surveys	Consumption vs Income
Afghanistan 2016	Consumption
Bangladesh 2016	Consumption
Bhutan 2017	Consumption
Sri Lanka 2016	Consumption
India 2011	Consumption
Nepal 2010	Consumption
Pakistan 2013	Consumption
Maldives 2016	Consumption

Sub-Saharan Africa



Surveys	Consumption vs Income
Côte d'Ivoire 2015	Consumption
Kenya 2015	Consumption
Malawi 2010	Consumption
Mozambique 2014	Consumption
Nigeria 2010	Consumption
South Africa 2014	Consumption
Tanzania 2014	Consumption
Uganda 2011	Consumption
Zambia 2015	Consumption
Zimbabwe 2011	Consumption



Lessons learned

- The concepts and vocabulary introduced in this lecture are of paramount importance for data providers, not just for analysts, because data quality depends on **relevance** for a specific research objective.
- Poverty analysts need a proxy variable for the standard of living. Economic theory combined with practical arguments suggest to use **consumption expenditure adjusted for purchasing power**.
- Economists call it **money-metric utility function**, defined as x/P , where x is consumption expenditure and P is a Paasche price index.
- **Income** remains a strong candidate.

References

Required readings

Deaton, A., & Cartwright, S. (2018). Guidelines for constructing consumption aggregates for welfare analysis (Vol. 135). World Bank Publications. (p. 6-10)

Suggested readings

Atkinson, A. B. (2015). *Inequality: What Can Be Done?* Harvard University Press.

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Meyer, B., & Sullivan, J. (2003). Measuring the Well-Being of the Poor Using Income and Consumption. *The Journal of Human Resources*, 38.

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Varian, H. R. (1992). *Microeconomic analysis*.

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Thank you for your attention

Homework

Exercise 1 – Engaging with the literature

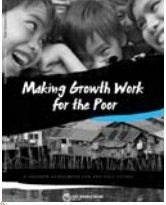
In a series of papers, Meyer and Sullivan (2003, 2009, 2011) discuss the conceptual and practical appeal of consumption with respect to income. Write a short essay (not to exceed 3000 characters) where you summarize – even schematically – the main findings.

Exercise 2 – Income or Consumption?

- Go to the following link:
https://openknowledge.worldbank.org/handle/10986/2118/discover?filter_type=supportedlanguage&filter_relational_operator>equals&filter=en
(the link takes you to the World Bank Open Knowledge Repository, and filters the Collection of Economic and Sector Work Studies to find all published Poverty Assessment Reports)
- Choose and download **five** Poverty Assessments and identify whether income or consumption (or something else) were used to derive the welfare indicator/aggregate.

Exercise 2 - Solution

Making Growth Work for the Poor : A Poverty Assessment for the Philippines (2018)



Box 1.1. Poverty estimates using national and international poverty lines

National official poverty estimates in the Philippines are produced by the Philippine Statistics Authority (PSA). These are derived using income welfare aggregates evaluated against per capita poverty lines that are set broadly following the cost-of-basic-needs (CBN) approach. Using a national reference food bundle based on expert opinion of what constitutes a nutritionally adequate bundle, province-specific bundles are set separately for urban and rural areas and reflect locally consumed commodities. These locally

Exercise 3 – Multidimensionality of well-being

- Go to: <https://data.worldbank.org/>
- Choose five indicators that you think are important to assess the living standard of the population (education, health, trade etc...)
- Draft a short essay on the living conditions in the country of your choice based on these indicators and their trend.
