

Measuring Consumption

C4D2 TRAINING
ROME | CENTER FOR DEVELOPMENT DATA

March 2020

1

Introduction

C4D2 TRAINING

2

Objectives of this course

1. Improve the **quality** of household survey **data** used for measuring living standards (poverty and inequality measurement)
2. Provide a **conceptual framework** for the measurement of living standards.
3. Provide **guidelines** for **survey design** and **data collection**, in the specific context of household consumption and expenditure modules.

C4D2 TRAINING

3

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

C4D2 TRAINING

4

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

C4D2 TRAINING

5

Course overview

fifteen two-hour lectures

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

C4D2 TRAINING

6

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



7

Contacts

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



8

Measuring living standards: a conceptual framework

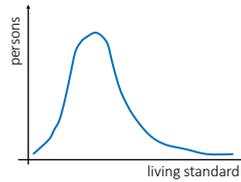
LECTURE 1



9

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).



C4D2 TRAINING

10

1. What is the standard of living?

C4D2 TRAINING

11

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

C4D2 TRAINING

12

Amartya Sen

(born in Bengal, India, 1933)



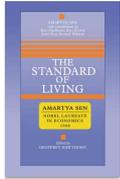
- 1998 Nobel Prize in Economics
- Why?
- “(...) for his contributions to welfare economics”



13

Amartya Sen

The standard of living, 1987, p. 2.



A clear admonition:

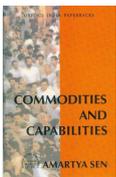
«The living standard cannot be defined completely afresh by us ‘professionals’, and we must not sacrifice all the richness of the idea of the living standard to get something nicely neat and agreeably simple»



14

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.»



15

How to narrow Sen's list down?

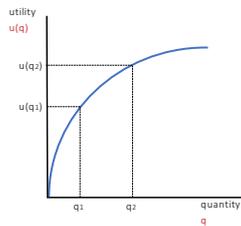
- Happiness
- Fulfillment
- Money
- Health
- Freedom
- ...
- Q. How did mainstream economics eschew this complexity?
- A. They introduced one more concept: 'utility'.



16

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.



17

Angus Deaton

(born in Edinburgh, Scotland, 1945)

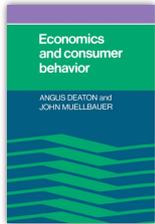


- 2015 Nobel Prize in Economics
- Why?
- "(...) for his analysis of consumption, poverty, and welfare"



18

Deaton and Muellbauer (1980)



- A fundamental textbook
- Must read for economists
- Deaton's next works assume familiarity with Chapter 2

19

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 (2020)

20

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 $u(q^*)$.

21

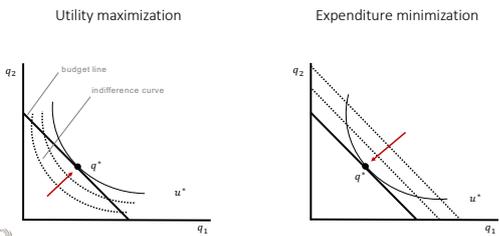
'Utility' in concrete terms

- 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 $x = p \times q^*$

22

*The consumer's problems (and solutions)

Mancini and Vecchi (2020)



23

A utility-consistent definition of the 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:

$u = x/P$ (P is a Paasche price index)

or

$u = x/L$ (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).

25

Deaton and Zaidi's recommendation # 1

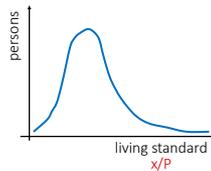
Box 1. Summary of Theoretical Issues and Recommendations	
Issue	Recommendation
<p>Money Metric Utility (MMU) vs. Welfare Ratio(WR)</p> <p>MMU is the amount required to sustain a level of living and requires that consumption be adjusted by a Paasche price index that reflects the prices the household faces and whose weights are different for each household.</p> <p>WR is an indication of how much better or worse off a household is than a reference household (usually at the poverty line) and requires consumption to be adjusted by a Laspeyres price index that reflects the prices faced by the reference household but whose weights are the same for all households.</p> <p>The use of MMU can cause difficulties in analysing the impact of redistributive policy but, on the other hand, WR does not necessarily represent welfare correctly. The latter is the more serious drawback in practice.</p>	<p>Attempt should be made to use Money Metric Utility and to calculate the Paasche price indices with individual household weights.</p>

C4D2 TRAINING

26

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.



C4D2 TRAINING

27

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).

C4D2 TRAINING

29

Recap

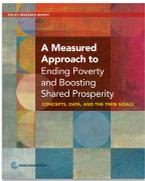
- There are a number of approaches to measuring living standards
- Economists seek to measure **utility**, which they approximate by **consumption expenditure, adjusted for purchasing power: x/P** .
- x/P has a technical name: it is called **money-metric utility (MMU)**
- This consumption-based measure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



30

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."



31

A final note on the literature



- There is little point in aiming at *measuring* inequality and poverty without a good understanding of its **foundations**
- The pictures (book covers) shown here are **not ornamental!**
- In particular, chapter 2 in Deaton and Zaidi is **essential**

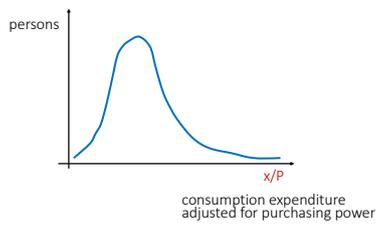


33

2. Choosing a measure of living standards

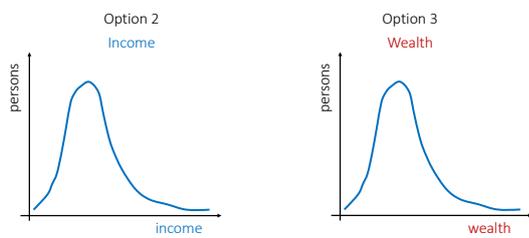
34

Option 1: consumption expenditure



35

Are there other options?



36

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.



37

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)



38

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?**



39

An answer

- The use of **consumption** is justified by the concept of standard of living that was explained earlier: it captures the value of **use** of commodities (money-metric utility).
- 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.
- In *Measuring Income and Wealth* we will return on this issue.



40

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.



42

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)



43

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)



44

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)



45

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**



46

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.



47

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.



48

The question then is ...

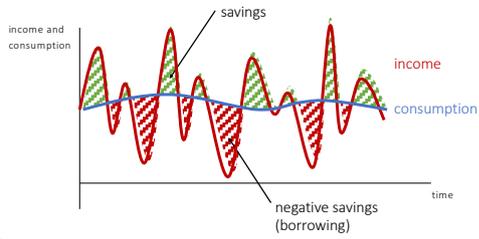
Deaton and Zaidi, 2002, p. 14

- 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



49

So, income or consumption expenditure?



C4D2 TRAINING

50

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.

C4D2 TRAINING

51

The international practice

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

C4D2 TRAINING

52

East Asia & Pacific



Surveys	Consumption vs Income
Australia 2015	Income
Cambodia 2011	Consumption
Indonesia 2016	Consumption
Japan 2016	Income
Malaysia 2016	Income
Mongolia 2016	Consumption
Myanmar 2017	Consumption
Philippines 2015	Income
Vietnam 2016	Consumption



53

Europe and Central Asia



Surveys	Consumption vs Income
Albania 2012	Consumption
Armenia 2015	Consumption
Bulgaria 2016	Income
France 2015	Income
Germany 2018	Income
Italy 2017	Consumption
Kosovo 2015	Consumption
Kyrgyz Republic 2013	Consumption
Macedonia 2017	Income
Moldova 2013	Consumption
Russian Federation 2008	Consumption
Tajikistan 2014	Consumption



54

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



55

Middle East & North Africa



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

56

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

57

Sub-Saharan Africa



Surveys	Consumption vs Income
Côte d'Ivoire 2015	Consumption
Kenya 2015	Consumption
Malawi 2016	Consumption
Mali 2018	Consumption
Mozambique 2014	Consumption
South Africa 2014	Consumption
Tanzania 2018	Consumption
Uganda 2016	Consumption
Zambia 2015	Consumption
Zimbabwe 2017	Consumption

58



Lessons learned

- The **concepts** and **vocabulary** introduced in this lecture are of paramount importance for data providers, not just for analysts.
- 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 (MMU) function**, defined as x/P , where x is consumption expenditure and P is a Paasche price index.
- **Income** remains a strong candidate.



59

References

Required readings

Deaton, A., & Zaidi, S. (2002). 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.

Deaton, A., & Mujilbauer, J. (1980). *Economics and consumer behavior*. Cambridge University Press.

Doemeland, D., and Trevino, J. (2014). Which World Bank Reports Are Widely Read?. Policy Research Working Paper No. 6851. Washington, DC: The World Bank.

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

Mandhi, G. and Vecchi, G. (2019). On the Construction of a Welfare Indicator for Inequality and Poverty Analysis, mimeo.

Meyer, B. D., & Sullivan, J. (2009). Five decades of consumption and income poverty. National Bureau of Economic Research.

Meyer, B. D., & Sullivan, J. (2011). Further results on measuring the well-being of the poor using income and consumption. *Canadian Journal of Economics*, 44(1), 52-87.

Ravallion, M. (2016). *The Economics of Poverty. History, Measurement, and Policy*. Oxford University Press

Sen, A. (1987). *The Standard of Living*. (Hawthorne G). Cambridge: Cambridge University Press.

Sen, A. (1987). *Commodities and Capabilities*. New Delhi: Oxford University Press.

Stiglitz, J. E., Sen, A., & Fitoussi, J. P. (2009). *Measurement of economic performance and social progress*.

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

World Bank Group. (2015). *A Measured Approach to Ending Poverty and Boosting Shared Prosperity: Concepts, Data, and the Twin Goals*. Policy Research Report. Washington, DC: World Bank.

World Bank. (2017). *Monitoring Global Poverty: Report of the Commission on Global Poverty*. Washington, DC: World Bank.



60

Thank you for your attention



61

Homework



62

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.



63

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.



64

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.