Measuring Consumption

May 2019
Introduction
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
  - Accuracy: no mistakes
  - Timeliness: punctuality in disseminating results
  - Comparability: consistency across time and space
  - Accessibility: easy access for users

  clear definition of the research objective
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

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

«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 \( x = p \times q^* \)
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:

  \[
  u = \frac{x}{P}
  \]  
  \( (P \) is a Paasche price index) 

  or

  \[
  u = \frac{x}{L}
  \]  
  \( (L \) 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).
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

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.
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.
“Consumption per capita is the preferred welfare indicator for the World Bank’s analysis of global poverty.”
2. Choosing a measure of living standards
Option 1: consumption expenditure

consumption expenditure adjusted for purchasing power

persons

x/P
Are there other options?

Option 2
Income

Option 3
Wealth

persons vs. income

persons vs. wealth
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?
“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: 
  \[ \text{income} = \text{consumption expenditure} \].

- 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: 
  \[ \text{income} = \text{consumption expenditure} + \text{savings} \].
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

<table>
<thead>
<tr>
<th>Surveys</th>
<th>Consumption vs Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia 2011</td>
<td>Consumption</td>
</tr>
<tr>
<td>Indonesia 2016</td>
<td>Consumption</td>
</tr>
<tr>
<td>Lao PDR 2012</td>
<td>Consumption</td>
</tr>
<tr>
<td>Malaysia 2016</td>
<td>Income</td>
</tr>
<tr>
<td>Mongolia 2016</td>
<td>Consumption</td>
</tr>
<tr>
<td>Myanmar 2015</td>
<td>Consumption</td>
</tr>
<tr>
<td>Philippines 2015</td>
<td>Income</td>
</tr>
<tr>
<td>Timor-Leste 2014</td>
<td>Consumption</td>
</tr>
<tr>
<td>Vietnam 2016</td>
<td>Consumption</td>
</tr>
</tbody>
</table>
Europe and Central Asia

<table>
<thead>
<tr>
<th>Surveys</th>
<th>Consumption vs Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia 2015</td>
<td>Consumption</td>
</tr>
<tr>
<td>Bosnia and Herzegovina 2004</td>
<td>Income</td>
</tr>
<tr>
<td>Kosovo 2015</td>
<td>Consumption</td>
</tr>
<tr>
<td>Kyrgyz Republic 2013</td>
<td>Consumption</td>
</tr>
<tr>
<td>Macedonia 2017</td>
<td>Income</td>
</tr>
<tr>
<td>Moldova 2013</td>
<td>Consumption</td>
</tr>
<tr>
<td>Russian Federation 2008</td>
<td>Consumption</td>
</tr>
<tr>
<td>Tajikistan 2014</td>
<td>Consumption</td>
</tr>
</tbody>
</table>
Latin America & Caribbean

<table>
<thead>
<tr>
<th>Surveys</th>
<th>Consumption vs Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina 2016</td>
<td>Income</td>
</tr>
<tr>
<td>Bolivia 2015</td>
<td>Income</td>
</tr>
<tr>
<td>Colombia 2017</td>
<td>Income</td>
</tr>
<tr>
<td>Ecuador 2013</td>
<td>Consumption</td>
</tr>
<tr>
<td>Ecuador 2018</td>
<td>Income</td>
</tr>
<tr>
<td>El Salvador 2015</td>
<td>Income</td>
</tr>
<tr>
<td>Guatemala 2014</td>
<td>Consumption</td>
</tr>
<tr>
<td>Haiti 2012</td>
<td>Consumption</td>
</tr>
<tr>
<td>Honduras 2018</td>
<td>Income</td>
</tr>
<tr>
<td>Mexico 2016</td>
<td>Income</td>
</tr>
<tr>
<td>Nicaragua 2014</td>
<td>Consumption</td>
</tr>
<tr>
<td>Panama 2008</td>
<td>Consumption</td>
</tr>
<tr>
<td>Paraguay 2017</td>
<td>Income</td>
</tr>
<tr>
<td>Peru 2017</td>
<td>Consumption</td>
</tr>
</tbody>
</table>
Middle East & North Africa

<table>
<thead>
<tr>
<th>Surveys</th>
<th>Consumption vs Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt 2008</td>
<td>Consumption</td>
</tr>
<tr>
<td>Iraq 2012</td>
<td>Consumption</td>
</tr>
<tr>
<td>Jordan 2010</td>
<td>Consumption</td>
</tr>
<tr>
<td>Lebanon 2011</td>
<td>Consumption</td>
</tr>
<tr>
<td>Djibouti 2017</td>
<td>Consumption</td>
</tr>
<tr>
<td>Morocco 2013</td>
<td>Consumption</td>
</tr>
<tr>
<td>West Bank and Gaza 2011</td>
<td>Consumption</td>
</tr>
<tr>
<td>Yemen 2005</td>
<td>Consumption</td>
</tr>
<tr>
<td>Surveys</td>
<td>Consumption vs Income</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Afghanistan 2016</td>
<td>Consumption</td>
</tr>
<tr>
<td>Bangladesh 2016</td>
<td>Consumption</td>
</tr>
<tr>
<td>Bhutan 2017</td>
<td>Consumption</td>
</tr>
<tr>
<td>Sri Lanka 2016</td>
<td>Consumption</td>
</tr>
<tr>
<td>India 2011</td>
<td>Consumption</td>
</tr>
<tr>
<td>Nepal 2010</td>
<td>Consumption</td>
</tr>
<tr>
<td>Pakistan 2013</td>
<td>Consumption</td>
</tr>
<tr>
<td>Maldives 2016</td>
<td>Consumption</td>
</tr>
</tbody>
</table>
Sub-Saharan Africa

<table>
<thead>
<tr>
<th>Surveys</th>
<th>Consumption vs Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Côte d’Ivoire 2015</td>
<td>Consumption</td>
</tr>
<tr>
<td>Kenya 2015</td>
<td>Consumption</td>
</tr>
<tr>
<td>Malawi 2010</td>
<td>Consumption</td>
</tr>
<tr>
<td>Mozambique 2014</td>
<td>Consumption</td>
</tr>
<tr>
<td>Nigeria 2010</td>
<td>Consumption</td>
</tr>
<tr>
<td>South Africa 2014</td>
<td>Consumption</td>
</tr>
<tr>
<td>Tanzania 2014</td>
<td>Consumption</td>
</tr>
<tr>
<td>Uganda 2011</td>
<td>Consumption</td>
</tr>
<tr>
<td>Zambia 2015</td>
<td>Consumption</td>
</tr>
<tr>
<td>Zimbabwe 2011</td>
<td>Consumption</td>
</tr>
</tbody>
</table>
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

Suggested readings
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:
type=supportedlanguage&filter_relaational_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 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.