



# Expanding Consumption Measurement

2021 Consumption Symposium  
Bureau of Labor Statistics  
September 23, 2021

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- In the information age, knowledge and information – which are nonrival goods—are transacted at very low marginal cost and often unpriced.
  - They generate utility without additional resource cost (free lunch!)
  - They thus escape our standard price procedures
  - These are the most important products of our age
- Utility matters for fundamental concepts that we wish to measure
  - Real income in a money metric depends on the cost of fixed utility bundle (expenditure function)
  - Real interest rates measure the marginal utility of a dollar as we transfer it between two points in time

# Introduction (cont'd)



- If we move beyond our normal price procedures, we need to verify new procedures from multiple perspectives to convince ourselves of their approximate truth
  - We want to be approximately correct, not precisely wrong
- The theoretical foundations for moving forward were laid out, by and large, decades ago
  - First work on household economics in Margaret Reid (1935!)
  - 1960s: Becker, Lancaster, Stigler, Griliches
  - The recent Beyond GDP movement looks to recapture utility measurement in GDP
  - CPI is, in principle, a cost-of-living index suitable for Beyond GDP

# Information and consumption: Examples to think about



- Baby aspirin saves lives
  - As valuable as beta blockers in preventing heart attacks and strokes
  - But the production technology did not change, only our knowledge of what aspirin could be used for
- Better information about products
  - Tourism hotel and restaurant characteristics
- Advance of scholarly knowledge
  - Value of a year of college or graduate education
  - Financial theory and low-cost equity mutual funds
- Networks and platforms facilitate communication
  - Utility grows with numbers of participants
- Zero-marginal-price goods
  - Free with advertising
  - Streaming subscriptions (utility of access to variety) versus ownership



# Recent research on consumption when information and knowledge advances

- What is consumption?
  - What do we consume?
  - How do we learn about consumption? By asking consumers!
- How do we spend our time?
  - Work, home investment, home work, leisure
- How do we experience utility?
  - Moment by moment, retrospectively, prospectively
- What is our willingness to pay and how does it relate to utility over time?

# Theory: Hulten and Nakamura



- Lancaster: consumption is a technology for producing “commodities” from market goods and household time
  - For example, a meal is produced with purchased foods and cooking and other prep time
    - The commodity technology can advance over time due to, e.g., recipes available on Internet
  - With unchanged market production technology, advance in commodity production technology can increase utility
- How to measure this increase in utility not visible in prices?
  - Feelings? Value of time? Willingness-to-pay? Paramaterized models?



- Follow Becker in considering utility as occurring throughout the day
  - These ideas picked up by Kahnemann and others
- Time use surveys tell us about time allocations during nonwork periods
  - Home work is work whose time we would like to shorten (time spent cooking meal, caring for children)
  - Leisure is time we don't want to compress (time spent in enjoyment of meal at home, entertainment)
- Stigler and Becker also consider extended utility function in which utility from a given item may change as a result of learning or habit formation
  - Object consumed may not change but utility changes

# Much additional work: meta-analysis needed!



- We need to use a variety of techniques to estimate gains in utility
  - And then we need to compare results of different methods with a sort of meta-analysis
- Value of time
  - Becker: wage rate of individual (upper bound?)
  - Bridgman: wage rate of activity (lower bound?)
- Willingness to accept and willingness to pay
  - Brynjolfsson and co-authors, Coyle and Nguyen
- Parameterized models with time use valuations
  - Goolsbee and Klenow, Boerma and Karabarbounis, Aguiar et al,
- Time use and feelings
  - Juster et al, Krueger et al, Coyle and Nguyen



# Home investment leads to streams of consumption services



- Cost-of-living measurement is made more difficult by household investments
- Household durable goods have been important elements of household technology
  - Stream of benefits: durable good services
- Household time spent on health care, education, and learning about products and technology are similarly investments
  - We do not expect caretaking, visits to the doctor, physical therapy or school work to have high direct utility
  - Ideally, we measure the stream of benefits from these investments, as we do with owner-occupied housing

# How to proceed?



- Understanding household behavior in real time is a way to “future-proof” consumption measurement
  - Meta-analysis discussed earlier
- First step: We want to allow consumers to inform our understanding of consumer behavior
  - Develop Time Use Survey and CEX to measure changes in household behavior along lines of recent studies
- NB: BLS is developing retail trade satellite account
  - Consumption satellite account as a complement?

# Possible additions to surveys



- American Time Use survey with Krueger measures of feeling
  - Secondary time uses expanded?
    - E.g. how does listening to a book or podcast while commuting change the feeling of this time use?
  - Time shifts between household and market
    - Grocery store checkout: automatic or human cashier
    - Time taxes from government? Disutility from time spent by households related to government and business services eg on hold to call centers, renewing licences online
- Module on Consumer expenditure survey
  - Happiness, economic well-being, time use, health status,

# A complication: 2020-21 shocks



- The pandemic reminds us that environmental and other shocks can have large impacts of consumption technology and on household utility
- The pandemic also accelerated information technology use by households.

# Conclusion



- The information age threatens our ability to measure basic aggregates
- We are experiencing very rapid changes in consumer behavior and welfare that are not registering in our measures of inflation
- There is a rising risk that our measures may not be taken seriously if they differ too far from public perceptions