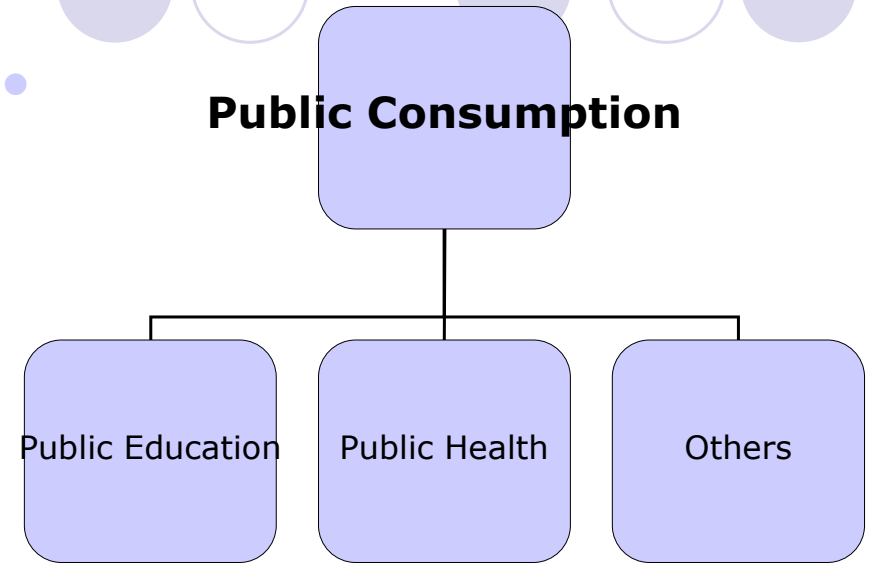
Private Consumption Estimation

Prepared by Nicole, Maliki, and Riki

Review



How to allocate education?

- Step 1: Find unit cost per student per school level

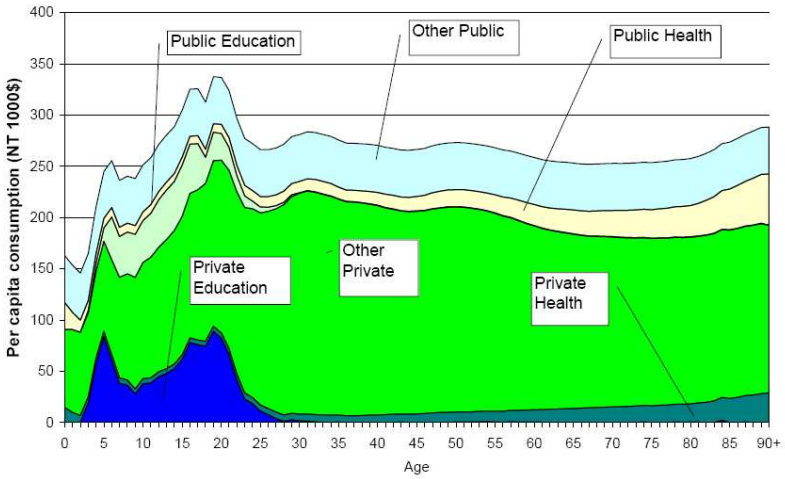
$$\text{unit cost for primary} = \frac{\text{public education consumption primary}}{\text{number of enrolled students at primary}}$$

- Step 2: Find out educ consumption per age group

Public educ cons for age 6

= unit cost primary * enrollment rate * population age 6

Figure 2. Per Capita Consumption, Private and Public by Sector, Taiwan, 1998

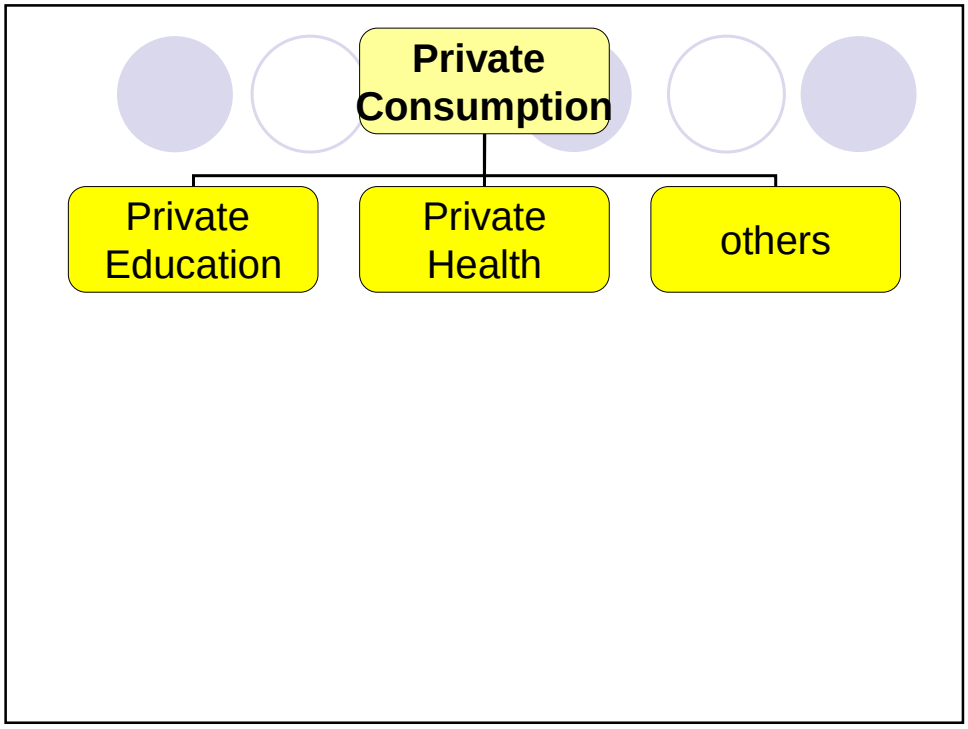


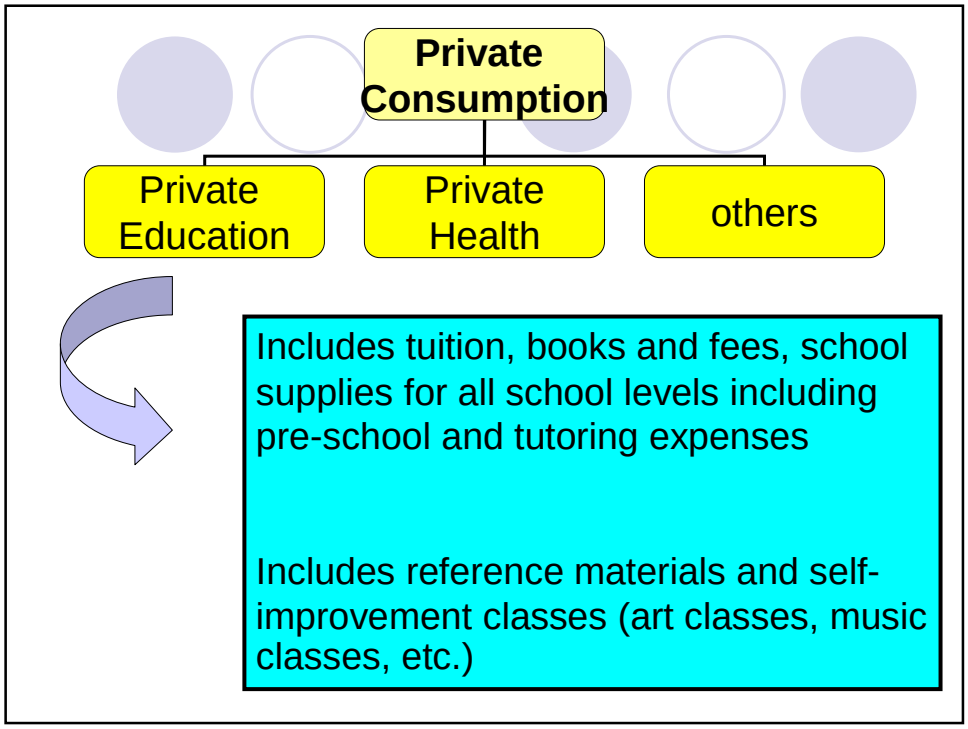
Source: Lee, Lee, and Mason (2008).

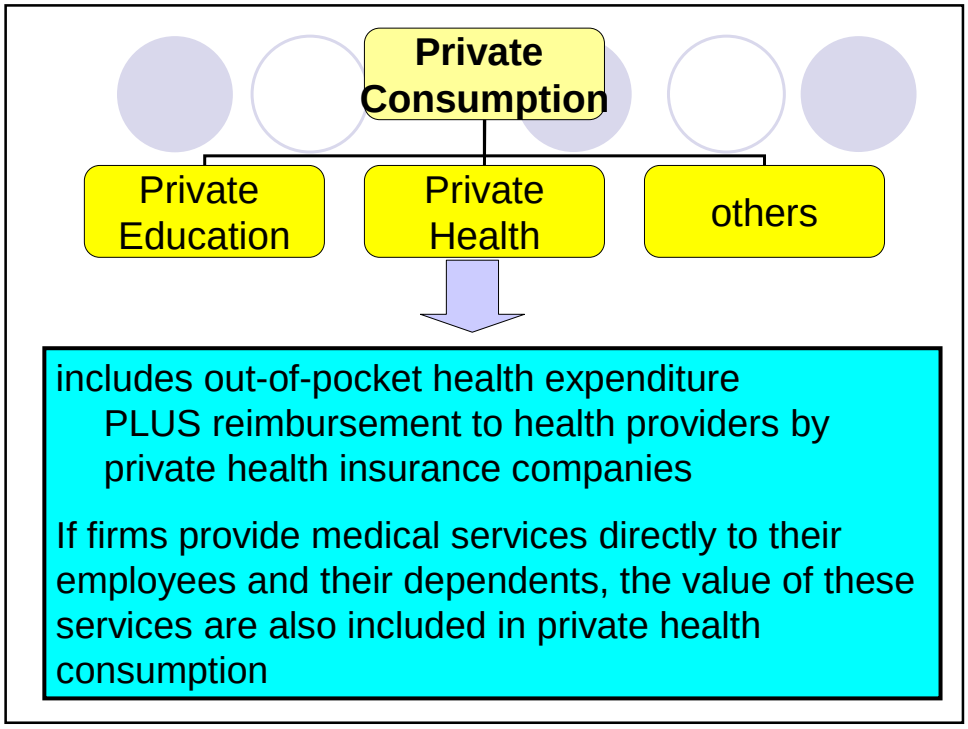
Private Consumption

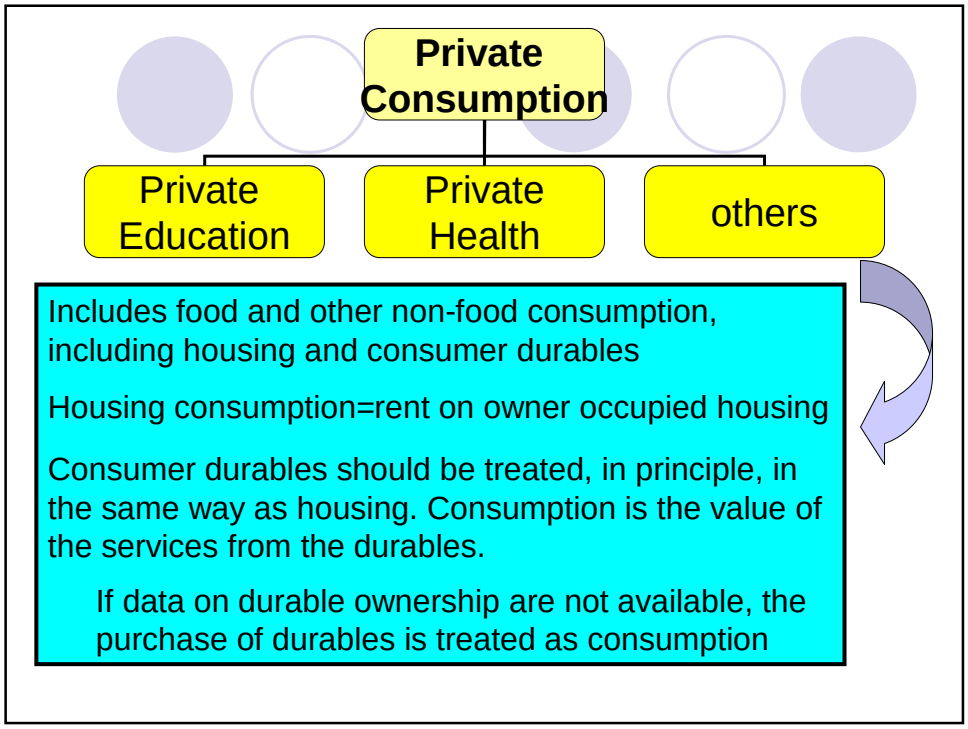
- is the value of goods and services consumed by individuals, households, or NPISHs that are acquired through the private sector
- All consumption can be assigned to individuals
- is typically allocated to individuals based on household surveys

- Household expenditure surveys usually include all household expenditures or outflows.


Private Consumption
Private Education
Private Health
others


Private Consumption
Private Education
Private Health
others
Includes tuition, books and fees, school supplies for all school levels including pre-school and tutoring expenses
Includes reference materials and self-improvement classes (art classes, music classes, etc.)


Private Consumption
Private Education
Private Health
others
includes out-of-pocket health expenditure
PLUS reimbursement to health providers by private health insurance companies
If firms provide medical services directly to their employees and their dependents, the value of these services are also included in private health consumption


Private Consumption
Private Education
Private Health
others
Includes food and other non-food consumption, including housing and consumer durables
Housing consumption=rent on owner occupied housing
Consumer durables should be treated, in principle, in the same way as housing. Consumption is the value of the services from the durables.
If data on durable ownership are not available, the purchase of durables is treated as consumption

1. How to estimate private education consumption?

- Private education consumption is allocated to household level, not individual.
- Therefore, objective is to allocate household private education consumption to individual household member

How to estimate private education consumption?

- Step 1: Run a regression to get coefficient

$$CFE_j = \sum_a \alpha(a) E_j(a) + \sum_a \beta(a) NE_j(a) + \varepsilon_j$$

- where
- CFEj = the household consumption of education of household j
- Ej = the number of enrolled members aged a (single age) in household j, and
- NEj = the number of not enrolled members aged a in household j.

- Regression without an intercept insuring that household consumption is fully allocated.
- Number of members not enrolled captures educational spending that is not part of the formal educational system.
- The regression method may yield negative coefficients for some age groups with very low or no enrollments. If so, the negative coefficients should be replaced with zero to avoid negative expenditure.

How to estimate private education consumption?

- Step 2: estimated coefficients are then used to create weights/share
- For those who are enrolled:

$$CFE_{ij}(x) = CFE_j \alpha(x) / \sum_a \alpha(a) E_j(a)$$

- where x is the age of the i^{th} household member
- Education consumption for those not enrolled is calculated in similar fashion

2. Private Health Consumption

- Household survey includes utilization measures of health services for household members
- For example, household health expenditure can be regressed on the number of members using outpatient services in each age group and the number of members using inpatient services in each age group

Private Health Consumption

- If per capita utilization by age is available from alternative sources. The household health consumption estimated is:

$$CFH_j = \sum_a \beta(a)U(a)M_j(a) + \varepsilon_j$$

- where U(a) represents a single utilization measure for each age
- Mj(a) is the number of household members aged a in household j
- The estimated parameters β (a) are interpreted as the unit cost for each age.

Private Health Consumption

- Even though it is discouraged, simple regression can be utilized when there is not enough information

$$CFH_j = \sum_a \beta(a) M_j(a) + \varepsilon_j$$

3. Other Private Consumption

- All other household consumption is allocated to individuals using an *ad hoc allocation* rule based on an extensive review of the literature on household consumption

3. Other Private Consumption

3. Other Private Consumption

- Consumption of individuals living within any household *j* is assumed to be proportional to an equivalence scale that is equal to 1 for adults aged twenty or older, declines linearly from age 20 to 0.4 at age 4, and is constant at 0.4 for those age 4 or younger

Other Consumption Estimation (3/3)

- Formula for equivalence scale

$$\alpha(a) = 1 - 0.6 * D(4 < a < 20) * ((20 - a) / 16 - 0.6 * D(a \leq 4)$$

- where *D(x)* is a dummy variable equal to 1 when condition x is met.
- Again, this scale is used to allocate the expenditure for each household *j* to household member i.

Aggregate Control

- All estimates have to be adjusted by aggregate control
- Some countries have detail data on private consumption in their National Account
  - Separated by sectors
- If not, then total private consumption can be adjusted and each component adjusted proportionally

Hands On Session

1. **Private Education Consumption Estimation**
2. **Private health consumption (simple regression)**
3. **Other Consumption**

Exercise for Education Consumption

- Identify household education consumption in your household survey (CFEi)
- Create school use single age (a)
- Identify household member who is enroll (enroll = 1)
- For exercise, please not using information on individual who is not enroll (nenroll = 1)
- Regression
- Assign coefficients for individual
- Distribute the education consumption to individual

Exercise for Health Consumption

- Identify household health consumption (CFHi)
- Create age groups (0, 1-2, 3-4) or single group
- Use simple regression method
- Take coefficients to predict the individual health consumption
- Put zeroes for negative coefficients
- Same steps as education consumption

Exercise for other consumption

- Identify other consumption = total – education – health
- Use formula to estimate the individual consumption
- No need regression
- Assign consumption to individuals