COMPONENTS OF HOUSEHOLD EXPENDITURE AGGREGATES

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Constructing aggregate consumption

This report discusses the basis for the consumption-based measure of welfare. It uses a comprehensive measure of consumption, drawing from several modules of the household survey. This includes both actual purchases expenditures and auto-consumption of food and nonfood items. The report also discusses the use of imputed use-values for owner-occupied housing and household durable goods. It should be noted here that welfare as defined is a fairly narrow, focusing only on an economic definition of living standards. Other important components of welfare such as freedom, health status, and education are related to income and consumption.

Another significant omission from the consumption measure is consumption of public goods. This is very difficult to measure as finding a set of prices (or shadow prices) that reflects what these public goods are worth to each household is ambiguous. However certain assumptions can be put in place and this be computed:-

(a) One way of trying to estimate prices is to look for the effects of the provision of public goods on the demand for private goods. Example, it may be possible to assess the value of a new public clinic by seeing how much less people/households spend on private clinics. Although this looks sensible, how robust is this assessment is arbitrary and cannot work in general.

(b) Another approach which has become popular is in project evaluation, is to ask households how much hey are prepared to pay for an additional unit of good. Whether such 'contingent valuation' derives any useful numbers remains controversial.[1]

The real value to the benefit of the public good provided can only accrue to households who use that amenity. All these welfare measures cannot be adequately captured by any simple monetary measure. Despite this consumption nevertheless remains a central component of any assessment of living standards.

[1] See Hanemann (1994) for arguments in favor and Diamond and Hausman (1994) for arguments against.

Food consumption

In principle, constructing food consumption sub-aggregates is a straightforward exercise. All that is need is the total value of food of the various food items for a reference period or quantities and prices for food items during the reference period. In practice, food expenditure should include: -

(a) Purchases in market prices including meals purchased away from home.

(b) Home-produced food

(c) Food items received as gifts or remittances

(d) Food received from employers as payment-in-kind for services rendered.

A household that stocks up food and whose captured may not be counted as well-off nor should someone who did not stock up be counted as poor. If the questionnaire allows, 'food consumed' can be distinguished from 'food purchased', as it the value of the former that should go into the consumption aggregate.

Information on food acquisition was recorded in the daily expenses questionnaire. The most common food items were pre-coded on the questionnaire but the questionnaire was open-ended so that households could include any food items not listed. As in the previous survey (1996), households were visited three times over a seven-day period and asked what foods had been acquired. Acquired here implied **purchases, own production and transfers** (gifts). On the first visit household was asked what they had acquired the previous day. On the subsequent visits (second and third) household was asked what they had acquired that day and the previous two days. The intra-household allocation of food is not captured by many households surveys and estimates derived are based on total household consumption irrespective of how many units by different ages and sex.

For each food item, the unit of measure (kg, liters, cans, cups, heap, etc), number of units acquired and amount spent for the food. For food received as transfers or gifts and home-produced items, household provided an estimate value for the food. Households were further asked how many days they expected the food item would last. This way, there would be no over- or under-estimates on food consumption expenditure. All food was then normalized to reflect an average of the week consumption.

Computation of food: Example: Let us assume that:
Value of food item = x
Unit quantity = y
Number of units = z
Number of days food would last = d

1. If the total estimated food was to last less than or equal to seven days, then it was assumed that the survey captured a typical week's food consumption. Therefore, the quantities and value were divided by seven to get daily consumption.

   Daily food value (a)= x/7.
   Daily quantity (b) = z/7.

2. If the total estimated food exceeded seven days (purchases of grain or flour, drinking beverages), then quantities and value were divided by number of days the food would last to get daily consumption.

   Daily food value (a) = x/d.
   Daily quantity (b) = z/d.

Finally, the estimates of daily food consumption for each item was then be aggregated to the household level to obtain daily total household food consumption. This would be the summation of all 'a'.

In summary FOOD = $\Sigma[x/d]$ which includes (purchases + gifts/transfers + and own consumption).

Nonfood consumption

The computation of non-food is also a straightforward but it is prone to problems in the choice of which items to include. The choice depends on which data is available and the analytic objectives of the survey being undertaken. Unlike food, most non-food are too heterogeneous to permit the collection of quantities consumed although there may be exceptions such as fuel, electricity, some transportation items. Nonfood is the summation of several nonfood components collected during different recall periods. Constructing aggregate non-food entails converting all these reported amounts to a uniform reference period, and then aggregating across various items.

Monthly and three-month non-food consumption

1. The monthly section asks common non-food items consumed frequently during the last one-month. This includes cooking fuel, medicines, soap and other items.

2. The three-month captures non-food items less frequently consumed such as clothing, footwear and other items.

These sections asked quantity purchased and value of item as well as place of purchase.

Computation of monthly non-food: Example: Let us assume that:
Value of non-food item = p
Unit quantity = q
Number of units = r

Reference period is 1 month

To convert into daily expenditure like food meant that monthly expenditure was divided by 30.417 (365 days/12 months).

Daily infrequent non-food (m) = p/30.417

Computation of three-month non-food: Example: Let us assume that:
value of non-food item = d
Unit quantity = e
Number of units = f
Reference period is 3 month

To convert into daily expenditure like food meant that monthly expenditure was divided by the three-month period by 91.25 (365 days/4 quarters).

Daily infrequent non-food (n) = p/91.25.

Consumer durable goods

However, for certain very expensive infrequently purchased items, a different approach was utilized. From the household welfare perspective, rather than using expenditure on purchase of durable goods, the appropriate measure of consumption of durable goods is the *value of services* that household receives from the possessions of the durable good over the reference period, i.e. the purchase of a durable good is not a realized over a single-use or a relatively short period but is realized over a fairly long period. It is the basis of this argument that durable goods are assigned a use-value relative to its lifespan.[2]

A use-value was assigned for the durable asset and imputed for all households. In 1996, the purchase year for households assets was not collected and therefore, a

[2] See Deaton and Zaidi for further details.

value and life-span for the items was assigned. It is this value that was imputed for households with assets.

The use value of durable goods has two components: the depreciation of the durable good over the period of consumption considered, and the opportunity cost of resources locked in the durable good over that period of consumption. Thus, the value of consumption of durable good *j* for household *i* can be estimated as:

$$Use\ value_{ij} = Current\ value_{ij} * \frac{(r + d_j)}{(1 - d_j)} \qquad (I)$$

Where:

- *Current value*$_{ij}$ is the value of good *j* for household *i* at the time of the survey
- *r* is the rate of interest
- d_j is rate of depreciation of good *j*.

When simplified further taking into account depreciation of assets (lifespan) formulae,

$$Use\ value_{ij} = Current\ value_{ij} * \left[\frac{(r + (1/(q*12)))}{(1 - (1/(q*12))}\right] \qquad (II)$$

Where:

- *Current value*$_{ij}$ is the value of good *j* for household *i* at the time of the survey
- *r* is the rate of interest
- q is the expected lifespan of asset (date of interview minus date asset acquired). The number of years is multiplied by 12 to get expected lifespan in months. This method of computing expected lifespan is based on the assumption that the age of items owned is normally distributed. This value is equivalent to 'd' in the previous formulae *(I)*. ***The monthly depreciation***

rate for each durable is the inverse of this expected lifespan in months. In Malawi this was further multiplied by a value of two.

In the 2000 survey, the same assets were collected but purchase value last 12 months was collected. Therefore any of the above methods could be applied but under some assumption, i.e. the lifespan of the assets should be identical to the one used in 1996 for consistency for assets that purchase year not collected. The value for 1996 for these assets should be recalculated to take into account inflation rates and currency value.

If households that owned assets and their use value not computed, there will be an under-representation of household expenditure aggregate.

Durable good	Assumed remaining lifespan (in years)
Table with four chairs	15
Medium bed	15
Refrigerator	10
Fan	5
Sewing machine	25
Electrical iron	5
Charcoal iron	5
Radio	5
Black and White television	5
Color television	5
Air conditioner	10
Clock	5
Telephone	10
Vehicle (car or truck)	15
Motor cycle	10
Bicycle	10

Note: The expected market values are for a used durable good in "good" condition.

Housing and imputed rent

Of all household consumption aggregates, the housing sub-component is one of the most problematic. This also applies to durable goods discussed earlier. As house purchase is such a large and relatively rare expenditure, under no circumstances should purchase expenditures be included in the consumption aggregate. The rent paid is the best choice to include housing expenditure but provided the rents are a

reasonable reflection of fair market value. If so, then rent paid is an excellent reflection of housing expenditure.

Dependent variable : log monthly rental		
Variable	Variable	Variable
Dummy variables		
Province-zone	*Number of rooms*	*If dwelling has a toilet*
Niassa rural	Number of rooms in dwelling	No
Caba Delgado urban	Missing data	Missing data
Caba Delgado rural	*If any room used exclusively for work*	*If dwelling has a latrine*
Nampula urban	No	No
Nampula rural	Missing data	Missing data
Zambezia urban	*Length of stay in dwelling*	*Type of lighting*
Zambezia rural	1 - 3 years	Oil lamp
Tete urban	4 - 5 years	Candle
Tete rural	5 - 10 years	Wood
Gaza urban	More than 10 years	Other
Gaza rural	Missing data	No lighting
Inhambane urban	*Age of dwelling*	*Type of habitation*
Inhambane rural	1 - 3 years	Flat or apartment
Manica urban	4 - 5 years	Hut or cabana
Manica rural	5 - 10 years	Other
Sofala urban	More than 10 years	
Sofala rural	Missing data	
Maputo province urban		
Maputo province rural		
Maputo Capital		
Floor	*Roof*	*Walls*
Marble	Tile	Wood or metal
Granulite	Composite	Adobe
Cement or concrete	Zinc	Reeds or sticks
Brick	Thatch	Reeds or sticks with mud plaster
Adobe	Other	Other
None (earthen)		
Other		
Mode of acquisition of dwelling	*Source of water*	*Type of cooking fuel*
Rented (not from APIE/Co-op)	Piped water in yard	Gas
Own home, fully paid	Public tap	Charcoal
Own home, still paying for it	Private well	Wood
Squatting	Public well	Other
Ceded by the state or others	River or lake	Do not cook
Other	Other	

The hedonic housing regressions are used to impute a value of housing consumption whenever information on rent is missing. The idea is to estimate an econometric model in which rents reported by the subset of the population are regressed on a set of housing characteristics as well as regional dummies. The same set of housing characteristics used in 1996 should be applied for consistency and to allow comparisons.

The dependent variable is the log rent. This will only be for households with rent value.

$$Ln(rent) = \alpha + \beta x_1 + \beta x_2 + \beta x_3 + \beta x_4 + \ldots \beta x_n$$

Where x_n is the dummy variables shown below.

β is the co-efficient of the dummy variables.

Finally,

COMPUTE realrent = exp(lnrentim).

Variable label realrent 'Annual rent (hedonic model)'.

In summary NON-FOOD = $\Sigma[$ m + n + (use value/365) + (realrent/365)$]$ which includes (daily infrequent, daily frequent, use value and rent).

Note on non-food expenditures

In some household surveys certain non-food expenditures should be excluded: -

(a) Capital account transactions such as for ‘saving club’.

(b) All financial assets as well as repayments of debts and interest payments.

(c) Relatively infrequent expenditures such as marriages, funerals, dowries, births.

Although transitory expenditures are real enough, consumption aggregates that include them can be thought of as ‘noisy’ measures of the longer-run averaged totals.

Total daily household expenditure = $[$ FOOD + NON-FOOD $]$.

Summary in constructing consumption aggregates

Food consumption

- Purchases
- Home-produced
- Received as gifts or in-kind payment
- Meals consumed outside home
  - Amounts spent in restaurants
  - prepared foods
  - Meals at work
  - Meals at school
  - Meals on vacation

Non-food consumption

- Frequent use items candles, matchboxes, saop among others.
- Infrequent use items such as clothing and footwear
- Health
- Education

Note

Exclude taxes, purchase of assets, loan repayments, as well as lumpy expenditures such as marriages, funerals, dowries.

Durable Goods

- Use-value for assets owned

Housing

- Both actaul rent paid and imputed rent

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