1. metrics for three measures, summary stats
2. Merge in 2013
3. Correlation tables, including wasting (weight for age: medium run)
4. Histograms, correlation
5. Cluster by month FE
6. resilience (what measures are capturing resilience)
7. What aspects of it? (Poke into the regression with FE)
8. Degree of variation
9. Food security for the same household over the time, correlate that variation with wasting (longer run)
10. Throw in ideas about the methods
11. What we try to do and what are our contribution

Regress measures on assets and mkt access

* + Malawi LSMS – ideally for rCSI, HDDS, FCS but also wasting if possible, and perhaps % of expenditure on food, comparing how these measures vary by month, hh assets (?), rural vs urban (?), market access (?)
* how these different measures capture (in)stability
  + including demographics useful for targeting. by household head status (male or female head), roofing material, age of household head?, # of kids?,
  + probability of insecurity and duration (e.g., while gender of head might increase the likelihood of fodo insecurity, does or doesn’t it affect the duration?
  + By social protection status, if (and only if) there is a tidy way to track receipt of some sort of social protection program (E.g., cash transfers). The endogeneity piece means it’ll be tricky to interpret, but it’d be useful to see coverage.

Food Security Metrics: the understudied role of stability and its implications for resilience

One understudied aspect of food security is food stability.  Food security varies substantially throughout the year.  Particularly in countries with a single primary growing season, food security can drop dramatically during the lean season. Large changes in food security over time can lead to bad nutrition and health outcomes, as well as household stress and lower productive investments (Cite needed) .  The degree to which households are affected by swings in food security over time varies by location, whether the household is rural versus urban and other factors that may capture household resilience.  In this paper, we study how different food security measures vary throughout the season.  We identify which measures are more sensitive to intra-annual variation and relate the variation in these measures to long-run metrics of nutrition.

Food security cannot be observed directly and instead is captured using various proxy measures, such as caloric consumption, dietary diversity, food security scores, food expenditures and the Coping Strategies Index and its shorter counterpart, the reduced Coping Strategies Index (CSI and rCSI).  Longer run food insecurity are captured using anthropometric measures such as stunting and wasting.  Different food security measures capture different aspects of food insecurity, such as diet quantity (rCSI), diet quality (HDDS) and utilization (wasting).

A general consensus from previous studies is the absence of a single measures that completely depicts all the aspects of food security. Although these proxy measures are in general correlated, the correlations vary from relatively weak to relatively strong (Maxwell et al., 2014; Vaitla et al., 2015). This is an indication that different measures are capturing different aspects of food security. Vaitla et al. (2017) finds that there are mainly two dimensions of these indicators: a quantity aspect characterized mainly by RCSI and a dietary diversity aspect represented by HDDS and FCS.

Using a fixed effect model on

Less is known about how these measures capture intra-year variability, household demographics, market access and household assets.

In this paper, we build on their work and explore both if and how these measures capture intra-year variation in food security, and which are more sensitive to factors such as market access ...

* + Malawi LSMS – ideally for rCSI, HDDS, FCS but also wasting if possible, and perhaps % of expenditure on food, comparing how these measures vary by month, hh assets (?), rural vs urban (?), market access (?)
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Our ability to capture these intra-annual variations is limited by the lack of temporally fine-grained food security data.  Even when data are collected over different seasons, they are often for different households, raising the question as to whether the differences we observe over time are due to seasonal variation or changes in the sample.  Very rarely do we observe food security measures for the same households over time.  However, recent LSMS panel data collect various measures of food security for the same household over several years and their sampling design is geared to be nationally representative each month.  We use these geocoded LSMS data collected monthly over several years in four sub-saharan African countries.  We then use these metrics of instability to predict longer run measures of food security and nutrition such as stunting and wasting.

Methods

The strength of correlations between measures and variables of interest was assessed using Spearman’s r, which is often used to measure bivariate relationship between variables. The household level Food security measures data comes from the Living Standards Measurement Study (LSMS) survey. A higher value of household dietary diversity score (HDDS) and food consumption score (FCS) means more food secure a household is. Positive correlation is expected for FCS, HDDS and asset related variables. Negative correlation is expected for FCS, HDDS and market price and market thinness. A higher value of the reduced coping strategies index (rCSI) means less food secure. Therefore, the relationship should be the inverse of those described above.

Results

All three diet-based measures of food security vary greatly by month, showing a pronounced lean season in March/April.  We find that rCSI seems to lag the dietary diversity measures by a month…  rCSI appears to be more sensitive to inter-annual variation…

Table 1. Correlation between food security measures and variables of interest

|  |  |  |  |
| --- | --- | --- | --- |
|  | HDDS | logFCS | RCSI |
| Market Thinness | -0.0306 | -0.0029 | -0.0012 |
| Maize Price | -0.0123 | -0.052 | 0.1074 |
| Urban | 0.313 | 0.3053 | -0.1251 |
| Asset index | 0.2898 | 0.2829 | -0.1396 |
| Cellphones Owned | 0.3807 | 0.4166 | -0.1715 |
| Household Size | 0.0679 | 0.0552 | 0.0304 |

[BKR2] I think these are likely true but I’m kinda making things up.  Any suggestions for literature are appreciated.

