**Table 1. Summary statistics of 2010 and 2013 Malawi food security measures and predictors for both household and cluster levels.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | Year 2010 (12270 households) | | | | | Year 2013 (3999 households) | | | |
| Variable | Mean | Median | Std. Dev. | | Min | Max | Mean | Median | | Std. Dev. | Min | Max |
| Household logFCS (0-4.72) | 3.82 | 3.83 | 0.373 | | 1.1 | 4.72 | 3.91 | 3.91 | | 0.363 | 2.2 | 4.72 |
| Household rCSI (0-42) | 3.68 | 0 | 6.51 | | 0 | 42 | 4.23 | 0 | | 6.95 | 0 | 42 |
| Household HDDS (0-12) | 5.18 | 5 | 1.27 | | 1 | 7 | 5.56 | 6 | | 1.15 | 1 | 7 |
|  | | | | Year 2010 (768 clusters) | | | | | Year 2013 (204 clusters) | | | |
| Cluster mean logFCS | 3.87 | 3.86 | 0.21 | | 3.23 | 4.53 | 3.96 | 3.95 | | 0.18 | 3.45 | 4.49 |
| Cluster mean rCSI | 3.68 | 2.88 | 3.05 | | 0.00 | 17.25 | 4.26 | 3.70 | | 2.66 | 0.00 | 16.28 |
| Cluster mean HDDS | 5.18 | 5.19 | 0.70 | | 3.00 | 6.75 | 5.55 | 5.55 | | 0.57 | 4.10 | 6.86 |
| Total rainfall (meters) | 1.00 | 0.99 | 0.18 | | 0.57 | 1.58 | 0.93 | 0.90 | | 0.17 | 0.59 | 1.58 |
| First day of rain | 45.02 | 41.00 | 10.25 | | 3.00 | 72.00 | 53.36 | 51.00 | | 13.26 | 30.00 | 72.00 |
| Max days without rain | 23.76 | 21.00 | 8.14 | | 10.00 | 52.00 | 24.30 | 24.00 | | 6.75 | 12.00 | 43.00 |
| Rainfall in flood prone regions (meters) | 2.04 | 0.00 | 9.66 | | 0.00 | 75.97 | 1.11 | 0.00 | | 7.34 | 0.00 | 69.15 |
| Number of cellphones owned | 0.60 | 0.44 | 0.60 | | 0.00 | 4.13 | 0.94 | 0.70 | | 0.71 | 0.05 | 4.40 |
| Maize price (log form) | 3.34 | 3.41 | 0.39 | | 2.40 | 5.19 | 4.46 | 4.50 | | 0.26 | 2.77 | 5.05 |
| Market thinness | 0.46 | 0.49 | 0.29 | | 0.00 | 1.00 | 0.27 | 0.25 | | 0.16 | 0.00 | 1.00 |
| Percent of non-natural roof | 0.36 | 0.49 | 0.25 | | 0.00 | 1.00 | 0.46 | 0.40 | | 0.27 | 0.00 | 1.00 |
| Household size | 4.56 | 4.56 | 0.68 | | 2.31 | 7.06 | 5.00 | 4.89 | | 0.72 | 3.58 | 7.53 |
| Household age | 42.15 | 42.06 | 4.65 | | 30.81 | 56.38 | 42.56 | 42.37 | | 4.06 | 33.63 | 56.19 |
| Household gender (1 for male, 2 for female) | 1.24 | 1.25 | 0.12 | | 1.00 | 1.69 | 1.23 | 1.22 | | 0.10 | 1.00 | 1.50 |
| Asset Index | 0.00 | -0.02 | 0.35 | | -0.83 | 1.05 | -0.02 | -0.30 | | 0.54 | -0.30 | 2.94 |
| Distance to road (km) | 8.37 | 4.36 | 10.15 | | 0.07 | 56.19 | 7.68 | 4.18 | | 8.40 | 0.06 | 44.68 |
| Distance to admarc market (km) | 8.06 | 6.56 | 5.77 | | 0.38 | 37.32 | 7.81 | 6.24 | | 5.04 | 1.20 | 32.89 |
| Percentage of agricultural land | 0.36 | 0.49 | 0.25 | | 0.00 | 1.00 | 0.34 | 0.41 | | 0.22 | 0.00 | 0.75 |
| Nutrition retention constrained | 0.28 | 0.00 | 0.44 | | 0.00 | 1.00 | 0.26 | 0.05 | | 0.38 | 0.00 | 1.00 |
| Elevation (km) | 0.87 | 0.90 | 0.35 | | 0.04 | 1.73 | 0.94 | 1.02 | | 0.29 | 0.12 | 1.55 |
| IPC Value (1 month lag) | 1.10 | 1.00 | 0.30 | | 1.00 | 2.00 | 1.12 | 1.00 | | 0.26 | 1.00 | 2.00 |
| IPC Value (12 month lag) | 1.00 | 1.00 | 0.00 | | 1.00 | 1.00 | 1.07 | 1.00 | | 0.22 | 1.00 | 2.00 |

**Table 2: Regression results for each food security measure using 2010 LSMS data for Malawi confirms that food security measures are associated with common drivers.**

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Dependent variable:

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logFCS HDDS rCSI

(1) (2) (3)

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IPC1 -0.008 -0.104 1.390\*\*\*

(0.024) (0.075) (0.452)

raincytot 0.155\*\*\* 0.167 -1.167

(0.042) (0.133) (0.800)

day1rain 0.001 0.001 0.005

(0.001) (0.002) (0.013)

maxdaysnorain -0.004\*\*\* -0.016\*\*\* -0.034\*\*

(0.001) (0.003) (0.016)

floodmax 0.001 0.001 -0.019

(0.001) (0.003) (0.018)

clust\_maize\_price -0.046\*\* -0.108\* 1.393\*\*\*

(0.020) (0.062) (0.374)

clust\_maize\_mktthin 0.007 0.037 -0.363

(0.025) (0.079) (0.479)

percent\_ag 0.025 0.087 -0.419

(0.028) (0.089) (0.534)

elevation -0.050\*\* 0.066 -1.477\*\*\*

(0.024) (0.076) (0.459)

nutri\_rent\_moderate\_constraint -0.005 -0.064 0.216

(0.016) (0.051) (0.307)

dist\_road -0.002\*\* -0.008\*\*\* -0.016

(0.001) (0.002) (0.015)

dist\_admarc 0.003\*\* 0.002 -0.004

(0.001) (0.004) (0.023)

roof\_natural\_inverse 0.126\*\*\* 0.603\*\*\* 0.186

(0.040) (0.125) (0.753)

number\_celphones 0.166\*\*\* 0.395\*\*\* -1.512\*\*\*

(0.021) (0.066) (0.396)

hhsize -0.007 -0.016 0.462\*\*

(0.011) (0.034) (0.202)

hh\_age -0.003\* -0.014\*\*\* -0.063\*\*

(0.002) (0.005) (0.030)

hh\_gender -0.114\*\* -0.222 1.356

(0.057) (0.181) (1.092)

asset\_index2 0.079\*\*\* 0.324\*\*\* -0.755\*

(0.024) (0.075) (0.451)

Constant 4.133\*\*\* 6.345\*\*\* 0.518

(0.145) (0.460) (2.771)

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Observations 417 417 417

Adjusted R2 0.566 0.589 0.221

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**Table 3: IPC value regression results indicate that the IPC is significantly associated with food insecurity but the explanatory power (R-squared) is quite low**

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Dependent variable:

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IPC1

(1) (2) (3)

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rCSI 0.025\*\*\*

(0.005)

logFCS -0.033

(0.073)

HDDS -0.017

(0.022)

Constant 1.010\*\*\* 1.227\*\*\* 1.186\*\*\*

(0.022) (0.284) (0.119)

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Observations 417 417 417

R2 0.058 0.0005 0.001

Adjusted R2 0.056 -0.002 -0.001

Residual Std. Error (df = 415) 0.288 0.297 0.297

F Statistic (df = 1; 415) 25.584\*\*\* 0.207 0.560

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Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

**Table 4: The percentage of food insecure clusters correctly predicted to be food insecure**

|  |  |  |  |
| --- | --- | --- | --- |
| Model | HDDS | logFCS | rCSI |
| IPC only | 1.00 | 0.00 | 0.15 |
| Full model | 1.00 | 0.67 | 0.88 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | logFCS | HDDS | rCSI |
| Old result | 0.536 | 0.623 | 0.169 |
|  |  |  |  |
| year.ols | 0.549 | 0.569 | 0.130 |
| year.ols+ quarter FE | 0.560 | 0.601 | 0.127 |
| year.ols+ month FE+quarter FE | 0.569 | 0.595 | 0.100 |
| year.LASSO | 0.570 | 0.600 | 0.111 |
|  |  |  |  |
|  |  |  |  |
| random.ols | 0.497 | 0.548 | 0.095 |
| random.ols+ quarter FE | 0.518 | 0.541 | 0.112 |
| random.ols+ monthFE+quaterFE | 0.526 | 0.542 | 0.180 |
| random.LASSO | 0.508 | 0.559 | 0.166 |

Comparison between models