

The Impact of Food Price Shocks on Household Food Security: Panel Evidence from Tanzania

Robert Rudolf

Korea University, Seoul

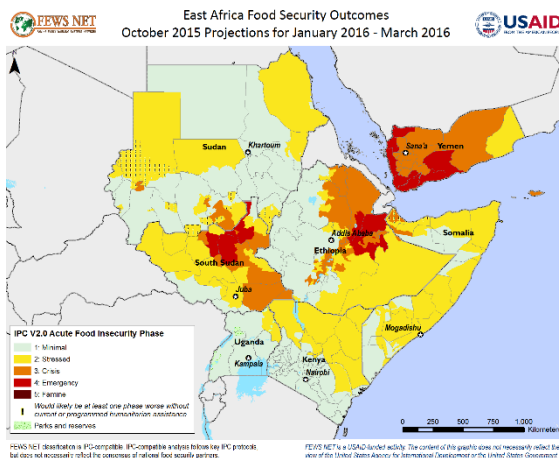
& Centre for Rural Development, Humboldt University Berlin

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Introduction



- Horn of Africa 2011 famine left 10 million food insecure
- 2016 African food crisis
 - Massive droughts due to El Niño
 - An estimated 52 million were food insecure in East and Southern Africa

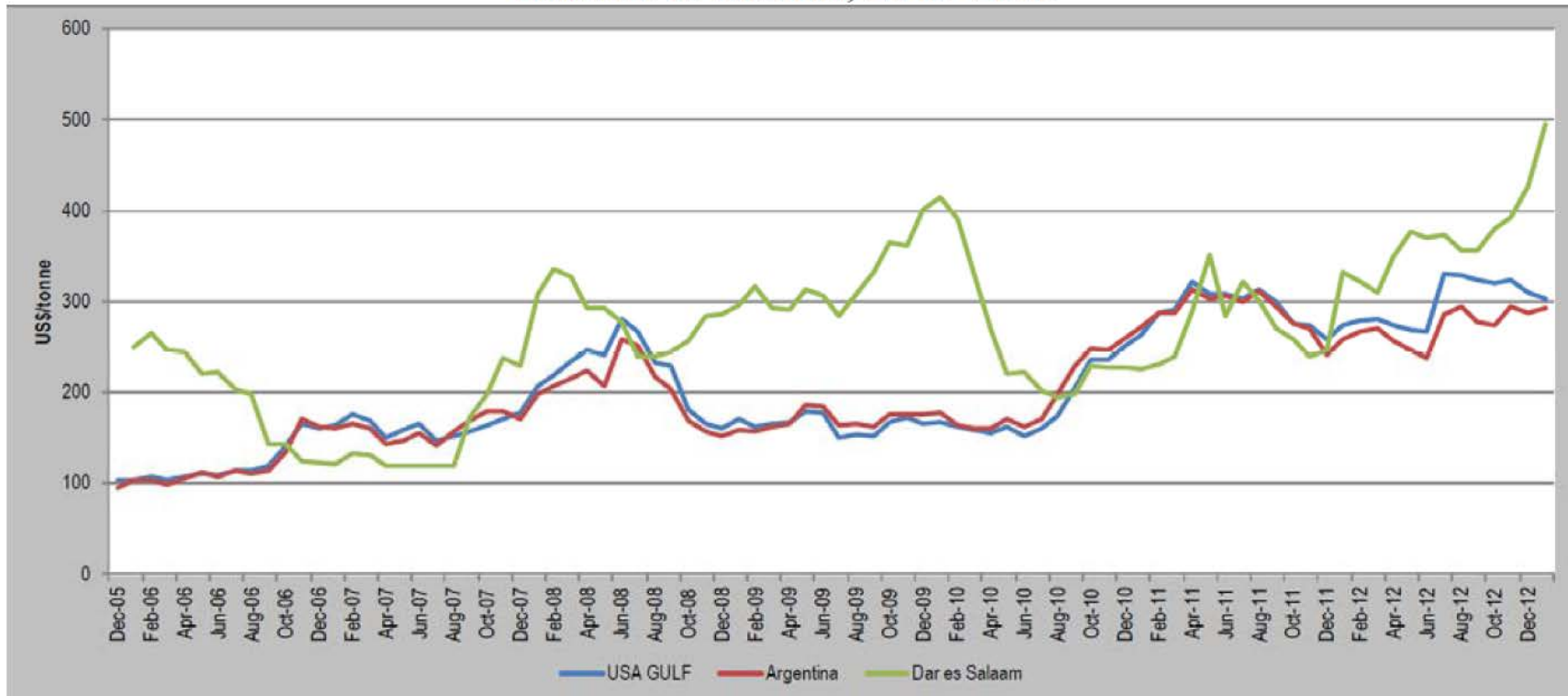


Introduction

- SDG target 2.c: “adopt measures [...] in order to help limit extreme food price volatility.”
- *Global* volatilities dominate the international discourse
- However, a recent FAO report from East Africa shows that *national* and *regional* volatility components are the driving forces behind overall volatility in the region (MAFAP, 2013)
 - E.g. substantial deviations of East African maize prices from international reference prices between 2006 and 2012
 - Causes: lack of integration with world markets; restrictive trade policies (on both import and export side)

Introduction

Figure A1: Maize prices in selected international markets and Dar es Salaam, 2005-2012



Source: MAFAP (2013)

Introduction

- In theory, food prices can have mixed effects on poverty and hunger
- Most poor in developing countries are *both consumers and producers* of food
- Net-sellers (net-buyers) of crop A would be expected to gain (lose) from a price increase in A

Related literature

- Past research on the “Food price and food security nexus” usually draws on cross-sectional data (Ivanic and Martin, 2008; Brinkman et al., 2010; de Hoyos and Medvedev, 2011; Ecker and Qaim, 2011; Harttgen et al., 2016)
 - Ex-ante simulations
 - Demand elasticities derived from cross-sectional variation
- Papers usually find that higher prices of the main staple food negatively affect food security
 - Ecker and Qaim (2011) argue that consumer subsidies for maize might improve overall calorie and mineral consumption, but might worsen vitamin consumption in urban areas
 - Harttgen et al. (2016) show that the impact is particularly strong for poor net food buyers

Related literature

- Anríquez et al. (2013): study of eight developing countries; food price spikes both reduce the calorie intake and worsen the distribution of food calories
- Levin and Vimefall (2015): a 25% increase in maize prices in Kenya would negatively affect 80% of the population
- Akter and Basher (2014) use panel data from selected poor districts in rural Bangladesh
 - Not actual consumption, but self-reported food shortages
 - Find that soaring food prices between 2007 and 2009 unequivocally aggravated food security

Research objective & contribution

■ Objective

- Study the impact of food price shocks on household food security using a nationally representative dataset (T=3; N=2,689 hh)

■ Contribution

- First such study for an LDC using nationally representative panel data
- Spatial setting and timing of study: one of the most populous SSA countries during a period of recurring food price crises
- Various population groups studied (rural vs. urban, producers vs. non-producers of maize, landless vs. landowners)

Dataset

- Tanzania National Panel Survey (TZNPS)
 - Nationally representative longitudinal household surveys
 - Conducted every 2-years since 2008/09
 - Initiated/Supported by World Bank (LSMS-ISA)
 - Broad information on agriculture, income, consumption, food intake, socio-economic background, village characteristics, geo variables, etc.
 - Low attrition: 95% of original sample re-interviewed in 3rd wave

Methodology

- Use of balanced panel (T=3; N=2,689 hh)
- Household fixed effects estimation
- Food security measure: Energy intake per day and per male adult-equivalent (x_{it})
 - TZNPS provides information on food consumption within and outside the household over the past week
 - Consumption of 59 individual food items \rightarrow aggregated into 11 major food groups $k \rightarrow x_{kit}$

Methodology

- Food prices
 - Price data (kg prices, unit values) from household food purchases over the past week
 - Median prices (p) constructed by region (r), interview year (y), and quarter (q)
 - Regression-based imputation in some cases: not all 59 food prices observed in each of the 26 regions during each wave
 - Construction of Laspeyres-type price indexes (I_{kit}): grouping 59 food items into 11 major food groups (k)
 - Food shares (weights of each food item in its food group) are average shares by region over all three waves

Methodology

- Marshallian demand elasticities

- Own-price elasticity of demand

$$e_{x_1, I_1} = \frac{\Delta x_1 / x_1}{\Delta I_1 / I_1} = \frac{\partial x_1}{\partial I_1} \cdot \frac{I_1}{x_1} = \frac{\partial \ln x_1}{\partial \ln I_1}$$

- Cross-price elasticity of demand

$$e_{x_2, I_1} = \frac{\Delta x_2 / x_2}{\Delta I_1 / I_1} = \frac{\partial x_2}{\partial I_1} \cdot \frac{I_1}{x_2} = \frac{\partial \ln x_2}{\partial \ln I_1}$$

- Empirical implementation (FE estimation)

$$\ln x_{kit} = \alpha + \beta_1 \ln I_{1it} + \beta_2 \ln I_{2it} + \dots + \beta_k \ln I_{kit} + \gamma_1 y_{it} + \gamma_2 y_{it}^2 + u_{it}$$

$$\forall k = \{1, 2, \dots, 11\}$$

$$u_i = \mu_i + v_t + \varepsilon_{it}$$

Methodology

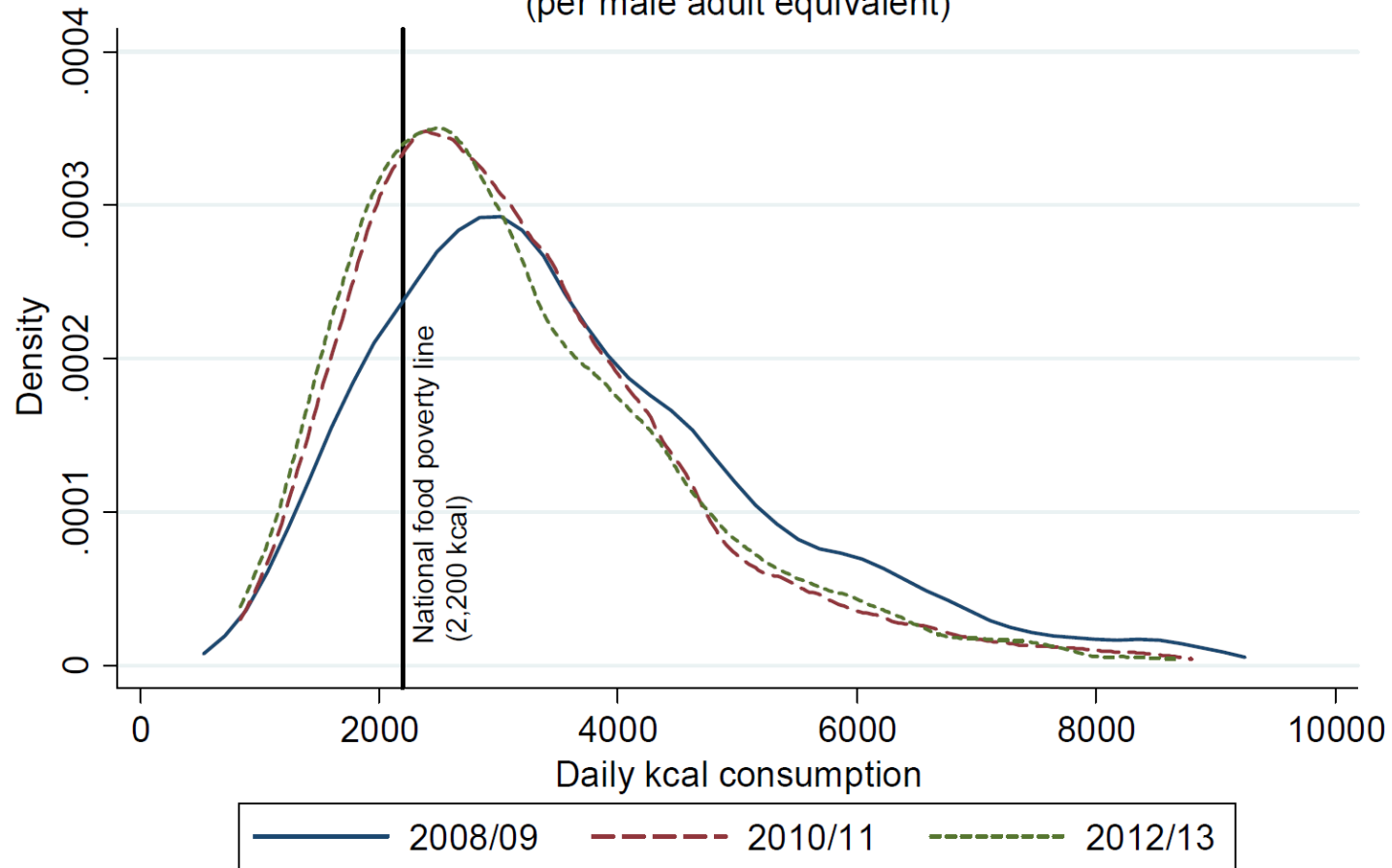
- Impact of food price shocks on food security

$$\ln x_{it} = \alpha + \beta_1 \ln I_{1it} + \beta_2 \ln I_{2it} + \dots + \beta_{11} \ln I_{11it} + \mu_i + v_t + \varepsilon_{it}$$

daily total energy intake per (male) adult equivalent: $x_{it} = \sum_{k=1}^{11} x_{kit}$

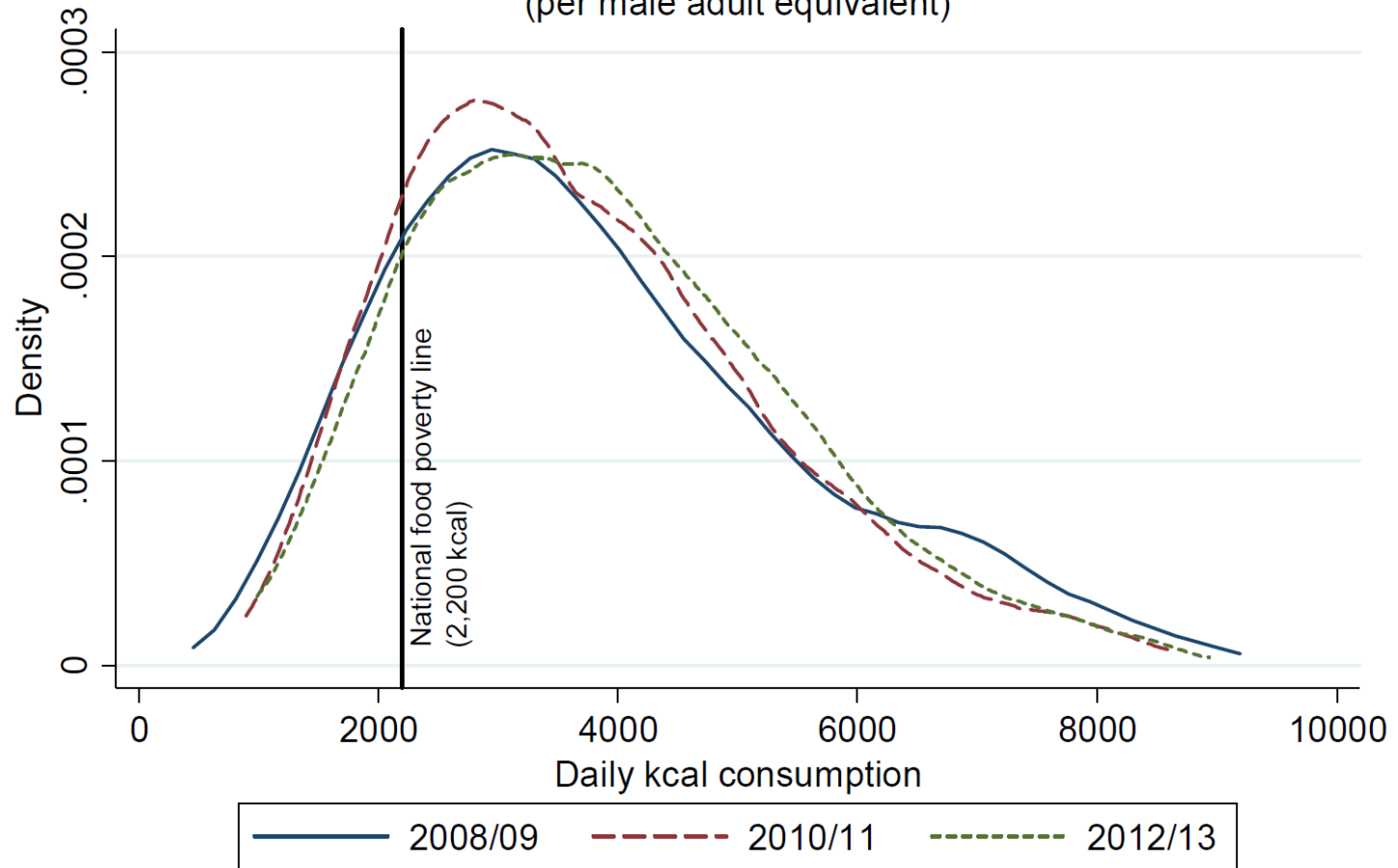
Descriptive analysis

Figure 1: Daily Calorie Consumption in Rural Tanzania, 2008/09 to 2012/13
 (per male adult equivalent)



Descriptive analysis

Figure 2: Daily Calorie Consumption in Urban Tanzania, 2008/09 to 2012/13
(per male adult equivalent)



Descriptive analysis

Table 1: Median calorie consumption by food group and over time

Year	Total kcal intake			Maize			Other cereals	Starches
	(all)	(rural)	(urban)	(all)	(rural)	(urban)		
2008/09	3357	3282	3536	971	1129	775	309	252
2010/11	3056	2932	3448	922	942	896	442	198
2012/13	3065	2838	3647	884	902	860	434	217
Average	3168			922			397	219
Share in total	1.00			0.29			0.13	0.07

Notes: All kcal values are medians of daily male adult equivalents. Sample consists of all household: these households were classified as rural households.

Year	Sugar & sweets	Pulses, dry	Nuts & seeds	Vegetables	Fruits	Meat & fish	Dairy	Oil & fats	Beverages
2008/09	130	122	143	19	9	67	0	123	5
2010/11	113	130	63	22	22	70	0	138	4
2012/13	113	140	119	24	21	65	0	146	4
Average	118	130	109	22	18	67	0	136	4
Share in total	0.04	0.04	0.03	0.01	0.01	0.02	0.00	0.04	0.00

that were successfully interviewed in all three waves (N=2,689). In wave 1, 67 percent of

Descriptive analysis



Table 2: National price trends of major food items and groups

	Maize	Other cereals	Starches	Sugar & sweets	Pulses, dry	Nuts & seeds	Vegetables	Fruits	Meat & fish	Dairy	Oil & fats	Beverages	Total household exp
2008/09	100	100	100	100	100	100	100	100	100	100	100	100	100
2010/11	154.5	108.4	139.2	132.3	118.8	163.3	110.5	133.1	128.4	149.5	119.6	294.9	111.8
2012/13	243.4	143.2	190.9	154.4	143.5	179.0	136.3	175.0	170.1	190.9	139.8	1281.2	147.6

Notes: Prices based on TZNPS households' self-reported food purchases. Price indexes with base year 2008/09. Each wave collected data between October and September of the following year. Total household expenditure is calculated per month and per adult-equivalent.

Table 3: Own-price and cross-price elasticities of food consumption in Tanzania, 2008/09 to 2012/13

<i>Dependent variables: In kcal consumption of particular food group</i>											
	Cereals	Starches	Sugar & sweets	Pulses	Nuts & seeds	Vegetables	Fruits	Meat & fish	Dairy	Oils & fats	Beverages
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Price index of food group</i>											
lnp_cereals	-0.322*** (0.122)	-0.0465 (0.214)	0.0831 (0.159)	0.131 (0.208)	-0.748*** (0.229)	0.0233 (0.0813)	0.355* (0.214)	-0.267* (0.145)	-0.153 (0.176)	-0.297* (0.169)	0.0368 (0.149)
lnp_starches	0.0347 (0.0963)	0.0936 (0.169)	-0.173 (0.126)	-0.162 (0.164)	0.0632 (0.181)	0.161** (0.0642)	0.0962 (0.169)	0.257** (0.114)	0.223 (0.139)	0.0547 (0.133)	0.0351 (0.117)
lnp_sugars	0.0313 (0.0652)	-0.0212 (0.115)	-0.00581 (0.0850)	-0.0366 (0.111)	-0.173 (0.122)	0.0114 (0.0435)	-0.317*** (0.115)	-0.0504 (0.0774)	-0.229** (0.0944)	0.00270 (0.0902)	-0.0927 (0.0795)
lnp_pulses	0.0518 (0.174)	-0.315 (0.306)	0.327 (0.227)	-0.138 (0.297)	-0.337 (0.327)	0.00387 (0.116)	0.780** (0.307)	0.510** (0.207)	-0.571** (0.253)	0.417* (0.241)	-0.129 (0.213)
lnp_nutsseeds	-0.0289 (0.0613)	0.0721 (0.108)	0.0339 (0.0799)	0.107 (0.105)	-0.302*** (0.115)	-0.0651 (0.0409)	0.101 (0.108)	-0.0723 (0.0728)	-0.000227 (0.0888)	-0.0721 (0.0848)	0.0560 (0.0748)
lnp_vegetables	0.0397 (0.106)	-0.118 (0.186)	0.465*** (0.138)	-0.443** (0.181)	-0.356* (0.199)	-0.531*** (0.0706)	-0.595*** (0.186)	-0.0846 (0.126)	-0.255* (0.153)	-0.0348 (0.146)	-0.180 (0.129)
lnp_fruits	0.0373 (0.0567)	0.0242 (0.0997)	0.132* (0.0739)	-0.0252 (0.0968)	-0.298*** (0.107)	-0.00653 (0.0379)	-0.273*** (0.0998)	0.0649 (0.0674)	-0.0374 (0.0822)	0.0750 (0.0785)	0.164** (0.0692)
lnp_meatfish	-0.407** (0.180)	-0.0601 (0.317)	0.0438 (0.235)	-0.694** (0.307)	0.654* (0.338)	-0.135 (0.120)	0.725** (0.317)	-0.398* (0.214)	0.0967 (0.261)	0.146 (0.249)	0.222 (0.220)
lnp_dairy	-0.0816 (0.0613)	0.0618 (0.108)	-0.122 (0.0800)	-0.154 (0.105)	0.0974 (0.115)	0.0167 (0.0409)	-0.0183 (0.108)	-0.0301 (0.0729)	-0.155* (0.0889)	-0.0243 (0.0849)	-0.0999 (0.0748)
lnp_oilfats	0.246 (0.161)	-0.553* (0.283)	-0.467** (0.210)	-0.335 (0.275)	-0.115 (0.303)	0.416*** (0.108)	0.191 (0.283)	0.395** (0.191)	0.351 (0.233)	-0.466** (0.223)	0.316 (0.196)
lnp_beverages	0.0479* (0.0246)	0.0145 (0.0432)	0.0436 (0.0320)	0.0177 (0.0419)	0.0596 (0.0462)	0.0113 (0.0164)	0.00177 (0.0432)	-0.0247 (0.0292)	-0.0469 (0.0356)	0.0944*** (0.0340)	-0.0224 (0.0300)
<i>Total expenditures</i>											
lnexpmeq	6.625*** (0.803)	0.705 (1.411)	4.698*** (1.046)	7.841*** (1.369)	3.607** (1.507)	1.241** (0.536)	-0.426 (1.411)	4.293*** (0.953)	-0.898 (1.163)	7.961*** (1.111)	-0.0411 (0.979)
lnexpmeq2	-0.222*** (0.0302)	0.00732 (0.0531)	-0.140*** (0.0394)	-0.262*** (0.0515)	-0.0995* (0.0567)	-0.0258 (0.0202)	0.0633 (0.0531)	-0.108*** (0.0359)	0.0621 (0.0438)	-0.267*** (0.0418)	0.0316 (0.0368)
Constant	-39.38*** (5.489)	-0.476 (9.653)	-33.89*** (7.155)	-45.45*** (9.364)	-19.41* (10.31)	-10.13*** (3.663)	-10.01 (9.654)	-35.42*** (6.520)	6.024 (7.952)	-54.97*** (7.598)	-4.687 (6.695)
Observations	7,778	7,778	7,778	7,778	7,778	7,778	7,778	7,778	7,778	7,778	7,778
No of hh	2,689	2,689	2,689	2,689	2,689	2,689	2,689	2,689	2,689	2,689	2,689

Notes: Fixed effects estimation. Control variables further include time effects (yearXmonth). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Maize price shocks and individual energy intake



Dep. Variable: Ln household kcal consumption by male adult equivalent

	(1) Full sample	(2) Rural	(3) Urban	(4) Rural maize producers	(5) Rural non- maize producers	(6) Rural landless	(7) Rural landowners
<i>Maize prices</i>							
lnp_maizeall	-0.158*** (0.0230)	-0.163*** (0.0272)	-0.116** (0.0553)	-0.182*** (0.0433)	-0.127*** (0.0401)	-0.282*** (0.0981)	-0.142*** (0.0288)
<i>Other food prices</i>							
lnp_cerealsother	-0.00967 (0.0601)	0.0360 (0.0692)	-0.300** (0.147)	0.181 (0.116)	-0.00513 (0.0956)	0.118 (0.213)	0.0821 (0.0756)
lnp_starches	0.0239 (0.0335)	0.0306 (0.0393)	0.0166 (0.0734)	0.0541 (0.0620)	-0.0280 (0.0567)	0.146 (0.131)	0.00434 (0.0426)
lnp_sugars	9.24e-05 (0.0227)	0.00286 (0.0298)	0.00188 (0.0374)	0.0354 (0.0439)	-0.0389 (0.0514)	0.0554 (0.0754)	-0.0137 (0.0330)
lnp_pulses	0.106* (0.0608)	0.0686 (0.0714)	0.0592 (0.151)	0.155 (0.123)	0.0521 (0.0981)	0.127 (0.240)	0.0253 (0.0762)
lnp_nutsseeds	-0.0282 (0.0214)	-0.0304 (0.0275)	0.0179 (0.0449)	0.0227 (0.0565)	-0.0665* (0.0363)	-0.145* (0.0736)	-0.00133 (0.0307)
lnp_vegetables	-0.0430 (0.0366)	-0.0565 (0.0439)	0.135 (0.0839)	-0.109* (0.0648)	0.0104 (0.0666)	0.0923 (0.130)	-0.0612 (0.0478)
lnp_fruits	-0.0301 (0.0199)	-0.0411* (0.0241)	0.0227 (0.0450)	-0.0676* (0.0373)	-0.000596 (0.0355)	0.0470 (0.0774)	-0.0604** (0.0260)
lnp_meatfish	-0.0513 (0.0619)	-0.0826 (0.0773)	-0.0408 (0.133)	-0.0337 (0.114)	-0.0738 (0.113)	-0.507** (0.249)	0.000312 (0.0837)
lnp_dairy	-0.00285 (0.0214)	0.00792 (0.0261)	-0.00851 (0.0425)	-0.00379 (0.0362)	0.0470 (0.0410)	-0.0198 (0.0901)	0.0145 (0.0280)
lnp_oilfats	-0.0818 (0.0565)	-0.0278 (0.0718)	-0.172* (0.103)	-0.0938 (0.113)	0.0252 (0.101)	-0.203 (0.232)	-0.0197 (0.0772)
lnp_beverages	0.00546 (0.00853)	0.0198* (0.0106)	-0.0272* (0.0159)	0.0255 (0.0163)	0.00927 (0.0146)	0.00724 (0.0374)	0.0155 (0.0112)
Constant	9.610*** (0.564)	9.597*** (0.679)	10.37*** (1.315)	8.872*** (1.154)	9.066*** (0.948)	10.34*** (2.198)	8.941*** (0.723)
Observations	7,778	5,186	2,592	2,491	2,695	673	4,513
No of households	2,689	1,806	883	870	936	230	1,576

Notes: Fixed-effects estimation. All models include time effects (yearXmonth). The classification into rural/urban, maizeproducer/no maizeproducer, and landowner/landless is based on initial conditions in wave 1 (2008/2009). Standard errors in parentheses, ***

Table 5: Maize price shocks and household dietary diversity

Dep. Variable: Household dietary diversity score (HDDS)



	(1) Full sample	(2) Rural	(3) Urban	(4) Rural maize producers	(5) Rural non- maize producers	(6) Rural landless	(7) Rural landowners
<i>Maize prices</i>							
lnp_maizeall	-0.0917 (0.0991)	-0.245** (0.113)	-0.0267 (0.259)	-0.221 (0.181)	-0.213 (0.164)	-0.159 (0.405)	-0.275** (0.120)
<i>Other food prices</i>							
lnp_cerealsother	-0.511** (0.259)	-0.266 (0.287)	-1.610** (0.688)	-0.431 (0.485)	-0.161 (0.390)	0.640 (0.881)	-0.412 (0.314)
lnp_starches	0.0661 (0.144)	0.0635 (0.163)	0.435 (0.344)	0.287 (0.259)	0.0613 (0.231)	0.0799 (0.539)	0.0219 (0.177)
lnp_sugars	-0.122 (0.0978)	-0.0865 (0.123)	-0.189 (0.175)	0.121 (0.184)	-0.211 (0.210)	0.399 (0.311)	-0.181 (0.137)
lnp_pulses	0.551** (0.262)	0.736** (0.296)	0.405 (0.709)	1.773*** (0.514)	0.213 (0.400)	0.781 (0.990)	0.715** (0.316)
lnp_nutsseeds	0.0198 (0.0923)	0.0739 (0.114)	0.0412 (0.210)	-0.331 (0.236)	0.129 (0.148)	-0.0332 (0.304)	0.0906 (0.127)
lnp_vegetables	-0.158 (0.158)	-0.253 (0.182)	0.391 (0.393)	-0.638** (0.271)	0.0254 (0.271)	0.230 (0.538)	-0.245 (0.198)
lnp_fruits	-0.0303 (0.0856)	0.0997 (0.0998)	-0.145 (0.211)	0.0941 (0.156)	0.0393 (0.145)	-0.0636 (0.320)	0.101 (0.108)
lnp_meatfish	0.799*** (0.267)	0.556* (0.320)	-0.0197 (0.623)	0.337 (0.476)	0.775* (0.461)	0.0768 (1.028)	0.605* (0.348)
lnp_dairy	-0.126 (0.0919)	-0.0789 (0.108)	-0.0992 (0.199)	0.0719 (0.152)	-0.260 (0.167)	-0.591 (0.372)	-0.0500 (0.116)
lnp_oilfats	-0.0340 (0.243)	0.374 (0.297)	-0.801* (0.484)	0.787* (0.471)	0.180 (0.413)	-0.174 (0.958)	0.341 (0.321)
lnp_beverages	-0.00473 (0.0367)	-0.0155 (0.0438)	-0.0690 (0.0744)	0.0190 (0.0681)	-0.0280 (0.0596)	-0.0176 (0.154)	-0.0144 (0.0465)
Constant	5.028** (2.430)	4.143 (2.811)	16.46*** (6.161)	0.639 (4.828)	5.139 (3.866)	3.371 (9.074)	4.324 (3.003)
Observations	7,778	5,186	2,592	2,491	2,695	673	4,513
No of households	2,689	1,806	883	870	936	230	1,576

Table A1: Basic robustness checks

Dep. Variable: Ln household kcal consumption by male adult equivalent

	(1)	(2)	(3)	(4)	(5)	(6)
Maize prices	-0.128*** (0.0113)	-0.154*** (0.0193)	-0.160*** (0.0203)	-0.133*** (0.0219)	-0.152*** (0.0221)	-0.158*** (0.0230)
Other food prices	NO	NO	NO	YES	YES	YES
Year Effects	NO	YES	NO	NO	YES	NO
Year X Month Effects	NO	NO	YES	NO	NO	YES
Constant	8.686*** (0.0560)	8.901*** (0.0936)	9.175*** (0.247)	8.581*** (0.191)	9.150*** (0.478)	9.610*** (0.564)
Observations	7,778	7,778	7,778	7,778	7,778	7,778
No of households	2,689	2,689	2,689	2,689	2,689	2,689

Notes: Fixed-effects estimation. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table A2: Maize price shocks and individual energy intake
(controlling for income effects)



Dep. Variable: Ln household kcal consumption by male adult equivalent

	(1) Full sample	(2) Rural	(3) Urban	(4) Rural maize producers	(5) Rural non- maize producers	(6) Rural landless	(7) Rural landowners
<i>Maize prices</i>							
lnp_maizeall	-0.108*** (0.0172)	-0.0986*** (0.0198)	-0.0663 (0.0429)	-0.101*** (0.0317)	-0.0882*** (0.0291)	-0.259*** (0.0766)	-0.0760*** (0.0208)
<i>Other food prices</i>							
lnp_cerealsoth	-0.0331 (0.0448)	-0.0112 (0.0502)	-0.257** (0.114)	0.101 (0.0841)	-0.0415 (0.0694)	-0.0391 (0.166)	0.0291 (0.0544)
lnp_starches	0.0190 (0.0250)	0.0303 (0.0286)	-0.0141 (0.0573)	0.0517 (0.0451)	-0.0399 (0.0411)	0.188* (0.102)	0.00436 (0.0307)
lnp_sugars	-0.0251 (0.0169)	-0.0405* (0.0217)	-0.000177 (0.0291)	-0.0249 (0.0319)	-0.0678* (0.0372)	-0.0166 (0.0587)	-0.0460* (0.0238)
lnp_pulses	0.00186 (0.0453)	-0.0933* (0.0519)	0.184 (0.117)	-0.0982 (0.0887)	-0.0863 (0.0713)	-0.0860 (0.187)	-0.124** (0.0550)
lnp_nutsseeds	-0.0537*** (0.0161)	-0.0635*** (0.0200)	-0.0435 (0.0354)	0.0168 (0.0409)	-0.107*** (0.0263)	-0.0829 (0.0571)	-0.0504** (0.0221)
lnp_vegetables	-0.0261 (0.0273)	-0.0380 (0.0318)	0.161** (0.0657)	-0.0663 (0.0468)	0.0300 (0.0482)	-0.00362 (0.101)	-0.0325 (0.0343)
lnp_fruits	-0.0273* (0.0148)	-0.0441** (0.0175)	0.0139 (0.0350)	-0.0547** (0.0273)	-0.0302 (0.0257)	0.0135 (0.0597)	-0.0545*** (0.0187)
lnp_meatfish	-0.168*** (0.0462)	-0.188*** (0.0562)	-0.208** (0.104)	-0.182** (0.0832)	-0.138* (0.0820)	-0.282 (0.194)	-0.159*** (0.0605)
lnp_dairy	-0.0168 (0.0159)	0.00995 (0.0190)	-0.0528 (0.0333)	-0.00309 (0.0263)	0.0266 (0.0298)	0.0113 (0.0708)	0.0110 (0.0201)
lnp_oilfats	-0.0119 (0.0421)	0.0178 (0.0522)	-0.0328 (0.0804)	-0.0949 (0.0820)	0.120 (0.0733)	-0.209 (0.177)	0.0293 (0.0557)
lnp_beverages	0.00807 (0.00635)	0.0135* (0.00766)	-0.00793 (0.0124)	0.0202* (0.0118)	0.00205 (0.0105)	0.00626 (0.0286)	0.0123 (0.00806)
<i>Total hh expenditures</i>							
lnexpmeq	0.653*** (0.0103)	0.670*** (0.0122)	0.624*** (0.0191)	0.685*** (0.0182)	0.658*** (0.0168)	0.619*** (0.0380)	0.676*** (0.0130)
Constant	1.916*** (0.437)	1.755*** (0.514)	1.110 (1.059)	1.128 (0.841)	1.216* (0.711)	3.240* (1.746)	1.444*** (0.547)
Observations	7,778	5,186	2,592	2,491	2,695	673	4,513
No of hh	2,689	1,806	883	870	936	230	1,576

Conclusions

- Between 2008/09 and 2012/13, food security slightly improved for urban Tanzanians, yet sharply deteriorated for rural dwellers
- Principal staple maize showed strongest price hikes among all major food items
- Main finding: Clear negative relationship between maize prices and individual energy intake
- Household demand for cereals more inelastic in rural areas → rural households hit stronger by maize price hikes
- Most population groups negatively affected by maize price hikes; rural landless most vulnerable

Conclusions

- Past cross-section studies tended to overestimate price elasticities of food demand for developing country households
 - Dietary changes (substitution) happen much less than expected; probably due to tastes, fixed habits, traditions, cultural norms
- Governments should try to abstain from trade restrictions for major staples (particularly on the import side) to help smooth prices over time
- Governments might want to promote more dietary flexibility (alternative diets, cooking) in times of crisis

Thank you for your attention.