

AJAE appendix for Food aid, food prices and producer disincentives in Ethiopia

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Note: The material contained herein is supplementary to the article named in the title and published in the American Journal of Agricultural Economics (*AJAE*).

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Derivation of equations (1')-(3')

The derivation for (1') is as follows:

The total differentiation is

$$dS = \frac{\partial f}{\partial P} dp + \frac{\partial f}{\partial R} dR$$

$$\text{Let } \mu_1 = \frac{\partial f}{\partial P} \frac{P}{S} \Rightarrow \frac{\partial f}{\partial P} = \mu_1 \frac{S}{P} \text{ and } \mu_2 = \frac{\partial f}{\partial R} \frac{R}{S} \Rightarrow \frac{\partial f}{\partial R} = \mu_2 \frac{S}{R}$$

Substituting these into the above gives

$$dS = \mu_1 \frac{dP}{P} S + \mu_2 \frac{dR}{R} S$$

Dividing both sides by S and letting:

$$\frac{dS}{S} = \ln S, \quad \frac{dP}{P} = \ln P, \quad \frac{dR}{R} = \ln R$$

we get $\ln S = \mu_1 \ln P + \mu_2 \ln R$, which is the same as (1'). Equations (2') and (3') can be derived in a parallel way.

Appendix Table 1. Full Results of Seemingly Unrelated Regression Reported in Table 2

Equation	Obs	Parms	RMSE	"R-sq" chi2	P
MM	125	18	111.5651	0.8016 491.17	0.0000
MD	125	18	123.5002	0.6746 243.26	0.0000
MA	125	18	82.79937	0.8276 613.34	0.0000
WM	125	18	125.0154	0.8320 621.56	0.0000
WD	125	18	127.0094	0.7966 495.92	0.0000
WA	125	18	91.328	0.8773 1037.77	0.0000
TM	125	18	113.0951	0.8438 721.40	0.0000
TD	125	18	117.894	0.7710 414.44	0.0000
TA	125	18	99.05255	0.7814 530.06	0.0000

	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
Maize_Markos (MM)						
MM_1	0.668	0.087	7.71	0.000	0.498	0.838
MM_2	0.152	0.085	1.79	0.074	-0.015	0.320
pfa	4.292	2.005	2.14	0.032	0.362	8.221
pfa_1	-3.454	1.881	-1.84	0.066	-7.140	0.233
POP	0.002	0.002	1.21	0.225	-0.001	0.006
RM	0.124	0.211	0.59	0.555	-0.289	0.538
RM_1	-0.053	0.201	-0.26	0.792	-0.448	0.342
Jan	-33.435	49.240	-0.68	0.497	-129.944	63.073
Feb	10.321	49.060	0.21	0.833	-85.835	106.476
Mar	21.482	50.384	0.43	0.670	-77.268	120.233
Apr	3.552	52.050	0.07	0.946	-98.464	105.569
May	127.079	51.378	2.47	0.013	26.379	227.779
Jun	109.043	66.997	1.63	0.104	-22.268	240.354
Jul	4.004	85.978	0.05	0.963	-164.510	172.517
Aug	34.399	90.843	0.38	0.705	-143.649	212.447
Sep	43.722	72.073	0.61	0.544	-97.539	184.983
Oct	27.415	53.982	0.51	0.612	-78.388	133.218
Nov	-62.345	48.009	-1.30	0.194	-156.442	31.752
_cons	-14.894	126.894	-0.12	0.907	-263.603	233.814

Maize_Dessie (MD)						
MD_1	0.283	0.072	3.93	0.000	0.142	0.424
MD_2	0.390	0.072	5.40	0.000	0.249	0.532
pfa	6.156	2.207	2.79	0.005	1.830	10.481
pfa_1	-4.703	2.035	-2.31	0.021	-8.693	-0.714
POP	0.000	0.002	0.17	0.862	-0.004	0.004
RD	0.207	0.212	0.98	0.329	-0.208	0.621
RD_1	0.032	0.208	0.16	0.876	-0.375	0.440
Jan	44.221	53.913	0.82	0.412	-61.446	149.889
Feb	-2.844	53.467	-0.05	0.958	-107.638	101.949
Mar	62.899	54.194	1.16	0.246	-43.319	169.118
Apr	71.536	56.736	1.26	0.207	-39.664	182.736
May	80.359	53.798	1.49	0.135	-25.082	185.801
Jun	146.155	54.609	2.68	0.007	39.124	253.186
Jul	28.708	80.498	0.36	0.721	-129.066	186.482
Aug	36.606	78.506	0.47	0.641	-117.263	190.476
Sep	28.994	55.659	0.52	0.602	-80.095	138.084
Oct	20.672	52.568	0.39	0.694	-82.359	123.703
Nov	-65.783	52.091	-1.26	0.207	-167.879	36.314
_cons	295.903	146.965	2.01	0.044	7.858	583.948

Maize_Addis						
MA_1	0.669	0.075	8.98	0.000	0.523	0.816
MA_2	0.129	0.074	1.75	0.081	-0.016	0.273
pfa	2.813	1.485	1.89	0.058	-0.097	5.723
pfa_1	-2.369	1.401	-1.69	0.091	-5.115	0.378
POP	0.001	0.001	0.41	0.683	-0.002	0.003
RA	-0.304	0.159	-1.91	0.056	-0.616	0.007
RA_1	0.074	0.163	0.46	0.649	-0.246	0.395
Jan	59.591	35.670	1.67	0.095	-10.321	129.502
Feb	55.074	36.139	1.52	0.128	-15.757	125.905
Mar	56.601	37.878	1.49	0.135	-17.637	130.840
Apr	64.860	38.904	1.67	0.095	-11.391	141.111
May	77.683	39.498	1.97	0.049	0.269	155.097
Jun	220.128	47.725	4.61	0.000	126.589	313.666
Jul	123.532	63.558	1.94	0.052	-1.040	248.105
Aug	143.452	62.128	2.31	0.021	21.684	265.220
Sep	112.539	43.302	2.60	0.009	27.669	197.409
Oct	47.723	35.740	1.34	0.182	-22.326	117.773
Nov	-8.955	34.637	-0.26	0.796	-76.842	58.933
_cons	141.001	99.470	1.42	0.156	-53.956	335.958

Wheat_Markos (WM)						
WM_1	0.602	0.076	7.92	0.000	0.453	0.752
WM_2	0.248	0.076	3.29	0.001	0.100	0.396
pfa	4.399	2.200	2.00	0.046	0.087	8.711
pfa_1	-5.079	2.128	-2.39	0.017	-9.250	-0.908
POP	0.001	0.002	0.30	0.762	-0.003	0.005
RM	0.282	0.229	1.23	0.218	-0.166	0.730
RM_1	0.158	0.221	0.71	0.475	-0.276	0.592
Jan	-86.238	56.893	-1.52	0.130	-197.747	25.270
Feb	96.464	57.180	1.69	0.092	-15.607	208.534
Mar	40.680	55.762	0.73	0.466	-68.612	149.971
Apr	23.076	57.621	0.40	0.689	-89.859	136.012
May	99.155	57.361	1.73	0.084	-13.272	211.581
Jun	135.610	71.909	1.89	0.059	-5.329	276.549
Jul	91.460	88.256	1.04	0.300	-81.518	264.439
Aug	63.398	98.347	0.64	0.519	-129.358	256.154
Sep	39.557	76.811	0.51	0.607	-110.989	190.103
Oct	72.384	58.269	1.24	0.214	-41.820	186.589
Nov	171.861	53.122	3.24	0.001	67.743	275.978
_cons	51.472	163.223	0.32	0.752	-268.438	371.383

Wheat_Dssie (WD)

WD_1	0.603	0.084	7.17	0.000	0.438	0.768
WD_2	0.207	0.083	2.49	0.013	0.044	0.370
pfa	1.544	2.188	0.71	0.480	-2.744	5.832
pfa_1	-3.999	2.147	-1.86	0.062	-8.207	0.209
POP	-0.004	0.003	-1.60	0.109	-0.009	0.001
RD	0.429	0.238	1.81	0.071	-0.037	0.895
RD_1	-0.107	0.227	-0.47	0.639	-0.552	0.339
Jan	-39.956	56.038	-0.71	0.476	-149.789	69.878
Feb	-55.134	55.953	-0.99	0.324	-164.800	54.531
Mar	-19.335	57.792	-0.33	0.738	-132.605	93.936
Apr	89.176	59.268	1.50	0.132	-26.986	205.339
May	64.835	56.098	1.16	0.248	-45.115	174.785
Jun	117.496	56.661	2.07	0.038	6.444	228.549
Jul	-105.423	86.144	-1.22	0.221	-274.262	63.416
Aug	-11.750	86.247	-0.14	0.892	-180.790	157.290
Sep	15.158	57.354	0.26	0.792	-97.253	127.570
Oct	-10.230	54.959	-0.19	0.852	-117.948	97.487
Nov	53.434	54.373	0.98	0.326	-53.135	160.004
_cons	614.340	245.126	2.51	0.012	133.902	1094.779

Wheat_Addis (WA)

WA_1	0.534	0.069	7.74	0.000	0.399	0.669
WA_2	0.362	0.070	5.13	0.000	0.223	0.500
pfa	1.916	1.600	1.20	0.231	-1.220	5.053
pfa_1	-4.468	1.581	-2.83	0.005	-7.568	-1.369
POP	0.000	0.002	0.07	0.940	-0.003	0.004
RA	-0.369	0.189	-1.95	0.051	-0.739	0.001
RA_1	0.114	0.194	0.58	0.559	-0.267	0.495
Jan	74.690	40.044	1.87	0.062	-3.796	153.175
Feb	49.874	40.016	1.25	0.213	-28.555	128.304
Mar	36.986	42.420	0.87	0.383	-46.156	120.128
Apr	116.662	43.990	2.65	0.008	30.443	202.882
May	134.898	44.799	3.01	0.003	47.094	222.702
Jun	174.457	54.543	3.20	0.001	67.555	281.360
Jul	167.709	72.348	2.32	0.020	25.910	309.508
Aug	189.064	72.108	2.62	0.009	47.734	330.394
Sep	170.837	48.980	3.49	0.000	74.837	266.837
Oct	125.298	39.889	3.14	0.002	47.118	203.478
Nov	55.857	38.750	1.44	0.149	-20.091	131.805
_cons	124.443	164.544	0.76	0.449	-198.057	446.944

Teff_Markos (TM)

TM_1	0.660	0.074	8.93	0.000	0.516	0.805
TM_2	0.202	0.075	2.70	0.007	0.055	0.348
pfa	2.470	1.933	1.28	0.201	-1.318	6.258
pfa_1	-3.812	1.900	-2.01	0.045	-7.535	-0.088
POP	0.004	0.002	1.91	0.057	0.000	0.007
RM	0.088	0.198	0.44	0.658	-0.301	0.476
RM_1	-0.301	0.192	-1.57	0.117	-0.676	0.075
Jan	-162.824	49.103	-3.32	0.001	-259.063	-66.584
Feb	-111.722	50.563	-2.21	0.027	-210.824	-12.620
Mar	-119.709	50.148	-2.39	0.017	-217.997	-21.421
Apr	-58.337	52.105	-1.12	0.263	-160.462	43.788
May	-6.666	51.385	-0.13	0.897	-107.378	94.046
Jun	108.478	63.992	1.70	0.090	-16.944	233.900
Jul	72.403	77.434	0.94	0.350	-79.366	224.172
Aug	31.810	86.297	0.37	0.712	-137.329	200.950
Sep	33.920	68.164	0.50	0.619	-99.680	167.519
Oct	-5.326	52.165	-0.10	0.919	-107.567	96.914
Nov	17.243	47.758	0.36	0.718	-76.361	110.846
_cons	67.162	133.684	0.50	0.615	-194.854	329.178

Teff_Dssie (TD)

TD_1	0.638	0.088	7.22	0.000	0.464	0.811
TD_2	0.212	0.088	2.41	0.016	0.039	0.384
Pfa	1.842	2.028	0.91	0.364	-2.133	5.817
pfa_1	-2.522	1.976	-1.28	0.202	-6.394	1.351
POP	0.001	0.002	0.67	0.502	-0.003	0.005
RD	0.105	0.219	0.48	0.631	-0.323	0.534
RD_1	-0.070	0.205	-0.34	0.733	-0.472	0.332
Jan	-11.685	51.372	-0.23	0.820	-112.372	89.003
Feb	-90.894	51.421	-1.77	0.077	-191.678	9.890
Mar	-9.583	52.834	-0.18	0.856	-113.136	93.970
Apr	1.731	54.503	0.03	0.975	-105.093	108.555
May	-12.459	51.810	-0.24	0.810	-114.005	89.088
Jun	45.574	52.817	0.86	0.388	-57.946	149.094
Jul	34.228	78.935	0.43	0.665	-120.481	188.937
Aug	69.336	77.342	0.90	0.370	-82.252	220.925
Sep	92.306	52.752	1.75	0.080	-11.087	195.698
Oct	-71.451	51.499	-1.39	0.165	-172.387	29.485
Nov	-70.450	50.261	-1.40	0.161	-168.960	28.059
_cons	244.689	180.325	1.36	0.175	-108.741	598.119

Teff_Addis (TA)						
TA_1	0.720	0.074	9.68	0.000	0.574	0.866
TA_2	0.145	0.076	1.91	0.056	-0.004	0.295
pfa	0.273	1.746	0.16	0.876	-3.150	3.696
pfa_1	-2.174	1.723	-1.26	0.207	-5.550	1.203
POP	0.000	0.002	0.05	0.963	-0.004	0.004
RA	-0.493	0.207	-2.38	0.017	-0.899	-0.087
RA_1	-0.023	0.211	-0.11	0.912	-0.436	0.390
Jan	43.137	44.572	0.97	0.333	-44.222	130.496
Feb	109.081	44.364	2.46	0.014	22.130	196.033
Mar	98.272	47.704	2.06	0.039	4.775	191.770
Apr	131.719	49.401	2.67	0.008	34.895	228.543
May	204.420	50.235	4.07	0.000	105.961	302.878
Jun	261.931	60.825	4.31	0.000	142.717	381.145
Jul	212.291	80.285	2.64	0.008	54.935	369.647
Aug	275.427	80.092	3.44	0.001	118.449	432.405
Sep	169.912	53.887	3.15	0.002	64.296	275.529
Oct	163.636	43.315	3.78	0.000	78.740	248.531
Nov	100.986	42.397	2.38	0.017	17.889	184.083
_cons	263.734	239.452	1.10	0.271	-205.582	733.051

Appendix Table 2. Granger Causality Wald Tests (χ^2 -statistics)

Cause	Effect	Maize	Wheat	<i>Teff</i>
Markos	Addis	4.99*	0.48	8.55**
Markos	Dessie	3.25	0.08	9.69***
Dessie	Markos	6.14**	2.96	4.69*
Dessie	Addis	26.04***	9.66***	17.86***
Addis	Markos	5.17*	15.39***	9.07***
Addis	Dessie	3.66	7.81**	1.34
		Addis	Dessie	Markos
Maize	Wheat	5.93*	1.90	21.16***
Maize	<i>Teff</i>	2.61	2.18	10.96*
Wheat	Maize	2.34	4.76*	1.82
Wheat	<i>Teff</i>	4.09	0.64	0.55
<i>Teff</i>	Maize	2.36	9.97*	0.87
<i>Teff</i>	Wheat	0.58	5.59*	0.35

Appendix Table 3. Coefficients (b) and t-values (t) of the Threshold-SUR Estimations

Food aid share	<0.07 b/t	0.03-0.08 b/t	0.05-0.12 b/t	0.06-0.13 b/t	0.066-0.139 b/t	0.071< b/t
Maize Markos						
MM_1	0.51 (3.50)	0.598 (4.72)	0.563 (4.58)	0.671 (5.67)	0.679 (6.77)	0.711 (6.90)
MM_2	0.151 (1.01)	0.184 (1.37)	0.033 (0.28)	-0.006 (-0.05)	0.068 (0.69)	0.045 (0.46)
pfa	0.358 (0.07)	10.084 (1.23)	12.285 (2.17)	9.493 (3.11)	5.014 (2.06)	6.942 (3.04)
pfa_1	7.127 (0.84)	24.303 (0.86)	18.149 (0.58)	0.887 (0.17)	-7.604 (-2.49)	-12.697 (-4.20)
POP	0.001 (0.22)	0.004 (0.69)	0.005 (1.14)	0.004 (1.71)	0.004 (1.75)	0.011 (3.28)
RM	0.273 (0.70)	0.204 (0.56)	0.107 (0.31)	0.044 (0.22)	-0.012 (-0.07)	0.085 (0.46)
RM_1	-0.475 (-1.12)	-0.04 (-0.10)	0.214 (0.60)	0.069 (0.34)	-0.059 (-0.35)	-0.018 (-0.11)
Jan	-46.979 (-0.55)	-17.397 (-0.21)	-18.904 (-0.25)	-30.428 (-0.59)	-36.808 (-0.77)	-44.112 (-0.97)
Feb	-44.682 (-0.52)	-11.82 (-0.14)	-25.608 (-0.34)	-21.045 (-0.41)	36.549 (0.76)	34.139 (0.75)
Mar	-12.846 (-0.14)	48.596 (0.55)	43.103 (0.55)	54.485 (1.03)	46.805 (0.94)	26.788 (0.57)
Apr	29.332 (0.31)	44.774 (0.49)	15.184 (0.19)	5.809 (0.10)	31.67 (0.62)	-23.074 (-0.48)
May	195.729 (2.04)	261.688 (2.89)	311.708 (3.81)	136.941 (2.57)	103.357 (2.13)	58.062 (1.27)

Jun	197.497 (1.61)	152.292 (1.32)	69.978 (0.66)	59.471 (0.87)	90.198 (1.52)	45.925 (0.78)
Jul	84.549 (0.51)	-29.573 (-0.20)	-89.771 (-0.72)	36.342 (0.46)	46.236 (0.66)	21.827 (0.30)
Aug	127.824 (0.74)	41.106 (0.27)	14.619 (0.11)	67.907 (0.77)	81.445 (1.10)	42.687 (0.55)
Sep	100.255 (0.75)	54.37 (0.42)	31.696 (0.29)	65.666 (0.96)	69.272 (1.17)	41.709 (0.69)
Oct	84.698 (0.90)	61.618 (0.65)	46.545 (0.58)	68.825 (1.29)	60.952 (1.22)	11.056 (0.23)
Nov	-42.413 (-0.50)	-51.032 (-0.63)	-67.451 (-0.96)	-76.128 (-1.57)	-58.499 (-1.29)	-54.707 (-1.26)
_cons	222.647 (0.94)	-383.88 (-0.63)	-202.37 (-0.42)	-4.5 (-0.04)	2.959 (0.02)	-363.7 (-2.15)

Maize Dessie

MD_1	0.289 (2.48)	0.361 (3.64)	0.28 (2.87)	0.34 (3.90)	0.274 (2.75)	0.364 (4.16)
MD_2	0.334 (2.78)	0.159 (1.56)	0.111 (1.12)	-0.022 (-0.25)	-0.005 (-0.04)	0.126 (1.40)
pfa	0.645 (0.14)	17.42 (2.36)	21.215 (3.85)	15.497 (4.05)	17.225 (3.85)	13.141 (4.78)
pfa_1	-3.642 (-0.42)	53.681 (2.21)	71.586 (2.32)	-7.135 (-1.01)	-14.451 (-2.96)	-14.293 (-4.67)
POP	-0.002 (-0.72)	0.005 -1.08	0.006 -1.82	0.005 -1.78	0.01 -2.86	0.011 -3.63
RD	0.59 (1.90)	0.052 (0.24)	-0.05 (-0.27)	0.229 (0.85)	-0.257 (-0.74)	0.02 (0.09)
RD_1	-0.521 (-1.46)	-0.044 (-0.20)	-0.08 (-0.40)	-0.006 (-0.02)	0.193 (0.71)	0.086 (0.41)
Jan	23.394 (0.27)	32.532 (0.45)	135.644 (2.04)	41.386 (0.60)	18.395 (0.27)	26.943 (0.57)
Feb	-66.903 (-0.76)	-58.5 (-0.81)	53.961 (0.80)	-92.841 (-1.37)	-93.865 (-1.37)	31.339 (0.67)
Mar	37.329 (0.41)	62.173 (0.86)	169.14 (2.54)	143.96 (2.10)	127.925 (1.87)	94.257 (1.99)
Apr	86.305 (0.92)	56.628 (0.74)	180.679 (2.56)	94.131 (1.21)	104.071 (1.32)	57.405 (1.13)
May	90.275 (1.02)	79.822 (1.11)	188.386 (2.80)	127.392 (1.87)	120.13 (1.75)	75.525 (1.60)
Jun	268.205 (2.90)	232.475 (3.11)	286.193 (4.10)	192.792 (2.85)	171.711 (2.53)	44.962 (0.94)
Jul	69.664 (0.60)	117.492 (1.20)	249.437 (2.81)	117.168 (0.87)	187.317 (1.38)	31.398 (0.35)

Aug	154.703 (1.27)	135.91 (1.48)	229.919 (2.77)	124.061 (1.07)	167.4 (1.29)	34.682 (0.41)
Sep	-2.205 (-0.02)	130.582 (1.70)	208.766 (3.15)	166.395 (2.39)	161.246 (2.27)	73.843 (1.48)
Oct	79.085 (0.91)	5.472 (0.07)	122.816 (1.88)	70.81 (1.06)	101.015 (1.50)	-12.27 (-0.27)
Nov	-25.414 (-0.29)	-87.75 (-1.21)	-0.107 (-0.00)	-10.334 (-0.16)	-28.423 (-0.45)	-70.945 (-1.60)
_cons	554.952 (1.88)	-405.51 (-0.78)	-586.39 (-1.34)	387.627 (2.28)	144.986 (0.76)	-100.06 (-0.62)

Maize Addis

MA_1	0.41 (3.67)	0.414 (4.52)	0.5 (5.68)	0.6 (7.35)	0.769 (9.01)	0.72 (7.30)
MA_2	0.248 (2.28)	0.124 (1.44)	0.066 (0.78)	-0.038 (-0.54)	-0.07 (-0.93)	-0.006 (-0.06)
pfa	-3.283 (-1.07)	13.278 (2.59)	9.957 (3.32)	5.385 (2.31)	4.703 (2.00)	7.056 (2.65)
pfa_1	5.466 (1.08)	58.228 (3.27)	37.658 (2.32)	-8.972 (-2.09)	-5.618 (-2.10)	-7.769 (-2.67)
POP	-0.002 (-1.21)	0.006 (1.75)	0.003 (1.78)	0.002 (1.36)	0.002 (1.06)	0.004 (1.54)
RA	-0.418 (-2.13)	-0.218 (-1.24)	-0.39 (-2.98)	-0.134 (-0.93)	0.004 (0.03)	-0.267 (-1.08)
RA_1	-0.081 (-0.39)	-0.114 (-0.57)	0.077 (0.46)	0.378 (2.15)	0.078 (0.48)	0.019 (0.07)
Jan	-0.577 (-0.01)	-9.654 (-0.20)	37.254 (1.00)	9.566 (0.25)	25.09 (0.68)	96.131 (2.12)
Feb	-16.36 (-0.35)	1.522 (0.03)	80.349 (2.13)	47.346 (1.21)	47.543 (1.24)	96.408 (2.07)
Mar	-15.652 (-0.31)	13.357 (0.25)	87.303 (2.21)	67.929 (1.70)	83.384 (2.13)	110.997 (2.24)
Apr	1.514 (0.03)	12.662 (0.24)	75.4 (1.79)	14.759 (0.34)	43.921 (1.03)	111.669 (2.20)
May	36.851 (0.68)	74.039 (1.31)	151.268 (3.49)	100.161 (2.37)	72.38 (1.80)	109.709 (2.19)
Jun	275.579 (4.02)	250.264 (3.83)	242.693 (4.74)	148.657 (3.18)	137.731 (3.03)	184.197 (3.11)
Jul	195.309 (2.42)	159.533 (2.00)	180.843 (2.99)	25.305 (0.38)	38.431 (0.58)	139.323 (1.50)

Aug	173.771 (2.30)	189.085 (2.54)	240.517 (4.05)	103.754 (1.62)	88.284 (1.34)	185.426 (2.00)
Sep	115.758 (2.10)	120.997 (2.15)	145.823 (3.34)	61.104 (1.31)	75.085 (1.68)	149.556 (2.53)
Oct	0.728 (0.02)	70.207 (1.40)	102.528 (2.83)	69.079 (1.82)	51.869 (1.40)	109.78 (2.45)
Nov	-38.62 (-0.85)	-57.988 (-1.21)	-9.79 (-0.28)	2.421 (0.07)	-45.03 (-1.29)	14.502 (0.33)
_cons	518.448 (2.90)	-446.67 (-1.24)	-158.81 (-0.68)	386.49 (3.43)	210.693 (1.88)	1.195 (0.01)

Wheat
Markos

WM_1	0.125 (1.19)	0.211 (1.94)	0.241 (2.17)	0.387 (3.37)	0.483 (3.98)	0.906 (9.42)
WM_2	0.196 (2.12)	0.341 (3.55)	0.228 (2.12)	0.142 (1.11)	0.12 (0.85)	-0.228 (-2.43)
pfa	-14.846 (-3.02)	12.479 (1.56)	20.473 (3.34)	16.882 (2.78)	14.231 (2.81)	12.867 (4.54)
pfa_1	29.068 (3.43)	68.331 (2.57)	13.928 (0.40)	-7.014 (-0.81)	-12.137 (-2.82)	-12.282 (-3.84)
POP	-0.011 (-3.62)	-0.002 (-0.32)	-0.002 (-0.56)	-0.007 (-1.92)	-0.002 (-0.91)	0.001 (0.33)
RM	0.336 (1.02)	0.408 (1.12)	0.495 (1.24)	0.45 (1.21)	-0.056 (-0.21)	0.257 (1.25)
RM_1	-0.353 (-1.01)	-0.174 (-0.44)	0.301 (0.72)	0.826 (2.33)	0.977 (3.82)	0.201 (1.03)
Jan	-398.37 (-4.71)	-293.93 (-3.28)	-284.92 (-2.95)	-116.98 (-1.30)	-89.926 (-1.26)	81.704 (1.60)
Feb	-180.05 (-1.91)	-16.639 (-0.18)	39.111 (0.39)	183.549 (1.93)	70.347 (0.98)	84.716 (1.69)
Mar	-270.72 (-3.04)	-81.75 (-0.91)	-100.71 (-1.05)	53.439 (0.59)	124.912 (1.76)	121.092 (2.42)
Apr	-250.32 (-2.70)	-90.481 (-0.98)	-108.11 (-1.11)	-5.564 (-0.06)	68.26 (0.98)	17.116 (0.33)
May	-177.45 (-1.89)	18.644 (0.20)	-50.041 (-0.50)	14.653 (0.16)	76.638 (1.18)	122.71 (2.43)
Jun	-59.249 (-0.54)	79.343 (0.70)	-34.412 (-0.29)	39.328 (0.35)	72.365 (0.91)	127.057 (2.01)
Jul	9.796	87.67	-54.202	-91.287	22.463	34.384

	(0.08)	(0.64)	(-0.41)	(-0.67)	(0.23)	(0.43)
Aug	69.481	91.569	-82.22	-147.76	-76.166	25.366
	(0.47)	(0.59)	(-0.52)	(-0.97)	(-0.73)	(0.29)
Sep	17.72	66.425	-72.505	-96.374	-32.699	33.274
	(0.16)	(0.53)	(-0.59)	(-0.83)	(-0.40)	(0.50)
Oct	22.597	109.44	5.042	59.866	98.488	93.278
	(0.28)	(1.16)	(0.05)	(0.66)	(1.49)	(1.79)
Nov	170.305	209.75	201.967	299.289	280.919	130.07
	(2.27)	(2.57)	(2.45)	(3.88)	(5.04)	(2.76)
_cons	1666.28	63.43	591.822	897.011	536.19	268.961
	(4.99)	(0.11)	(1.02)	(2.49)	(1.99)	(1.34)

Wheat Dessie

WD_1	0.427 (3.74)	0.453 (4.29)	0.514 (4.34)	0.515 (4.24)	0.481 (3.13)	0.548 (4.37)
WD_2	0.029 (0.25)	0.161 (1.54)	0.103 (0.85)	0.068 (0.52)	-0.096 (-0.74)	0.001 (0.01)
pfa	-13.373 (-3.05)	5.133 (0.74)	13.352 (2.58)	10.928 (2.30)	20.398 (3.47)	8.52 (2.71)
pfa_1	13.026 (1.74)	44.525 (1.95)	31.284 (1.08)	-11.167 (-1.43)	-17.4 (-2.94)	-9.301 (-2.06)
POP	-0.017 (-4.07)	-0.008 (-1.56)	-0.004 (-1.07)	-0.01 (-2.34)	-0.01 (-2.40)	-0.012 (-2.22)
RD	0.447 (1.94)	0.146 (0.56)	0.166 (0.65)	0.508 (1.34)	-0.198 (-0.46)	0.703 (1.60)
RD_1	-0.459 (-1.71)	0.12 (0.45)	0.093 (0.34)	0.12 (0.35)	0.368 (0.99)	-0.13 (-0.33)
Jan	-202.13 (-3.16)	-71.605 (-0.99)	-42.719 (-0.57)	-41.955 (-0.55)	-84.635 (-1.31)	116.364 (1.51)
Feb	-242.36 (-3.69)	-88.846 (-1.21)	-44.836 (-0.59)	-37.822 (-0.51)	-99.905 (-1.48)	87.198 (1.16)
Mar	-224.77 (-3.12)	-102.01 (-1.34)	-70.939 (-0.91)	-73.053 (-0.95)	-30.495 (-0.42)	119.654 (1.56)
Apr	-64.142 (-0.86)	56.437 (0.71)	141.72 (1.76)	89.62 (1.02)	42.157 (0.53)	140.418 (1.72)
May	-75.161 (-1.08)	54.042 (0.71)	77.061 (0.96)	46.783 (0.58)	-6.651 (-0.09)	133.951 (1.81)
Jun	65.868 (0.95)	119.323 (1.54)	162.104 (2.04)	191.755 (2.60)	213.524 (3.23)	154.177 (2.05)
Jul	-175.92 (-2.09)	-100.05 (-1.00)	-82.171 (-0.81)	-159.67 (-0.86)	-105.77 (-0.64)	-41.639 (-0.25)

Aug	45.671 (0.48)	107.267 (1.11)	70.41 (0.72)	-57.224 (-0.37)	51.228 (0.34)	-46.494 (-0.30)
Sep	-91.066 (-1.41)	78.629 (1.04)	103.636 (1.43)	107.375 (1.34)	92.779 (1.30)	109.108 (1.33)
Oct	-49.627 (-0.77)	52.96 (0.73)	73.483 (1.03)	67.307 (0.90)	94.725 (1.46)	43.425 (0.61)
Nov	-28.483 (-0.45)	41.791 (0.58)	67.136 (0.96)	49.624 (0.73)	49.714 (0.82)	138.744 (1.92)
_cons	2300.77 (4.67)	869.216 (1.50)	605.499 (1.09)	1398.88 (3.04)	1735.66 (3.28)	1553.19 (3.11)

Wheat Addis

WA_1	0.462 (5.11)	0.533 (6.45)	0.554 (6.63)	0.418 (4.46)	0.306 (2.75)	0.405 (4.49)
WA_2	0.408 (4.28)	0.323 (3.88)	0.291 (3.49)	0.36 (3.84)	0.2 (1.84)	0.322 (3.60)
pfa	-4.101 (-1.03)	-6.593 (-1.21)	-0.272 (-0.09)	2.267 (0.68)	10.744 (3.33)	8.119 (3.62)
pfa_1	0.761 (0.13)	-9.224 (-0.59)	-13.939 (-0.59)	-2.18 (-0.37)	-5.325 (-1.54)	-5.896 (-2.06)
POP	-0.002 (-0.73)	-0.006 (-1.44)	-0.002 (-0.70)	-0.006 (-1.48)	-0.012 (-2.70)	-0.004 (-1.15)
RA	-0.877 (-3.28)	-0.767 (-3.27)	-0.67 (-3.09)	-0.33 (-1.22)	0.162 (0.57)	0.004 (0.02)
RA_1	0.093 (0.33)	0.024 (0.09)	0.369 (1.32)	0.983 (2.95)	0.466 (1.54)	0.544 (2.12)
Jan	56.739 (0.96)	69.429 (1.24)	104.558 (1.83)	129.37 (2.24)	26.008 (0.49)	93.965 (2.03)
Feb	56.616 (0.96)	35.521 (0.64)	105.579 (1.88)	42.761 (0.76)	-15.011 (-0.28)	41.461 (0.90)
Mar	-15.809 (-0.25)	39.117 (0.66)	97.109 (1.69)	70.073 (1.21)	-6.946 (-0.12)	61.605 (1.25)
Apr	65.296 (1.00)	92.316 (1.51)	125.292 (2.01)	43.81 (0.67)	45.341 (0.67)	129.337 (2.52)
May	161.57 (2.35)	198.243 (3.01)	215.559 (3.32)	156.858 (2.42)	76.334 (1.19)	92.418 (1.82)
Jun	219.28 (2.53)	206.199 (2.66)	203.175 (2.70)	132.345 (1.83)	80.324 (1.10)	118.87 (2.01)
Jul	230.146 (2.27)	232.71 (2.47)	185.857 (2.07)	-34.109 (-0.31)	-19.943 (-0.18)	20.356 (0.22)

Aug	288.947 (2.93)	293.115 (3.15)	254.744 (2.78)	13.884 (0.13)	-21.806 (-0.19)	23.07 (0.25)
Sep	182.559 (2.61)	188.869 (2.89)	147.335 (2.30)	35.465 (0.50)	103.031 (1.49)	122.404 (2.08)
Oct	137.889 (2.36)	157.908 (2.71)	159.4 (2.93)	106.599 (1.91)	124.663 (2.39)	124.989 (2.76)
Nov	55.096 (0.98)	23.823 (0.44)	90.571 (1.75)	123.938 (2.38)	90.121 (1.84)	76.86 (1.73)
_cons	377.202 (1.17)	743.987 (1.70)	472.802 (0.98)	700.969 (1.60)	1581.53 (3.03)	615.359 (1.94)

Teff Markos

TM_1	0.58 (5.85)	0.573 (6.02)	0.691 (6.39)	0.72 (6.82)	0.577 (5.29)	0.503 (5.10)
TM_2	0.211 (1.95)	0.361 (3.58)	0.226 (2.05)	-0.036 (-0.37)	-0.072 (-0.64)	0.052 (0.57)
pfa	-10.729 (-2.27)	-7.901 (-1.27)	-2.045 (-0.50)	10.979 (2.86)	15.759 (4.00)	14.971 (5.84)
pfa_1	-3.628 (-0.44)	-22.081 (-1.09)	-51.214 (-2.00)	6.859 (1.09)	-7.091 (-1.86)	-14.322 (-4.19)
POP	0.001 (0.60)	-0.002 (-0.42)	0 (-0.11)	0 (-0.20)	0.008 (2.80)	0.013 (4.16)
RM	-0.01 (-0.04)	-0.295 (-1.11)	-0.37 (-1.33)	0.168 (0.70)	0.261 (1.17)	0.325 (1.53)
RM_1	-0.695 (-2.37)	-0.112 (-0.40)	0.118 (0.41)	-0.112 (-0.47)	-0.335 (-1.52)	-0.337 (-1.70)
Jan	-270.53 (-3.71)	-229.24 (-3.51)	-234.8 (-3.67)	-164.81 (-2.77)	-156.83 (-2.91)	-65.3 (-1.30)
Feb	-121.59 (-1.56)	-59.956 (-0.88)	24.353 (0.37)	54.265 (0.88)	-103.5 (-1.84)	-139.4 (-2.76)
Mar	-143.44 (-1.80)	-84.715 (-1.23)	-86.88 (-1.27)	-120.22 (-1.99)	-149.68 (-2.67)	-130.16 (-2.55)
Apr	-37.033 (-0.44)	-4.973 (-0.07)	15.019 (0.23)	35.084 (0.56)	-68.115 (-1.15)	-139.36 (-2.63)
May	-34.836 (-0.41)	24.428 (0.34)	33.93 (0.49)	58.689 (0.94)	-12.632 (-0.22)	-31.695 (-0.61)
Jun	170.918 (1.69)	160.845 (1.87)	109.395 (1.30)	45.484 (0.59)	6.718 (0.10)	22.927 (0.36)
Jul	229.769 (1.96)	127.487 (1.23)	61.605 (0.65)	-6.089 (-0.07)	-38.71 (-0.45)	-58.915 (-0.74)

Aug	173.805 (1.32)	125.169 (1.08)	118.514 (1.06)	77.054 (0.73)	25.066 (0.27)	-35.694 (-0.41)
Sep	104.697 (1.00)	93.388 (0.97)	49.443 (0.56)	-17.4 (-0.22)	-13.77 (-0.19)	-0.357 (-0.01)
Oct	18.874 (0.24)	1.028 (0.01)	-10.996 (-0.16)	7.631 (0.12)	-21.438 (-0.37)	-22.496 (-0.43)
Nov	61.639 (0.86)	-37.254 (-0.57)	-64.757 (-1.09)	1.997 (0.04)	-18.002 (-0.36)	-17.585 (-0.37)
_cons	488.592 (2.11)	546.004 (1.15)	655.654 (1.64)	431.196 (2.34)	335.445 (1.92)	-8.162 (-0.05)

Teff Dessie

TD_1	0.47 (3.75)	0.507 (3.90)	0.612 (4.50)	0.989 (7.49)	0.559 (4.56)	0.699 (6.06)
TD_2	0.108 (0.81)	0.152 (1.10)	0.062 (0.45)	-0.234 (-1.71)	0.029 (0.22)	0.042 (0.36)
pfa	-16.278 (-3.12)	-4.304 (-0.51)	5.029 (0.95)	3.506 (1.00)	11.709 (3.51)	7.723 (3.79)
pfa_1	3.032 (0.35)	21.202 (0.88)	-5.02 (-0.14)	-2.961 (-0.44)	-0.019 (-0.01)	-2.384 (-0.87)
POP	-0.002 (-0.82)	-0.001 (-0.17)	0.003 (0.72)	-0.002 (-0.76)	0.002 (0.88)	-0.001 (-0.25)
RD	0.49 (1.76)	0.179 (0.58)	0.261 (0.84)	-0.219 (-0.61)	-0.762 (-2.25)	-0.111 (-0.41)
RD_1	-0.478 (-1.56)	0.024 (0.08)	0.062 (0.19)	0.069 (0.22)	0.636 (2.55)	0.371 (1.55)
Jan	-72.73 (-0.94)	-23.59 (-0.28)	-59.993 (-0.66)	-11.141 (-0.17)	-43.294 (-0.84)	2.597 (0.06)
Feb	-251.88 (-3.23)	-147.98 (-1.73)	-169.61 (-1.85)	-62.292 (-0.95)	-45.728 (-0.89)	21.593 (0.46)
Mar	-102.43 (-1.21)	-41.84 (-0.48)	-81.454 (-0.89)	67.249 (1.00)	-4.462 (-0.09)	24.873 (0.52)
Apr	-76.111 (-0.87)	-9.772 (-0.11)	-10.541 (-0.11)	-5.989 (-0.08)	-13.518 (-0.23)	-2.566 (-0.05)
May	-91.803 (-1.11)	4.404 (0.05)	-18.798 (-0.20)	78.182 (1.18)	66.229 (1.27)	7.598 (0.16)
Jun	12.502 (0.14)	33.75 (0.36)	-49.985 (-0.50)	37.763 (0.56)	24.299 (0.47)	38.579 (0.82)
Jul	-46.032 (-0.45)	-16.922 (-0.15)	-82.079 (-0.69)	132.581 (0.82)	93.961 (0.77)	-21.571 (-0.20)

Aug	94.544 (0.88)	67.103 (0.61)	-4.428 (-0.04)	115.625 (0.83)	156.998 (1.34)	-3.049 (-0.03)
Sep	172.278 (2.22)	190.403 (2.18)	128.286 (1.45)	62.517 (0.88)	47.22 (0.87)	14.262 (0.28)
Oct	-53.094 (-0.65)	-85.283 (-0.93)	-169.55 (-1.80)	-112.91 (-1.70)	-15.386 (-0.31)	-50.331 (-1.12)
Nov	-89.191 (-1.15)	-114.01 (-1.32)	-181.11 (-2.10)	-23.683 (-0.38)	14.405 (0.30)	6.396 (0.14)
_cons	1249.13 (3.20)	704.802 (1.00)	568.914 (0.98)	655.219 (2.27)	624.061 (2.30)	509.502 (1.94)

Teff Addis

TA_1	0.74 (7.96)	0.771 (9.13)	0.834 (8.29)	0.584 (4.98)	0.637 (5.34)	0.575 (4.99)
TA_2	0.076 (0.79)	0.182 (2.00)	0.145 (1.48)	-0.021 (-0.20)	-0.035 (-0.33)	0.162 (1.41)
pfa	-5.489 (-1.63)	-12.157 (-2.44)	-1.123 (-0.33)	4.14 (1.60)	6.711 (2.90)	3.744 (2.00)
pfa_1	0.142 (0.02)	-24.147 (-1.72)	-7.731 (-0.27)	1.896 (0.40)	0.957 (0.33)	0.674 (0.23)
POP	-0.001 (-0.48)	-0.005 (-1.41)	0.002 (0.57)	-0.013 (-3.19)	-0.009 (-1.91)	-0.007 (-1.28)
RA	-0.891 (-3.34)	-1.068 (-4.88)	-1.125 (-4.72)	-0.492 (-2.00)	-0.25 (-0.92)	-0.343 (-1.16)
RA_1	-0.097 (-0.35)	0.069 (0.27)	0.115 (0.39)	0.676 (2.41)	0.345 (1.34)	0.321 (1.04)
Jan	39.656 (0.60)	76.785 (1.50)	136.285 (2.32)	77.837 (1.63)	39.007 (0.80)	41.666 (0.83)
Feb	48.917 (0.76)	69.675 (1.37)	165.255 (2.81)	107.311 (2.28)	96.54 (1.88)	136.305 (2.64)
Mar	33.378 (0.48)	78.447 (1.44)	155.563 (2.56)	83.819 (1.71)	92.496 (1.69)	137.108 (2.38)
Apr	80.71 (1.14)	131.25 (2.32)	218.349 (3.31)	48.198 (0.84)	60.341 (0.97)	156.402 (2.63)
May	228.582 (3.10)	271.423 (4.44)	376.869 (5.45)	219.091 (3.75)	155.285 (2.55)	162.057 (2.77)
Jun	278.017 (3.05)	276.147 (3.87)	372.1 (4.72)	242.333 (3.86)	216.197 (3.13)	245.958 (3.52)
Jul	240.845 (2.28)	236.339 (2.69)	300.178 (3.20)	44.426 (0.46)	70.734 (0.70)	155.516 (1.40)

Aug	284.289 (2.75)	365.45 (4.30)	475.703 (4.99)	206.125 (2.12)	198.875 (1.90)	243.11 (2.16)
Sep	136.507 (1.81)	164.81 (2.75)	239.504 (3.65)	101.57 (1.70)	155.949 (2.57)	196.442 (2.89)
Oct	134.171 (2.10)	155.443 (2.96)	232.908 (4.23)	160.383 (3.47)	176.311 (3.88)	196.7 (4.02)
Nov	80.046 (1.29)	45.378 (0.92)	106.283 (2.03)	146.505 (3.51)	148.597 (3.48)	131.782 (2.71)
_cons	573.622 (1.96)	725.908 (1.61)	-155.32 (-0.22)	1799.96 (3.22)	1449.74 (2.17)	934.664 (1.51)

Appendix Table 4. Results for Seemingly Unrelated Regression Model for Windfall Period (Per Capita Food Production Greater Than Per Capita Food Demand)

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
MM (Maize_Markos)	72	18	85.59701	0.8357	418.49	0.0000
MD (Maize_Dessie)	72	18	103.7767	0.6518	139.75	0.0000
MA (Maize_Addis)	72	18	91.93547	0.7556	231.80	0.0000
WM (wheat_Markos)	72	18	108.8341	0.8720	499.95	0.0000
WD (Wheat_Dessie)	72	18	122.4569	0.8587	436.09	0.0000
WA (Wheat_Addis)	72	18	90.95185	0.8892	614.23	0.0000
TM (Teff_Markos)	72	18	99.72896	0.8249	345.13	0.0000
TD (Teff_Dessie)	72	18	92.33187	0.8748	516.75	0.0000
TA (Teff_Addis)	72	18	75.52039	0.8585	460.16	0.0000

Maize Markos	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
MM_1	0.731	0.094	7.76	0	0.546	0.915
MM_2	0.138	0.100	1.38	0.167	-0.058	0.334
Dpfa	0.257	2.311	0.11	0.911	-4.272	4.786
pfa_1	-3.489	2.612	-1.34	0.182	-8.607	1.630
POP	0.002	0.003	0.86	0.389	-0.003	0.008
RM	0.136	0.186	0.73	0.464	-0.229	0.501
RM_1	-0.042	0.204	-0.2	0.838	-0.441	0.358
Jan	2.523	51.522	0.05	0.961	-98.459	103.504
Feb	37.533	51.684	0.73	0.468	-63.767	138.833
Mar	76.931	52.644	1.46	0.144	-26.249	180.112
Apr	34.099	54.095	0.63	0.528	-71.924	140.123
May	114.311	52.322	2.18	0.029	11.762	216.860
Jun	140.256	64.228	2.18	0.029	14.373	266.140
Jul	68.638	77.483	0.89	0.376	-83.227	220.503
Aug	73.835	85.876	0.86	0.39	-94.479	242.150
Sep	73.404	70.321	1.04	0.297	-64.423	211.231
Oct	44.833	56.296	0.8	0.426	-65.505	155.171
Nov	-79.929	50.381	-1.59	0.113	-178.674	18.817
_cons	-27.149	202.923	-0.13	0.894	-424.871	370.573

Maize
Dessie

MD_1	0.319	0.085	3.75	0	0.152	0.486
MD_2	0.239	0.089	2.7	0.007	0.066	0.413
Dpfa	0.442	2.615	0.17	0.866	-4.684	5.568
pfa_1	0.985	2.810	0.35	0.726	-4.522	6.493
POP	-0.003	0.003	-0.96	0.338	-0.010	0.003
RD	0.027	0.224	0.12	0.906	-0.413	0.466
RD_1	0.193	0.202	0.95	0.34	-0.203	0.589
Jan	-2.807	57.651	-0.05	0.961	-115.801	110.187
Feb	-41.978	56.015	-0.75	0.454	-151.765	67.810
Mar	47.168	56.608	0.83	0.405	-63.783	158.118
Apr	28.967	60.368	0.48	0.631	-89.353	147.287
May	58.197	56.229	1.03	0.301	-52.010	168.403
Jun	97.866	56.837	1.72	0.085	-13.533	209.265
Jul	6.119	105.263	0.06	0.954	-200.194	212.431
Aug	54.825	93.632	0.59	0.558	-128.690	238.339
Sep	82.698	63.184	1.31	0.191	-41.140	206.537
Oct	-76.382	59.099	-1.29	0.196	-192.213	39.450
Nov	-113.253	56.703	-2	0.046	-224.388	-2.118
_cons	730.341	280.999	2.6	0.009	179.592	1281.089

Maize
Addis

MA_1	0.548	0.093	5.89	0	0.365	0.730
MA_2	0.043	0.087	0.49	0.623	-0.128	0.213
dpfa	-0.386	2.471	-0.16	0.876	-5.230	4.457
pfa_1	5.503	2.910	1.89	0.059	-0.201	11.206
POP	-0.007	0.003	-2.14	0.032	-0.014	-0.001
RA	-0.169	0.263	-0.64	0.52	-0.684	0.346
RA_1	-0.070	0.229	-0.3	0.762	-0.519	0.380
Jan	69.234	51.909	1.33	0.182	-32.506	170.973
Feb	58.554	52.579	1.11	0.265	-44.499	161.606
Mar	57.339	54.209	1.06	0.29	-48.909	163.587
Apr	64.386	55.788	1.15	0.248	-44.956	173.727
May	93.046	55.953	1.66	0.096	-16.621	202.713
Jun	247.801	63.982	3.87	0	122.400	373.202
Jul	149.767	98.539	1.52	0.129	-43.367	342.900
Aug	195.877	92.502	2.12	0.034	14.577	377.177
Sep	139.701	63.319	2.21	0.027	15.598	263.804
Oct	77.397	53.891	1.44	0.151	-28.227	183.022
Nov	15.967	51.196	0.31	0.755	-84.375	116.309
_cons	838.625	266.568	3.15	0.002	316.161	1361.089

Wheat
Markos

WM_1	0.480	0.099	4.86	0	0.286	0.673
WM_2	0.201	0.093	2.17	0.03	0.019	0.382
Dpfa	-1.015	2.893	-0.35	0.726	-6.685	4.655
pfa_1	3.674	3.493	1.05	0.293	-3.172	10.520
POP	-0.016	0.005	-2.91	0.004	-0.026	-0.005
RM	-0.104	0.260	-0.4	0.69	-0.613	0.405
RM_1	0.112	0.286	0.39	0.696	-0.449	0.672
Jan	-77.322	64.159	-1.21	0.228	-203.072	48.428
Feb	145.869	66.881	2.18	0.029	14.785	276.953
Mar	57.289	66.963	0.86	0.392	-73.956	188.533
Apr	31.031	66.114	0.47	0.639	-98.550	160.612
May	122.031	66.969	1.82	0.068	-9.226	253.288
Jun	267.671	81.989	3.26	0.001	106.976	428.365
Jul	205.279	102.964	1.99	0.046	3.472	407.085
Aug	213.638	115.649	1.85	0.065	-13.031	440.306
Sep	181.217	92.218	1.97	0.049	0.472	361.962
Oct	182.581	70.169	2.6	0.009	45.053	320.109
Nov	148.006	61.931	2.39	0.017	26.623	269.390
_cons	1326.969	432.060	3.07	0.002	480.147	2173.791

Wheat
Dessie

WD_1	0.482	0.108	4.47	0	0.271	0.694
WD_2	0.072	0.104	0.69	0.489	-0.132	0.277
dpfa	-3.131	3.398	-0.92	0.357	-9.790	3.528
pfa_1	2.418	3.415	0.71	0.479	-4.276	9.113
POP	-0.029	0.008	-3.54	0	-0.045	-0.013
RD	0.489	0.373	1.31	0.19	-0.242	1.220
RD_1	0.041	0.331	0.13	0.9	-0.607	0.690
Jan	-2.456	71.924	-0.03	0.973	-143.424	138.512
Feb	-27.060	71.174	-0.38	0.704	-166.558	112.438
Mar	-11.245	73.588	-0.15	0.879	-155.475	132.986
Apr	41.548	78.359	0.53	0.596	-112.033	195.129
May	77.905	71.285	1.09	0.274	-61.810	217.621
Jun	69.276	70.804	0.98	0.328	-69.496	208.049
Jul	-125.307	158.911	-0.79	0.43	-436.768	186.154
Aug	29.478	139.415	0.21	0.833	-243.770	302.727
Sep	78.357	80.967	0.97	0.333	-80.336	237.050
Oct	-4.255	72.588	-0.06	0.953	-146.524	138.015
Nov	107.416	71.674	1.5	0.134	-33.062	247.894
_cons	2678.065	702.193	3.81	0	1301.792	4054.339

Wheat
Addis

WA_1	0.438	0.090	4.87	0	0.262	0.615
WA_2	0.331	0.090	3.67	0	0.154	0.507
dpfa	-1.781	2.643	-0.67	0.5	-6.961	3.399
pfa_1	1.634	2.987	0.55	0.584	-4.220	7.489
POP	-0.013	0.006	-2.42	0.015	-0.024	-0.003
RA	-0.677	0.338	-2	0.045	-1.339	-0.015
RA_1	0.217	0.287	0.76	0.449	-0.345	0.779
Jan	112.265	53.120	2.11	0.035	8.152	216.378
Feb	24.040	54.167	0.44	0.657	-82.126	130.206
Mar	45.752	56.765	0.81	0.42	-65.505	157.010
Apr	135.764	60.609	2.24	0.025	16.973	254.555
May	138.527	60.918	2.27	0.023	19.129	257.925
Jun	226.213	71.486	3.16	0.002	86.103	366.323
Jul	237.541	116.115	2.05	0.041	9.960	465.122
Aug	233.511	110.467	2.11	0.035	16.999	450.023
Sep	217.020	70.074	3.1	0.002	79.678	354.363
Oct	156.760	57.104	2.75	0.006	44.838	268.681
Nov	48.077	52.871	0.91	0.363	-55.548	151.703
_cons	1231.576	486.769	2.53	0.011	277.526	2185.626

Teff
Markos

TM_1	0.539	0.095	5.68	0	0.353	0.725
TM_2	0.089	0.095	0.94	0.348	-0.097	0.274
dpfa	-5.197	2.950	-1.76	0.078	-10.979	0.584
pfa_1	7.916	3.094	2.56	0.011	1.851	13.980
POP	-0.012	0.004	-2.74	0.006	-0.020	-0.003
RM	0.038	0.237	0.16	0.874	-0.426	0.502
RM_1	-0.425	0.256	-1.66	0.096	-0.927	0.076
Jan	-135.301	57.468	-2.35	0.019	-247.937	-22.666
Feb	-100.977	58.580	-1.72	0.085	-215.792	13.839
Mar	-156.742	59.093	-2.65	0.008	-272.563	-40.921
Apr	-71.950	61.840	-1.16	0.245	-193.154	49.254
May	-27.764	61.744	-0.45	0.653	-148.779	93.252
Jun	133.587	75.295	1.77	0.076	-13.989	281.162
Jul	84.318	92.720	0.91	0.363	-97.410	266.045
Aug	116.794	105.085	1.11	0.266	-89.168	322.756
Sep	75.481	83.592	0.9	0.367	-88.357	239.318
Oct	21.532	64.212	0.34	0.737	-104.321	147.385
Nov	-4.498	56.857	-0.08	0.937	-115.936	106.941
_cons	1454.744	387.762	3.75	0	694.745	2214.743

Teff
Dessie

TD_1	0.802	0.106	7.54	0	0.594	1.011
TD_2	-0.086	0.116	-0.74	0.46	-0.313	0.142
dpfa	-1.677	2.730	-0.61	0.539	-7.028	3.674
pfa_1	5.781	2.717	2.13	0.033	0.455	11.107
POP	-0.014	0.005	-2.59	0.01	-0.024	-0.003
RD	-0.045	0.277	-0.16	0.872	-0.588	0.499
RD_1	0.047	0.249	0.19	0.852	-0.442	0.535
Jan	51.543	53.541	0.96	0.336	-53.395	156.481
Feb	-35.383	53.426	-0.66	0.508	-140.096	69.330
Mar	47.991	54.378	0.88	0.377	-58.587	154.569
Apr	4.116	59.270	0.07	0.945	-112.050	120.283
May	55.646	53.002	1.05	0.294	-48.236	159.527
Jun	92.132	53.627	1.72	0.086	-12.976	197.239
Jul	87.666	121.122	0.72	0.469	-149.729	325.062
Aug	103.797	104.482	0.99	0.32	-100.983	308.578
Sep	94.486	60.863	1.55	0.121	-24.804	213.776
Oct	-69.998	55.102	-1.27	0.204	-177.996	38.000
Nov	22.443	54.985	0.41	0.683	-85.326	130.212
_cons	1428.053	507.001	2.82	0.005	434.348	2421.757

Teff
Addis

TA_1	0.538	0.093	5.8	0	0.356	0.720
TA_2	0.135	0.098	1.38	0.169	-0.057	0.326
dpfa	1.190	2.282	0.52	0.602	-3.283	5.662
pfa_1	0.868	2.001	0.43	0.665	-3.055	4.791
POP	-0.014	0.004	-3.24	0.001	-0.022	-0.005
RA	-0.322	0.290	-1.11	0.265	-0.890	0.245
RA_1	0.312	0.246	1.27	0.205	-0.170	0.794
Jan	41.597	45.069	0.92	0.356	-46.736	129.931
Feb	42.337	44.780	0.95	0.344	-45.431	130.105
Mar	28.459	48.513	0.59	0.557	-66.625	123.544
Apr	71.214	51.477	1.38	0.167	-29.679	172.108
May	94.847	51.709	1.83	0.067	-6.501	196.194
Jun	186.415	61.173	3.05	0.002	66.517	306.312
Jul	53.032	99.487	0.53	0.594	-141.958	248.023
Aug	118.349	94.454	1.25	0.21	-66.776	303.475
Sep	119.959	58.965	2.03	0.042	4.390	235.528
Oct	87.437	46.754	1.87	0.061	-4.200	179.074
Nov	94.006	43.644	2.15	0.031	8.465	179.546
_cons	1661.469	491.952	3.38	0.001	697.261	2625.677

Appendix Table 4. Results for Seemingly Unrelated Regression Model for Shortfall Period (Per Capita Food Production Less than Per Capita Food Demand)

Equation		Obs	Parms	RMSE	"R-sq"	chi2	P
MM	(Maize_Markos)	53	18	123.4113	0.7740	180.68	0.0000
MD	(Maize_Dessie)	53	18	124.8441	0.7096	124.49	0.0000
MA	(Maize_Addis)	53 18	60.15636	0.9009	499.41	0.0000	
WM	(wheat_Mark)	53	18	115.2513	0.8018	232.77	0.0000
WD	(Wheat_Dessie)	53	18	100.9584	0.7386	153.93	0.0000
WA	(Wheat_Addis)	53	18	75.54891	0.8964	519.09	0.0000
TM	(Teff_Markos)	53	18	108.4213	0.8901	471.65	0.0000
TD	(Teff_Dessie)	53	18	110.5371	0.7562	160.79	0.0000
TA	(Teff_Addis)	53	18	108.2382	0.7707	201.02	0.0000

	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
Maize						
Markos						
MM_1	0.381	0.160	2.39	0.017	0.068	0.694
MM_2	0.060	0.145	0.42	0.677	-0.223	0.344
dpfa	1.137	10.794	0.11	0.916	-20.018	22.292
pfa_1	-16.681	5.219	-3.20	0.001	-26.910	-6.452
POP	0.011	0.004	2.96	0.003	0.004	0.019
RM	0.089	0.437	0.20	0.838	-0.767	0.946
RM_1	-0.434	0.350	-1.24	0.215	-1.121	0.252
Jan	-59.493	83.351	-0.71	0.475	-222.858	103.873
Feb	-26.664	83.498	-0.32	0.749	-190.316	136.988
Mar	-47.476	87.760	-0.54	0.589	-219.482	124.530
Apr	-21.257	90.543	-0.23	0.814	-198.719	156.205
May	149.894	92.487	1.62	0.105	-31.377	331.166
Jun	106.968	125.713	0.85	0.395	-139.425	353.362
Jul	37.954	182.443	0.21	0.835	-319.628	395.537
Aug	120.139	178.175	0.67	0.500	-229.077	469.355
Sep	83.677	132.347	0.63	0.527	-175.718	343.073
Oct	39.588	87.618	0.45	0.651	-132.141	211.316
Nov	-33.995	78.613	-0.43	0.665	-188.074	120.083
_cons	-102.669	196.130	-0.52	0.601	-487.076	281.738

Maize
Dessie

MD_1	0.226	0.118	1.93	0.054	-0.004	0.457
MD_2	0.334	0.123	2.72	0.007	0.093	0.575
dpfa	18.287	11.871	1.54	0.123	-4.979	41.553
pfa_1	-7.886	4.264	-1.85	0.064	-16.243	0.472
POP	0.002	0.003	0.68	0.499	-0.004	0.008
RD	0.440	0.349	1.26	0.207	-0.244	1.123
RD_1	-0.417	0.391	-1.07	0.286	-1.183	0.350
Jan	51.260	85.581	0.60	0.549	-116.476	218.996
Feb	7.443	87.118	0.09	0.932	-163.305	178.191
Mar	33.327	90.701	0.37	0.713	-144.444	211.098
Apr	107.967	91.639	1.18	0.239	-71.643	287.577
May	95.404	87.829	1.09	0.277	-76.738	267.546
Jun	198.230	92.680	2.14	0.032	16.580	379.881
Jul	77.646	112.108	0.69	0.489	-142.083	297.374
Aug	110.959	125.960	0.88	0.378	-135.918	357.835
Sep	-15.051	84.000	-0.18	0.858	-179.687	149.585
Oct	147.896	79.679	1.86	0.063	-8.272	304.063
Nov	14.252	84.593	0.17	0.866	-151.548	180.052
_cons	244.262	194.787	1.25	0.210	-137.512	626.037

Maize
Addis

MA_1	0.710	0.119	5.98	0.000	0.478	0.943
MA_2	0.089	0.117	0.76	0.447	-0.141	0.319
dpfa	-2.543	5.450	-0.47	0.641	-13.224	8.138
pfa_1	-6.484	2.436	-2.66	0.008	-11.260	-1.709
POP	0.002	0.002	1.60	0.110	-0.001	0.005
RA	-0.485	0.178	-2.72	0.007	-0.835	-0.135
RA_1	0.292	0.210	1.39	0.164	-0.120	0.704
Jan	10.929	41.142	0.27	0.791	-69.707	91.565
Feb	19.097	41.123	0.46	0.642	-61.502	99.696
Mar	41.851	45.588	0.92	0.359	-47.499	131.202
Apr	32.976	47.952	0.69	0.492	-61.008	126.959
May	32.156	49.089	0.66	0.512	-64.057	128.369
Jun	163.417	68.248	2.39	0.017	29.653	297.182
Jul	93.020	74.547	1.25	0.212	-53.089	239.129
Aug	93.000	78.480	1.19	0.236	-60.817	246.817
Sep	93.950	52.286	1.80	0.072	-8.527	196.428
Oct	37.103	39.555	0.94	0.348	-40.424	114.630
Nov	-21.439	38.404	-0.56	0.577	-96.710	53.832
_cons	101.205	103.646	0.98	0.329	-101.938	304.348

Wheat
Markos

WM_1	0.631	0.108	5.83	0.000	0.419	0.843
WM_2	0.087	0.126	0.69	0.487	-0.159	0.334
dpfa	-1.987	10.528	-0.19	0.850	-22.621	18.646
pfa_1	-11.950	4.145	-2.88	0.004	-20.075	-3.826
POP	0.005	0.002	2.08	0.038	0.000	0.010
RM	0.566	0.372	1.52	0.129	-0.164	1.295
RM_1	-0.120	0.301	-0.40	0.689	-0.710	0.469
Jan	-102.823	87.610	-1.17	0.241	-274.536	68.890
Feb	-51.922	85.837	-0.60	0.545	-220.161	116.316
Mar	-58.807	85.256	-0.69	0.490	-225.905	108.291
Apr	-35.920	87.041	-0.41	0.680	-206.518	134.678
May	-25.549	88.394	-0.29	0.773	-198.799	147.701
Jun	-36.819	109.979	-0.33	0.738	-252.374	178.735
Jul	3.703	136.047	0.03	0.978	-262.945	270.351
Aug	-10.816	147.483	-0.07	0.942	-299.877	278.245
Sep	-25.068	109.765	-0.23	0.819	-240.204	190.068
Oct	5.233	79.998	0.07	0.948	-151.561	162.027
Nov	202.031	75.947	2.66	0.008	53.177	350.884
_cons	80.598	205.107	0.39	0.694	-321.405	482.601

Wheat
Dessie

WD_1	0.549	0.144	3.82	0.000	0.267	0.831
WD_2	0.357	0.147	2.43	0.015	0.069	0.646
dpfa	8.548	8.870	0.96	0.335	-8.838	25.934
pfa_1	-4.545	3.381	-1.34	0.179	-11.173	2.082
POP	-0.001	0.002	-0.59	0.557	-0.006	0.003
RD	-0.098	0.291	-0.34	0.735	-0.668	0.472
RD_1	-0.132	0.318	-0.41	0.678	-0.755	0.491
Jan	-101.125	68.443	-1.48	0.140	-235.270	33.020
Feb	-131.091	69.487	-1.89	0.059	-267.283	5.101
Mar	-33.945	76.340	-0.44	0.657	-183.569	115.679
Apr	140.091	75.068	1.87	0.062	-7.040	287.221
May	42.134	71.216	0.59	0.554	-97.447	181.715
Jun	231.386	74.526	3.10	0.002	85.318	377.454
Jul	-57.347	89.489	-0.64	0.522	-232.742	118.048
Aug	-21.618	113.324	-0.19	0.849	-243.728	200.492
Sep	-53.682	68.819	-0.78	0.435	-188.565	81.202
Oct	16.842	65.646	0.26	0.798	-111.821	145.505
Nov	18.032	64.186	0.28	0.779	-107.771	143.835
_cons	266.218	340.459	0.78	0.434	-401.070	933.505

Wheat
Addis

WA_1	0.705	0.117	6.05	0.000	0.476	0.933
WA_2	0.092	0.124	0.74	0.458	-0.151	0.336
dpfa	-6.382	7.350	-0.87	0.385	-20.786	8.023
pfa_1	-10.509	3.085	-3.41	0.001	-16.555	-4.462
POP	0.000	0.002	0.14	0.888	-0.003	0.004
RA	-0.387	0.188	-2.06	0.040	-0.756	-0.019
RA_1	-0.226	0.243	-0.93	0.352	-0.703	0.250
Jan	24.716	51.543	0.48	0.632	-76.305	125.738
Feb	81.752	50.676	1.61	0.107	-17.571	181.075
Mar	11.482	54.690	0.21	0.834	-95.709	118.672
Apr	125.361	60.847	2.06	0.039	6.102	244.620
May	130.370	58.283	2.24	0.025	16.138	244.602
Jun	155.919	77.998	2.00	0.046	3.045	308.793
Jul	195.260	87.233	2.24	0.025	24.286	366.234
Aug	268.247	90.538	2.96	0.003	90.796	445.699
Sep	184.536	62.242	2.96	0.003	62.544	306.528
Oct	96.537	47.364	2.04	0.042	3.704	189.370
Nov	65.061	46.943	1.39	0.166	-26.945	157.067
_cons	426.681	241.263	1.77	0.077	-46.184	899.547

Teff
Markos

TM_1	0.746	0.109	6.87	0.000	0.533	0.959
TM_2	0.003	0.118	0.02	0.981	-0.228	0.233
dpfa	-4.608	9.512	-0.48	0.628	-23.252	14.035
pfa_1	-12.010	3.714	-3.23	0.001	-19.289	-4.730
POP	0.010	0.003	3.23	0.001	0.004	0.016
RM	-0.013	0.301	-0.04	0.965	-0.603	0.577
RM_1	-0.244	0.247	-0.99	0.324	-0.729	0.241
Jan	-224.608	72.861	-3.08	0.002	-367.414	-81.802
Feb	-150.507	78.250	-1.92	0.054	-303.875	2.860
Mar	-120.526	77.801	-1.55	0.121	-273.013	31.961
Apr	-117.751	79.504	-1.48	0.139	-273.577	38.075
May	-58.924	80.883	-0.73	0.466	-217.453	99.604
Jun	28.980	97.264	0.30	0.766	-161.654	219.614
Jul	74.359	116.355	0.64	0.523	-153.693	302.412
Aug	-20.194	124.281	-0.16	0.871	-263.780	223.392
Sep	33.190	96.932	0.34	0.732	-156.794	223.173
Oct	-19.991	72.304	-0.28	0.782	-161.704	121.723
Nov	49.427	68.753	0.72	0.472	-85.326	184.181
_cons	-14.268	166.142	-0.09	0.932	-339.901	311.365

Teff
Dessie

TD_1	0.266	0.121	2.21	0.027	0.030	0.503
TD_2	0.313	0.129	2.43	0.015	0.061	0.565
dpfa	13.722	9.759	1.41	0.160	-5.405	32.849
pfa_1	-6.801	3.678	-1.85	0.064	-14.009	0.408
POP	0.009	0.003	3.44	0.001	0.004	0.014
RD	0.718	0.296	2.43	0.015	0.139	1.298
RD_1	-0.139	0.325	-0.43	0.670	-0.776	0.499
Jan	-132.420	74.360	-1.78	0.075	-278.163	13.324
Feb	-232.284	74.472	-3.12	0.002	-378.246	-86.322
Mar	-224.019	81.355	-2.75	0.006	-383.473	-64.565
Apr	-118.653	80.923	-1.47	0.143	-277.260	39.954
May	-180.179	77.606	-2.32	0.020	-332.283	-28.074
Jun	-146.471	82.242	-1.78	0.075	-307.662	14.719
Jul	-219.415	97.306	-2.25	0.024	-410.131	-28.699
Aug	-106.709	108.230	-0.99	0.324	-318.835	105.418
Sep	54.677	71.599	0.76	0.445	-85.655	195.009
Oct	-30.326	73.141	-0.41	0.678	-173.681	113.028
Nov	-127.424	69.475	-1.83	0.067	-263.593	8.744
_cons	350.442	235.270	1.49	0.136	-110.678	811.562

Teff
Addis

TA_1	0.770	0.114	6.75	0.000	0.546	0.994
TA_2	-0.058	0.115	-0.50	0.616	-0.283	0.168
dpfa	-13.315	10.491	-1.27	0.204	-33.877	7.248
pfa_1	-5.083	3.586	-1.42	0.156	-12.112	1.946
POP	0.000	0.002	0.10	0.916	-0.005	0.005
RA	-0.730	0.277	-2.64	0.008	-1.273	-0.187
RA_1	-0.124	0.329	-0.38	0.707	-0.768	0.521
Jan	3.811	73.894	0.05	0.959	-141.018	148.640
Feb	143.804	74.909	1.92	0.055	-3.015	290.622
Mar	96.818	82.836	1.17	0.242	-65.536	259.173
Apr	126.267	86.035	1.47	0.142	-42.359	294.893
May	266.7739	88.09913	3.03	0.002	94.10278	439.445
Jun	289.0675	113.3244	2.55	0.011	66.95565	511.1793
Jul	310.1887	123.7983	2.51	0.012	67.54838	552.8289
Aug	391.601	128.480	3.05	0.002	139.784	643.417
Sep	201.197	88.190	2.28	0.023	28.347	374.047
Oct	231.129	67.313	3.43	0.001	99.197	363.060
Nov	95.591	68.304	1.4	0.162	-38.282	229.464
_cons	763.846	400.981	1.9	0.057	-22.062	1549.754