

Update on WTO/GATT and weather variables

January 28, 2018

Table 1: Production reg: GATT/WTO status + country specific weather

	(1) Calor. weight Prod.	(2) Food Prod.	(3) Food Consump.	(4) Conflict
Temp.	0.030 (0.031)	-0.117*** (0.038)	1.547 (2.123)	-0.023 (0.036)
Rainfall	0.011* (0.006)	-0.020 (0.012)	1.549** (0.649)	-0.006 (0.008)
L.Temp.	-0.466*** (0.038)	-0.290*** (0.056)	-10.539*** (2.732)	-0.018 (0.030)
L.Rainfall	-0.063*** (0.010)	-0.019 (0.018)	-2.108 (1.349)	0.004 (0.017)
WTO	-0.282 (0.182)	-0.644*** (0.114)	38.989** (16.862)	0.124 (0.205)
WTO \times L.NINO3 late	-0.026** (0.013)	0.034** (0.017)	-2.425** (1.133)	0.038** (0.017)
WTO \times L.Temp.	0.101* (0.058)	-0.069 (0.069)	5.909* (3.042)	-0.011 (0.027)
WTO \times L.Rainfall	0.010 (0.008)	-0.017 (0.012)	0.126 (1.169)	-0.010 (0.011)
WTO \times Temp.	-0.090 (0.059)	0.101 (0.070)	-7.284*** (2.706)	-0.000 (0.026)
WTO \times Rainfall	-0.015* (0.008)	0.014 (0.013)	-1.774*** (0.656)	0.017* (0.010)
Year fixed Effects	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y
Country specific Weather	Y	Y	Y	Y
Country specific trends	N	N	N	N
Observations	4585	4585	4733	4733
Clusters	113	113	113	113
R ²	0.782	0.670	0.900	0.199

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 2: Price reg: GATT/WTO status + country specific weather

	(1) CPI index	(2) logcpifood	(3) Maize price	(4) Rice price	(5) Wheat price
Temp.	-0.316** (0.144)	-0.392 (0.274)	-0.734** (0.302)	-0.819*** (0.242)	-0.326 (0.234)
Rainfall	0.009 (0.025)	-0.086 (0.074)	-0.204** (0.100)	-0.254** (0.119)	-0.117 (0.076)
L.Temp.	0.175 (0.130)	-0.028 (0.272)	1.170*** (0.340)	0.681 (0.453)	-0.233 (0.246)
L.Rainfall	-0.046 (0.045)	0.060 (0.084)	0.128 (0.128)	0.199 (0.125)	0.096 (0.081)
WTO	1.117** (0.426)	-1.198 (1.526)	-1.718*** (0.567)	-1.655*** (0.539)	-1.363 (1.504)
WTO \times L.NINO3 late	-0.111** (0.049)	0.027 (0.037)	0.204*** (0.058)	0.183*** (0.061)	0.094*** (0.034)
WTO \times L.Temp.	-0.171 (0.116)	-0.378 (0.374)	-0.831** (0.333)	-0.869** (0.344)	-0.406 (0.368)
WTO \times L.Rainfall	0.018 (0.031)	-0.082 (0.081)	-0.109 (0.101)	-0.148 (0.114)	0.035 (0.092)
WTO \times Temp.	0.127 (0.125)	0.484 (0.361)	0.840*** (0.313)	0.869*** (0.321)	0.356 (0.327)
WTO \times Rainfall	-0.028 (0.030)	0.069 (0.058)	0.190* (0.096)	0.242** (0.113)	0.140 (0.086)
Year fixed Effects	Y	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y	Y
Country specific Weather	Y	Y	Y	Y	Y
Country specific trends	N	N	N	N	N
Observations	3096	2721	2242	2023	1329
Clusters	104	102	84	72	47
R ²	0.427	0.376	0.465	0.437	0.460

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 3: Production reg:GATT/WTO status + regional specific weather

	(1) Calor. weight Prod.	(2) Food Prod.	(3) Food Consump.	(4) Conflict
Temp.	-0.011 (0.033)	-0.102*** (0.029)	-0.966 (2.053)	-0.005 (0.030)
Rainfall	0.004 (0.005)	-0.014* (0.007)	1.089* (0.633)	-0.007 (0.007)
L.Temp.	0.025 (0.053)	0.199** (0.076)	-5.318 (5.593)	-0.035 (0.067)
L.Rainfall	0.013 (0.009)	0.005 (0.010)	4.367*** (1.259)	0.012 (0.013)
WTO	-0.146 (0.206)	-0.781*** (0.127)	47.865*** (16.572)	-0.073 (0.186)
WTO \times L.NINO3 late	-0.024* (0.013)	0.029** (0.014)	-2.188* (1.116)	0.032* (0.018)
WTO \times L.Temp.	0.021 (0.019)	-0.032 (0.037)	-0.069 (1.971)	0.013 (0.022)
WTO \times L.Rainfall	0.000 (0.004)	-0.009* (0.005)	-0.547 (0.625)	-0.012 (0.007)
WTO \times Temp.	-0.016 (0.024)	0.069* (0.039)	-1.599 (1.599)	-0.016 (0.021)
WTO \times Rainfall	-0.007 (0.006)	0.008 (0.007)	-1.121* (0.646)	0.019** (0.008)
Africa \times L.Rainfall	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
East and S.E. Asia \times L.Rainfall	-0.018** (0.008)	-0.018* (0.010)	-4.024*** (1.231)	-0.010 (0.015)
South Asia \times L.Rainfall	-0.009 (0.009)	0.012 (0.010)	-3.887*** (1.321)	0.019 (0.036)
West Asia \times L.Rainfall	-0.068*** (0.023)	-0.063** (0.025)	-5.636** (2.564)	-0.034* (0.019)
South America \times L.Rainfall	-0.012 (0.011)	0.007 (0.010)	-4.114*** (1.227)	-0.001 (0.015)
Africa \times L.Temp.	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
East and S.E. Asia \times L.Temp.	-0.095 (0.101)	-0.436*** (0.093)	6.538 (7.396)	-0.074 (0.074)
South Asia \times L.Temp.	-0.034 (0.051)	-0.119* (0.064)	0.098 (4.830)	0.264*** (0.077)
West Asia \times L.Temp.	-0.006 (0.077)	-0.089 (0.089)	5.192 (6.183)	0.036 (0.079)
South America \times L.Temp.	-0.104** (0.052)	-0.117* (0.063)	-5.453 (5.799)	0.002 (0.066)
Year fixed Effects	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y
Country specific Weather	N	N	N	N
Country specific trends	N	N	N	N
Observations	4585	4585	4733	4733
Clusters	113	113	113	113
R ²	0.749	0.619	0.885	0.127

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 4: Production reg:: GATT/WTO status + regional specific weather

	(1) CPI index	(2) logcpifood	(3) Maize price	(4) Rice price	(5) Wheat price
Temp.	-0.164 (0.115)	-0.267 (0.217)	-0.446 (0.332)	-0.460 (0.286)	-0.181 (0.225)
Rainfall	-0.004 (0.018)	-0.056 (0.045)	-0.142** (0.066)	-0.164** (0.079)	-0.146** (0.065)
L.Temp.	0.216 (0.173)	0.132 (0.403)	0.891** (0.442)	1.246*** (0.427)	0.862** (0.363)
L.Rainfall	-0.023 (0.037)	0.004 (0.067)	0.026 (0.053)	0.054 (0.062)	0.043 (0.046)
WTO	0.001 (0.562)	-1.177 (1.176)	-3.279*** (0.788)	-3.401*** (0.638)	-1.971 (1.556)
WTO \times L.NINO3 late	-0.157*** (0.054)	0.009 (0.040)	0.170*** (0.050)	0.148*** (0.051)	0.069** (0.033)
WTO \times L.Temp.	0.048 (0.097)	-0.007 (0.162)	-0.180 (0.299)	-0.239 (0.298)	-0.186 (0.242)
WTO \times L.Rainfall	-0.008 (0.021)	-0.052 (0.039)	-0.026 (0.037)	-0.039 (0.043)	-0.002 (0.051)
WTO \times Temp.	-0.035 (0.092)	0.100 (0.164)	0.256 (0.269)	0.311 (0.271)	0.172 (0.236)
WTO \times Rainfall	-0.007 (0.020)	0.033 (0.037)	0.109* (0.055)	0.138** (0.066)	0.154** (0.067)
Africa \times L.Rainfall	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
East and S.E. Asia \times L.Rainfall	0.039 (0.037)	0.020 (0.059)	-0.086 (0.056)	-0.107* (0.061)	-0.119** (0.050)
South Asia \times L.Rainfall	0.017 (0.053)	0.065 (0.058)	-0.079 (0.058)	-0.027 (0.061)	-0.022 (0.066)
West Asia \times L.Rainfall	0.010 (0.110)	-0.176 (0.168)	0.260** (0.128)	0.184 (0.119)	0.201 (0.125)
South America \times L.Rainfall	0.039 (0.048)	-0.056 (0.089)	0.028 (0.057)	0.024 (0.058)	-0.014 (0.054)
Africa \times L.Temp.	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
East and S.E. Asia \times L.Temp.	-0.940*** (0.260)	-0.836** (0.409)	-2.086*** (0.584)	-2.529*** (0.564)	-1.629*** (0.428)
South Asia \times L.Temp.	-0.404** (0.198)	-0.444 (0.340)	-1.380*** (0.412)	-1.539*** (0.362)	-0.920** (0.375)
West Asia \times L.Temp.	-0.268 (0.188)	0.023 (0.416)	-0.086 (0.496)	-0.403 (0.518)	0.160 (0.460)
South America \times L.Temp.	-0.616 (0.456)	1.859*** (0.695)	0.227 (0.997)	0.005 (1.048)	0.380 (1.186)
Year fixed Effects	Y	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y	Y
Country specific Weather	N	N	N	N	N
Country specific trends	N	N	N	N	N
Observations	3096	2721	2242	2023	1329
Clusters	104	102	84	72	47
R ²	0.349	0.327	0.377	0.344	0.397

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 5: Price reg: GATT/WTO status + country specific weather + country specific trend

	(1) Calor. weight Prod.	(2) Food Prod.	(3) Food Consump.	(4) Conflict
Temp.	−0.028** (0.011)	−0.052*** (0.017)	−1.216 (1.435)	−0.019 (0.036)
Rainfall	−0.001 (0.005)	−0.005 (0.006)	0.690* (0.381)	0.001 (0.006)
L.Temp.	−0.009 (0.013)	0.033** (0.016)	−1.870 (1.694)	0.053 (0.047)
L.Rainfall	0.016** (0.007)	0.022*** (0.008)	−0.978 (0.849)	0.023* (0.012)
WTO	−0.612*** (0.140)	−0.142 (0.114)	8.410 (21.005)	0.845*** (0.295)
WTO × L.NINO3 late	−0.009* (0.005)	0.007 (0.007)	−0.619 (0.436)	0.022 (0.014)
WTO × L.Temp.	0.005 (0.014)	−0.042* (0.023)	0.141 (1.794)	−0.039 (0.039)
WTO × L.Rainfall	0.000 (0.006)	−0.003 (0.007)	0.274 (0.817)	−0.024*** (0.009)
WTO × Temp.	0.020 (0.015)	0.045** (0.021)	−1.080 (1.304)	−0.003 (0.037)
WTO × Rainfall	0.002 (0.005)	0.010 (0.007)	−0.643 (0.422)	0.010 (0.009)
Year fixed Effects	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y
Country specific Weather	N	N	N	N
Country specific trends	Y	Y	Y	Y
Observations	4585	4585	4733	4733
Clusters	113	113	113	113
R ²	0.888	0.834	0.941	0.330

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 6: Production reg: reg: GATT/WTO status + country specific weather + country specific trend

	(1) CPI index	(2) logcpifood	(3) Maize price	(4) Rice price	(5) Wheat price
Temp.	-0.259** (0.125)	-0.075 (0.212)	-0.275 (0.185)	-0.188 (0.158)	0.193* (0.104)
Rainfall	0.018 (0.043)	-0.090 (0.090)	-0.104 (0.072)	-0.105 (0.076)	0.049 (0.029)
L.Temp.	0.604*** (0.141)	0.378 (0.481)	0.916*** (0.205)	0.023 (0.254)	0.557*** (0.204)
L.Rainfall	-0.060 (0.059)	0.045 (0.081)	0.226* (0.130)	0.175 (0.110)	0.180 (0.158)
WTO	2.809*** (0.745)	-0.915 (0.947)	0.096 (1.033)	0.599 (1.086)	1.383 (2.535)
WTO \times L.NINO3 late	-0.066 (0.052)	0.063* (0.035)	0.160*** (0.024)	0.103*** (0.027)	0.033 (0.029)
WTO \times L.Temp.	-0.316*** (0.099)	-0.374 (0.537)	-0.235 (0.174)	-0.145 (0.156)	0.173 (0.286)
WTO \times L.Rainfall	0.071 (0.044)	-0.017 (0.050)	-0.153 (0.101)	-0.157 (0.102)	-0.058 (0.171)
WTO \times Temp.	0.172 (0.105)	0.412 (0.566)	0.266* (0.149)	0.148 (0.114)	-0.178 (0.151)
WTO \times Rainfall	-0.060 (0.045)	0.041 (0.062)	0.112* (0.067)	0.120* (0.071)	-0.017 (0.045)
Year fixed Effects	Y	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y	Y
Country specific Weather	N	N	N	N	N
Country specific trends	Y	Y	Y	Y	Y
Observations	3096	2721	2242	2023	1329
Clusters	104	102	84	72	47
R ²	0.591	0.603	0.663	0.681	0.682

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Table 7: Temperature bins

	(1) Calor. weight Prod.	(2) Food Prod.	(3) Food Consump.	(4) Conflict
L.Temp less than 7.5	-0.322** (0.142)	-0.288** (0.121)	-16.287** (6.513)	0.126 (0.125)
L.Temp less than 12.5	-0.154 (0.141)	-0.127 (0.121)	-6.850 (6.431)	0.131 (0.120)
L.Temp less than 17.5	-0.165 (0.129)	-0.155 (0.117)	-10.118* (5.510)	0.112 (0.097)
L.Temp less than 22.5	-0.007 (0.085)	0.003 (0.077)	-11.186*** (3.172)	0.037 (0.084)
L.Temp less than 27.5	0.043 (0.077)	0.041 (0.074)	-7.058*** (1.935)	0.110** (0.044)
WTO	-0.035 (0.077)	0.059 (0.056)	-5.455 (7.500)	0.080 (0.105)
GATT	-0.021 (0.122)	-0.102 (0.114)	9.900 (10.577)	-0.112 (0.186)
WTO=1 \times L.Rainfall	-0.001 (0.004)	-0.005 (0.003)	0.198 (0.356)	0.003 (0.011)
WTO=1 \times Rainfall	0.002 (0.004)	-0.000 (0.003)	0.228 (0.294)	-0.013* (0.008)
GATT=1 \times L.Rainfall	0.005 (0.004)	0.006* (0.004)	-0.503 (0.337)	-0.015* (0.009)
GATT=1 \times Rainfall	-0.002 (0.005)	0.003 (0.004)	-0.753** (0.288)	0.008 (0.008)
Rainfall	0.004 (0.004)	0.002 (0.004)	0.820*** (0.242)	0.006 (0.006)
L.Rainfall	-0.003 (0.003)	-0.002 (0.004)	0.664* (0.347)	0.011 (0.007)
WTO=1 \times L.NINO3 late	-0.030*** (0.011)	-0.014 (0.010)	-0.443 (0.686)	0.009 (0.018)
GATT=1 \times L.NINO3 late	-0.003 (0.006)	0.007 (0.007)	-0.339 (0.538)	-0.001 (0.015)
Year Effects and Country specific trend	\mathbb{Y}	\mathbb{Y}	\mathbb{Y}	\mathbb{Y}
Observations	4585	4585	4733	4733
Clusters	113	113	113	113
R ²	0.872	0.817	0.932	0.281

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.