Macroeconomic Effects of Disruptions in Global Food Commodity Markets: Evidence for the United States

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(Discussion by Mark Watson)

Contributions

(1) Quarterly Food Production Index (1961 →)

(2) Narrative Food Production Shock Indicators (13, +&–)

(3) SVAR evidence on effect of global food production shocks on U.S. macro variables.

Findings

(1) $R^2_{Y|Food}$ are small

(2) Food Shock $\uparrow$ $\Rightarrow$ Food Price $\downarrow$, GDP $\uparrow$, Cons $\uparrow$

(3) Large effects on Cons. Durables, Investment

(4) Small effect on interest rates

10-Variable VAR

Food Production
Food Prices

World IP
US GDP
US Consumption
US Prices (CPI)
US Interest Rates

Oil Production
Oil Price
Seeds

Series	Lag	IRF	VD
Food Prod	0	1.00 (0.00)	1.00
Food Prices	1	–0.41 (0.13)	0.08
World IP	5	0.11 (0.035)	0.07
GDP	5	0.066 (0.024)	0.06
Cons.	5	0.070 (0.024)	0.09
Prices	5	-0.033 (0.024)	0.04
FedFunds (BP)	1	-2.20 (2.24)	0.01
Oil Prod	5	0.092 (0.047)	0.04
Oil Price	4	0.26 (0.30)	0.00
Seeds	0	0.073 (0.027)	0.04

De Winne-Peersman Specification:

Log-Levels
5 lags (= 50+ regressors)
Food and Oil Prices deflated by CPI

An Alternative Specification:

Log-differences
5 lags
Food and Oil Prices deflated by core PCE

Same lag as in Table above	DeWinne-Peersman		Alternative	
Series	IRF	VD	IRF	VD
Food Prod	1.00 (0.00)	1.00	1.00 (0.00)	1.00
Food Prices	–0.41 (0.13)	0.08	–0.46 (0.14)	0.09
World IP	0.11 (0.035)	0.07	0.019 (0.041)	0.00
GDP	0.066 (0.024)	0.06	0.033 (0.028)	0.01
Cons.	0.070 (0.024)	0.09	0.030 (0.025)	0.01
Prices	-0.033 (0.024)	0.04	-0.052 (0.030)	0.04
FedFunds	-2.20 (2.24)	0.01	-1.37 (2.05)	0.08
Oil Prod	0.092 (0.047)	0.04	0.081 (0.053)	0.02
Oil Price	0.26 (0.30)	0.00	-0.12 (0.34)	0.00
Seeds	0.073 (0.027)	0.04	0.066 (0.025)	0.04

Effect on Other Variables:

$$X_t = \Lambda F_t + u_t$$

$$\Phi(\mathrm{L}) F_t = \varepsilon_t$$

F_t: 10 observed variables in SVAR

X_t contains many (≈ 200) variables of potential interest

Using the Alternative Specification

Series	IRF	VD
Food Prod	1.00 (0.00)	1.00
Food Prices	–0.46 (0.14)	0.09
	5 Quarter horizon	
Cons ND	0.026 (0.020)	0.01
Cons SV	0.011 (0.011)	0.01
Cons Dur	0.11 (0.10)	0.01
InvNonRes	0.037 (0.057)	0.00
InvRes	0.14 (0.11)	0.01
Permits	0.18 (0.17)	0.01

Possible Omitted Variable Bias

$$X_t = \Lambda F_t + u_t$$

$$\Phi(\mathrm{L}) F_t = \varepsilon_t$$

F_t: 6 unobserved "macro" factors +
Food Production and Food Prices

(4 lags)

Series	IRF	VD
Food Prod	1.00 (0.00)	1.00
Food Prices	-0.38 (0.11)	0.07
	5 Quarter horizon	
GDP	0.037 (0.021)	0.01
Cons ND	0.044 (0.019)	0.03
Cons SV	0.027 (0.010)	0.03
Cons Dur	0.15 (0.07)	0.03
InvNonRes	-0.002 (0.062)	0.01
InvRes	0.34 (0.12)	0.04
Permits	0.66 (0.23)	0.04
IP Autos	0.19 (0.11)	0.01

	IRF	VD
FFunds (BP)	-4.31 (2.14)	0.04
10 Yr Tbonds	-2.44 (0.81)	0.03
PCE Deflator		
Food and Bev	-0.14 (0.06)	0.05
Core (LFE)	-0.029 (0.014)	0.02
Oil Prod	0.057 (0.026)	0.01
CPI Gasoline	-0.26 (0.14)	0.03

Are these Results Stable?

(Full Sample 1963-2013)

Repeat the Exercise using the model with 6 unobserved factors + Food Production + Food Prices

Over First Half and Second Half of Sample

Series	First Half	Second Half
Food Prod	1.00	1.00
Food Prices	-0.21 (0.23)	-0.34 (0.14)
	5 Quarter horizon	
GDP	0.001 (0.030)	0.011 (0.025)
Cons ND	0.011 (0.026)	0.009 (0.022)
Cons SV	0.010 (0.015)	0.004 (0.014)
Cons Dur	-0.000 (0.010)	0.102 (0.089)
InvNonRes	-0.027 (0.076)	-0.056 (0.099)
InvRes	0.12 (0.16)	0.21 (0.16)
Permits	0.21 (0.41)	0.42 (0.29)
IP Autos	0.032 (0.21)	0.28 (0.15)

	First Half	Second Half
FFunds (BP)	-3.71 (4.72)	-1.95 (1.89)
10 Yr Tbonds	-1.16 (1.40)	-1.36 (1.09)
PCE Deflator		
Food and Bev	-0.066 (0.150)	0.030 (0.056)
Core (LFE)	-0.017 (0.025)	-0.015 (0.011)
Oil Prod	-0.008 (0.060)	-0.014 (0.024)
CPI Gasoline	-0.167 (0.161)	-0.077 (0.22)

Findings

(1) $R^2_{Y|Food}$ are small

(very small … hard to precisely estimate effects this small)

(2) Food Shock ↑ ⇒

Food Price ↓ (yes),

GDP ↑ (maybe),

Cons ↑ (maybe)

(3) Large effects on Cons. Durables, Investment

(yes, but …)

(4) Small effect on interest rates

(yes)