Table 1. Descriptive statistics

	VIX ($\xi_{\text{VIX},t}$)	Oil Price Change (Δp_t)	Integrated Oil and Gas Producer Index (R_t^{Prod})	Industrial Production Index (IP) (q_t)	CPI (π_t)
Mean	20.283	0.167	0.462	0.149	0.207
S.D.	8.100	10.724	5.471	1.000	0.258
Min	10.125	-49.791	-21.895	-13.562	-1.786
Max	62.639	45.502	29.403	6.049	1.367
Skewness	1.906	-0.366	-0.411	-6.070	-1.356
Kurtosis	5.778	2.611	3.305	87.440	10.576
JB	848.873***	131.177***	206.569***	137725.216***	2110.934***
Q(1)	301.190***	4.330**	0.416	33.755***	83.809***
Q(6)	975.969***	10.882*	6.059	43.094***	86.241***
ARCH(1)	161.904***	11.170***	4.093**	5.930**	67.814***
ARCH(6)	161.471***	47.772***	52.957***	18.208***	73.253***

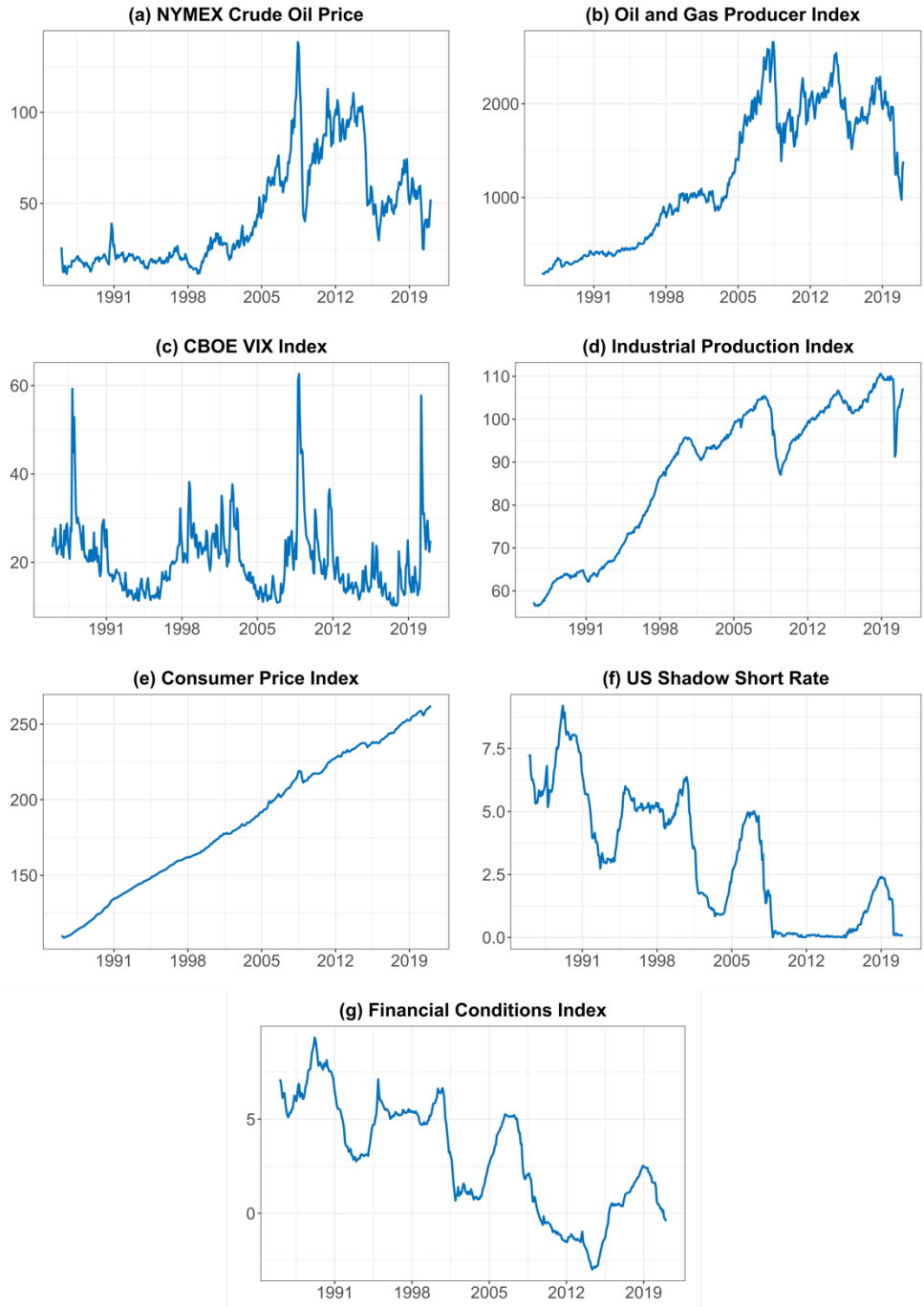
	SSR (r_t)	FCI (F_t)	Risk Shock (ν_t)	Supply Shock (s_t)	Demand Shock (d_t)
Mean	2.930	-0.370	-0.081	0.000	0.000
S.D.	2.959	0.497	16.156	9.249	5.126
Min	-2.986	-1.066	-34.663	-38.071	-21.372
Max	9.335	2.720	107.948	35.136	28.012
Skewness	-0.080	2.656	1.877	-0.397	0.061
Kurtosis	-1.042	10.539	7.724	2.663	3.220
JB	19.101***	2465.308***	1306.343***	137.772***	185.064***
Q(1)	417.192***	392.403***	0.000	1.974	0.555
Q(6)	2390.520***	1745.122***	4.498	11.654*	10.569
ARCH(1)	408.236***	355.358***	1.042	15.441***	3.319*
ARCH(6)	405.322***	380.630***	1.553	37.190***	58.221***

Pearson correlation coefficient estimates

	Δp_t	s_t	d_t	ν_t
Δp_t	1.000			
s_t	0.862	1.000		
d_t	0.502	0.000	1.000	
ν_t	-0.065	0.000	0.000	1.000

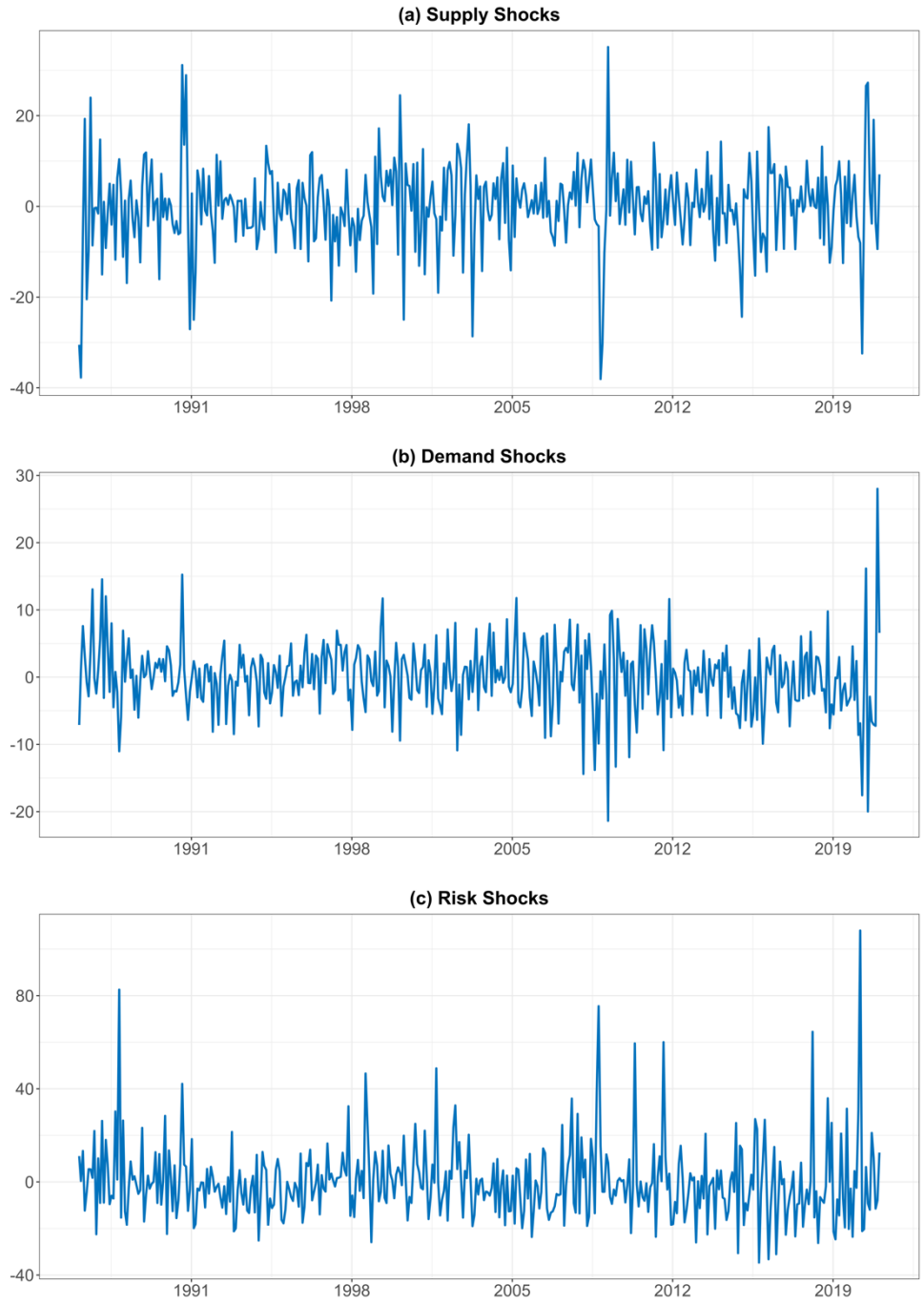
Note: The table reports descriptive statistics for the Chicago Board of Exchange Volatility Index (VIX, $\xi_{\text{VIX},t}$), 1-month returns on the second nearest maturity NYMEX Crude–Light Sweet Oil contract (Δp_t), monthly return on the World Integrated Oil and Gas Producer Index (R_t^{Prod}), growth rate of the industrial production (IP) index (q_t), inflation (π_t) based on consumer price index (CPI), interest rates (r_t) represented by shadow short rates (SSR; Wu and Xia, 2016), and the Chicago Fed's National Financial Conditions Index (FCI, F_t) in addition to descriptive statistics for risk shocks (ν_t) associated with oil demand shocks, oil supply shocks (s_t), and oil demand shocks (d_t) calculated using the approach of Ready (2018). The Pearson correlation coefficient estimates for among the oil price change and orthogonal risk, supply, and demand shocks are also presented in the table. The data is at monthly frequency and covers the period 1986:M2-2021:M1 with 420 observations. In addition to mean, standard deviation (S.D.), minimum value (Min), maximum value (max), skewness, excess Kurtosis, Jarque-Bera normality test (JB), the table reports first [Q(1)] and sixth [Q(6)] order serial correlation test, and also first [ARCH(1)] and sixth [ARCH(6)] order autoregressive conditional heteroskedasticity test.

Figure 1. Time series plots of the data in levels



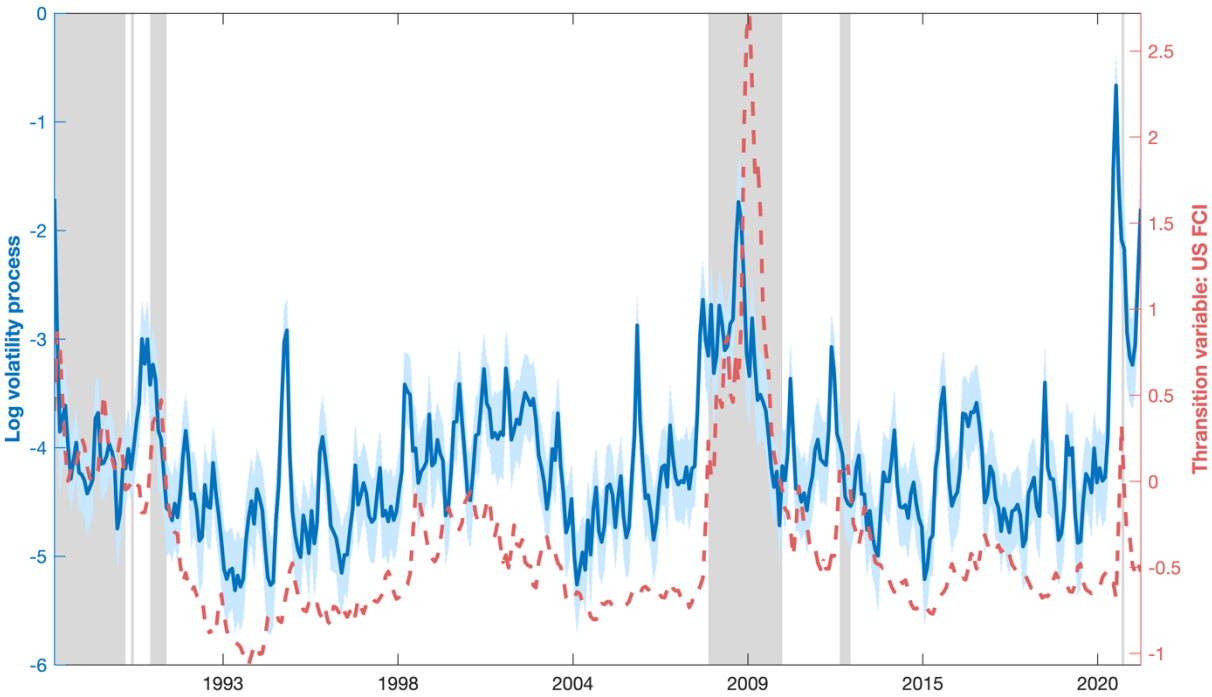
Note: The figure plots the levels of the Chicago Board of Exchange Volatility Index (VIX, $\xi_{\text{VIX},t}$), NYMEX Crude–Light Sweet Oil 1-month contract price, the World Integrated Oil and Gas Producer Index, industrial production (IP) index, consumer price index (CPI), interest rates (r_t) represented by shadow short rates (SSR; Wu and Xia, 2016), and the Chicago Fed's National Financial Conditions Index (FCI) for the period 1986:M1-2021:M1.

Figure 2. Time series plots of oil supply, oil demand, and risk shocks



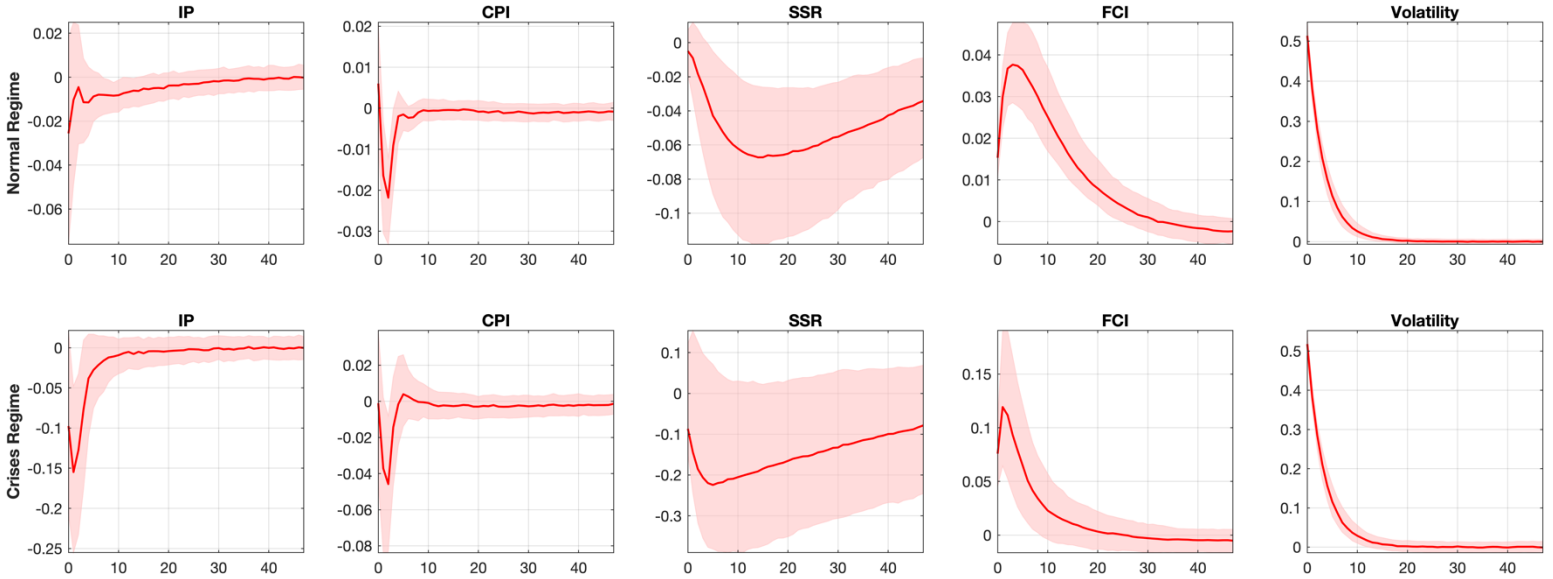
Note: The figure presents the plots of risk shocks associated with oil demand shocks, oil supply shocks, and oil demand shocks calculated using the approach of Ready (2018).

Figure 3. The US financial regimes and estimated economic uncertainty



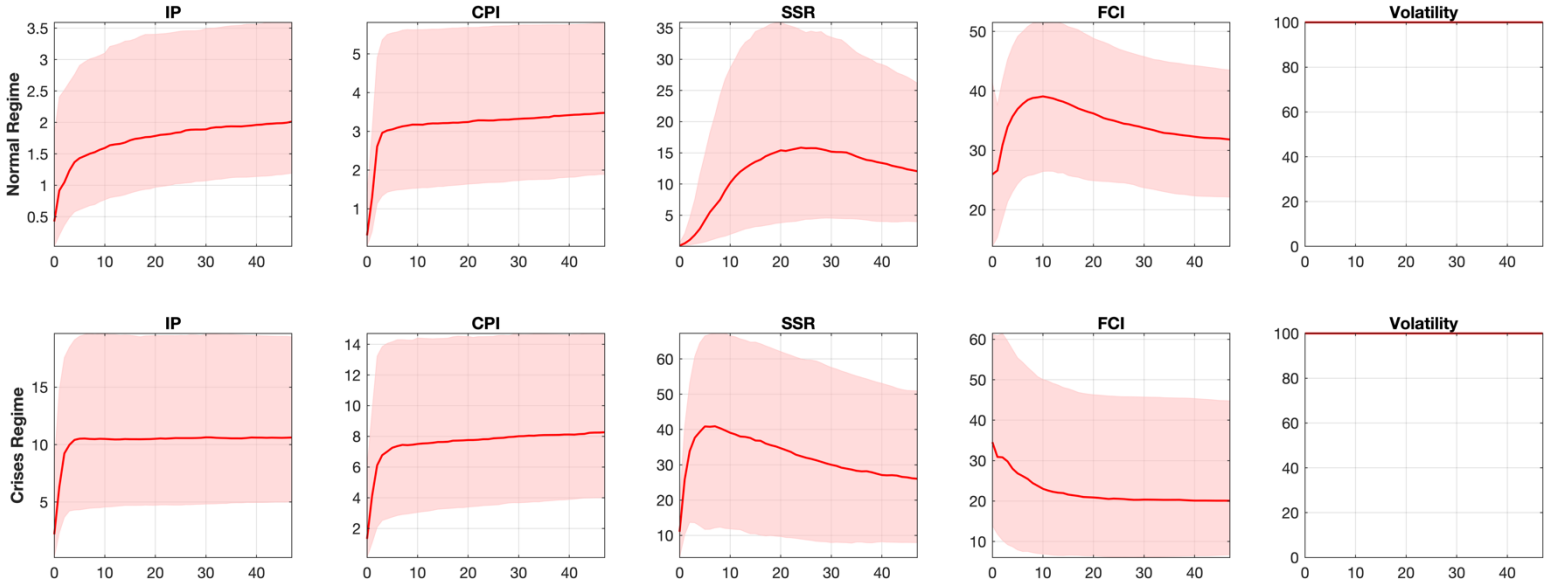
Note: The figure displays the US financial regimes index (US FCI, right axis and dashed line in red color) and the estimated economic uncertainty measured by the median log stochastic volatility (left axis and solid line in blue color) over the period 1987:M11-2021:M1. The log volatility is estimated by the threshold VAR model (TVAR) explained in Section 3. The estimated threshold value is -0.0115. Periods with the values of FCI above -0.0115 are identified as the financial distress or crises regime periods. The light blue band around the log volatility designates the 68% confidence band. The gray shaded regions mark the financial crises regime periods identified by the TVAR model. The TVAR model is estimated using the Gibbs sampling with 50,000 posterior and 50,000 burn-in draws. A training sample of 20 observations is used for the initialization of priors. The lag order of the TVAR is 2 and the delay for the transition variable is 2. (For the interpretation of the color references, the reader may refer to web version of this figure available at https://dataverse.harvard.edu/dataverse/fin_regimes_oil.)

Figure 4. Impact of volatility shocks



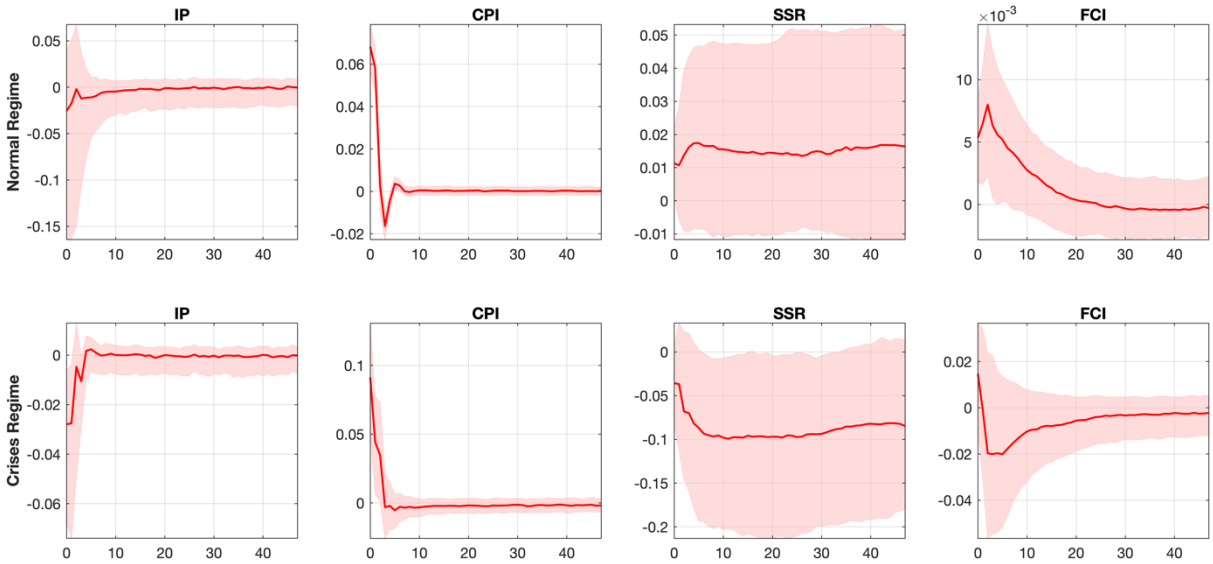
Note: The figure presents the median impulse responses (solid line) and 68% confidence bands (shaded regions) of the macroeconomic variables for a one standard deviation increase in the overall economic volatility in normal (first row) and crises periods (second row). Specifically, impulse responses of the IP growth rate, CPI inflation, shadow short rate, and financial conditions index as well as the overall economic volatility is given in the figure. Horizontal axes are time in months measured from 0 (contemporaneous effect) to 47. The 2-regime TVAR model is estimated using the Gibbs sampling with 50,000 posterior and 50,000 burn-in draws. A training sample of 20 observations is used for the initialization of priors. The estimation period is 1987:M11-2021:M1. The lag order of the TVAR is selected as 2 by the Schwarz's Bayesian information criterion and the delay for the transition variable is 2. The crises or financial distress regime corresponds to the periods where the FCI exceeds the estimated threshold of -0.0115.

Figure 5. Forecast error variance decomposition for the effect of volatility shocks



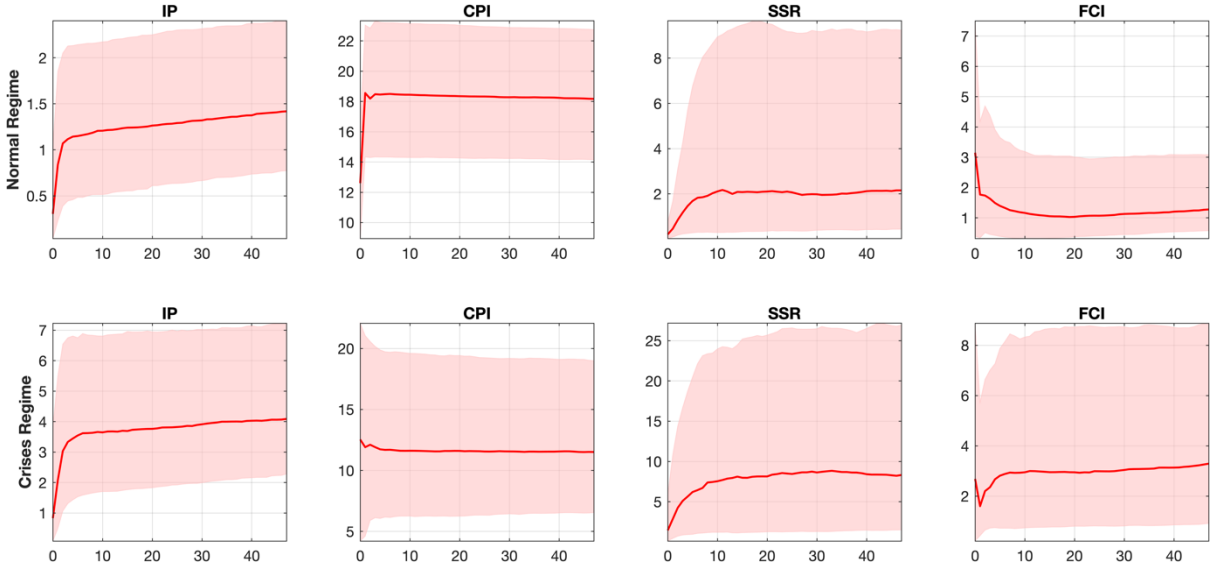
Note: The solid line in each panel shows the fraction of median forecast error variance explained by volatility shocks for one of the variables (first to fourth columns) and volatility shock itself (fifth column). Shaded regions mark 68% confidence bands for median forecast error variance. Horizontal axes represent time in months measured from 0 (contemporaneous effect) to 47 months. The first row corresponds to triangular periods identified by the regime where the FCI is below the endogenously determined threshold estimate of -0.0115. The second row presents the forecast error variance decomposition for the financial distress periods where the FCI is above the threshold value. The TVAR model with two regimes is estimated using the Gibbs sampling with 50,000 posterior and 50,000 burn-in draws. A sample size of 20 is used for initial training to initialize priors. The data for the period 1987:M11-2021:M1 is used for the estimation. The lag order of the TVAR is 2, which is selected by the Schwarz's Bayesian information criterion, and the threshold delay is also 2.

Figure 6. Impact of oil supply shocks



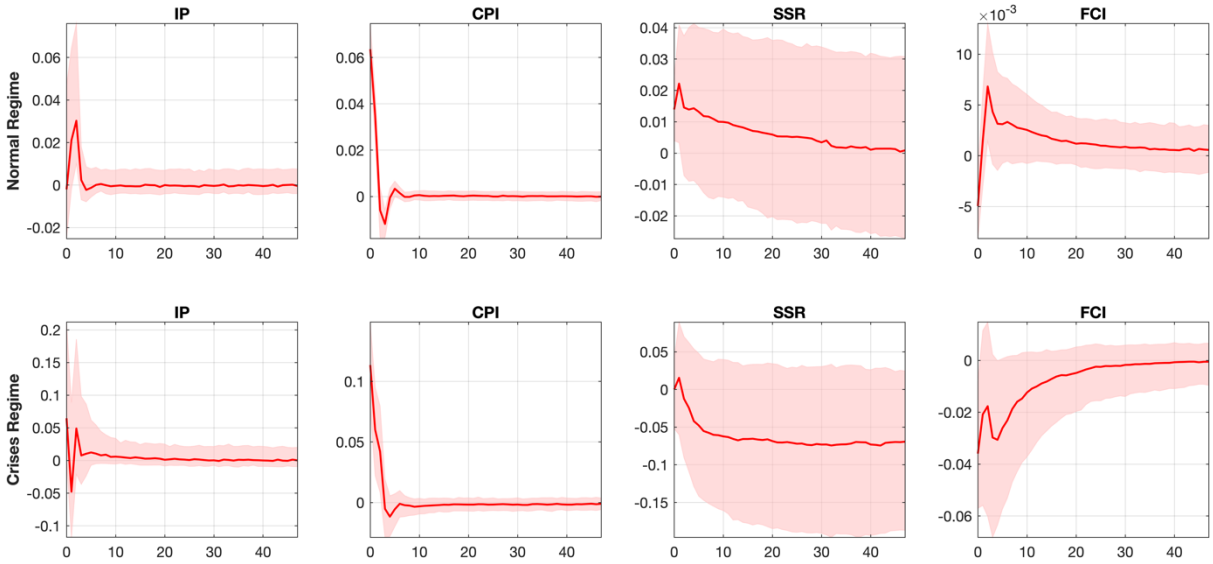
Note: The figure presents the median impulse responses (solid line) and 68% confidence bands (shaded regions) of the US macroeconomic variables for a one standard decrease in oil supply in normal (first row) and crises periods (second row). See note to Figure 4 for further details.

Figure 7. Forecast error variance decomposition for the effect of oil supply shocks



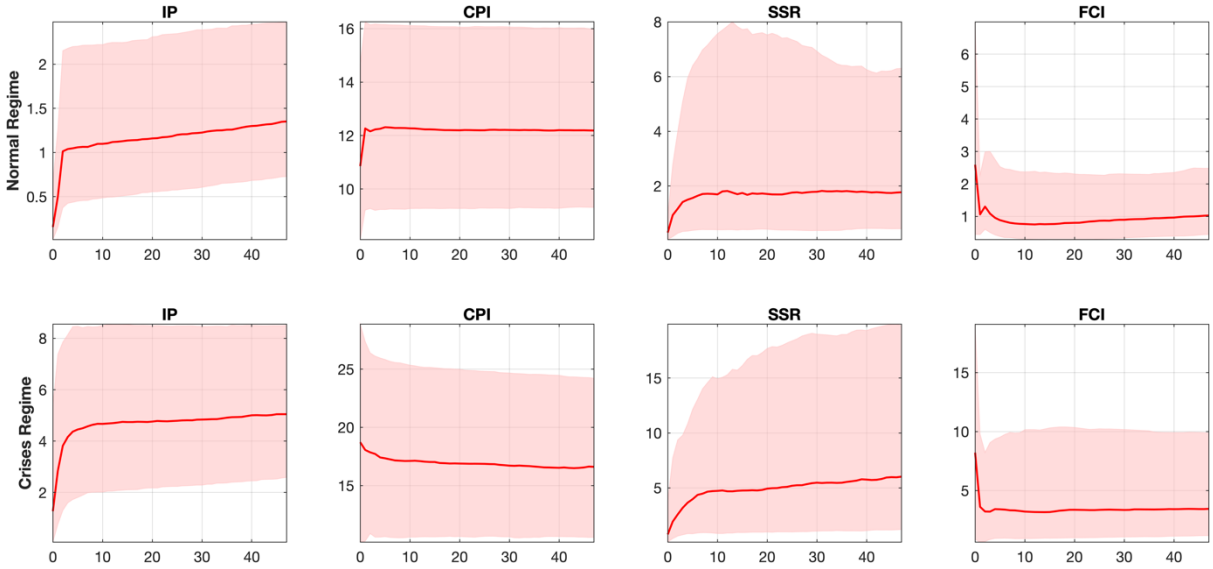
Note: Each panel of the figure presents the fraction of median forecast error variance explained by oil supply shocks in calm periods (first row) and financial distress periods (second row) for one of the variables of US. Shaded regions represent 68% confidence bands. Horizontal axes are in months from 0 to 47. See note to Figure 5 for further details.

Figure 8. Impact of oil demand shocks



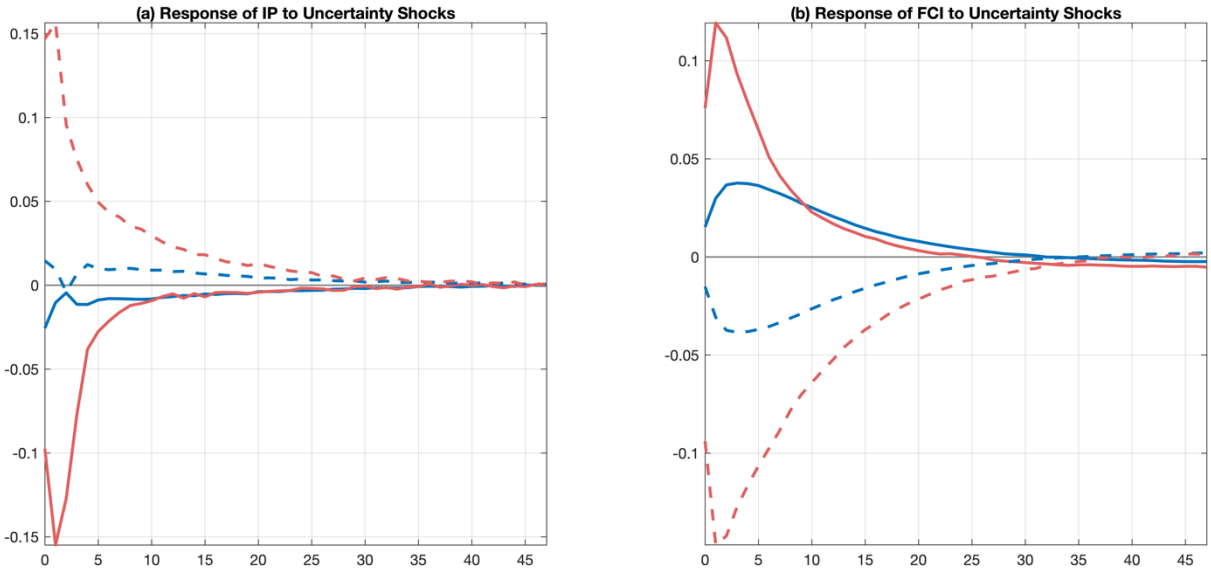
Note: The figure presents the median impulse responses (solid line) and 68% confidence bands (shaded regions) of the US macroeconomic variables for a one standard deviation increase in demand in normal (first row) and crises periods (second row). See note to Figure 4 for further details.

Figure 9. Forecast error variance decomposition for the effect of oil demand shocks



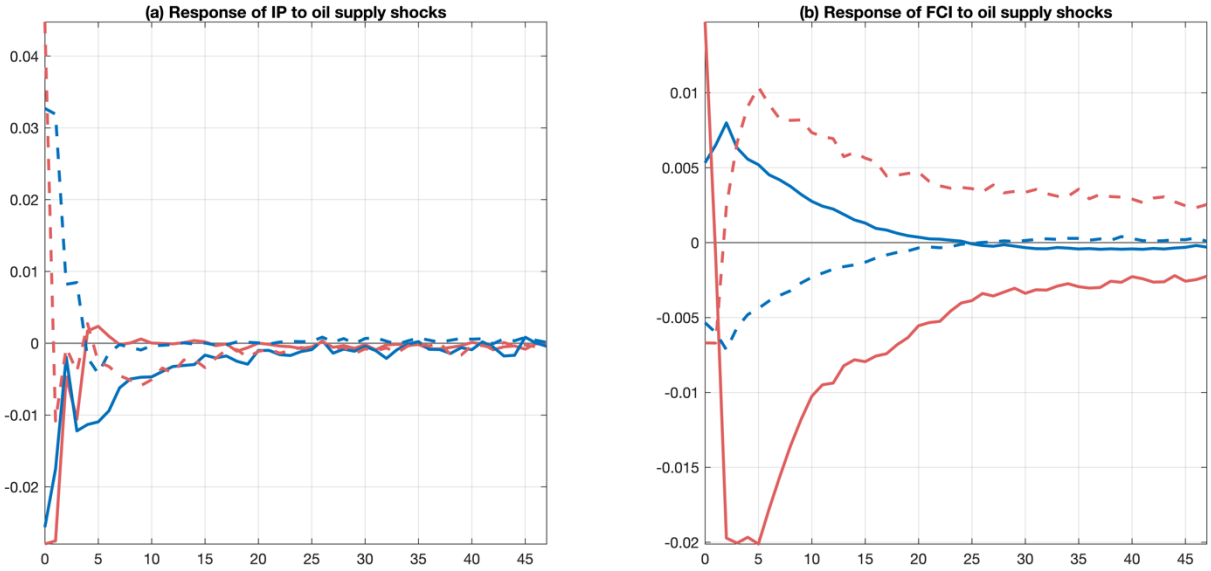
Note: Each panel of the figure presents the fraction of median forecast error variance explained by oil demand shock in calm periods (first row) and financial distress periods (second row) for one of the variables of US. Shaded regions represent 68% confidence bands. Horizontal axes are in months from 0 to 47. See note to Figure 5 for further details.

Figure 10. Asymmetry in uncertainty shocks



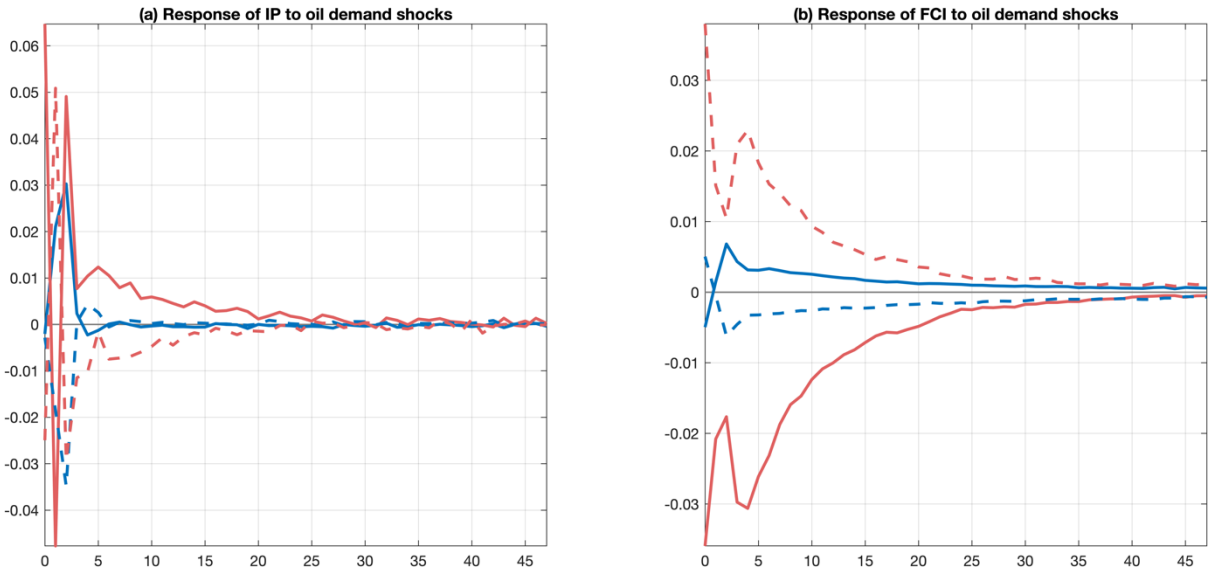
Note: The figure presents median impulse responses of industrial production (left panel) and financial conditions (right panel) to one standard deviation positive (solid lines) and negative (dashed lines) shock in economic uncertainty in normal (blue color) and crises periods (red color). See note to Figure 4 for further details. (For the interpretation of the color references, the reader may refer to web version of this figure available at https://dataverse.harvard.edu/dataverse/fin_regimes_oil.)

Figure 11. Asymmetry in oil supply shocks



Note: The figure presents median impulse responses of industrial production (left panel) and financial conditions (right panel) to one standard deviation positive (solid lines) and negative (dashed lines) shock in oil supply in normal (blue color) and crises periods (red color). See note to Figure 4 for further details. (For the interpretation of the color references, the reader may refer to web version of this figure available at https://dataverse.harvard.edu/dataverse/fin_regimes_oil.)

Figure 12. Asymmetry in oil demand shocks



Note: The figure presents median impulse responses of industrial production (left panel) and financial conditions (right panel) to one standard deviation positive (solid lines) and negative (dashed lines) shocks in oil demand in normal (blue color) and crises periods (red color). See note to Figure 4 for further details. (For the interpretation of the color references, the reader may refer to web version of this figure available at https://dataverse.harvard.edu/dataverse/fin_regimes_oil.)