

Not-for-Publication Appendix to:

The Confidence Channel of Macroeconomic Uncertainty:  
Evidence from Disaggregated IP indices.\*

Mohamad B. Karaki<sup>†</sup>      Sandeep Kumar Rangaraju<sup>‡</sup>

**Abstract**

This paper evaluates the link between confidence and the transmission of macro uncertainty shocks. Using data on aggregate and disaggregate industrial production (IP) indices, we estimate a factor augmented vector autoregressive model. First, we compute the impulse response functions and find that uncertainty shocks adversely affect total IP, and generate a disproportionate change in disaggregated IP indices. Second, we conduct a counterfactual analysis to evaluate whether changes in consumer confidence amplify the effect of uncertainty shocks on IP indices. Our results suggest that uncertainty shocks propagate through a confidence multiplier effect. Third, we conduct a historical decomposition exercise and find that relative to consumer confidence shocks and shocks to total IP, macro uncertainty shocks contributed the most to the historical changes in total IP during the early 80s recession and the 2008-2009 financial crisis. Last but not least, we employ a historical counterfactual analysis and show that uncertainty shocks propagated via a confidence channel during those two recessions.

*Keywords:* Macro uncertainty, consumer confidence, business cycles, FAVAR.

*JEL codes:* C32, C53, E32.

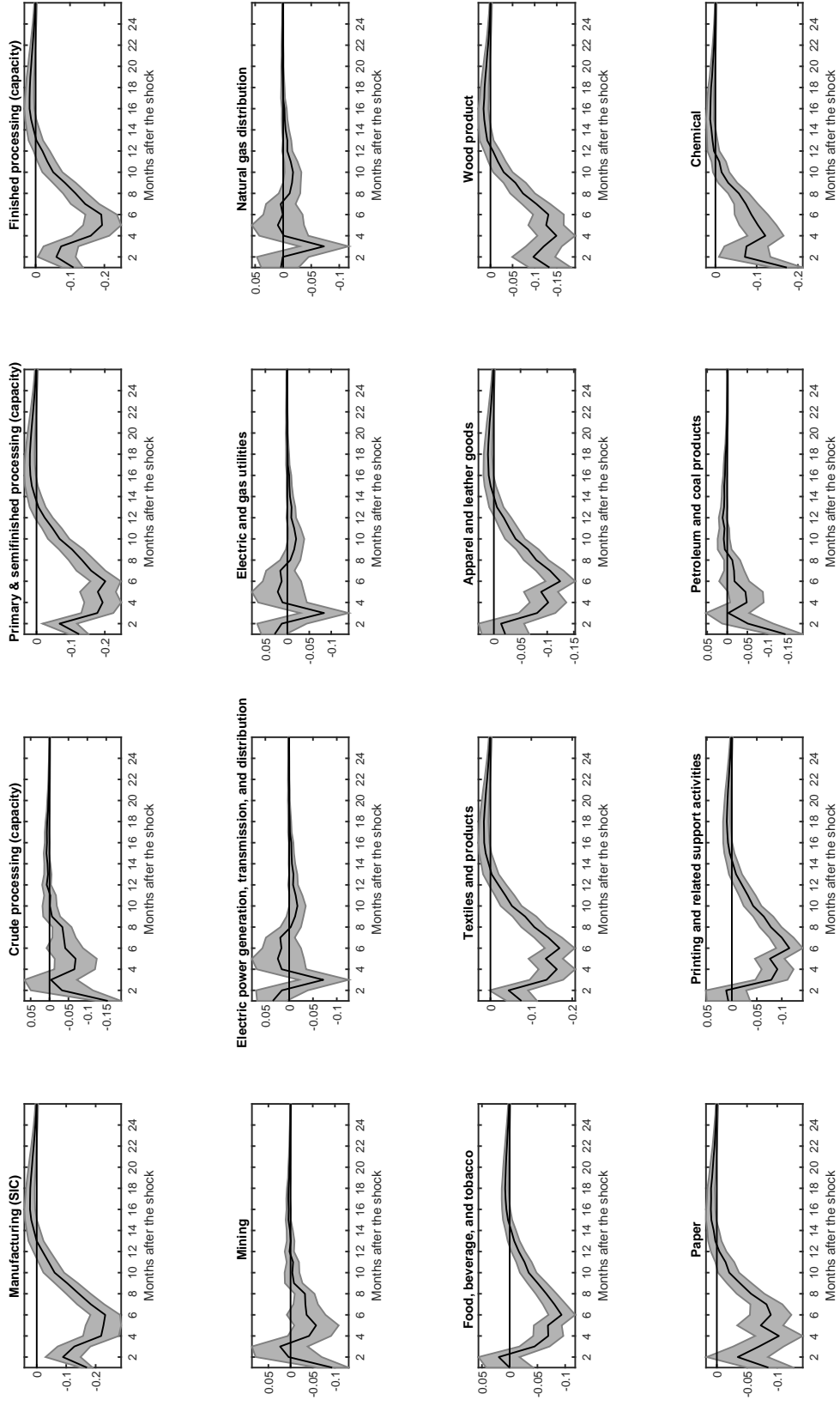
---

\*We thank Ana María Herrera and John Keating for comments on earlier draft. We have also benefited from the many helpful comments provided by participants at various economic conferences and seminars. All remaining errors are ours.

<sup>†</sup>Department of Economics, Adnan Kassar School of Business, Lebanese American University; Beirut, Lebanon; e-mail: mkaraki@lau.edu.lb.

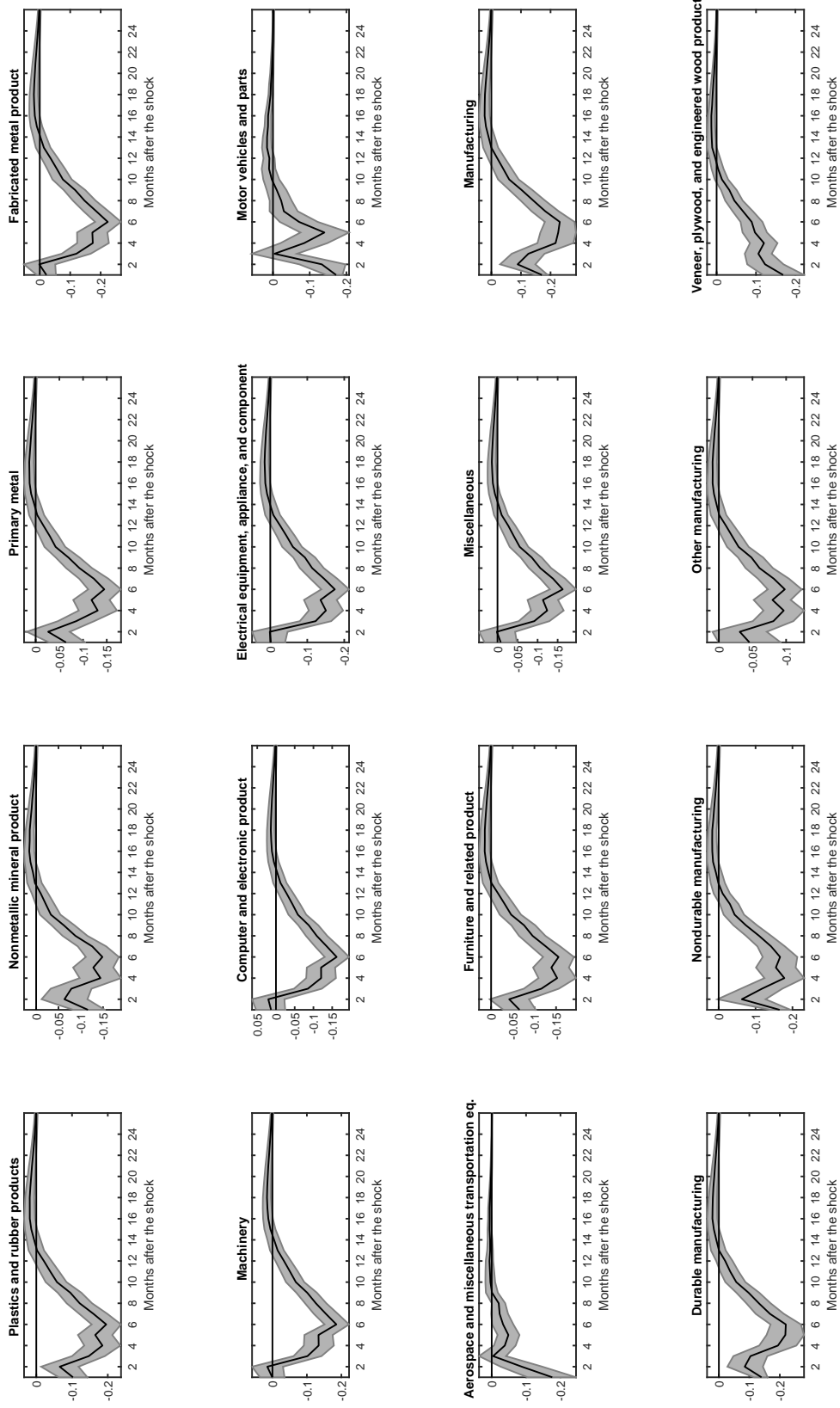
<sup>‡</sup>Department of Economics, Goddard School of Business & Economics, Weber State University, Ogden 84408-3801; e-mail: srangaraju@weber.edu

Figure A.1: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



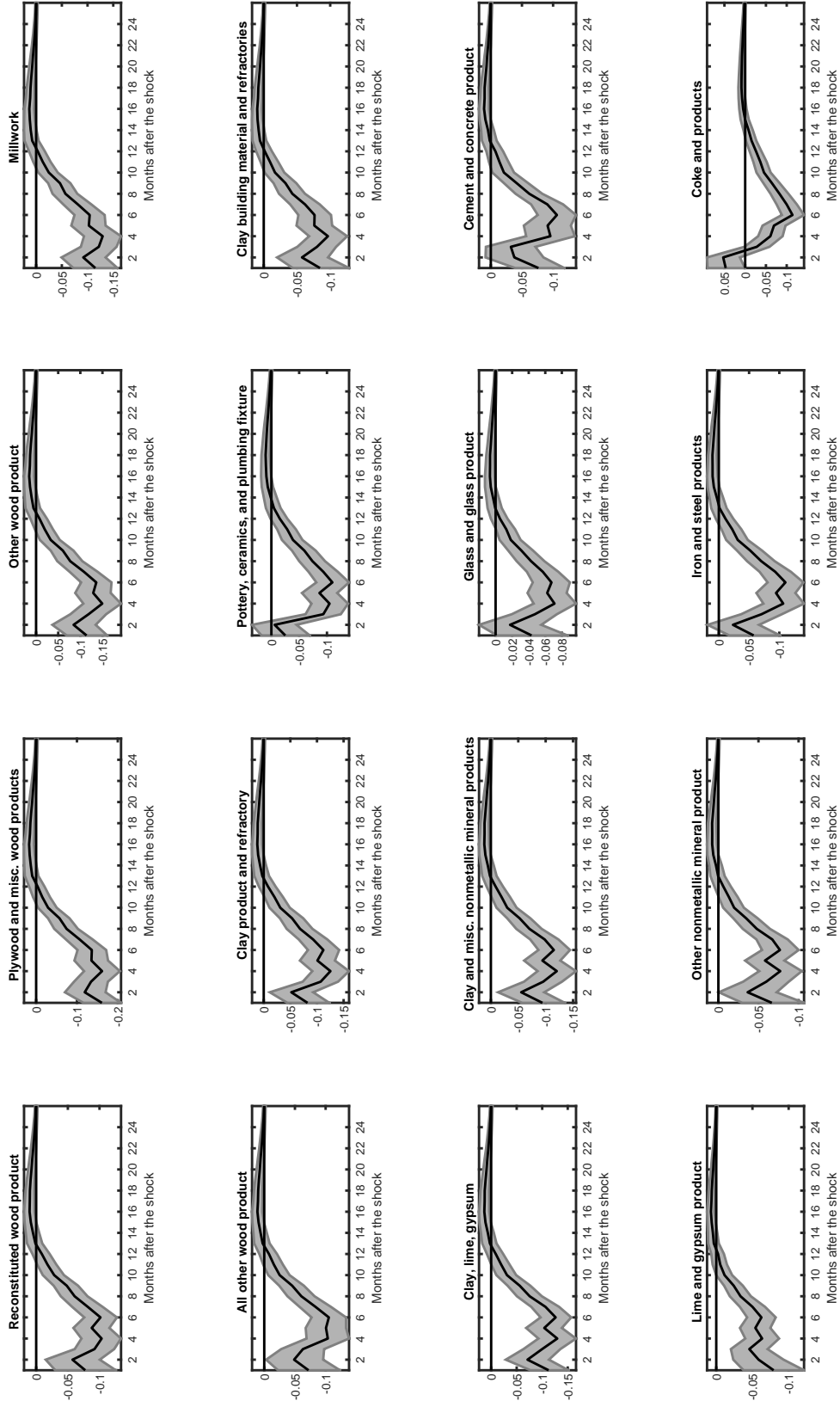
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.2: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



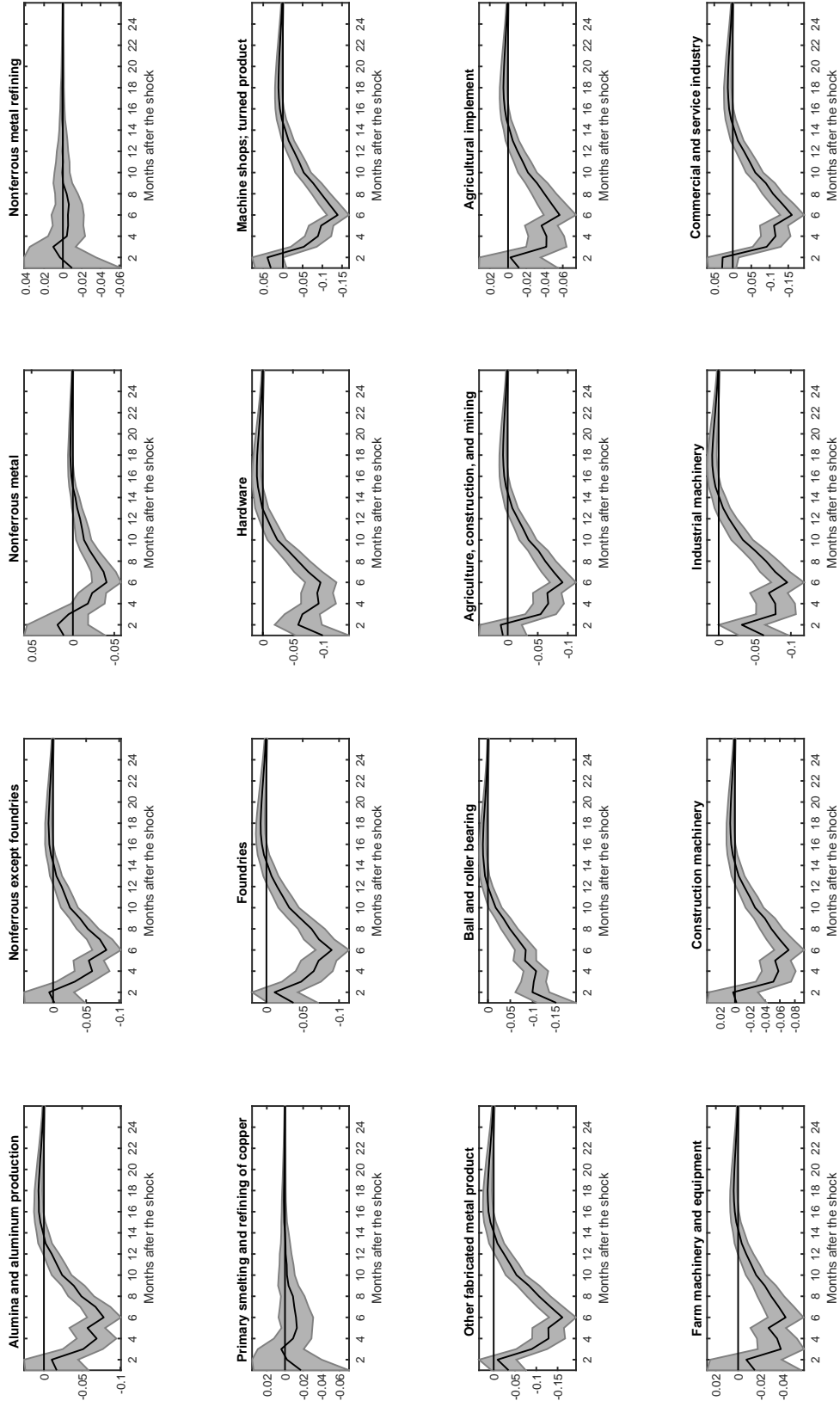
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.3: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



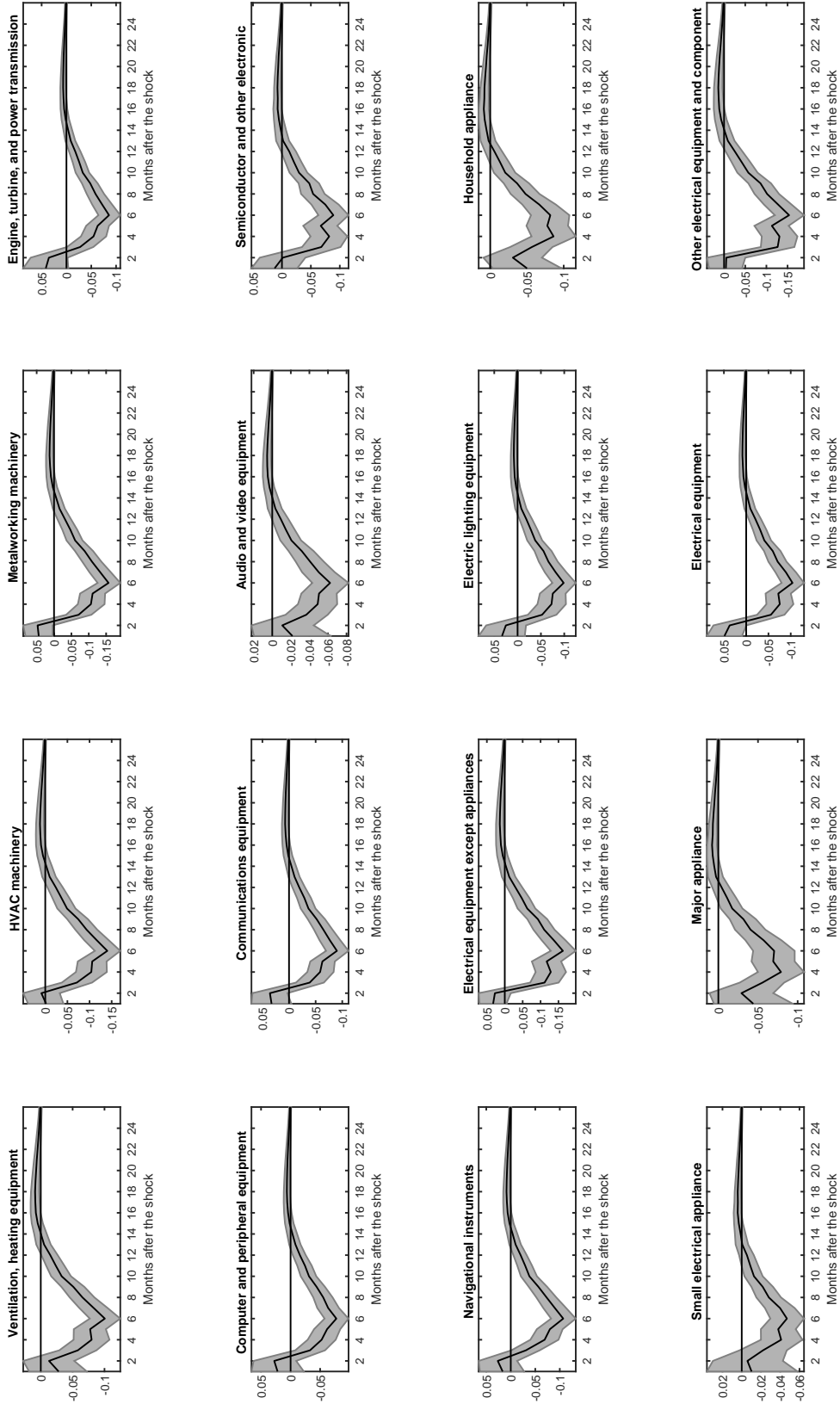
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.4: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



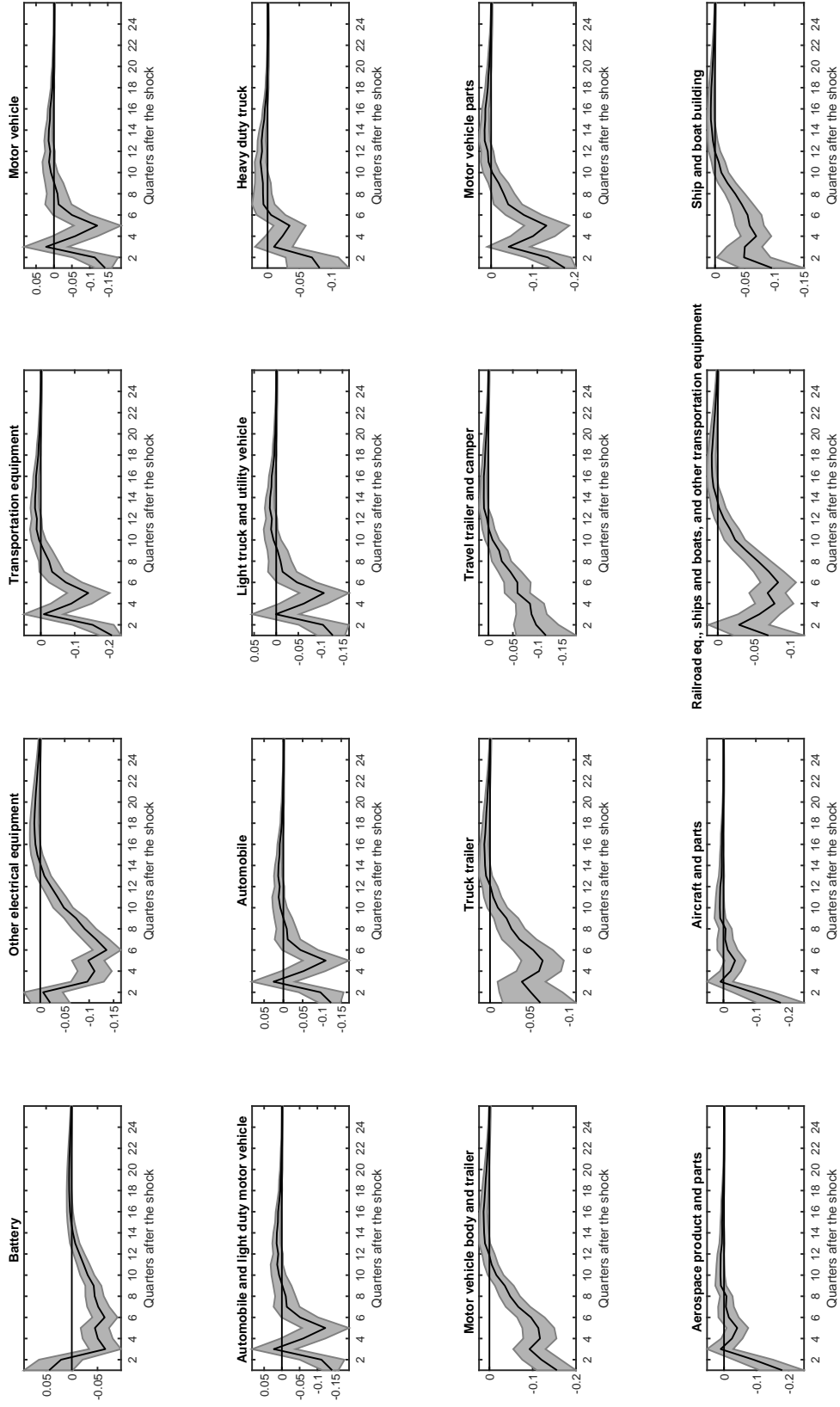
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.5: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



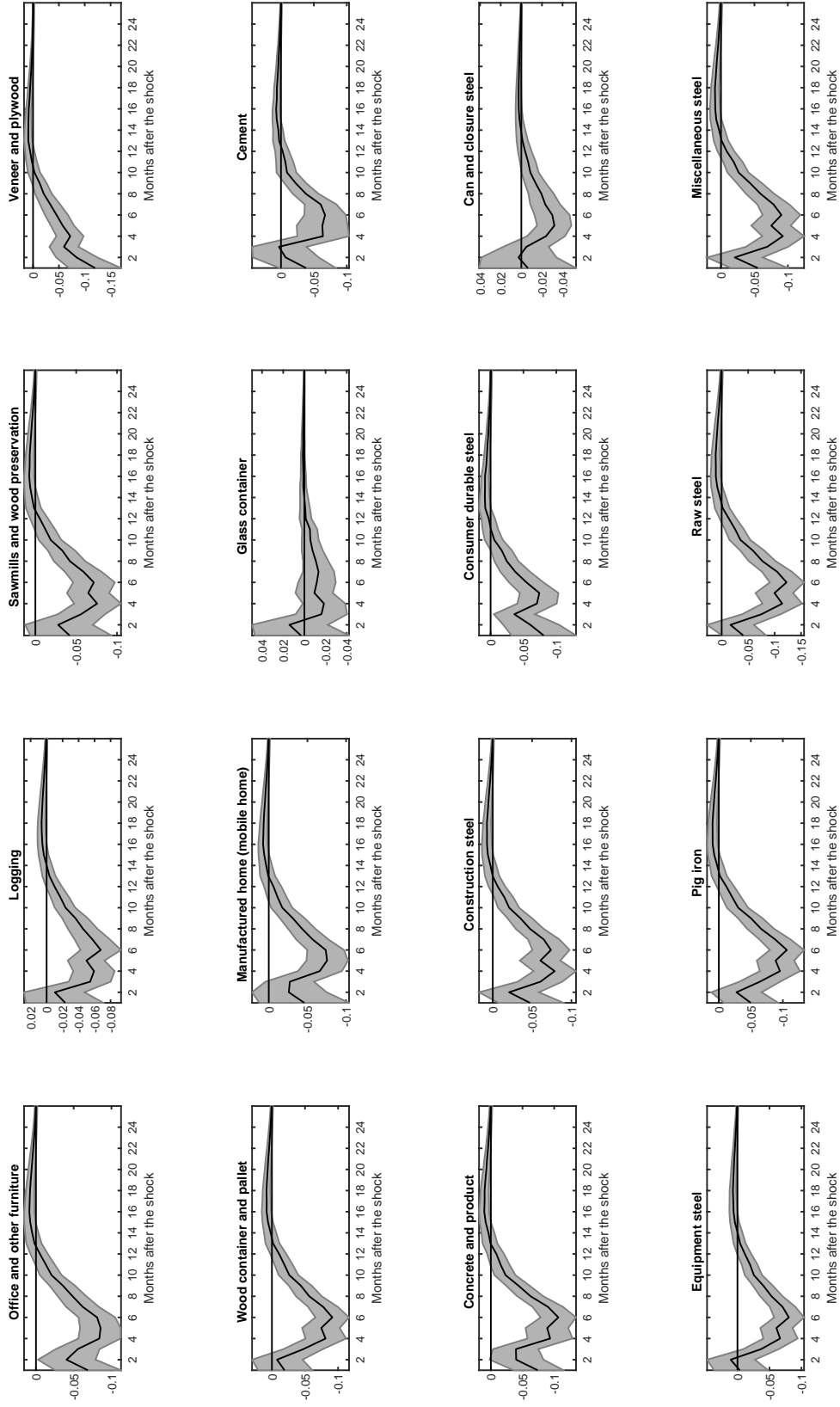
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.6: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

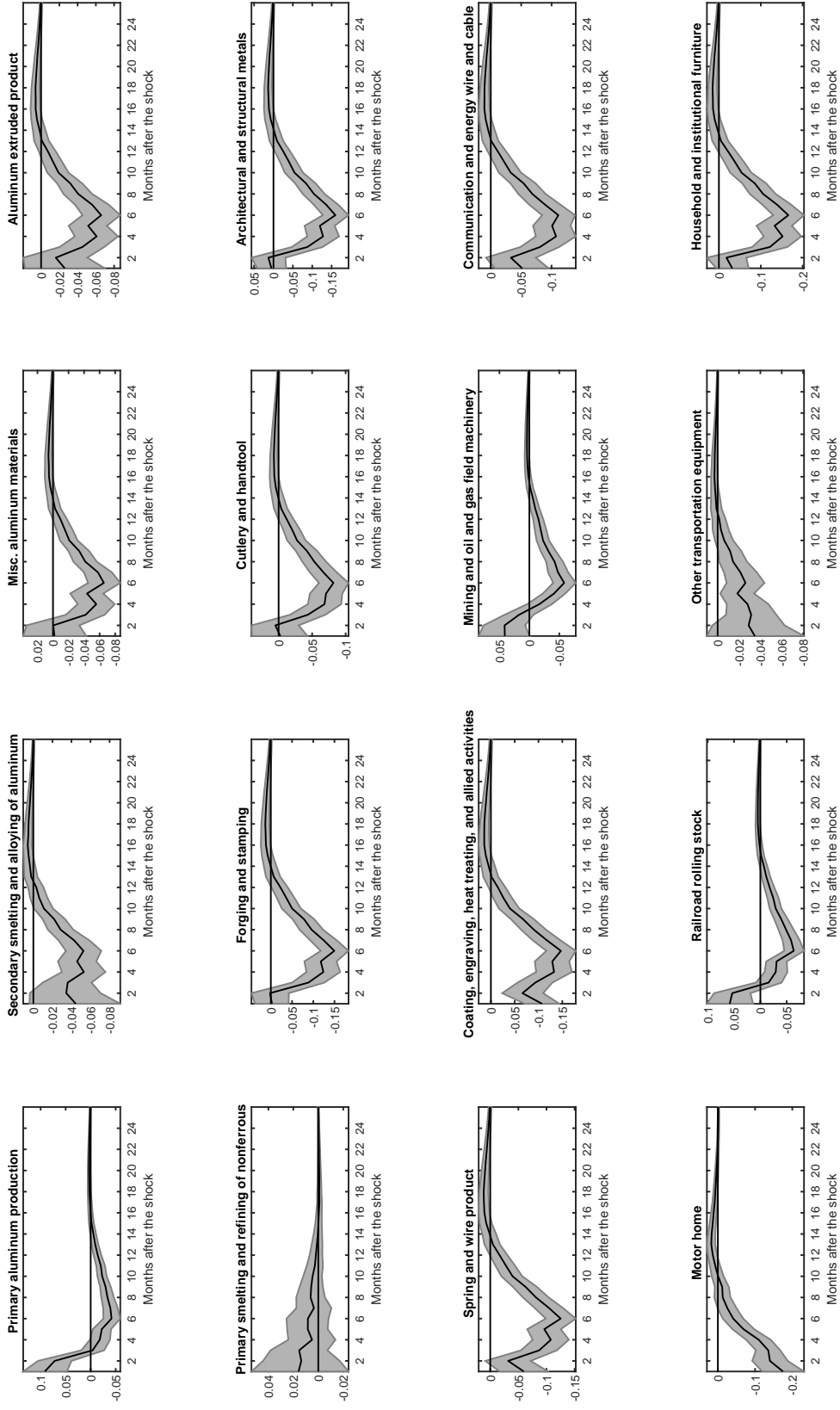
Figure A.7: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

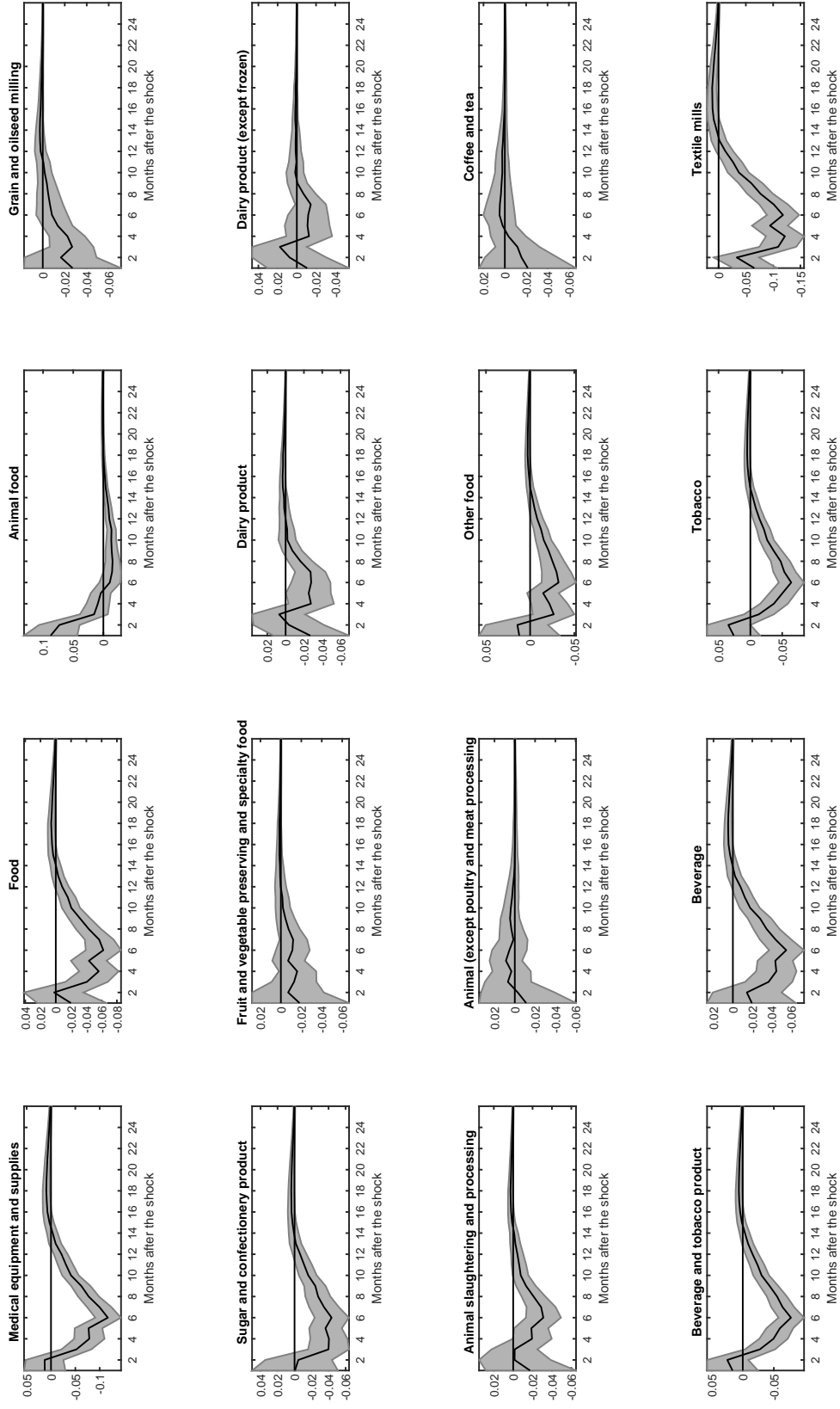


Figure A.8: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



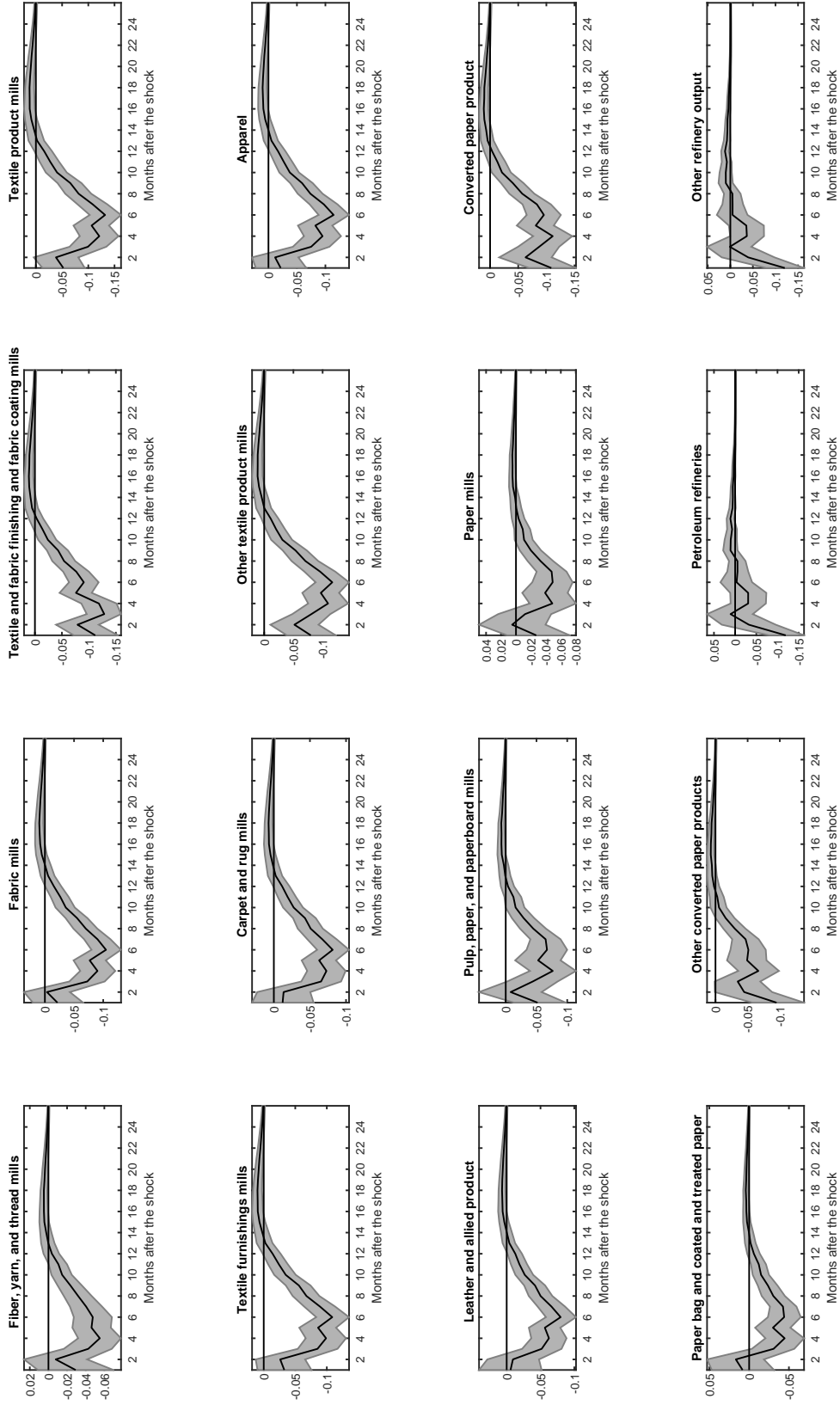
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.9: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



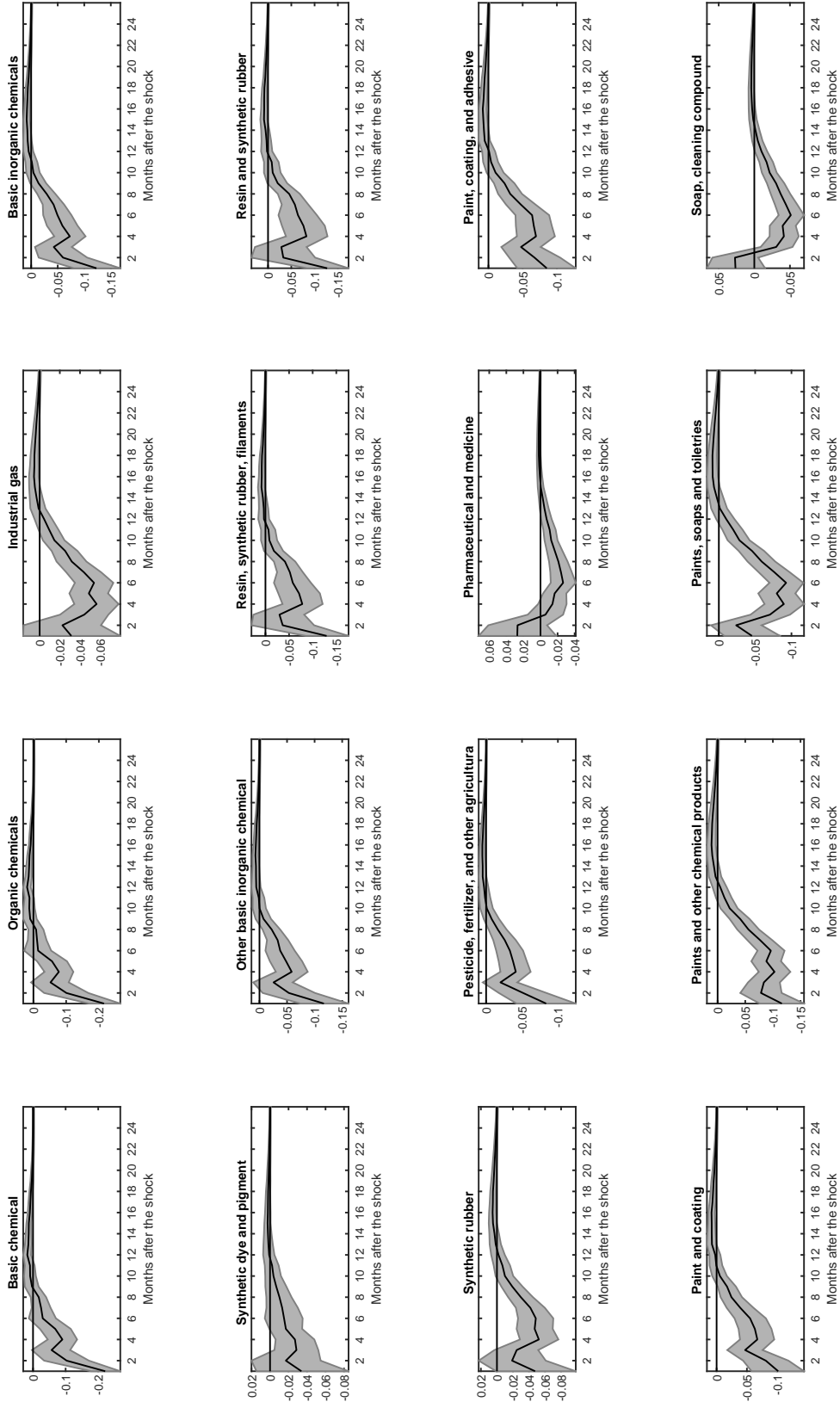
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.10: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



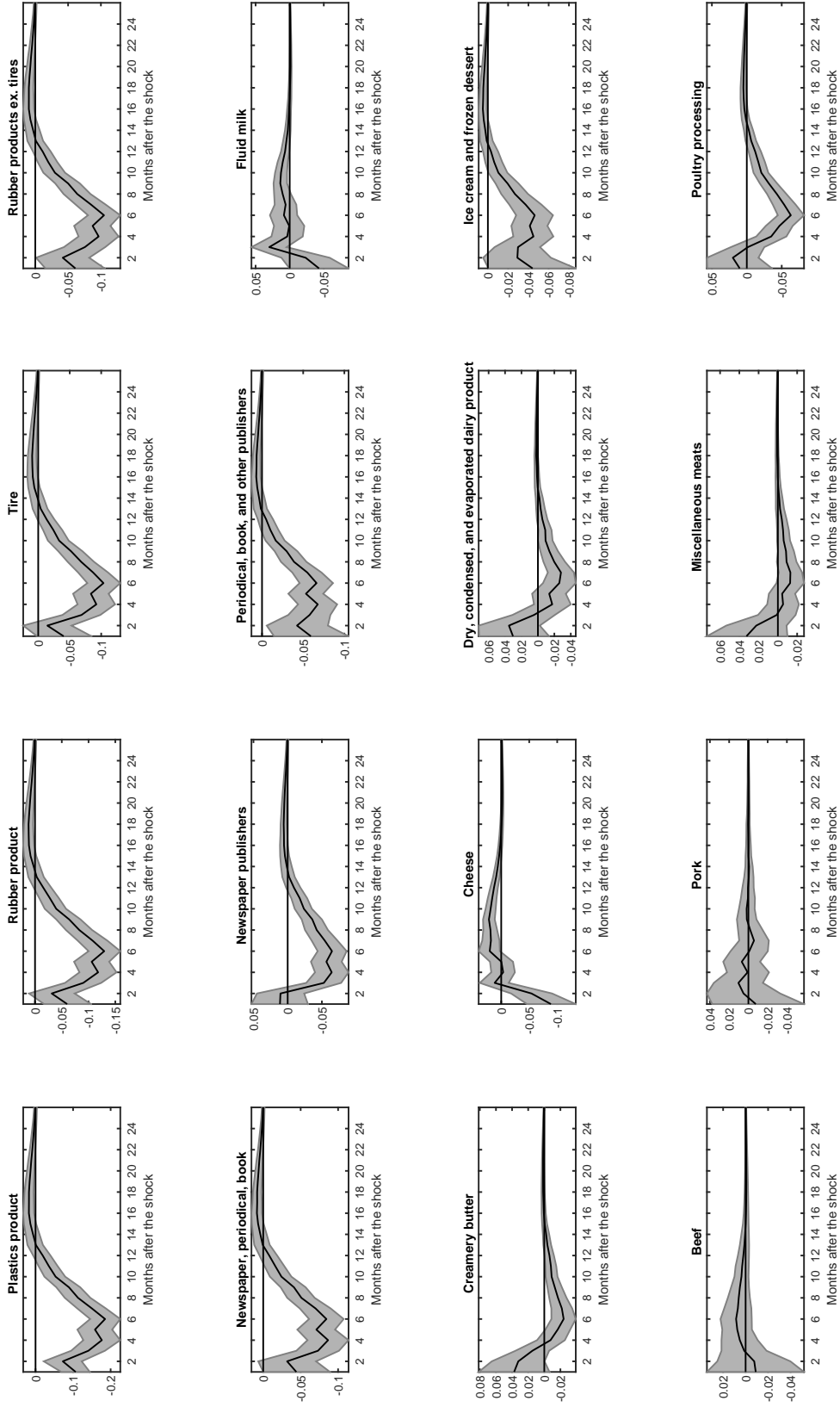
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.11: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



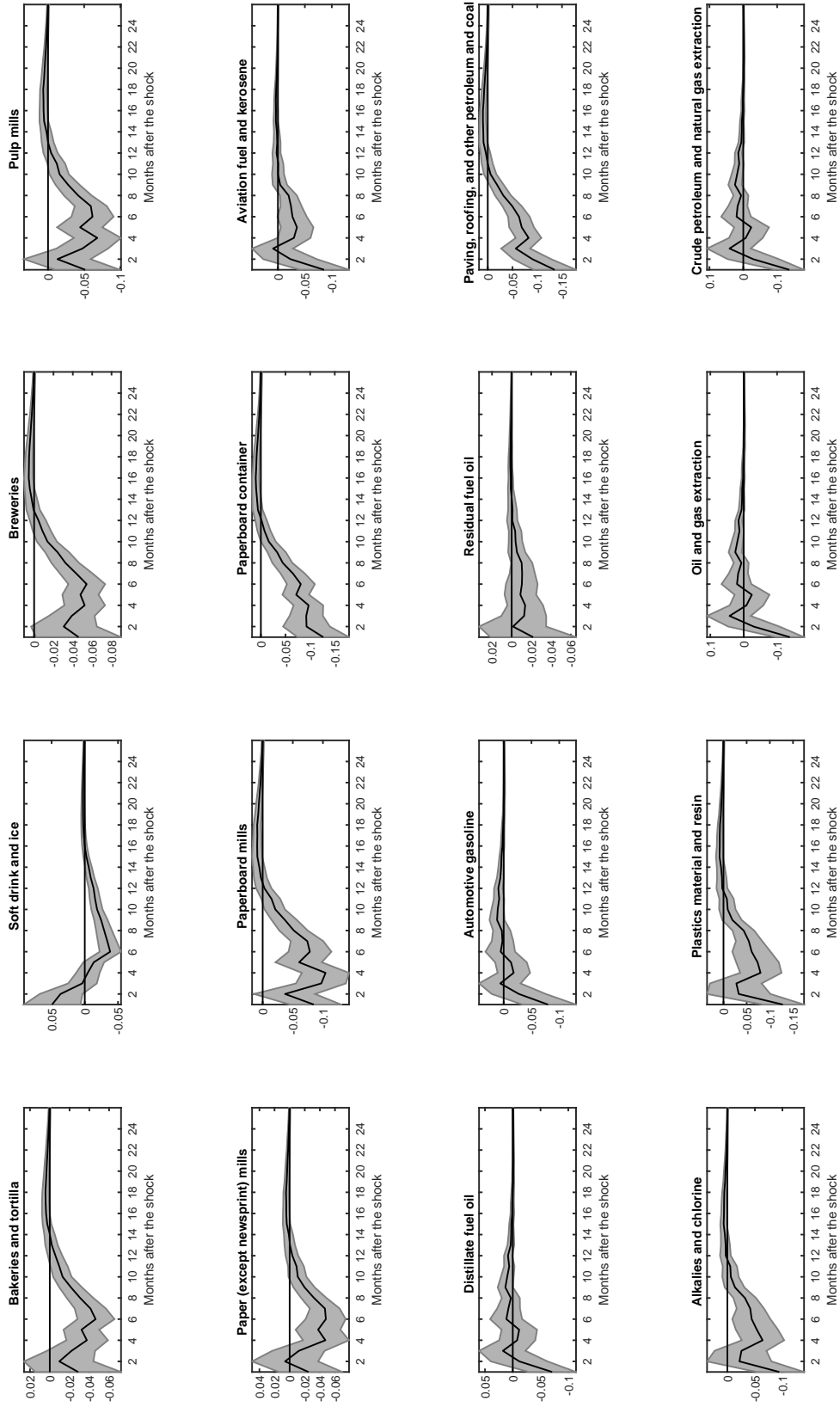
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.12: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



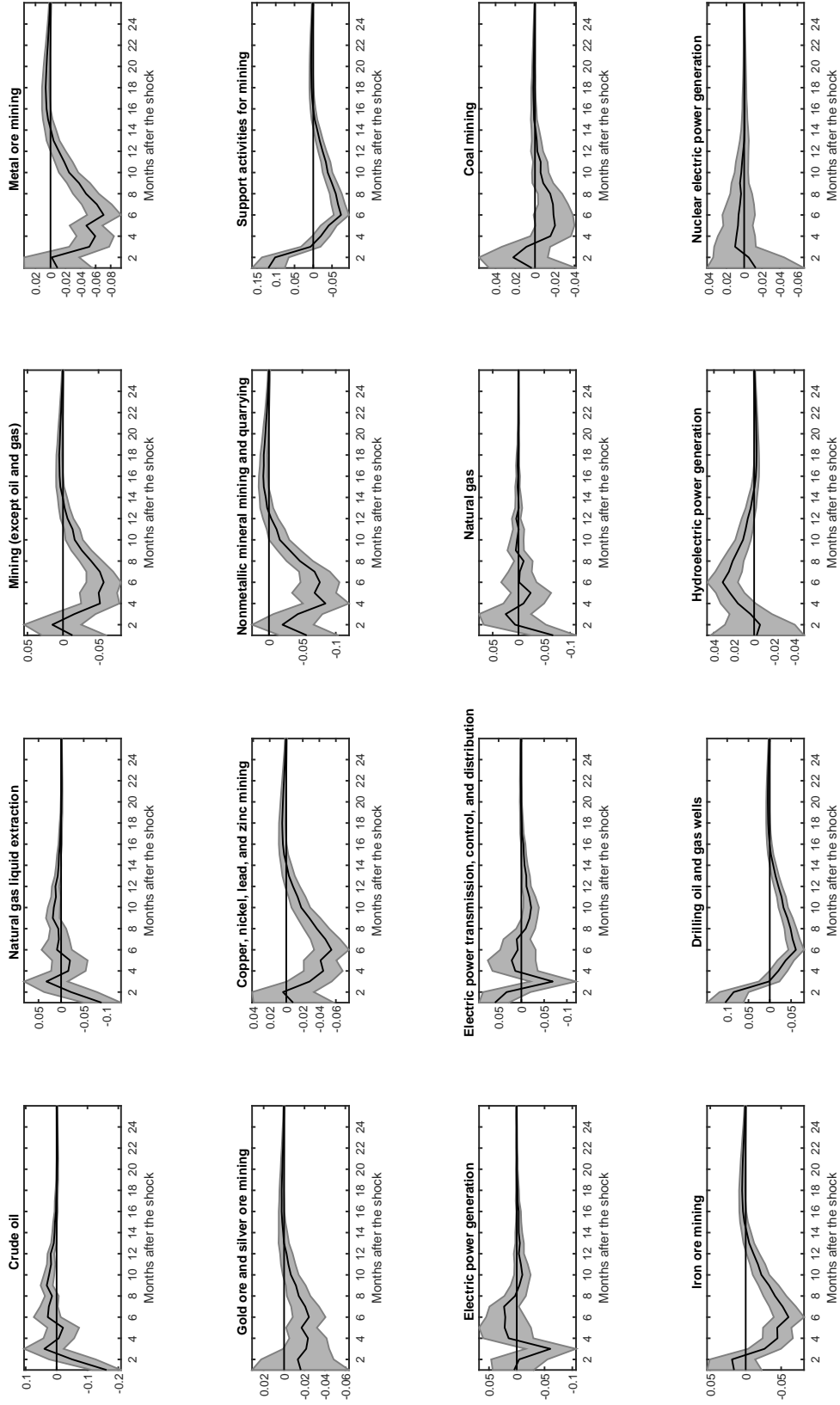
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.13: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



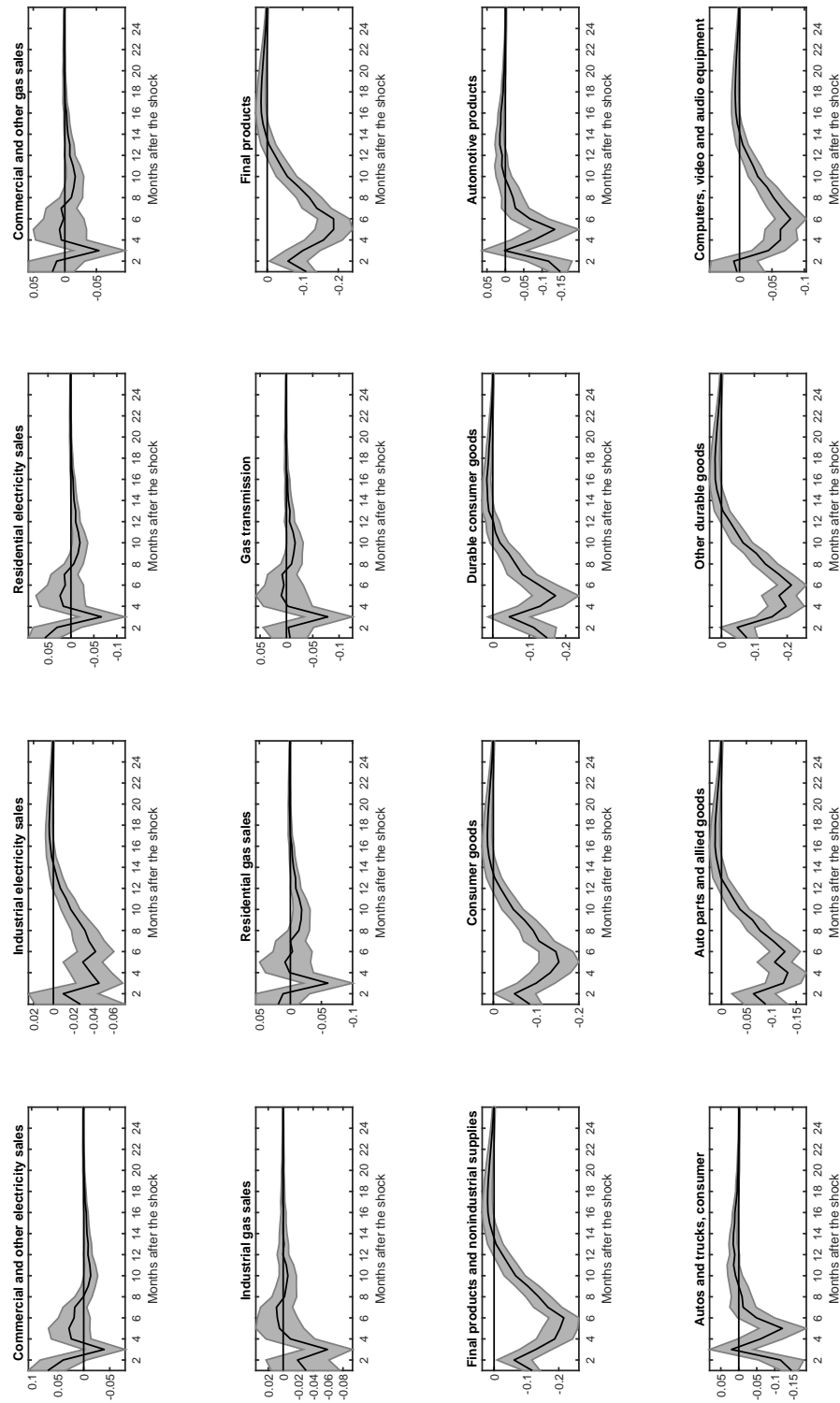
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.14: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

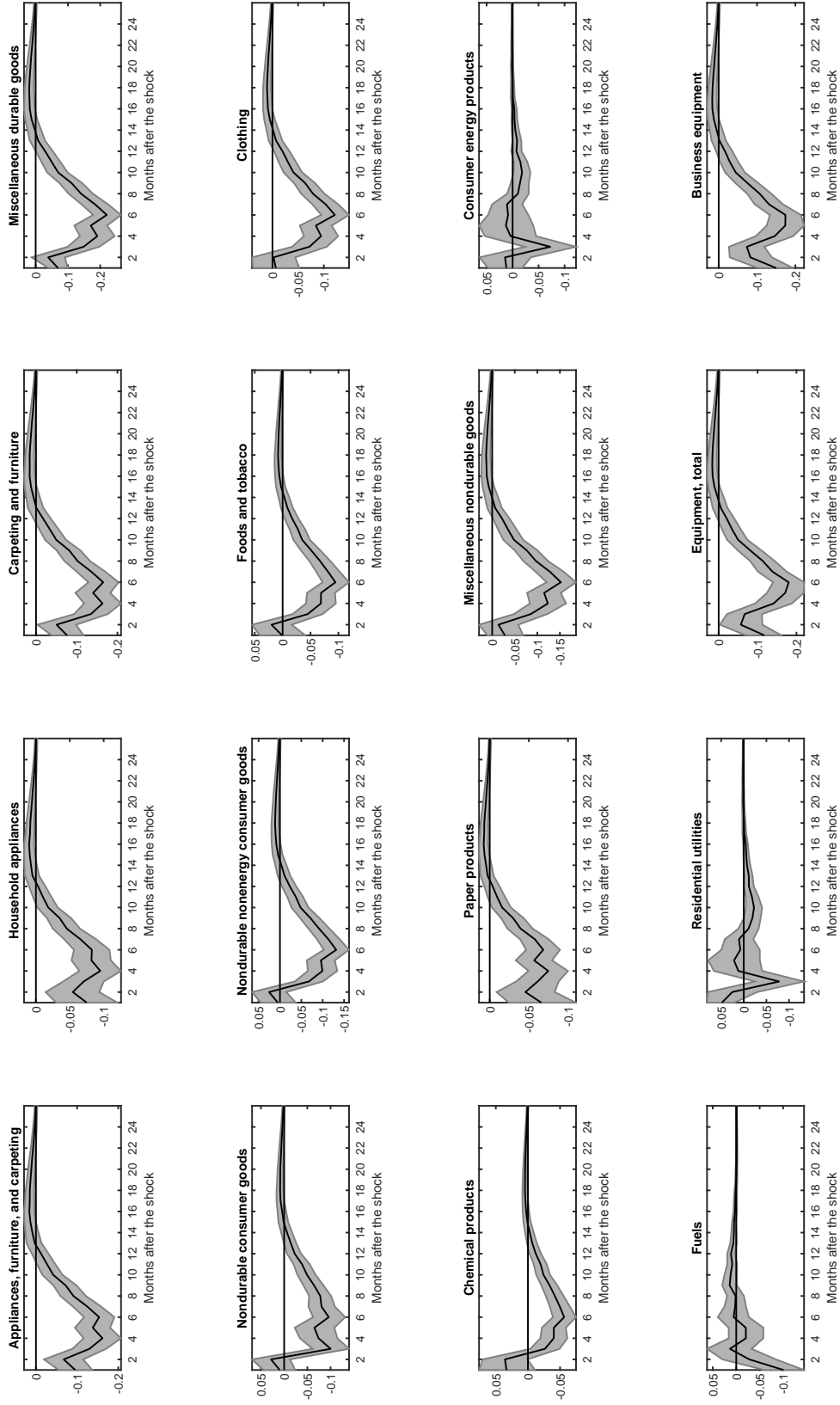
Figure A.15: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

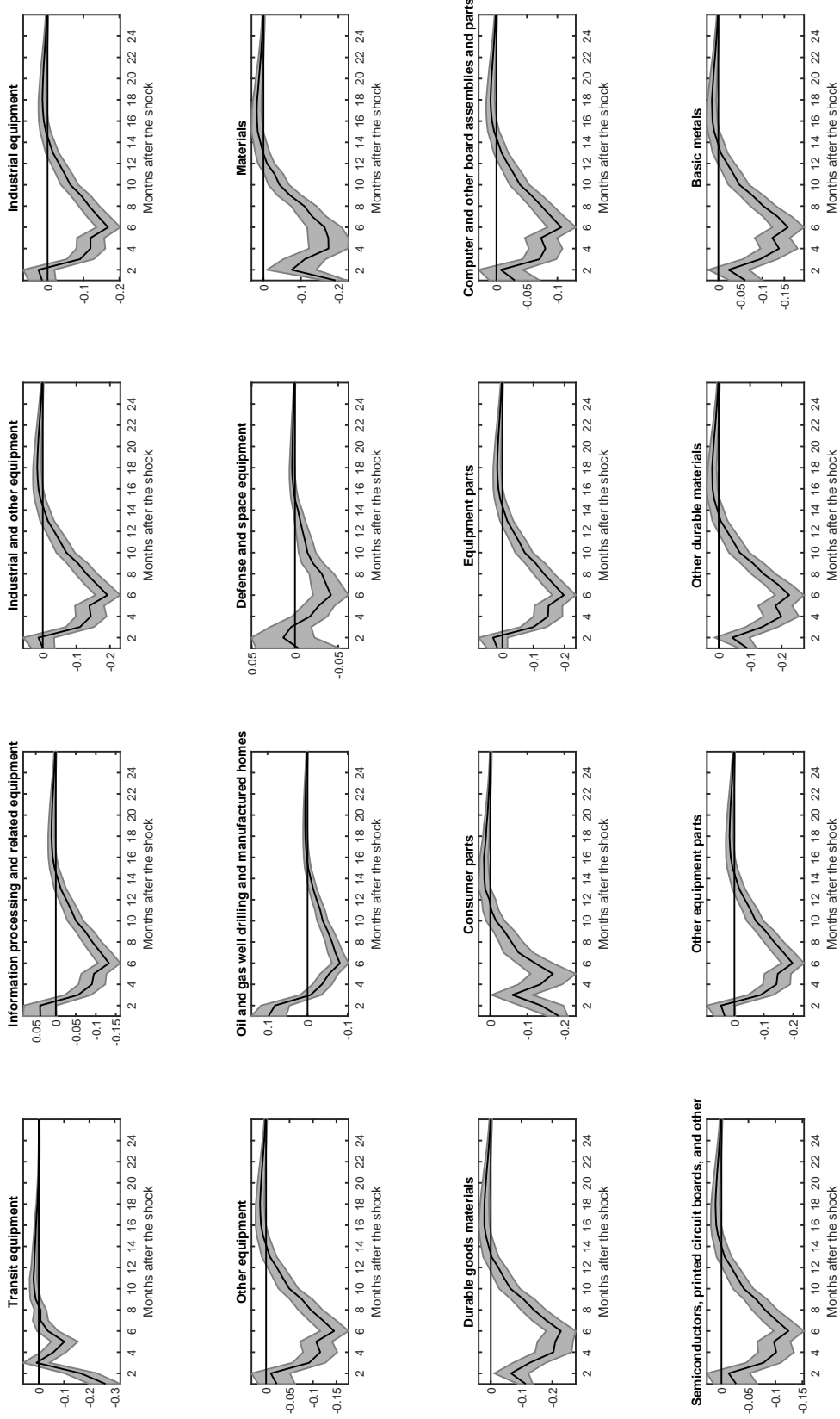


Figure A.16: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



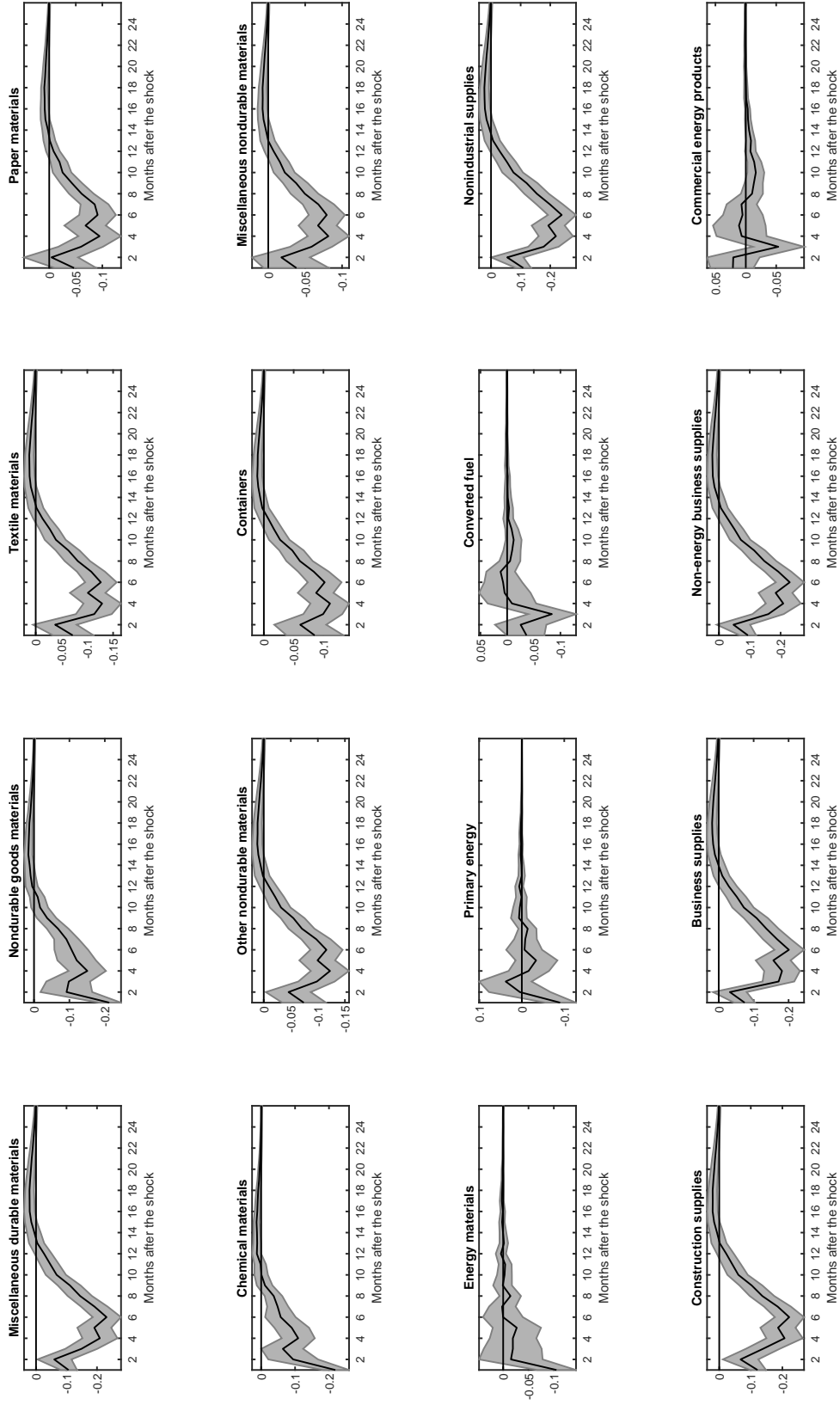
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.17: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



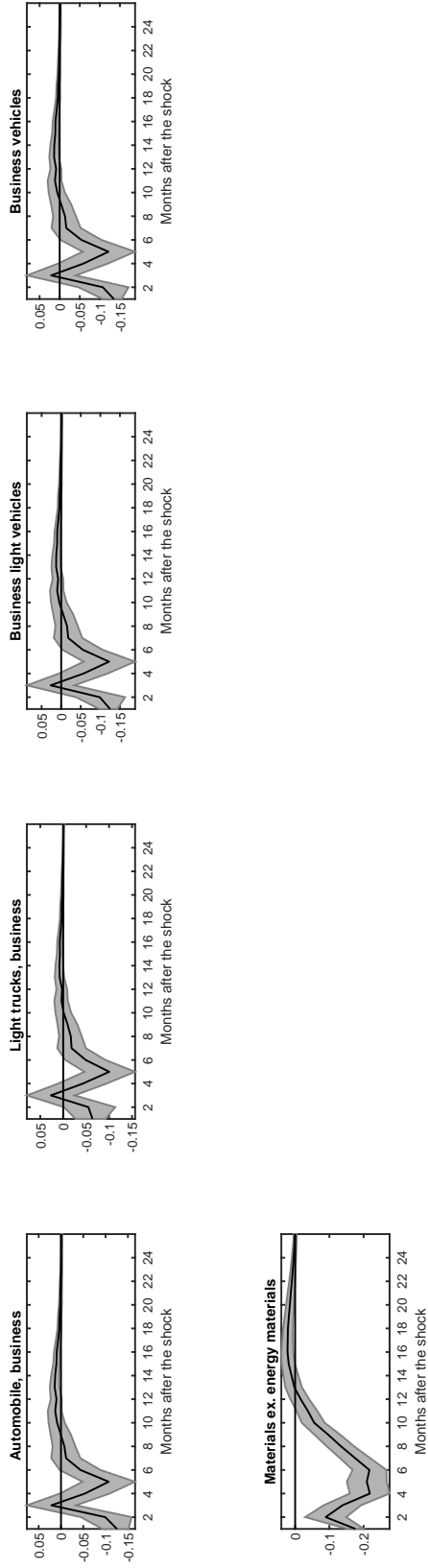
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.18: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



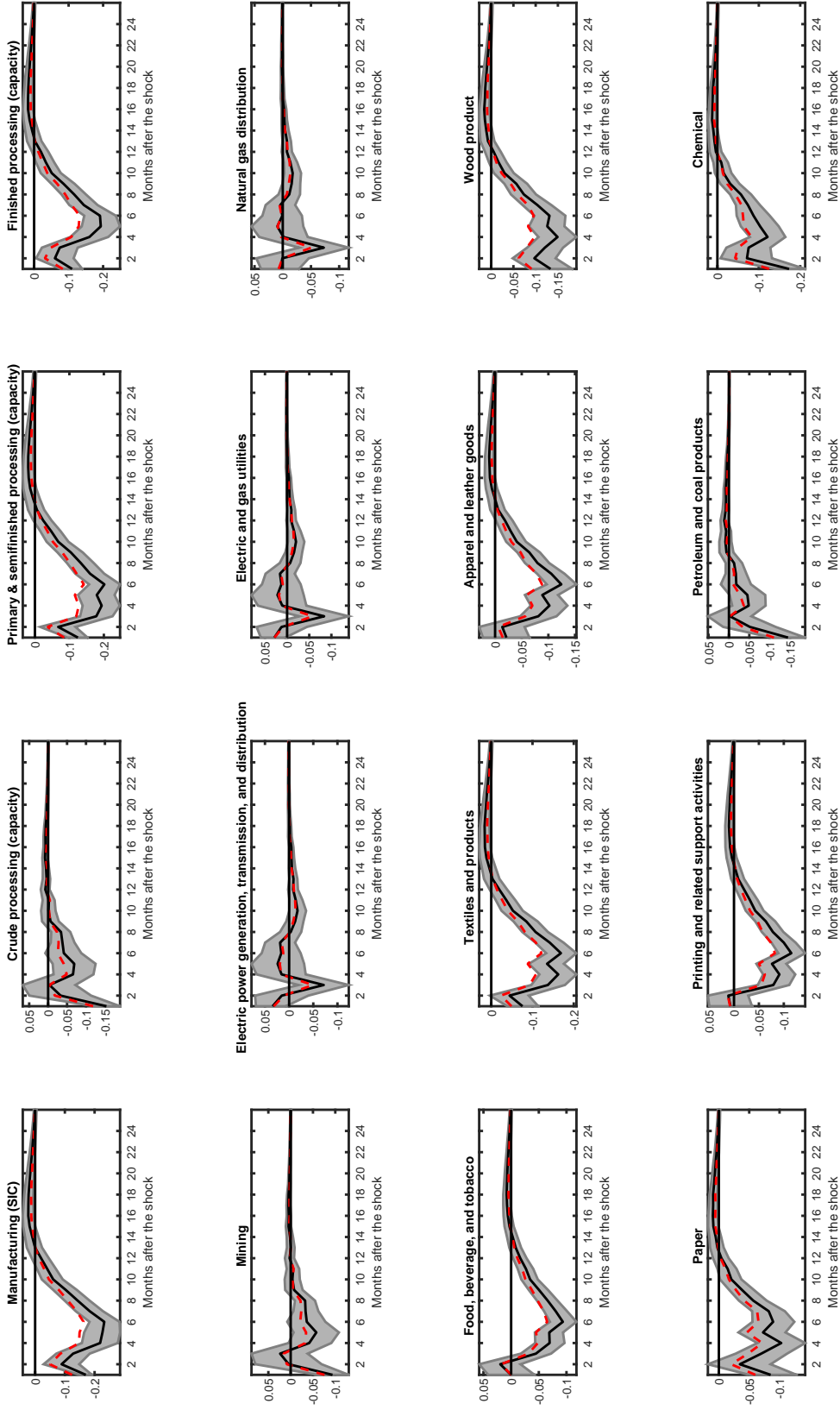
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.19: The Actual Response of Industrial Production to a Shock in Macro Uncertainty



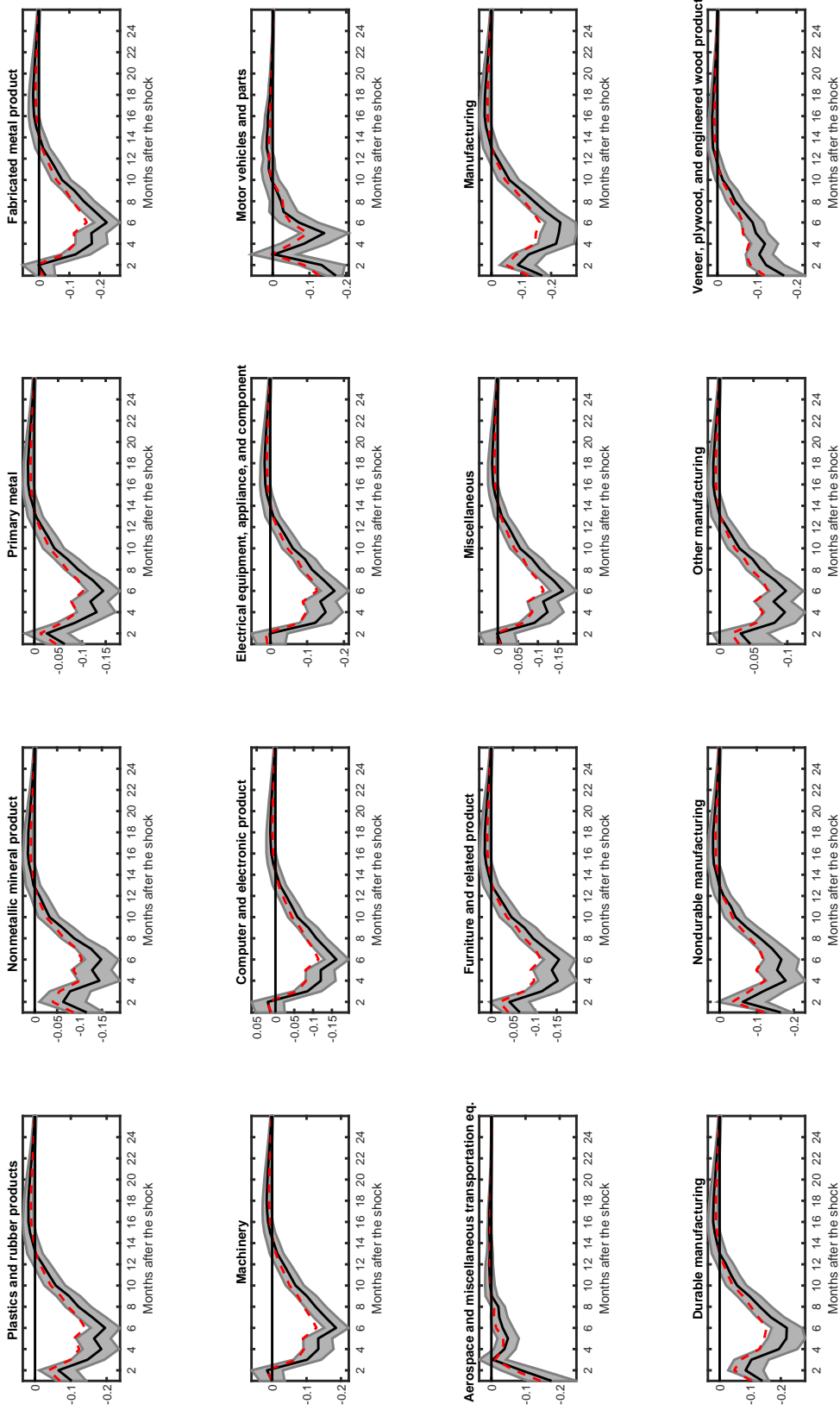
*Note:* The point estimate is denoted by the solid black line while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.20: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



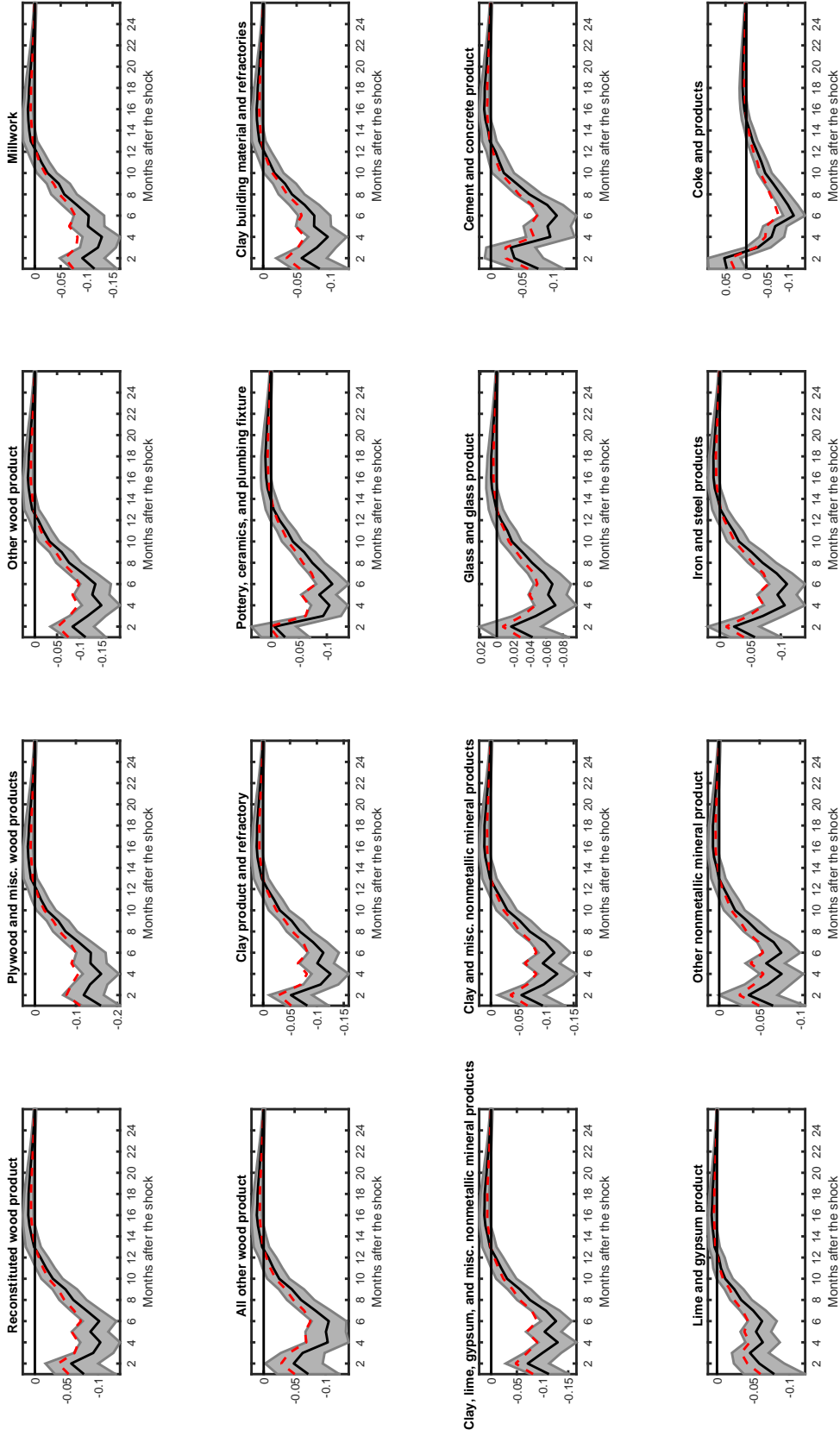
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.21: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



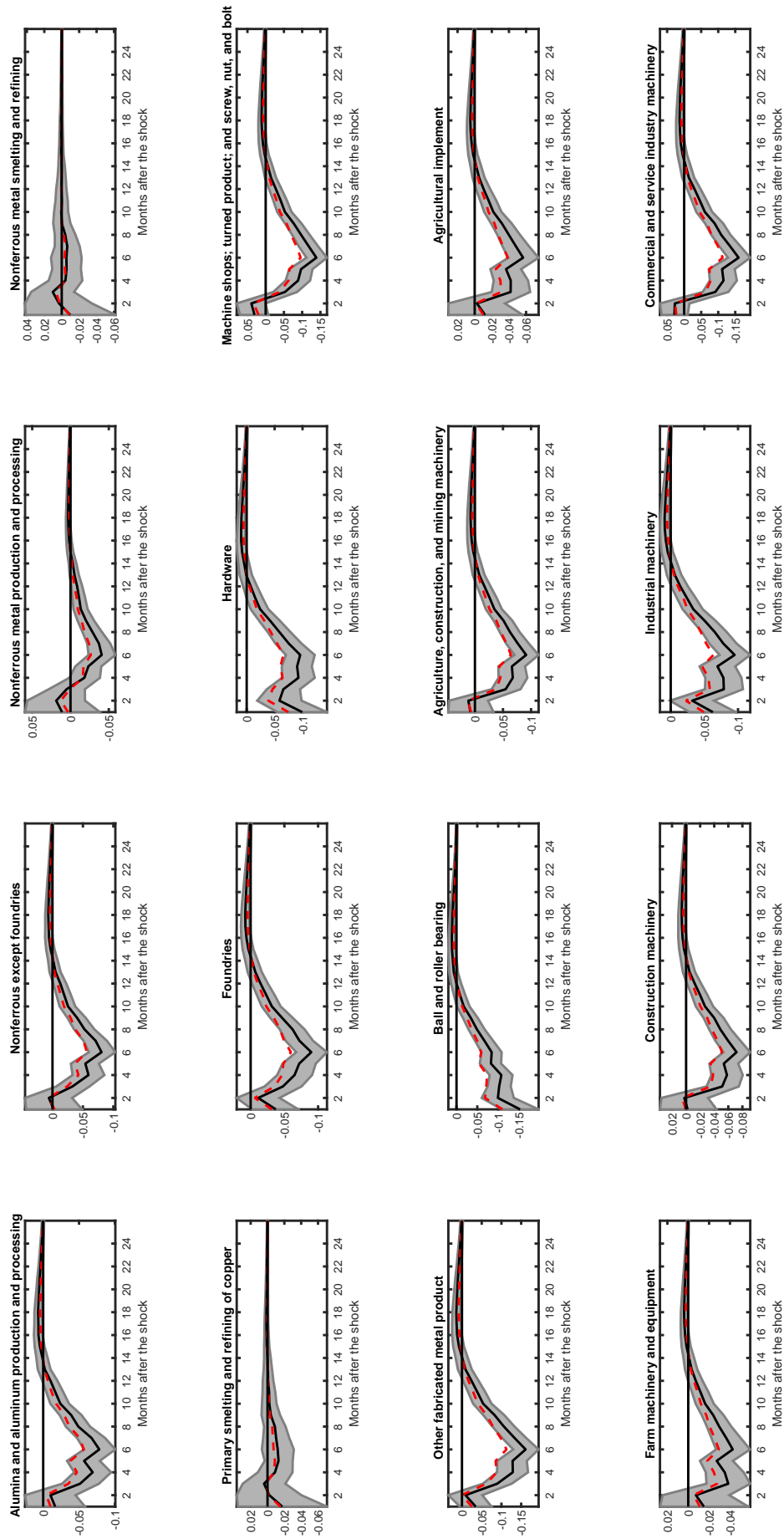
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.22: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

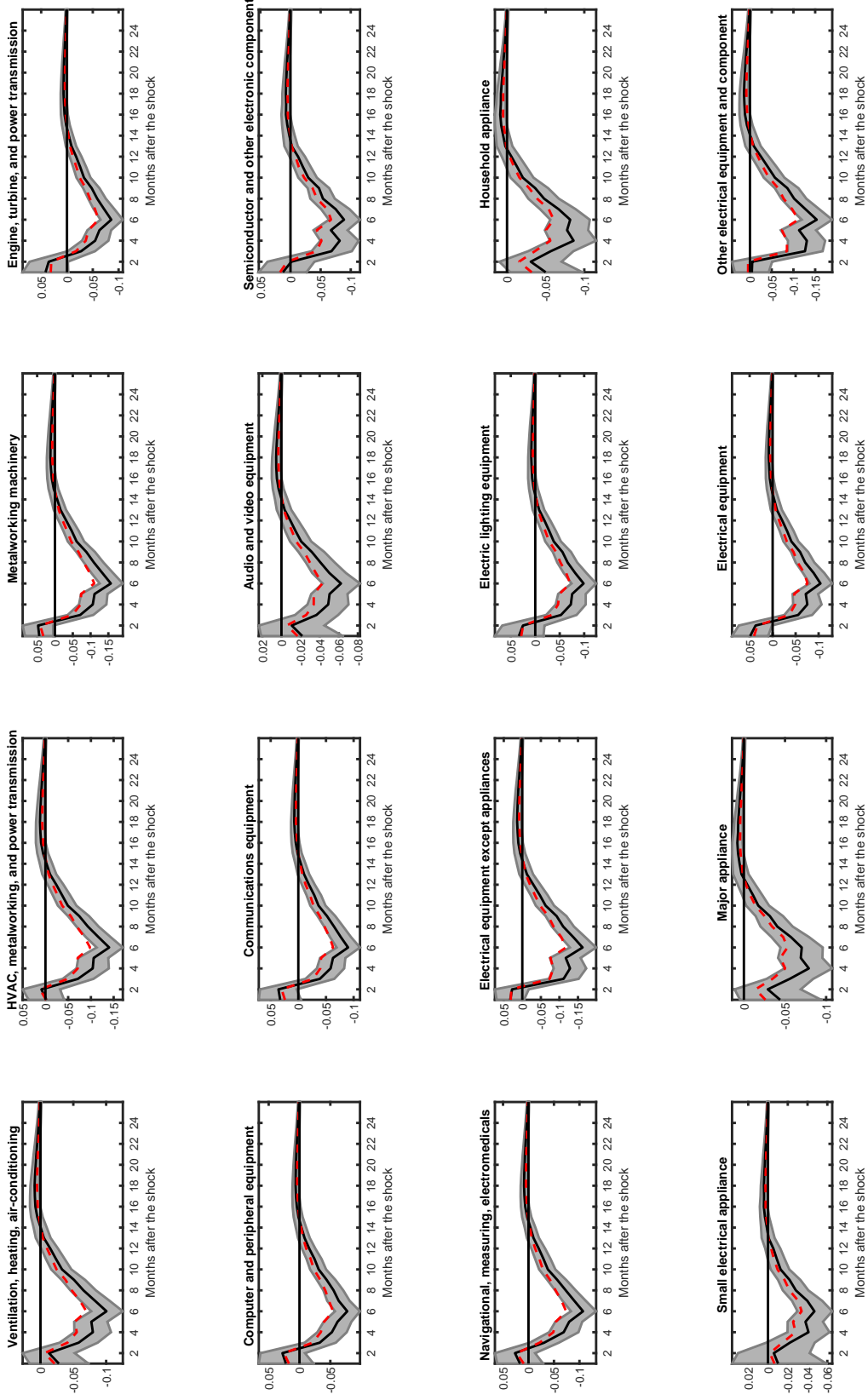
Figure A.23: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

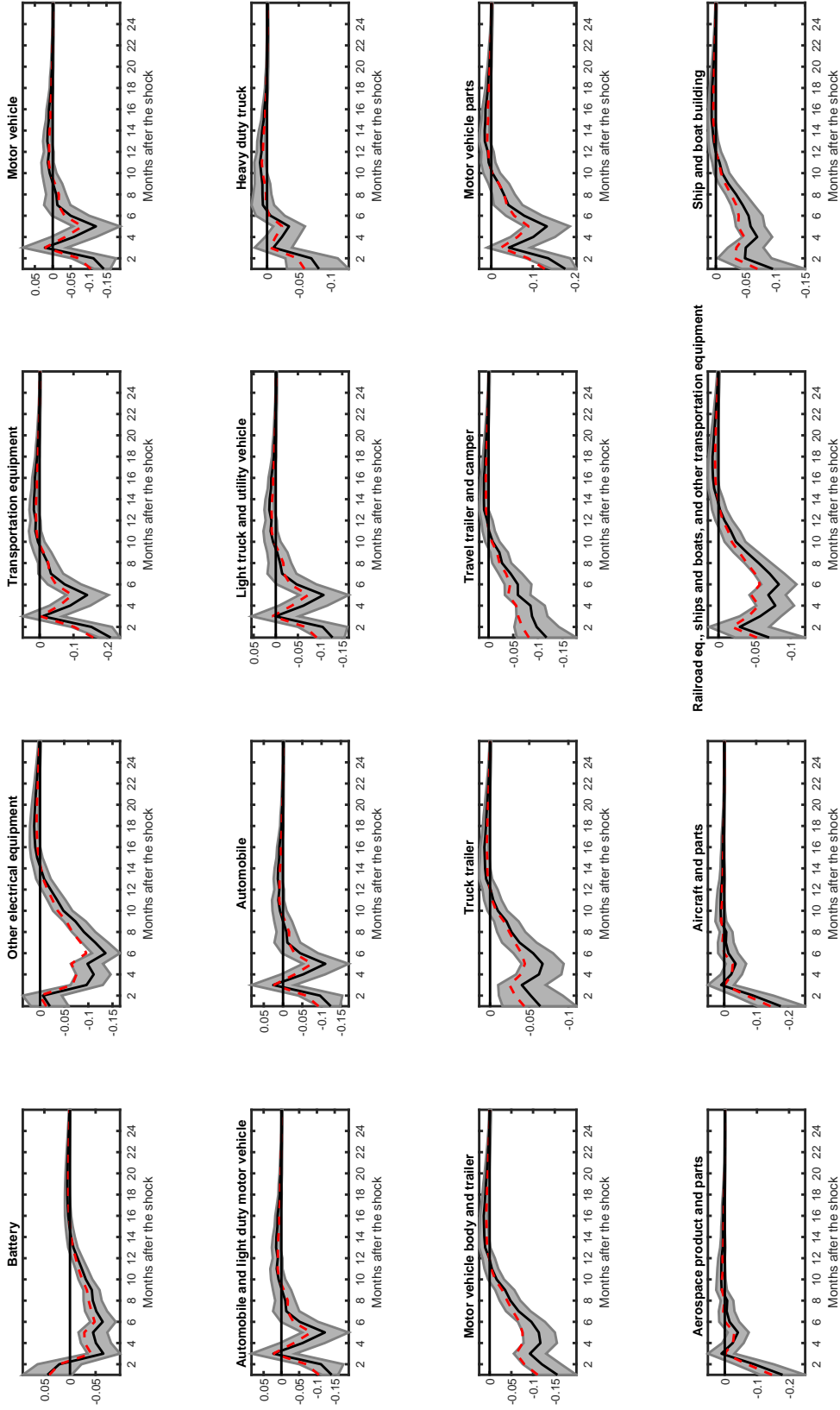


Figure A.24: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



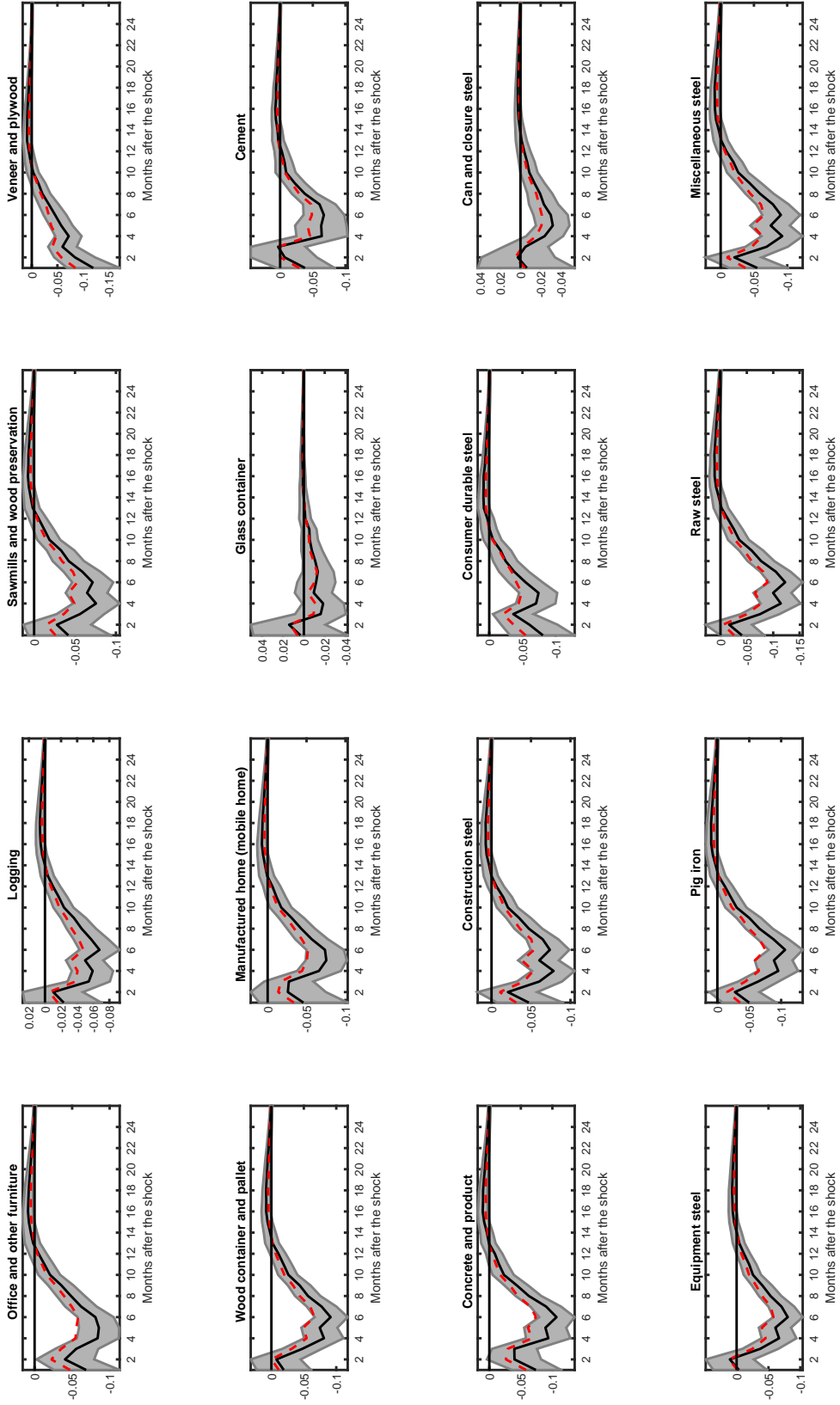
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.25: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



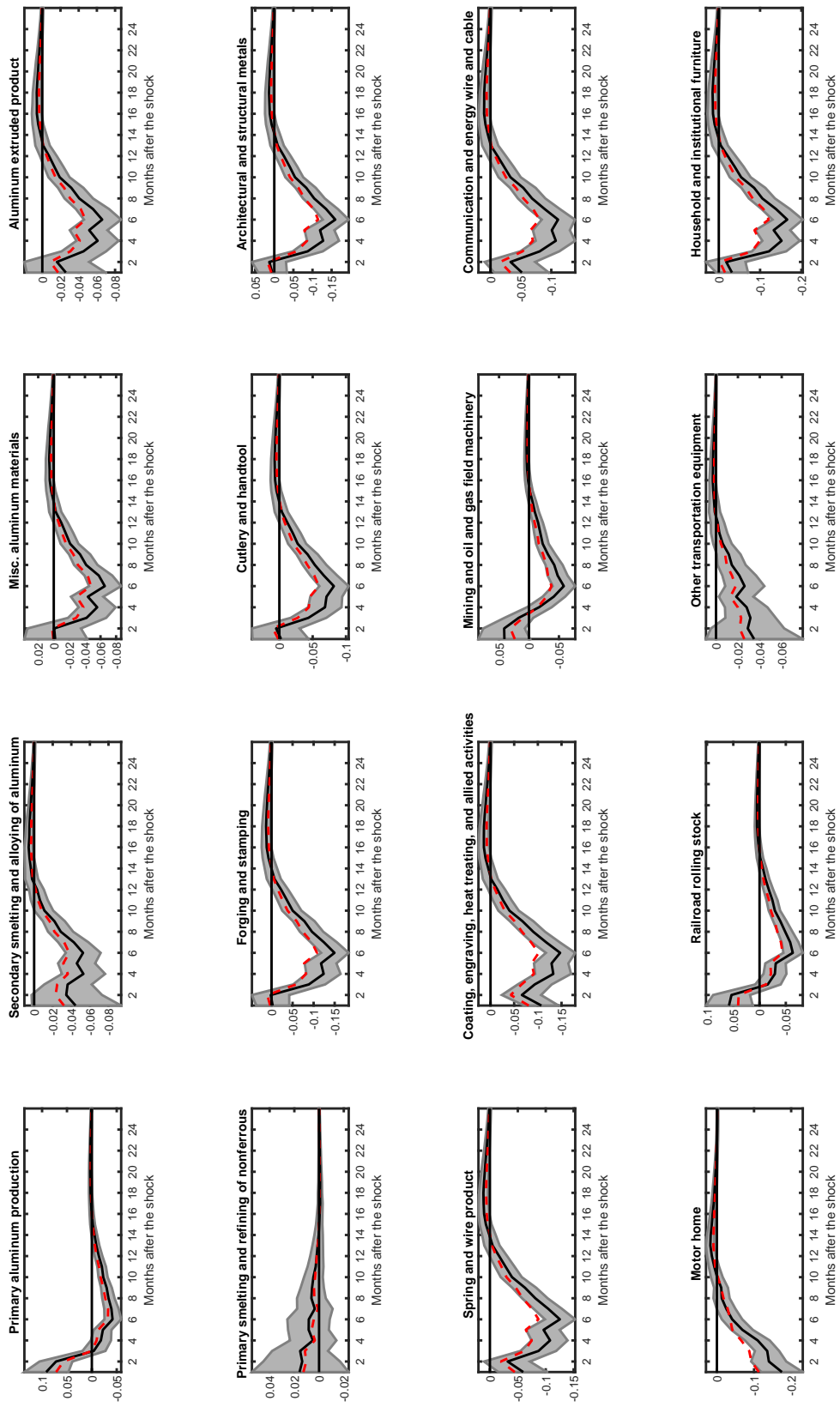
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.26: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



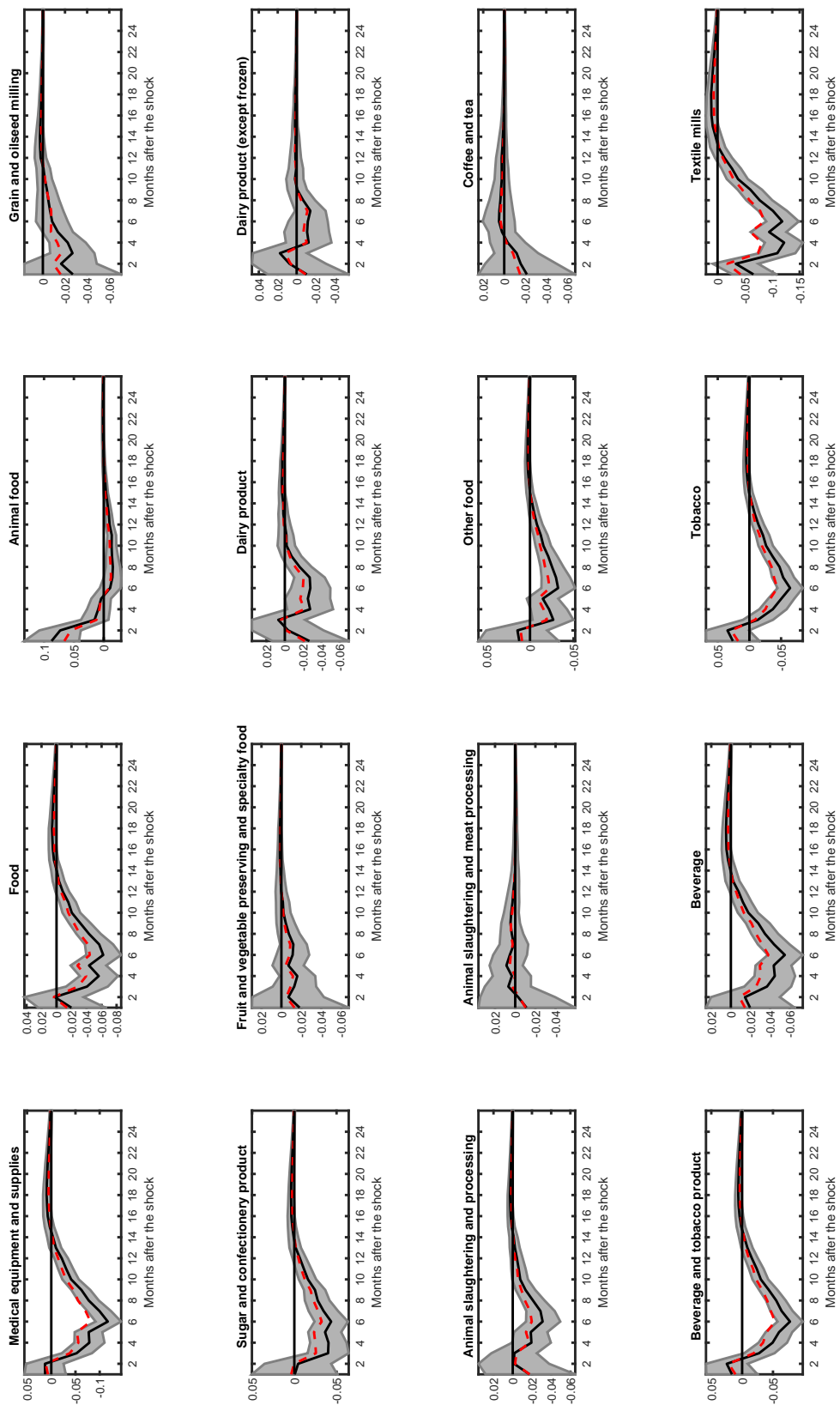
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.27: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



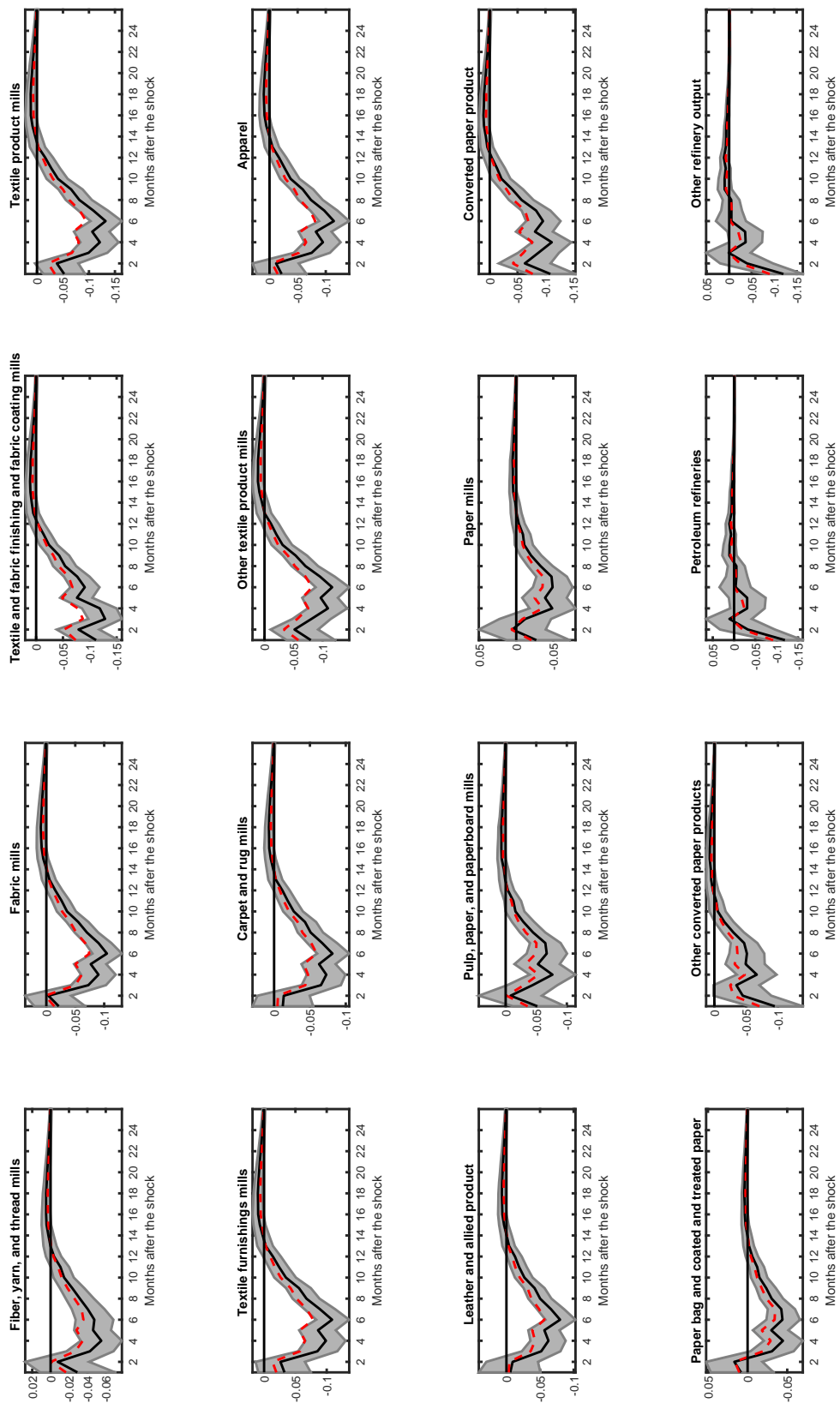
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.28: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



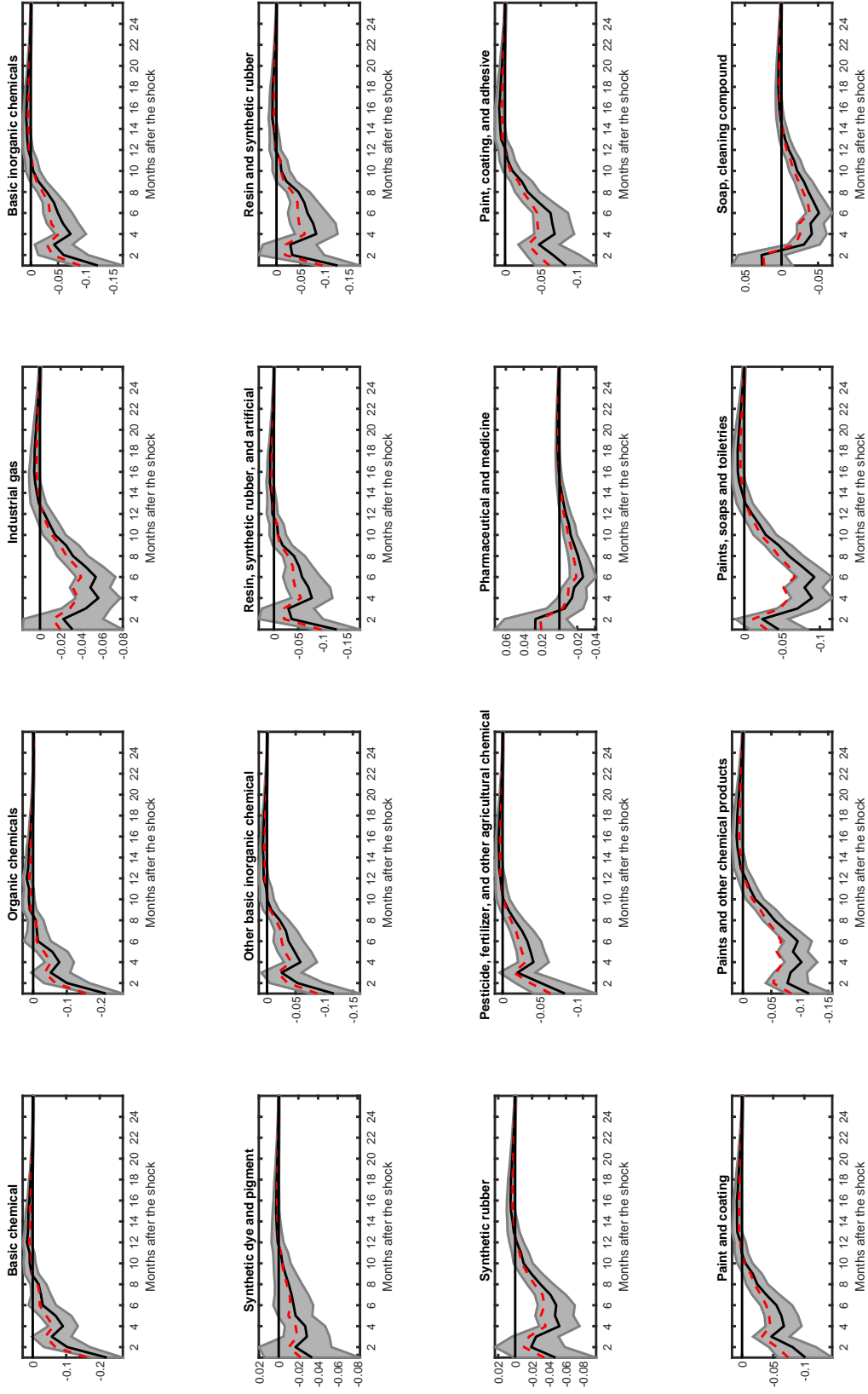
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.29: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



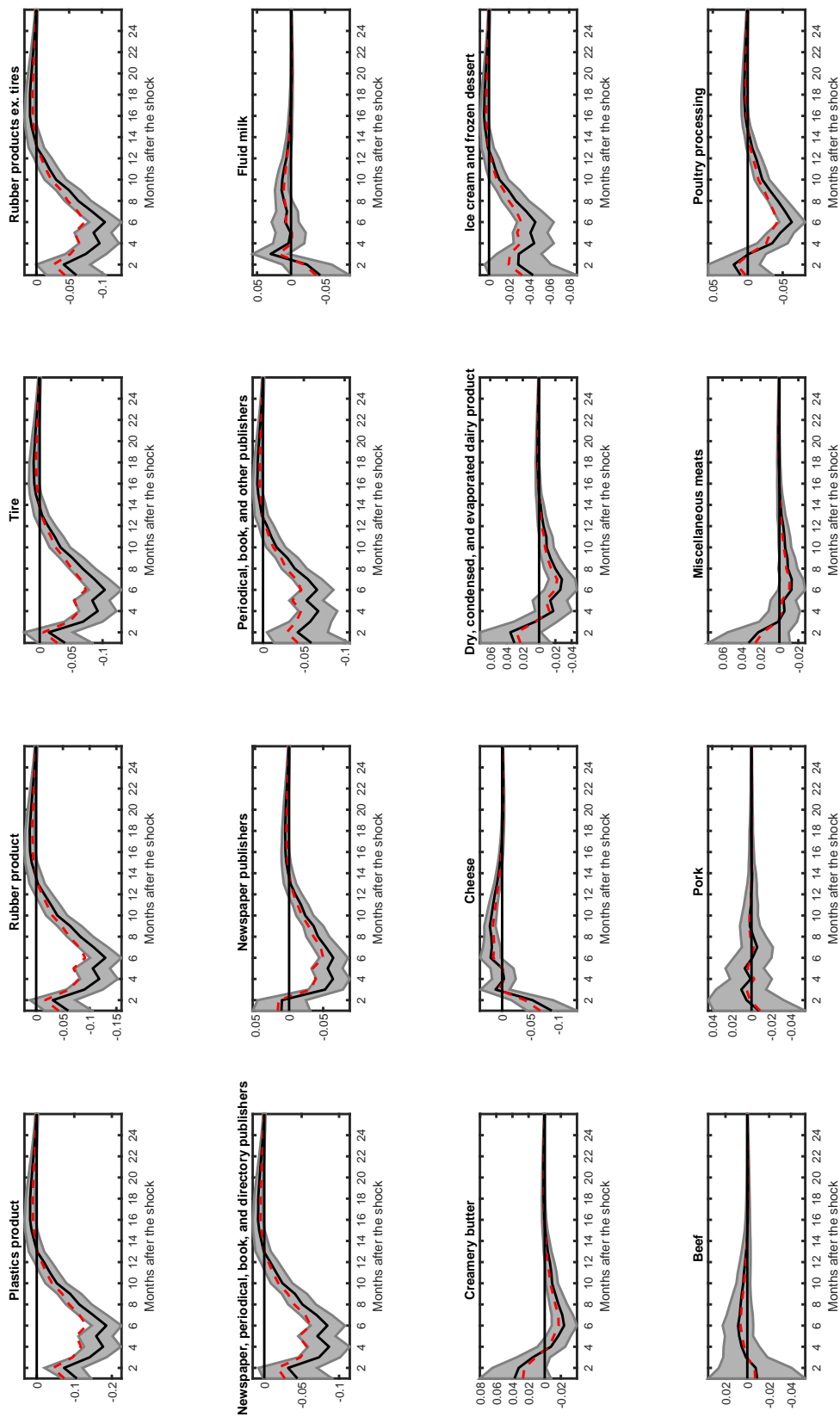
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.30: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

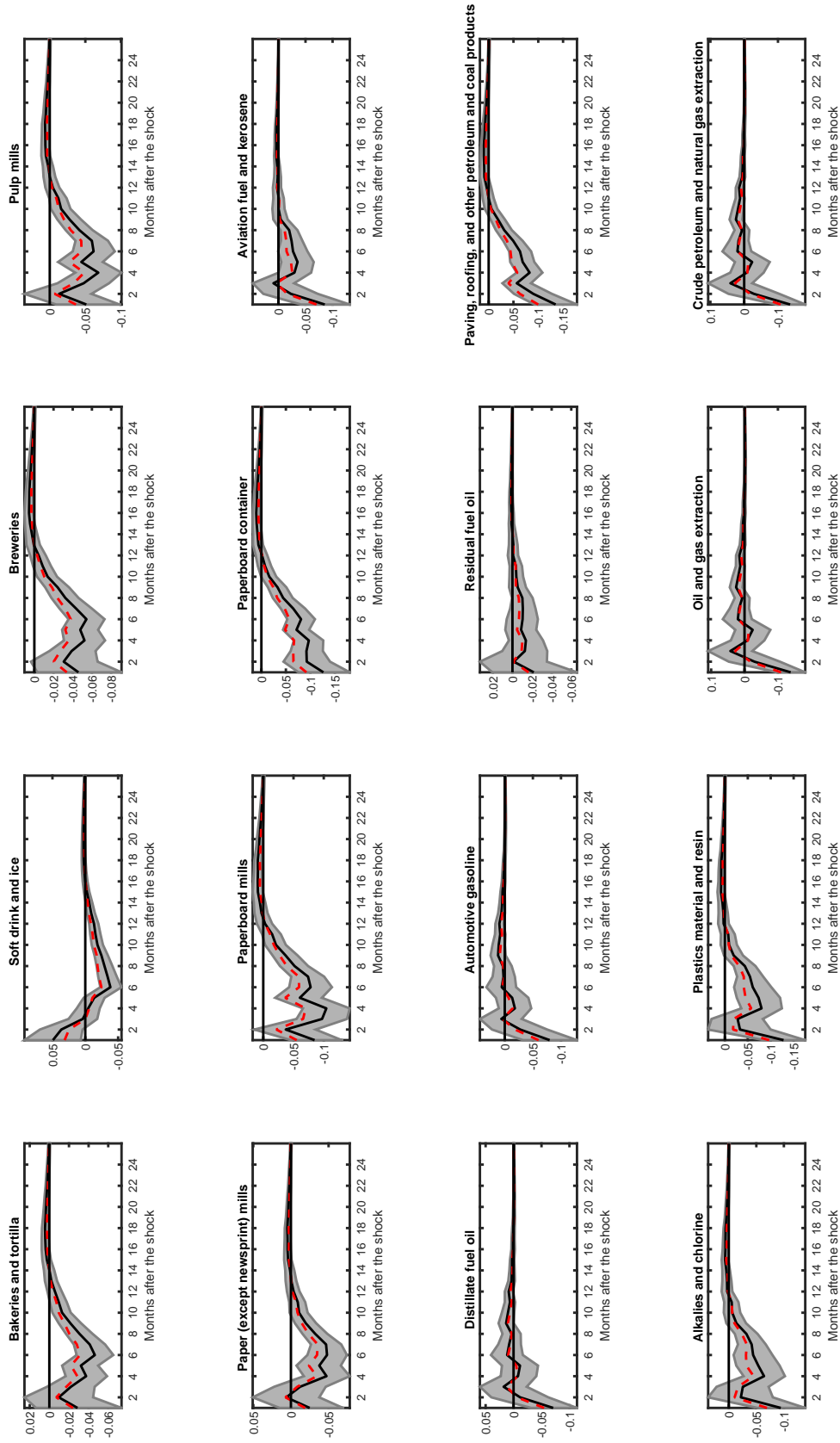
Figure A.31: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

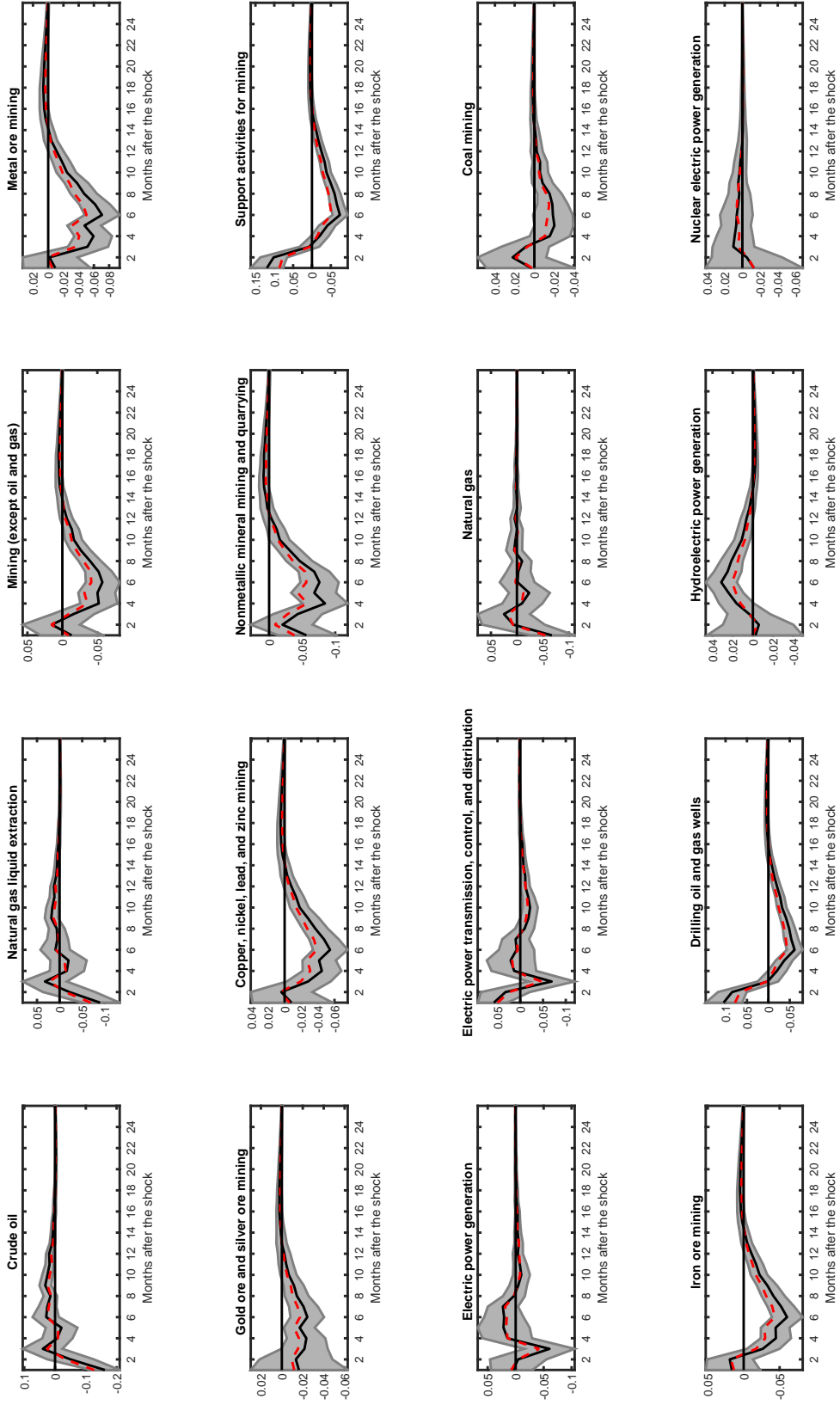


Figure A.32: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



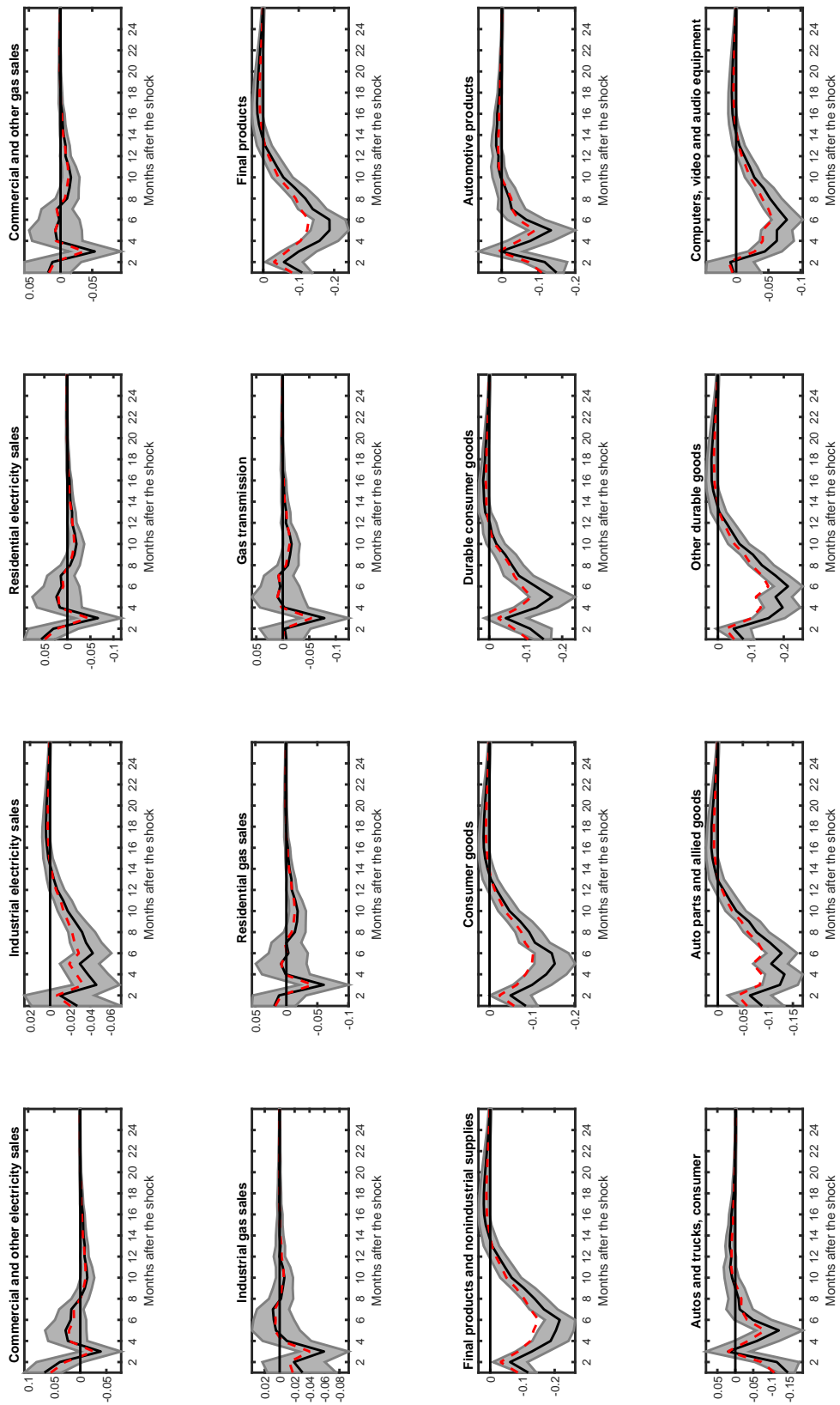
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.33: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



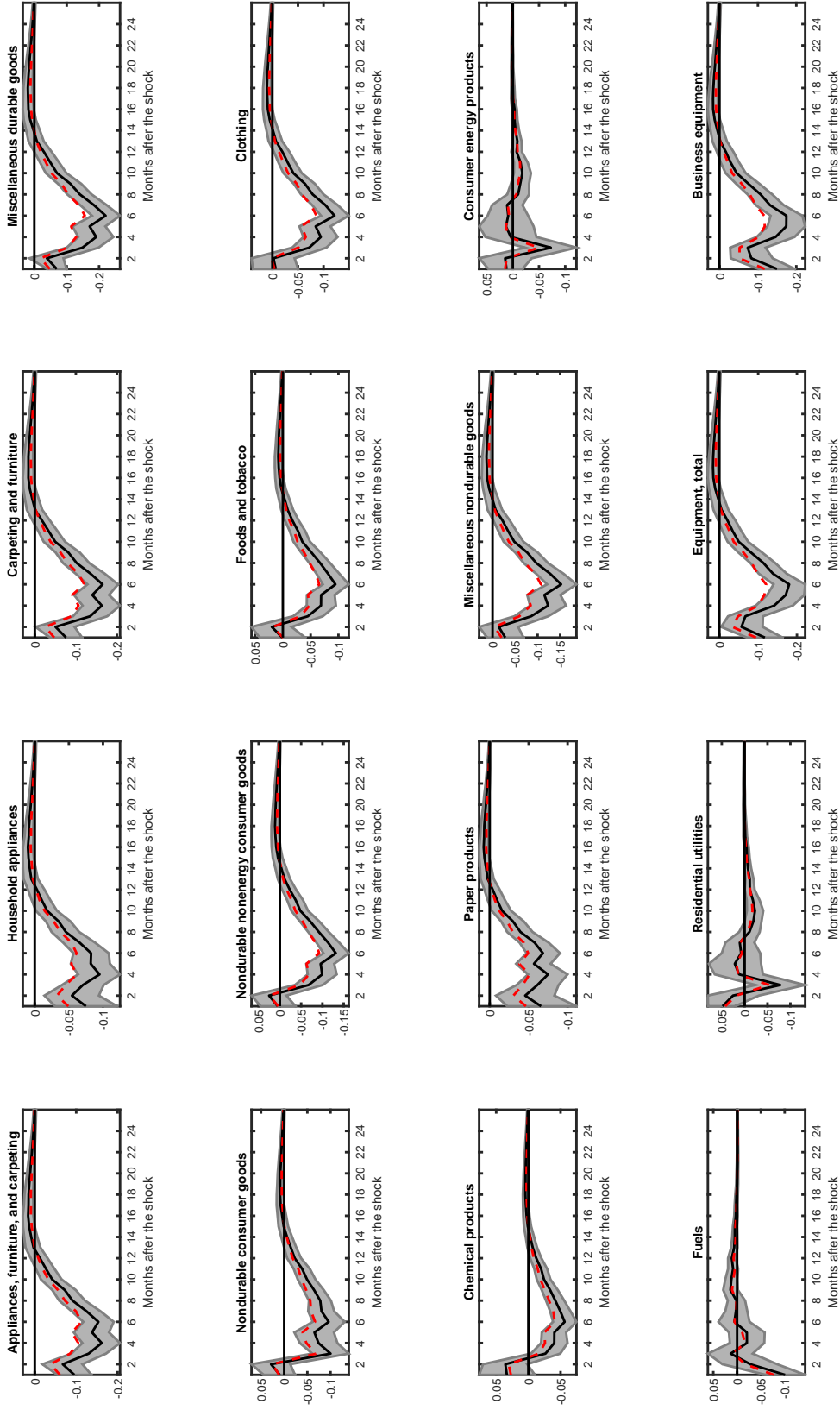
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.34: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



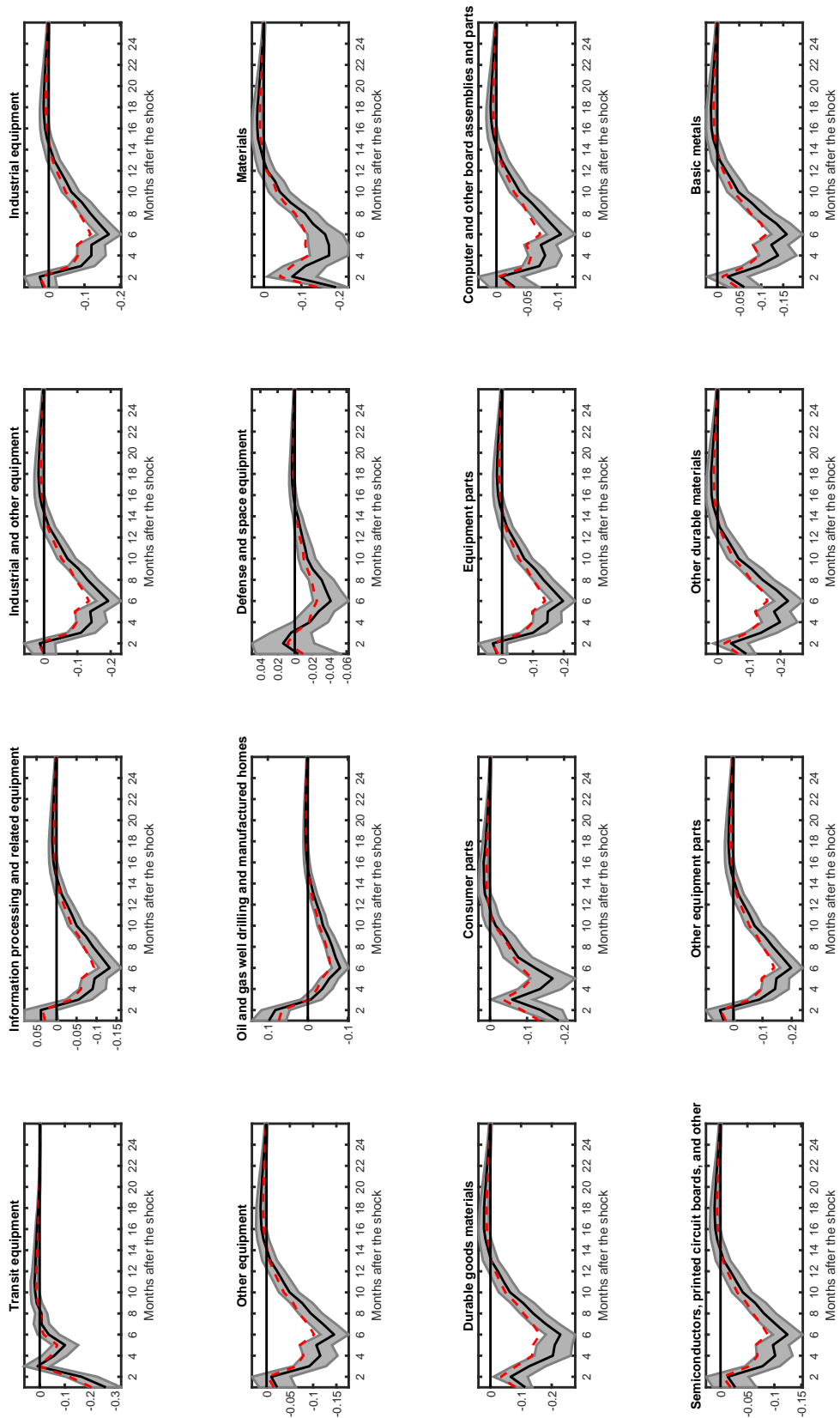
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.35: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



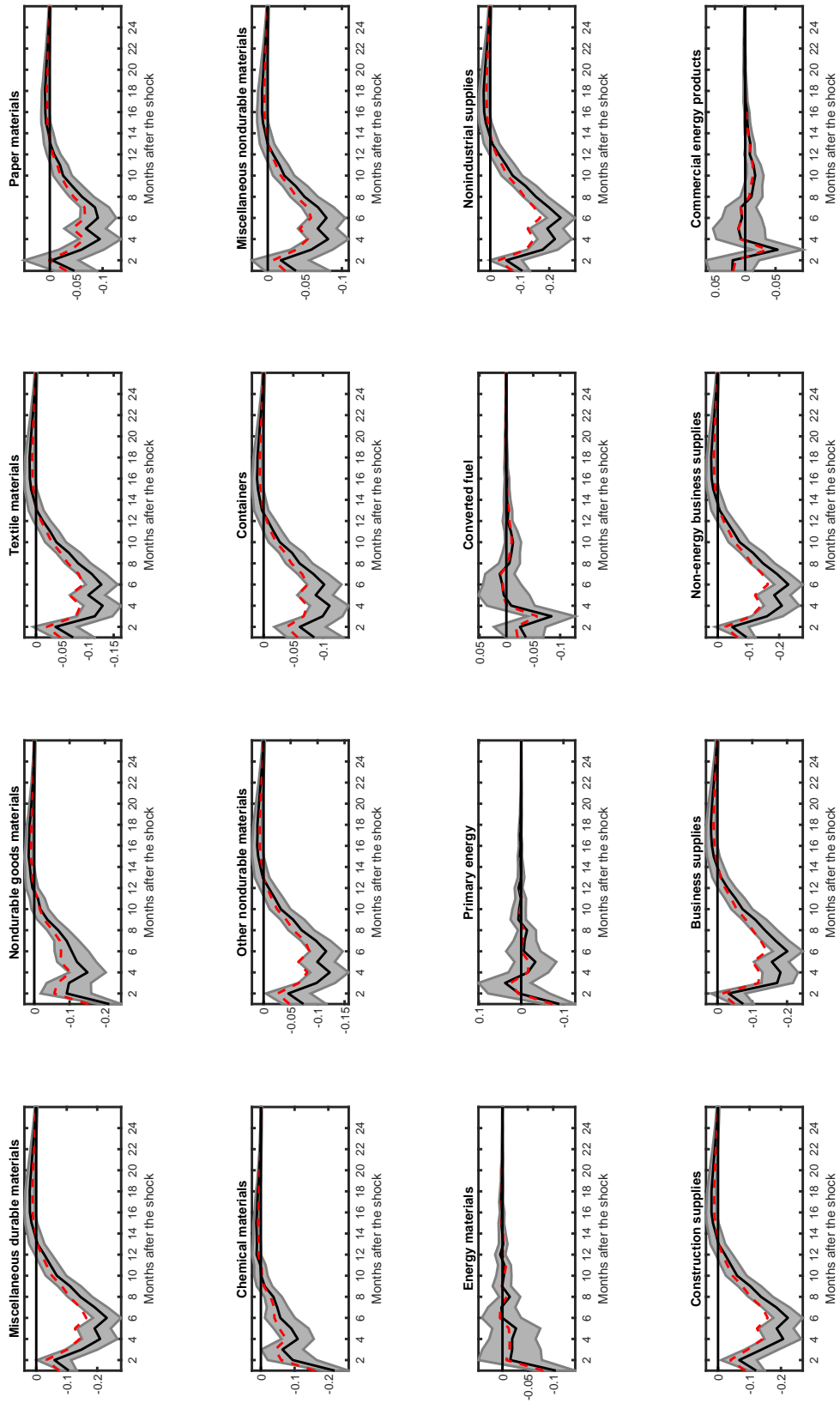
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.36: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



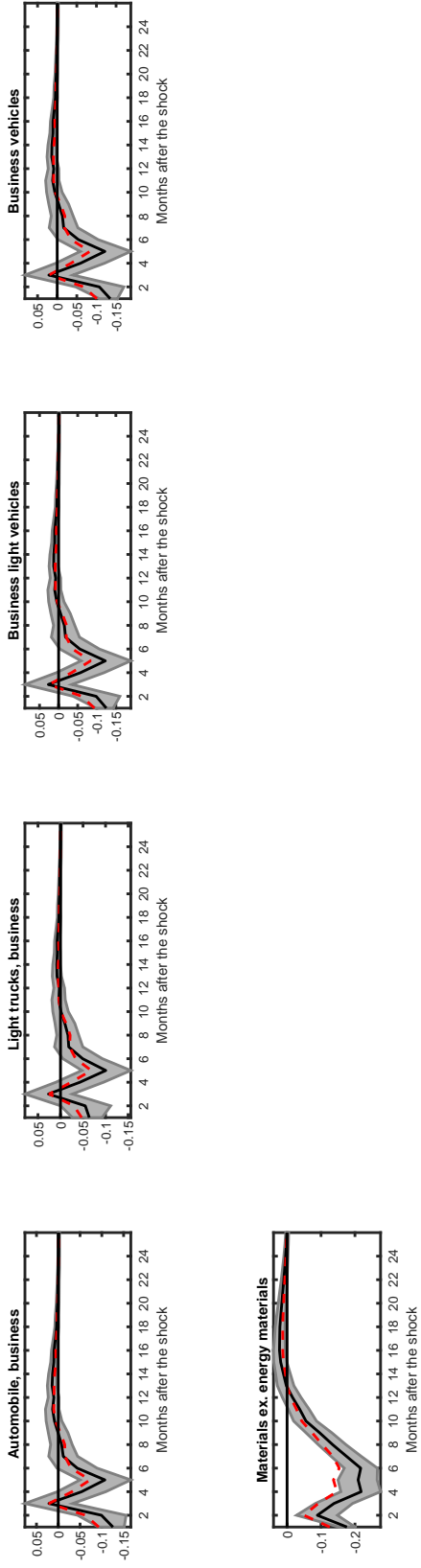
*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.37: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).

Figure A.38: The Counterfactual Response of Industrial Production to a Shock in Macro Uncertainty



*Note:* The dashed red line indicates the counterfactual response and the black line indicates the actual response while the shaded regions represent the 68% confidence intervals. The confidence bands are constructed using a residual based wild bootstrap (see Gonçalves and Kilian, 2004).