Monetary and central bank information shocks: Tales from alternative identifications

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Abstract

? proposed a straightforward method to deconstruct monetary policy surprises into pure monetary policy shocks and central bank information shocks by exploiting the opposite-signed comovements between stock price surprises and the two shocks. They highlighted that each shock brings about significantly different effects on the economy. Expanding upon their approach, this paper examines and compares a variety of alternative instruments, including New Keynesian- and Fama-French factor-based, for the decomposition of monetary policy surprises. Our results collectively suggest that Fama-French's High-minus-Low factor is a promising navigator, almost comparable to stock price surprises.

JEL Classification: E43, E52, E58.
Keywords: Monetary policy shocks, central bank information shocks, sign restriction.

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Online Appendix for "Monetary and central bank information shocks: Tales from alternative identifications"

(Not for publication)

A. Identification Through Additional Twenty Instruments

We list up additional 20 instruments used for experimentation in the shock identification. The instruments include changes in the 5–1 year treasury bond (TB) spreads, changes in the 5–1 year TB expected short rate spread, changes in the 5-1 year TB term premium spread, changes in Fama-French 5 factors (robust minus weak (RMW) and conservative minus aggressive (CMA)) and the momentum (WML). Expected short rates and term premia are available on the New York Fed's website. Also, Fama-French factors are sourced from Ken French's website.

Identification Instruments	Frequency	MP sign	CBI sign
Change in 5-1 year Treasury Bond (TB) spread	daily	+	-
Change in 5-1 year TB Expected Short Rate spread	daily	+	-
Change in 5-1 year TB term premium spread	daily	+	-
Change in RMW Return, FF 5 Factor	daily	+	-
Change in CMA Return, FF 5 Factor	daily	-	+
Change in WML Return, FF 5 Factor	daily	-	+
Change in Nondurables Return (FF 10 Industry)	daily	-	+
Change in Hi Tech-Nondurable (FF 10 Industry)	daily	-	+
Change in Durable Return (FF 10 Industry)	daily	-	+
Change in Automobiles and Trucks Return (FF 48 Industry)	daily	-	+
Change in Oil Return (FF 48 Industry)	daily	-	+
Change in Wholesale Return (FF 48 Industry)	daily	-	+
Change in Machinery Return (FF 48 Industry)	daily	-	+
Change in Meal Service Return (FF 48 Industry)	daily	-	+
Change in Meal Service - Food Return (FF 48 Industry)	daily	-	+
Change in Finance Return (FF 48 Industry)	daily	+	-
Change in Bank Return (FF 48 Industry)	daily	+	-
Change in Chips Return (FF 48 Industry)	daily	-	+
Change in Real Estate Return (FF 48 Industry)	daily	-	+
Change in Insurance Return (FF 48 Industry)	daily	-	+

Table A1: Other instruments for decomposition of monetary policy announcements

Notes: This table presents unreported identification experiments with 20 more instruments. Identification Instruments and Frequency columns indicate each instrument and the frequency of a corresponding instrument. MP sign and CBI sign represent sign restrictions to identify each shock, depending on the response of an instrument.

Admittedly, determining sign restrictions *a priori* is challenging due to a lack of references. Nevertheless, irrespective of the imposed signs, all the additional instruments prove ineffective in identifying the two shocks because their results are either inconsistent or insignificant. For example, both positive CBI and MP shocks, identified by changes in the 5-1 year Treasury bill term premium spread, lower the S&P 500 index.[1]

[1]The details of results are not reported here to save space, but they are available upon request.

B. Additional Impulse Responses: The Remaining Candidate Shocks

We additionally provide the impulse responses, of which the details are not reported in Section **??**, to the candidate shocks based on: the Cleveland Fed's inflation expectation, excess bond premium, credit spread, JPY and GBP.

B.1. Identification with the Cleveland Fed's Inflation Expectation

Figure A1 displays results from shocks identified with Cleveland Fed's inflation expectations. Overall, the identification is not successful in producing appreciable results, either. In response to a positive EINF CBI shock, the stock price index falls and the excess bond premium rises in contrast to the benchmark, as the response of GDP is insignificant. On a contractionary EINF MP shock, the one-year treasury yield shows a decline, whereas a rise in the short-term rate follows in the benchmark. Taken these results into account, we conclude that identifications with the two inflation expectations are not a promising alternative to the benchmark identification.

B.2. Identification with Excess Bond Premium

In the benchmark identification, the excess bond premium (**?**) exhibits contrasting responses to CBI and MP shocks. We explore if this pattern is also useful to isolating the two shocks from the

(a) CB Information Shock **(b)** Monetary Policy Shock

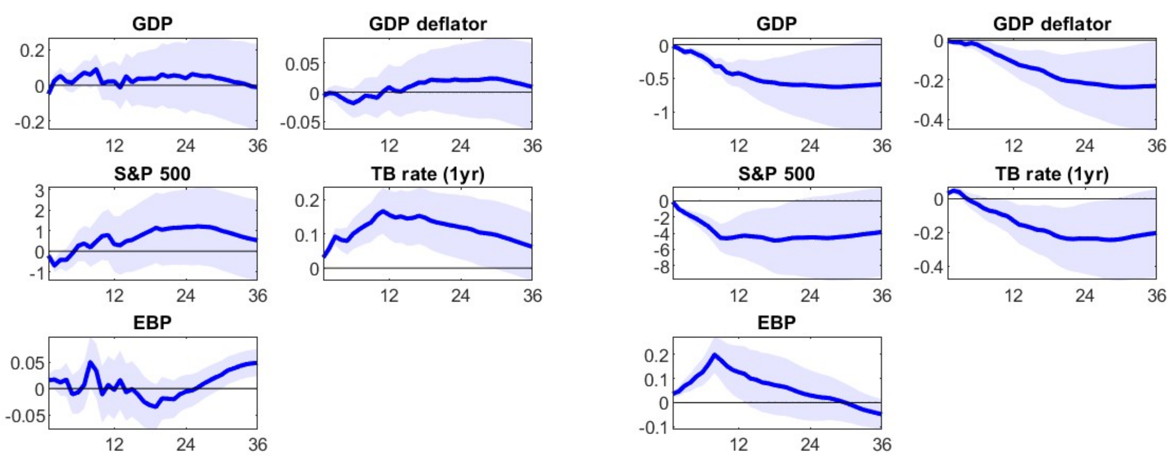

Figure A1: Responses from the Identification with Inflation Expectation (Cleveland Fed)

Notes: The figures present the impulse responses of the baseline variables to central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified with Cleveland Fed's inflation expectation. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

original data. The identification is based on the benchmark results—mapping negative sign to the candidate CBI shock and positive sign to the candidate MP shock. The two shocks are labelled as '*EBP CBI shock*' and '*EBP MP shock*,' respectively.

The impulse responses are presented in Figure A2. A notable feature here is the sizeable magnitudes of the responses. Although the one-standard-deviation for the EBP CBI shock (0.047) is slightly larger than that for the benchmark CBI shock (0.034), the responses to the EBP CBI shock appear overstated. For example, a one-standard-deviation positive EBP CBI shock increases GDP by 1% over 36 months. Besides, the GDP deflator rises by 0.3% over the forecasting horizons. Compared with the benchmark results, their magnitudes are amplified by greater than ten times. Other variables also show larger responses by factors of three to eight, approximately.

In addition, the EBP MP shock still yields large responses while it has a smaller standard deviation (0.051) than the benchmark MP shock (0.059). Declines in GDP, the GDP deflator, and the S&P 500 index are much steeper for the EBP MP shock than the benchmark MP shock, by factors of three to five. These sizeable responses may raise a question about the appropriateness of identification with the excess premium. More importantly, the one-year treasury yield falls after the EBP MP shock. This response contrasts with the benchmark case where the yield rises. We interpret that as effects of the large declines in output and the price level dominate, they drive down the one-year yield although a contractionary monetary policy shock may generate

(a) CB Information Shock

(b) Monetary Policy Shock

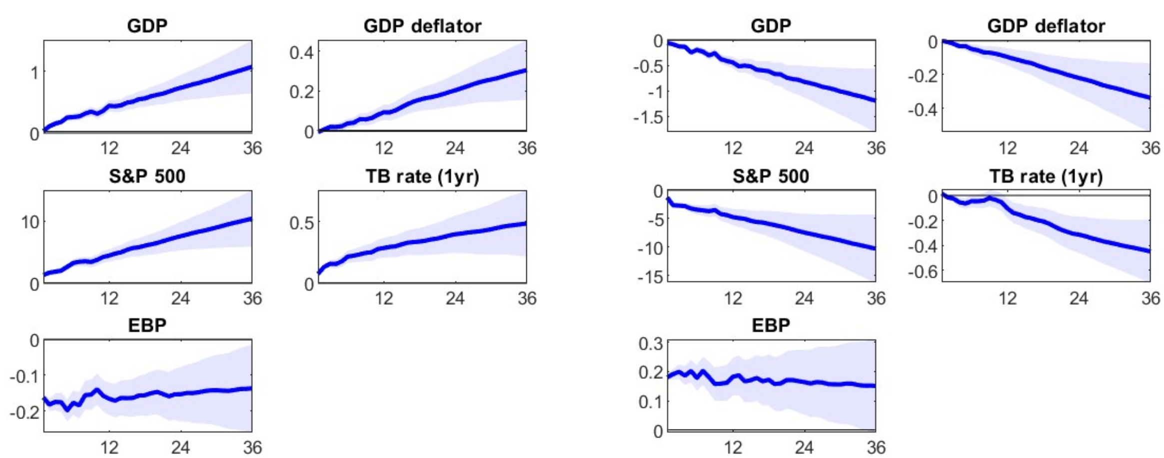

Figure A2: Responses from the Identification with Excess Bond Premium

Notes: The figures present the impulse responses of the baseline variables to central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified with excess bond premium (**?**). Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

(a) CB Information Shock **(b)** Monetary Policy Shock

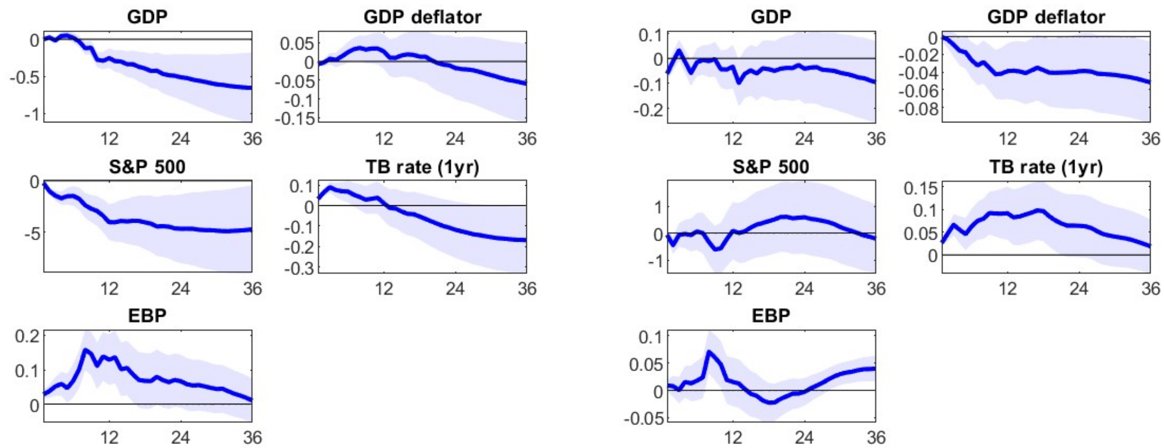

Figure A3: Responses from the Identification with Credit Spread

Notes: The figures present the impulse responses of the baseline variables to central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified with credit spread (10-year BAA corporate bond yield – 10-year treasury yield). Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

an opposite force to some extent.

The results from the identification through the excess bond premium do not align well with those from the benchmark identification. While magnitudes of responses to both shocks are much larger, the response of one-year treasury yield to a contractionary EBP MP shock offers a sharp contrast to that to the benchmark MP shock.

B.3. Identification with Credit Spread

Contractionary monetary policy leads to tighter financial conditions. As this raises default risk, credit spreads between high- and low-rated bonds can increase. On the other hand, improved economic outlook can increase risk appetite, inducing investors to expect lower default risk, and credit spreads can decrease as a result. Positing that this relationship is captured by the changes in the credit spread at a daily frequency, we identify a shock lowering (raising) credit spread as a candidate CBI (MP) shock, referring them to '*CSP CBI* (*MP*) *shock*'. We use the difference between the 10-year BAA corporate bond yield and the treasury yield of the same maturity as the credit spread.

The impulse responses to the identified shocks are in Figure A3. According to Panel (a), the CSP CBI shock does not produce comparable results to the benchmark CBI shock. First of all, output eventually falls, albeit a brief and small rise. On top of that, responses of the S&P 500 index and the excess bond premium are not well aligned with the those to benchmark CBI shock. The S&P 500 index declines and the excess bond premium increases. Although the one-year treasury yield rises initially, it tends to fall in two years. This result would be due to the adverse effects on output that drag down the yield after all.

Results from the CSP MP shock are not very appealing, either. In the benchmark, output falls significantly in about one year after a MP shock. However, such a response is not observed in this case. In addition, the stock price looks almost unresponsive at impact whereas if falls immediately in the benchmark result. The initial response of the excess bond premium is also too weak to be significant.

The identification with the excess bond premium produces consistent results in most of the cases, at least, with respect to directions of responses. However, we find that the identification with the credit spread yields surprisingly disappointing results. This result suggests that the two measures have substantially different information contents although they are considered conceptually similar.

B.4. Identification with Exchange rates: JPY and GBP

Lastly, we present the responses of baseline variables to the shocks identified using JPY (Figure A4) and GBP (Figure A5), respectively.[2] By large, they show the similar failure as the expected inflation-based identification. Neither of them generate anticipated results from a standard central bank information shock, with each variable moving in the same or wrong direction. Respective EXR CBI shocks drive down the GDP deflator and the stock price (only in response to JPY-based shocks) and drive up the excess bond premium. In comparison, MP EXR shocks identified with JPY or GBP generate impulse responses consistent with standard ones, with a few exceptions. The results indicate that exchange rate-based identifications have limitations to isolating information shocks.

[2] As in Section **??**, JPY and GBP represent the exchange rates of US dollar against Japanese yen and US dollar against British pound, respectively.

(a) CB Information Shock **(b)** Monetary Policy Shock

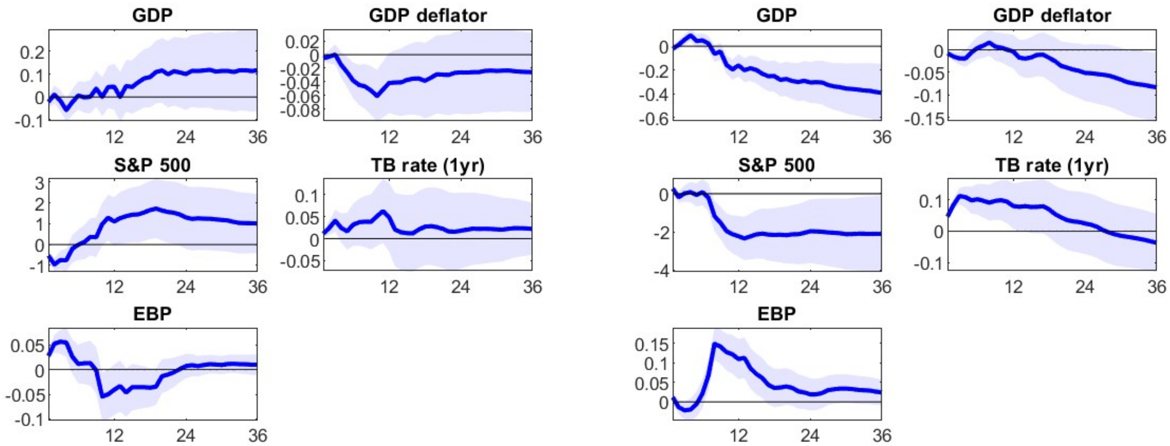

Figure A4: Responses from the Identification with JPY

Notes: The figures present the impulse responses of the baseline variables to central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified with exchange rates of US dollar against Japanese yen. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

(a) CB Information Shock **(b)** Monetary Policy Shock

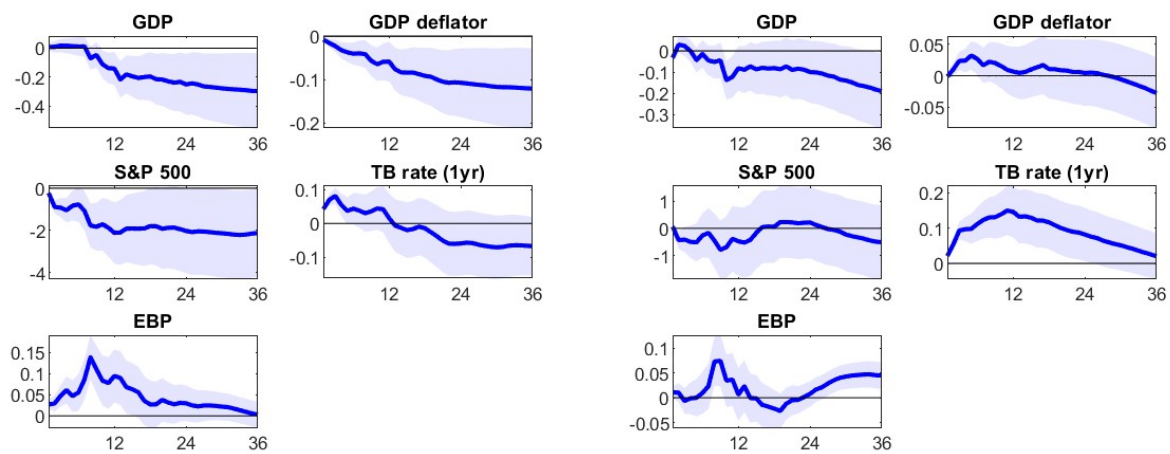

Figure A5: Responses from the Identification with GBP

Notes: The figures present the impulse responses of the baseline variables to central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified with exchange rates of US dollar against British pound. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

C. Comparison of the Identified Shocks

This appendix reports additional figures which summarize the relationships among the benchmark and the identified shocks.

C.1. Benchmark and HML-based Shocks

Figure A6 depicts the benchmark shocks (median) with boundary values conforming to sign restrictions, and the deviations of HML-based shocks. Most HML-based CBI and MP shocks (red dots) lie within the boundary of benchmark shocks (blue shaded areas). However, some are located outside of the boundary, indicating that candidate shocks share similar information to the benchmarks but exhibit different patterns in particular when the Fed changed the policy stances.

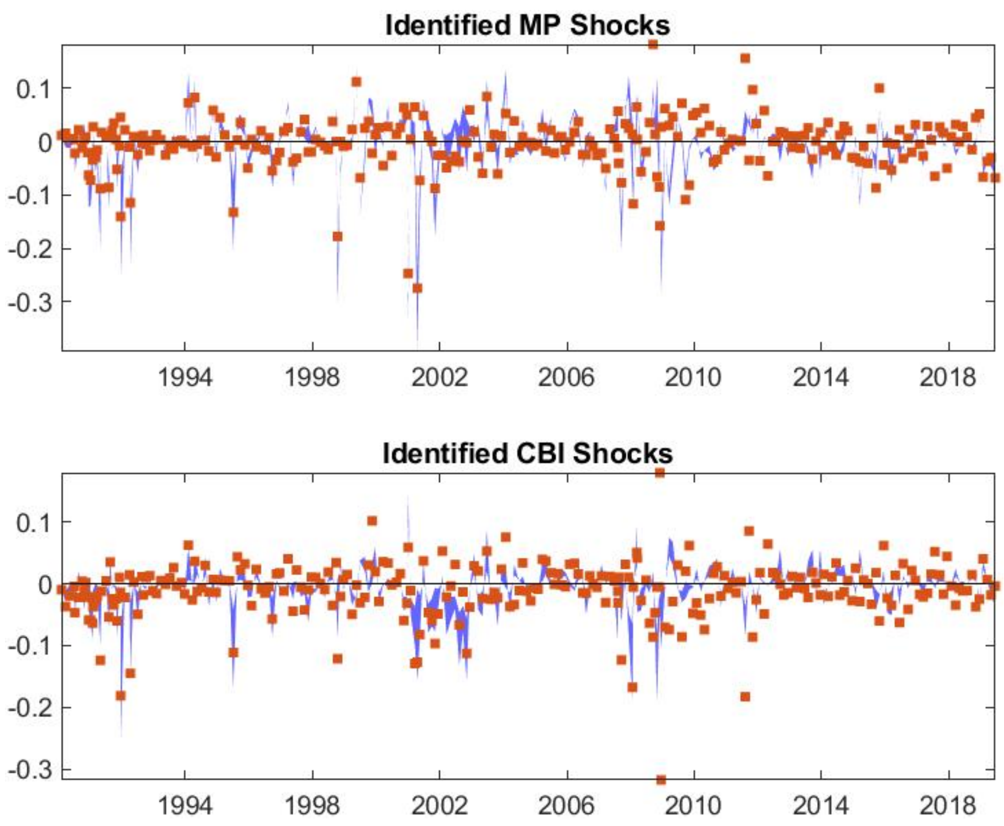

Figure A6: HML-based Shocks and Benchmark Boundary

Notes: The figure displays the benchmark CBI and MP shocks (median) with boundary values conforming to sign restrictions (blue shaded areas), and the deviations of HML-based corresponding shocks (red dots).

C.2. IRFs with Benchmark and HML-based Shocks

For easy comparison, we additionally provide the figures (Figures A7 and A8) which display the IRFs with HML-based shocks (solid blue) against the benchmark results (dotted red). These IRFs are qualitatively and quantitatively consistent, confirming our findings.

(a) CB Information Shock **(b)** Monetary Policy Shock

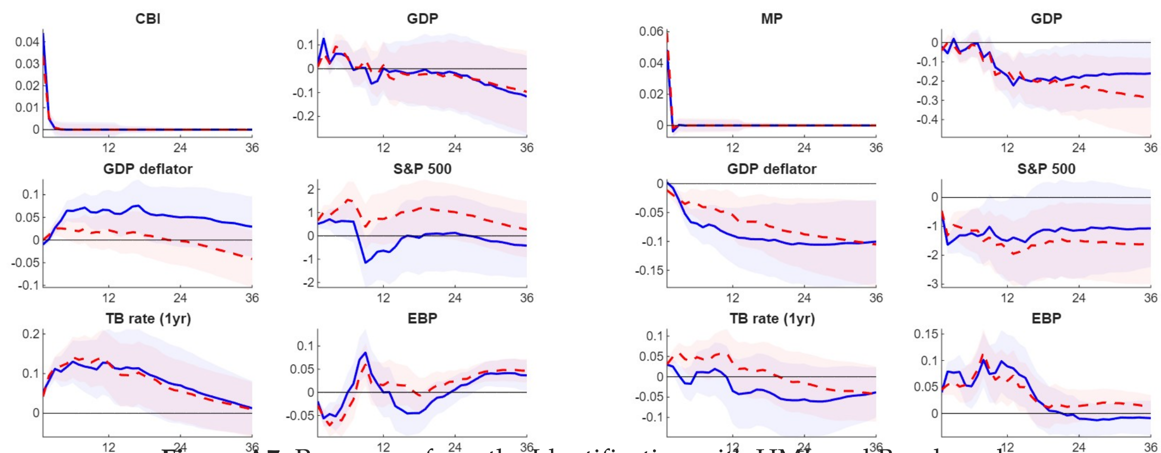

Figure A7: Responses from the Identification with HML and Benchmark

Notes: The figures present the impulse responses of the baseline variables to central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified with HML (solid blue) and benchmark (dotted red) factors. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

(a) CB Information Shock **(b)** Monetary Policy Shock

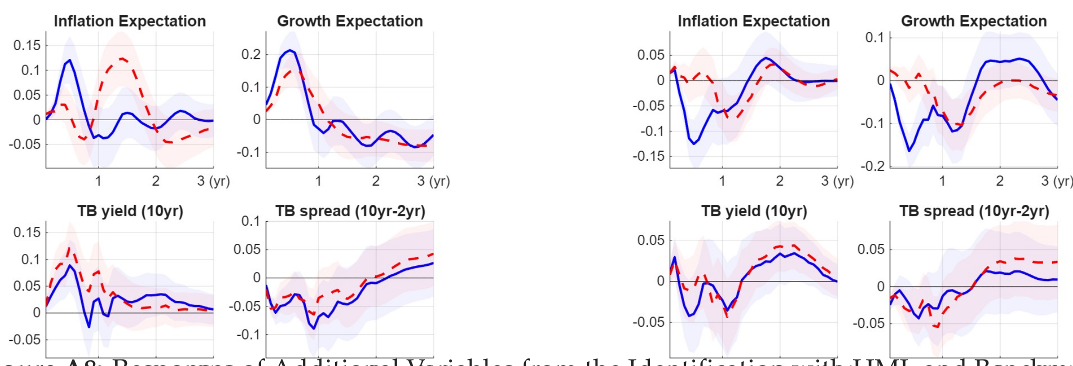

Figure A8: Responses of Additional Variables from the Identification with HML and Benchmark

Notes: The figures present the impulse responses of additional variables, each added to the baseline one by one, to central bank information shocks (panel (a)) and monetary policy shocks (b), respectively. The shocks are identified with HML (solid blue) and benchmark (dotted red) factors, respectively. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

C.3. Correlations

Figure A9 provides a summary of correlation coefficients among the identified shocks in a box chart format. Each box and whisker is characterized by 14 (benchmark & 13 candidates) correlations among the shocks. Blue bars represent those for CBI shocks while red bars do those for MP shocks. The results reconfirm the findings in Section **??**, in particular demonstrating a relatively stronger correlations among MP shocks.

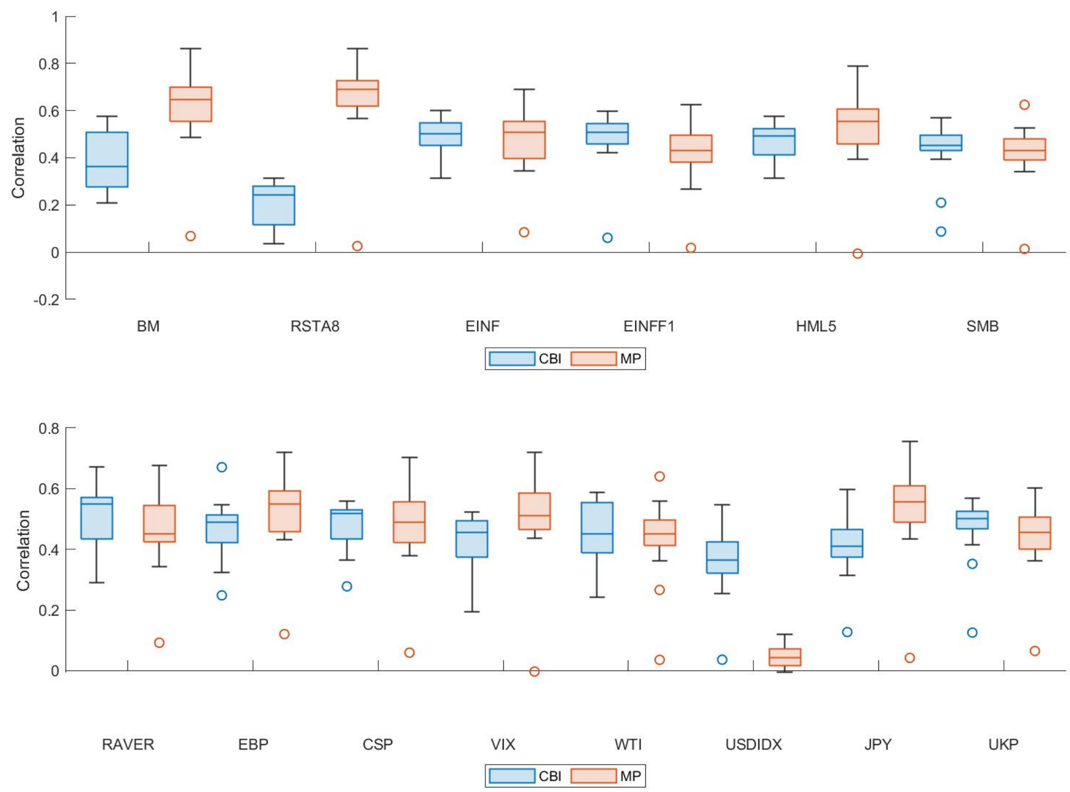

Figure A9: Correlations of Candidate Shocks

Notes: The figure displays the box plots of correlations among the candidate shocks. Each box and whisker is characterized by 14 (benchmark & 13 candidates) correlations among the shocks. The shocks are identified with the benchmark approach of **?** (BM) and the alternative methods. RSTA8, EINF, and EINFF1 represent the shocks identified through r-star, inflation expectation from Consensus Economics, and that from the Cleveland Fed, respectively. RAVER, EBP, CSP, and VIX denote the shocks decomposed using risk aversion index, excess bond premium, credit spread, and the VIX index. USDIDX, JPY, and UKP are those of US dollar index, US dollar against Japanese yen and British pound.

D. Bayesian Estimation Results

In this appendix, we evaluate the robustness of our baseline findings by employing a Bayesian VAR (BVAR) framework.[3] Specifically, we estimate the VAR model (**??**) with an *independent Normal-Inverted Wishart* prior for the coefficients and the covariance matrix. The model is estimated using Markov Chain Monte Carlo (MCMC) methods; we generate 2,000 draws from the posterior distribution, discarding the first 1,000 draws as burn-in.

To check prior sensitivity, we compare the estimation results under different hyperparameter values, similar to **?**. Table A2 summarizes the sets of hyperparameter values.

Figures A10—A16 display the impulse response of variables to both CBI and MP shocks, identified with HML factors, under these seven sets of hyperparameter values. All in all, the Bayesian estimation results are qualitatively and quantitatively similar to our baseline results. That is, the MP shock consistently leads to a contraction in output and a decline in prices, while the CBI shock generates positive comovements in output and prices, confirming the distinct transmission channels of these two shocks.

Specification	Overall tightness of the prior	Lag decay	Sum-of-coefficients dummy observation prior	Co-persistence dummy observation prior
1. Baseline	5	1	0	0
2. Tighter Sum of coeff., Initial dummy	5	1	3	3
3. Tighter lag decay	5	2	1	1
4. Tighter overall tightness	7	1	1	1
5. **?**	5	1	1	1
6. Looser overall tightness	3	1	1	1
7. Looser lag decay	5	0.5	1	1

Table A2: Prior Choices with Alternative Hyperparameter Values

[3] We adapted the Alexandria toolbox for our Bayesian analysis and would like to thank Legrand for making the resource available online.

(a) CB Information Shock **(b)** Monetary Policy Shock

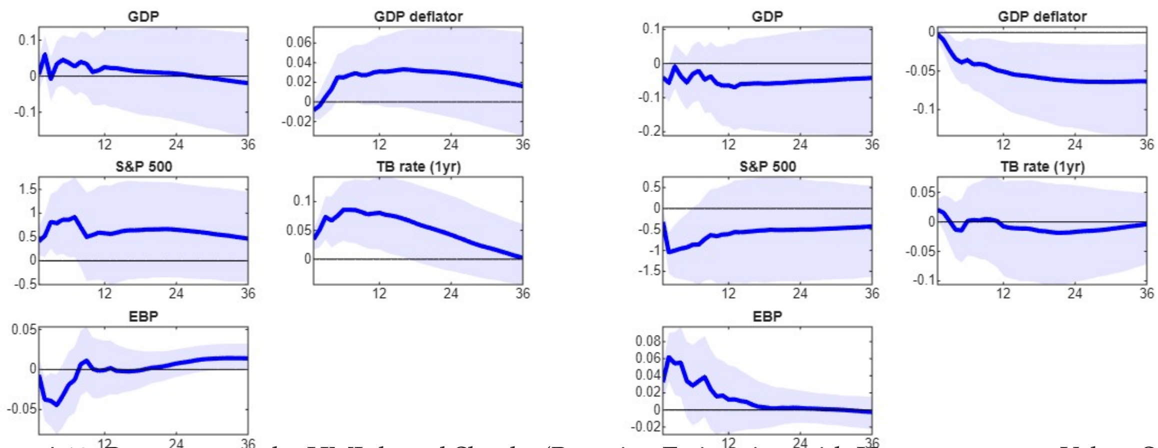

Figure A10: Responses to the HML-based Shocks (Bayesian Estimation with Hyperparameter Value: Set 1)

Notes: The figures present the impulse responses of the baseline variables to the HML-based central bank information shocks (panel (a)) and monetary policy shocks (b), respectively. The results are estimated using a BVAR with an independent Normal-Inverted Wishart prior. The hyperparameter values correspond to set 1 (Baseline) in Table A2. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% credible intervals. The solid lines represent the posterior medians.

(a) CB Information Shock **(b)** Monetary Policy Shock

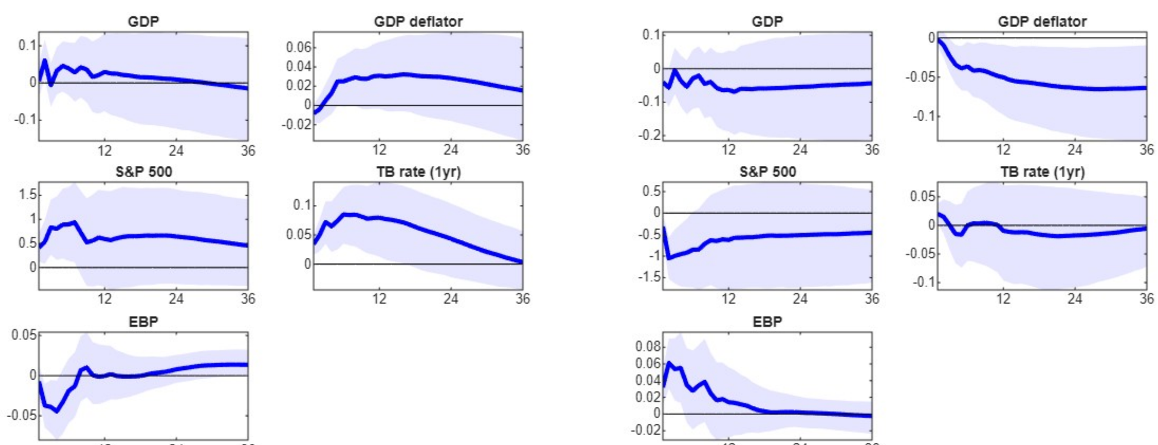

Figure A11: Responses to the HML-based Shocks (Bayesian Estimation with Hyperparameter Value: Set 2)

Notes: The figures present the impulse responses of the baseline variables to the HML-based central bank information shocks (panel (a)) and monetary policy shocks (b), respectively. The results are estimated using a BVAR with an independent Normal-Inverted Wishart prior. The hyperparameter values correspond to set 2 in Table A2. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% credible intervals. The solid lines represent the posterior medians.

(a) CB Information Shock

(b) Monetary Policy Shock

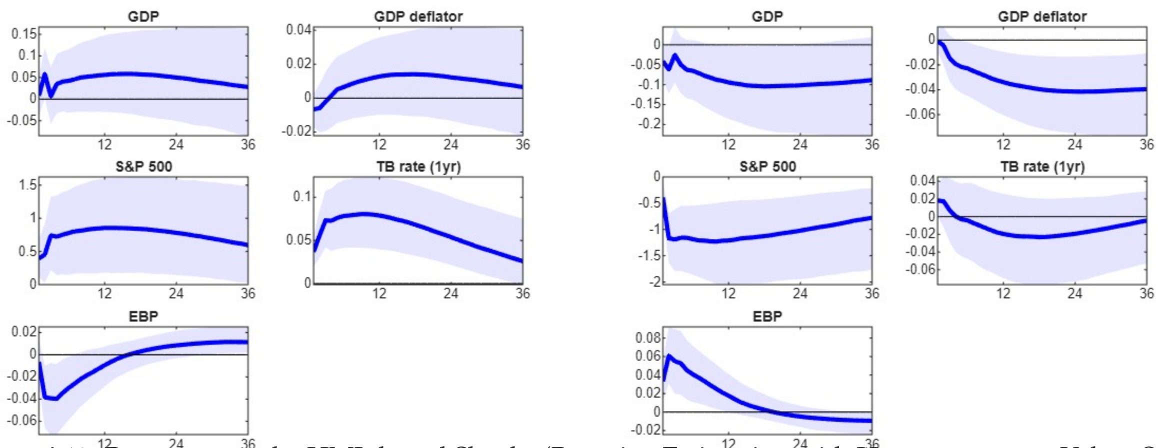

Figure A12: Responses to the HML-based Shocks (Bayesian Estimation with Hyperparameter Value: Set 3)

Notes: The figures present the impulse responses of the baseline variables to the HML-based central bank information shocks (panel (a)) and monetary policy shocks (b), respectively. The results are estimated using a BVAR with an independent Normal-Inverted Wishart prior. The hyperparameter values correspond to set 3 in Table A2. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% credible intervals. The solid lines represent the posterior medians.

(a) CB Information Shock

(b) Monetary Policy Shock

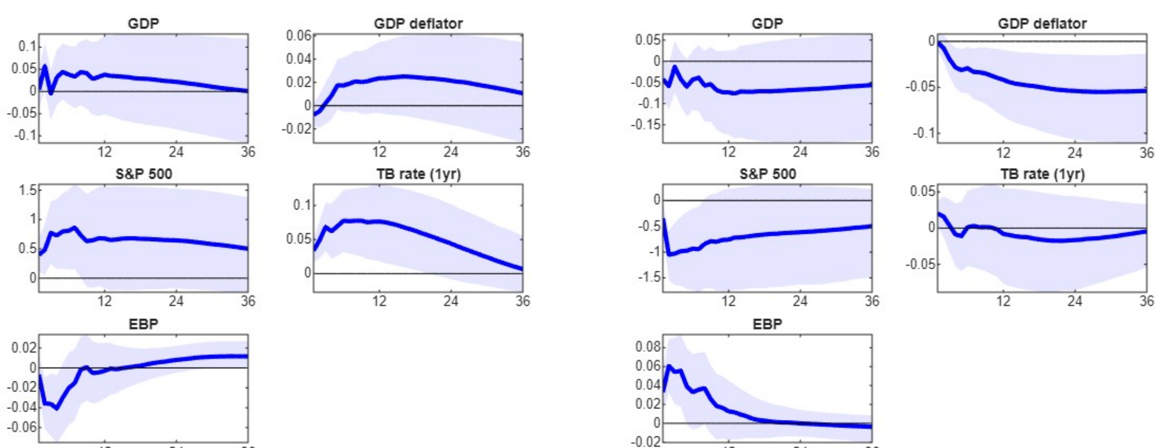

Figure A13: Responses to the HML-based Shocks (Bayesian Estimation with Hyperparameter Value: Set 4)

Notes: The figures present the impulse responses of the baseline variables to the HML-based central bank information shocks (panel (a)) and monetary policy shocks (b), respectively. The results are estimated using a BVAR with an independent Normal-Inverted Wishart prior. The hyperparameter values correspond to set 4 in Table A2. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% credible intervals. The solid lines represent the posterior medians.

(a) CB Information Shock **(b)** Monetary Policy Shock

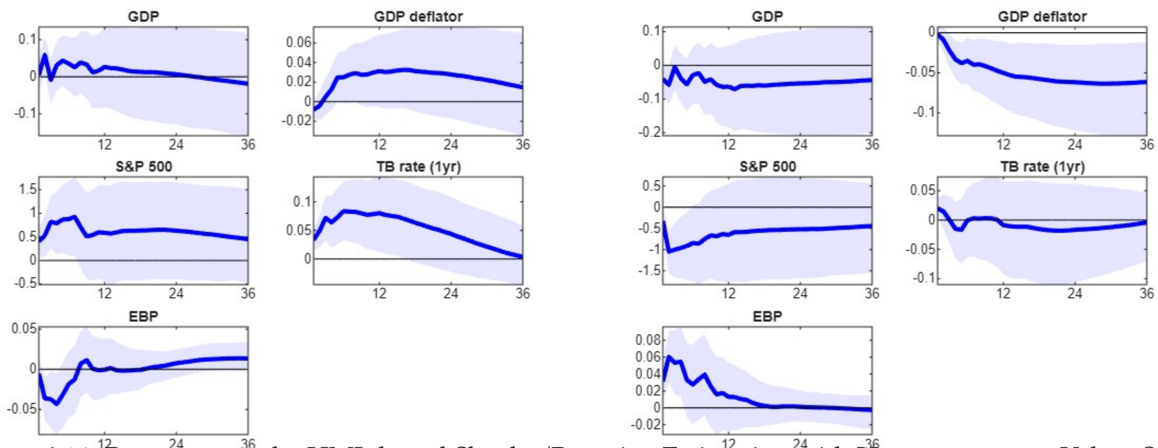

Figure A14: Responses to the HML-based Shocks (Bayesian Estimation with Hyperparameter Value: Set 5)

Notes: The figures present the impulse responses of the baseline variables to the HML-based central bank information shocks (panel (a)) and monetary policy shocks (b), respectively. The results are estimated using a BVAR with an independent Normal-Inverted Wishart prior. The hyperparameter values correspond to set 5 in Table A2. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% credible intervals. The solid lines represent the posterior medians.

(a) CB Information Shock **(b)** Monetary Policy Shock

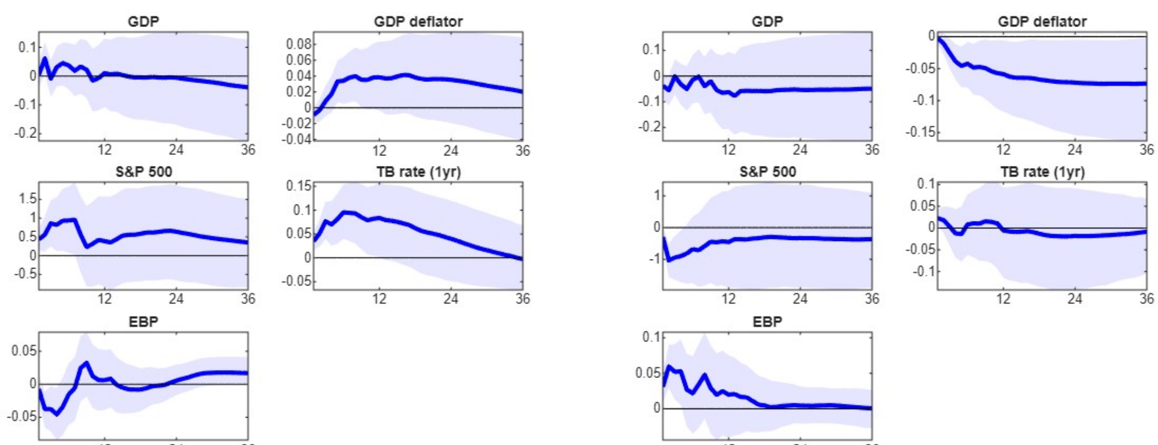

Figure A15: Responses to the HML-based Shocks (Bayesian Estimation with Hyperparameter Value: Set 6)

Notes: The figures present the impulse responses of the baseline variables to the HML-based central bank information shocks (panel (a)) and monetary policy shocks (b), respectively. The results are estimated using a BVAR with an independent Normal-Inverted Wishart prior. The hyperparameter values correspond to set 6 in Table A2. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% credible intervals. The solid lines represent the posterior medians.

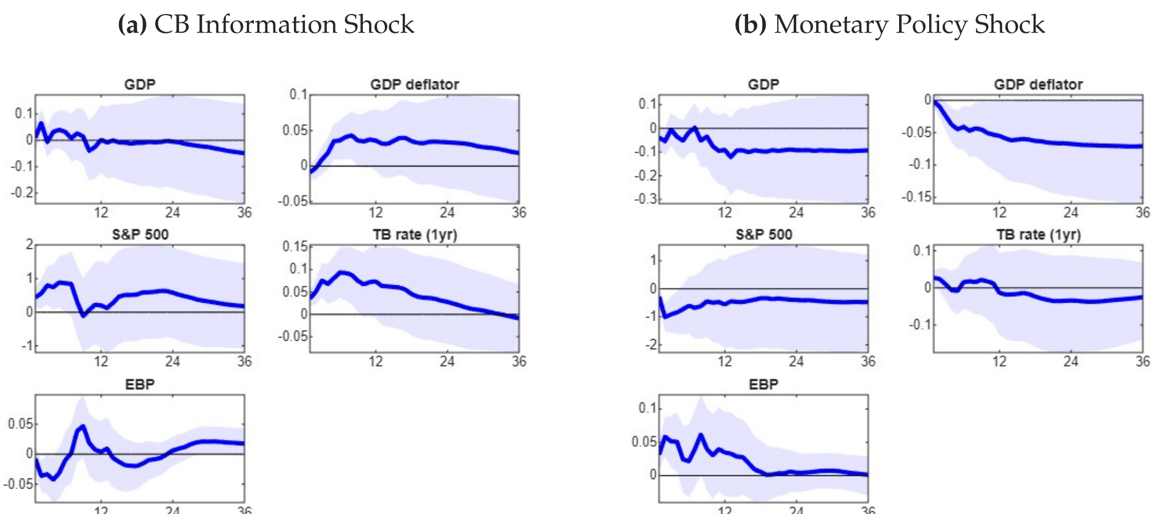

Figure A16: Responses to the HML-based Shocks (Bayesian Estimation with Hyperparameter Value: Set 7)

Notes: The figures present the impulse responses of the baseline variables to the HML-based central bank information shocks (panel (a)) and monetary policy shocks (b), respectively. The results are estimated using a BVAR with an independent Normal-Inverted Wishart prior. The hyperparameter values correspond to set 7 in Table A2. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% credible intervals. The solid lines represent the posterior medians.

E. Robustness Checks

This appendix provides additional results to check the robustness of main results related to HML-based shocks. Specifically, they include

(1) the responses to HML-based shocks for the pre-zero lower bound period,

(2) the responses to HML-based shocks with a 3-month lag implied by information criteria,

(3) the responses to HML-based shocks with zero restrictions on GDP and GDP deflator,

(4) the responses to HML-based shocks identified with a median value approach.

E.1. Responses to HML-based Shocks with the Pre-Zero Lower Bound Sample

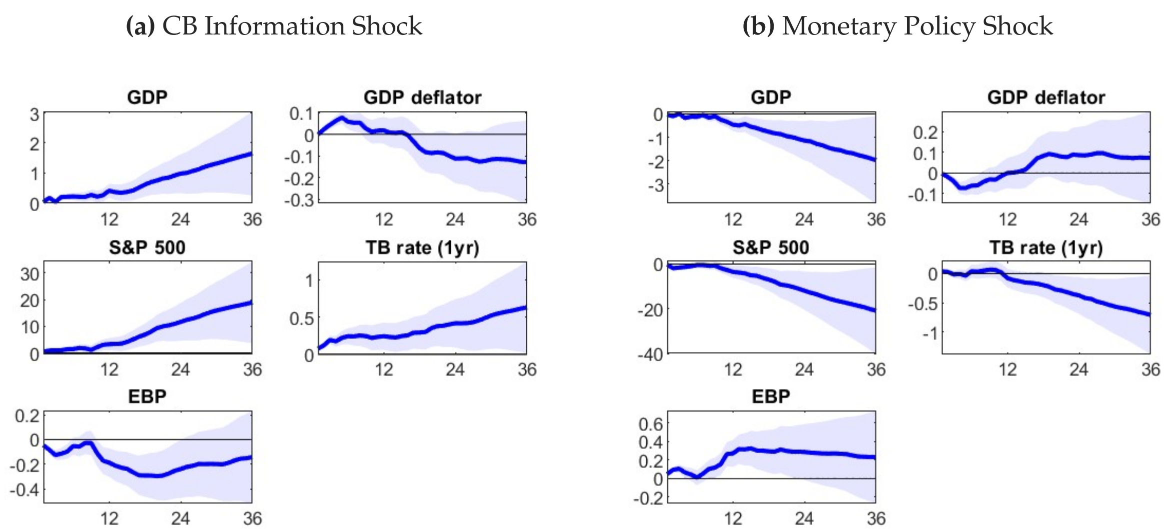

Figure A17: Responses of HML with the pre-ZLB Sample

Notes: The figures present the impulse responses of the baseline variables to the central bank information shocks (panel (a)) and monetary policy shocks (b) over the pre-ZLB (zero lower bound) samples, respectively, which are identified with HML factor. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

E.2. Responses to HML-based Shocks with a 3-month Lag of VAR

(a) CB Information Shock **(b)** Monetary Policy Shock

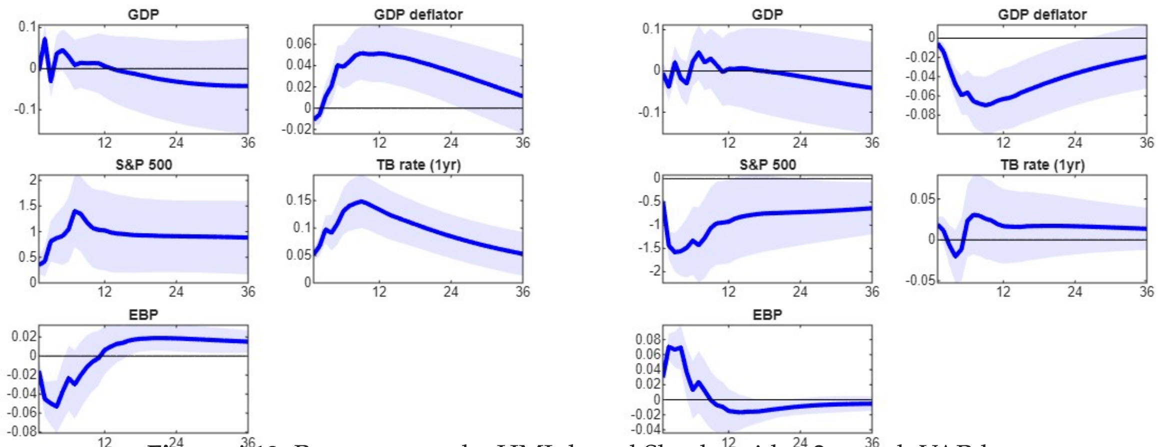

Figure A18: Responses to the HML-based Shocks with a 3-month VAR lag

Notes: The figures present the impulse responses of the baseline variables in a 6-month lag of VAR model to the central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified by HML factor. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

E.3. Responses to HML-based Shocks with Short-run Restrictions on the Macro-variables

(a) CB Information Shock **(b)** Monetary Policy Shock

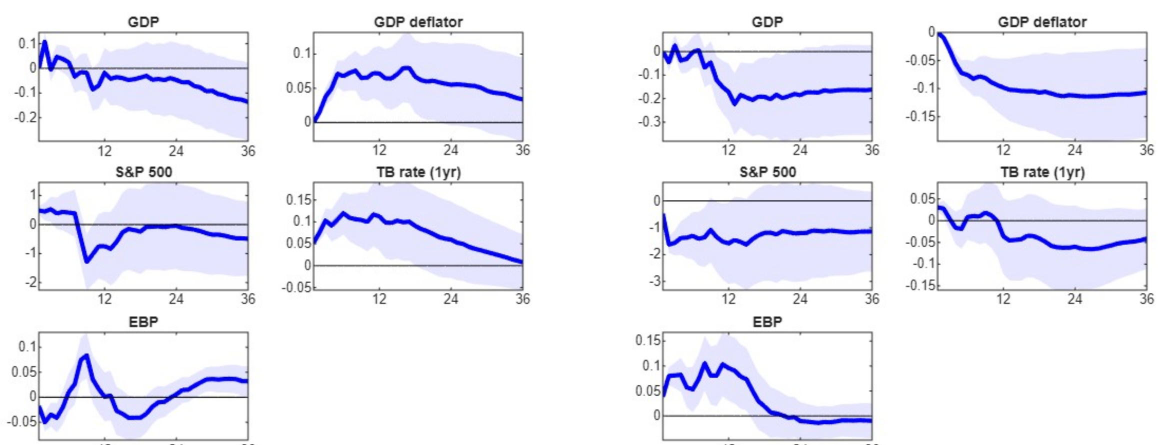

Figure A19: Responses to the HML-based Shocks with Short-run Restrictions

Notes: The figures present the impulse responses of the baseline variables to the central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified by HML factor. We impose short-run zero restrictions where GDP and GDP deflator respond with a 1-month lag. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

E.4. Responses to HML-based Shocks (Median Value)

(a) CB Information Shock **(b)** Monetary Policy Shock

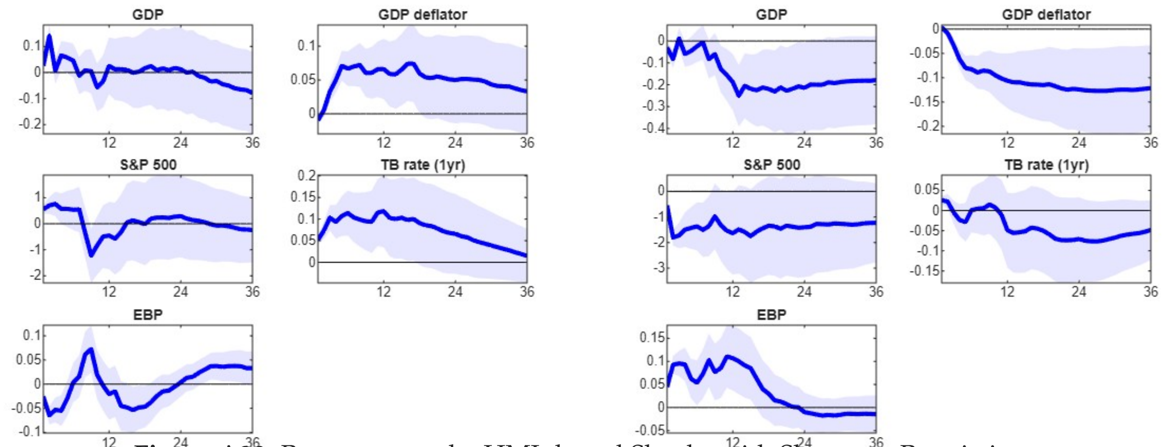

Figure A20: Responses to the HML-based Shocks with Short-run Restrictions

Notes: The figures present the impulse responses of the baseline variables to the central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified by HML factor. The two shocks are identified with a median value approach. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

F. Additional Figures

F.1. Responses of HML to the Benchmark Shocks

(a) CB Information Shock **(b)** Monetary Policy Shock

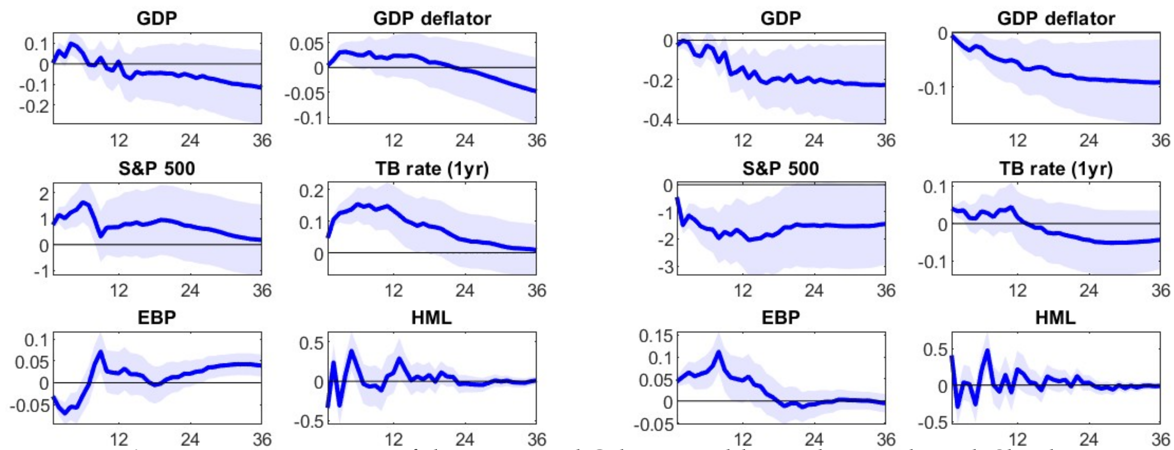

Figure A21: Responses of the HML and Other Variables to the Benchmark Shocks

Notes: The figures present the impulse responses of the baseline variables and HML to the central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified with the benchmark approach by **?**. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

F.2. Responses to the Breakeven Inflation-based Shocks

(a) CB Information Shock **(b)** Monetary Policy Shock

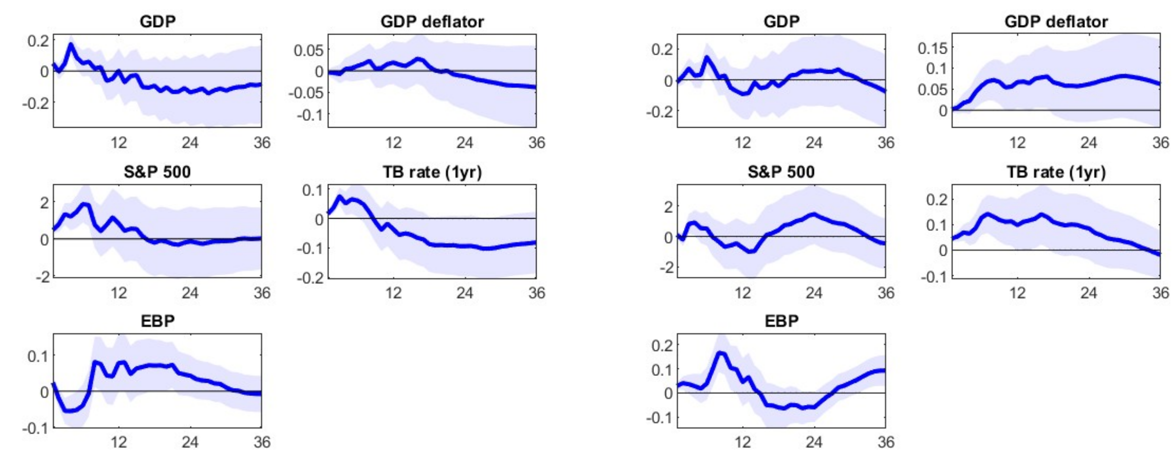

Figure A22: Responses to the Breakeven Inflation (10-year)-based Shocks

Notes: The figures present the impulse responses of the baseline variables to the central bank information shocks (panel (a)) and monetary policy shocks (b), respectively, which are identified with the breakeven inflation. Breakeven inflation is derived from 10-year Treasury yields and 10-year Treasury inflation-indexed yields. Each x- and y-axis represents the months after the occurrence of the shocks and the responses in percent or percentage points, respectively. The shaded areas are 90% confidence intervals.

F.3. Relations between the Identified Shocks and Other Structural Shocks

F.3.1. New Keynesian-based Shocks

(a) CB Information Shock **(b)** Monetary Policy Shock

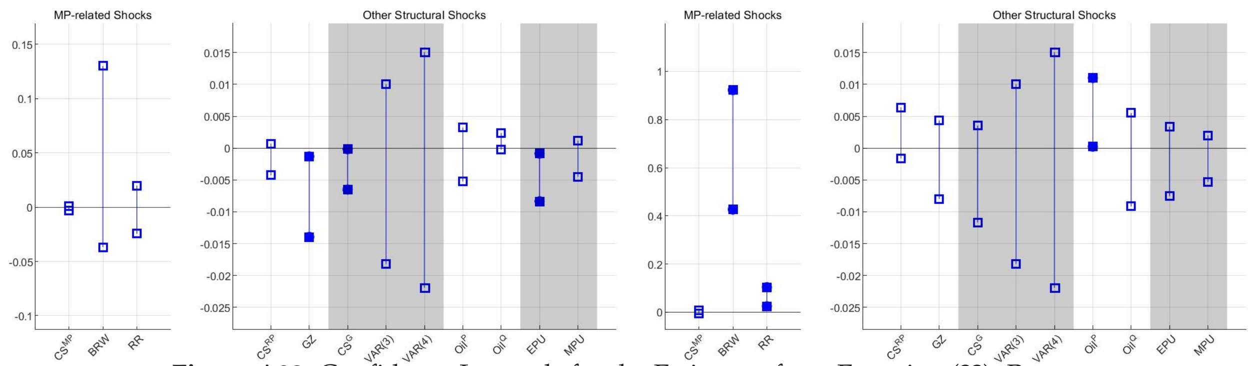

Figure A23: Confidence Intervals for the Estimates from Equation (**??**): R-star

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with r-stars are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating significant estimates and blank tips indicating non-significant estimates.

(a) CB Information Shock **(b)** Monetary Policy Shock

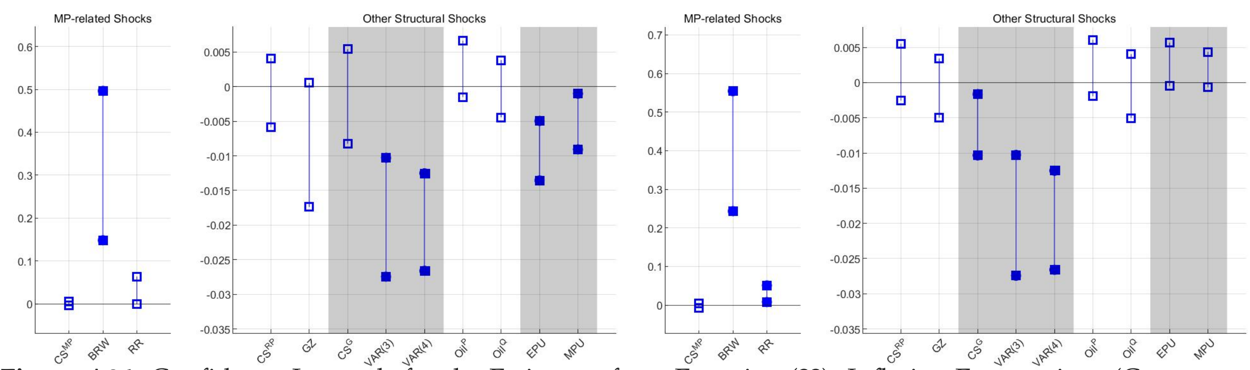

Figure A24: Confidence Intervals for the Estimates from Equation (**??**): Inflation Expectations (Consensus Economics)

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with inflation expectation (Consensus Economics) are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

F.3.2. Fama-French Factor-based Shocks: SMB

(a) CB Information Shock **(b)** Monetary Policy Shock

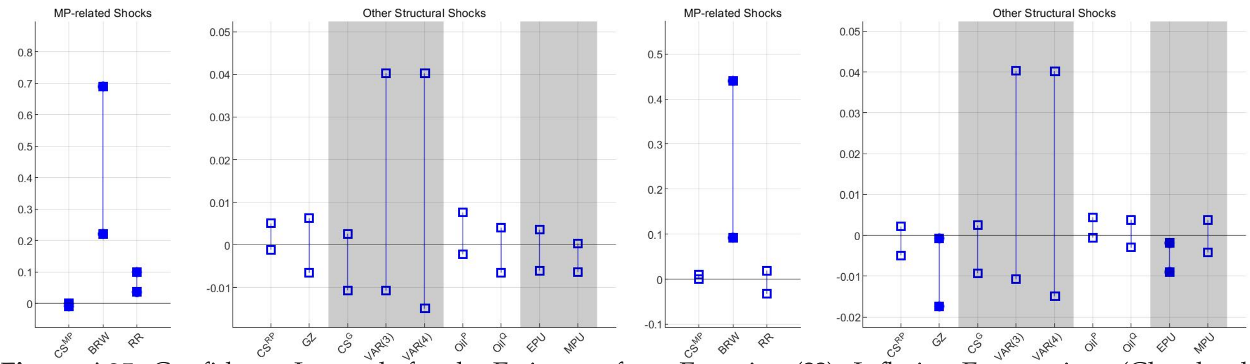

Figure A25: Confidence Intervals for the Estimates from Equation (**??**): Inflation Expectations (Cleveland Fed)

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with inflation expectation (Cleveland Fed) are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

(a) CB Information Shock **(b)** Monetary Policy Shock

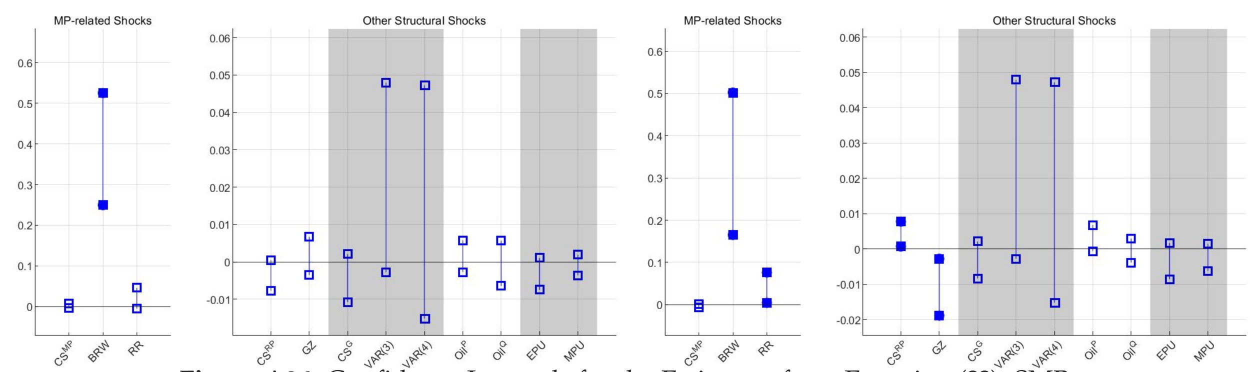

Figure A26: Confidence Intervals for the Estimates from Equation (**??**): SMB

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with Fama-French SMB factor are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

F.3.3. Risk appetite-based Shocks

(a) CB Information Shock **(b)** Monetary Policy Shock

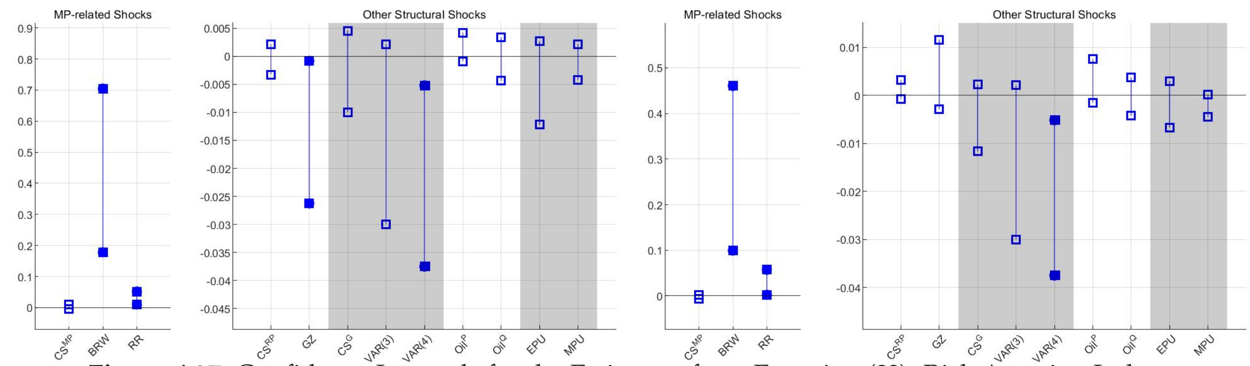

Figure A27: Confidence Intervals for the Estimates from Equation (**??**): Risk Aversion Index

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with risk aversion index are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

(a) CB Information Shock **(b)** Monetary Policy Shock

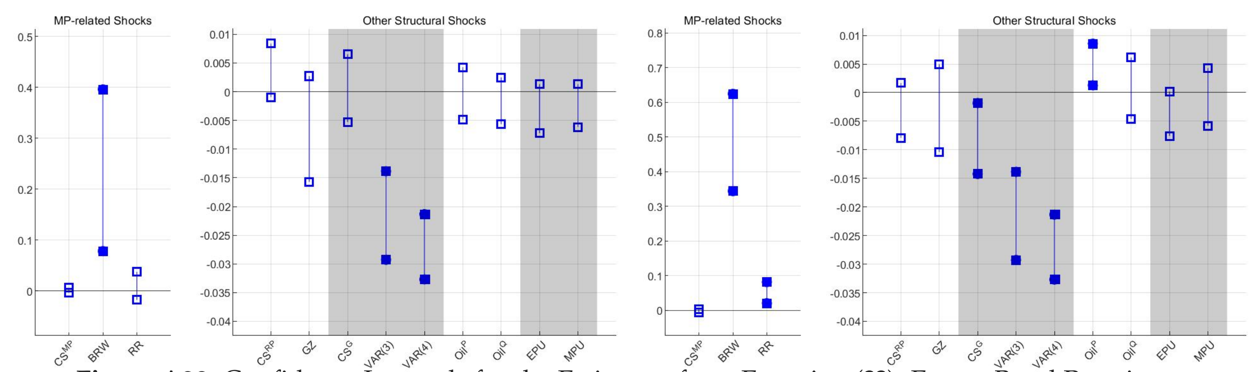

Figure A28: Confidence Intervals for the Estimates from Equation (**??**): Excess Bond Premium

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with excess bond premium are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

(a) CB Information Shock **(b)** Monetary Policy Shock

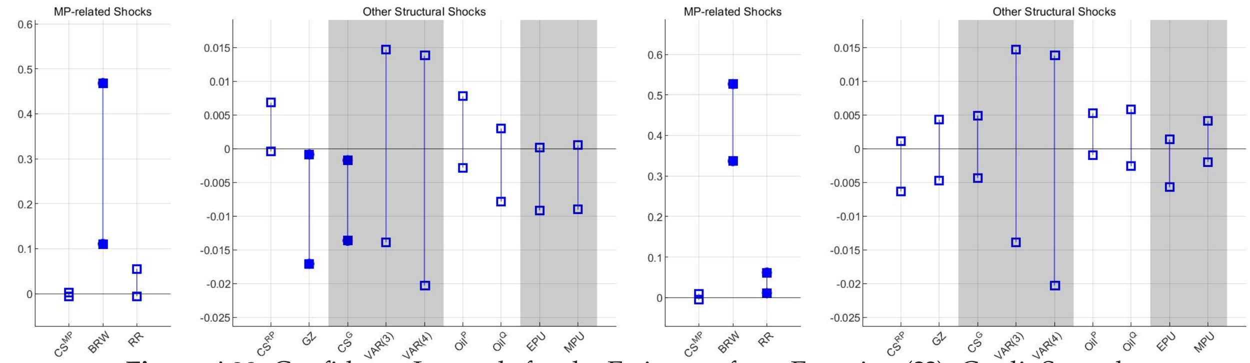

Figure A29: Confidence Intervals for the Estimates from Equation (**??**): Credit Spread

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with credit spread are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

(a) CB Information Shock **(b)** Monetary Policy Shock

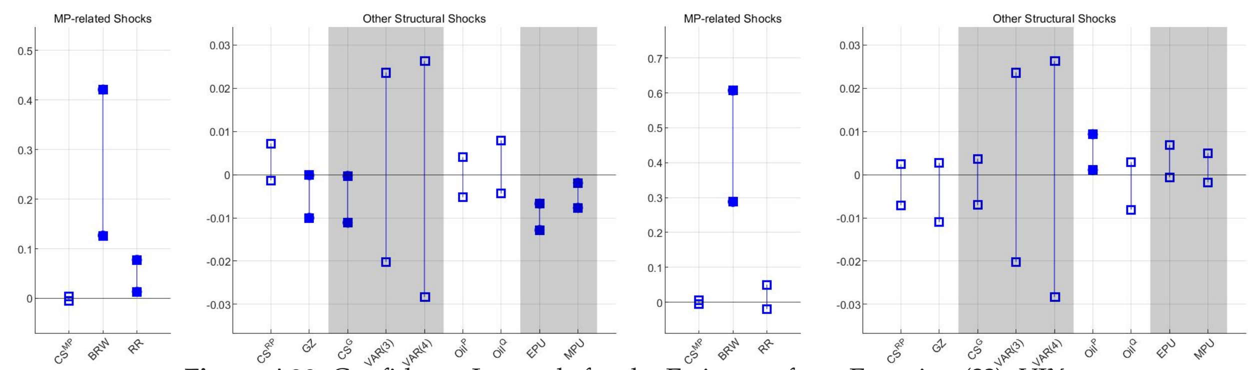

Figure A30: Confidence Intervals for the Estimates from Equation (**??**): VIX

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with VIX are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

F.3.4. Commodity- and Currency-based Shocks

(a) CB Information Shock **(b)** Monetary Policy Shock

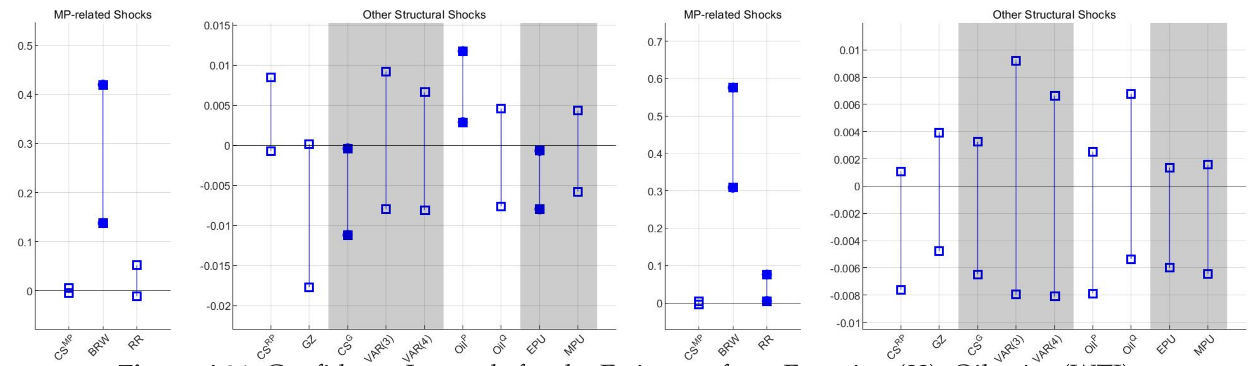

Figure A31: Confidence Intervals for the Estimates from Equation (**??**): Oil price (WTI)

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with oil price (WTI) are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

(a) CB Information Shock **(b)** Monetary Policy Shock

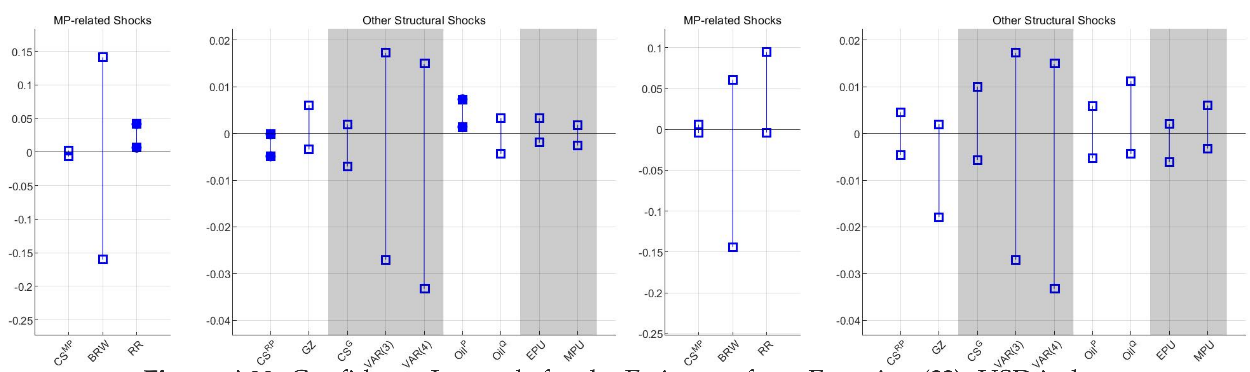

Figure A32: Confidence Intervals for the Estimates from Equation (**??**): USD index

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with USD index are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

(a) CB Information Shock

(b) Monetary Policy Shock

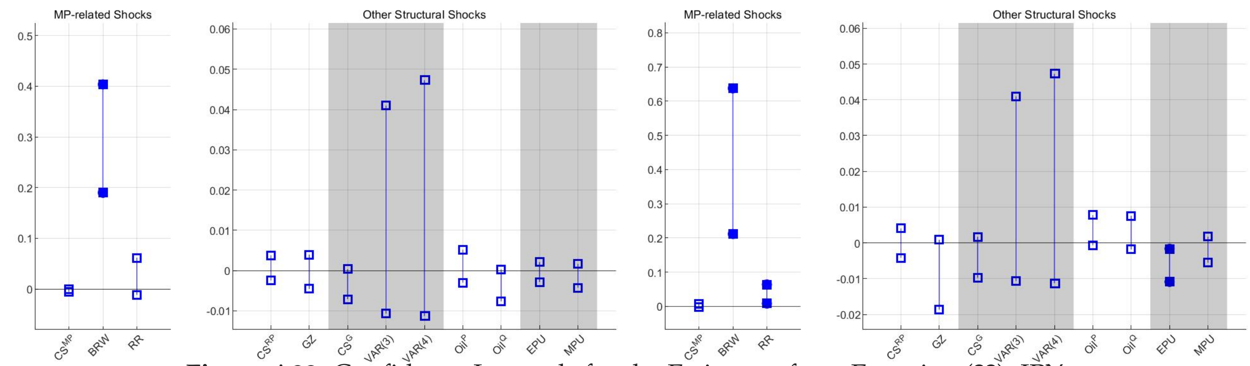

Figure A33: Confidence Intervals for the Estimates from Equation (**??**): JPY

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with exchange rates of Japanese yen per US dollar are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.

(a) CB Information Shock

(b) Monetary Policy Shock

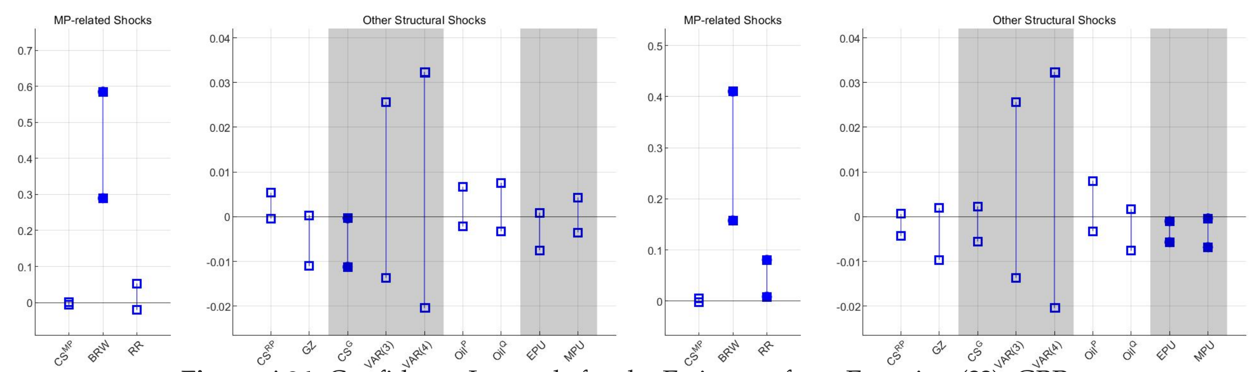

Figure A34: Confidence Intervals for the Estimates from Equation (**??**): GBP

Notes: The figures summarize the confidence intervals of the estimates ($\hat{\beta}_i$) from the regression (**??**) where the shocks identified with exchange rates of British pound per US dollar are employed as dependent variables. Panels (a) and (b) report the results for central bank information shocks and monetary policy shocks, respectively. In each panel, the left-hand side chart presents the results for MP-related shocks, while the right-hand side chart shows those for other structural shocks, including (*i*) financial shocks, (*ii*) growth shocks, (*iii*) oil shocks, and (*iv*) uncertainty. Acronyms on the x-axis correspond identically to those in Figure **??**. The bars are 90% confidence intervals, with dark-colored tips indicating statistically significant estimates and blank tips indicating non-significant estimates.