Internet Appendix for "A High-frequency Measure of Chinese Monetary Policy Shocks"

Jianyao He, Dun Jia, Kai Li, and Wenbin Wu

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Appendix A. Alternative Measure: Latent Factor Approach

We further demonstrate that a single time series of simplicity is sufficient to capture the monetary policy surprises in China, despite its complexity and its institutional uniqueness. We therefore provide an alternative shock series using standard principal component analysis (PCA) following Gürkaynak, Sack, and Swanson (2005), which shows that the U.S. monetary policy could have more than one factor to span its policy scope.[1] This is to determine if there are multiple underlying factors affecting the market responses to monetary policy changes in China.

First, we note that correlations among the 20 NCD rates are very high. To correctly obtain the underlying policy factors, we select the two most commonly issued maturities from each issuer type.[2] We finally work with a set of 6 NCD rates of both short and longer term maturities, namely, UCB(3M), UCB(1Y), RCB(1M), RCB(3M), JSCB(3M), and JSCB(1Y). We then pool these 6 NCD rates into a "response" data matrix X with dimensions $T \times N$, where each row corresponds to a monetary policy announcement event day and each column to a distinct NCD rate. In particular, the individual elements x_{mn} of matrix X represent the 1-day alterations in the n^{th} NCD rate following the m^{th} announcement. We explore the factor structure of this data matrix such that

$$X = F\Lambda + \epsilon \tag{1}$$

where F denotes a $T \times k$ matrix containing $k \leq N$ common latent factors, Λ represents a $k \times N$ matrix of loadings of NCD rate responses on the k factors, and ϵ is a $T \times N$ matrix of white noise residuals.

We then run estimations and present the results in Table IA.1. According to the tabulation of estimates in this table, it suggests that a single and statistically significant factor with uncorrelated white noise is effectively summarizing the dynamics in the dataset X of response NCD interest rates across maturities and across issuer types. No additional distinct factor is needed to increase the explanatory power of the dimension reduction estimation exercise. Hence, we continue to take the first component derived from the principal components of matrix X, which is subsequently normalized to align with $\Delta r^{\text{UCB}}_{\text{1-year}}$. This composite forms our

[1] Gürkaynak et al. (2005) show that both a target factor for the interest rate and the slope factor of interest rate paths are important to fully characterize the monetary policy surprises in the U.S.. Swanson (2021) demonstrates that a third factor of large scale asset purchases (LSAP) is needed in more recent years to fully summarize the U.S. monetary policy scope.

[2] This also means that we have to exclude the NCDs issued by the state-owned commercial banks for this purpose due to their limited issuance count (only six issuers of this type)

alternative high-frequency measure of Chinese monetary policy shocks, subsequently referred to as the PCA shocks.

We present the daily and monthly time series plots for the PCA shock series in Figure IA.1. Furthermore, Figure IA.2 compares the PCA shock series and shifts in the underlying monetary instruments. Similar patterns of the PLS shock series are observed within the PCA shock series. Our PLS shock and PCA shock exhibit a a daily correlation coefficient of 0.5031 and a monthly correlation coefficient of 0.6089. Both are statistically significant at 1% level.

Similar to what's shown for the baseline PLS shocks, we first examine the immediate effects of the alternative PCA shocks, using both regression specifications (4) and (5) in the main script, and results are available in Table IA.2 and Table IA.3. The robustness of all conclusions is reaffirmed. Notably, compared to the PLS shock, the PCA shock exhibits a more significant impact on the NCD market, both in terms of issuance rates and secondary yields, as well as on the inter-bank market, where coefficients for all short-term market rates become significant.

We then proceed to examine the dynamic effects of the alternative PCA shocks following the specification (6) in the main script and check its robustness using IV regression. Impulse response functions are reported in Figure IA.3 and Figure IA.4. We see that the PCA shocks exhibit larger and more enduring effects across all analyzed asset classes compared to the baseline PLS shock.

Lastly, we examine the cumulative PCA shock transmission into the real economy using monthly VAR (see Figure IA.5). With the exception for the price puzzle observed in the Cholesky identification, where a contractionary PCA shock is followed by higher rather than lower inflation, the findings reaffirm the conventionally anticipated trends.

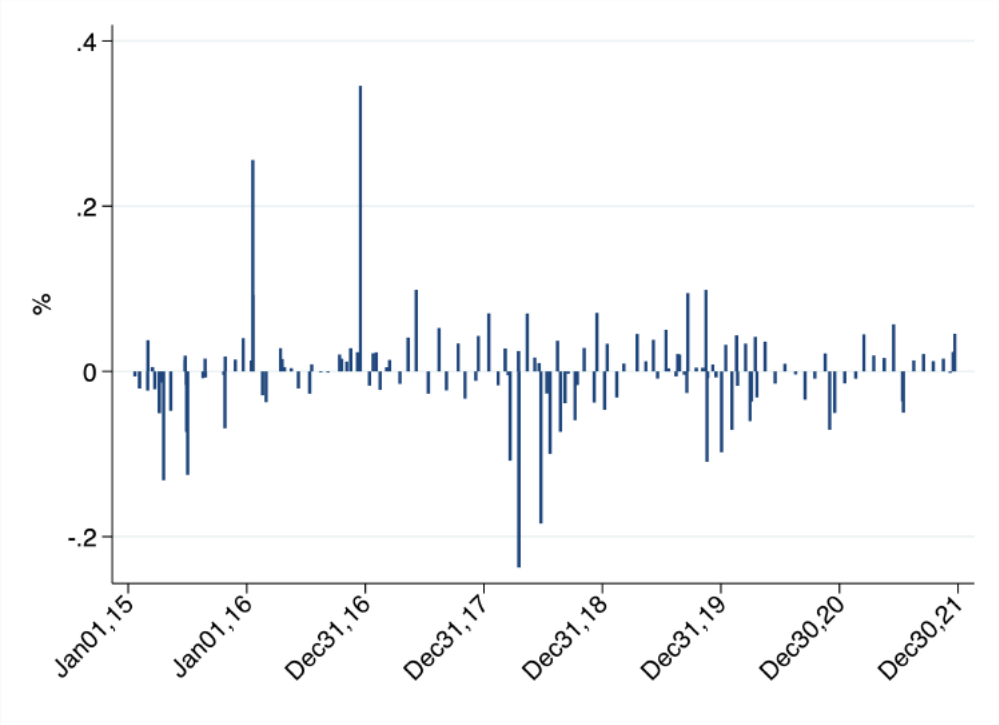
Table IA.1. Test of Number of Factors Characterizing Chinese Monetary Policy Announcements

	χ^2 degree of freedom	Wald statistic	p-value	Number of observations
$H_0 : k = 0$	15	29.3691	0.0144	138
$H_0 : k = 1$	9	11.6145	0.2359	138
$H_0 : k = 2$	4	4.5595	0.3355	138

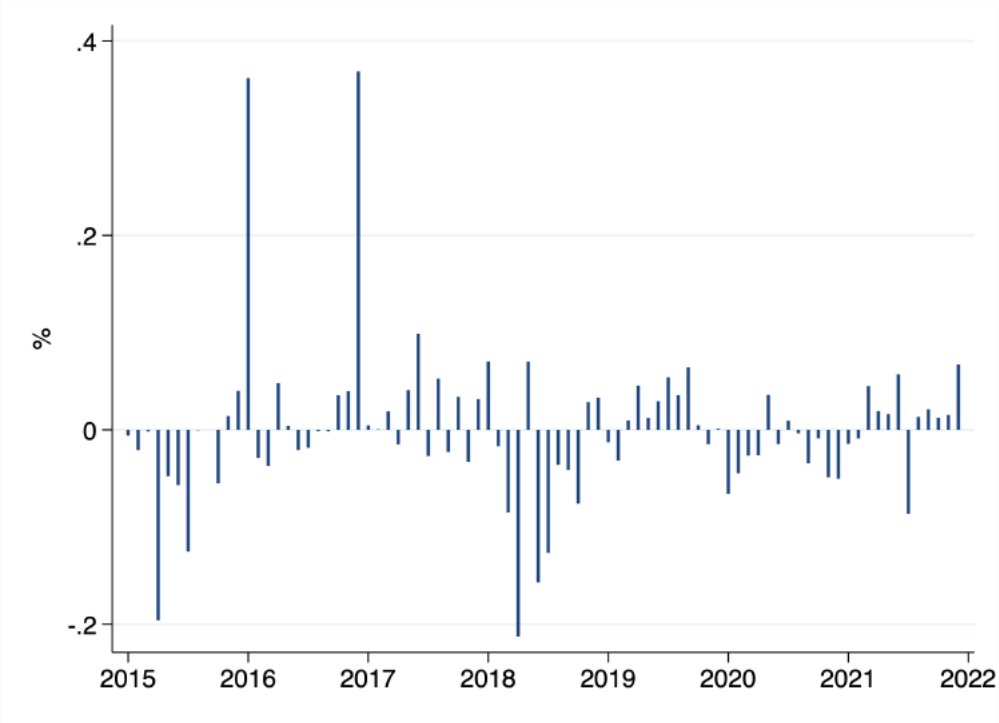
Note: The results of the Cragg and Donald (1997) are provided to ascertain the number of underlying factors k within the 138×6 matrix X representing responses of NCD issuance rates to Chinese monetary policy announcements spanning from January 2015 to December 2021. See text for details. The test examines the hypothesis $H_0 : k = k_0$ against the alternative $H_1 : k > k_0$.

Fig. IA.1. PCA Shock Series (Jan2015 to Dec2021)

(a) Daily

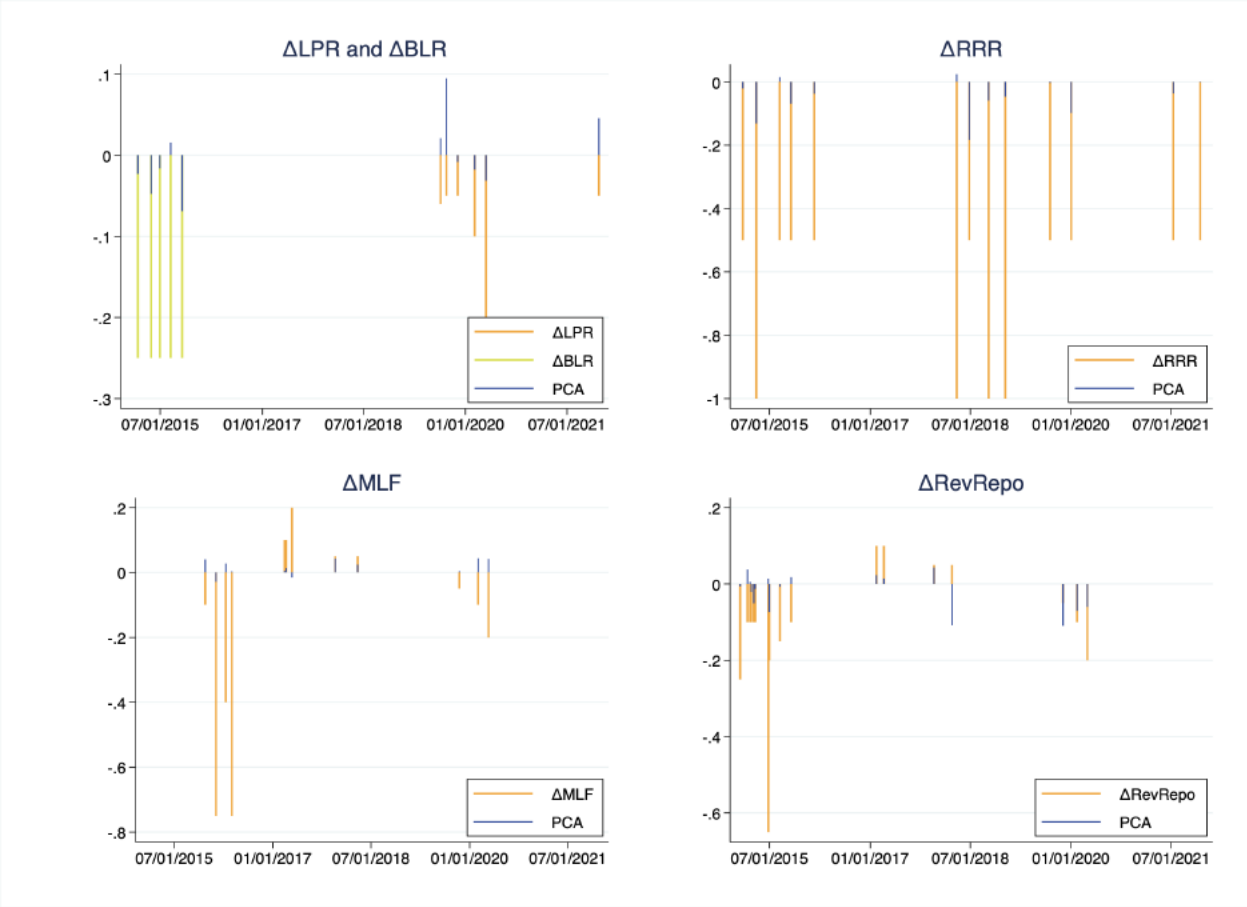


(b) Monthly



Note: Time series of Chinese monetary policy shock estimated through principal component analysis (1st component). This specific shock series is subsequently referred to as PCA shock.

Fig. IA.2. PCA Shock Series v.s. Changes in Monetary Instruments



Note: The PCA shock is juxtaposed against alterations in each underlying monetary instrument. "LPR" denotes the loan prime rate, "BLR" denotes the benchmark lending rate, "RRR" denotes the required reserve ratio, "MLF" denotes the medium-term lending facility rate, and "RevRepo" denotes the 7-day reverse repo rate.

Table IA.2. PCA Shock On Impact

(a) NCDs' Issue Rates & Yields (%)

	Primary Dealer's Issue Rate						Yields-to-Maturity			
	Urban(1Y)	1M	3M	6M	9M	1Y	AAA+(3M)	AAA+(6M)	AAA+(9M)	AAA+(1Y)
e_t	1.0490***	1.5161***	1.1379***	0.6494***	0.6092***	0.5989***	0.2674**	0.2947***	0.2649***	0.3078***
	(0.1641)	(0.2971)	(0.1125)	(0.1736)	(0.1904)	(0.1703)	(0.1110)	(0.0944)	(0.0941)	(0.0735)
Constant	-0.0091	-0.0257***	-0.0099*	-0.0152*	-0.0106	-0.0031	-0.0034	-0.0058	-0.0070**	-0.0059**
	(0.0065)	(0.0096)	(0.0053)	(0.0081)	(0.0068)	(0.0055)	(0.0045)	(0.0037)	(0.0034)	(0.0030)
N	129	120	136	129	111	131	138	138	138	138
adj. R^2	0.39	0.44	0.56	0.16	0.17	0.25	0.08	0.14	0.14	0.22

(b) Inter-bank Market Rates (%)

	DR007	DR014	ShiborON	Shibor3M	FR007(1Y)	FR007(5Y)	Shibor3M(1Y)	Shibor3M(5Y)
e_t	0.2705*	0.7366*	0.3229**	0.1531***	0.1978**	0.2082***	0.3186**	0.2638**
	(0.1477)	(0.4090)	(0.1492)	(0.0420)	(0.0802)	(0.0679)	(0.1275)	(0.1256)
Constant	-0.0017	0.0131	0.0028	-0.0032**	-0.0128***	-0.0103***	-0.0156***	-0.0165***
	(0.0085)	(0.0169)	(0.0119)	(0.0015)	(0.0033)	(0.0030)	(0.0037)	(0.0041)
N	138	138	138	138	138	138	138	138
adj. R^2	0.02	0.04	0.01	0.21	0.08	0.11	0.16	0.09

(c) Bonds' Yields (%)

	3M	6M	9M	1Y	3Y	5Y	7Y	9Y	10Y	15Y	30Y
Treasury	0.2154***	0.1756**	0.2105***	0.2293***	0.2423***	0.2080***	0.1895***	0.1558***	0.1391***	0.1922***	0.2106**
	(0.0778)	(0.0701)	(0.0675)	(0.0684)	(0.0871)	(0.0582)	(0.0705)	(0.0466)	(0.0405)	(0.0686)	(0.1004)
Commercial(AAA)	0.6088***	0.6660***	0.6109***	0.5005***	0.2900***	0.2407***	0.1980**	0.1923**	0.1769**	0.1637*	0.1686**
	(0.1069)	(0.1565)	(0.1533)	(0.1509)	(0.1060)	(0.0856)	(0.0827)	(0.0803)	(0.0854)	(0.0863)	(0.0839)
Enterprise(AAA)		0.2894***		0.2914***	0.2601***	0.2417***	0.2026**	0.1960**	0.1858**	0.1827***	0.1982***
		(0.0945)		(0.0923)	(0.0915)	(0.0889)	(0.0824)	(0.0788)	(0.0764)	(0.0678)	(0.0722)
Enterprise(AA+)		0.1692		0.1786	0.1869*	0.1744*	0.1651*	0.1730**	0.1725**	0.1631**	0.1653**
		(0.1092)		(0.1106)	(0.1087)	(0.1003)	(0.0898)	(0.0839)	(0.0815)	(0.0671)	(0.0678)
Corporate(AAA)		0.1772		0.1780	0.1582	0.1644	0.1502	0.1875**			
		(0.1170)		(0.1147)	(0.1082)	(0.1010)	(0.0953)	(0.0933)			
Corporate(AA+)		0.2842***		0.2799**	0.2610**	0.2338**	0.2082*	0.2442**			
		(0.1067)		(0.1079)	(0.1132)	(0.1148)	(0.1165)	(0.0955)			

(d) Stock Market Returns $[t+4, t-1]$ (%)

	SSEC	SSEA	SSEB	CSI300	SZI	ChiNext	SZSE100R	SMEC
e_t	-4.9088	-4.9166	-3.3471	-5.7668	-6.4165	-13.9674*	-6.6571	-6.7735
	(5.1110)	(5.1100)	(7.1298)	(5.1048)	(6.1512)	(7.2231)	(5.8930)	(6.5493)
Constant	-0.6004*	-0.6006*	-0.5080	-0.5458	-0.9204**	-0.9831**	-0.6675*	-0.7667**
	(0.3179)	(0.3180)	(0.3774)	(0.3302)	(0.3652)	(0.3950)	(0.3444)	(0.3852)
N	138	138	138	138	138	138	138	138
adj. R^2	-0.00	-0.00	-0.01	0.00	0.00	0.03	0.00	0.00

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: This table presents the impact of 1 percentage point contractionary PCA shock series on an array of financial products, as per the specification outlined in main text, except for the effect on stock market indexes. In the context of stock market indexes, $\Delta y_{i,t} = y_{i,t+4} - y_{i,t-1}$ denotes the cumulative 5-day stock returns expressed in percentage terms.

Table IA.3. PCA Shock On Impact - IV Regression

(a) NCDs' Issue Rates & Yields (%)

	Primary Dealer's Issue Rate					Yields-to-Maturity			
	Urban(1Y)	1M	3M	6M	9M	AAA+(3M)	AAA+(6M)	AAA+(9M)	AAA+(1Y)
Primary(1Y)	1.5622***	2.4621***	1.9390***	1.0624***	0.7881***	0.4461**	0.5085**	0.4564**	0.5130**
	(0.3266)	(0.8587)	(0.5904)	(0.2626)	(0.1740)	(0.1984)	(0.2098)	(0.2144)	(0.2017)
Constant	-0.0025	-0.0232	-0.0047	-0.0137	-0.0077	-0.0026	-0.0049	-0.0055	-0.0043
	(0.0107)	(0.0155)	(0.0112)	(0.0088)	(0.0079)	(0.0051)	(0.0047)	(0.0042)	(0.0042)
N	124	116	131	124	111	131	131	131	131
R^2	.	.	.	.	.	.	.	.	.

First stage regression: Robust F: 12.3709 p-value: 0.0006 R^2: 25.54% Adjusted R^2: 24.97%

(b) Inter-bank Market Rates (%)

	DR007	DR014	ShiborON	Shibor3M	FR007(1Y)	FR007(5Y)	Shibor3M(1Y)	Shibor3M(5Y)
Primary(1Y)	0.4391	1.1958	0.5242*	0.2485***	0.3211***	0.3380***	0.5172***	0.4282***
	(0.2833)	(0.8160)	(0.2676)	(0.0590)	(0.1097)	(0.0838)	(0.1197)	(0.1186)
Constant	-0.0006	0.0160	0.0041	-0.0026	-0.0120***	-0.0094***	-0.0143***	-0.0154***
	(0.0085)	(0.0177)	(0.0118)	(0.0018)	(0.0035)	(0.0032)	(0.0040)	(0.0042)
N	138	138	138	138	138	138	138	138
R^2	.	.	0.02	.	.	.	.	0.06

First stage regression: Robust F: 14.642 p-value: 0.0002 R^2: 27.01% Adjusted R^2: 26.48%

(c) Bonds' Yields (%)

	3M	6M	9M	1Y	3Y	5Y	7Y	9Y	10Y	15Y	30Y
Treasury	0.3429**	0.2795*	0.3351**	0.3650**	0.3858**	0.3311**	0.3017*	0.2480**	0.2214**	0.3060*	0.3353
	(0.1714)	(0.1566)	(0.1477)	(0.1738)	(0.1942)	(0.1463)	(0.1581)	(0.1106)	(0.0927)	(0.1607)	(0.2265)
Commercial(AAA)	0.9884***	1.0811***	0.9917***	0.8125***	0.4709***	0.3907***	0.3215***	0.3122***	0.2873***	0.2658***	0.2736***
	(0.1931)	(0.1809)	(0.1274)	(0.1099)	(0.0965)	(0.0894)	(0.0839)	(0.0843)	(0.0936)	(0.0979)	(0.0942)
Enterprise(AAA)		0.4715***		0.4748***	0.4238***	0.3938***	0.3302***	0.3193***	0.3027***	0.2977***	0.3230***
		(0.1025)		(0.0998)	(0.1034)	(0.0998)	(0.0881)	(0.0797)	(0.0767)	(0.0669)	(0.0725)
Enterprise(AA+)		0.2757**		0.2910**	0.3045**	0.2841***	0.2690***	0.2818***	0.2811***	0.2658***	0.2693***
		(0.1272)		(0.1268)	(0.1195)	(0.1055)	(0.0912)	(0.0825)	(0.0785)	(0.0629)	(0.0627)
Corporate(AAA)		0.2888**		0.2901**	0.2578**	0.2678**	0.2448**	0.3055***			
		(0.1353)		(0.1297)	(0.1234)	(0.1071)	(0.1027)	(0.0928)			
Corporate(AA+)		0.4631***		0.4560***	0.4252***	0.3809***	0.3393***	0.3980***			
		(0.1245)		(0.1223)	(0.1202)	(0.1199)	(0.1258)	(0.0890)			

First stage regression: Robust F: 14.642 p-value: 0.0002 R^2: 27.01% Adjusted R^2: 26.48%

(d) Stock Market Returns $[t+4, t-1]$ (%)

	SSEC	SSEA	SSEB	CSI300	SZI	ChiNext	SZSE100R	SMEC
Primary(1Y)	-7.9987	-8.0113	-5.4540	-9.3967	-10.4554	-22.7592*	-10.8475	-11.0371
	(8.2277)	(8.2251)	(11.6785)	(8.2866)	(9.9522)	(12.3722)	(9.6068)	(10.7110)
Constant	-0.6204*	-0.6206*	-0.5216	-0.5693*	-0.9465***	-1.0399***	-0.6946**	-0.7942**
	(0.3186)	(0.3187)	(0.3636)	(0.3311)	(0.3625)	(0.3987)	(0.3418)	(0.3816)
N	138	138	138	138	138	138	138	138
R^2	.	.	0.00	.	0.01	.	0.01	0.01

First stage regression: Robust F: 14.5621 p-value: 0.0002 R^2: 26.89% Adjusted R^2: 26.35%

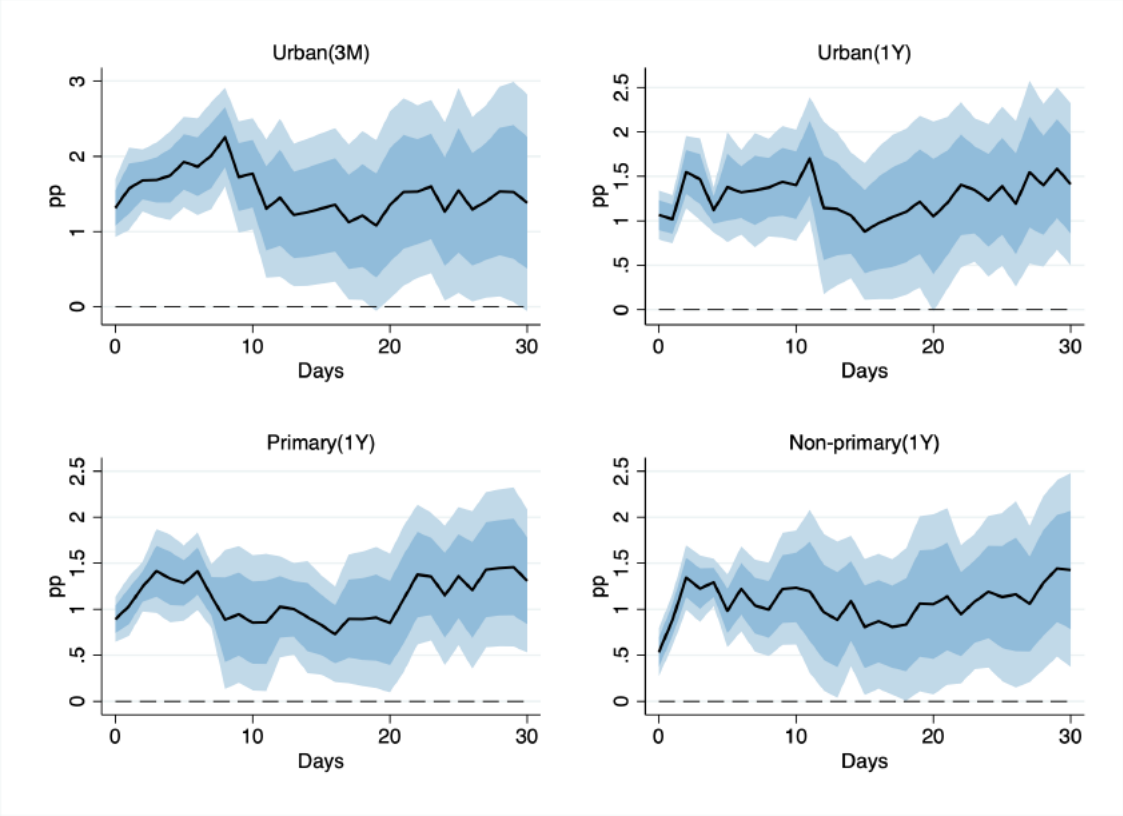
Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

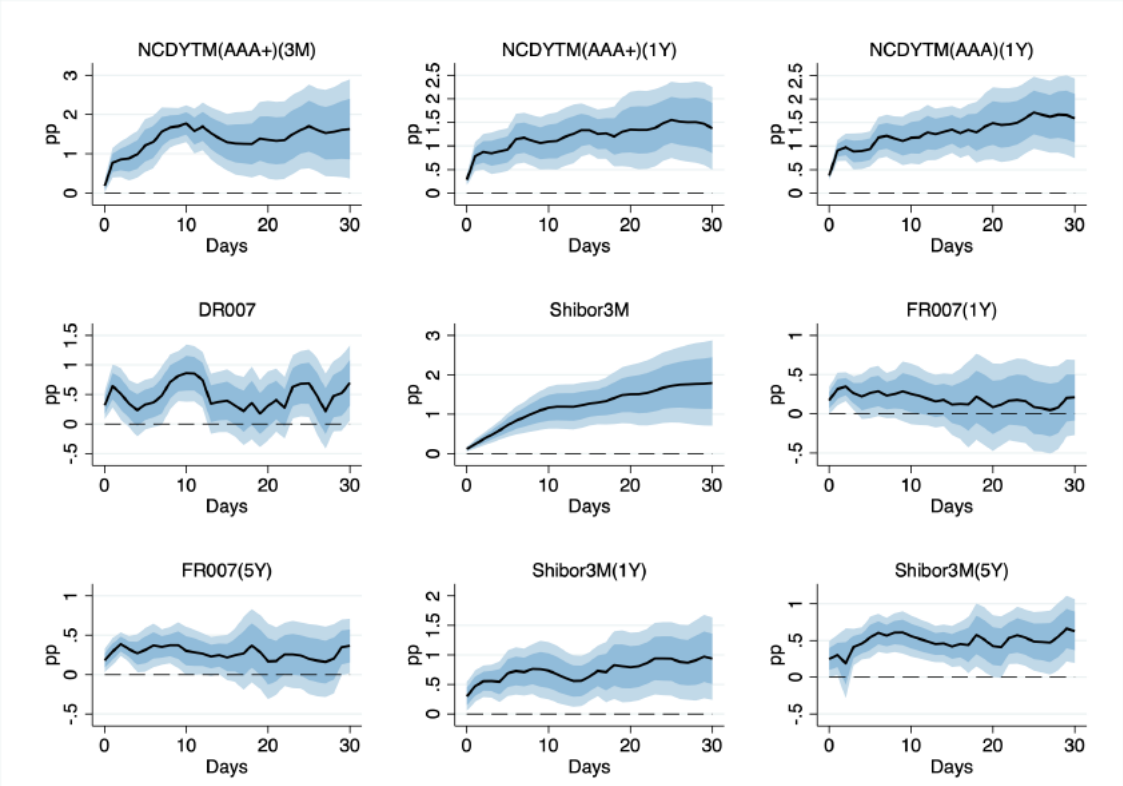
Note: This table presents the impact of 1 percentage point contractionary PCA shock on an array of financial products using instrumental variable regression where 1-yr primary dealers' NCD issuance rate is instrumented with PCA shock. This instrument NCD rate is henceforth denoted as "Primary(1Y)". In the context of stock market indexes, $\Delta y_{i,t} = y_{i,t+4} - y_{i,t-1}$ denotes the cumulative 5-day stock returns expressed in percentage terms.

Fig. IA.3. PCA Shock Impulse Responses - Local Projection

(a) NCD Issuance Rates

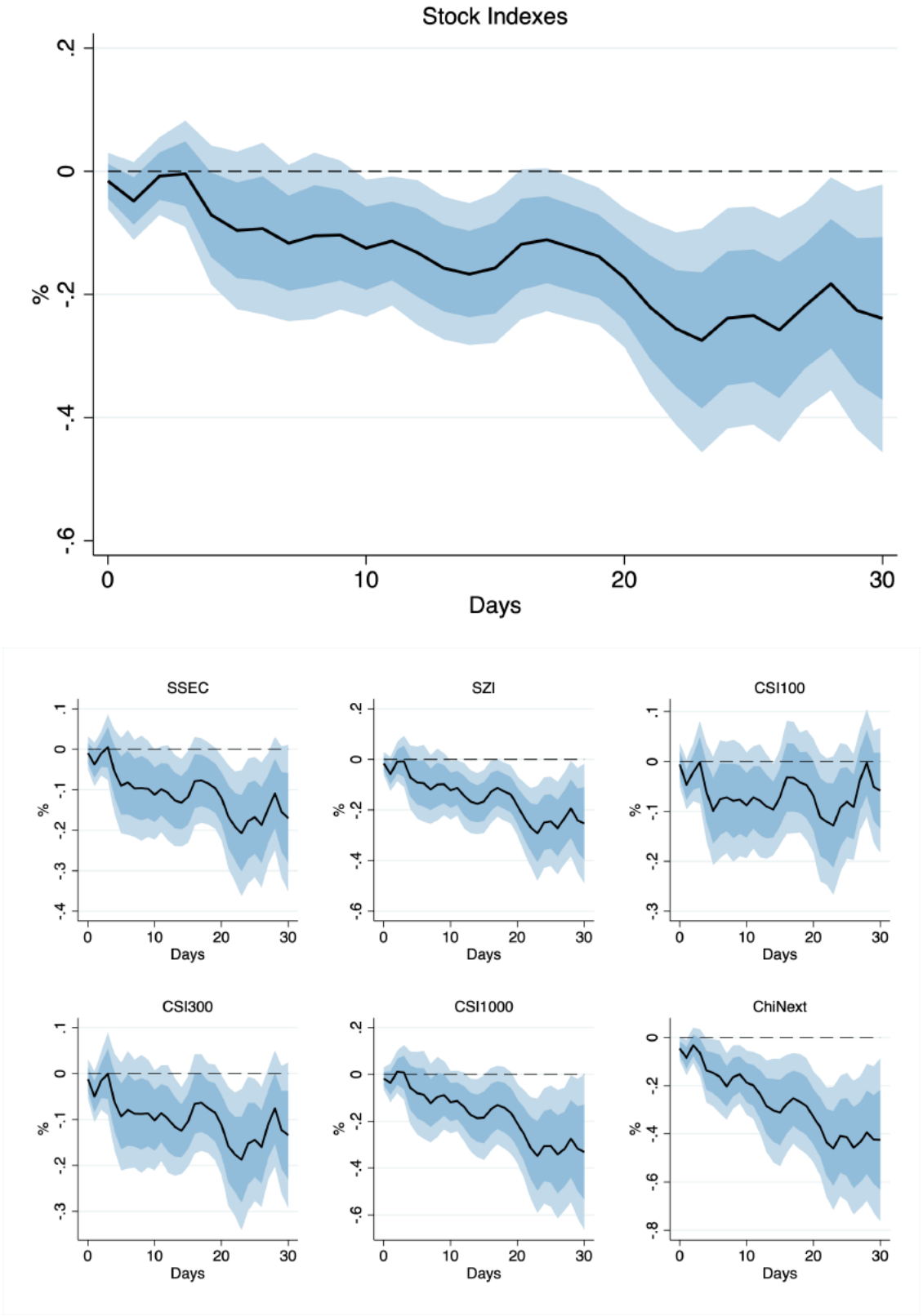


(b) Inter-bank Market



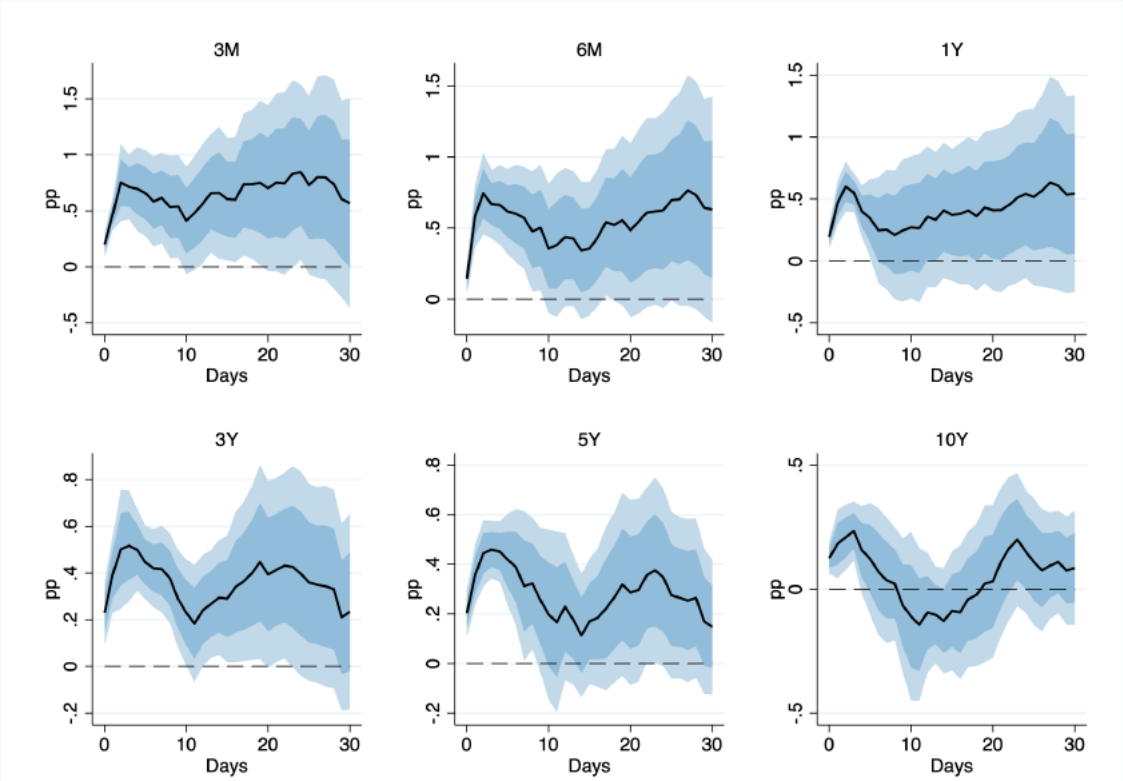
Note: Cumulative impulse response functions to a 1 percentage point increase in the PCA shock series. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors.

(c) Stock Market

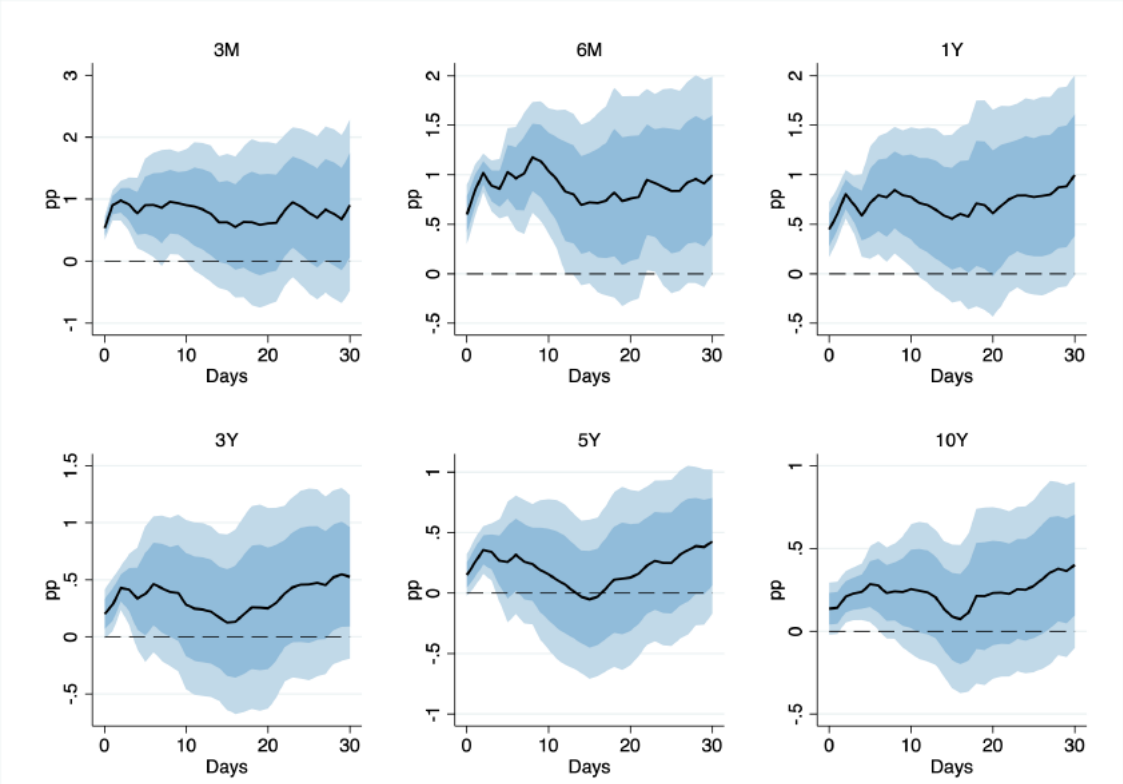


Note: The upper panel reports the panel impulse response function of prominant stock market indexes to a 1 percentage point increase in the PCA shock series. Deep and shallow blue shaded areas are 68% and 90% confidence intervals generated by standard errors clustered at both month and index levels. The lower panel report the impulse response function for individual stock market indexes, with confidence intervals calculated using Newey-West standard errors.

(d) Treasuries

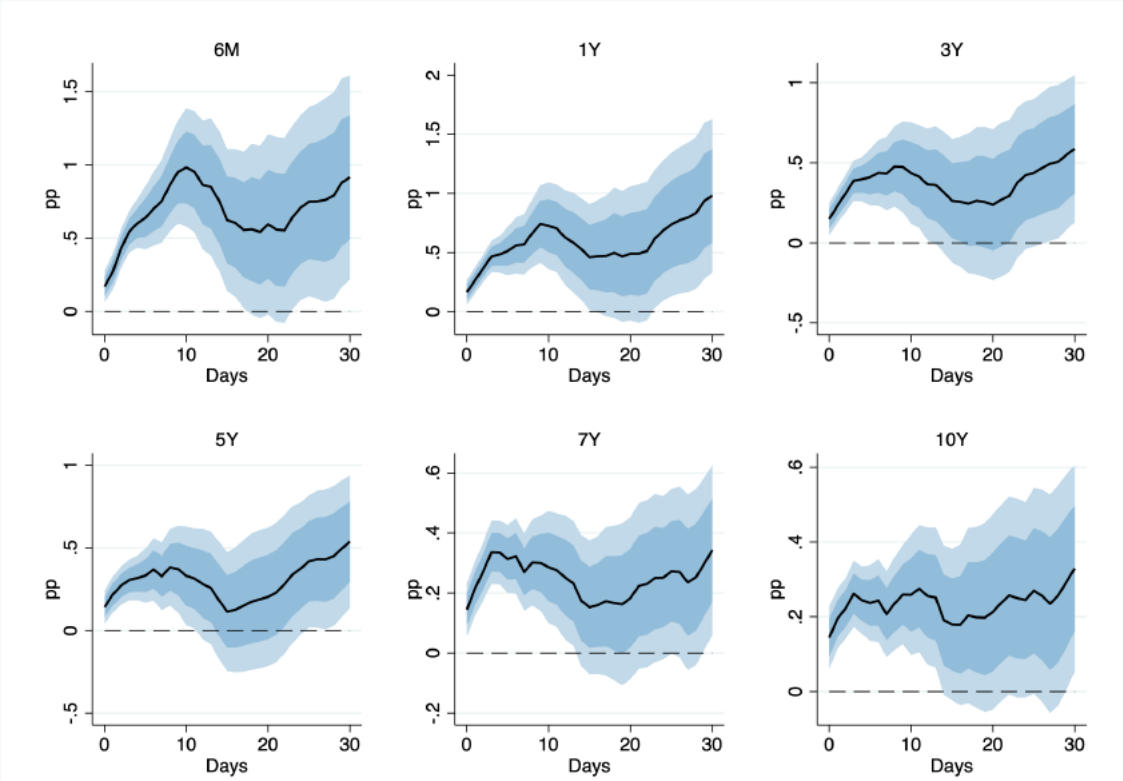


(e) Commercial Bank Bonds

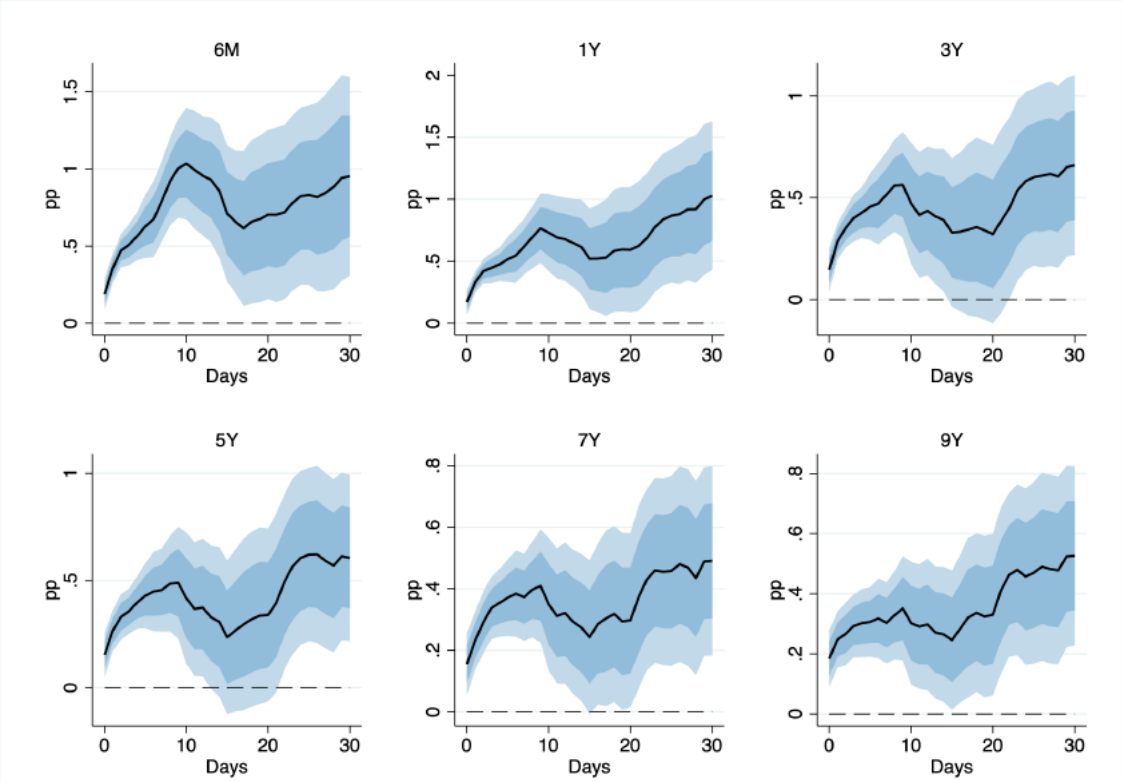


Note: The upper (lower) panel reports the impulse response functions of treasury yields (AAA-rated commercial bank bonds) to a 1 percentage point increase in the PCA shock series. Deep and shallow blue shaded areas are 68% and 90% confidence intervals generated by Newey-West standard errors.

(f) Enterprise Bonds



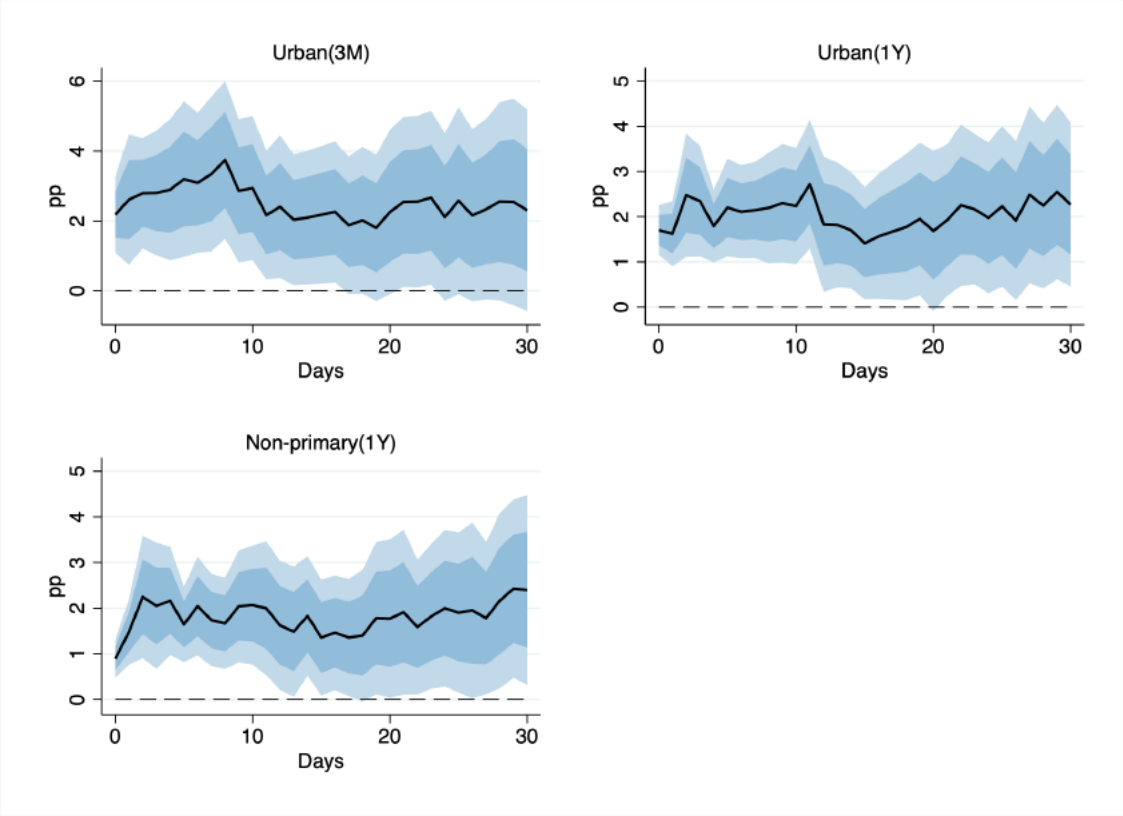
(g) Corporate Bonds



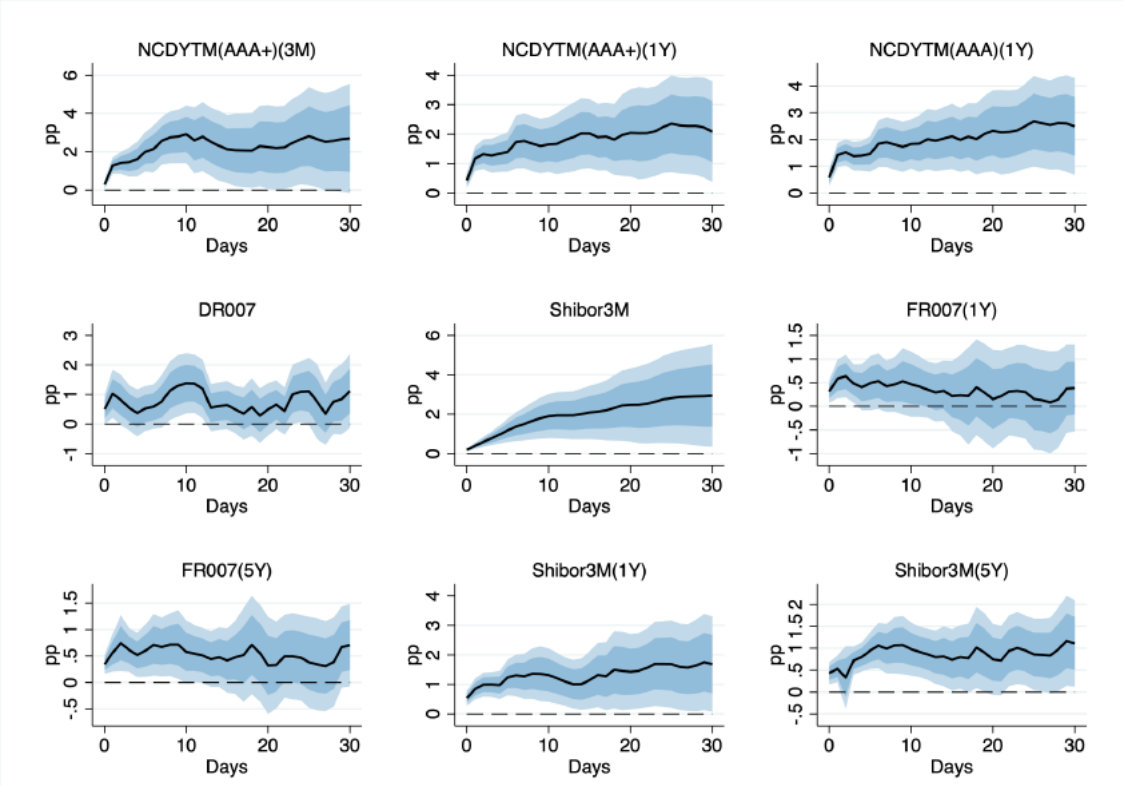
Note: The upper (lower) panel reports panel impulse response functions of yields of enterprise (corporate) bonds with AAA, AA+, and AA ratings to a 1 basis points increase in the PCA shock series. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors.

Fig. IA.4. PCA Shock Impulse Responses - Local Projection (IV Regression)

(a) NCD Issuance Rates

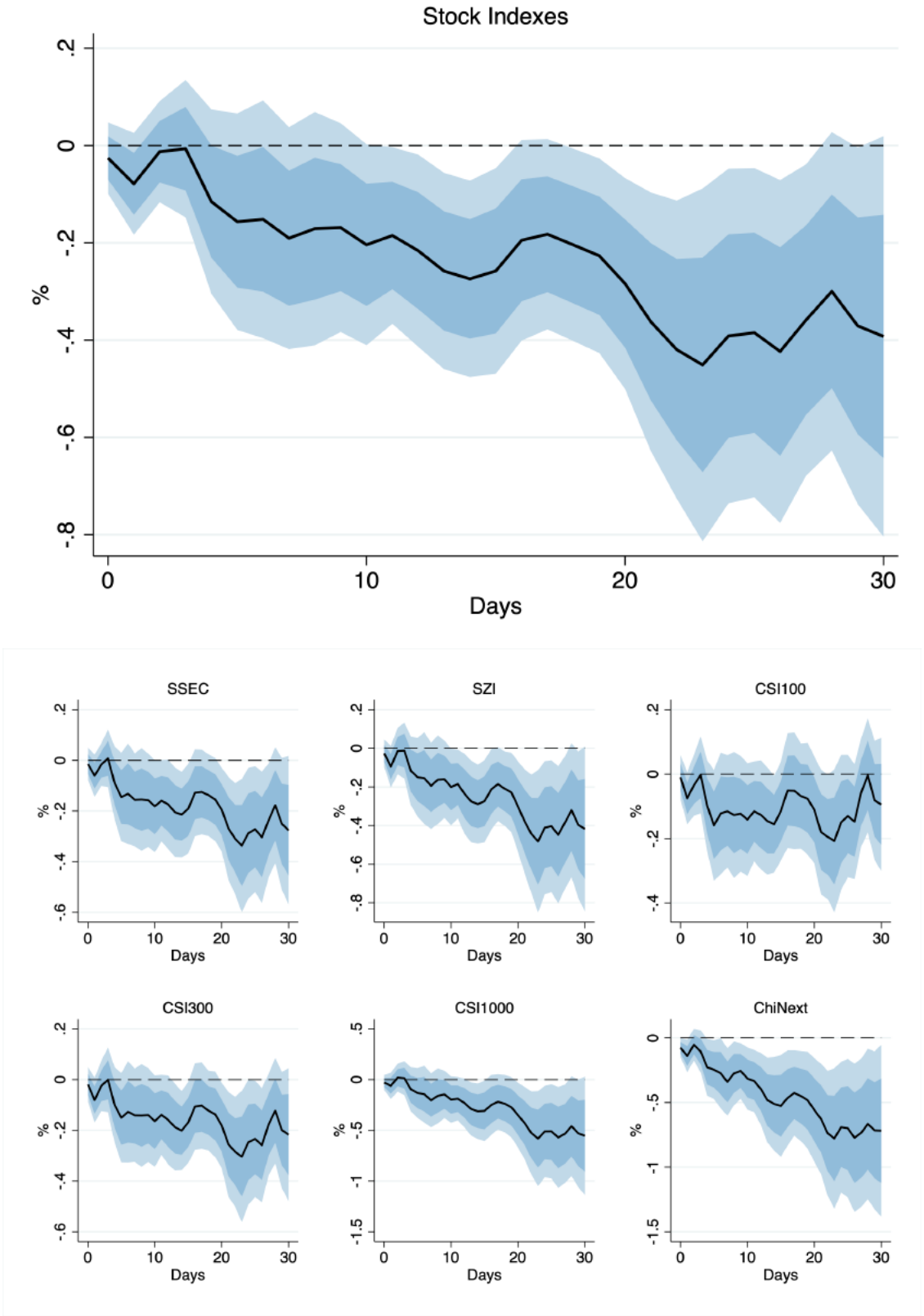


(b) Inter-bank Market



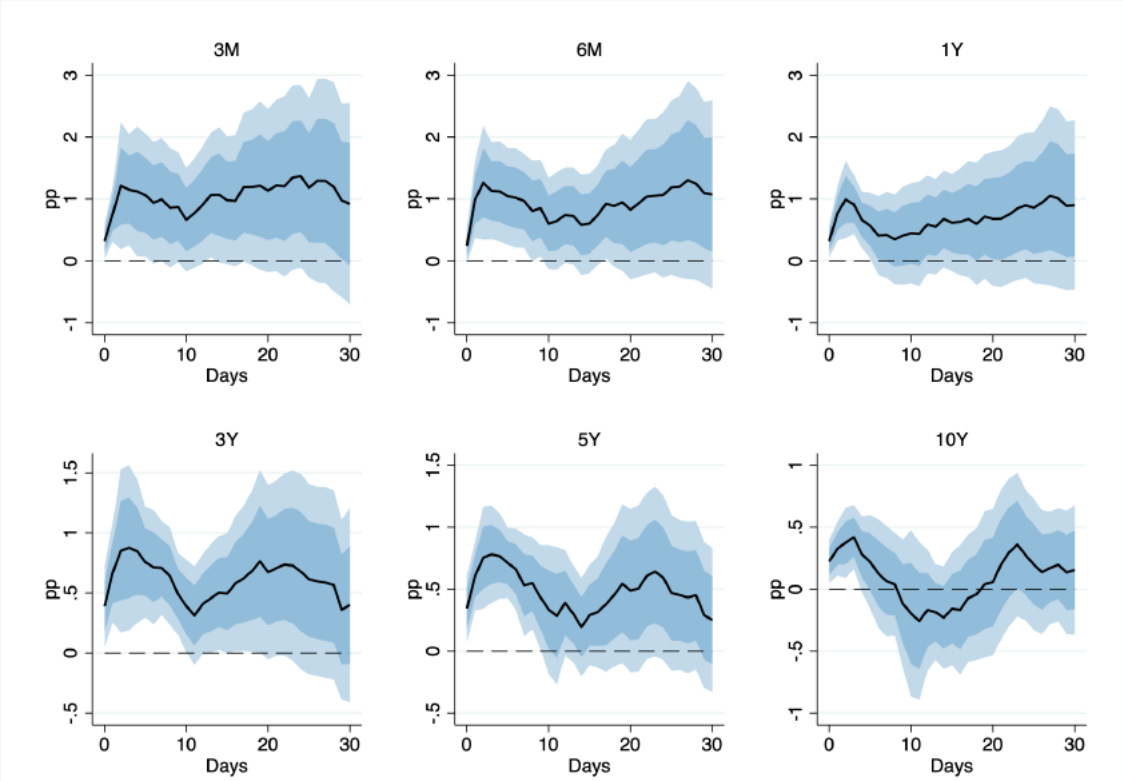
Note: Cumulative impulse response functions to a 1pp increase in the PCA shock series. These functions are derived through IV regressions, with the Primary(1Y) being instrumented by the PCA shock. Deep and shallow blue shaded areas are 68% and 90% confidence intervals computed using robust standard errors.

(c) Stock Market

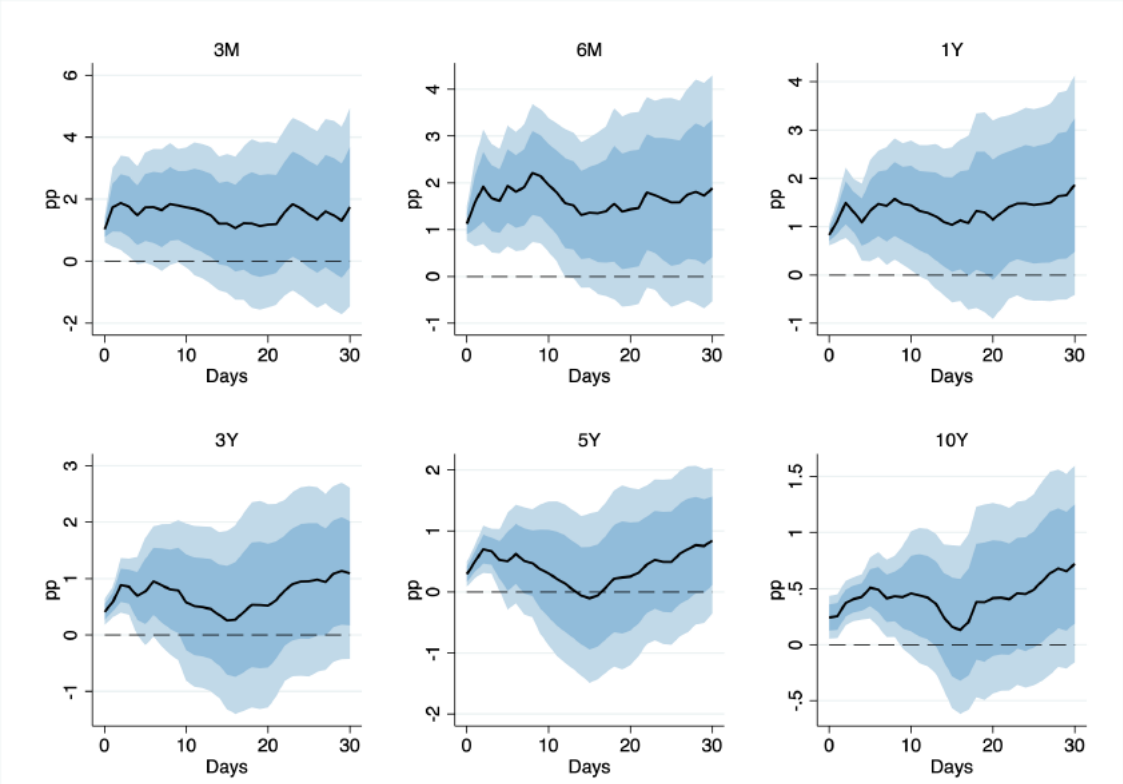


Note: The upper panel reports the panel impulse response function of prominent stock market indexes to a 1 percentage point increase in the PCA shock series. These functions are derived through IV regressions, with the Primary(1Y) variable being instrumented by the PCA shock. Deep and shallow blue shaded areas are 68% and 90% confidence intervals generated by standard errors clustered at both month and index levels. The lower panel report the impulse response function for individual stock market indexes, with confidence intervals calculated using robust standard errors.

(d) Treasuries

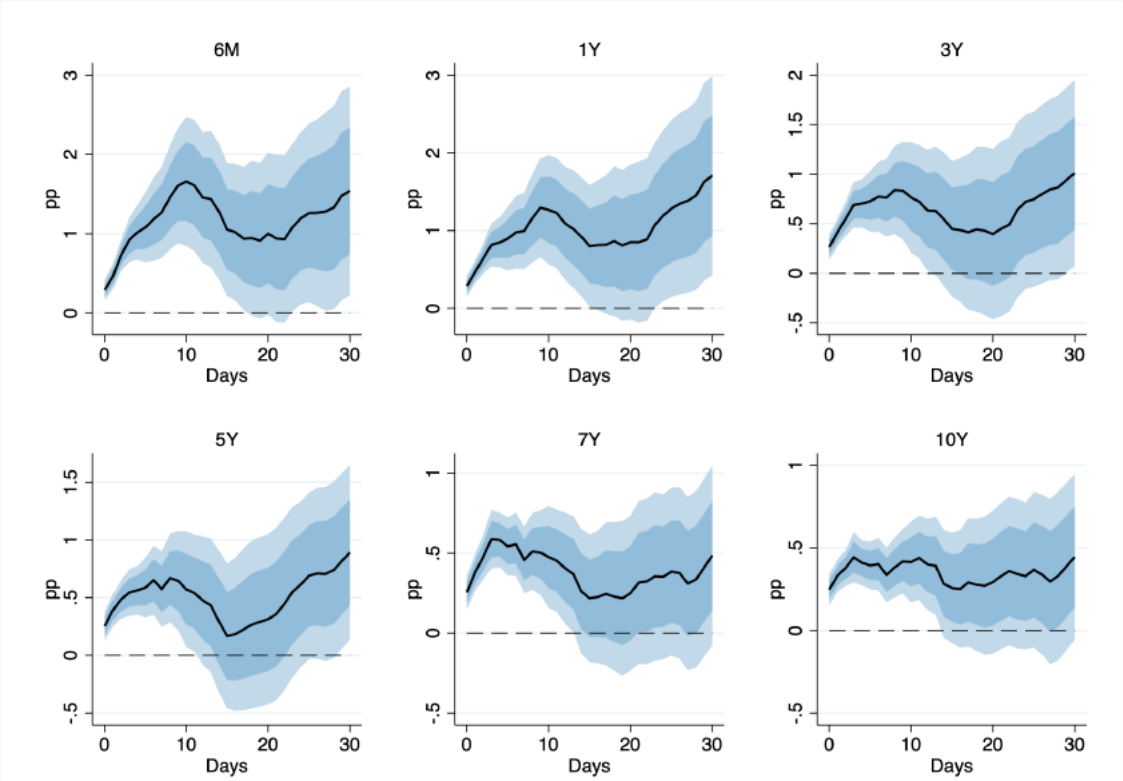


(e) Commercial Bank Bonds

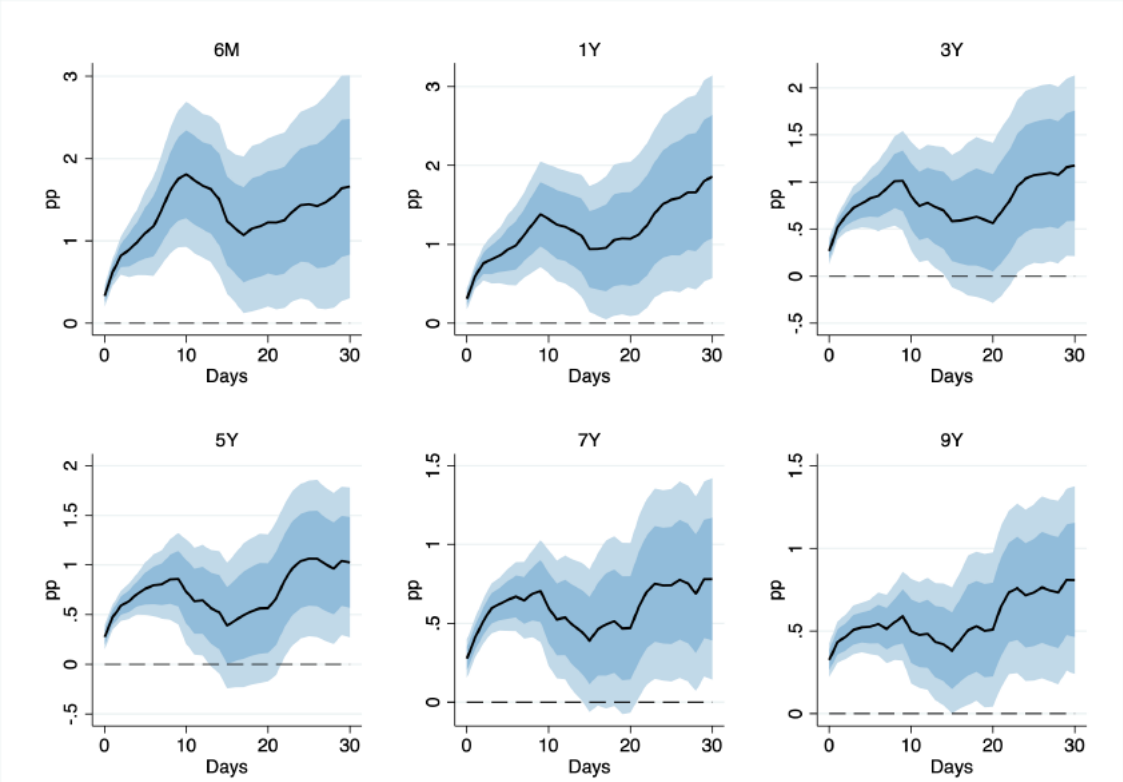


Note: The upper (lower) panel reports the impulse response functions of treasury yields (AAA-rated commercial bank bonds) to a 1 percentage point increase in the PCA shock series. These functions are derived through IV regressions, with the Primary(1Y) variable being instrumented by the PCA shock. Deep and shallow blue shaded areas are 68% and 90% confidence intervals calculated using robust standard errors.

(f) Enterprise Bonds



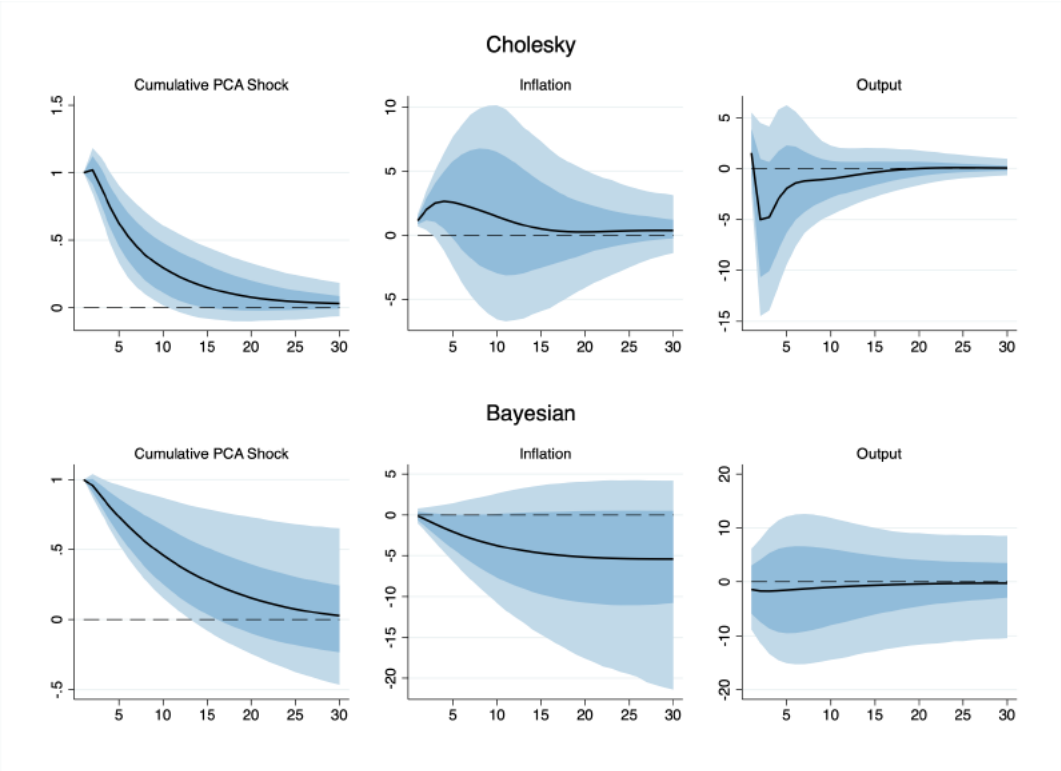
(g) Corporate Bonds



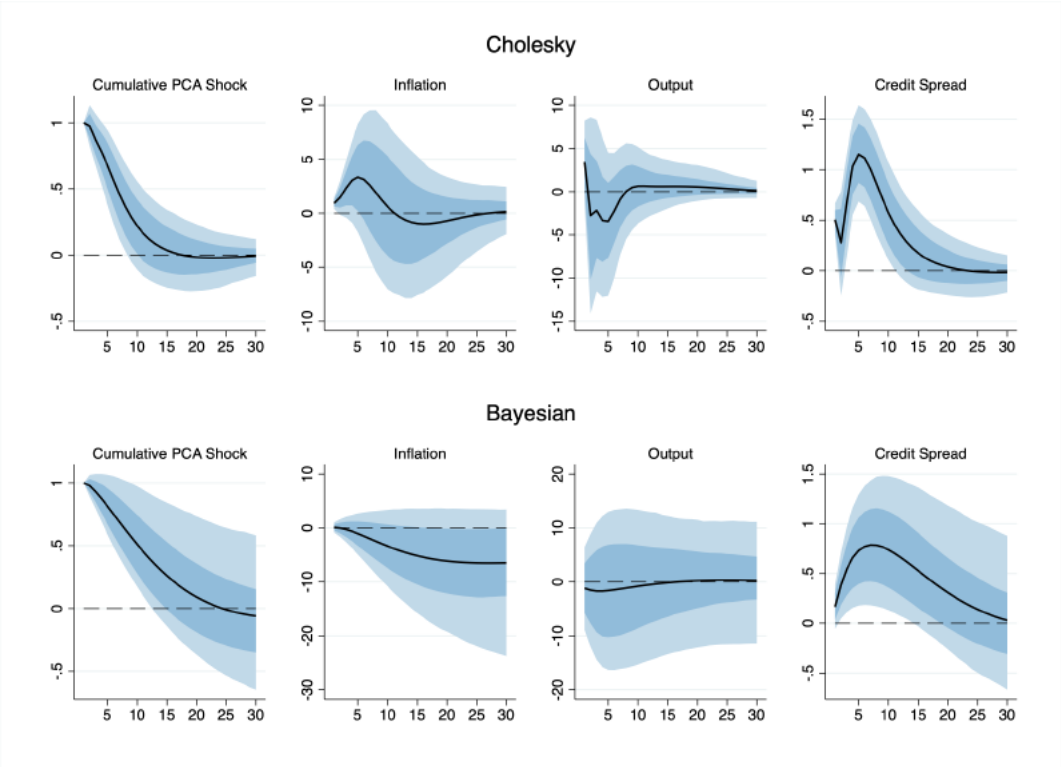
Note: The upper (lower) panel reports panel impulse response functions of yields of enterprise (corporate) bonds with AAA, AA+, and AA ratings to a 1 basis points increase in the PCA shock series. These functions are derived through IV regressions, with the Primary(1Y) variable being instrumented by the PCA shock. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by robust standard errors.

Fig. IA.5. PCA Shock Impulse Responses - Structural VAR

(a) 3 System VAR



(b) 4 System VAR



Note: Impulse response of VAR with 3 and 4 variables are reported in Panel (a) and (b), respectively. Variables are ordered: cumulative PLS shock series, % growth of PPI, % growth of IVA, and credit spread. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by bootstrapping 3000 times.

Appendix B. More Details on the Monetary Policy Instruments and Tools

Reserve Requirement Ratio (RRR). Lowering RRR has consistently been an important instrument to support the development of the real economy and maintain overall financing cost since June 2011. Over the sample period, the PBOC announced 13 RRR cuts, of which 14 were implemented as scheduled. In this paper, we study RRR revisions targeting either all financial institutions or a subset of banks, namely small and medium-sized banks.

7-day Reverse Repo Rate (RevRepo). The 7-day reverse repo operation is one of the essential mechanisms through which the PBOC manages liquidity in the economy, influences short-term interest rates, and provides temporary funding to financial institutions. PBOC frequently conducts 7-day reverse repo operations as part of its daily OMO. Consequently, we concentrate on days when there were changes in the rate. Over the sample period, the PBOC revised the 7-day reverse repo rate 17 times, with 13 of these revisions involving a downward adjustment.

The Benchmark Loan Rate (BLR). The benchmark loan rate along with the benchmark deposit rate were once an important tool to guide market interest rates, and reductions helped the real interest rates return to normal levels, as well as reduce the financing cost incurred by enterprises. Yet it has not been changed since 2016 and there are 5 cuts happened in 2015.

Loan Prime Rate (LPR). On August 17, 2019, the PBOC introduced a refined formation mechanism of LPR, stipulated in the Announcement No.15 [2019]. Under this mechanism, 18 quoting banks submit their quotes to the National inter-bank Funding Center (NIFC) before 9:00a.m. on the 20^{th} day of each month, starting from August 20^{th}, 2019. Subsequently, at 9:30a.m., the NIFC publishes the arithmetic average rate for two maturities, 1-year and beyond 5-year. We specifically focus on the 6 events when 1-year LPR changed.

The Medium-Lending Facility (MLF). MLF operation serves as a means through which the PBOC injects medium-term liquidity into commercial banks. In addition to providing targeted funding to specific sectors or industries, its rate also serves as a benchmark to other market rates. Thus, we include changes in the MLF loan rate for all three maturities (3-month, 6-month, 1year) in this study, with a total of 14 adjustments observed (2, 9, and 8, respectively).

Table IA.4. Co-released Announcements

	MLF	LPR	RRR	BLR	RevRepo
MLF	104				
LPR	0	6			
RRR	1	0	14		
BLR	0	0	2	5	
RevRepo	3	0	0	0	17

Note: The number indicates the count of row announcement events that coincide with the column announcement events. An overlap is considered if both labeled announcement types are identified on the same day. The sum of row or column values may not necessarily match the total number of announcement events for a specific announcement label.

Fig. IA.6. Examples of Monetary Announcements

(a) MLF & RevRepo

Announcement on Open Market Operations No.182 [2021]

To Read Chinese Version

Announcement on Open Market Operations No.182 [2021]

(Open Market Operations Office, September 15, 2021)

In order to keep the liquidity in the banking system adequate at a reasonable level, the People's Bank of China (PBC) conducted Medium-term Lending Facility (MLF) operations in the amount of RMB600 billion (including the rollover of the MLF maturing on September 15) and reverse repo operations in the amount of RMB10 billion on September 15, 2021.

Details of the MLF Operations

Maturity	Volume	Rate
1 year	RMB600 billion	2.95%

Details of the Reverse Repo Operations

Maturity	Volume	Rate
7 days	RMB10 billion	2.20%

Date of last update SEP. 15, 2021

Announcement on Open Market Operations No.18 [2020]

To Read Chinese Version

Announcement of Open Market Operations No.18 [2020]

(Open Market Operations Office, February 3, 2020)

In order to offset the impact of the maturing of reverse repos and the concentrated maturing of financial market products, and to maintain reasonable and adequate liquidity in the banking system during the period of epidemic prevention and control, the People's Bank of China conducts reverse repo operations in the amount of RMB1.2 trillion through interest rate bidding on February 3, 2020.

Details of the Reverse Repo Operations

Maturity	Volume	Interest Rate
7 days	RMB900 billion	2.40%
14 days	RMB300 billion	2.55%

The People's Bank of China will continue to pay close attention to market liquidity during the period of epidemic prevention and control to ensure adequate liquidity supply.

Date of last update FEB. 03, 2020

(b) BLR & RRR

PBC Decides to Cut RMB Benchmark Loan and Deposit Interest Rates and Reduce Reserve Requirement Ratio

The PBC has decided to cut RMB benchmark loan and deposit interest rates for financial institutions as of August 26, 2015 to further reduce the financing cost of the corporate sector. The one-year RMB benchmark loan interest rate and deposit interest rate will both be lowered by 0.25 percentage points, to 4.6 percent and 1.75 percent, respectively. Adjustments are made correspondingly to benchmark interest rates on deposits and loans of other maturities, and to deposit and loan interest rates on personal housing provident fund. Furthermore, the upper limit of the floating range of the interest rate of time deposit with a maturity of more than one year is lifted while the upper limit of the floating range of the interest rate of time deposit with a maturity of less than one year and that of demand deposit remain unchanged.

Effective from September 6, 2015 onward, the RMB deposit reserve requirement ratio of financial institutions will be lowered by 0.5 percentage points to maintain adequate liquidity in the banking system and guide the stable and reasonable growth of money and credit. Meanwhile, in order to enhance the capacity of financial institutions to support the agricultural sector, rural area and the farmers, and the small and micro-enterprises, the deposit reserve requirement ratio will be cut by an additional 0.5 percentage points for the county-level rural commercial banks, rural cooperative banks, rural credit cooperatives, and township and village banks; the deposit reserve requirement ratio of financial leasing companies and auto finance companies will be cut by an additional 3 percentage points to support its role in boosting consumption.

The PBC is Scheduled to Lower Required Reserve Ratio on July 15

To Read Chinese Version

To support the real economy and ensure that overall financing costs are stable with a slight decrease, the People's Bank of China (PBC) is scheduled to reduce required reserve ratio by 0.5 percentage points effective July 15 (not applicable to financial institutions that already carry a required reserve ratio of 5%). The action will reduce the weighted average required reserve ratio of financial institutions to 8.9%.

In light of rising costs for micro and small businesses (MSBs) caused by increasingly higher commodity prices this year, the monetary policy in China maintains its stability and continues to pursue effectiveness. Instead of indiscriminate stimulus, the PBC adopts targeted measures such as increasing the support for MSBs. It will maintain a sound monetary policy and prioritize financial stability. In particular, it will ensure that liquidity is adequate at a reasonable level and that the growth of money supply and aggregate financing to the real economy is in line with nominal GDP growth. The PBC will also focus on inter-temporal policy designs to support small and medium-sized enterprises, green development, and innovations of science and technology, so as to provide a favorable monetary and financial environment for high-quality development and supply-side structural reforms.

Date of last update JUL. 09, 2021

(c) LPR

Announcement on Loan Prime Rate (September 22, 2021)

To Read Chinese Version

Under the authorization of the People's Bank of China (PBC), the National Interbank Funding Center (NIFC) announced the Loan Prime Rate (LPR) on September 22, 2021 as follows: the one-year LPR is 3.85% and the above-five-year LPR is 4.65%. The rates are effective until the next release.

Date of last update SEP. 22, 2021

Appendix C. Other Measure: Chen, Ren, and Zha (2018)

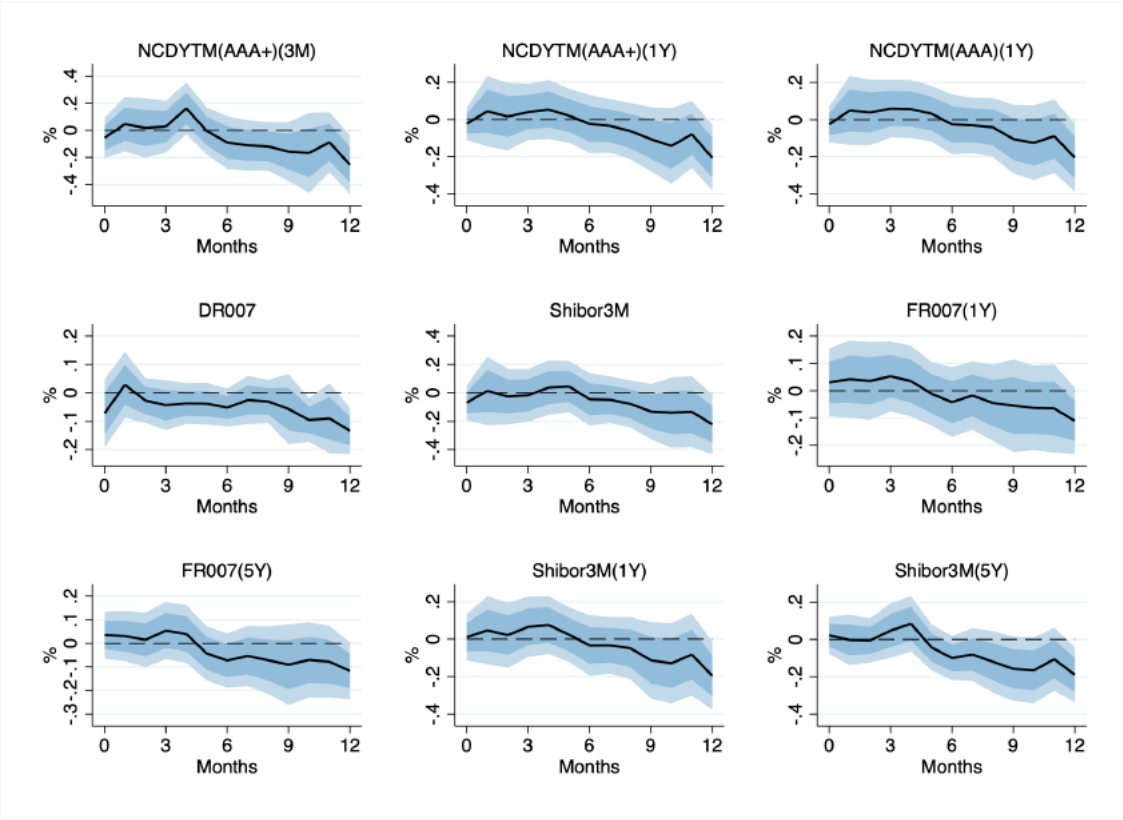
We estimate the monthly measure of Chinese monetary policy shock following the methodology outlined in Chen et al. (2018), using the annual growth rates of M2, started from January 2000 and extended up to December 2021. This measure is hereafter referred to as the "CRZ2018" shock. Given its nature as a quantity-based metric, we invert the sign of the shock series, ensuring that a positive value denotes a contractionary monetary policy shock.

Similar to the methodology employed for our baseline PLS shock and the alternative PCA shock, we assess the dynamic effects of CRZ2018 using monthly local projection, as specified in Equation (6) in the main text, where t represents a month rather than a trading day. This analysis spans from January 2015 to December 2021. Impulse response functions to a 1 percentage point of CRZ2018 shock are reported in Figure IA.7. Notably, a positive quantity-based monetary policy shock exhibits no immediate impact on the interbank market rates, treasury yields, or commercial bank bonds yields. Instead, it leads to a significant reduction in short-term credit bond yields which could persist for one quarter, i.e., 6-month enterprise bond yields. The stock market indexes response remain significantly negative for a year.

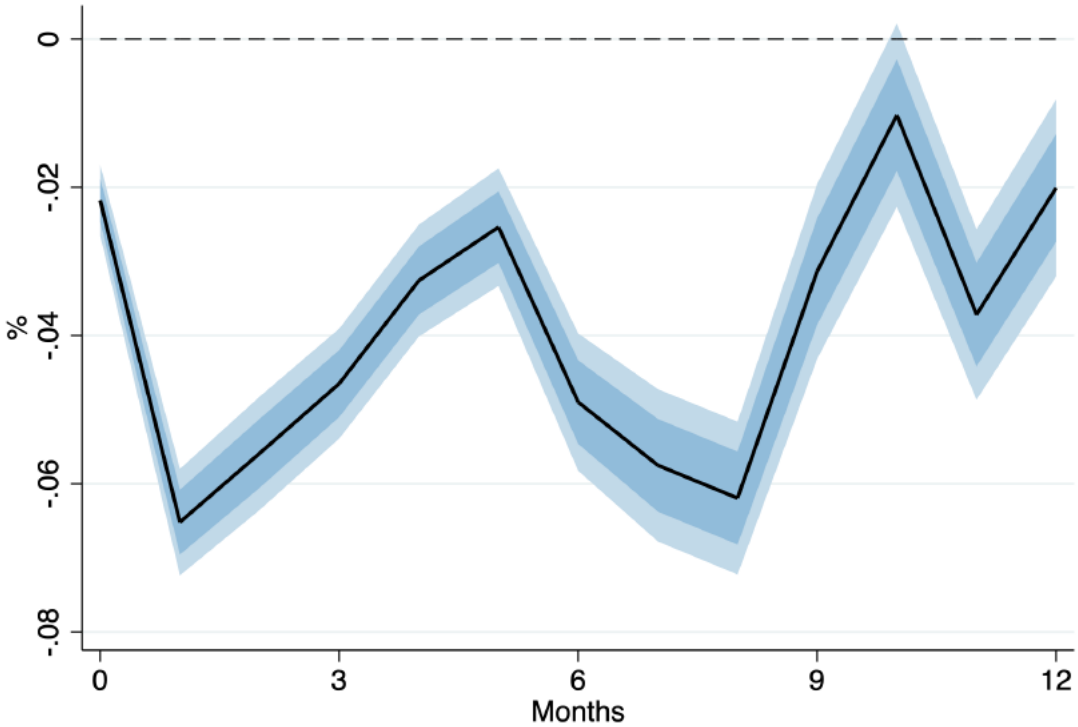
Figure IA.8 presents the impulse responses of real economic variables to 1 percentage point cumulative CRZ2018 shock. These estimates are derived from a monthly VAR model with two lags, covering the period from January 2015 to December 2021. In Panel (a), we observe increases in both output and inflation subsequent to a contractionary CRZ2018 shock, with significance sustained for 5 and 2 months, respectively, representing a departure from conventional signs.

Fig. IA.7. CRZ2018 Impulse Responses - Monthly Local Projection

(a) Inter-bank Market

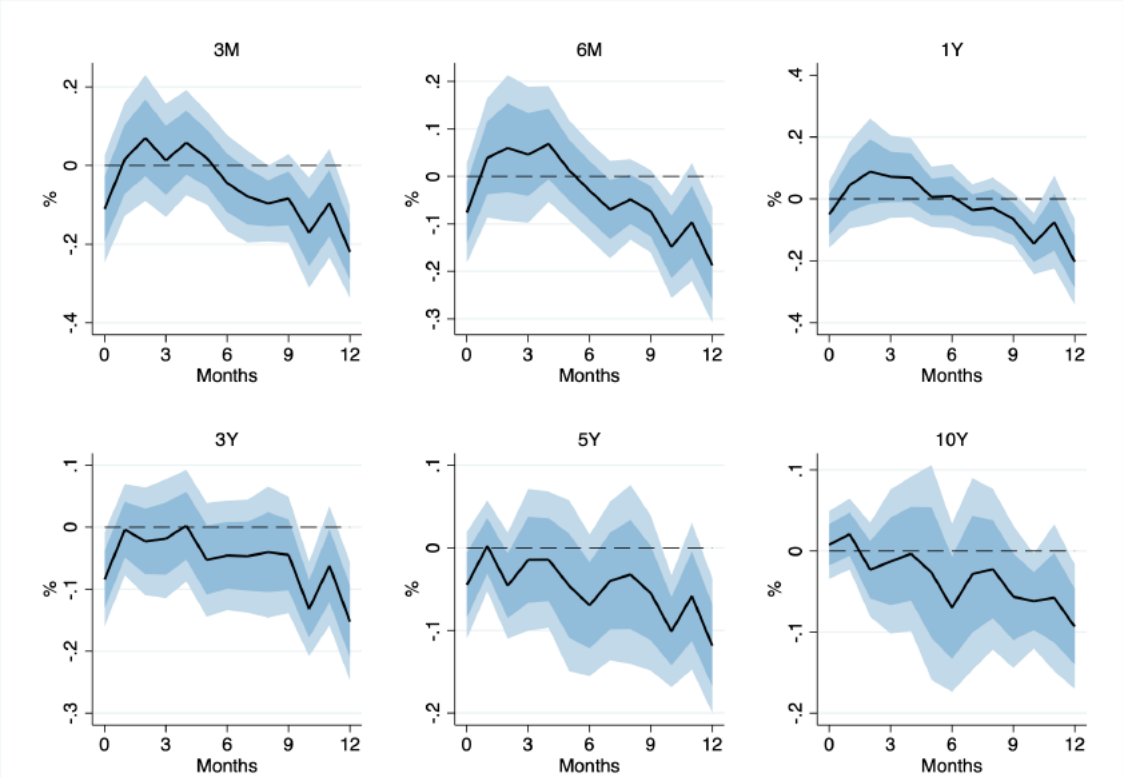


(b) Stock Market

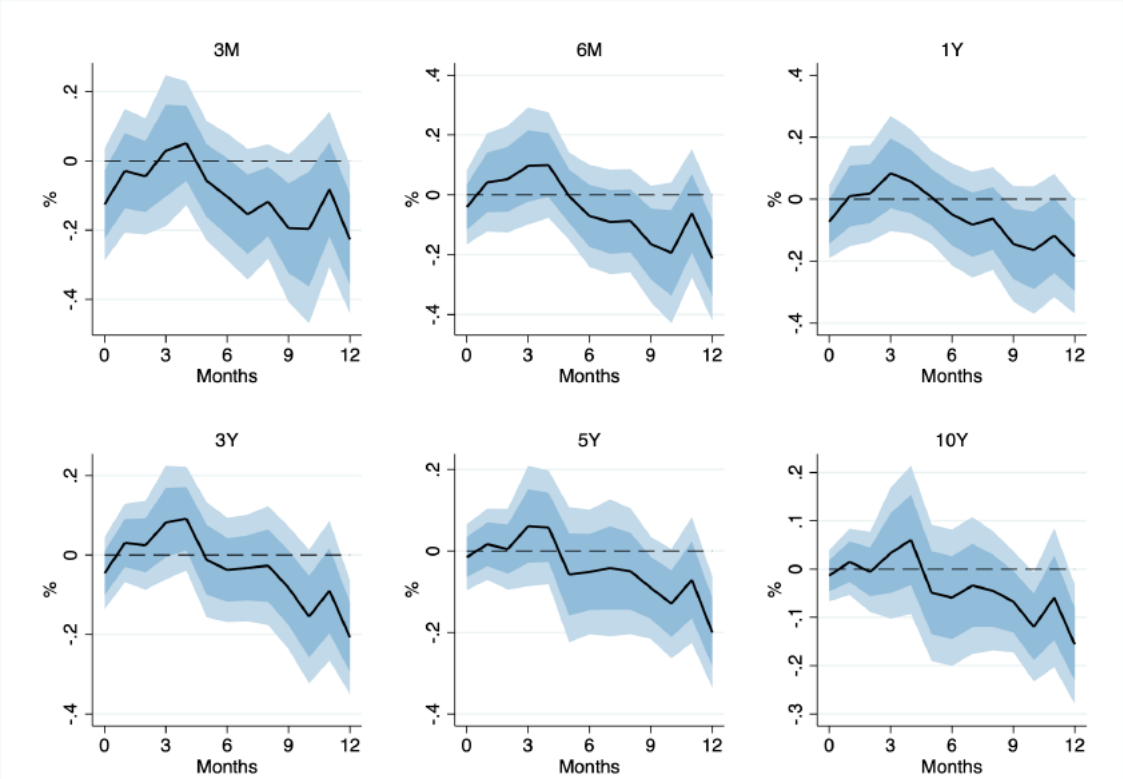


Note: The upper panel reports cumulative impulse response functions to a 1pp increase in CRZ2018. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors. The lower panel reports the panel impulse response functions of prominent stock market indexes to a 1pp in the CRZ2018. Deep and shallow blue shaded areas are 68% and 90% confidence intervals generated by standard errors clustered at both month and index levels.

(c) Treasuries

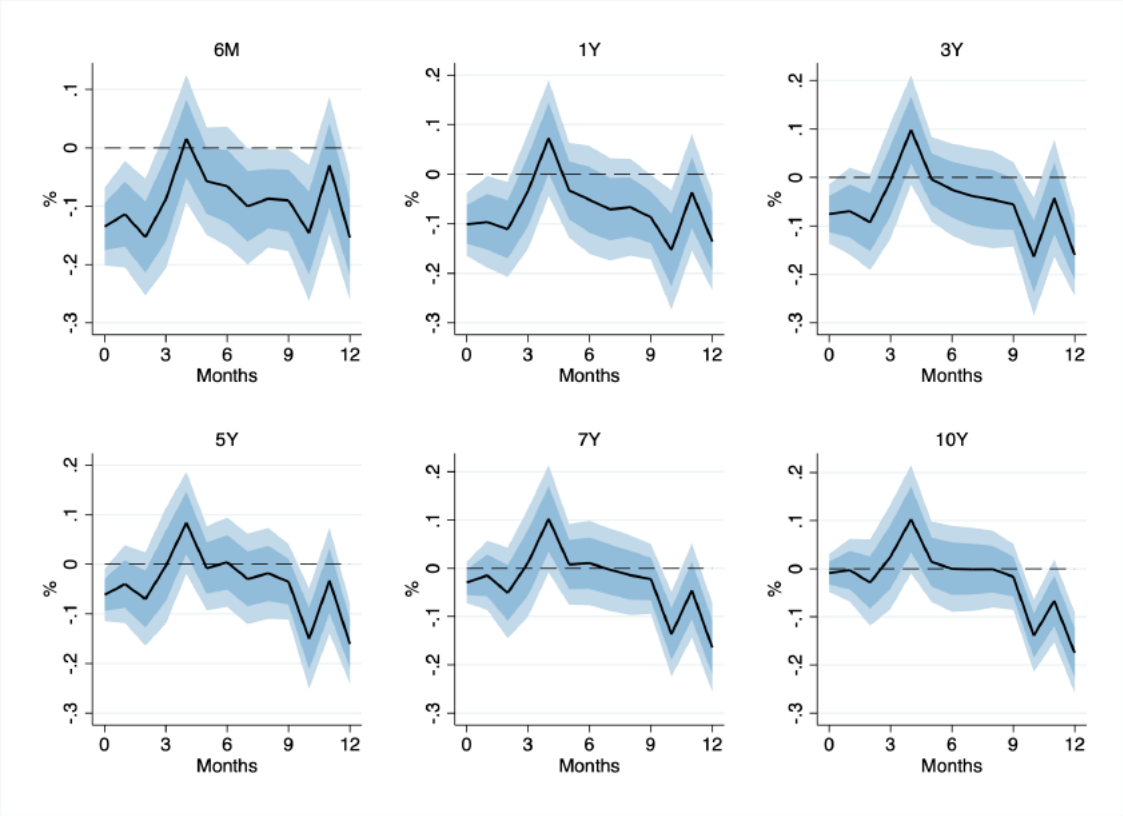


(d) Commercial Bank Bonds (AAA)

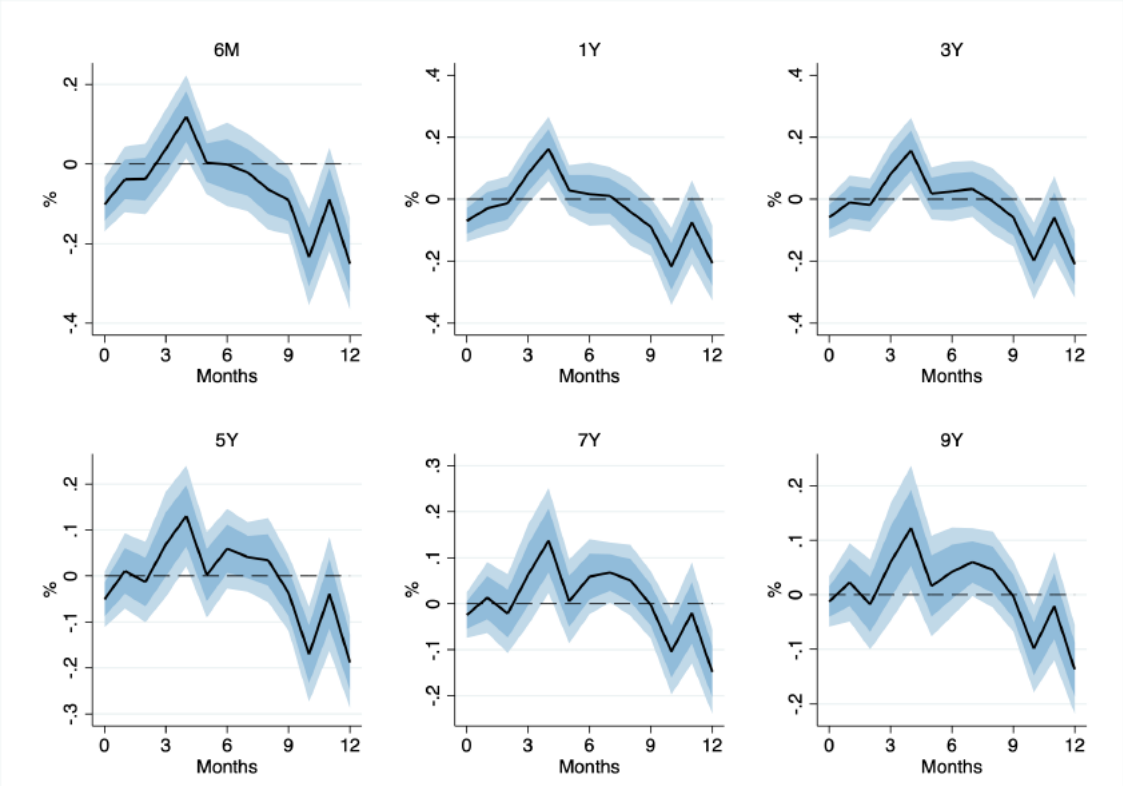


Note: Cumulative impulse response functions to a 1pp increase in CRZ2018. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors.

(e) Enterprise Bonds (AAA, AA+, AA)



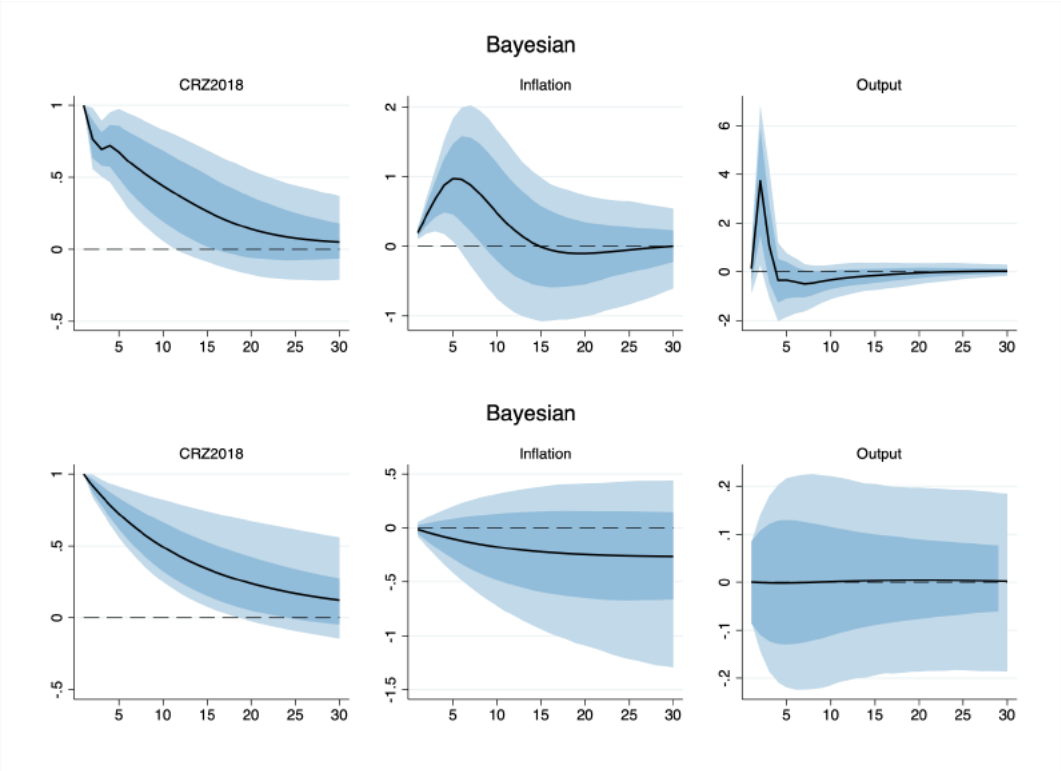
(f) Corporate Bonds (AAA, AA+, AA)



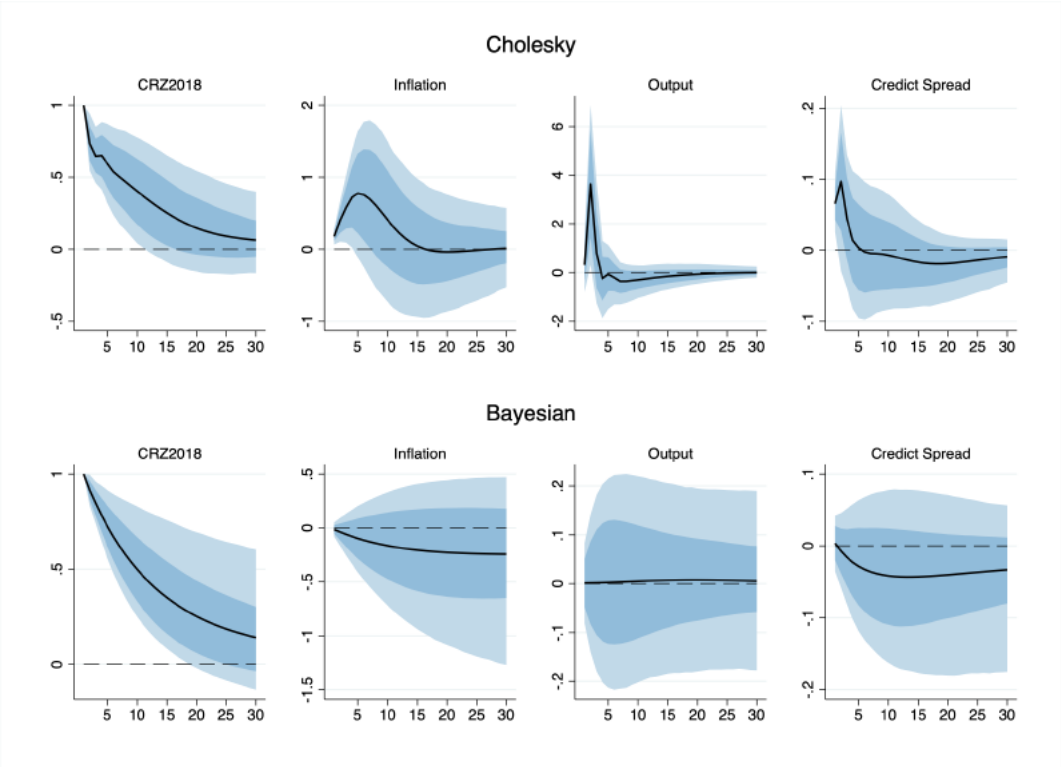
Note: The upper (lower) panel reports panel impulse response functions of yields of enterprise (corporate) bonds with AAA, AA+, and AA ratings to a 1pp increase in CRZ2018. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors.

Fig. IA.8. CRZ2018 Impulse Responses - Structural VAR

(a) 3 System VAR



(b) 4 System VAR



Note: Impulse response of VAR with 3 and 4 variables are reported in Panel (a) and (b), respectively. Variables are ordered: cumulative CRZ2018 shock, % growth of PPI, % growth of IVA, and credit spread. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by bootstrapping 3000 times.

Appendix D. Other Measure: Xu and Jia (2019)

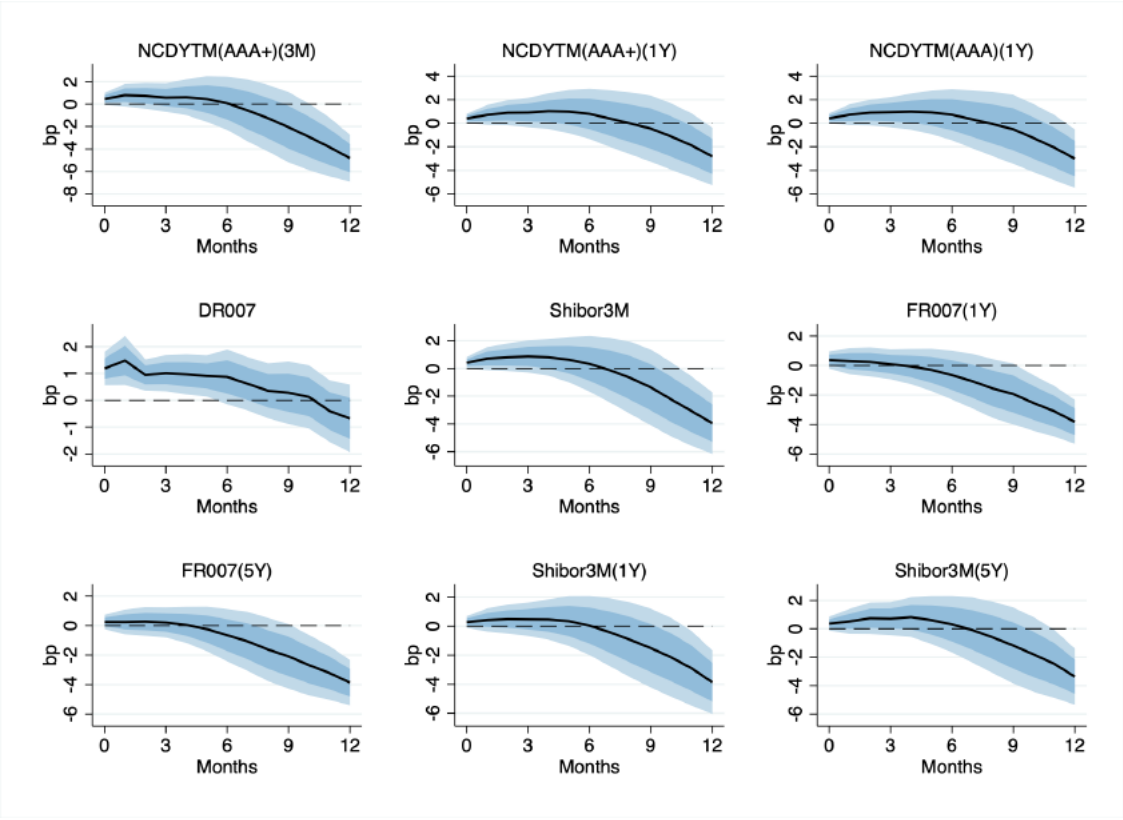
We generate shock series based on Xu and Jia (2019)'s monetary policy price and quantity index, calculating the annual percentage change for each. These resulting shock series are labeled as "XJ2019-Price" and "XJ2019-Quantity". Once again, we invert the sign for XJ2019-Quantity, ensuring that a positive value now indicates a positive monetary policy shock. Noteworthy is the statistically significant negative correlation of -0.23 between the price-based shock and the quantity-based shock.

Similar to the approach applied for the monthly CRZ2018 shock, we examine the dynamic effects of XJ2019-Price and XJ2019-Quantity using monthly local projection over the same sample period from January 2015 to December 2021. As shown in Figure IA.9, the responses of interbank market rates to a 1 percentage point of XJ2019-Price shock are mostly insignificantly positive, with an exception of DR007, which exhibits a significant increase. Most bond yields increase after a contractionary XJ2019-Price shock, peaking in about half a year. Additionally, the stock market's response increases significantly, peaking in a quarter before declining after 5 months. Turing to the results for XJ2019-Quantity in Figure IA.11, all interbank market rates and yield curves decrease insignificantly in the first quarter after a contractionary XJ2019 quantity-based shock, continuing to decrease significantly over the 1-year horizon. The stock market index's response to a contractionary XJ2019-Quantity shock also increases significantly in the first month.

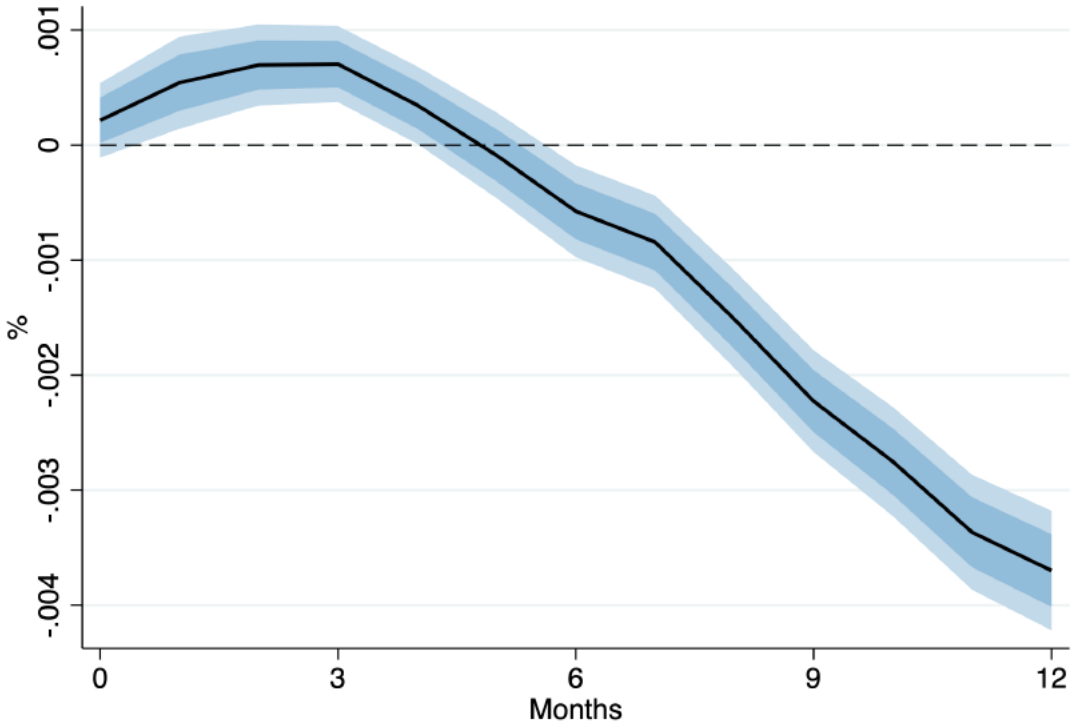
Figures IA.10 and IA.12 present impulse responses of real economic variables to one unit of cumulative shocks in both XJ2019-Price and XJ2019-Quantity. These estimates are derived from a monthly VAR model with two lags, covering the period from January 2015 to December 2021. In Figure IA.10, we present the results for a contractionary XJ2019 price-based shock series. Despite impulse response functions for all examined real variables exhibiting conventional signs, the economic magnitudes are significantly smaller. Additionally, it is noteworthy that the shock's response to itself intensifies, reaching its peak at approximately one year, as opposed to an immediate decay (see Panel (a) of Figure IA.10). Similar findings were observed for the XJ2019 quantity-based shock in Figure IA.12.

Fig. IA.9. XJ2019-Price Impulse Responses - Monthly Local Projection

(a) Inter-bank Market

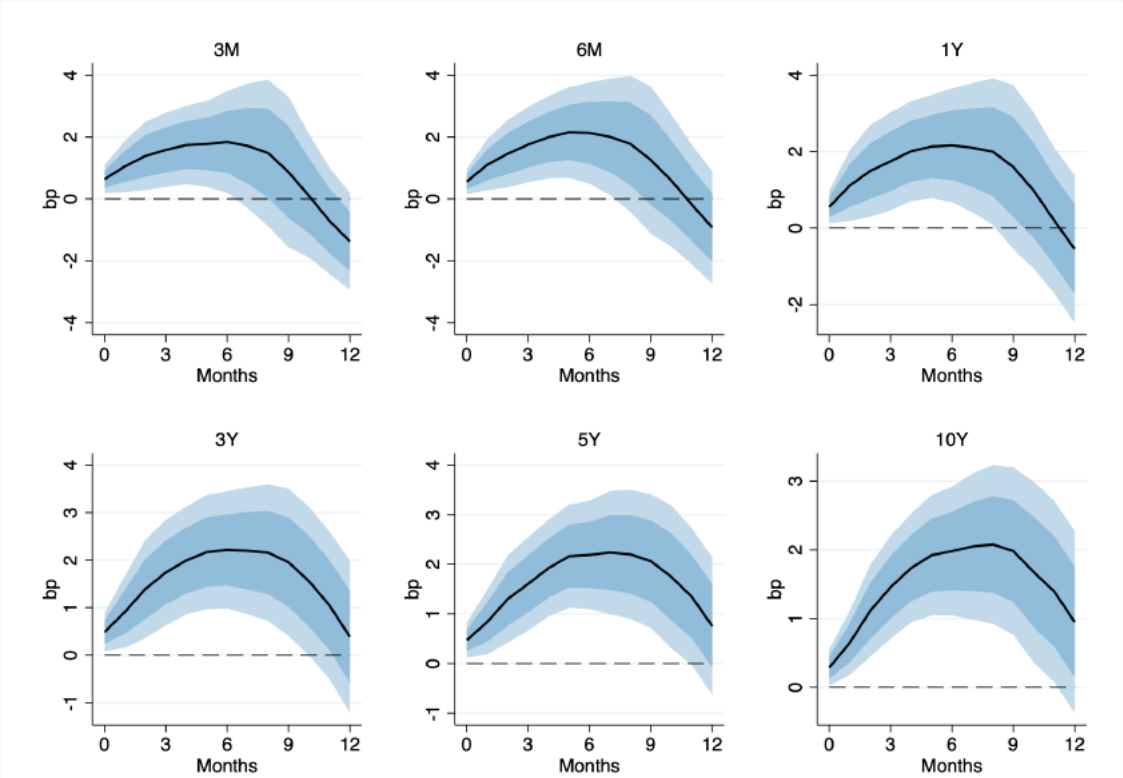


(b) Stock Market

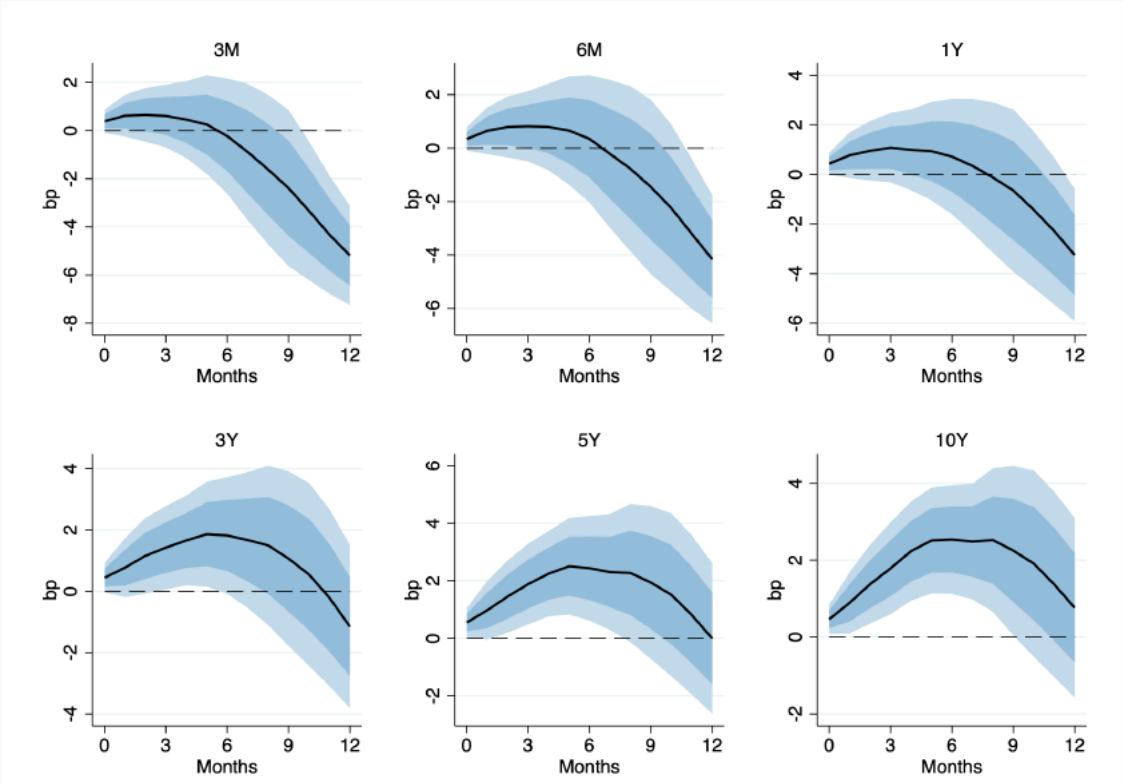


Note: The upper panel reports cumulative impulse response functions to a 1pp increase in XJ2019-Price. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors. The lower panel reports the panel impulse response functions of prominent stock market indexes to a 1pp in the XJ2019-Price. Deep and shallow blue shaded areas are 68% and 90% confidence intervals generated by standard errors clustered at both month and index levels.

(c) Treasuries

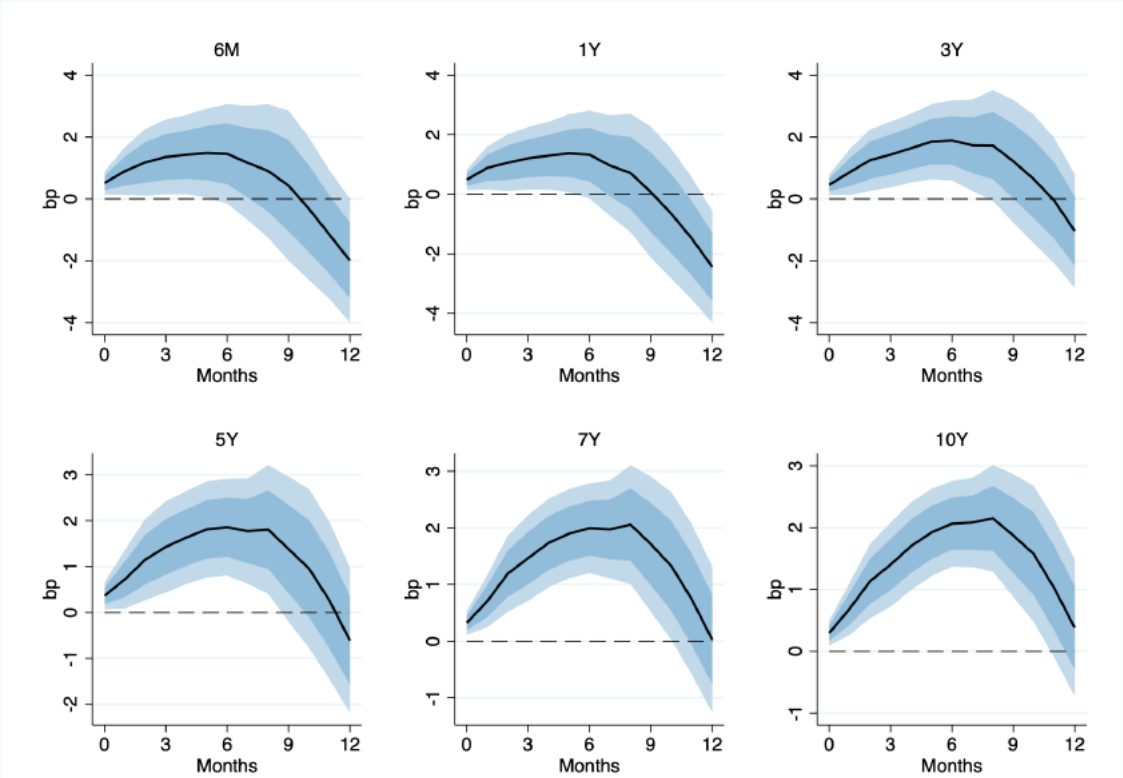


(d) Commercial Bank Bonds (AAA)

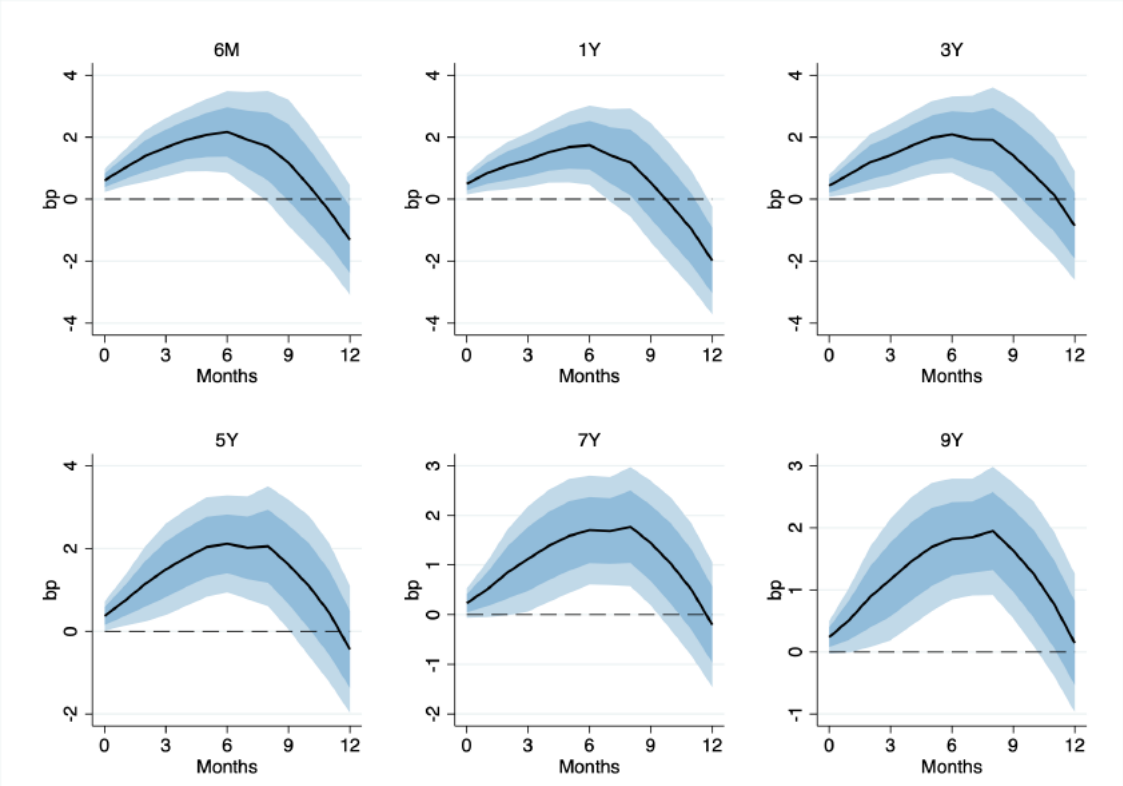


Note: Cumulative impulse response functions to a 1pp increase in XJ2019-Price. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors.

(e) Enterprise Bonds (AAA, AA+, AA)



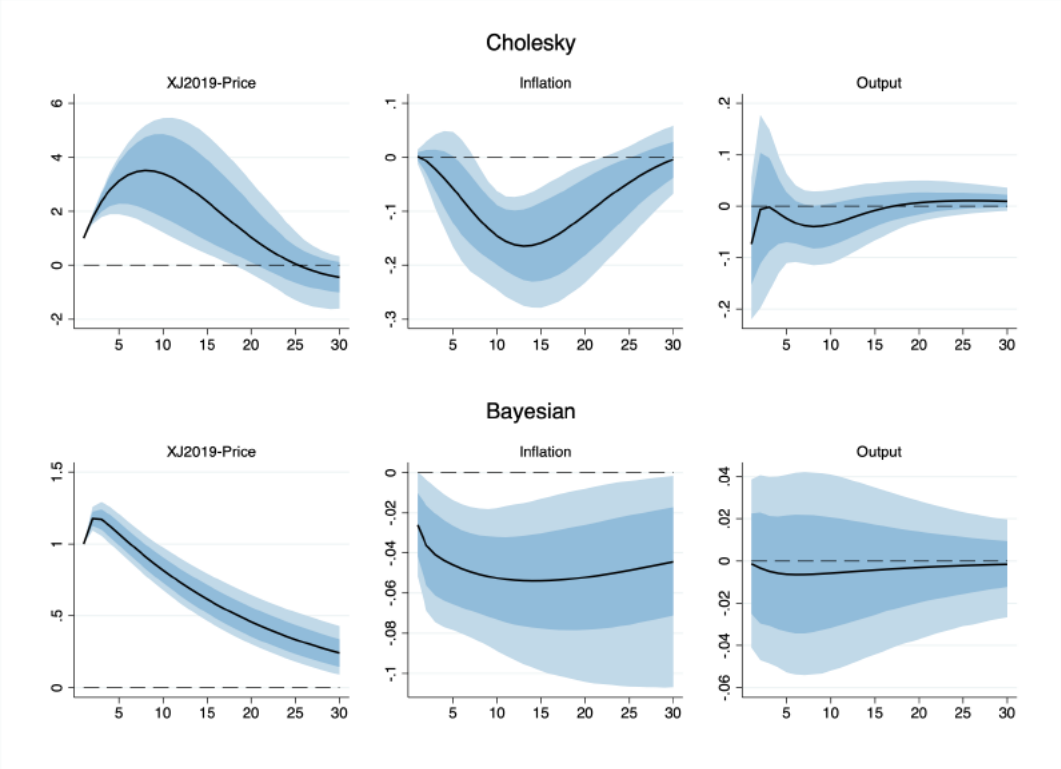
(f) Corporate Bonds (AAA, AA+, AA)



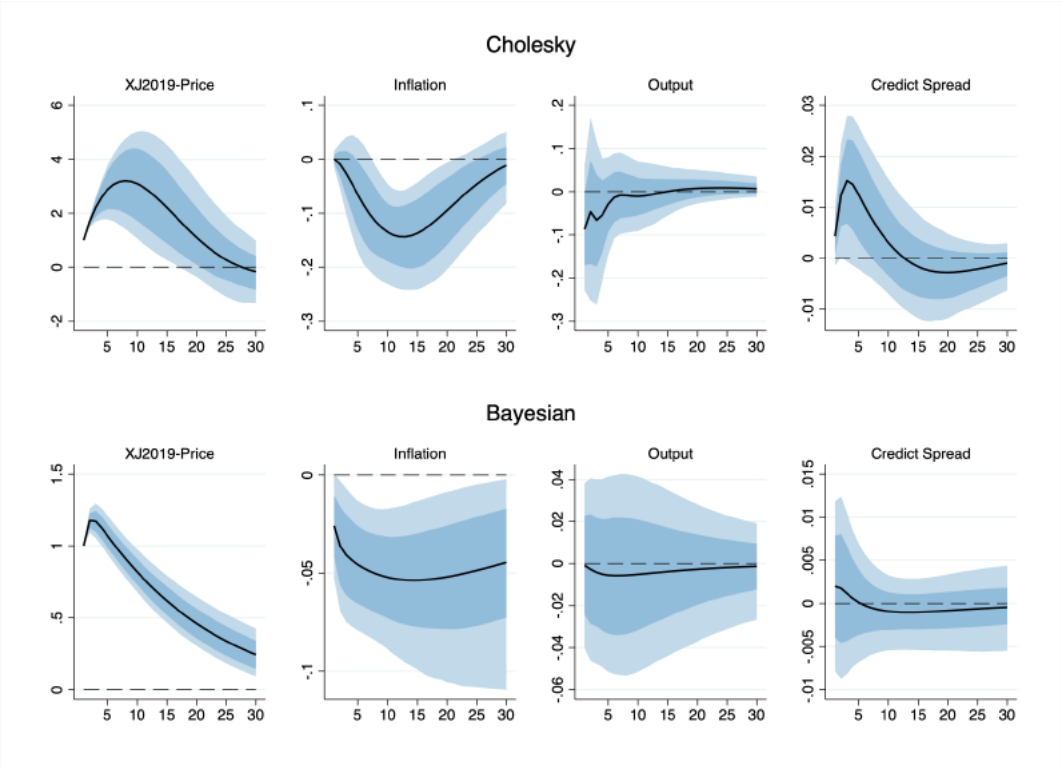
Note: The upper (lower) panel reports panel impulse response functions of yields of enterprise (corporate) bonds with AAA, AA+, and AA ratings to a 1pp increase in XJ2019-Price. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors.

Fig. IA.10. XJ2019-Price Impulse Responses - Structural VAR

(a) 3 System VAR



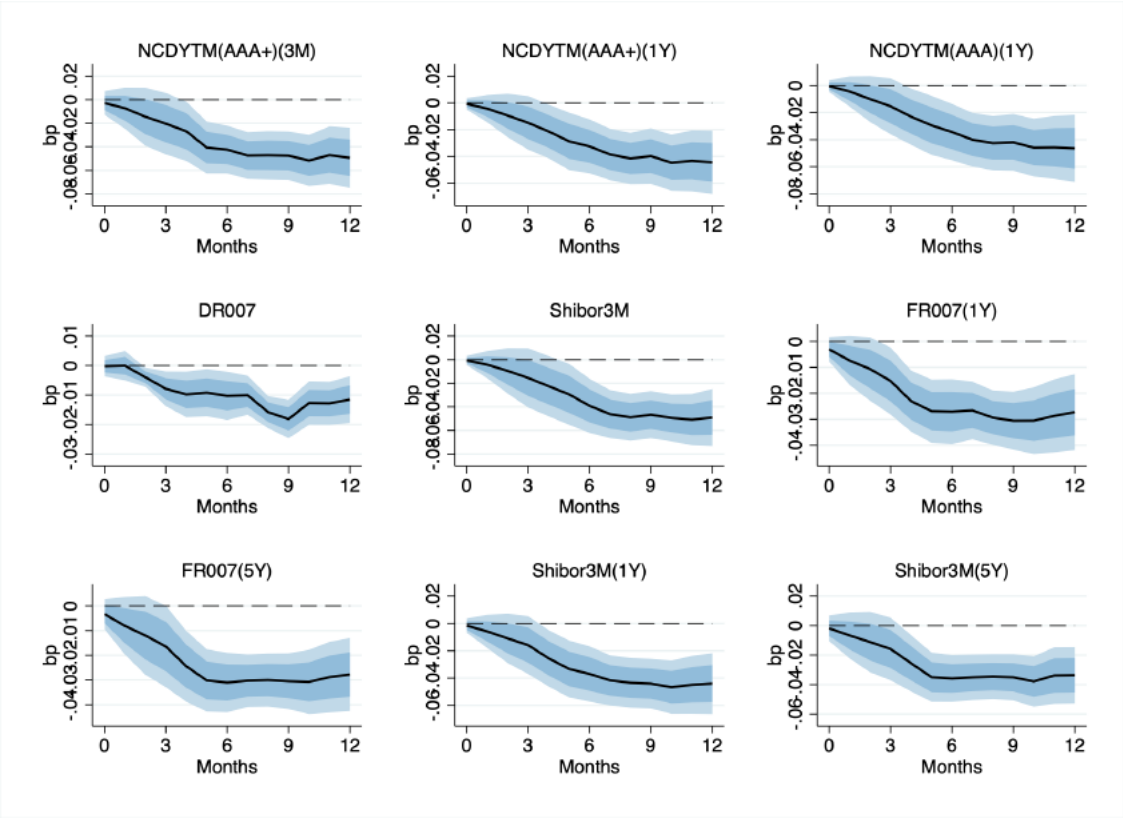
(b) 4 System VAR



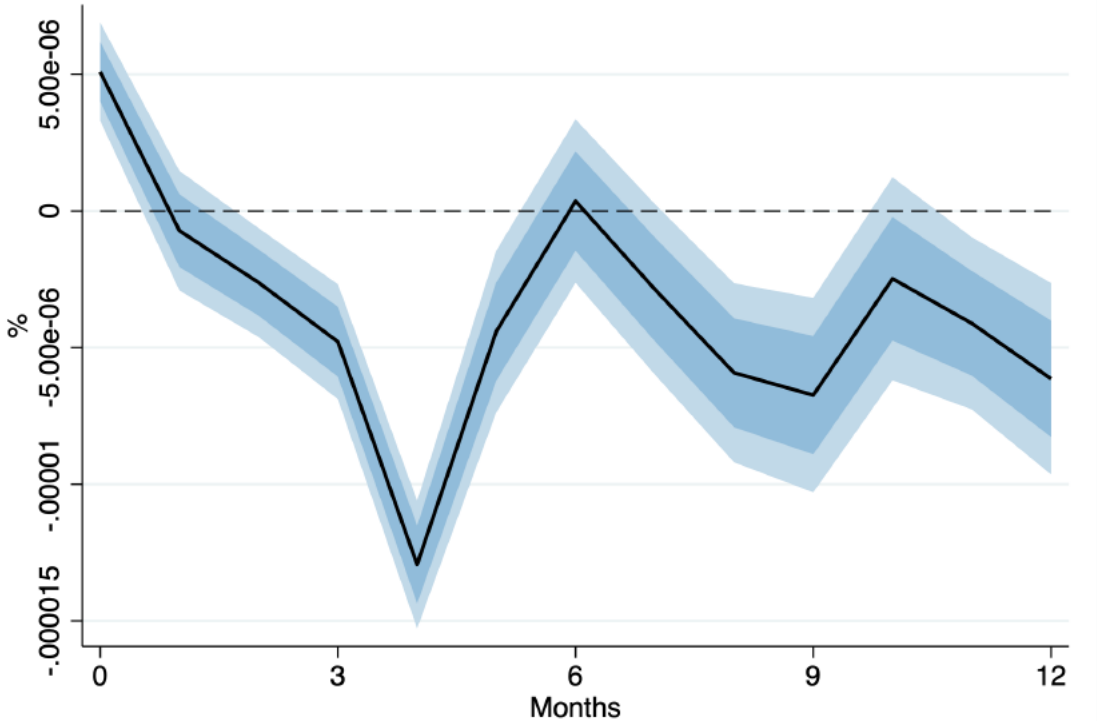
Note: Impulse response of VAR with 3 and 4 variables are reported in Panel (a) and (b), respectively. Variables are ordered: cumulative XJ2019-Price shock, % growth of PPI, % growth of IVA, and credit spread. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by bootstrapping 3000 times.

Fig. IA.11. XJ2019-Quantity Impulse Responses - Monthly Local Projection

(a) Inter-bank Market

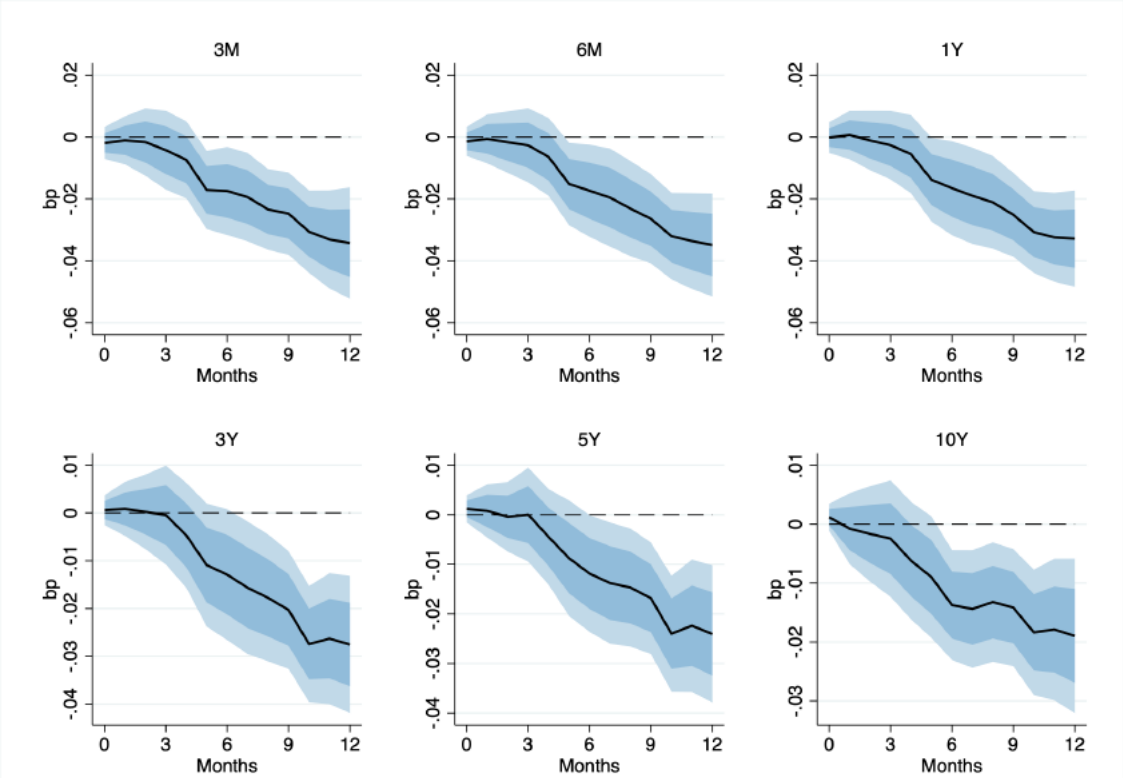


(b) Stock Market

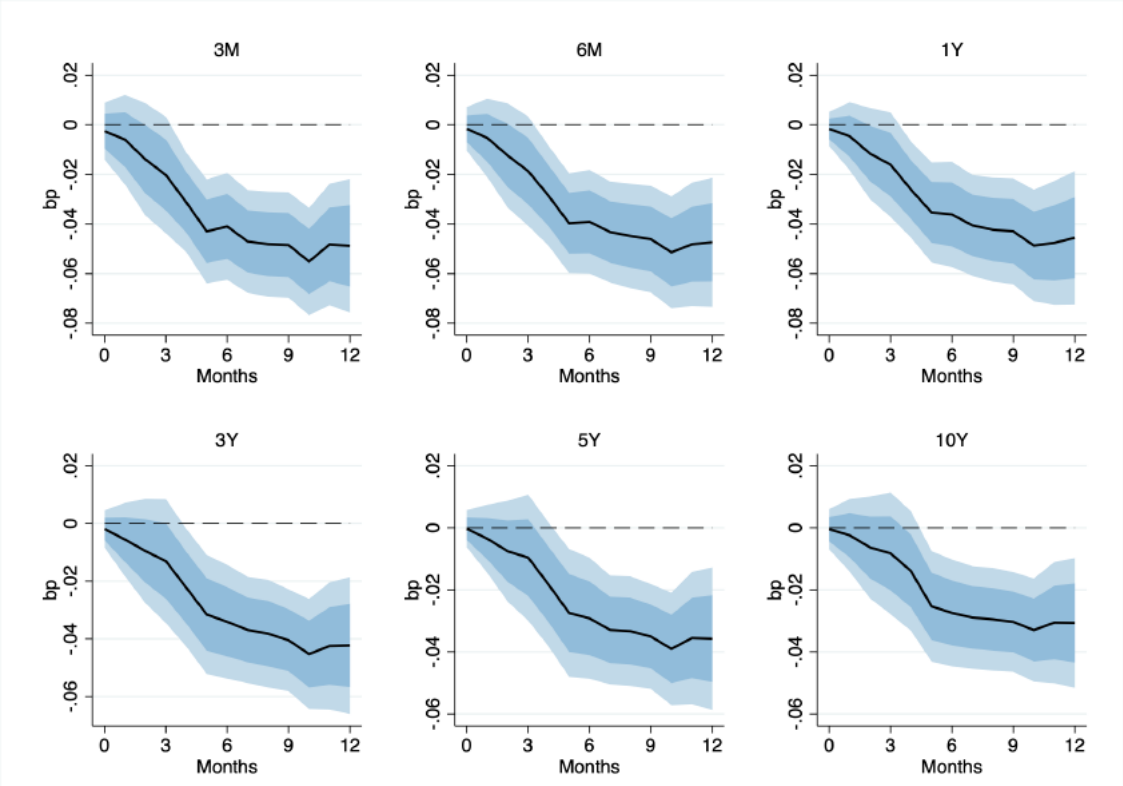


Note: The upper panel reports cumulative impulse response functions to a 1pp increase in XJ2019-Quantity. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors. The lower panel reports the panel impulse response functions of prominent stock market indexes to a 1pp in the XJ2019-Quantity. Deep and shallow blue shaded areas are 68% and 90% confidence intervals generated by standard errors clustered at both month and index levels.

(c) Treasuries

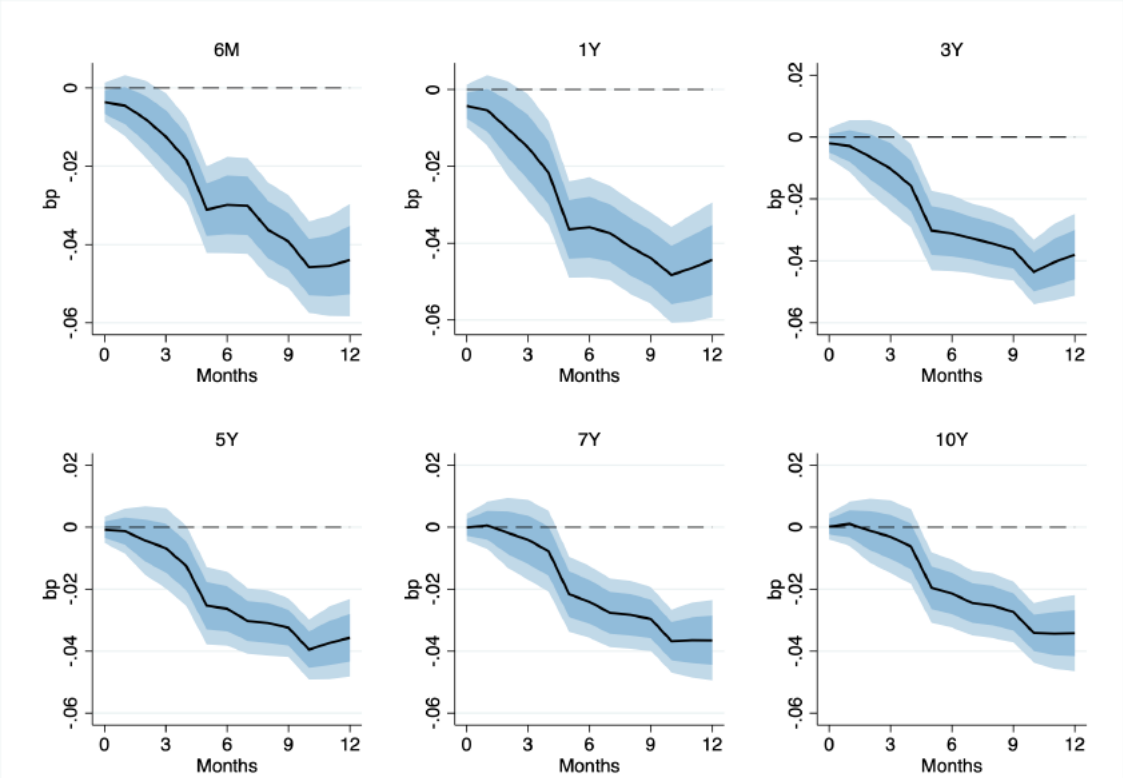


(d) Commercial Bank Bonds (AAA)

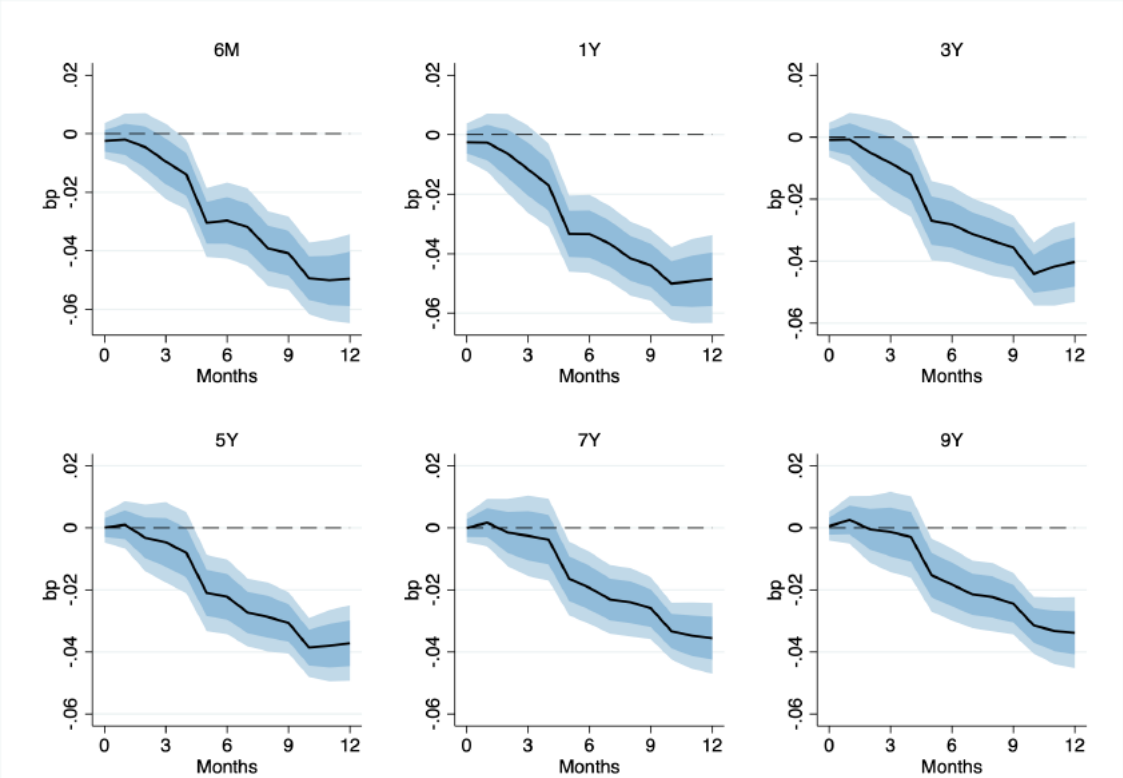


Note: Cumulative impulse response functions to a 1pp increase in XJ2019-Quantity. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors.

(e) Enterprise Bonds (AAA, AA+, AA)



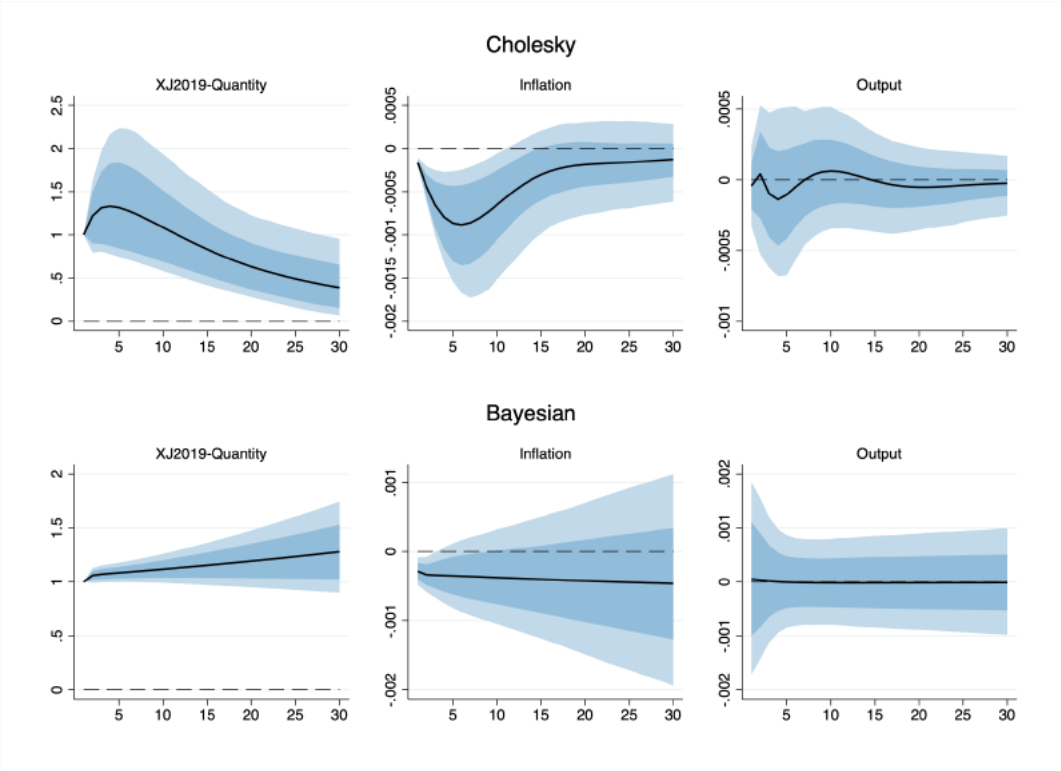
(f) Corporate Bonds (AAA, AA+, AA)



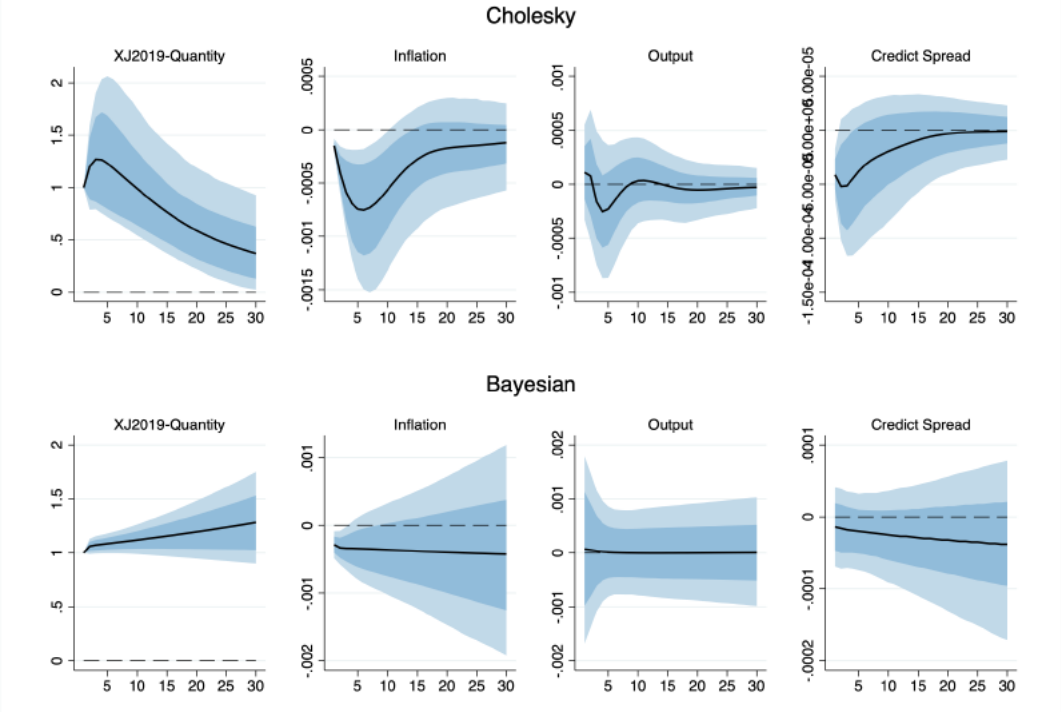
Note: The upper (lower) panel reports panel impulse response functions of yields of enterprise (corporate) bonds with AAA, AA+, and AA ratings to a 1pp increase in XJ2019-Quantity. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by Newey-West standard errors.

Fig. IA.12. XJ2019-Quantity Impulse Responses - Structural VAR

(a) 3 System VAR



(b) 4 System VAR



Note: Impulse response of VAR with 3 and 4 variables are reported in Panel (a) and (b), respectively. Variables are ordered: cumulative XJ2019-Quantity shock, % growth of PPI, % growth of IVA, and credit spread. Deep and shallow blue shaded areas are 68% and 90% confidence intervals produced by bootstrapping 3000 times.

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