Spillover E ects of U.S. Monetary Policy and Policy Uncertainty on Chinese Economy

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Background

- U.S. unconventional monetary policy
  - zero lower bound
  - LSAP
  - QEs
  - tapering
- impact on emerging market, especially China
- China is likely to pass U.S. as world's leading economic power

Questions

- How do U.S. monetary policy and policy uncertainty shocks a ect China, especially during and after the Great Recession?
  - What's the transmission channel?
  - Which one is more important?
  - Is there any structural change in the past few years?

What Do We Do?

- Factor-Augmented VAR
- U.S. monetary policy
- U.S. policy uncertainty
- both before and at the ZLB

Main Results

- At the ZLB,
  - U.S. monetary policy shocks do have signi cant impact on Chinese monetary policy and real economy
  - U.S. policy uncertainty shocks are less important
- Comparing the cases before and at the ZLB,
  - Dynamics of Chinese macro variables are di erent under the same shocks
  - Relative importance of the two shocks changes
  - Indicate structural changes in both U.S. policy transmission and Chinese economy

FAVAR { Bernanke et al(2005, QJE)

$$\begin{matrix} F_t \\ Y_t \end{matrix} = (L) \begin{matrix} F_{t-1} \\ Y_{t-1} \end{matrix} + \nu_t, \quad (1)$$

$$X_t = {}^{f}F_t + {}^{y}Y_t + e_t. \quad (2)$$

F_t: factors ($T \times K$),
X_t: macro variables ($T \times N$, $N > K$),
Y_t: policy indicators.

Why FAVAR?

- Overcomes some shortcomings of structural VAR:
  - use more information
  - no arbitrary choice of a speci c data series
  - impulse responses for all variables

Data

Ajustment

- New Year e ect (except policy variables) (Fernald et al (2013))
- seasonal adjustment (US Census Bureau X13 Software)
- EM algorithm for missing values (Stock and Watson (2002, JEBS))
- fast/slow moving variable (asset price vs. wages)
- Transformation for stationarity: no transformation, rst di erence, logarithm, rst log di erence (Bernanke et al(2005, QJE), Stock and Watson (2002, JEBS))

Estimation and Identi cation { Bernanke et al(2005, QJE)

- factors are constructed to be orthogonal to policy rate and uncertainty
  - pc_t: principal components of all series, pc_t^s: principal components for slow-moving series
  - run the regression:

$$pc_t = b_{pc} pc_t^s + b_{pc}^Y Y_t + \eta_t^{pc}$$

  - factors are constructed to be

$$F_t = pc_t - \hat{b}_{pc}^Y Y_t$$

Estimation and Identi cation { Bernanke et al(2005, QJE)

- estimate the observation equation by OLS (2 lags)
- estimate the transition equation by OLS
- identi cation is achieved through recursive assumption
- two subsamples: 2000M1 - 2008M9, 2008M12 - 2014M2

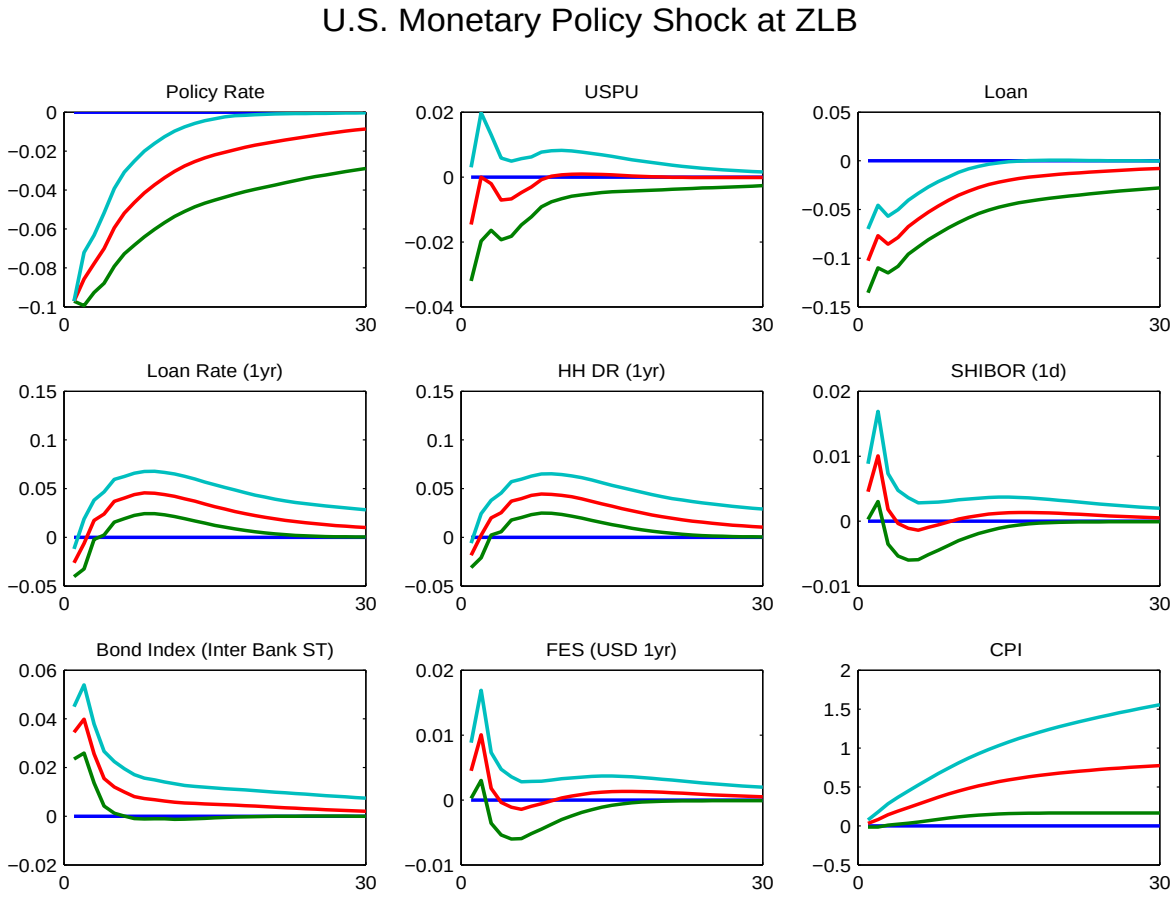
R^2

Variables	Full Name	R^2	
		before ZLB	at ZLB
SSEI	Shanghai Stock Exchange Composite Index	0.928	0.639
PE ratio (SSE All)	PE ratio (SSE All Stocks)	0.871	0.806
PE ratio (SSE A)	PE ratio (SSE A-Shares)	0.872	0.806
PE ratio (SSE Fin)	PE ratio (SSE Finence)	0.736	0.835
PE ratio (SSE RE)	PE ratio (SSE Real Esta(.181476Tf271.752168.654Td S330.9152.614cm 0d0 0.398w00m		

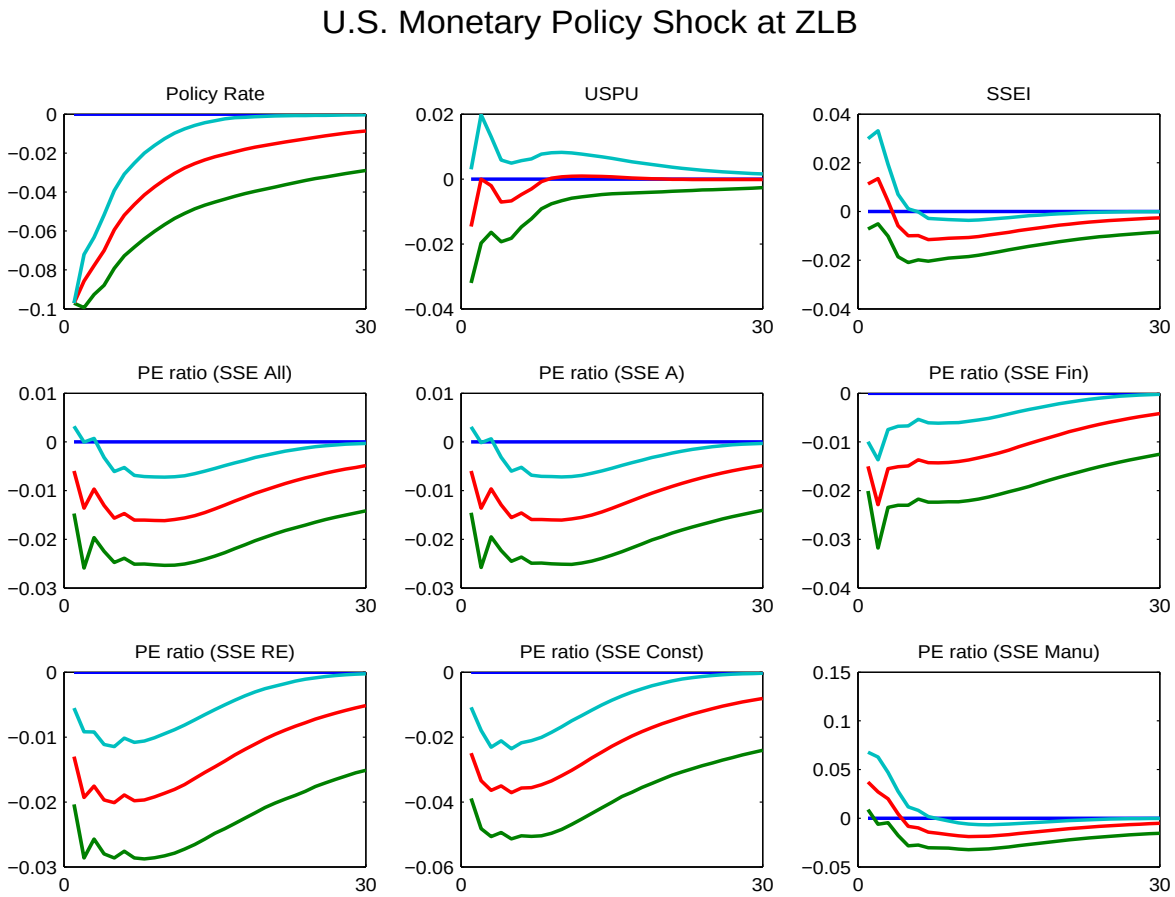
Outline

- after 2008M12 (ZLB is binding in the U.S.)
  - IRFs to U.S. monetary policy shock
  - IRFs to U.S. policy uncertainty shock
- before 2008M12 (ZLB is not binding in the U.S.)
  - IRFs to U.S. monetary policy shock

IRFs to USMP Shock at the ZLB



IRFs to USMP Shock at the ZLB



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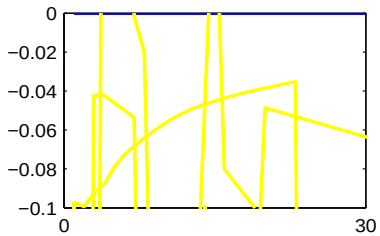
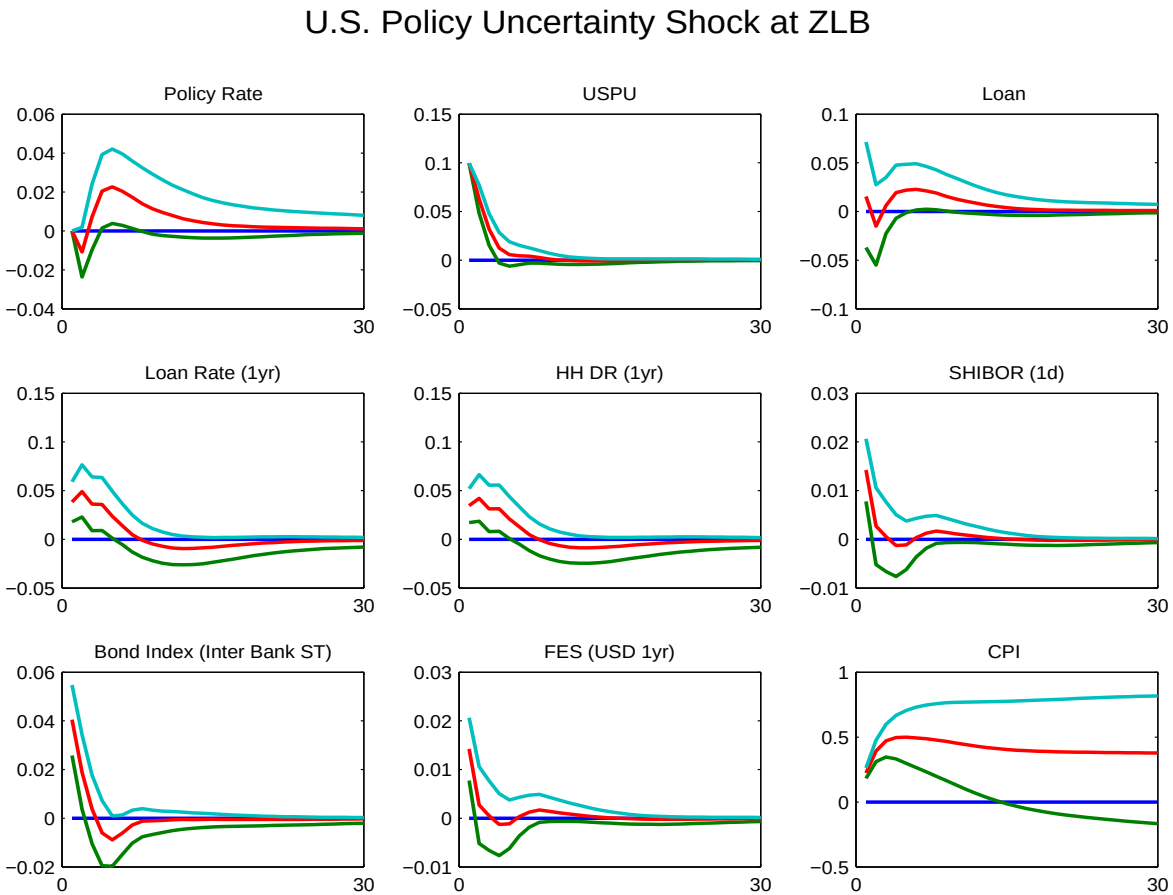
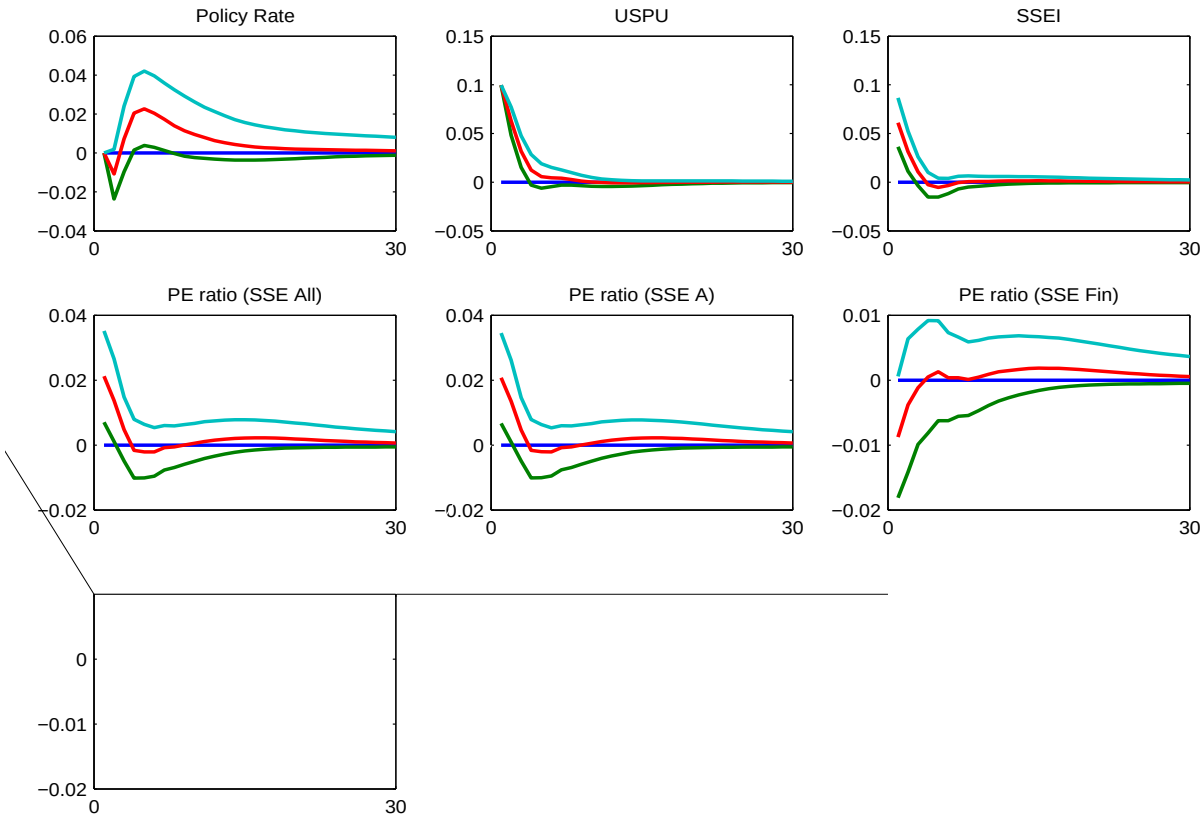


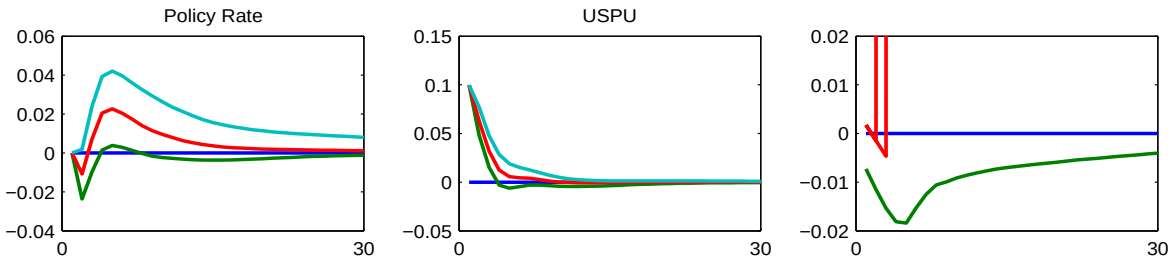
IRFs to USPU Shock at the ZLB



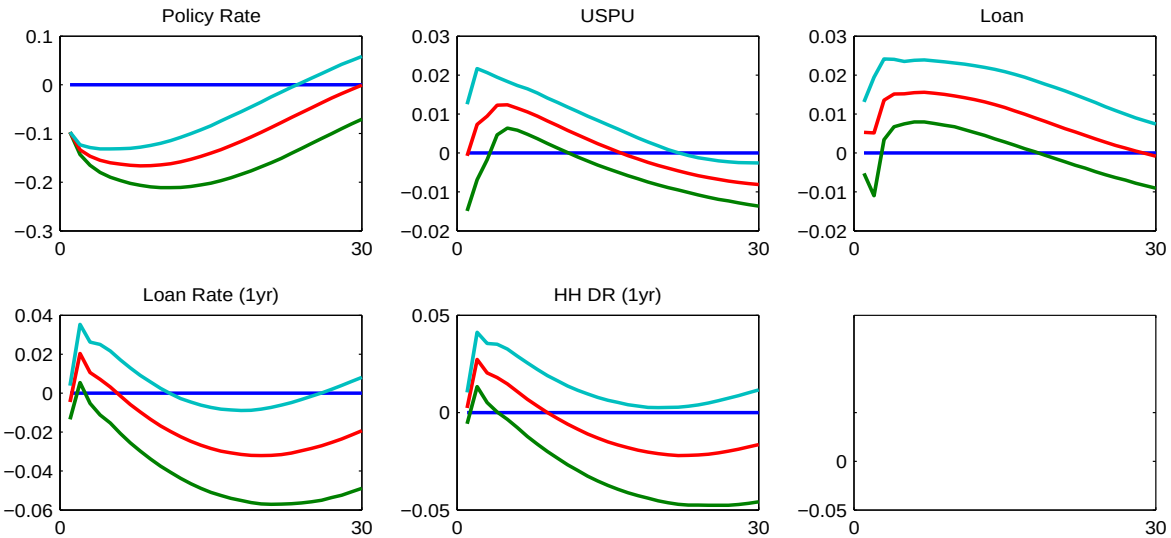
IRFs to USPU Shock at the ZLB



IRFs to USPU Shock at the ZLB



IRFs to USMP Shock before the ZLB



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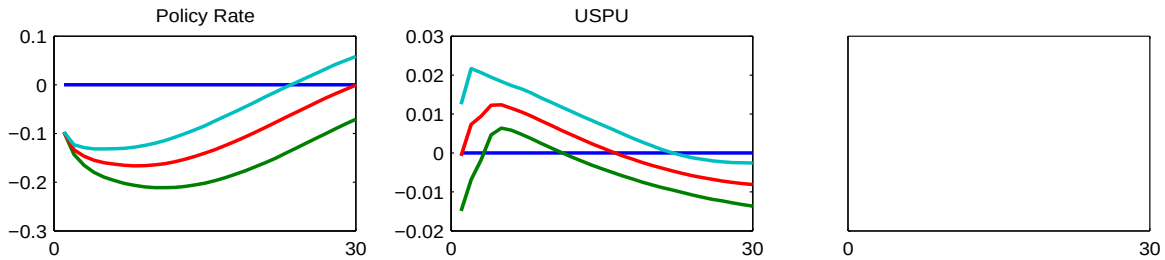

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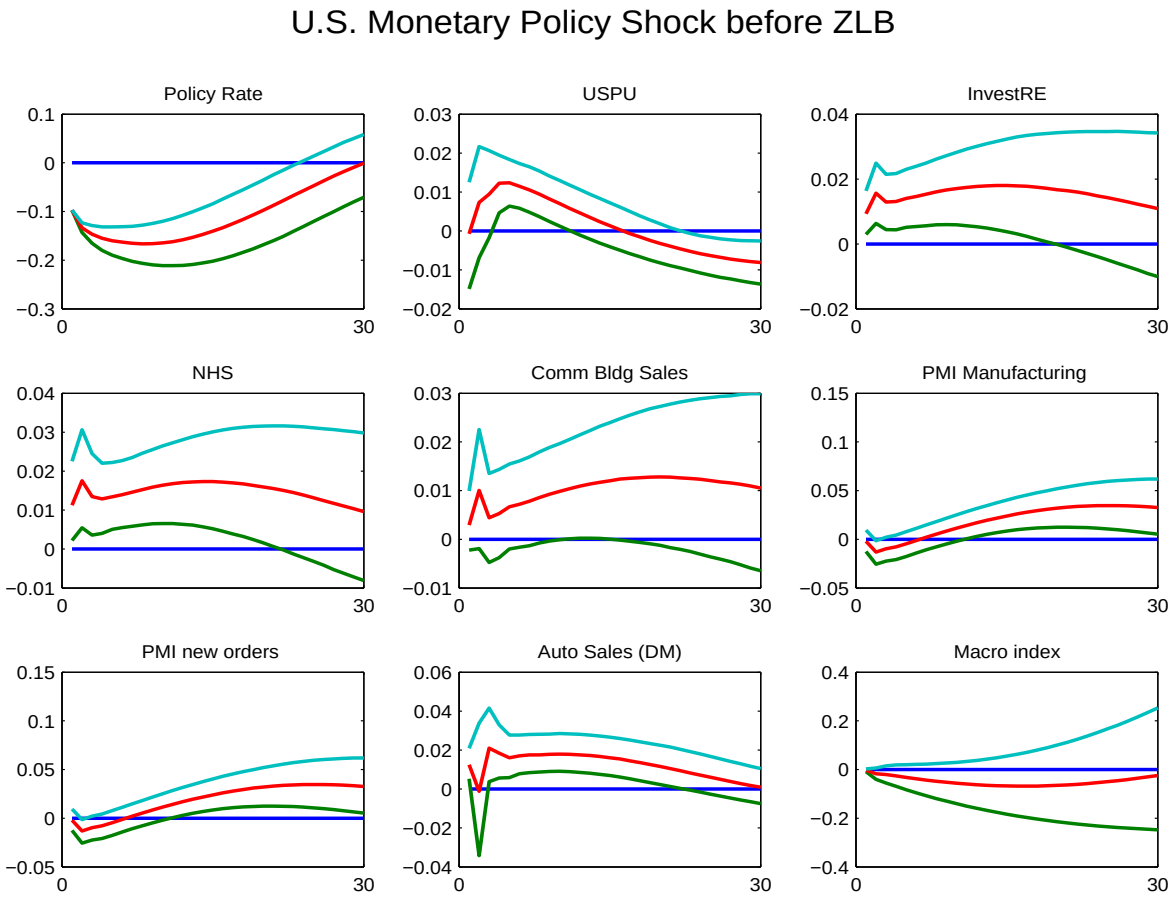

Variance Decomposition

Variables	Variance Decomposition Ratio (MP/PU)							
	before ZLB				at ZLB			
	1m	2m	6m	12m	1m	2m	6m	12m
SSEI	0.087	0.129	0.032	89.780	0.462	0.354	9.251	58.813
PE ratio (SSE All)	0.000	0.003	0.029	9.973	0.042	88018	20.859	249.379
PE ratio (SSE A)	0.000	0.003	0.033	10.914	0.046	70479	20.749	253.409
PE ratio (SSE Fin)	0.016	0.000	0.055	164.872	5.991	11.672	108.486	209.800
PE ratio (SSE RE)	0.000	0.017	0.001	4.114	1.539	4.477	88.145	68.655
PE ratio (SSE Const)	0.005	0.047	0.000	35.081	0.891	4.278	994.457	30.264
PE ratio (SSE Manu)	0.007	0.057	0.016	0.217	0.593	2.551	1.281	254288
Loan	0.000	12.958	0.977	0.434	83.851	286.516	5.670	6.229
Loan Rate (1yr)	0.095	0.021	0.057	1.007	0.070	0.158	8.091	33.931
HH DR (1yr)	0.207	0.136	0.115	3.210	0.029	0.265	9.104	41.260
SHIBOR (1d)	0.010	0.003	0.005	0.238	1.343	0.482	6.980	0.653
Bond Index	0.532	15.728	58.577	122.821	5.789	1307.944	2.522	67.232
FES (USD 1yr)	0.010	0.003	0.005	0.238	1.342	0.477	7.000	0.649
CPI	0.003	1.994	10.303	0.485	0.098	0.513	241.168	12.285
InvestRE	0.171	0.402	1.488	11.697	652.787	57.601	15.390	51.016
NHS	0.184	0.524	2.181	56.772	4.615	3.149	60.259	62.506
Comm Bldg Sales	0.169	0.261	0.204	0.821	290.534	5.371	985.425	71.211
PMI Manufacturing	0.010	0.003	0.005	0.238	1.346	0.486	7.071	0.645
PMI new orders	0.010	0.003	0.005	0.238	1.347	0.490	7.062	0.647
Auto Sales (DM)	0.761	0.066	1.601	0.402	6.584	46721.652	143.343	9.218
Macro index	81.930	0.001	0.018	0.033	1.442	311.628	2.459	340.906

Results

- At the ZLB,
  - U.S. monetary policy shocks do have signi cant impact on Chinese real economy
  - The impact transmits not through market interest rate channel
  - Possible transmission mechanism: hot money and people's expectations $\begin{cases} \\ : \end{cases}$ $\begin{array}{l} \\ < \\ \\ \Rightarrow \\ \Downarrow \\ \Rightarrow \end{array}$ $\begin{array}{l} \text{Chinese policy rates} \\ \\ \\ \text{real economy} \end{array}$
  - U.S. policy uncertainty shocks are less important
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