Unconventional Monetary Policy and International Risk Premia

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The views expressed are solely those of the authors and do not indicate conccurrence by other staff members or the Board of Governors.

Introduction

- Paper studies dynamic effects of monetary policy on intl asset prices and risk premia in a VAR.
- Focus on ZLB period.
- Extends event study approach of RSW (2014).
- Avoid recursive identification (EE (1995)).
  - Troubling with asset prices in VAR.

VAR Identification

- VAR in monthly data: $A(L)Y_t = \varepsilon_t$.
- Errors: $\varepsilon_t = R\eta_t$; $\eta_t = (\eta_{1t}, \eta_{2t}')'$.
- Let Z_t be the monetary policy shock.
- Define W_t as daily (or intradaily) change in Y_t bracketing monetary policy announcements.
  - Set $W_t = \varepsilon_t$ for variables with only monthly data.
- Identify R_1 by regressing W_t onto Z_t.

VAR Identification

- Identification methodology combines event-study methodology with external instruments (OSW (2013), Mertens and Ravn (2013), Gertler and Karadi (2014)).
- Identifying assumptions are quite mild.

Data

- Data in VAR:
  - 3-month, 5-year and 10-year zero coupon US yields.
  - 3-month and 10-year foreign zero coupon yields : (UK, Germany, Japan).
  - Log exchange rate.
  - Log employment and core CPI.
  - BAA-Treasury spread.

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  - BAA-Treasury spread.
- Monetary policy instrument Z_t: change in five-year Treasury futures rate from 15 minutes before to 1hr. 45 minutes after announcement.
- Announcements are all FOMC meetings and some other events.

Preamble: Event Study Regression

Estimated Effects of 25 bp easing monetary policy surprise

US 3-month	0.006
US 10-year	-0.24***
Pound	1.21***
Euro	1.36***
Yen	1.09***
UK 3-month	-0.02
Germany 3-month	0.004
Japan 3-month	-0.006**
UK 10-year	-0.13***
Germany 10-year	-0.11***
Japan 10-year	-0.04***

Econometric Methodology

- Diffuse prior for reduced form VAR parameters.
- Diffuse prior for regression of W_t on Z_t.
- Normal-IW posteriors.
- Coefficient in regression of W_t on Z_t identifies R_1 up to sign and scale.
- Compute impulse responses to shock that lowers five-year ZC yield by 25 basis points.
  - Sample Period: January 1990-Dec 2015 for VAR.
  - October 2008-Dec 2015 for regression of W_t on Z_t.

Risk Premia

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- Domestic Term Premium

$$TP_t(m) = r_t(m) - E_t(\frac{1}{m/3}\Sigma_{i=0}^{m/3-1} r_{t+3i}(3)).$$

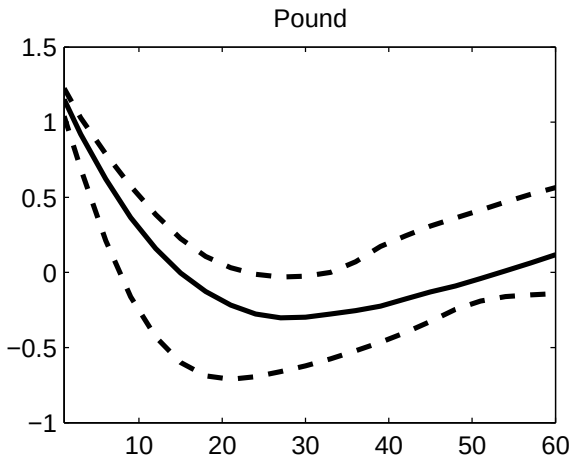
- Foreign Term Premium

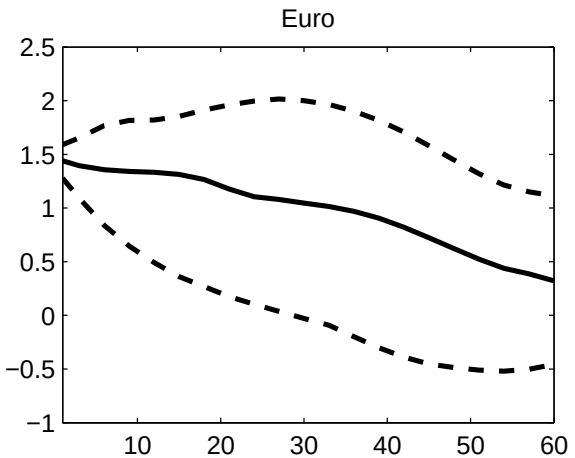
$$TP_t^*(m) = r_t^*(m) - E_t(\frac{1}{m/3}\Sigma_{i=0}^{m/3-1} r_{t+3i}^*(3)).$$

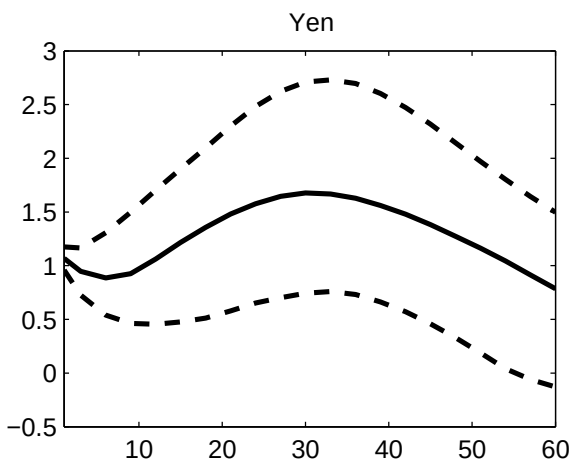
- Foreign Exchange Risk Premium

$$FP(m) = \frac{1}{m/3}\Sigma_{i=0}^{m/3-1}[E_t r_{t+3i}^*(3) - E_t r_{t+3i}(3) + 400(E_t s_{t+3i+3} - E_t s_{t+3i})].$$

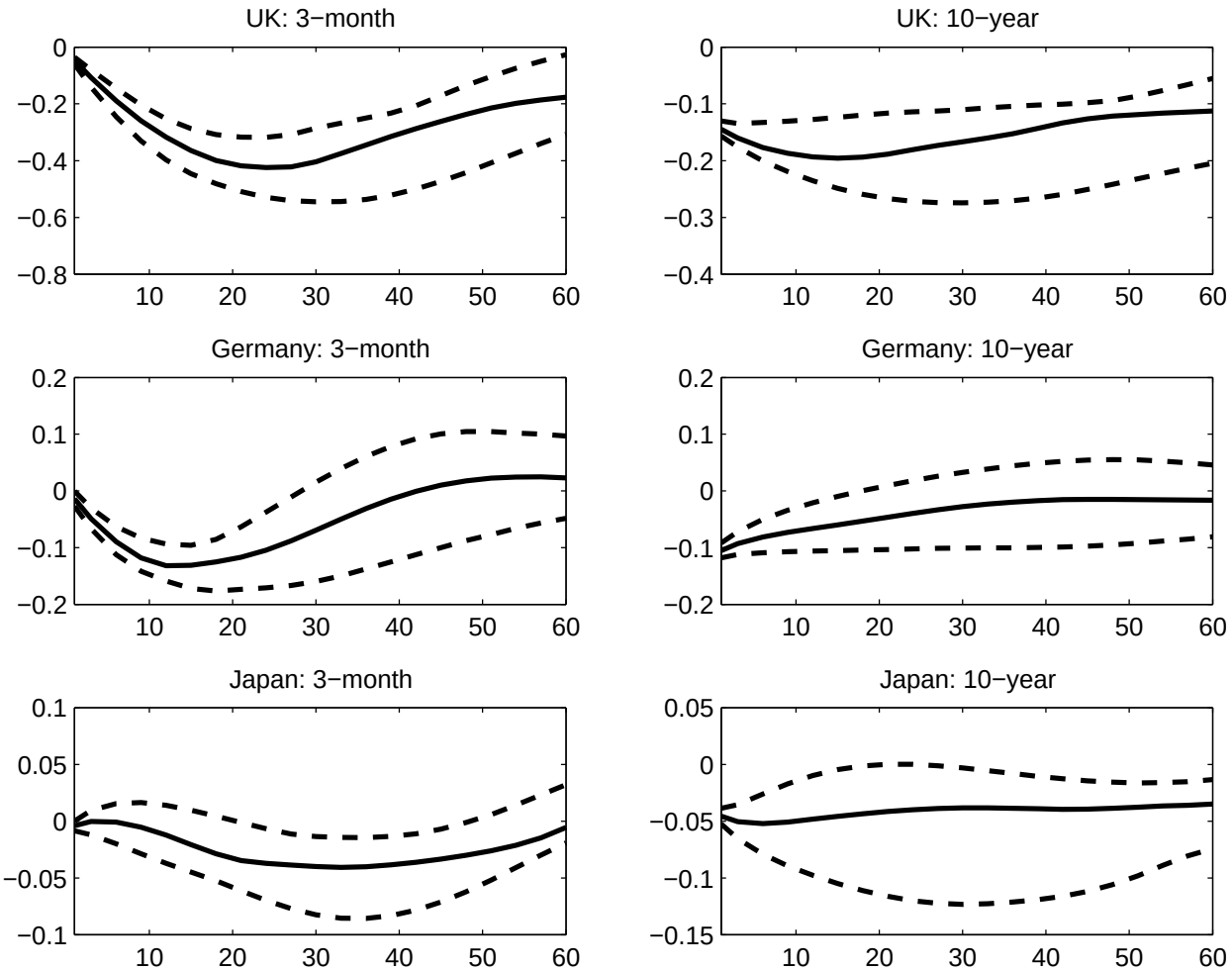
Effects of US monetary policy shock at ZLB: Foreign Exchange Rates



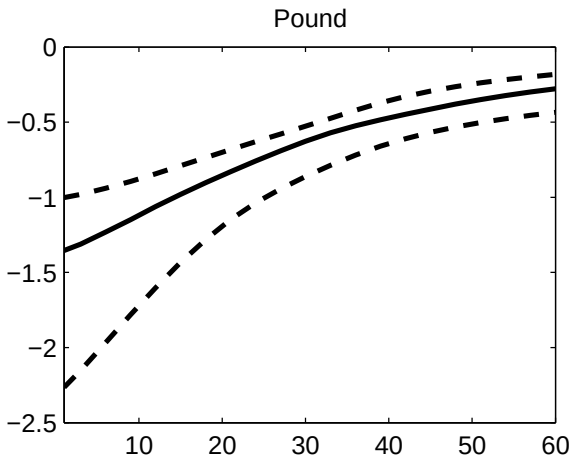


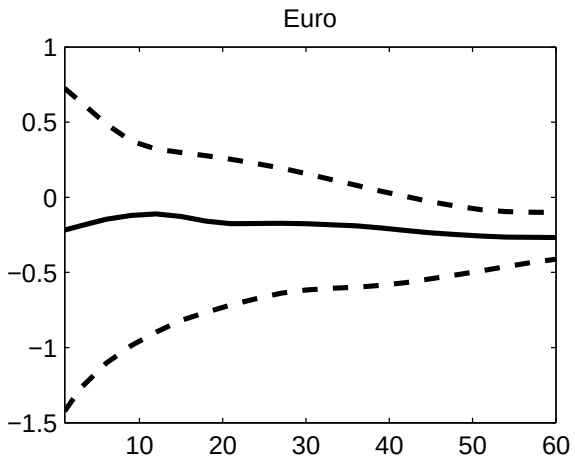


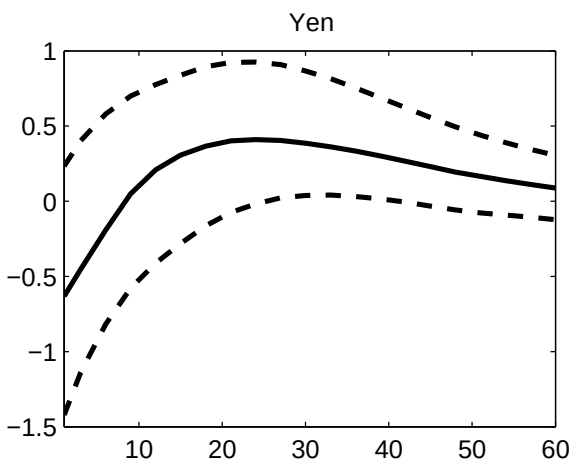
Effects of US monetary policy shock at ZLB: Interest Rates



Effects of US monetary policy shock at ZLB: Foreign Exchange Risk Premia



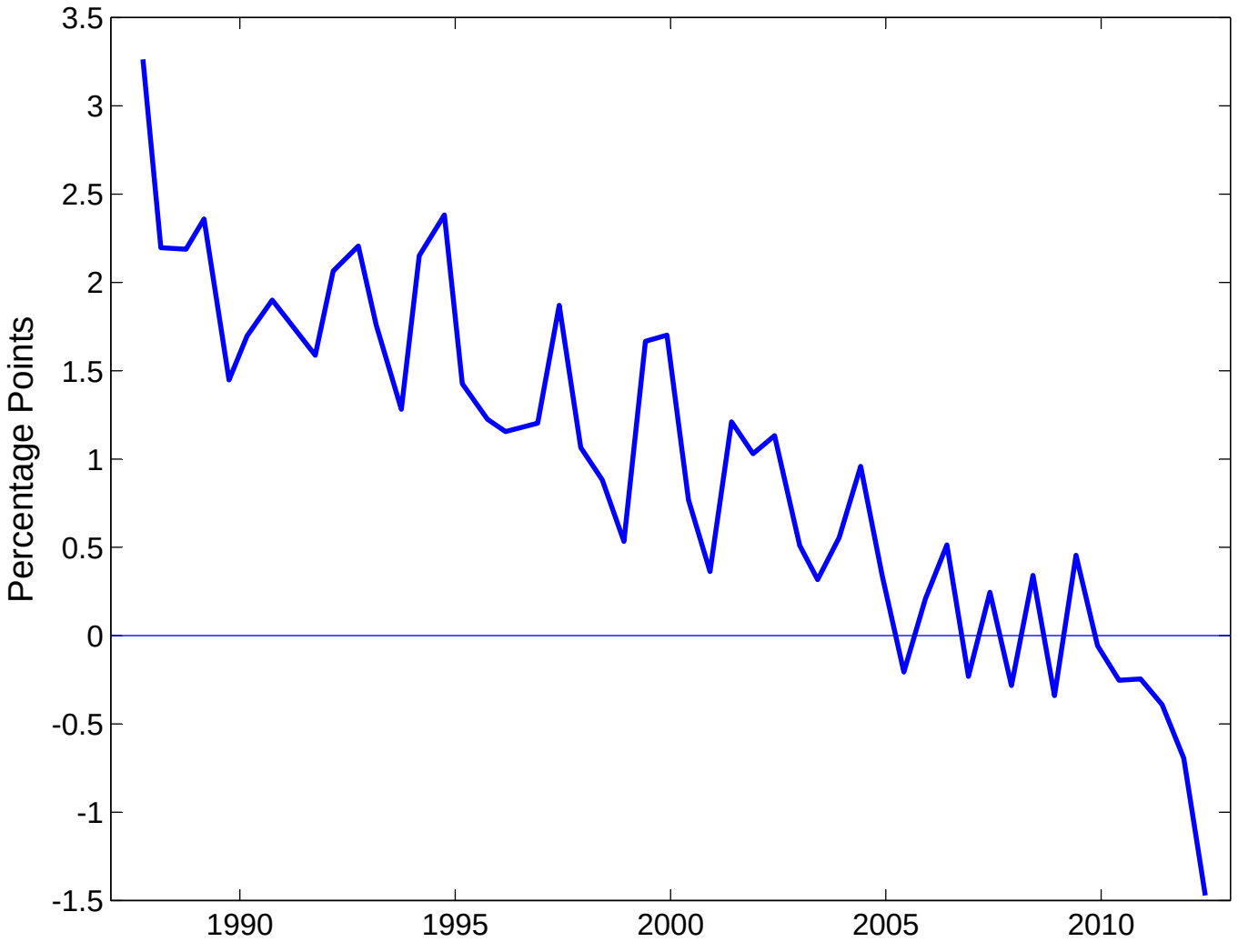




Effects of US monetary policy shock at ZLB: Domestic Term Premia

	Point Estimate	Confidence Interval
Five-year	-7.7	(-17.8,-3.8)
Ten-year	-9.3	(-18.8,-6.5)

Ten-year US Term Premium (Model Free Estimate)



Effects of US monetary policy shock at ZLB: Foreign Term Premia

	Posterior Median	Confidence Interval
UK	5.4	(-4.1,12.7)
Germany	-8.8	(-12.2,-4.6)
Japan	-5.7	(-7.2,-4.6)

Foreign Exchange Risk Premia

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- Opposite direction to the failure of conditional UIP found by EE (1995) and others.

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- Opposite direction to the failure of conditional UIP found by EE (1995) and others.
- Liquidity premium on short-term Treasuries.
  - Backus et al. (2010) and Engel (2016).
  - 25 bp easing shock lowers TED spread 19 bps (t:1.65)
- IMF (2013) note that unconventional monetary policy easings shift risk-reversals in the direction of skewness towards dollar depreciation.
  - If policy easings give the dollar more "crash risk", then risk premium on foreign asset should fall.

Regression of 2-day change in risk reversals on US monetary policy surprises

Risk Reversal Maturity	Euro	Pound	Yen
1 month	1.08^{***}	0.81^{**}	1.61^{**}
	(0.32)	(0.32)	(0.65)
3 months	1.00^{***}	0.67^{**}	1.52^{**}
	(0.30)	(0.26)	(0.68)
6 months	0.80^{***}	0.56^{**}	1.07^{**}
	(0.23)	(0.23)	(0.48)
1 year	0.66^{***}	0.49^{**}	0.83^{**}
	(0.20)	(0.22)	(0.41)

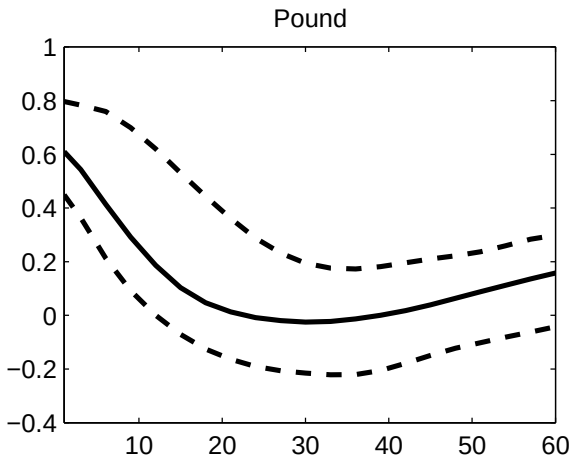
Forward Guidance versus LSAPs

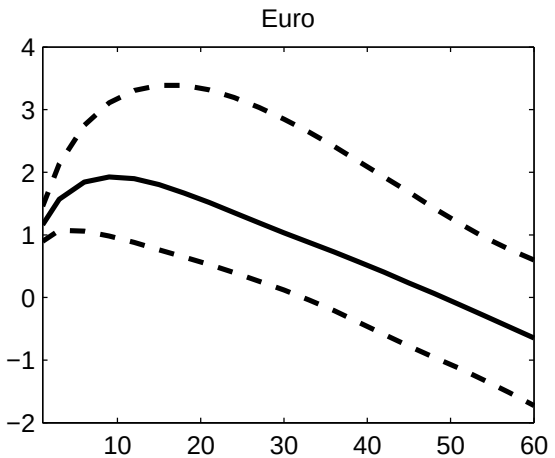
- Can define two monetary policy shocks:
  - Jump in two-year yields.
  - Orthogonal component of jump in ten-year yields.
- Similar in spirit to GSS (2005) and Swanson (2016).
- Makes confidence intervals even wider.

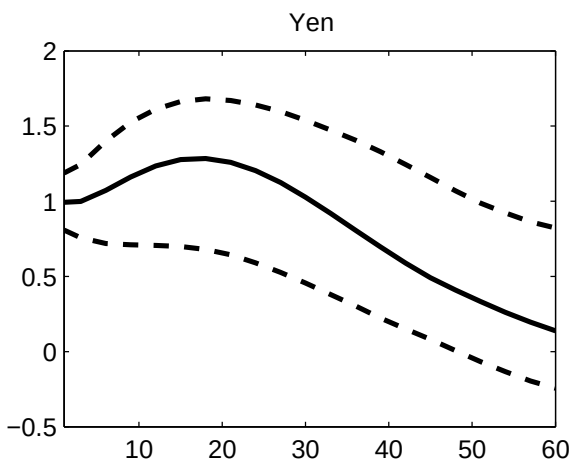
Monetary Policy Shocks before the ZLB

- Can apply methodology to monetary policy shocks before the ZLB.
- Monetary policy surprise Z_t is change in fourth eurodollar contract.
- R_1 estimated over Feb 1994-Oct 2008.

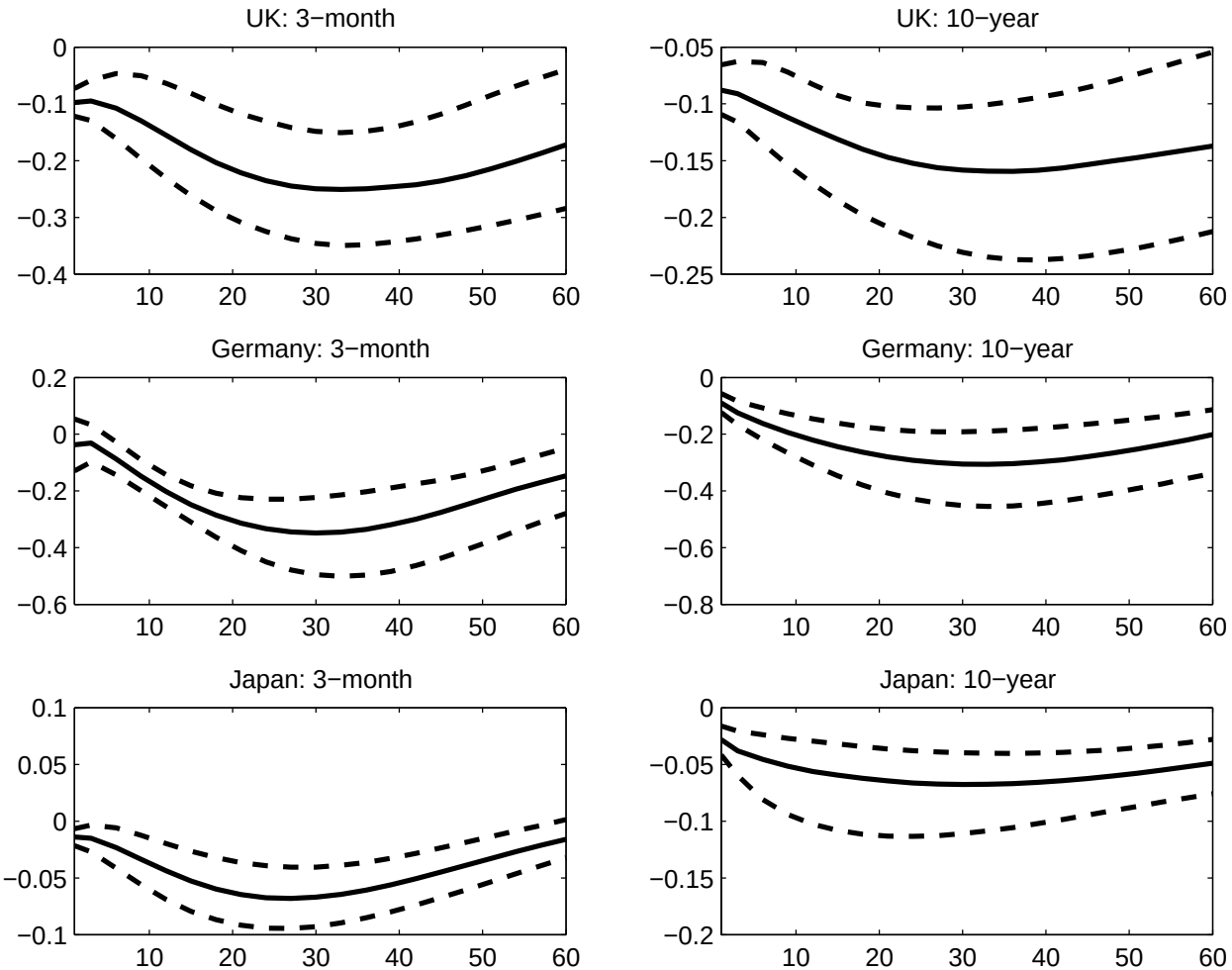
Effects of US monetary policy shock pre-ZLB: Foreign Exchange Rates



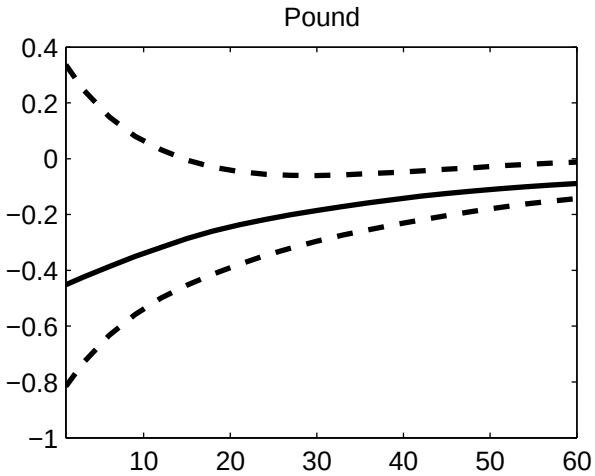


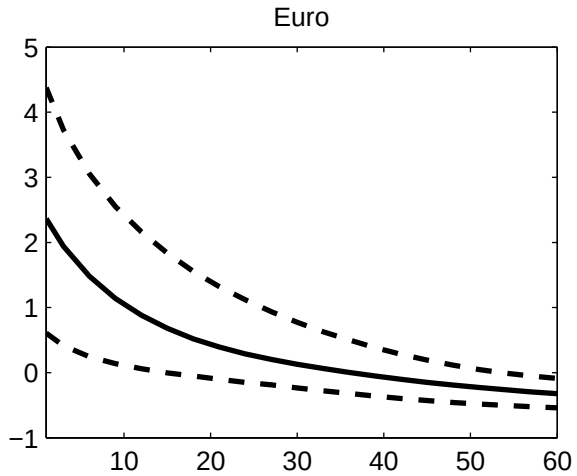


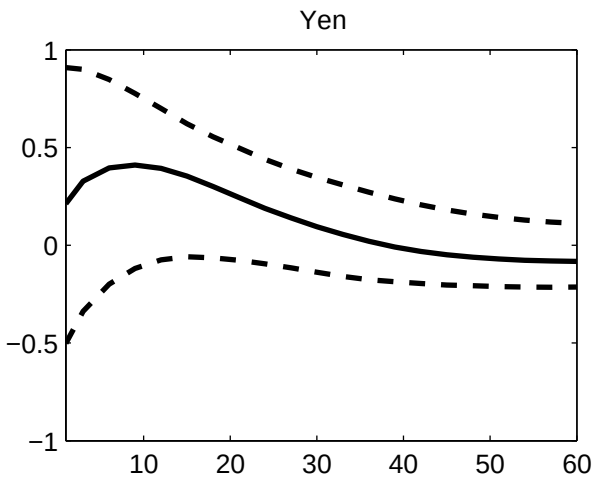
Effects of US monetary policy shock pre-ZLB: Interest Rates



Effects of US monetary policy shock pre-ZLB: Foreign Exchange Risk Premia



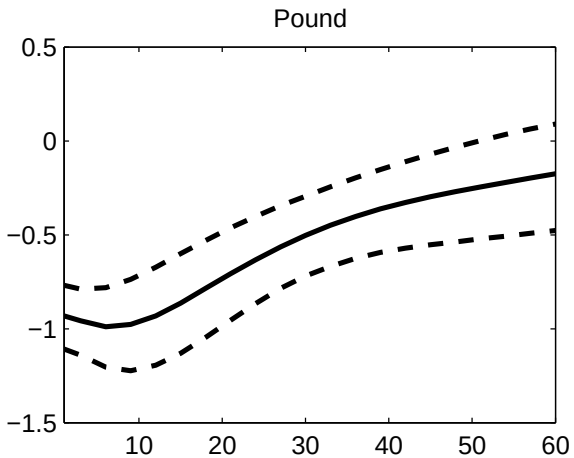


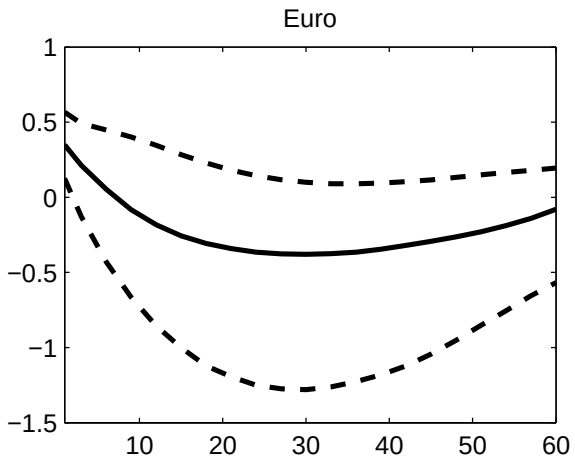


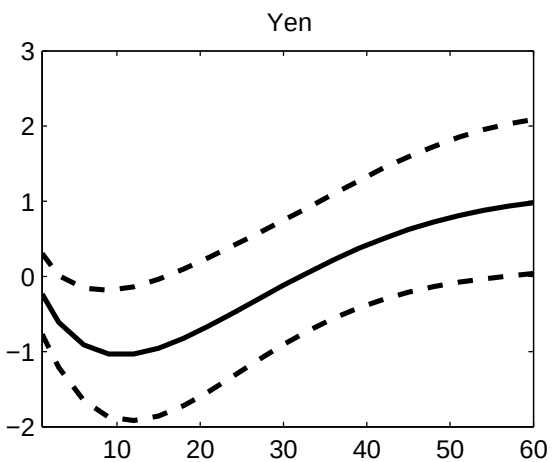
Non-US Monetary Policy Shocks

- Redo the same analysis for BOE, ECB and BOJ monetary policy shocks.
  - Japan:Jan 2000-Mar 2015.
  - Euro: Aug 2007-Mar 2015.
  - UK: Oct 2008-Mar 2015.
- External instrument is change in ten-year yields for UK and Japan and change in ten-year Italian/German spread for ECB.

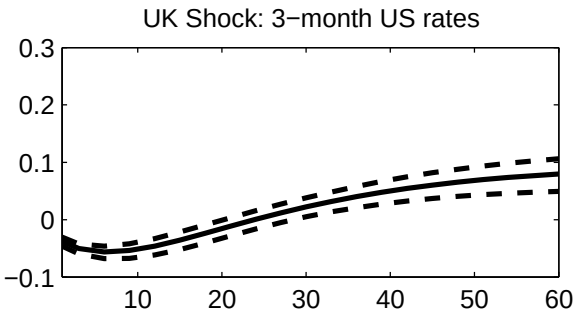
Effects of foreign monetary policy shocks: Foreign Exchange Rates

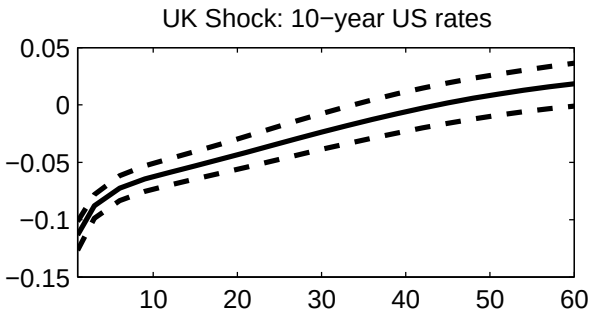


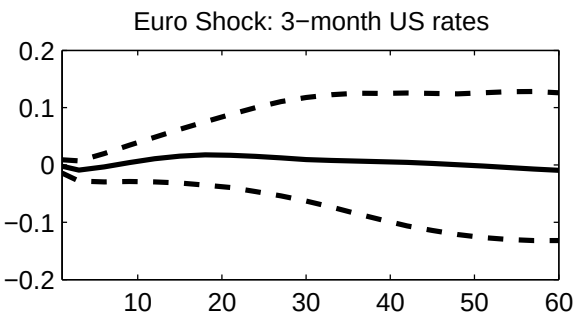


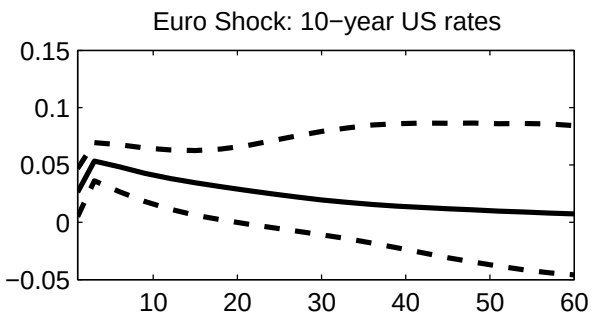


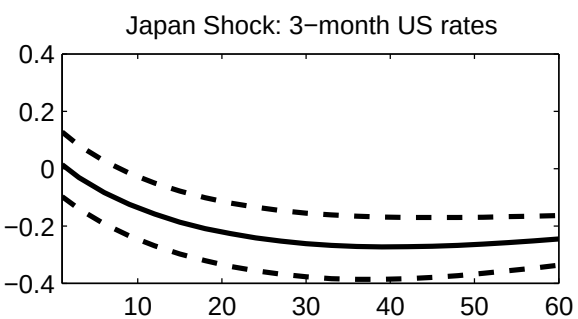
Effects of foreign monetary policy shocks: Interest Rates

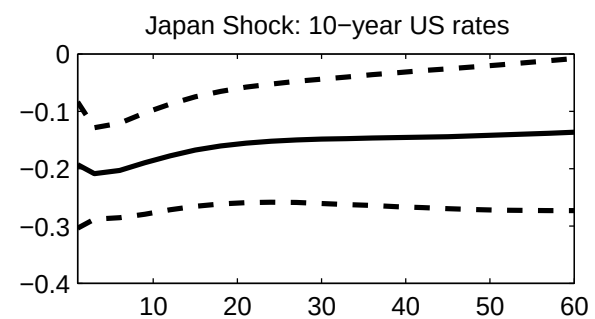




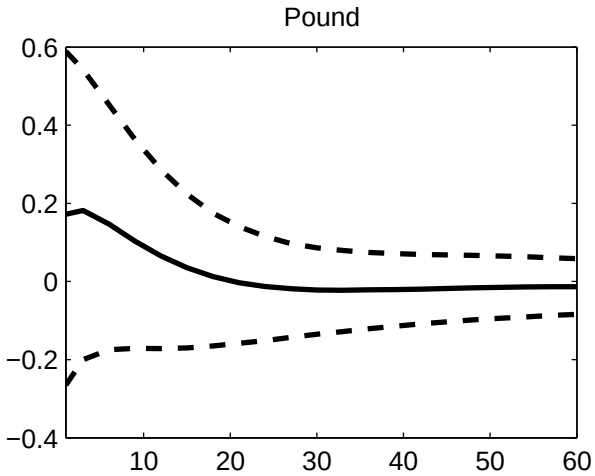


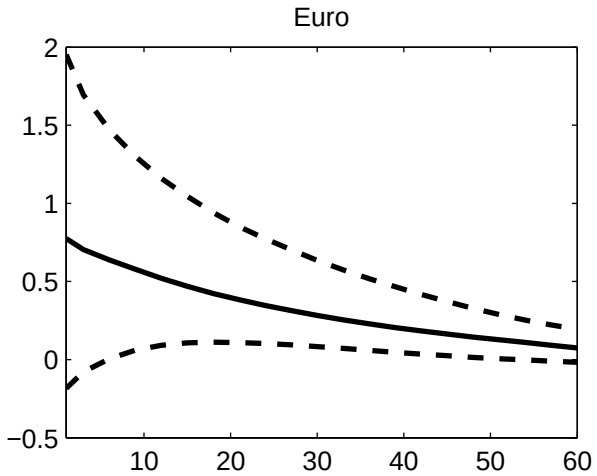


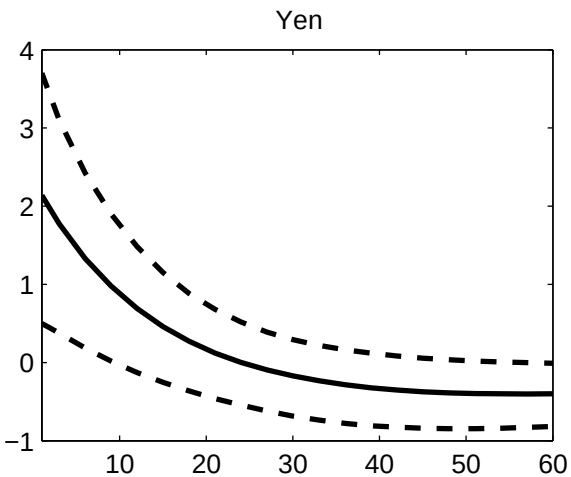




Effects of foreign monetary policy shocks: Foreign Exchange Risk Premia







Conclusions

- Proposed approach for identifying unconventional monetary policy shock in a VAR in domestic and foreign interest rates and exchange rates.
- Monetary policy easing shocks:
  - Depreciate exchange rate.
  - Lower interest rates globally.
  - Lower term premia globally.
  - Shift forex risk premia in favor of US rates.
  - US spillovers are more important.