Unconventional Monetary Policy and International Risk Premia

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Spillovers of conventional and unconventional monetary policy: the role of real and financial linkages

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This paper...

Explores the effects of monetary policy shocks at the ZLB on:

1. Domestic interest rates (US)
2. Foreign interest rates (Japan / Euro / UK)
3. Exchange Rates
4. Financial market risk premia
   - Domestic term premium
   - Foreign term premium
   - Foreign exchange risk premium
5. Generalized carry-trade return

Monetary Policy Shock

Changes in the 5-year US Treasury future around a monetary policy announcement.

- **Highlights**
  - High frequency data:
    15 minutes before FOMC announcement vs. 1 hour and 45 minutes after
  - Up to a scale factor: decrease of 25 basis points
- **Identification**
  - External instrument
  - Structural VAR
  - At the ZLB: 10/2008-03/2015

Estimation Strategy

Step 1: **Estimate monthly VAR(p) 1990-2015.**

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + ... + \beta_p Y_{t-p} + \varepsilon_t$$

$$Y_t = \begin{bmatrix} \textit{Domestic rates} & \equiv & r_t^{US}(3m) \;\; r_t^{US}(5y) \;\; r_t^{US}(10y) \\ \textit{Foreign rates} & \equiv & r_t^{*}(3m) \;\; r_t^{*}(10y) \\ \textit{Exchange rate} & \equiv & ln(s_t) \\ \textit{US Employment} & \equiv & ln\left(employ^{US}\right) \\ \textit{US Price level} & \equiv & ln\left(CPI^{US}\right) \\ \textit{Credit spread} & \equiv & \textit{BAA} - \textit{Treasury Spread} \end{bmatrix}$$

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Reduced form: $\varepsilon_t = R\eta_t$, Structural shocks: $\eta_t = \left(\eta_{1,t}, \eta_{2,t}^{'}\right)^{'}$,

where $\eta_{1,t} \equiv$ monetary policy shocks, $\eta_{2,t} \equiv$ other

Estimation Strategy

Step 2: External Instrument.

- Construct Z_t with intraday (τ) changes around monetary policy announcements (MPA)

$$Z_t = \left\{ \begin{array}{ccc} \triangle^{MPA} r_{\tau}^{US}(5y) & if & \exists \text{ one MPA at } t \\ \sum_{all,t} \triangle^{MPA} r_{\tau}^{US}(5y) & if & \exists \text{ multiple MPA at } t \\ 0 & if & \nexists \text{ MPA at } t \end{array} \right\}$$

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- Construct X_t with intraday changes in Y_t when possible
  If $\triangle^{MPA} Y_{t,\mathbf{i}}$ is not available for variable **i** at time t, then use $\varepsilon_{t,\mathbf{i}}$

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  If $\triangle^{MPA} Y_{t,\mathbf{i}}$ is not available for variable **i** at time t, then use $\varepsilon_{t,\mathbf{i}}$
- Assumptions:

$$\text{(i) } E(\eta_{1,t} Z_t) = \alpha \text{ and } E(\eta_{2,t} Z_t) = 0.$$
$$\text{(ii) } E(Z_t(\varepsilon_t - X_t)) = 0.$$

Estimation Strategy

Step 3: Identification.

- Regress X_t onto Z_t to identify the first column of R from $\varepsilon_t = R\eta_t$.
- Only focus on ZLB sample: 10/2008 - 03/2015.
- First stage is strong.
- Trace out effect of monetary policy shock on future values of Y_t.

Estimation Strategy: Comments

- **Exclusion restriction: How strong is the assumption?**

$$\text{(i) } E\left(\eta_{1,t} Z_t\right) = \alpha \text{ and } E\left(\eta_{2,t} Z_t\right) = 0.$$

MPA might be driven by unexpected changes in employment/CPI reports.

- **Aggregation of MPA: Could this potentially bias results down?**

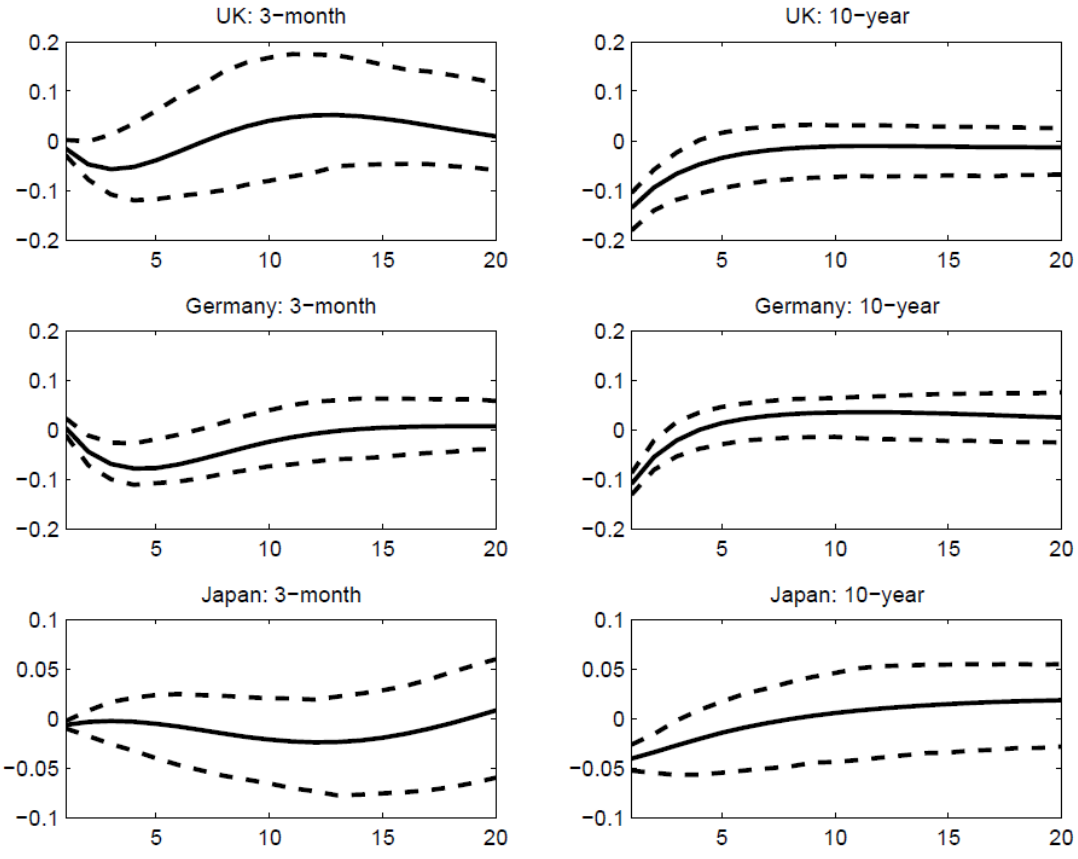
$$\sum_{all,t} \triangle^{MPA} r_{\tau}^{US}(5y) \quad \textit{if} \quad \exists \textit{ multiple MPA at } t$$

Adjusting by day of the month should help.

- **Are all effects immediate, particularly when trading hours are different?** *(e.g., US & Japan)*
- **Power in the regressions?** *(p vs. number of observations)*

Main Results: Foreign interest rates

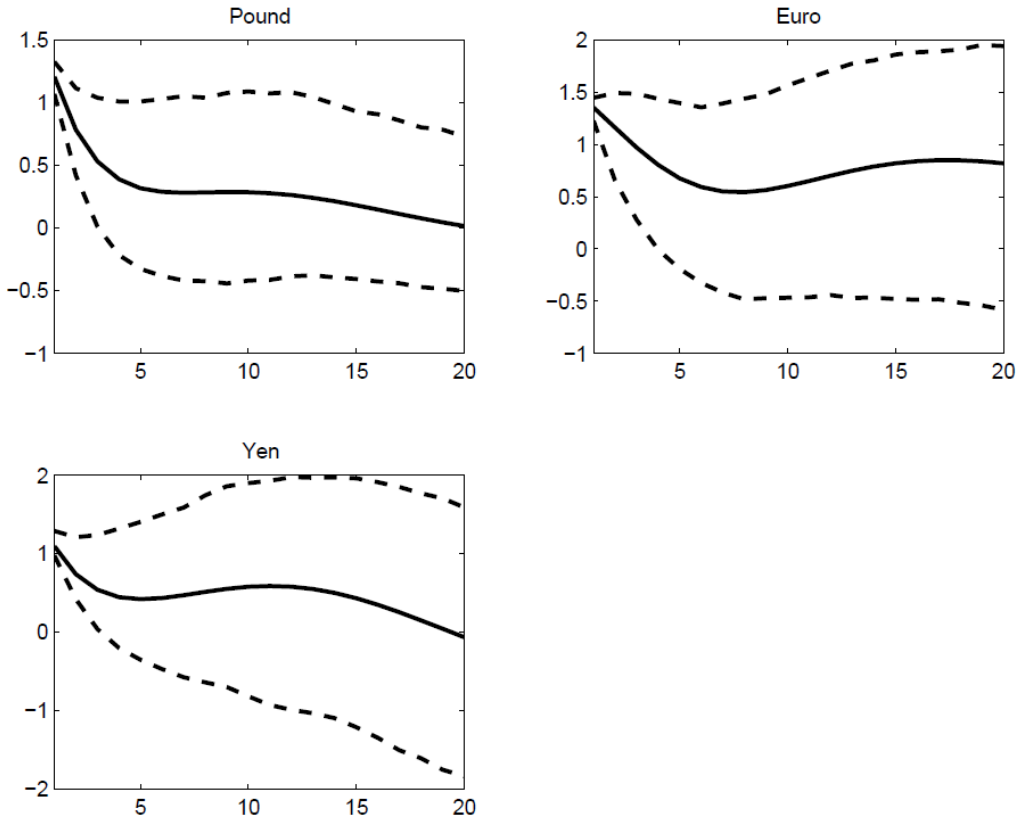
Figure 2: Effects of US Monetary Policy Shock on Foreign Interest Rates



NOTE: This figure plots the effects of a monetary policy shock that lowers the US five-year yield by 25 basis points on foreign interest rates (in percentage points) over the subsequent 20 quarters. The dashed lines are 68 percent confidence intervals.

Main Results: Exchange rates

Figure 1: Effects of US Monetary Policy Shock on Exchange Rates



NOTE: This figure plots the effects of a monetary policy shock that lowers the US five-year yield by 25 basis points on exchange rates (in percentage points, measured as dollars per unit of foreign currency) over the subsequent 20 quarters. The dashed lines are 68 percent confidence intervals.

Main Results: Domestic term premia

Table 4: Effects of US Monetary Policy Shock on Domestic Term Premia (in basis points)

	Point Estimate	Confidence Interval
Five-year	-21.5	(-27.0,-12.6)
Ten-year	-20.5	(-25.8,-10.8)

Notes: The table reports the point estimates and 68% bootstrap confidence intervals for the effects of a monetary policy shock that lowers the US five-year yield by 25 basis points on the five- and ten-year US term premium.

Main Results: Foreign term premia

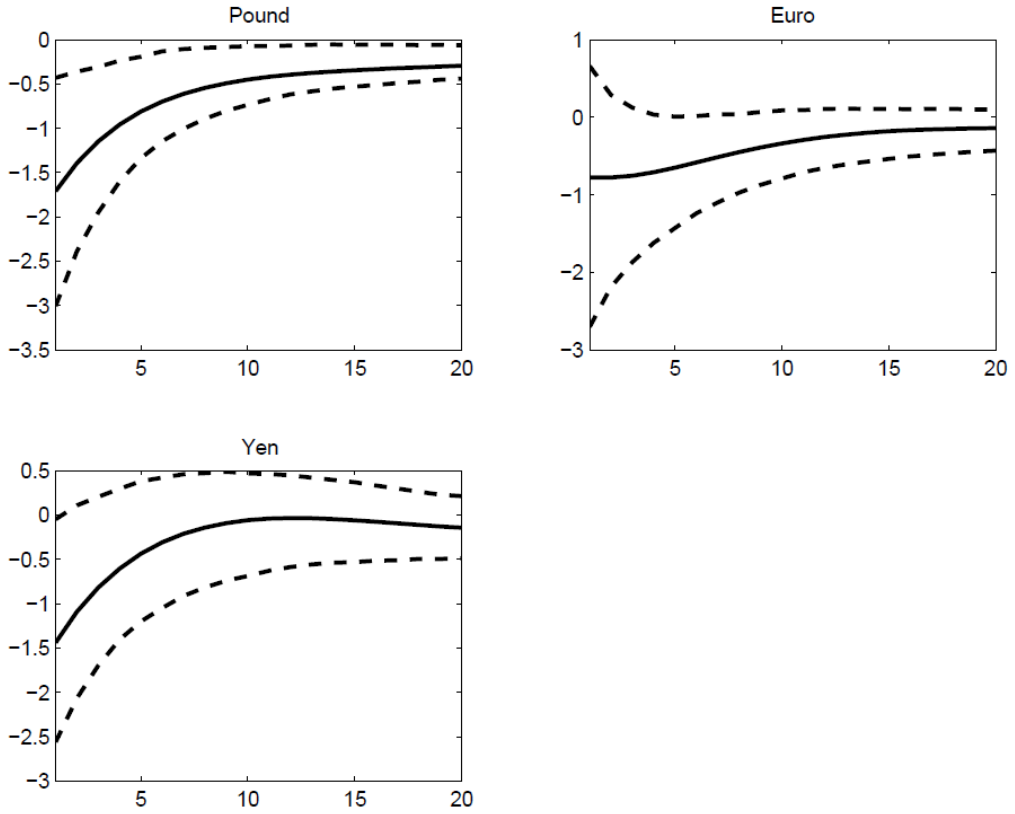
Table 1: Effects of US Monetary Policy Shock on Foreign Ten-Year Term Premia (in basis points)

	Point Estimate	Confidence Interval
UK	-13.6	(-22.6,-7.1)
Germany	-10.3	(-13.8,-7.1)
Japan	-5.4	(-10.0,-1.0)

Notes: The table reports the point estimates and 68% bootstrap confidence intervals for the effects of a monetary policy shock that lowers the US five-year yield by 25 basis points on the ten-year term premium in the UK, Germany and Japan.

Main Results: Foreign exchange premia

Figure 3: Effects of US Monetary Policy Shock on Foreign Exchange Risk Premium



NOTE: This figure plots the effects of a monetary policy shock that lowers the US five-year yield by 25 basis points on the foreign exchange risk premium (as defined in equation (5) in the text, and measured in percentage points) over the subsequent 20 quarters. The dashed lines are 68 percent confidence intervals.

Main Results: Generalized carry-trade returns

Table 2: Effects of US Monetary Policy Shock on Long Foreign/Short US Ten-Year Portfolio Returns (in basis points)

	Point Estimate	Confidence Interval
UK	12.9	(-28.5,78.0)
Germany	1.7	(-23.8,32.4)
Japan	-93.2	(-113.9,-54.2)

Notes: The table reports the point estimates and 68% bootstrap confidence intervals for the instantaneous effects of a monetary policy shock that lowers the US five-year yield by 25 basis points on the returns on a portfolio that is long foreign ten-year bonds and short US ten-year bonds. The foreign country is the United Kingdom, Germany or Japan.

Main Results: Comments

- **Placebo tests**

  e.g., What is the effect on variables of $\triangle^{notMPA} r_{\tau}^{US}(5y)$ *?*

- **Pre-ZLB vs ZLB**
  - *Different instruments*
  - *Different number of observations*

- Interpretation of confidence intervals.

- Studying effects in domestic economy.

Conclusion

This paper explores the international effects of US monetary policy shocks on macroeconomic variables.

- Zero lower bound is a particularly interesting period.
- Structural shocks are identified via external instruments approach.
- Effects on interest rates, exchange rates, financial market risk premia, and generalized carry trade return.
- Results suggest that US monetary policy easing shocks lower domestic and foreign bond premia, and lead to dollar depreciation.