Online Appendix (not intended for publication): The International Spillover Effects of US Monetary Policy Uncertainty

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A.1 Interpretation of monetary policy uncertainty

In this section we discuss the interpretation of the monetary policy uncertainty from the perspective of a simple policy rule. Consider a general monetary policy rule of the ofrm

$$i_t = g\left(\Omega_t\right) + \varepsilon_t \tag{1}$$

where i_t is the short-term nominal interest rate, $g\left(.\right)$ is a linear function that depends on the central bank's information set (Ω_t) and ε_t is the monetary policy shock. In this framework uncertainty about the interest rates comes from i)variance of ε_t and ii)any uncertainty about reaction function $g\left(\Omega_t\right)$. Specifically the h period ahead variance of the interest rate can be written as

$$Var_t[i_{t+h}] = Var_t[g\left(\Omega_{t+h}\right)] + Var_t[\varepsilon_{t+h}] + \text{covariance terms} \tag{2}$$

What would cause changes in $Var_t[\varepsilon_{t+h}]$? As discussed in the survey on monetary policy shocks (Christiano et al. (1999)), there are various interpretations of what constitutes the shock ε itself. For example, the shock can arise due to changing political pressure on the Fed, changing composition of the voting members of the FOMC, technical factors like measurement error in the preliminary data available to the FOMC when it makes its decision or even strategic aspects as FOMC wanting to avoid disappointing market expectations. Any change in the expected importance of these factors would lead to a change in $Var_t[\varepsilon_{t+h}]$.

What could cause changes in $Var_t[g\left(\Omega_{t+h}\right)]$? Any uncertainty about future changes to the reaction function will drive this. For example, consider a simple version of the Taylor rule $g\left(\Omega_{t+h}\right) = r^* + \pi^* + \alpha y_t + \beta\pi_t$. Uncertainty about the parameters (α, β), inflation target (π^*) or equilibrium real interest rate (r^*) will drive $Var_t[g\left(\Omega_{t+h}\right)]$. [1]

Thus changes in monetary policy uncertainty around FOMC announcements can be interpreted as changes in uncertainty about the monetary reaction function or changes in the variance of the shock to the policy rule.

[1] Note that short-rate uncertainty is also driven by uncertainty about economic fundamentals in addition to the two sources of monetary policy uncertainty discussed above. In other words, in the above example $Var_t[\pi_{t+h}]$ and $Var_t[y_{t+h}]$ will also affect $Var_t[i_{t+h}]$. Fortunately, a decomposition of high-frequency uncertainty changes coming from macro variables and that coming from monetary policy (shock and reaction function) is not necessary for the purpose of our paper. Our solution to identifying changes to monetary policy uncertainty is to follow a large event-study literature and squarely focus on the changes in asset prices and our uncertainty measure over short time windows containing FOMC announcements. Over these short time windows, asset prices are driven by the news in these announcements. Since these changes in uncertainty are due to monetary policy announcements, we speak of monetary policy uncertainty.

A.2 Construction of monetary policy uncertainty measure (mpu)

Our measure is based on the approach of Bauer et al. (2019) which uses options on Eurodollar futures and does not require distributional assumptions. Let $F_{t,T}$ be the time-t value of a Eurodollar futures contract expiring at T with value at expiration is $F_{T,T} = 100 - L_T$, where L_T is LIBOR in percent. For option contracts, denote the payoff $max(F_{T,T} - K, 0)$ for call options and $max(K - F_{T,T}, 0)$ for put options, where K is the strike price. For a given trading date t and an expiration date T we use the prices of call options, $c_{t,T}(K)$, and put options, $p_{t,T}(K)$ to calculate the market-based conditional variance of future LIBOR, $Var_t(L_T)$. Starting from the relationship $Var_t(L_T) = Var_t(F_{T,T}) = E_t F_{T,T}^2 - (E_t F_{T,T})^2 = E_t F_{T,T}^2 - F_{t,T}^2$, we can show that[2]

$$\begin{aligned} Var_t(L_T) &= \frac{2}{P_{t,T}} \int_0^\infty c_{t,T}(K) dK - F_{t,T}^2 \\ &= \frac{2}{P_{t,T}} \left(\int_0^{F_{t,T}} p_{t,T}(K) + \int_{F_{t,T}}^\infty c_{t,T}(K) dK \right) \\ &= 2 \int_0^\infty \left[\frac{c_{t,T}(K)}{P_{t,T}} - \max(0, F_{t,T} - K) \right] dK \end{aligned}$$

We then approximate this integral with out-of-the money option prices. While Eurodollar contracts have a fixed maturity, we interpolate contracts to get a fixed-horizon measure. Our baseline measure mpu is the two-day change around FOMC announcements in $\sqrt{Var_t(L_{t+h})}$ with h equal to 12 months.

[2] For details on the derivation see Bauer et al. (2019).

Table A.1: Response of forecast dispersion to monetary shocks

Panel (a)	SPF forecast	
	GDP	GDP Deflator
mps	0.32	0.37
	[0.49]	[0.23]
mpu	0.52	0.75**
	[0.84]	[0.30]
Constant	0.07	0.02
	[0.04]	[0.02]
Observations	97	97
R-squared	0.023	0.113

Panel (b)	SEP forecast	
	PCE inflation	Unemployment
mps	0.01	-0.02
	[0.09]	[0.07]
mpu	0.12**	0.09*
	[0.05]	[0.05]
Constant	0.04	0.01
	[0.05]	[0.04]
Observations	39	39
R-squared	0.119	0.097

The table shows the results of regressing the changes in the cross-sectional dispersion of SPF forecasts (GDP and GDP deflator) and SEP forecasts (PCE inflation and unemployment rate) on the monetary policy shock measures. The SPF regression (Panel (a)) is at a quarterly frequency with the monetary policy shock series summed for a given quarter. The SEP regression (Panel (b)) is at the FOMC meeting frequency. Heteroskedasticity-robust standard errors are reported in parentheses.

Table A.2: Data coverage for sample countries

	Emerging Economy?	Exchange Rate	Equity Index	Yields
Argentina	Y	X	X	
Australia		X	X	2/1/1995
Austria		X	2/3/1999	5/19/1998
Belgium		X	X	5/19/1998
Canada		X	X	2/1/1995
Chile	Y	X	X	
China	Y	8/23/2010	8/23/2010	9/12/2003
Czech Republic		X	2/1/1995	7/1/1998
Denmark		X	X	2/1/1995
Estonia		X	6/26/2002	
Finland		X	2/1/1995	7/1/1998
France		X	2/3/1999	5/19/1998
Germany		X	2/3/1999	X
Hong Kong		X	X	7/1/1998
Hungary	Y	X	2/1/1995	7/1/1998
Iceland		X	5/9/2007	
India	Y	X	X	11/17/1998
Indonesia	Y	X	X	3/18/2003
Ireland		X	X	5/19/1998
Israel		X	X	
Italy		X	2/4/1998	2/4/1998
Japan		X	X	X
Korea, Republic of		X	X	
Malaysia	Y	X	X	10/5/1999
Mauritius	Y	X	X	
Netherlands		X	2/3/1999	5/19/1998
New Zealand		X	1/3/2001	2/1/1995
Norway		X	1/31/1996	8/18/1998
Pakistan	Y	X	X	
Peru	Y	X	X	
Philippines	Y	X	X	
Poland	Y	X	X	7/1/1998
Portugal		X	2/3/1999	5/19/1998
Russian Federation	Y	X	9/30/1997	1/31/2007
Singapore		X	10/5/1999	7/1/1998
Slovakia		X	2/3/1999	
Slovenia		5/20/1997	6/26/2002	
South Africa	Y	X	7/6/1995	2/1/1995
Spain		X	2/3/1999	5/19/1998
Sweden		X	1/31/1996	2/1/1995
Switzerland		X	X	2/1/1995
Thailand	Y	X	8/22/1995	
Turkey	Y	X	X	
United Kingdom		X	X	2/1/1995
United States			X	2/1/1995

This table displays the availability for each country's data series. The full sample period covers all FOMC announcements between January 1995 and June 2019, excluding the announcements on Sep. 17, 2001, Oct. 8, 2008, May 22, 2013 and May 2, 2018. Cells with an X indicate a start date of Jan. 1, 1995, cells with a date indicate the first date with available data, and blank cells indicate the data series was not available.

Table A.3: Response of international bond yields to monetary shocks with QE dummy

	Advanced countries		Emerging countries	
	2 Year Yield	10 Year Yield	2 Year Yield	10 Year Yield
mps	0.365***	0.205***	0.140**	0.098
	[0.063]	[0.070]	[0.044]	[0.055]
mpu	0.091*	0.233***	0.117***	0.099**
	[0.053]	[0.061]	[0.033]	[0.029]
*mps**QE	-0.439	0.203	0.150	0.235
	[0.310]	[0.500]	[0.151]	[0.206]
*mpu**QE	0.292	0.063	0.153	0.305*
	[0.222]	[0.422]	[0.177]	[0.159]
QE	0.016	0.054	0.268	0.557***
	[0.202]	[0.421]	[0.180]	[0.155]
Constant	-0.048	0.007	-0.025	-0.075**
	[0.041]	[0.048]	[0.028]	[0.022]
Observations	4,154	4,154	1,270	1,270
R-squared	0.150	0.160	0.075	0.096

The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*), monetary policy uncertainty (*mpu*) shock, and interactions with a quantitative easing dummy. The QE dummy is 1 for the dates listed in Fawley et al. (2013) and 0 otherwise. All variables have been normalized to have unit standard deviation. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.4: Response of international bond yields to monetary shocks (Pre-crisis sample)

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.502***	0.452***	0.373***	0.289***
	[0.074]	[0.073]	[0.099]	[0.094]
mpu		0.131**		0.220**
		[0.062]		[0.086]
Constant	-0.026	0.036	-0.009	0.094
	[0.055]	[0.060]	[0.070]	[0.074]
Observations	2,042	2,042	2,042	2,042
R-squared	0.216	0.231	0.119	0.160

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.181**	0.160**	0.118	0.113
	[0.067]	[0.065]	[0.082]	[0.090]
mpu		0.053		0.014
		[0.063]		[0.047]
Constant	-0.062	-0.038	-0.095***	-0.089**
	[0.045]	[0.054]	[0.021]	[0.026]
Observations	502	502	502	502
R-squared	0.027	0.029	0.011	0.012

The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*) and monetary policy uncertainty (*mpu*) shock. All variables have been normalized to have unit standard deviation. Column (1) has only *mps* as a regressor, while column 2 adds *mpu* to this specification. The sample consists of 108 FOMC announcements from January 1995 to November 2007. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.5: Response of international asset prices to monetary shocks (Post-crisis sample)

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.340***	0.275***	0.313**	0.128
	[0.090]	[0.089]	[0.127]	[0.079]
mpu		0.117		0.337***
		[0.080]		[0.088]
Constant	-0.191***	-0.132**	-0.222***	-0.051
	[0.051]	[0.059]	[0.071]	[0.081]
Observations	2,112	2,112	2,112	2,112
R-squared	0.089	0.100	0.076	0.162

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.325***	0.178***	0.327***	0.171**
	[0.081]	[0.041]	[0.092]	[0.055]
mpu		0.268***		0.284***
		[0.059]		[0.072]
Constant	-0.103*	0.032	-0.123**	0.021
	[0.046]	[0.047]	[0.049]	[0.056]
Observations	768	768	768	768
R-squared	0.082	0.137	0.083	0.145

The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*) and monetary policy uncertainty (*mpu*) shock. All variables have been normalized to have unit standard deviation. Column (1) has only *mps* as a regressor, while column 2 adds *mpu* to this specification. The sample consists of 96 FOMC announcements from December 2007 to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension

Table A.6: Response of US bond term premia to monetary policy shocks

	JSZ		ACM		KW	
	2 year	10 year	2 year	10 year	2 year	10 year
mps	0.225	-0.124	0.119	-0.009	0.571***	0.310***
	[0.185]	[0.099]	[0.094]	[0.080]	[0.125]	[0.099]
mpu	0.256*	0.393***	0.373***	0.458***	0.246**	0.395***
	[0.139]	[0.113]	[0.085]	[0.079]	[0.097]	[0.088]
Constant	0.323***	0.344***	0.110	0.140**	0.155**	0.164**
	[0.099]	[0.091]	[0.073]	[0.070]	[0.076]	[0.075]
Observations	204	204	204	204	204	204
R-squared	0.151	0.130	0.185	0.207	0.437	0.329

The table shows the response of the expected component (ec) and term premium (tp) of 2 and 10 year government bond yields to a monetary policy uncertainty (*mpu*) shock. Yields are decomposed into the expected component and term premium using the methodology of Joslin et al. (2011) (JSW), Adrian et al. (2013) (ACM) and Kim and Wright (2005) (KW). All variables have been normalized to have unit standard deviation. Panel (b) adds the US 10 year yield term premium to the specification. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Heteroskedasticity-robust standard errors are reported in parentheses.

Table A.7: Response of term premium component of international bond yields to mpu shocks (bond substitutability interaction)

	10 year term premium		
	All Countries	Advanced	Emerging
mpu	-0.16**	-0.08	-0.10
	(0.069)	(0.114)	(0.102)
mpu x bond sub.	0.50***	0.42**	0.26
	(0.120)	(0.156)	(0.197)
Observations	5,410	4,140	1,270
R-squared	0.044	0.062	0.008

The table shows the response of 10 year government bond yield term premia to a monetary policy uncertainty (*mpu*) shock and the interaction with a measure of bond substitutability with the United States. The term premium is calculated using the methodology of Joslin et al. (2011). Bond substitutability is calculated as the correlation between the 10 year term premium for country i and the United States using all non-FOMC days between January 1995 and the FOMC day on day t . Bond substitutability is standardized to the interval 0 to 1, representing a range in the correlation between -1 and 1. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All term premium changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.8: Response of US holdings of foreign bonds to monetary shocks (robustness)

	Advanced	Emerging
mps	-	-
mpu	-	-
idiff	-0.016	-0.026
	[0.013]	[0.020]
mps x idiff	-0.001	0.013
	[0.008]	[0.017]
mpu x idiff	0.007	-0.029**
	[0.006]	[0.011]
Constant	0.135***	0.062
	[0.002]	[0.075]
Observations	3,536	901
R-squared	0.149	0.290

The table shows the response of changes in US holdings of foreign bonds to the interaction between a monetary policy surprise (*mps*) and monetary policy uncertainty (*mpu*) shock with the interest rate differential between the 3 month rate in foreign countries relative to the US (idiff). US holdings of foreign bonds are from the monthly TIC data. Country and time fixed effects are included in the specification. The sample runs from January 1995 to December 2018 for a total of 187 FOMC meetings, which excludes the financial crisis period from December 2007 to June 2009. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.9: Understanding the cross-country heterogeneity of asset price responses: Advanced countries

	2 year yield	10 year yield
mpu	0.111***	0.251***
	[0.035]	[0.053]
IRDiff3mChg**mpu*	-0.075***	-0.026
	[0.020]	[0.027]
FinDepth**mpu*	-0.039	0.007
	[0.042]	[0.048]
FXRegime**mpu*	0.039	0.001
	[0.036]	[0.052]
TradeOpen**mpu*	-0.012	0.018
	[0.022]	[0.024]
Observations	3,391	3,391
R-squared	0.170	0.179

The table shows the response of 2 and 10 year government bond yields to a monetary policy uncertainty (*mpu*) shock and the interactions with measures for financial depth (FinDepth), capital account openness (KAopen), exchange rate regime (FXRegime), the change in the 3 month interest rate differential with the US on an FOMC day (IRiff3mChg), and trade openness (TradeOpen). These observables are orthogonalized recursively as in Iacoviello and Navarro (2019). See Section 4.4 for details on the specification and variable creation. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.10: Understanding the cross-country heterogeneity of asset price responses: Emerging countries with dollar debt exposure

	2 year yield	10 year yield
mpu	0.124***	0.134**
	[0.030]	[0.043]
TradeOpen**mpu*	0.007	-0.013
	[0.041]	[0.033]
KAopen**mpu*	0.193***	0.146*
	[0.047]	[0.069]
FXRegime**mpu*	-0.068	0.134
	[0.138]	[0.168]
DollarDebt**mpu*	0.094	0.154*
	[0.079]	[0.064]
IRDiff3mChg**mpu*	-0.046	-0.034
	[0.039]	[0.029]
Observations	808	808
R-squared	0.0660	0.0559

The table shows the response of 2 and 10 year government bond yields to a monetary policy uncertainty (*mpu*) shock and the interactions with measures for trade openness (TradeOpen), capital account openness (KAopen), exchange rate regime (FXRegime), dollar debt exposure (DollarDebt), and the change in the 3 month interest rate differential with the US on an FOMC day (IRiff3mChg). These observables are orthogonalized recursively as in Iacoviello and Navarro (2019). See Section 4.4 for details on the specification and variable creation. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.11: Response of international bond yields to monetary shocks (1-day window)

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.340***	0.263***	0.266**	0.164*
	[0.075]	[0.070]	[0.096]	[0.084]
mpu		0.192***		0.257***
		[0.055]		[0.049]
Constant	-0.086**	0.045	-0.084*	0.092
	[0.038]	[0.046]	[0.048]	[0.059]
Observations	4,154	4,154	4,154	4,154
R-squared	0.101	0.132	0.062	0.117

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.196***	0.131***	0.139*	0.092
	[0.046]	[0.036]	[0.066]	[0.059]
mpu		0.161**		0.117*
		[0.063]		[0.053]
Constant	-0.086**	0.021	-0.075*	0.003
	[0.036]	[0.043]	[0.033]	[0.038]
Observations	1,270	1,270	1,270	1,270
R-squared	0.034	0.055	0.017	0.028

The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*) and monetary policy uncertainty (*mpu*) shock. All variables have been normalized to have unit standard deviation. Column (1) has only *mps* as a regressor, while column 2 adds *mpu* to this specification. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a one day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.12: Response of international bond yields to monetary shocks, controlling for LIBOR-OIS spread

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.382***	0.301***	0.341***	0.162*
	[0.079]	[0.077]	[0.115]	[0.086]
mpu		0.139**		0.305***
		[0.056]		[0.072]
LIBOR-OIS Spread	-0.002	0.002	-0.014	-0.005
	[0.021]	[0.017]	[0.010]	[0.008]
Constant	-0.099**	-0.032	-0.123**	0.023
	[0.043]	[0.047]	[0.058]	[0.064]
Observations	3,212	3,212	3,212	3,212
R-squared	0.115	0.132	0.099	0.173

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.230***	0.137**	0.195**	0.104
	[0.054]	[0.042]	[0.062]	[0.057]
mpu		0.164***		0.159**
		[0.041]		[0.046]
LIBOR-OIS Spread	-0.006	-0.001	-0.038***	-0.033***
	[0.006]	[0.004]	[0.006]	[0.007]
Constant	-0.071*	0.008	-0.096**	-0.019
	[0.031]	[0.035]	[0.030]	[0.037]
Observations	1,103	1,103	1,103	1,103
R-squared	0.051	0.076	0.089	0.114

The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*) and monetary policy uncertainty (*mpu*) shock while controlling for the LIBOR-OIS spread. The sample consists of 146 FOMC announcements from December 2001 (when LIBOR-OIS data becomes available) to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.13: Response of international bond yields to monetary shocks, 2 year yield as *mps*

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps (2yr)	0.389***	0.345***	0.399***	0.313***
	[0.051]	[0.051]	[0.053]	[0.050]
mpu		0.125**		0.240***
		[0.051]		[0.053]
Constant	-0.065*	-0.008	-0.076	0.034
	[0.036]	[0.038]	[0.045]	[0.048]
Observations	4,154	4,154	4,154	4,154
R-squared	0.146	0.160	0.154	0.204

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps (2yr)	0.170**	0.101*	0.156**	0.084*
	[0.054]	[0.051]	[0.052]	[0.043]
mpu		0.188***		0.194***
		[0.040]		[0.051]
Constant	-0.061*	0.024	-0.092**	-0.005
	[0.031]	[0.030]	[0.029]	[0.030]
Observations	1,270	1,270	1,270	1,270
R-squared	0.025	0.056	0.021	0.055

The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*) (measured as the change in the 2 year Treasury yield) and monetary policy uncertainty (*mpu*) shock. All variables have been normalized to have unit standard deviation. Column (1) has only *mps* as a regressor, while column 2 adds *mpu* to this specification. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.14: Response of international bond yields to monetary shocks, 10 year yield as *mps*

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps (10 yr)	0.293***	0.230***	0.527***	0.479***
	[0.063]	[0.067]	[0.056]	[0.062]
mpu		0.121*		0.093*
		[0.059]		[0.050]
Constant	-0.080*	-0.026	-0.072*	-0.030
	[0.040]	[0.044]	[0.038]	[0.042]
Observations	4,154	4,154	4,154	4,154
R-squared	0.088	0.099	0.287	0.293

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps (10 yr)	0.174***	0.087*	0.215***	0.142***
	[0.044]	[0.045]	[0.039]	[0.036]
mpu		0.173***		0.145**
		[0.044]		[0.056]
Constant	-0.064*	0.013	-0.092***	-0.027
	[0.031]	[0.033]	[0.026]	[0.031]
Observations	1,270	1,270	1,270	1,270
R-squared	0.032	0.054	0.050	0.065

The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*) (measured as the change in the 10 year Treasury yield) and monetary policy uncertainty (*mpu*) shock. All variables have been normalized to have unit standard deviation. Column (1) has only *mps* as a regressor, while column 2 adds *mpu* to this specification. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.15: Response of international bond yields to monetary shocks, controlling for target and path factor

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
Target	0.429***	0.386***	0.369***	0.260***
	[0.058]	[0.058]	[0.066]	[0.057]
Path	0.254**	0.212	0.543***	0.435***
	[0.119]	[0.138]	[0.171]	[0.145]
mpu		0.086		0.221***
		[0.052]		[0.061]
Constant	-0.103***	-0.061	-0.114**	-0.006
	[0.035]	[0.041]	[0.046]	[0.051]
Observations	4,154	4,154	4,154	4,154
R-squared	0.147	0.153	0.146	0.184

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
Target	0.247***	0.159**	0.224**	0.129*
	[0.054]	[0.048]	[0.071]	[0.058]
Path	0.031	-0.045	0.048	-0.034
	[0.097]	[0.086]	[0.091]	[0.074]
mpu		0.163***		0.175***
		[0.034]		[0.043]
Constant	-0.077**	0.001	-0.107***	-0.023
	[0.030]	[0.034]	[0.028]	[0.030]
Observations	1,270	1,270	1,270	1,270
R-squared	0.044	0.065	0.036	0.060

The table shows the response of 2 and 10 year government bond yields to a target factor shock, path factor shock, and monetary policy uncertainty (*mpu*) shock. All variables have been normalized to have unit standard deviation. Column (1) includes the target and path factors as regressors, while column 2 adds *mpu* to the specification. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.16: Response of international bond yields to monetary shocks (only scheduled FOMC meetings)

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.427***	0.356***	0.448***	0.308***
	[0.074]	[0.078]	[0.068]	[0.069]
mpu		0.110**		0.216***
		[0.051]		[0.062]
Constant	-0.105***	-0.047	-0.137**	-0.022
	[0.036]	[0.043]	[0.048]	[0.055]
Observations	3,978	3,978	3,978	3,978
R-squared	0.125	0.134	0.133	0.167

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.240***	0.132*	0.232**	0.121
	[0.053]	[0.053]	[0.081]	[0.071]
mpu		0.155***		0.160**
		[0.041]		[0.053]
Constant	-0.065	0.016	-0.105**	-0.022
	[0.034]	[0.039]	[0.032]	[0.036]
Observations	1,217	1,217	1,217	1,217
R-squared	0.038	0.055	0.036	0.055

The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*) and monetary policy uncertainty (*mpu*) shock. All variables have been normalized to have unit standard deviation. Column (1) has only *mps* as a regressor, while column 2 adds *mpu* to this specification. The sample consists of 195 scheduled FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.17: Response of international bond yields to monetary shocks controlling for information effect

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.372***	0.336***	0.275***	0.201***
	[0.072]	[0.068]	[0.081]	[0.072]
mpu		0.088		0.181***
		[0.057]		[0.058]
Constant	-0.112**	-0.095*	-0.084	-0.048
	[0.053]	[0.053]	[0.061]	[0.059]
Observations	2,680	2,680	2,680	2,680
R-squared	0.114	0.121	0.074	0.110

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.129**	0.088*	0.128	0.081
	[0.040]	[0.043]	[0.075]	[0.067]
mpu		0.094**		0.111**
		[0.039]		[0.047]
Constant	-0.077*	-0.060	-0.086*	-0.065*
	[0.040]	[0.042]	[0.038]	[0.033]
Observations	739	739	739	739
R-squared	0.014	0.023	0.015	0.028

The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*) and monetary policy uncertainty (*mpu*) shock. *mps* and *mpu* have been purged of information effects in this specification. Each monetary shock is regressed on the difference between Federal Reserve Greenbook forecasts and private sector Blue Chip forecasts of CPI, GDP, and the unemployment rate. The residual from these regressions is taken as an information-robust measure of *mps* and *mpu*. Column (1) has only *mps* as a regressor, while column 2 adds *mpu* to this specification. The sample consists of 204 FOMC announcements from January 1995 to December 2011. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.18: Response of international bond yields to monetary shocks with country fixed-effects

	Advanced countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.410***	0.360***	0.345***	0.221***
	[0.065]	[0.062]	[0.080]	[0.069]
mpu		0.107**		0.264***
		[0.048]		[0.060]
Constant	-0.103***	-0.051	-0.115**	0.014
	[0.033]	[0.040]	[0.047]	[0.053]
Observations	4,154	4,154	4,154	4,154
R-squared	0.140	0.150	0.100	0.157

	Emerging countries			
	2 year yield		10 year yield	
	(1)	(2)	(1)	(2)
mps	0.239***	0.159***	0.215**	0.129*
	[0.051]	[0.043]	[0.070]	[0.057]
mpu		0.160***		0.172***
		[0.039]		[0.046]
Constant	-0.077***	0.000	-0.108***	-0.024
	[0.020]	[0.029]	[0.024]	[0.033]
Observations	1,270	1,270	1,270	1,270
R-squared	0.048	0.069	0.038	0.062

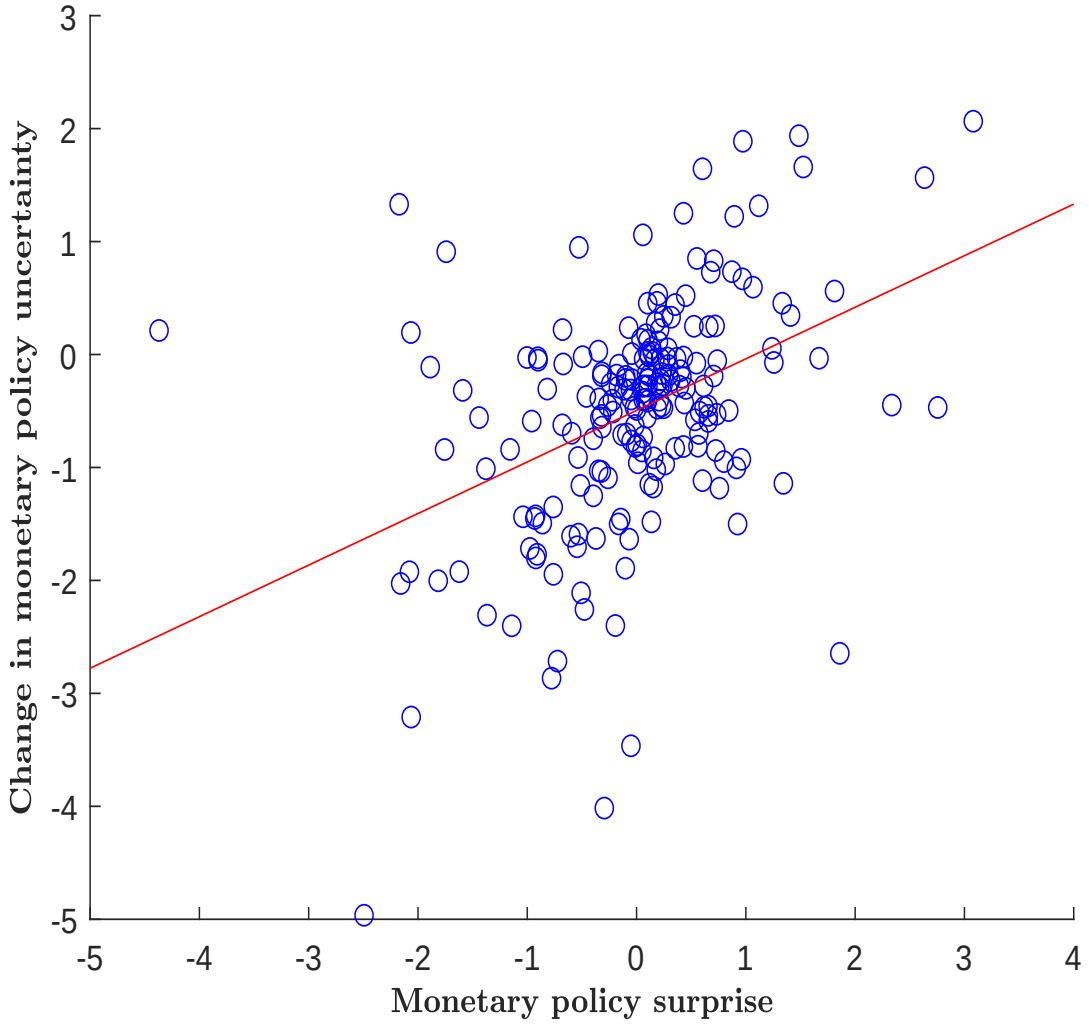
The table shows the response of 2 and 10 year government bond yields to a monetary policy surprise (*mps*) and monetary policy uncertainty (*mpu*) shock, with country fixed effects included in the specification. All variables have been normalized to have unit standard deviation. Column (1) has only *mps* as a regressor, while column 2 adds *mpu* to this specification. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Table A.19: Response of expected component and term premium component of international bond yields to monetary policy uncertainty (pre- and post-crisis samples)

	Jan-1995 to Nov-2007							
Panel (a)	Advanced countries				Emerging countries			
	2y ec	10y ec	2y tp	10y tp	2y ec	10y ec	2y tp	10y tp
mpu	-0.013	-0.011	0.147**	0.206**	0.020	0.017	0.049	0.007
	[0.060]	[0.057]	[0.067]	[0.084]	[0.065]	[0.038]	[0.046]	[0.030]
Panel (b)	Advanced countries				Emerging countries			
	2y ec	10y ec	2y tp	10y tp	2y ec	10y ec	2y tp	10y tp
mpu	0.026	0.024	0.051	0.052	0.025	0.019	0.048	0.006
	[0.050]	[0.055]	[0.046]	[0.061]	[0.071]	[0.042]	[0.052]	[0.032]
US 10y tp	-0.111**	-0.101*	0.276***	0.439***	-0.017	-0.004	0.005	0.001
	[0.046]	[0.052]	[0.053]	[0.063]	[0.032]	[0.024]	[0.042]	[0.042]
	Dec-2007 to Jun-2019							
Panel (c)	Advanced countries				Emerging countries			
	2y ec	10y ec	2y tp	10y tp	2y ec	10y ec	2y tp	10y tp
mpu	-0.012	0.010	0.141*	0.297***	0.192***	0.246***	0.084	0.094
	[0.077]	[0.090]	[0.080]	[0.099]	[0.028]	[0.056]	[0.051]	[0.060]
Panel (d)	Advanced countries				Emerging countries			
	2y ec	10y ec	2y tp	10y tp	2y ec	10y ec	2y tp	10y tp
mpu	0.052	0.051	0.047	0.103	0.214***	0.244***	0.034	0.055
	[0.079]	[0.098]	[0.060]	[0.085]	[0.032]	[0.053]	[0.041]	[0.076]
US 10y tp	-0.139*	-0.089	0.205***	0.422***	-0.049	0.003	0.109**	0.084
	[0.069]	[0.077]	[0.064]	[0.055]	[0.066]	[0.049]	[0.037]	[0.070]

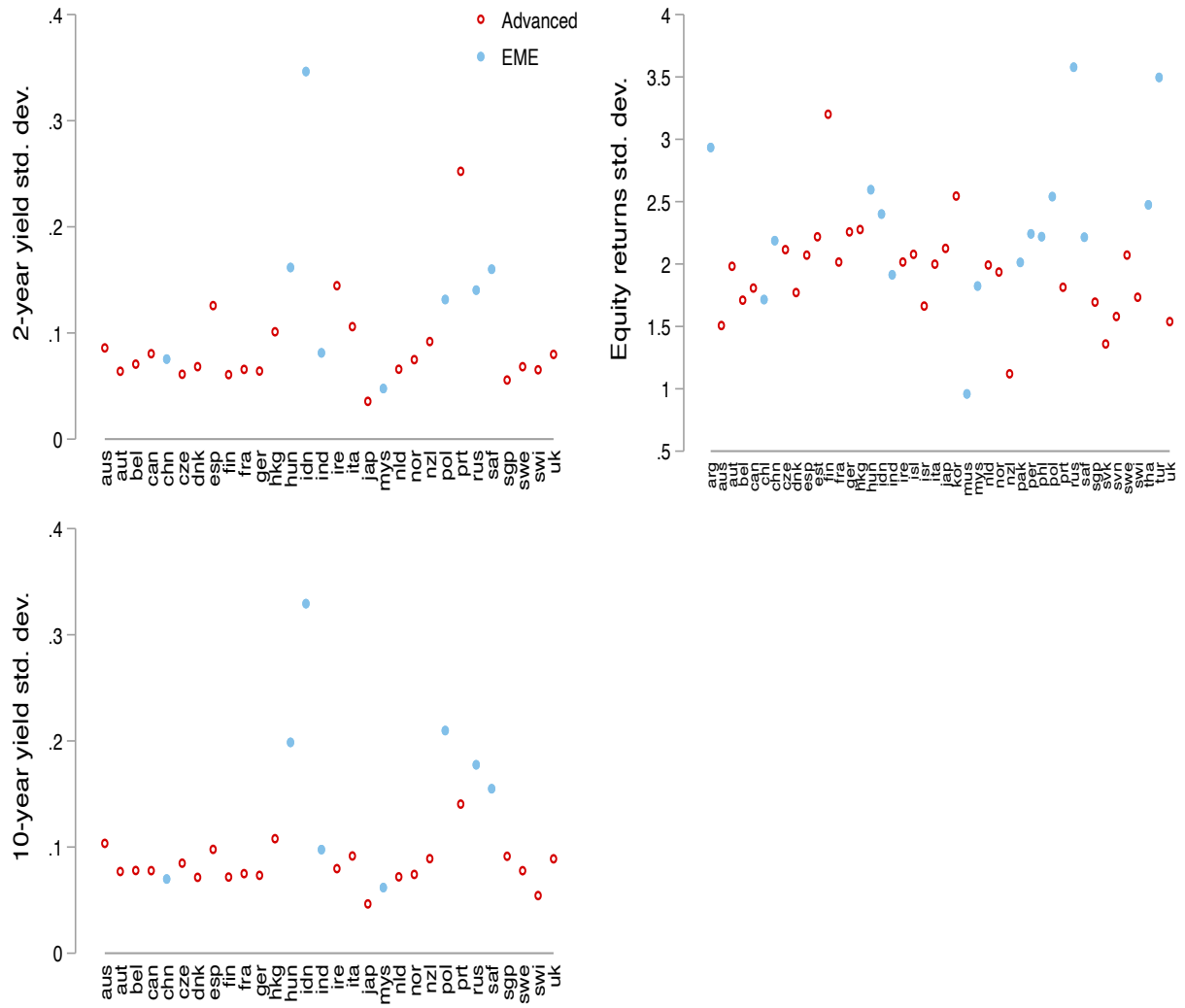
The table shows the response of the expected component (ec) and term premium (tp) of 2 and 10 year government bond yields to a monetary policy uncertainty (*mpu*) shock. Yields are decomposed into the expected component and term premium using the methodology of Joslin et al. (2011). All variables have been normalized to have unit standard deviation. Panels (a) and (b) show results for the pre-crisis sample, consisting of 108 FOMC announcements from January 1995 to November 2007. Panels (c) and (d) show results for the post-crisis sample, consisting of 96 FOMC announcements from December 2007 to June 2019. Panels (a) and (c) report the effects of *mpu* only. Panels (b) and (d) add the US 10 year yield term premium to the specification. All changes are calculated in a two day window around FOMC announcements. Standard errors reported in parentheses are calculated with two-way clustering (along the country and time dimension).

Figure A.1: Correlation between change in monetary policy uncertainty (*mpu*) and monetary policy surprise (*mps*)



The figure plots the monetary policy uncertainty (*mpu*) shock against the monetary policy surprise (*mps*). Both measures are calculated in a two day window around FOMC announcements. The sample consists of 204 FOMC announcements from January 1995 to June 2019. The diagonal line shows the fit from the regression of *mpu* on *mps*.

Figure A.2: Standard deviation of international asset prices

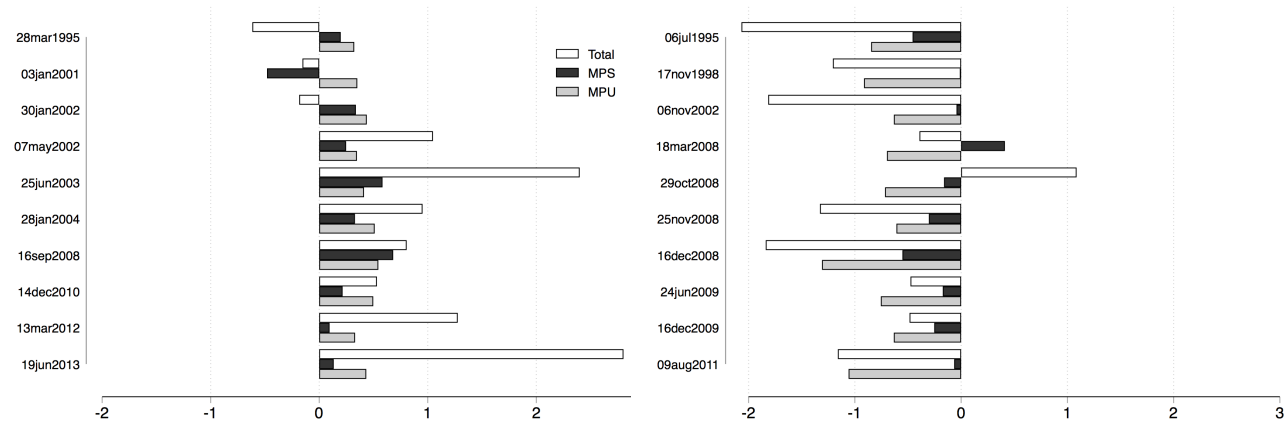


The figure plots the standard deviation of the 2-day change in the 2 and 10 year bond yields and stock market return by country.

Figure A.3: 10 Year Yield Response on Prominent Monetary Policy Uncertainty Dates

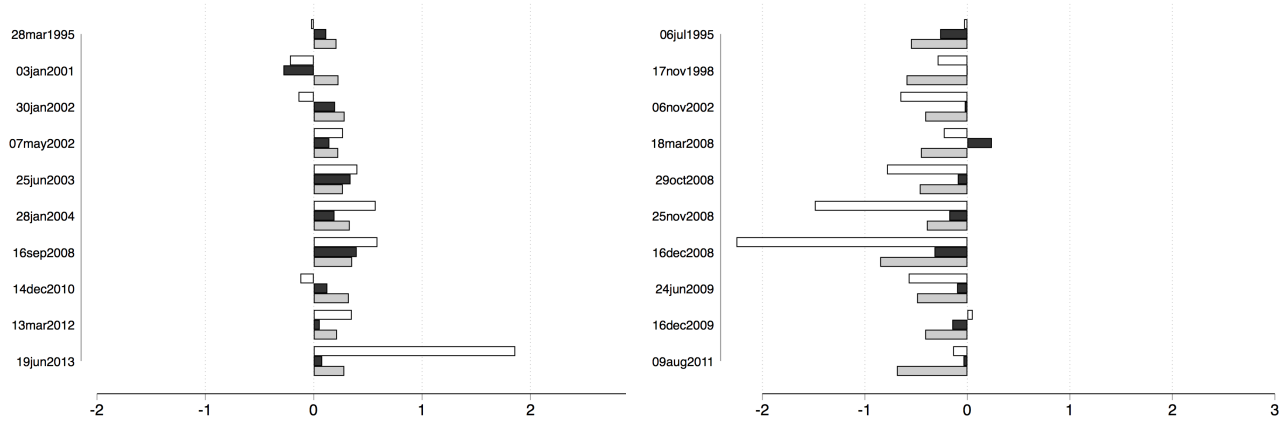
(a) Advanced: MPU Increase Dates

(b) Advanced: MPU Decrease Dates



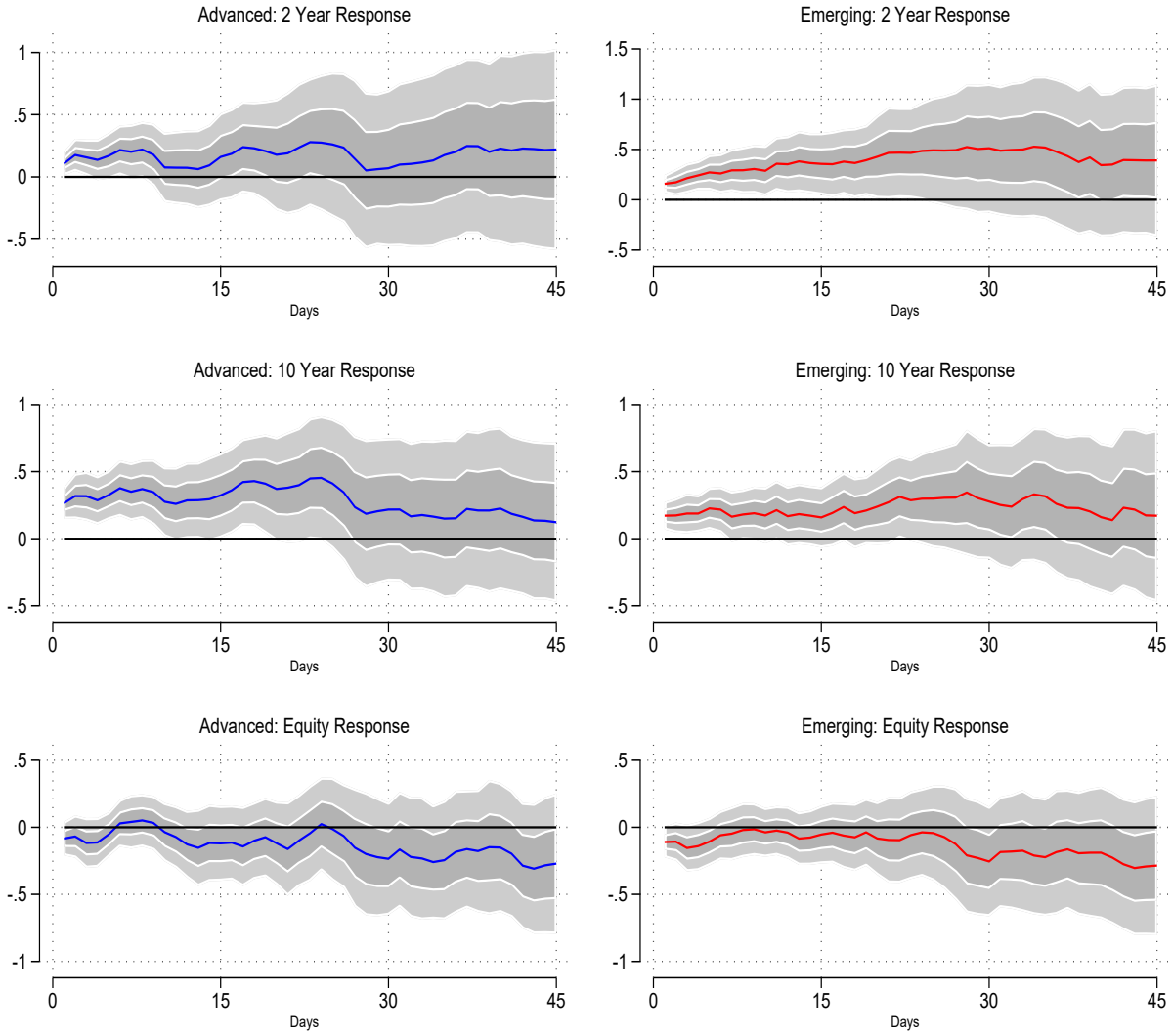
(c) Emerging: MPU Increase Dates

(d) Emerging: MPU Decrease Dates



The figure shows the change in 10 year yields, the change attributable to the monetary policy surprise (*mps*) and the change attributable to the monetary policy uncertainty (*mpu*) shock on FOMC dates with prominent changes in *mpu*. Panel (a) displays the reaction of advanced yields for dates with large *mpu* increases, panel (b) displays the reaction of advanced yields for dates with large *mpu* decreases, panel (c) displays the reaction of emerging yields for dates with large *mpu* increases, and panel (d) displays the reaction of emerging yields for dates with large decreases in *mpu*.

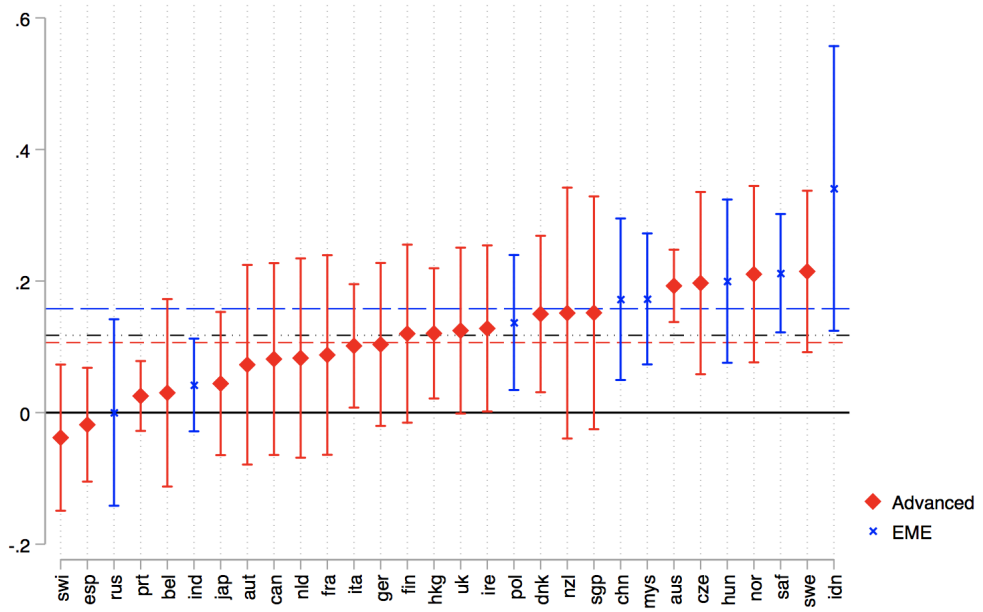
Figure A.4: Persistence of international asset price response to *mpu*



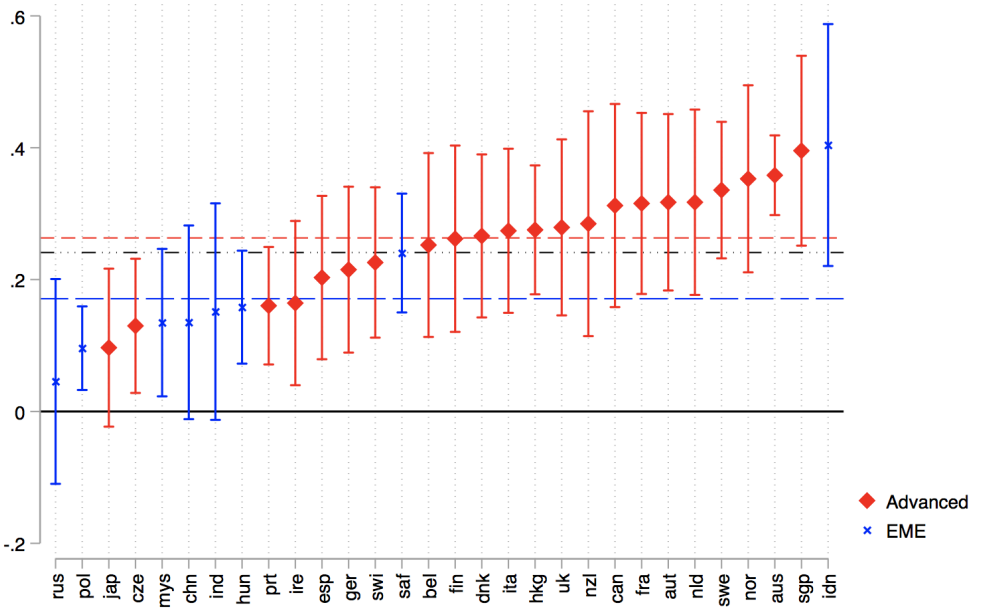
The figure shows the dynamic response of 2 year government bond yields, 10 year month government bond yields, and equity returns to a monetary policy uncertainty (*mpu*) shock over a 45 day horizon. The change in asset prices have been normalized to have unit standard deviation. The sample consists of 204 FOMC announcements from January 1995 to June 2019. *mpu* is calculated over a two day window around FOMC announcements. 95% and 68% confidence bands are constructed from Driscoll and Kraay standard errors.

Figure A.5: Heterogeneity in response to *mpu* across countries

(a) 2 year yields



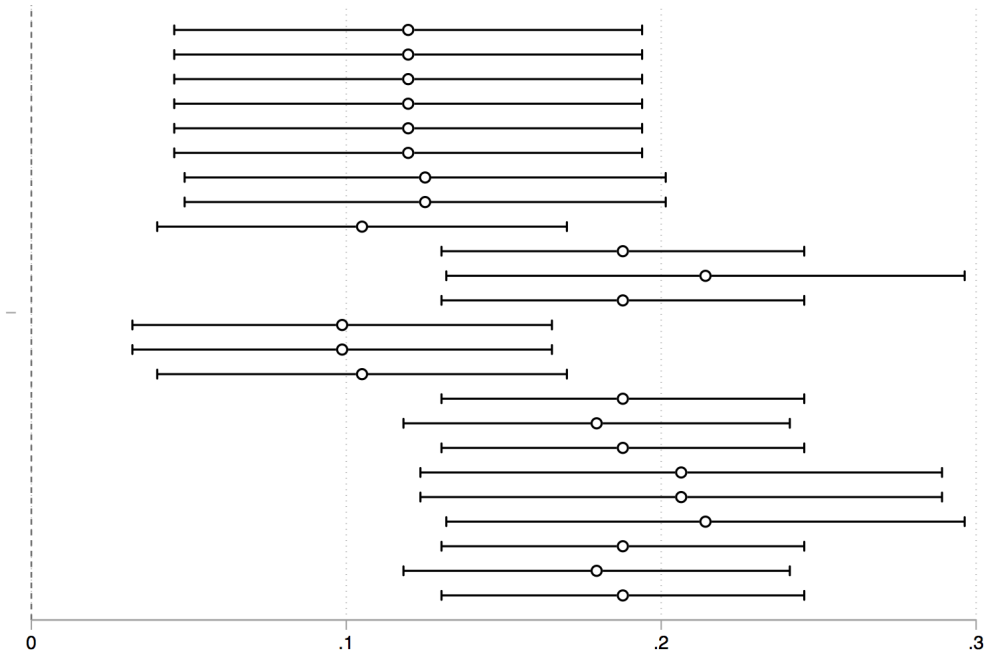
(b) 10 year yields



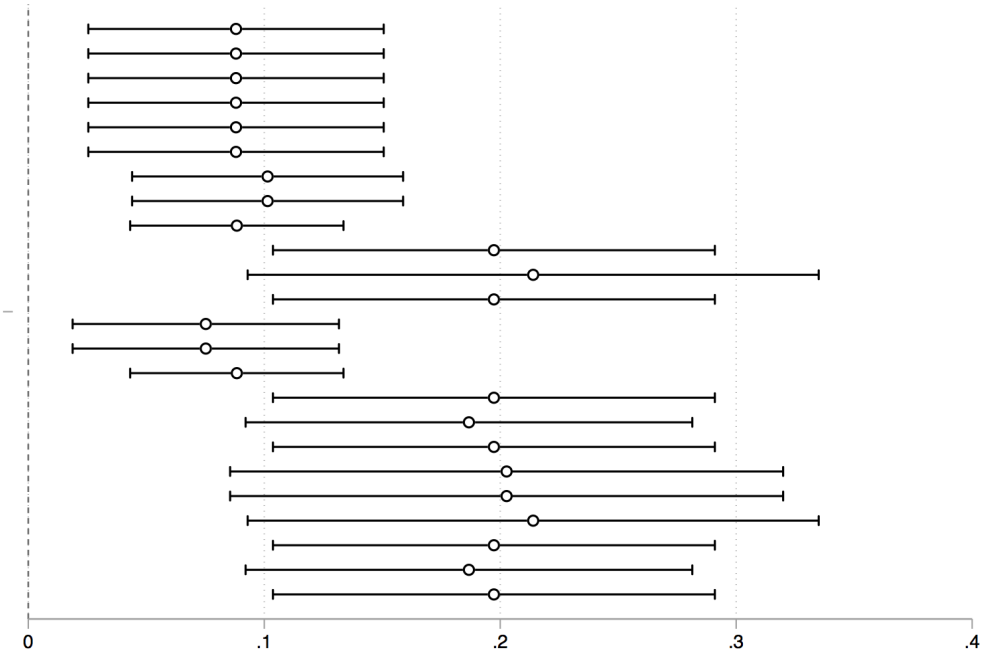
The figure shows country specific responses to a monetary policy uncertainty (*mpu*) shock. Panel (a) shows the response of 2 year yields and panel (b) shows the response of 10 year yields. Coefficients are estimated for the full sample period available for each country. 90% confidence intervals are reported. The dashed-with-3-dots line is the pooled OLS estimate. The long-dashed line is the emerging OLS estimate. The short-dashed line is the advanced OLS estimate.

Figure A.6: Robustness of capital account openness interaction with mpu

(a) 2 year yields



(b) 10 year yields

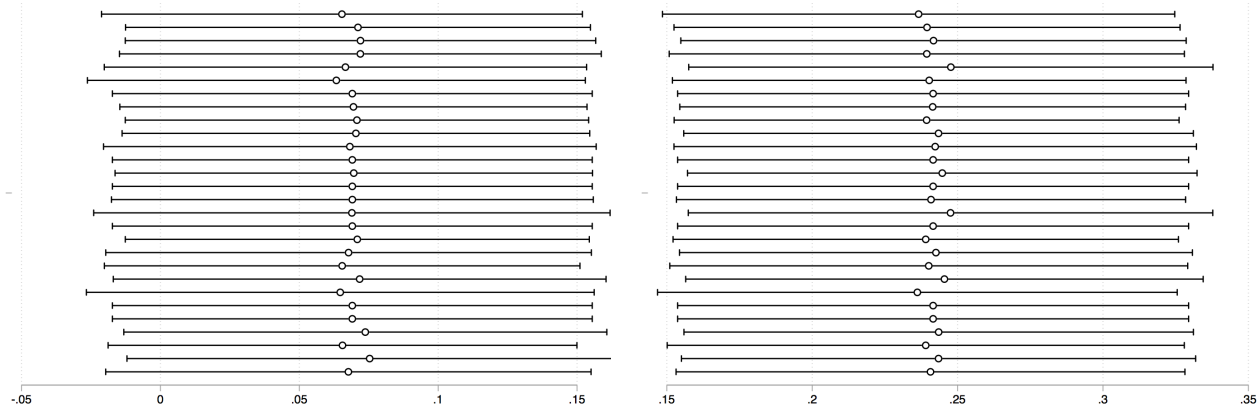


The figure shows the KAopen**mpu* coefficient from Table 9 for the 24 unique variable orderings with financial depth appearing first in the orthogonalization. The top estimate is the baseline specification. 90% confidence intervals are reported.

Figure A.7: 2 and 10 Year Yield Response to Monetary Policy Uncertainty. Dropping One Country at a Time.

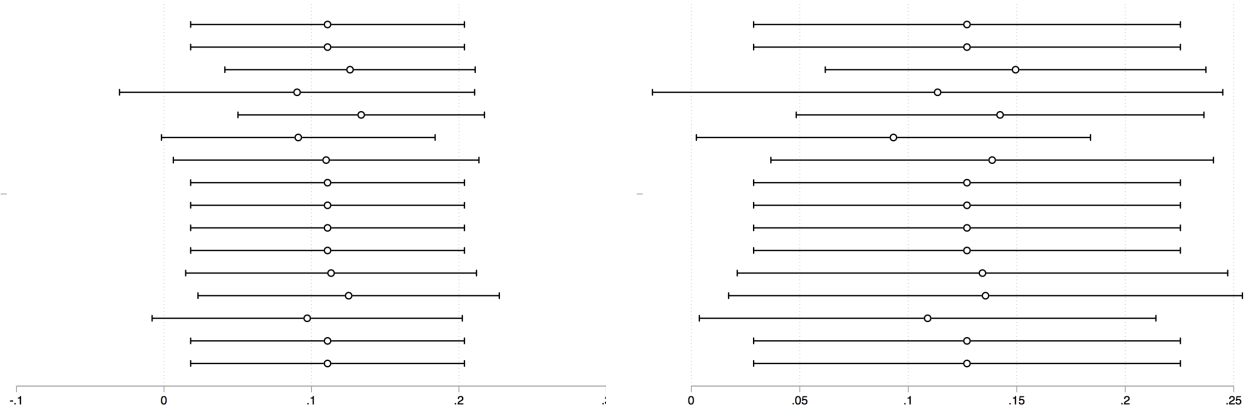
(a) Advanced: 2 Year Yield

(b) Advanced: 10 Year Yield



(c) Emerging: 2 Year Yield

(d) Emerging: 10 Year Yield

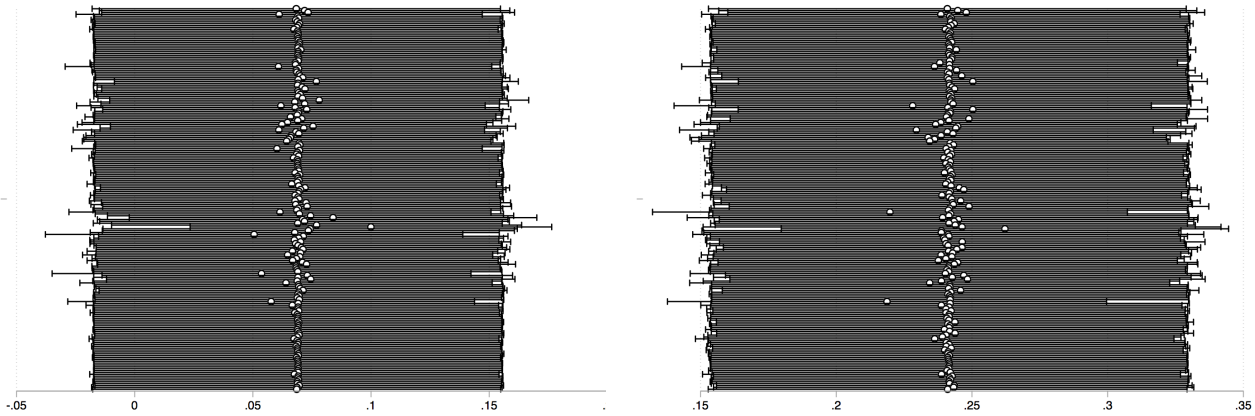


The figure shows the response of 2 and 10 year government bond yields to a monetary policy uncertainty (mpu) shock while dropping one country at a time from the advanced and emerging country samples, respectively. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Confidence intervals are constructed with two-way clustered standard errors (along the country and time dimension).

Figure A.8: 2 and 10 Year Yield Response to Monetary Policy Uncertainty. Dropping One FOMC Date at a TIme.

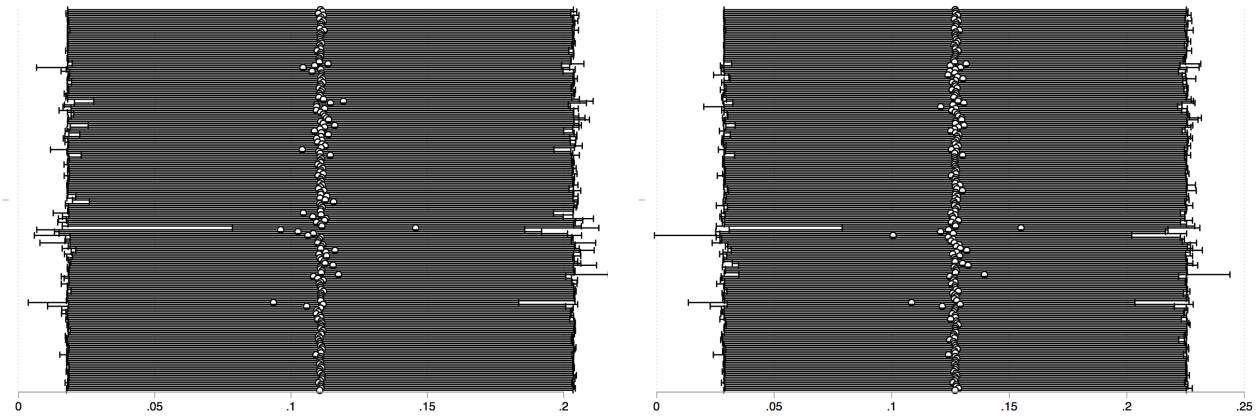
(a) Advanced: 2 Year Yield

(b) Advanced: 10 Year Yield



(c) Emerging: 2 Year Yield

(d) Emerging: 10 Year Yield



The figure shows the response of 2 and 10 year government bond yields to a monetary policy uncertainty (mpu) shock while dropping one FOMC date at a time. The sample consists of 204 FOMC announcements from January 1995 to June 2019. All changes are calculated in a two day window around FOMC announcements. Confidence intervals are constructed with two-way clustered standard errors (along the country and time dimension).

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