

ECB Monetary Policy Spillovers to Middle Eastern and North African Countries

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1 Introduction

Using a simple pooled OLS panel regression model with dummy variables corresponding to ECB monetary policy announcements, this paper seeks to identify spillover effects to a series of financial variables in Middle East and North African (MENA) countries over the period 2008-01-03 to 2017-12-29.

Sample Countries

- Algeria, Bahrain, Egypt, Iraq, Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, Turkey, United Arab Emirates, Yemen

Financial variables of interest

- Foreign Exchange Rates
- Stock Market Indices
- Interbank lending rates (3 months)
- Credit Default Swaps (5 year and 10 year maturities)

ECB Monetary Policy Programs

- Liquidity providing
 - long-term refinancing operations (LTRO)
 - targeted longer-term refinancing operations (TLTRO)
- Asset Purchases
 - covered bond purchase program (CBPP1, CBPP2, CBPP3)
 - securities markets program (SMP)
 - outright monetary transactions (OMT)
 - public sector purchase program (PSPP)

2 Data

All data was retrieved Reuters' Eikon database with the following codes:

Figure 1: Financial Variables of Interest

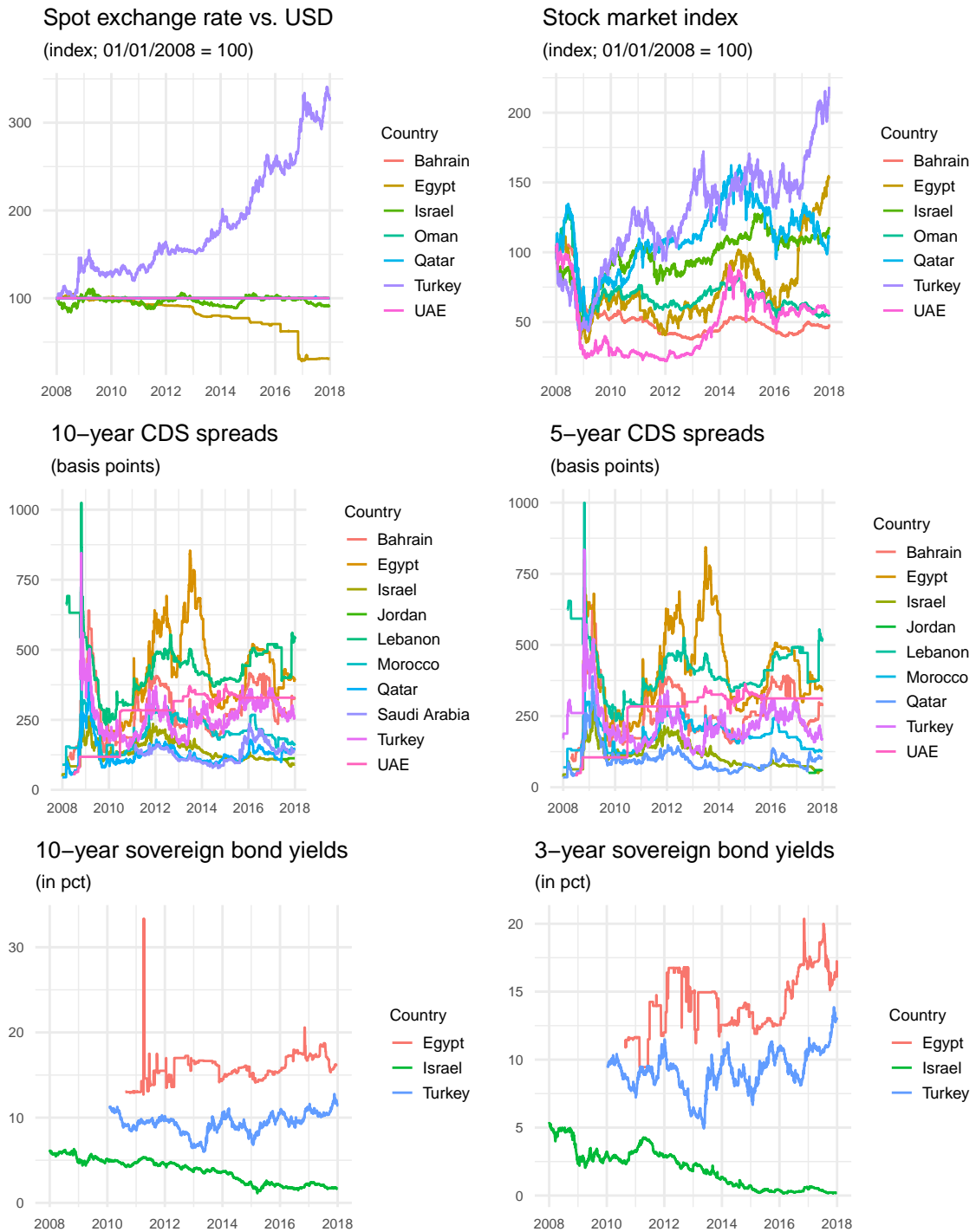


Figure 2: Foreign Exchange Rates

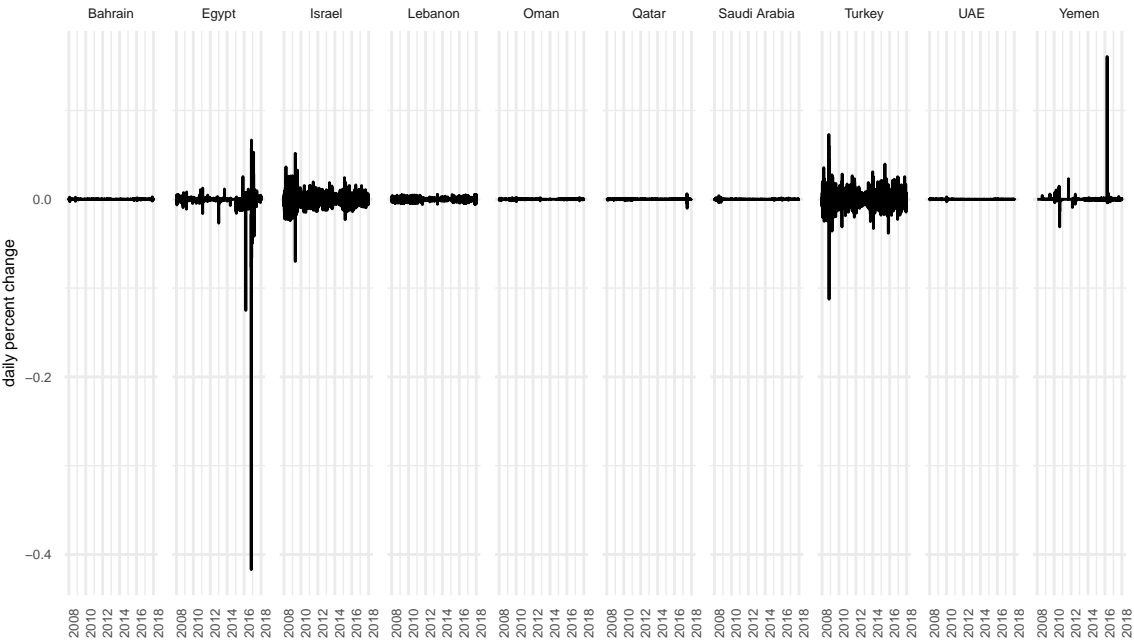


Figure 3: Stock Market Indexes

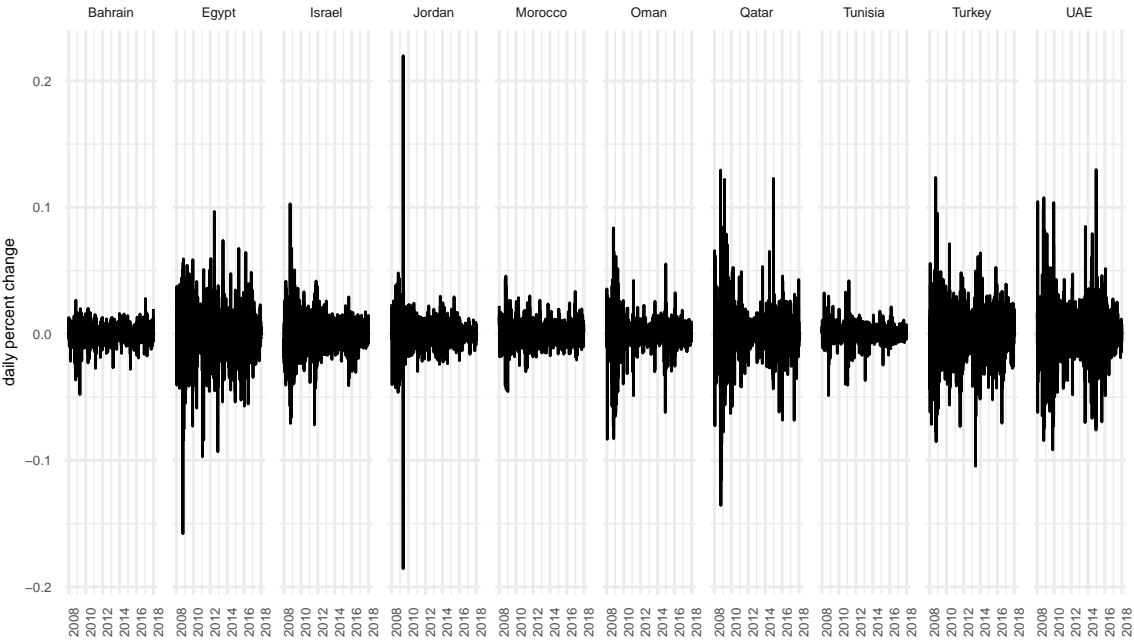


Figure 4: Interbank Rates

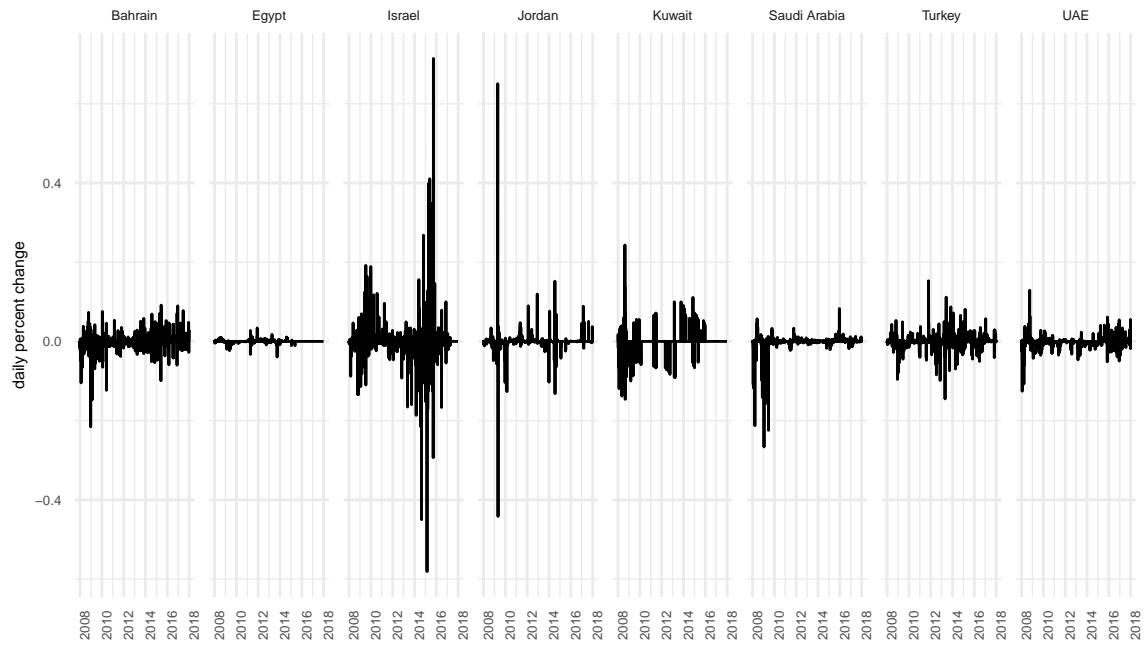


Figure 5: Sovereign Bond Yields

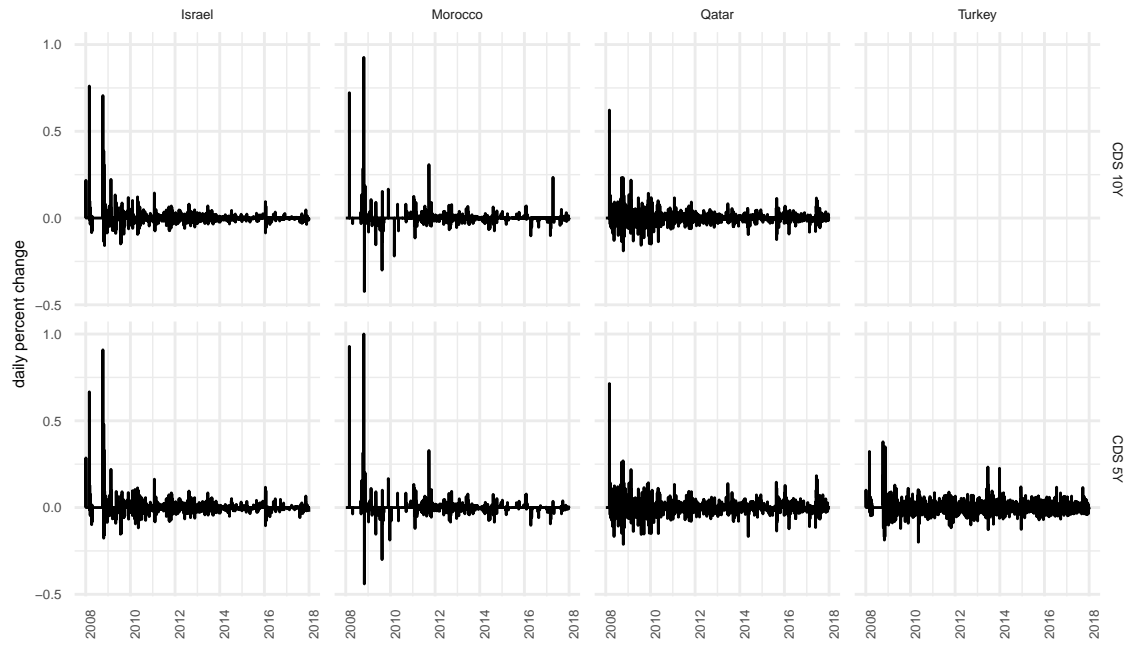
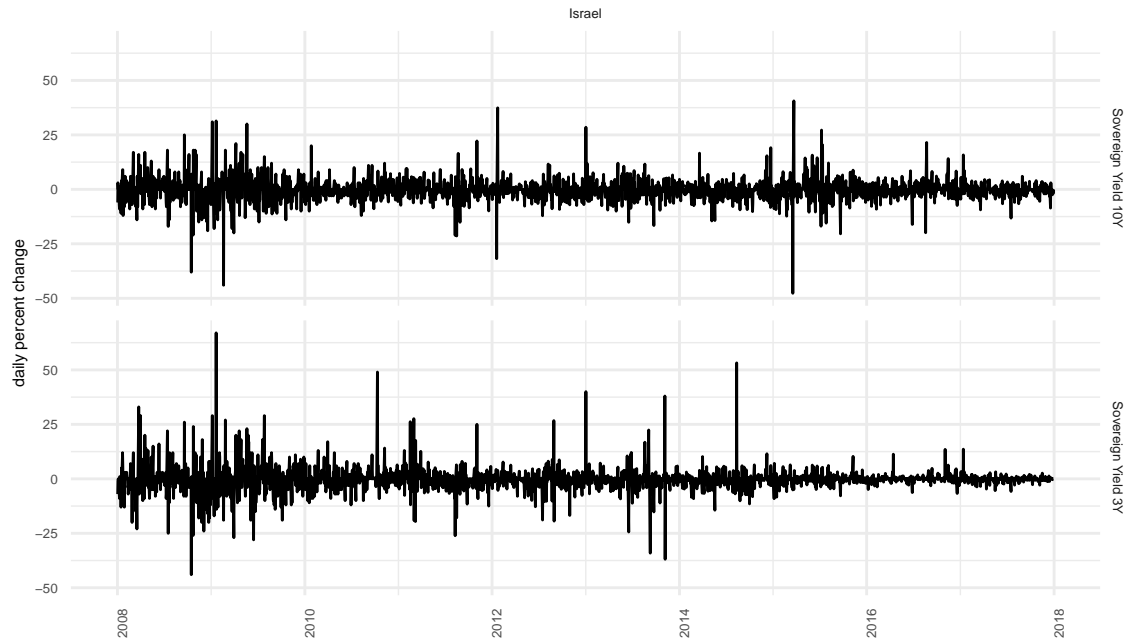


Figure 6: Sovereign Bond Yields



2.1 Missingness

The largest challenge in conducting this analysis is data availability. The use of monetary policy announcement dummy variables on a 1-day window requires daily data for all financial variables of interest. For many countries, only a subset of the financial variables of interest are fully available for the full sample period (2008-01-03 to 2017-12-29). The following chart shows the "missingness" of each variable across all MENA countries. In order to maintain fully balanced panel data samples, only series with no missing values on the sample period were selected for the regressions.

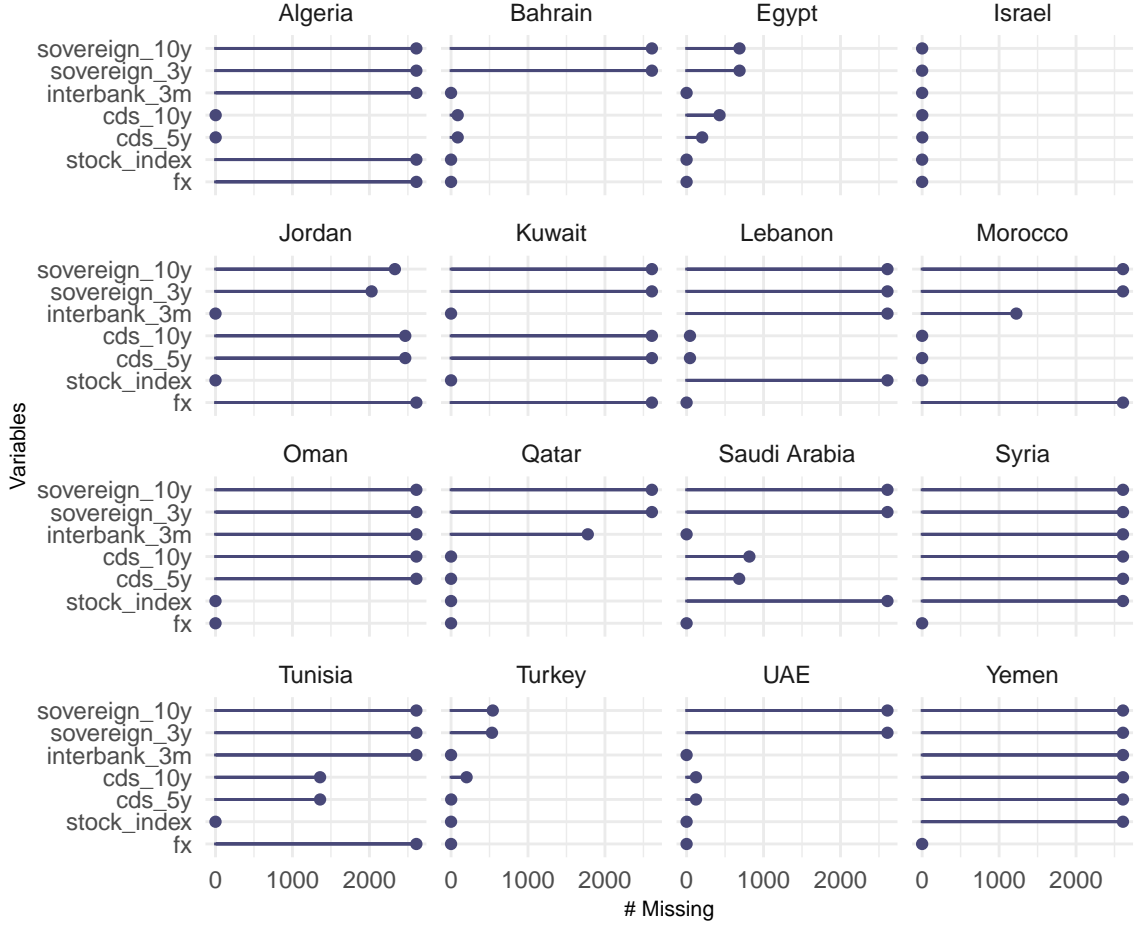


Figure 7: Missing Values in Data by Country and Series

3 Empirical Approach

3.1 Linear Panel Model

The general form of a pooled OLS model can be described through the following specification:

$$y_{it} = \alpha + x_{it}\beta + \epsilon_{it}$$

where $i = 1, \dots, n$ indexes individual countries, $t = 1, \dots, T$ is the time index, and ϵ_{it} is a random disturbance term. The key element of this approach is parameter homogeneity, meaning that the constant α and the estimated coefficient β terms follow $\alpha_{it} = \alpha$ and $\beta_{it} = \beta$ for all i, t .

Following the general form specified above, this analysis employs the following regression:

$$\Delta y_{i,t} = \alpha + \beta_1 MP_t^{ECB} + \beta_2 \Delta IR_t^{ECB} + \beta_3 \Delta VIX_t + \beta_4 y_{i,t-1} + \epsilon_{i,t}$$

where $y_{i,t}$ represents the financial variable of interest, MP_t^{ECB} a vector of monetary policy dummy variables, IR_t^{ECB} the rate on the ECB's marginal lending facility, and VIX_t a volatility index used to control for periods of high volatility in financial markets that may otherwise have falsely attributed spillovers to announcements.

The financial variables of interest were transformed along the following specification:

- Daily change in bps:
 - interbank lending rate
 - ECB marginal lending rate
- Daily discrete rate of changes:
 - exchange rates
 - stock market indices
 - volatility index
 - credit default swaps

4 Results

A panel regression was estimated for each financial variable of interest. Due to data availability, each regression contains only a subset of all MENA countries. The following table indicates which countries were included in each regression.

Table 1: Liquidity-Providing Policy Announcements

	CDS 10Y	CDS 5Y	FX	Interbank Rate	Stock Index
	(1)	(2)	(3)	(4)	(5)
Liquidity.1	−0.001 (0.002)	0.001 (0.002)	−0.000 (0.000)	−0.223 (0.244)	−0.001* (0.000)
VIX	0.033*** (0.004)	0.062*** (0.004)	0.002** (0.001)	1.591*** (0.547)	−0.020*** (0.001)
lag(value, 1)	0.017* (0.010)	0.035*** (0.009)	−0.000 (0.006)	0.093*** (0.007)	0.081*** (0.006)
Observations	10,424	13,030	28,666	20,848	26,060
R ²	0.007	0.019	0.000	0.009	0.022
Adjusted R ²	0.007	0.018	−0.000	0.009	0.021
F Statistic	25.517***	82.012***	2.575*	64.090***	193.273***

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 2: Asset-Purchasing Policy Announcements

	CDS 10Y	CDS 5Y	FX	Interbank Rate	Stock Index
	(1)	(2)	(3)	(4)	(5)
Purchases.1	−0.009*** (0.003)	−0.007** (0.003)	−0.000 (0.001)	−0.289 (0.418)	0.002** (0.001)
VIX	0.033*** (0.004)	0.062*** (0.004)	0.002** (0.001)	1.597*** (0.547)	−0.020*** (0.001)
lag(value, 1)	0.016* (0.010)	0.035*** (0.009)	−0.000 (0.006)	0.093*** (0.007)	0.081*** (0.006)
Observations	10,424	13,030	28,666	20,848	26,060
R ²	0.008	0.019	0.000	0.009	0.022
Adjusted R ²	0.008	0.018	−0.000	0.009	0.021
F Statistic	28.361***	83.623***	2.304*	63.968***	194.433***

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 3: SMP Policy Announcements

	CDS 10Y	CDS 5Y	FX	Interbank Rate	Stock Index
	(1)	(2)	(3)	(4)	(5)
SMP.1	−0.047*** (0.015)	−0.057*** (0.016)	−0.004 (0.003)	0.776 (2.085)	0.014*** (0.004)
VIX	0.032*** (0.004)	0.061*** (0.004)	0.002** (0.001)	1.629*** (0.548)	−0.019*** (0.001)
lag(value, 1)	0.017* (0.010)	0.036*** (0.009)	−0.000 (0.006)	0.093*** (0.007)	0.081*** (0.006)
Observations	10,424	13,030	28,666	20,848	26,060
R ²	0.008	0.020	0.000	0.009	0.022
Adjusted R ²	0.008	0.019	−0.000	0.009	0.022
F Statistic	28.793***	86.518***	2.651**	63.854***	197.294***

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 4: OMT Policy Announcements

	CDS 10Y	CDS 5Y	FX	Interbank Rate	Stock Index
	(1)	(2)	(3)	(4)	(5)
OMT.1	−0.001 (0.007)	−0.005 (0.007)	−0.000 (0.001)	−0.191 (0.931)	0.002 (0.002)
VIX	0.033*** (0.004)	0.062*** (0.004)	0.002** (0.001)	1.610*** (0.547)	−0.020*** (0.001)
lag(value, 1)	0.017* (0.010)	0.035*** (0.009)	−0.000 (0.006)	0.093*** (0.007)	0.081*** (0.006)
Observations	10,424	13,030	28,666	20,848	26,060
R ²	0.007	0.019	0.000	0.009	0.022
Adjusted R ²	0.007	0.018	−0.000	0.009	0.021
F Statistic	25.383***	82.123***	2.140*	63.822***	192.676***

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 5: PSPP Policy Announcements

	CDS 10Y	CDS 5Y	FX	Interbank Rate	Stock Index
	(1)	(2)	(3)	(4)	(5)
PSPP.1	0.000 (0.006)	0.000 (0.006)	−0.000 (0.001)	−0.175 (0.787)	0.000 (0.001)
VIX	0.033*** (0.004)	0.062*** (0.004)	0.002** (0.001)	1.611*** (0.547)	−0.020*** (0.001)
lag(value, 1)	0.017* (0.010)	0.035*** (0.009)	−0.000 (0.006)	0.093*** (0.007)	0.081*** (0.006)
Observations	10,424	13,030	28,666	20,848	26,060
R ²	0.007	0.019	0.000	0.009	0.022
Adjusted R ²	0.007	0.018	−0.000	0.009	0.021
F Statistic	25.381***	81.981***	2.162*	63.824***	192.228***

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 6: CBPP Policy Announcements

	FX	Interbank Rate	Stock Index	CDS 10Y	CDS 5Y
	(1)	(2)	(3)	(4)	(5)
CBPP.1	-0.000 (0.001)	-0.004** (0.002)	0.001 (0.001)	-0.010* (0.006)	-0.010* (0.005)
VIX	0.002** (0.001)	0.001 (0.002)	-0.020*** (0.001)	0.046*** (0.004)	0.080*** (0.004)
lag(value, 1)	-0.000 (0.006)	0.013* (0.007)	0.081*** (0.006)	0.022** (0.011)	0.052*** (0.010)
Observations	28,677	20,856	26,070	7,820	10,426
R ²	0.000	0.000	0.022	0.015	0.035
Adjusted R ²	-0.000	-0.000	0.021	0.014	0.035
F Statistic	2.226*	3.164**	193.235***	38.954***	127.591***

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 7: ABSPP Policy Announcements

	CDS 10Y	CDS 5Y	FX	Interbank Rate	Stock Index
	(1)	(2)	(3)	(4)	(5)
ABSPP.1	0.002 (0.006)	0.003 (0.006)	0.000 (0.001)	0.583 (0.850)	-0.001 (0.002)
VIX	0.033*** (0.004)	0.062*** (0.004)	0.002** (0.001)	1.623*** (0.547)	-0.020*** (0.001)
lag(value, 1)	0.017* (0.010)	0.035*** (0.009)	-0.000 (0.006)	0.093*** (0.007)	0.081*** (0.006)
Observations	10,424	13,030	28,666	20,848	26,060
R ²	0.007	0.019	0.000	0.009	0.022
Adjusted R ²	0.007	0.018	-0.000	0.009	0.021
F Statistic	25.409***	82.040***	2.193*	63.966***	192.400***

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 8: CSPP Policy Announcements

	CDS 10Y	CDS 5Y	FX	Interbank Rate	Stock Index
	(1)	(2)	(3)	(4)	(5)
CSPP.1	-0.003 (0.007)	-0.002 (0.007)	-0.000 (0.001)	-0.192 (0.930)	0.001 (0.002)
VIX	0.033*** (0.004)	0.062*** (0.004)	0.002** (0.001)	1.614*** (0.547)	-0.020*** (0.001)
lag(value, 1)	0.017* (0.010)	0.035*** (0.009)	-0.000 (0.006)	0.093*** (0.007)	0.081*** (0.006)
Observations	10,424	13,030	28,666	20,848	26,060
R ²	0.007	0.019	0.000	0.009	0.022
Adjusted R ²	0.007	0.018	-0.000	0.009	0.021
F Statistic	25.464***	82.012***	2.143*	63.822***	192.258***

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.