Table OA2a. Foreign Exchange Market Positions and Dealer Leverage
Foreign Dealers: USD Contracts
Monthly

	(1) calls purchased foreign dlrs	(2) calls sold foreign dlrs	(3) puts purchased foreign dlrs	(4) puts sold foreign dlrs
contemporaneous chg log s.t. borrowing, foreign	0.465*	0.443*	0.823***	0.697***
	(1.83)	(1.71)	(3.09)	(2.69)
lag chg log s.t. borrowing, foreign	0.574**	0.589**	0.499**	0.547**
	(2.27)	(2.35)	(2.18)	(2.36)
lag Fed Funds rate	-1.001	-1.046	-1.298	-1.447
	(-1.07)	(-1.13)	(-1.29)	(-1.39)
lag chg Fed Funds rate	6.132	5.900	5.150	3.632
	(1.43)	(1.29)	(1.01)	(0.71)
lag chg in VIX	-0.190	-0.132	-0.330	-0.291
	(-0.43)	(-0.30)	(-0.79)	(-0.66)
lag VIX	-0.127	-0.181	-0.027	-0.135
	(-0.46)	(-0.58)	(-0.09)	(-0.40)
lag log Fed QE purchases	-0.012	-0.012	0.001	0.002
	(-0.93)	(-0.93)	(0.34)	(0.35)
lag chg log value USD calls purchased, foreign	-0.319**			
	(-2.52)			
lag chg log value USD calls sold, foreign		-0.303**		
		(-2.47)		
lag chg log value USD puts purchased, foreign			-0.185	
			(-1.47)	
lag chg log value USD puts sold, foreign				-0.186
				(-1.53)
Constant	0.044	0.055	0.026	0.050
	(0.66)	(0.77)	(0.36)	(0.64)
r2				
p	0.067	0.090	0.002	0.004
N	105	105	105	105

t statistics in parentheses

Note: The results in Table OA2 correspond to the summary Table 12 in the paper. The dependent variable is the change in the log value of contracts of type listed in column header. Regressions use Newey-West standard errors with 3 lags. Short-term borrowing is the aggregate overnight and continuing repurchase agreements and securities lending agreements of the specified subset of primary dealers in the United States.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table OA2b. Foreign Exchange Market Positions and Dealer Leverage
Foreign Dealers: USD Contracts
Monthly

	(1) swaps purchased foreign dlrs	(2) swaps sold foreign dlrs	(3) futures purchased foreign dlrs	(4) futures sold foreign dlrs
contemporaneous chg log s.t. borrowing, foreign	1.210***	1.198***	2.764***	2.485***
	(7.47)	(7.61)	(2.97)	(2.76)
lag chg log s.t. borrowing, foreign	0.439***	0.458***	1.334**	1.520**
	(2.72)	(2.85)	(2.04)	(2.38)
lag Fed Funds rate	-0.448	-0.352	0.962	0.742
	(-0.94)	(-0.77)	(0.37)	(0.39)
lag chg Fed Funds rate	3.036	2.840	1.808	5.430
	(0.98)	(0.95)	(0.18)	(0.52)
lag chg in VIX	0.342*	0.311*	-1.600*	-0.309
	(1.87)	(1.73)	(-1.76)	(-0.34)
lag VIX	0.059	0.063	0.501	0.261
	(0.62)	(0.67)	(0.50)	(0.30)
lag log Fed QE purchases	0.016***	0.016***	-0.009	0.002
	(5.43)	(5.05)	(-0.89)	(0.20)
lag chg log value USD swaps purchased, foreign	-0.482***			
	(-7.89)			
lag chg log value USD swaps sold, foreign		-0.500***		
		(-8.04)		
lag chg log value USD futures purchased, foreign			-0.324***	
			(-2.79)	
lag chg log value USD futures sold, foreign				-0.458***
				(-4.90)
Constant	-0.003	-0.006	-0.159	-0.109
	(-0.13)	(-0.24)	(-0.64)	(-0.54)
r2				
p	0.000	0.000	0.001	0.000
N	105	105	105	105

t statistics in parentheses

Note: Note: The results in Table OA2 correspond to the summary Table 12 in the paper. The dependent variable is the change in the log value of contracts of type listed in column header. Regressions use Newey-West standard errors with 3 lags. Short-term borrowing is the aggregate overnight and continuing repurchase agreements and securities lending agreements of the specified subset of primary dealers in the United States. Swaps contracts purchased or sold includes spot and forward contracts.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table OA2c. Foreign Exchange Market Positions and Dealer Leverage
Domestic Dealers: USD Contracts
Monthly

	(1) calls purchased domestic dlrs	(2) calls sold domestic dlrs	(3) puts purchased domestic dlrs	(4) puts sold domestic dlrs
contemporaneous chg log s.t. borrowing, domestic	-0.357*	-0.423*	-0.458	-0.334
	(-1.67)	(-1.68)	(-1.55)	(-1.21)
lag chg log s.t. borrowing, domestic	0.085	0.451**	0.096	0.695**
	(0.47)	(2.50)	(0.45)	(2.44)
lag Fed Funds rate	0.941	0.774	0.966*	1.833*
	(1.46)	(1.47)	(1.67)	(1.84)
lag chg Fed Funds rate	2.827	-3.005	-0.034	-2.031
	(1.34)	(-0.69)	(-0.01)	(-0.36)
lag chg in VIX	0.297	-0.467	-0.205	-1.054*
	(1.31)	(-0.98)	(-0.39)	(-1.84)
lag VIX	-0.341***	-0.356***	-0.411***	-0.183
	(-2.65)	(-2.69)	(-2.64)	(-1.17)
lag log Fed QE purchases	-0.006**	-0.013**	-0.002	0.002
	(-2.30)	(-2.48)	(-0.39)	(0.50)
lag chg log value USD calls purchased, domestic	-0.662***			
	(-4.53)			
lag chg log value USD calls sold, domestic		-0.317*		
		(-1.92)		
lag chg log value USD puts purchased, domestic			-0.485***	
			(-3.34)	
lag chg log value USD puts sold, domestic				-0.475***
				(-2.66)
Constant	0.062*	0.066**	0.071*	0.011
	(1.88)	(2.07)	(1.87)	(0.27)
r2				
p	0.000	0.000	0.000	0.000
N	105	105	105	105

t statistics in parentheses

Note: The results in Table OA2 correspond to the summary Table 12 in the paper. The dependent variable is the change in the log value of contracts of type listed in column header. Regressions use Newey-West standard errors with 3 lags. Short-term borrowing is the aggregate overnight and continuing repurchase agreements and securities lending agreements of the specified subset of primary dealers in the United States.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table OA2d. Foreign Exchange Market Positions and Dealer Leverage
Domestic Dealers: USD Contracts
Monthly

	(1) swaps purchased domestic dlrs	(2) swaps sold domestic dlrs	(3) futures purchased domestic dlrs	(4) futures sold domestic dlrs
contemporaneous chg log s.t. borrowing, domestic	-0.067	-0.073	0.562*	-0.270
	(-0.57)	(-0.62)	(1.69)	(-0.55)
lag chg log s.t. borrowing, domestic	0.244**	0.232**	0.107	-0.127
	(2.32)	(2.17)	(0.35)	(-0.30)
lag Fed Funds rate	0.313	0.334	-0.112	-0.366
	(1.18)	(1.27)	(-0.16)	(-0.33)
lag chg Fed Funds rate	-1.419	-1.415	-15.668***	12.447
	(-0.67)	(-0.67)	(-2.66)	(1.53)
lag chg in VIX	0.009	0.015	0.156	-0.287
	(0.07)	(0.11)	(0.33)	(-0.44)
lag VIX	-0.131	-0.133	-0.273	-0.294
	(-1.15)	(-1.26)	(-1.34)	(-0.62)
lag log Fed QE purchases	0.007***	0.007***	0.021***	0.013
	(3.59)	(3.62)	(5.51)	(1.51)
lag chg log value USD swaps purchased, domestic	-0.440***			
	(-4.11)			
lag chg log value USD swaps sold, domestic		-0.434***		
		(-3.93)		
lag chg log value USD futures purchased, domestic			-0.247***	
			(-3.95)	
lag chg log value USD futures sold, domestic				-0.257***
				(-3.10)
Constant	0.033	0.033	0.049	0.065
	(1.37)	(1.44)	(0.99)	(0.64)
r2				
p	0.000	0.000	0.000	0.012
N	105	105	105	105

t statistics in parentheses

Note: Note: The results in Table OA2 correspond to the summary Table 12 in the paper. The dependent variable is the change in the log value of contracts of type listed in column header. Regressions use Newey-West standard errors with 3 lags. Short-term borrowing is the aggregate overnight and continuing repurchase agreements and securities lending agreements of the specified subset of primary dealers in the United States. Swaps contracts purchased or sold includes spot and forward contracts.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table OA2e. Foreign Exchange Market Positions and Dealer Leverage
Foreign Dealers: Foreign Currency Contracts
Monthly

	(1) calls purchased foreign dlrs	(2) calls sold foreign dlrs	(3) puts purchased foreign dlrs	(4) puts sold foreign dlrs
contemporaneous chg log s.t. borrowing, foreign	0.779*	0.683	0.673	0.629
	(2.53)	(2.12)	(2.03)	(1.90)
lag chg log s.t. borrowing, foreign	0.448	0.481	0.561	0.630
	(1.47)	(1.70)	(1.80)	(2.05)
lag Fed Funds rate	-0.956	-1.117	-0.571	-0.650
	(-1.24)	(-1.38)	(-0.43)	(-0.49)
lag chg Fed Funds rate	13.484**	12.410*	6.112	5.644
	(2.89)	(2.50)	(1.32)	(1.12)
lag chg in VIX	-0.311	-0.229	-0.832	-0.794
	(-1.17)	(-0.67)	(-1.65)	(-1.49)
lag VIX	-0.083	-0.207	-0.009	-0.061
	(-0.38)	(-0.78)	(-0.03)	(-0.20)
lag log Fed QE purchases	0.005	0.006	-0.010	-0.012
	(0.98)	(1.02)	(-1.27)	(-1.42)
Lag chg log value FX calls purchased, foreign	-0.262*			
	(-2.40)			
Lag chg log value FX calls sold, foreign		-0.260**		
		(-2.90)		
Lag chg log value FX puts purchased, foreign			-0.345*	
			(-2.62)	
Lag chg log value FX puts sold, foreign				-0.347*
				(-2.72)
r2	0.142	0.134	0.163	0.166
p	0.142	0.134	0.221	0.277
N	525	525	525	525

t statistics in parentheses

Note: The results in Table OA2 correspond to the summary Table 12 in the paper. The dependent variable is the change in the log value of contracts of type listed in column header. Foreign currency contract variables are a panel of separate observations for positions in EUR, JPY, GBP, CHF, and CAD. Standard errors are clustered by time and currency. Short-term borrowing is the aggregate overnight and continuing repurchase agreements and securities lending agreements of the specified subset of primary dealers in the United States.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table OA2f. Foreign Exchange Market Positions and Dealer Leverage
Foreign Dealers: Foreign Currency Contracts
Monthly

	(1) swaps purchased foreign dlrs	(2) swaps sold foreign dlrs	(3) futures purchased foreign dlrs	(4) futures sold foreign dlrs
contemporaneous chg log s.t. borrowing, foreign	1.401***	1.403***	5.084***	3.483**
	(8.37)	(8.65)	(6.11)	(3.02)
lag chg log s.t. borrowing, foreign	0.396**	0.372*	2.684*	0.547
	(2.89)	(2.66)	(2.51)	(0.64)
lag Fed Funds rate	-0.689	-0.714	4.574	3.159
	(-0.96)	(-1.00)	(1.81)	(1.25)
lag chg Fed Funds rate	4.012	4.305	12.691	9.321
	(1.00)	(1.05)	(0.83)	(0.56)
lag chg in VIX	0.406	0.434	-2.353	-2.105
	(1.87)	(1.97)	(-2.06)	(-1.35)
lag VIX	0.046	0.057	2.524**	1.517
	(0.33)	(0.41)	(3.44)	(1.64)
lag log Fed QE purchases	0.016***	0.017***	-0.032**	-0.026
	(5.01)	(5.34)	(-3.06)	(-1.78)
Lag chg log value FX swaps purchased, foreign	-0.389***			
	(-7.10)			
Lag chg log value FX swaps sold, foreign		-0.379***		
		(-6.51)		
Lag chg log value FX futures purchased, foreign			-0.292**	
			(-3.78)	
Lag chg log value FX futures sold, foreign				-0.110
				(-1.10)
r2	0.492	0.488	0.197	0.086
p	0.492	0.488	0.010	0.291
N	525	525	525	525

t statistics in parentheses

Note: The results in Table OA2 correspond to the summary Table 12 in the paper. The dependent variable is the change in the log value of contracts of type listed in column header. Foreign currency contract variables are a panel of separate observations for positions in EUR, JPY, GBP, CHF, and CAD. Standard errors are clustered by time and currency. Short-term borrowing is the aggregate overnight and continuing repurchase agreements and securities lending agreements of the specified subset of primary dealers in the United States. Swaps contracts purchased or sold includes spot and forward contracts.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table OA2g. Foreign Exchange Market Positions and Dealer Leverage
Domestic Dealers: Foreign Currency Contracts
Monthly

	(1) calls purchased domestic dlrs	(2) calls sold domestic dlrs	(3) puts purchased domestic dlrs	(4) puts sold domestic dlrs
contemporaneous chg log s.t. borrowing, domestic	0.082	0.237	0.338*	0.180
	(0.59)	(1.38)	(2.18)	(1.65)
lag chg log s.t. borrowing, domestic	0.036	0.082	0.164	0.160
	(0.24)	(0.57)	(1.02)	(1.22)
lag Fed Funds rate	0.012	-0.061	0.028	0.109
	(0.03)	(-0.14)	(0.06)	(0.25)
lag chg Fed Funds rate	-1.047	-4.986	-5.729	-1.157
	(-0.50)	(-0.94)	(-1.15)	(-0.76)
lag chg in VIX	0.018	-0.476	-0.568	-0.046
	(0.12)	(-1.26)	(-1.36)	(-0.46)
lag VIX	-0.267*	-0.291*	-0.223	-0.188*
	(-2.74)	(-2.71)	(-1.92)	(-2.18)
lag log Fed QE purchases	0.001	-0.001	-0.000	-0.001
	(0.40)	(-0.21)	(-0.15)	(-0.31)
Lag chg log value FX calls purchased, domestic	-0.184			
	(-1.73)			
Lag chg log value FX calls sold, domestic		-0.057		
		(-1.37)		
Lag chg log value FX puts purchased, domestic			-0.084*	
			(-2.35)	
Lag chg log value FX puts sold, domestic				-0.205
				(-2.07)
r2	0.082	0.050	0.064	0.086
p	0.057	0.050	0.064	0.086
N	525	525	525	525

t statistics in parentheses

Note: The results in Table OA2 correspond to the summary Table 12 in the paper. The dependent variable is the change in the log value of contracts of type listed in column header. Foreign currency contract variables are a panel of separate observations for positions in EUR, JPY, GBP, CHF, and CAD. Standard errors are clustered by time and currency. Short-term borrowing is the aggregate overnight and continuing repurchase agreements and securities lending agreements of the specified subset of primary dealers in the United States.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table OA2h. Foreign Exchange Market Positions and Dealer Leverage
Domestic Dealers: Foreign Currency Contracts
Monthly

	(1) swaps purchased domestic dlrs	(2) swaps sold domestic dlrs	(3) futures purchased domestic dlrs	(4) futures sold domestic dlrs
contemporaneous chg log s.t. borrowing, domestic	-0.116	-0.108	-1.673	0.750
	(-1.01)	(-0.98)	(-1.60)	(1.08)
lag chg log s.t. borrowing, domestic	0.292*	0.289*	0.075	0.766
	(2.36)	(2.44)	(0.16)	(1.79)
lag Fed Funds rate	0.142	0.130	-0.914	-0.409
	(0.47)	(0.44)	(-0.38)	(-0.38)
lag chg Fed Funds rate	-1.762	-1.687	7.705	-4.765
	(-1.04)	(-1.00)	(0.49)	(-0.39)
lag chg in VIX	0.070	0.072	-1.405	-1.055
	(0.53)	(0.54)	(-1.19)	(-1.08)
lag VIX	-0.154	-0.155	-1.358	-0.289
	(-1.37)	(-1.38)	(-1.10)	(-0.50)
lag log Fed QE purchases	0.010***	0.010***	0.017	0.015
	(4.61)	(4.77)	(0.73)	(1.00)
Lag chg log value FX swaps purchased, domestic	-0.422***			
	(-6.31)			
Lag chg log value FX swaps sold, domestic		-0.416***		
		(-6.12)		
Lag chg log value FX futures purchased, domestic			-0.211	
			(-1.94)	
Lag chg log value FX futures sold, domestic				-0.279***
				(-7.55)
r2	0.231	0.228	0.089	0.091
p	0.017	0.015	0.164	0.025
N	525	525	525	525

t statistics in parentheses

Note: The results in Table OA2 correspond to the summary Table 12 in the paper. The dependent variable is the change in the log value of contracts of type listed in column header. Foreign currency contract variables are a panel of separate observations for positions in EUR, JPY, GBP, CHF, and CAD. Standard errors are clustered by time and currency. Short-term borrowing is the aggregate overnight and continuing repurchase agreements and securities lending agreements of the specified subset of primary dealers in the United States. Swaps contracts purchased or sold includes spot and forward contracts.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$