ONLINE APPENDIX

A Forecasting Analysis of Risk-Neutral Equity and Treasury Volatilities

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Out-of-Sample Competing Performance of VIX^2 and $MOVE^2$

In Tables A.1 to A.5 shown below, we report the detailed results discussed in the out-of-sample analysis of Section 5. All tables have the same structure. For each horizon, we present in-sample and out-of-sample results for the same competing predictors. In the first panel, for a given horizon, we show the in-sample evidence with a regression of two independent variables, namely each of the competing predictors and either VIX^2 or $MOVE^2$. In the second panel, again for a given horizon, we report the pairwise out-of-sample forecasting comparison. That is to say, we compare either VIX^2 or $MOVE^2$ against each of the competitors and report the *RMSE* and the corresponding *p*-values.

With respect to the forecasting of real activity reported in Table A.1, *DEF*, *HJ* volatility bound and *TED* are all significant predictors with a negative sign at short horizons. At longer horizons, *TERM* becomes a significant predictor with a positive sign, but the *HJ* bound and *TED* remain significantly different from zero. Except for *TED*, all results have been found before in the literature. In Table A.2, we show that only *TERM* and *DY* predict future excess market returns at longer horizons and with the expected positive sign. Table A.3 shows the results regarding Treasury excess returns. *DEF* is a significant predictor for all horizons with a negative sign, while *TED* also forecast bond returns at the 3-month horizon. The results regarding *HML* are displayed in Table A.4. *DEF* with a positive sign, and the *HJ* bound with a negative sign are significant predictors of the value-growth risk factor at all horizons and, finally, Table A.5 shows that the *HJ* volatility bound with a negative sign and *TERM* with a positive sign are significant predictors of the BAB factor at practically all horizons.

Table A.1 Out-of-Sample Industrial Production Growth Forecasting Power of VIX^2 and MOVE^2 against Alternative Standard Predictors, May 1988-June 2017.

Panel A: In-Sample Forecasting Ability: $\tau = 1$

	$\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag IPI	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag IPI	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.003 (5.42)	0.003 (3.08)	0.008 (5.16)	0.006 (3.67)	0.008 (3.71)	0.004 (4.26)	0.004 (6.29)	0.003 (3.12)	0.003 (2.38)	0.009 (5.22)	0.005 (2.71)	0.009 (3.30)	0.004 (4.26)	0.004 (3.79)
$\hat{\beta}_1$	0.162 (2.36)	0.036 (1.15)	-0.287 (-3.41)	-0.112 (-1.77)	-0.008 (-2.20)	-0.067 (-0.68)	-0.162 (-2.38)	0.171 (2.27)	0.059 (2.05)	-0.303 (-4.11)	-0.076 (-1.12)	-0.009 (-2.31)	-0.040 (-2.43)	-0.186 (-2.48)
$\hat{\beta}_2$	-0.041 (-3.06)	-0.047 (-2.79)	-0.010 (-0.79)	-0.046 (-3.24)	-0.045 (-3.18)	-0.040 (-2.43)	-0.040 (-2.74)	-0.190 (-1.78)	-0.262 (-2.13)	-0.051 (-0.67)	-0.221 (-1.85)	-0.235 (-2.16)	-0.067 (-0.68)	-0.189 (-1.70)
Adj R^2	0.101	0.085	0.151	0.095	0.102	0.083	0.097	0.072	0.057	0.150	0.051	0.072	0.083	0.066

Panel A.1: Out-of-Sample Forecasting Ability: $\tau = 1$

	Unrestricted : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag IPI	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag IPI	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	0.977	0.964	1,013	0.960	0.967	0.987	0.979	0.996	0.979	1.012	0.988	0.988	1.005	0.995
p-val (*t*)	0.018	0.043	0.994	0.025	0.507	0.322	0.054	0.138	0.106	0.959	0.122	0.576	0.749	0.233
p-val (*F*)	0.003	0.005	0.980	0.001	0.326	0.291	0.026	0.123	0.037	0.916	0.070	0.531	0.701	0.213

Panel B: In-Sample Forecasting Ability: $\tau = 3$

	$\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag IPI	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag IPI	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.002 (3.98)	0.003 (3.43)	0.007 (4.61)	0.006 (3.97)	0.008 (3.63)	0.004 (4.74)	0.004 (7.66)	0.002 (2.65)	0.003 (2.55)	0.008 (4.80)	0.005 (2.83)	0.009 (3.34)	0.004 (4.74)	0.004 (4.25)
$\hat{\beta}_1$	0.455 (4.54)	0.045 (1.60)	-0.181 (-2.37)	-0.092 (-1.62)	-0.008 (-2.16)	-0.094 (-0.86)	-0.179 (-2.42)	0.504 (6.14)	0.072 (2.68)	-0.226 (-4.09)	-0.048 (-0.76)	-0.009 (-2.43)	-0.042 (-2.90)	-0.200 (-2.52)
$\hat{\beta}_2$	-0.028 (-3.38)	-0.050 (-3.20)	-0.027 (-1.83)	-0.050 (-3.70)	-0.048 (-3.79)	-0.042 (-2.90)	-0.044 (-3.80)	-0.107 (-1.39)	-0.300 (-2.33)	-0.130 (-1.37)	-0.261 (-2.00)	-0.266 (-2.41)	-0.094 (-0.86)	-0.216 (-2.14)
Adj R^2	0.365	0.213	0.255	0.217	0.245	0.208	0.236	0.331	0.161	0.244	0.130	0.183	0.208	0.169

Panel B.1: Out-of-Sample Forecasting Ability: $\tau = 3$

	Unrestricted : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag IPI	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag IPI	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	0.995	0.903	1,006	0.895	0.907	0.966	0.934	0.994	0.922	0.991	0.947	0.943	0.997	0.963
p-val (*t*)	0.014	0.003	0.069	0.001	0.009	0.004	0.007	0.016	0.002	0.005	0.004	0.011	0.030	0.006
p-val (*F*)	0.000	0.000	0.687	0.000	0.000	0.000	0.000	0.002	0.000	0.003	0.000	0.000	0.015	0.000

Table A.1 (continued). Out-of-Sample Industrial Production Growth Forecasting Power of VIX^2 and MOVE^2 against Alternative Standard Predictors, May 1988-June 2017.

Panel C: In-Sample Forecasting Ability: $\tau = 6$

	$\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag IPI	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag IPI	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.002 (2.81)	0.002 (2.74)	0.006 (3.59)	0.004 (3.09)	0.007 (3.00)	0.004 (4.58)	0.003 (7.62)	0.002 (2.76)	0.003 (2.61)	0.006 (4.09)	0.004 (2.62)	0.008 (3.10)	0.004 (4.58)	0.004 (4.74)
$\hat{\beta}_1$	0.362 (2.10)	0.049 (1.85)	-0.147 (-1.77)	-0.050 (-0.92)	-0.007 (-1.79)	-0.131 (-1.13)	-0.209 (-2.48)	0.371 (2.43)	0.073 (2.69)	-0.156 (-2.66)	-0.011 (-0.19)	-0.008 (-2.13)	-0.024 (-2.11)	-0.206 (-2.87)
$\hat{\beta}_2$	-0.020 (-2.38)	-0.036 (-2.73)	-0.017 (-1.34)	-0.036 (-3.02)	-0.034 (-3.16)	-0.024 (-2.11)	-0.028 (-3.35)	-0.121 (-1.43)	-0.262 (-2.36)	-0.134 (-1.46)	-0.232 (-2.01)	-0.227 (-2.38)	-0.131 (-1.13)	-0.174 (-2.07)
Adj R^2	0.234	0.150	0.174	0.134	0.176	0.150	0.185	0.225	0.163	0.187	0.115	0.172	0.150	0.171

Panel C.1: Out-of-Sample Forecasting Ability: $\tau = 6$

	Unrestricted : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag IPI	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag IPI	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.008	0.943	1,012	0.933	0.952	0.996	0.979	0.989	0.925	0.989	0.948	0.947	0.990	0.971
p-val (*t*)	0.092	0.001	0.088	0.000	0.010	0.023	0.019	0.022	0.003	0.008	0.014	0.005	0.016	0.041
p-val (*F*)	0.706	0.000	0.922	0.000	0.000	0.005	0.000	0.001	0.000	0.000	0.000	0.000	0.003	0.001

Panel D: In-Sample Forecasting Ability: $\tau = 12$

	$\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag IPI	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag IPI	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.002 (3.21)	0.001 (1.56)	0.004 (2.88)	0.002 (1.41)	0.007 (2.99)	0.003 (4.22)	0.003 (6.81)	0.002 (3.03)	0.002 (2.24)	0.004 (3.29)	0.002 (1.44)	0.007 (2.89)	0.003 (4.22)	0.003 (4.77)
$\hat{\beta}_1$	0.095 (0.57)	0.060 (2.39)	-0.103 (-1.32)	0.031 (0.62)	-0.008 (-1.85)	-0.079 (-0.67)	-0.248 (-2.34)	0.089 (0.55)	0.074 (2.65)	-0.094 (-1.72)	0.055 (1.01)	-0.008 (-2.09)	-0.010 (-0.94)	-0.245 (-3.03)
$\hat{\beta}_2$	-0.014 (-2.39)	-0.017 (-2.47)	-0.004 (-0.48)	-0.017 (-2.63)	-0.015 (-2.36)	-0.010 (-0.94)	-0.007 (-1.09)	-0.101 (-1.18)	-0.151 (-1.79)	-0.060 (-0.75)	-0.135 (-1.55)	-0.115 (-1.59)	-0.079 (-0.67)	-0.048 (-0.79)
Adj R^2	0.043	0.081	0.066	0.039	0.107	0.047	0.128	0.045	0.105	0.073	0.048	0.114	0.047	0.128

Panel D.1: Out-of-Sample Forecasting Ability: $\tau = 12$

	Unrestricted : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $\Delta IPI_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag IPI	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag IPI	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.005	0.987	1,018	0.981	1.007	1.013	1.026	0.998	0.972	1.004	0.980	0.996	1.001	1.009
p-val (*t*)	0.090	0.014	0.399	0.005	0.059	0.095	0.260	0.027	0.010	0.151	0.011	0.056	0.040	0.070
p-val (*F*)	0.502	0.000	0.981	0.000	0.432	0.856	0.996	0.018	0.000	0.221	0.000	0.019	0.057	0.868

Table A.2. Out-of-Sample Excess Market Return Forecasting Power of VIX^2 and MOVE^2 against Alternative Standard Predictors, May 1988-June 2017.

Panel A: In-Sample Forecasting Ability: $\tau = 1$

	$EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.004 (0.86)	0.005 (0.80)	0.013 (1.35)	-0.004 (-0.41)	0.025 (1.43)	0.014 (1.95)	0.007 (1.52)	0.013 (2.08)	0.012 (1.79)	0.012 (1.17)	0.002 (0.17)	0.033 (1.85)	0.014 (1.95)	0.014 (2.21)
$\hat{\beta}_1$	0.092 (1.52)	0.054 (0.27)	-0.383 (-0.88)	0.480 (1.32)	-0.034 (-1.28)	-1.413 (-1.75)	-0.992 (-1.11)	0.048 (0.90)	0.130 (0.61)	0.142 (0.35)	0.676 (1.81)	-0.032 (-1.38)	0.145 (1.92)	-0.550 (-0.81)
$\hat{\beta}_2$	0.052 (0.46)	0.012 (0.10)	0.060 (0.54)	0.009 (0.07)	0.020 (0.19)	0.145 (1.92)	0.056 (0.65)	-0.700 (-0.98)	-0.837 (-1.11)	-0.879 (-1.22)	-0.964 (-1.28)	-0.770 (-1.14)	-1.413 (-1.75)	-0.606 (-0.97)
Adj R^2	0.001	-0.005	-0.003	0.000	0.003	0.017	0.005	0.008	0.007	0.006	0.016	0.014	0.017	0.009

Panel A.1: Out-of-Sample Forecasting Ability: $\tau = 1$

	Unrestricted : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.010	1.013	1,007	1.016	1.013	1.002	1.010	1.008	1.007	1.005	1.004	1.009	0.997	1.009
p-val (*t*)	0.540	0.622	0.260	0.663	0.547	0.277	0.553	0.460	0.308	0.259	0.192	0.522	0.064	0.599
p-val (*F*)	0.473	0.608	0.303	0.731	0.557	0.250	0.512	0.476	0.374	0.288	0.193	0.577	0.073	0.586

Panel B: In-Sample Forecasting Ability: $\tau = 3$

	$EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.001 (0.34)	0.003 (0.50)	0.012 (1.36)	-0.007 (-0.78)	0.020 (1.31)	0.010 (1.83)	0.005 (1.33)	0.010 (1.97)	0.008 (1.44)	0.010 (1.03)	-0.002 (-0.27)	0.025 (1.58)	0.010 (1.83)	0.010 (2.04)
$\hat{\beta}_1$	0.143 (1.56)	0.089 (0.47)	-0.430 (-0.97)	0.536 (1.62)	-0.028 (-1.16)	-0.988 (-1.65)	-0.732 (-1.07)	0.035 (0.42)	0.133 (0.71)	0.045 (0.11)	0.663 (1.95)	-0.026 (-1.15)	0.127 (1.96)	-0.402 (-0.79)
$\hat{\beta}_2$	0.088 (0.99)	0.035 (0.36)	0.090 (0.96)	0.032 (0.32)	0.043 (0.48)	0.127 (1.96)	0.069 (0.93)	-0.380 (-0.70)	-0.488 (-0.86)	-0.467 (-0.90)	-0.606 (-1.06)	-0.418 (-0.80)	-0.988 (-1.65)	-0.287 (-0.57)
Adj R^2	0.011	-0.001	0.006	0.015	0.014	0.027	0.014	0.005	0.008	0.004	0.031	0.018	0.027	0.007

Panel B.1: Out-of-Sample Forecasting Ability: $\tau = 3$

	Unrestricted : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.004	1.017	1,006	1.015	1.012	0.997	1.008	1.005	1.003	1.003	0.999	1.007	0.989	1.006
p-val (*t*)	0.066	0.291	0.066	0.158	0.168	0.064	0.097	0.113	0.057	0.068	0.033	0.106	0.006	0.117
p-val (*F*)	0.309	0.982	0.534	0.995	0.887	0.051	0.508	0.286	0.219	0.152	0.029	0.682	0.002	0.556

Table A.2 (continued). Out-of-Sample Excess Market Return Forecasting Power of VIX^2 and MOVE^2 against Alternative Standard Predictors, May 1988-June 2017.

Panel C: In-Sample Forecasting Ability: $\tau = 6$

	$EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	-0.001 (-0.14)	0.000 (0.06)	0.010 (1.35)	-0.010 (-1.48)	0.018 (1.37)	0.008 (2.45)	0.003 (1.36)	0.008 (2.25)	0.005 (1.26)	0.006 (0.85)	-0.005 (-0.75)	0.022 (1.58)	0.008 (2.45)	0.008 (2.37)
$\hat{\beta}_1$	0.181 (1.45)	0.165 (1.05)	-0.418 (-1.02)	0.611 (2.13)	-0.027 (-1.20)	-0.862 (-1.79)	-0.583 (-1.08)	-0.006 (-0.04)	0.192 (1.22)	0.096 (0.27)	0.699 (2.23)	-0.024 (-1.14)	0.146 (2.83)	-0.257 (-0.66)
$\hat{\beta}_2$	0.120 (2.13)	0.066 (1.25)	0.120 (2.17)	0.064 (1.19)	0.074 (1.47)	0.146 (2.83)	0.095 (2.04)	-0.236 (-0.65)	-0.301 (-0.79)	-0.290 (-0.93)	-0.396 (-1.08)	-0.205 (-0.56)	-0.862 (-1.79)	-0.112 (-0.30)
Adj R^2	0.034	0.024	0.029	0.056	0.041	0.054	0.034	-0.001	0.013	0.000	0.052	0.021	0.054	0.001

Panel C.1: Out-of-Sample Forecasting Ability: $\tau = 6$

	Unrestricted : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	0.983	1.008	0.988	0.996	0.996	0.977	0.989	1.005	1.003	1.004	1.000	1.007	0.983	1.007
p-val (*t*)	0.004	0.117	0.017	0.019	0.036	0.005	0.008	0.107	0.046	0.196	0.029	0.117	0.001	0.183
p-val (*F*)	0.000	0.612	0.001	0.008	0.016	0.003	0.001	0.297	0.152	0.322	0.027	0.705	0.000	0.689

Panel D: In-Sample Forecasting Ability: $\tau = 12$

	$EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag EXC MKT	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.001 (0.51)	-0.002 (-0.56)	0.006 (1.07)	-0.009 (1.71)	0.018 (1.93)	0.006 (2.48)	0.004 (2.05)	0.007 (1.77)	0.002 (0.57)	0.004 (0.66)	-0.006 (-1.06)	0.020 (1.82)	0.006 (2.48)	0.006 (1.82)
$\hat{\beta}_1$	0.130 (0.89)	0.274 (2.28)	-0.138 (-0.49)	0.602 (2.55)	-0.027 (-1.59)	-0.490 (-1.23)	-0.695 (-1.51)	-0.020 (-0.13)	0.293 (2.30)	0.162 (0.62)	0.665 (2.51)	-0.025 (-1.49)	0.093 (2.11)	-0.470 (-1.18)
$\hat{\beta}_2$	0.074 (2.46)	0.048 (1.70)	0.066 (2.12)	0.044 (1.75)	0.055 (1.67)	0.093 (2.11)	0.081 (2.14)	-0.113 (-0.33)	-0.203 (-0.59)	-0.195 (-0.61)	-0.249 (-0.77)	-0.065 (-0.19)	-0.490 (-1.23)	0.099 (0.32)
Adj R^2	0.024	0.070	0.016	0.088	0.065	0.039	0.058	-0.004	0.058	0.001	0.082	0.040	0.039	0.013

Panel D.1: Out-of-Sample Forecasting Ability: $\tau = 12$

	Unrestricted : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $EXCMKET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag EMKT	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag EMKT	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	0.987	1.009	0.997	0.995	0.999	0.986	0.989	1.007	1.007	1.004	1.002	1.018	0.994	1.010
p-val (*t*)	0.002	0.229	0.040	0.028	0.034	0.003	0.019	0.079	0.108	0.131	0.105	0.216	0.023	0.227
p-val (*F*)	0.000	0.911	0.018	0.008	0.032	0.000	0.002	0.771	0.643	0.504	0.145	0.996	0.005	0.776

Table A.3. Out-of-Sample Excess Treasury Bond Return Forecasting Power of VIX^2 and MOVE^2 against Alternative Standard Predictors, May 1988-June 2017.

Panel A: In-Sample Forecasting Ability: $\tau = 1$

	$TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag TRY RET	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag TRY RET	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	-0.001 (-0.58)	-0.001 (-0.46)	0.007 (1.52)	-0.004 (-0.79)	0.002 (0.33)	0.001 (0.35)	-0.001 (-0.38)	0.001 (0.26)	0.001 (0.32)	0.002 (0.44)	-0.001 (-0.24)	0.003 (0.46)	0.001 (0.35)	0.001 (0.42)
$\hat{\beta}_1$	0.242 (5.09)	-0.005 (-0.05)	-0.513 (-2.09)	0.108 (0.52)	-0.006 (-0.60)	-0.398 (-1.47)	-0.234 (-1.01)	0.256 (5.75)	-0.014 (-0.13)	-0.088 (-0.39)	0.111 (0.55)	-0.004 (-0.40)	0.113 (2.33)	-0.034 (-0.13)
$\hat{\beta}_2$	0.057 (1.45)	0.076 (0.88)	0.141 (3.27)	0.075 (1.87)	0.077 (1.92)	0.113 (2.33)	0.084 (1.89)	0.071 (0.27)	0.096 (0.29)	0.146 (0.44)	0.062 (0.18)	0.094 (0.28)	-0.398 (-1.47)	0.074 (0.22)
Adj R^2	0.072	0.014	0.034	0.015	0.016	0.021	0.016	0.062	-0.005	-0.004	-0.004	-0.005	0.021	-0.006

Panel A.1: Out-of-Sample Forecasting Ability: $\tau = 1$

	Unrestricted : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag TRY RET	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag TRY RET	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.006	1.005	0.986	1.011	1.005	0.993	1.000	1.014	1.015	1.009	1.015	1.017	1.004	1.014
p-val (*t*)	0.231	0.149	0.011	0.204	0.420	0.047	0.093	0.770	0.674	0.399	0.589	0.471	0.444	0.600
p-val (*F*)	0.398	0.327	0.004	0.671	0.453	0.030	0.095	0.858	0.860	0.593	0.864	0.578	0.513	0.827

Panel B: In-Sample Forecasting Ability: $\tau = 3$

	$TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag TRY RET	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag TRY RET	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.000 (0.25)	-0.001 (-0.38)	0.009 (2.29)	-0.001 (-0.12)	0.003 (0.50)	0.000 (0.02)	0.003 (1.36)	0.000 (0.02)	-0.001 (-0.34)	0.005 (1.30)	-0.000 (-0.08)	0.002 (0.36)	0.000 (0.02)	0.001 (0.26)
$\hat{\beta}_1$	-0.012 (-0.18)	0.079 (0.79)	-0.473 (-2.58)	0.049 (0.25)	-0.005 (-0.47)	0.079 (0.35)	0.606 (2.10)	0.000 (0.00)	0.066 (0.65)	-0.304 (-1.62)	0.020 (0.10)	-0.004 (-0.41)	0.021 (0.53)	0.353 (1.65)
$\hat{\beta}_2$	0.029 (0.78)	0.028 (0.80)	0.089 (2.48)	0.028 (0.79)	0.030 (0.86)	0.021 (0.53)	-0.064 (-1.71)	0.170 (0.77)	0.145 (0.64)	0.362 (1.37)	0.164 (0.74)	0.173 (0.78)	0.079 (0.35)	0.015 (0.08)
Adj R^2	0.001	0.005	0.039	0.001	0.002	0.001	0.016	-0.000	0.002	0.020	-0.001	0.000	0.001	0.010

Panel B.1: Out-of-Sample Forecasting Ability: $\tau = 3$

	Unrestricted : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag TRY RET	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag TRY RET	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.006	1.003	0.983	1.007	1.006	1.004	1.009	1.006	1.007	0.996	1.005	1.009	1.005	1.006
p-val (*t*)	0.085	0.120	0.011	0.179	0.060	0.100	0.253	0.244	0.333	0.022	0.199	0.344	0.331	0.440
p-val (*F*)	0.371	0.197	0.000	0.721	0.525	0.291	0.559	0.431	0.678	0.011	0.258	0.906	0.463	0.472

Table A.3 (continued). Out-of-Sample Excess Treasury Bond Return Forecasting Power of VIX^2 and $MOVE^2$ against Alternative Standard Predictors, May 1988-June 2017.

Panel C: In-Sample Forecasting Ability: $\tau = 6$

	$TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag TRY RET	TERM	DEF	DY	HJ VOL	$Move^2$	TED	Lag TRY RET	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.002 (1.31)	0.000 (0.12)	0.007 (2.47)	0.002 (0.46)	0.005 (1.03)	0.002 (0.95)	0.002 (1.45)	0.002 (0.97)	0.000 (0.07)	0.006 (2.16)	0.001 (0.34)	0.005 (0.93)	0.002 (0.95)	0.002 (1.32)
$\hat{\beta}_1$	-0.159 (-1.52)	0.099 (1.15)	-0.308 (-2.10)	0.023 (0.14)	-0.006 (-0.65)	0.068 (0.40)	0.243 (1.54)	-0.161 (-1.55)	0.103 (1.18)	-0.270 (-1.92)	0.022 (0.13)	-0.006 (-0.68)	-0.016 (-0.62)	0.231 (1.49)
$\hat{\beta}_2$	0.000 (0.01)	-0.009 (-0.45)	0.030 (1.28)	-0.009 (-0.46)	-0.008 (-0.39)	-0.016 (-0.62)	-0.023 (-1.12)	0.027 (0.20)	-0.039 (-0.27)	0.174 (1.07)	-0.005 (-0.04)	0.006 (0.05)	0.068 (0.40)	-0.118 (-0.82)
Adj R^2	0.019	0.009	0.027	-0.004	0.000	-0.004	0.009	0.020	0.008	0.027	-0.006	-0.001	-0.004	0.005

Panel C.1: Out-of-Sample Forecasting Ability: $\tau = 6$

	Unrestricted : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag TRY RET	TERM	DEF	DY	HJ VOL	$Move^2$	TED	Lag TRY RET	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.009	1.007	1.000	1.010	1.007	1.005	1.002	1.010	1.011	1.002	1.007	1.009	1.007	1.005
p-val (*t*)	0.479	0.123	0.058	0.121	0.359	0.147	0.096	0.453	0.292	0.106	0.247	0.320	0.271	0.217
p-val (*F*)	0.876	0.518	0.061	0.740	0.387	0.384	0.142	0.733	0.878	0.152	0.520	0.846	0.612	0.352

Panel D: In-Sample Forecasting Ability: $\tau = 12$

	$TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag TRY RET	TERM	DEF	DY	HJ VOL	$Move^2$	TED	Lag TRY RET	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.002 (1.93)	0.000 (0.27)	0.006 (3.07)	0.002 (0.64)	0.004 (0.98)	0.001 (0.84)	0.002 (1.70)	0.001 (1.01)	0.000 (0.00)	0.005 (2.65)	0.001 (0.44)	0.006 (1.59)	0.001 (0.84)	0.010 (2.16)
$\hat{\beta}_1$	-0.414 (-4.75)	0.076 (1.25)	-0.263 (-2.44)	0.004 (0.03)	-0.003 (-0.50)	0.114 (0.97)	0.084 (0.80)	-0.416 (-5.04)	0.074 (1.18)	-0.242 (-2.78)	-0.007 (-0.05)	0.208 (1.32)	-0.016 (-0.82)	-0.024 (-0.13)
$\hat{\beta}_2$	0.007 (0.50)	-0.006 (-0.36)	0.028 (1.30)	-0.006 (-0.36)	-0.005 (-0.32)	-0.016 (-0.82)	-0.011 (-0.71)	0.102 (1.06)	0.016 (0.15)	0.204 (2.05)	0.046 (0.43)	-0.054 (-0.21)	0.114 (0.97)	-0.215 (-0.85)
Adj R^2	0.160	0.015	0.049	-0.005	-0.002	0.001	-0.001	0.167	0.014	0.058	-0.004	0.041	0.001	0.002

Panel D.1: Out-of-Sample Forecasting Ability: $\tau = 12$

	Unrestricted : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $TRYRET_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag TRY RET	TERM	DEF	DY	HJ VOL	$Move^2$	TED	Lag TRY RET	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.020	1.069	1.027	1.028	1.050	1.034	1.043	1.004	1.018	0.995	1.007	1.006	0.995	1.004
p-val (*t*)	0.172	0.369	0.228	0.140	0.430	0.248	0.317	0.040	0.902	0.025	0.194	0.121	0.018	0.076
p-val (*F*)	0.970	1.000	0.979	01.000	1.000	0.999	1.000	0.314	0.963	0.009	0.832	0.638	0.006	0.222

Table A.4 Out-of-Sample *HML* Forecasting Power of VIX^2 and $MOVE^2$ against Alternative Standard Predictors, May 1988-June 2017.

Panel A: In-Sample Forecasting Ability: $\tau = 1$

	$HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag HML	TERM	DEF	DY	HJ VOL	$Move^2$	TED	Lag HML	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.006 (3.01)	0.007 (1.40)	0.001 (0.20)	0.013 (1.61)	0.022 (2.76)	0.008 (2.19)	0.009 (3.84)	0.007 (1.84)	0.007 (1.15)	0.008 (1.25)	0.012 (1.32)	0.024 (2.65)	0.008 (2.19)	0.009 (2.21)
$\hat{\beta}_1$	0.156 (2.58)	0.015 (0.07)	0.355 (1.16)	-0.284 (-0.82)	-0.026 (-1.96)	-0.118 (-2.20)	-0.522 (-1.24)	0.167 (2.73)	0.071 (0.32)	-0.011 (-0.04)	-0.201 (-0.58)	-0.028 (-2.03)	-0.079 (-0.19)	-0.633 (-1.47)
$\hat{\beta}_2$	-0.112 (-2.91)	-0.126 (-3.19)	-0.171 (-3.85)	-0.124 (-3.07)	-0.119 (-3.00)	-0.079 (-0.19)	-0.109 (-2.53)	-0.535 (-1.53)	-0.615 (-1.62)	-0.582 (-1.66)	-0.537 (-1.43)	-0.572 (-1.69)	-0.118 (-2.20)	-0.409 (-1.18)
Adj R^2	0.047	0.022	0.027	0.026	0.033	0.023	0.032	0.036	0.009	0.008	0.010	0.020	0.023	0.019

Panel A.1: Out-of-Sample Forecasting Ability: $\tau = 1$

	$Unrestricted: HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ $Restricted: HML_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							$Unrestricted: HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ $Restricted: HML_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag HML	TERM	DEF	DY	HJ VOL	$Move^2$	TED	Lag HML	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	0.996	0.991	0.989	0.992	0.993	1.005	0.998	1.000	0.998	0.997	1.000	1.001	1.005	1.002
p-val (*t*)	0.062	0.040	0.049	0.044	0.461	0.846	0.127	0.100	0.083	0.087	0.110	0.471	0.851	0.278
p-val (*F*)	0.033	0.008	0.020	0.013	0.365	0.722	0.101	0.096	0.064	0.082	0.106	0.476	0.728	0.304

Panel B: In-Sample Forecasting Ability: $\tau = 3$

	$HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag HML	TERM	DEF	DY	HJ VOL	$Move^2$	TED	Lag HML	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.006 (2.73)	0.007 (1.41)	-0.002 (-0.48)	0.012 (1.49)	0.021 (2.96)	0.006 (1.70)	0.008 (3.58)	0.006 (1.39)	0.005 (0.95)	0.005 (0.81)	0.010 (1.14)	0.024 (2.68)	0.006 (1.70)	0.006 (1.61)
$\hat{\beta}_1$	0.091 (0.77)	0.003 (0.01)	0.519 (2.25)	-0.248 (-0.75)	-0.025 (-2.20)	0.090 (0.26)	-0.494 (-1.95)	0.118 (1.12)	0.045 (0.23)	0.083 (0.43)	-0.187 (-0.57)	-0.028 (-2.29)	-0.124 (-2.78)	-0.658 (-2.16)
$\hat{\beta}_2$	-0.110 (-2.35)	-0.116 (-2.68)	-0.182 (-4.20)	-0.115 (-2.66)	-0.109 (-2.61)	-0.124 (-2.78)	-0.098 (-2.52)	-0.435 (-1.08)	-0.464 (-1.15)	-0.500 (-1.29)	-0.399 (-0.99)	-0.425 (-1.18)	0.090 (0.26)	-0.232 (-0.68)
Adj R^2	0.060	0.052	0.076	0.059	0.076	0.052	0.071	0.027	0.014	0.014	0.017	0.043	0.052	0.038

Panel B.1: Out-of-Sample Forecasting Ability: $\tau = 3$

	$Unrestricted: HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ $Restricted: HML_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							$Unrestricted: HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ $Restricted: HML_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag HML	TERM	DEF	DY	HJ VOL	$Move^2$	TED	Lag HML	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	0.988	0.976	0.964	0.973	0.981	0.990	0.992	0.999	0.997	0.993	1.000	1.003	1.004	1.003
p-val (*t*)	0.020	0.013	0.009	0.002	0.021	0.024	0.018	0.045	0.033	0.010	0.010	0.054	0.197	0.112
p-val (*F*)	0.000	0.000	0.000	0.000	0.001	0.001	0.004	0.036	0.015	0.000	0.010	0.115	0.445	0.169

Table A.4 (continued). Out-of-Sample *HML* Forecasting Power of VIX^2 and MOVE^2 against Alternative Standard Predictors, May 1988-June 2017.

Panel C: In-Sample Forecasting Ability: $\tau = 6$

	$HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag HML	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag HML	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.004 (1.98)	0.004 (0.93)	-0.005 (-1.19)	0.008 (1.01)	0.018 (2.71)	0.004 (1.29)	0.005 (2.45)	0.003 (1.09)	0.003 (0.72)	-0.000 (-0.02)	0.007 (0.86)	0.018 (2.59)	0.004 (1.29)	0.004 (1.25)
$\hat{\beta}_1$	0.062 (0.51)	0.005 (0.03)	0.492 (2.61)	-0.177 (-0.56)	-0.025 (-2.30)	0.038 (0.13)	-0.393 (-1.63)	0.075 (0.66)	0.024 (0.15)	0.228 (1.44)	-0.152 (-0.48)	-0.026 (-2.32)	-0.057 (-1.35)	-0.479 (-1.91)
$\hat{\beta}_2$	-0.050 (-1.43)	-0.053 (-1.58)	-0.116 (-3.48)	-0.052 (-1.49)	-0.046 (-1.32)	-0.057 (-1.35)	-0.037 (-1.05)	-0.192 (-0.70)	-0.216 (-0.82)	-0.354 (-1.25)	-0.171 (-0.63)	-0.182 (-0.79)	0.038 (0.13)	-0.042 (-0.18)
Adj R^2	0.019	0.016	0.055	0.022	0.056	0.016	0.032	0.007	0.001	0.013	0.006	0.046	0.016	0.023

Panel C.1: Out-of-Sample Forecasting Ability: $\tau = 6$

	Unrestricted : $HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $HML_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $HML_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag HML	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag HML	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.011	0.996	0.980	0.996	1.007	1.012	1.015	1.006	1.006	0.996	1.006	1.004	1.008	1.006
p-val (*t*)	0.129	0.037	0.001	0.008	0.048	0.117	0.113	0.170	0.064	0.021	0.133	0.053	0.624	0.231
p-val (*F*)	0.929	0.014	0.000	0.000	0.599	0.758	0.973	0.522	0.397	0.008	0.770	0.207	0.704	0.298

Panel D: In-Sample Forecasting Ability: $\tau = 12$

	$HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag HML	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag HML	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.003 (1.86)	0.002 (0.48)	-0.003 (-0.75)	0.006 (0.91)	0.012 (2.45)	0.002 (1.12)	0.003 (2.05)	0.002 (1.03)	0.001 (0.31)	0.000 (0.00)	0.005 (0.76)	0.012 (2.42)	0.002 (1.12)	0.002 (0.86)
$\hat{\beta}_1$	-0.029 (-0.17)	0.074 (0.59)	0.315 (1.99)	-0.135 (-0.49)	-0.016 (-1.94)	0.109 (0.54)	-0.215 (-1.22)	-0.022 (-0.13)	0.081 (0.63)	0.136 (1.06)	-0.138 (-0.49)	-0.017 (-1.96)	-0.036 (-1.17)	-0.312 (-1.51)
$\hat{\beta}_2$	-0.027 (-1.28)	-0.026 (-1.27)	-0.067 (-2.53)	-0.025 (-1.07)	-0.022 (-0.93)	-0.036 (-1.17)	-0.016 (-0.67)	-0.050 (-0.35)	-0.079 (-0.57)	-0.137 (-0.83)	-0.013 (-0.09)	-0.031 (-0.25)	0.109 (0.54)	0.077 (0.50)
Adj R^2	0.004	0.011	0.033	0.010	0.036	0.006	0.010	-0.005	0.003	0.002	0.001	0.030	0.006	0.008

Panel D.1: Out-of-Sample Forecasting Ability: $\tau = 12$

	Unrestricted : $HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $HML_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $HML_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $HML_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag HML	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag HML	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.013	0.999	0.999	1.006	1.020	1.013	1.023	1.010	1.003	1.005	1.006	1.019	1.003	1.007
p-val (*t*)	0.100	0.104	0.041	0.030	0.114	0.095	0.102	0.464	0.025	0.120	0.391	0.505	0.123	0.410
p-val (*F*)	0.934	0.090	0.025	0.558	0.964	0.963	0.985	0.866	0.100	0.605	0.570	1.000	0.142	0.771

Table A.5 Out-of-Sample *BAB* Forecasting Power of VIX^2 and MOVE^2 against Alternative Standard Predictors, May 1988-June 2017.

Panel A: In-Sample Forecasting Ability: $\tau = 1$

	$BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag BAB	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag BAB	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.017 (5.97)	0.012 (2.59)	0.003 (0.38)	0.024 (2.31)	0.051 (4.55)	0.016 (3.88)	0.020 (5.63)	0.014 (3.72)	0.009 (1.79)	0.017 (2.65)	0.019 (1.86)	0.052 (4.79)	0.016 (3.88)	0.016 (4.61)
$\hat{\beta}_1$	0.098 (1.24)	0.360 (1.75)	0.877 (1.75)	-0.251 (-0.60)	-0.058 (-3.29)	0.430 (0.84)	-0.802 (-1.54)	0.120 (1.37)	0.453 (2.05)	-0.084 (-0.31)	-0.137 (-0.31)	-0.064 (-3.64)	-0.300 (-4.84)	-1.211 (-2.42)
$\hat{\beta}_2$	-0.245 (-4.56)	-0.259 (-5.09)	-0.371 (-4.70)	-0.258 (-4.24)	-0.244 (-3.50)	-0.300 (-4.84)	-0.228 (-3.52)	-0.735 (-2.31)	-1.031 (-3.15)	-0.811 (-2.60)	-0.828 (-2.30)	-0.825 (-2.33)	0.430 (0.84)	-0.484 (-1.30)
Adj R^2	0.083	0.087	0.093	0.075	0.108	0.076	0.083	0.028	0.034	0.014	0.014	0.056	0.076	0.035

Panel A.1: Out-of-Sample Forecasting Ability: $\tau = 1$

	Unrestricted : $BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag BAB	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag BAB	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	0.982	0.977	0.973	0.971	0.991	0.989	1.005	1.001	0.993	0.999	0.999	1.004	1.003	1.006
p-val (*t*)	0.005	0.003	0.016	0.002	0.588	0.160	0.178	0.138	0.059	0.150	0.088	0.602	0.911	0.496
p-val (*F*)	0.000	0.000	0.001	0.000	0.478	0.053	0.332	0.150	0.024	0.147	0.075	0.647	0.856	0.697

Panel B: In-Sample Forecasting Ability: $\tau = 3$

	$BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag BAB	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag BAB	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.012 (3.32)	0.007 (1.50)	0.002 (0.73)	0.016 (1.64)	0.048 (4.52)	0.013 (4.14)	0.015 (4.30)	0.009 (2.66)	0.006 (1.31)	0.014 (2.75)	0.013 (1.41)	0.049 (4.88)	0.013 (4.14)	0.013 (4.67)
$\hat{\beta}_1$	0.209 (2.05)	0.411 (2.19)	0.540 (1.34)	-0.091 (-0.23)	-0.059 (-3.43)	0.185 (0.41)	-0.585 (-1.58)	0.245 (2.30)	0.485 (2.41)	-0.059 (-0.25)	0.006 (0.02)	-0.063 (-3.59)	-0.189 (-2.32)	-0.828 (-2.19)
$\hat{\beta}_2$	-0.139 (-2.11)	-0.171 (-3.13)	-0.240 (-2.76)	-0.171 (-2.68)	-0.155 (-2.07)	-0.189 (-2.32)	-0.148 (-2.12)	-0.353 (-1.32)	-0.810 (-3.30)	-0.592 (-2.20)	-0.631 (-2.20)	-0.579 (-2.07)	0.185 (0.41)	-0.366 (-1.29)
Adj R^2	0.118	0.119	0.094	0.077	0.164	0.078	0.089	0.074	0.076	0.019	0.018	0.118	0.078	0.042

Panel B.1: Out-of-Sample Forecasting Ability: $\tau = 3$

	Unrestricted : $BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							*Unrestricted* : $BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ *Restricted* : $BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag BAB	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag BAB	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.018	0.992	1.003	0.987	1.038	1.021	1.046	1.007	0.987	1.003	0.998	1.008	1.005	1.009
p-val (*t*)	0.106	0.022	0.061	0.019	0.082	0.144	0.197	0.352	0.004	0.085	0.013	0.122	0.113	0.293
p-val (*F*)	0.998	0.001	0.203	0.000	0.999	0.991	1.000	0.611	0.000	0.162	0.011	0.485	0.261	0.939

Table A.5 (continued). Out-of-Sample *BAB* Forecasting Power of VIX^2 and $MOVE^2$ against Alternative Standard Predictors, May 1988-June 2017.

Panel C: In-Sample Forecasting Ability: $\tau = 6$

	$BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag BAB	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag BAB	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.009 (3.10)	0.005 (1.29)	0.005 (0.80)	0.011 (1.24)	0.048 (5.14)	0.011 (3.89)	0.013 (4.86)	0.006 (1.89)	0.004 (0.98)	0.011 (2.33)	0.008 (0.95)	0.048 (5.31)	0.011 (3.89)	0.011 (4.05)
$\hat{\beta}_1$	0.264 (2.52)	0.372 (2.06)	0.406 (1.15)	0.068 (0.18)	-0.063 (-4.03)	0.265 (0.59)	-0.726 (-2.19)	0.307 (2.90)	0.419 (2.21)	-0.056 (-0.28)	0.123 (0.30)	-0.066 (-4.08)	-0.143 (-2.36)	-0.962 (-2.81)
$\hat{\beta}_2$	-0.082 (-1.83)	-0.119 (-3.53)	-0.171 (-2.77)	-0.119 (-3.03)	-0.101 (-1.89)	-0.143 (-2.36)	-0.088 (-1.80)	-0.076 (-0.30)	-0.514 (-2.11)	-0.318 (-1.20)	-0.384 (-1.32)	-0.291 (-1.15)	0.265 (0.59)	-0.037 (-0.14)
Adj R^2	0.121	0.111	0.072	0.057	0.209	0.060	0.085	0.094	0.073	0.006	0.008	0.173	0.060	0.055

Panel C.1: Out-of-Sample Forecasting Ability: $\tau = 6$

	$Unrestricted: BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ $Restricted: BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							$Unrestricted: BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ $Restricted: BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag BAB	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag BAB	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.014	0.980	0.993	0.983	1.027	1.010	1.037	1.007	0.994	1.002	1.000	1.009	1.004	1.007
p-val (*t*)	0.125	0.024	0.039	0.006	0.047	0.032	0.096	0.266	0.003	0.108	0.035	0.085	0.107	0.361
p-val (*F*)	0.998	0.000	0.004	0.000	0.997	0.758	0.998	0.547	0.000	0.080	0.035	0.659	0.266	0.619

Panel D: In-Sample Forecasting Ability: $\tau = 12$

	$BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$							$BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$						
	Lag BAB	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag BAB	TERM	DEF	DY	HJ VOL	Vix^2	TED
$\hat{\alpha}$	0.009 (2.83)	0.003 (0.69)	0.005 (0.85)	0.007 (0.89)	0.044 (5.47)	0.009 (3.57)	0.012 (4.51)	0.006 (1.59)	0.002 (0.56)	0.010 (2.16)	0.005 (0.63)	0.044 (5.55)	0.009 (3.57)	0.009 (3.40)
$\hat{\beta}_1$	0.157 (1.02)	0.436 (2.82)	0.370 (1.42)	0.190 (0.56)	-0.059 (-4.28)	0.263 (0.69)	-0.957 (-2.53)	0.208 (1.32)	0.473 (2.89)	-0.024 (-0.13)	0.230 (0.62)	-0.061 (-4.31)	-0.114 (-2.20)	-1.214 (-3.48)
$\hat{\beta}_2$	-0.071 (-1.75)	-0.090 (-3.38)	-0.138 (-2.83)	-0.091 (-2.85)	-0.074 (-1.58)	-0.114 (-2.20)	-0.049 (-1.12)	-0.054 (-0.21)	-0.416 (-2.06)	-0.215 (-0.85)	-0.287 (-1.21)	-0.175 (-0.81)	0.263 (0.69)	0.160 (0.72)
Adj R^2	0.070	0.162	0.067	0.054	0.248	0.054	0.112	0.041	0.131	0.002	0.010	0.216	0.054	0.102

Panel D.1: Out-of-Sample Forecasting Ability: $\tau = 12$

	$Unrestricted: BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 VIX_t^2 + \varepsilon_{t,t+\tau}$ $Restricted: BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$							$Unrestricted: BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \beta_2 MOVE_t^2 + \varepsilon_{t,t+\tau}$ $Restricted: BAB_{t,t+\tau} = \alpha + \beta_1 X_t + \varepsilon_{t,t+\tau}$						
	Lag BAB	TERM	DEF	DY	HJ VOL	Move^2	TED	Lag BAB	TERM	DEF	DY	HJ VOL	Vix^2	TED
RMSE	1.009	0.973	0.977	0.991	1.016	0.992	1.038	1.006	0.995	1.004	1.000	1.011	1.002	1.004
p-val (*t*)	0.046	0.004	0.026	0.094	0.070	0.013	0.070	0.067	0.005	0.086	0.112	0.189	0.041	0.057
p-val (*F*)	0.818	0.000	0.000	0.010	0.977	0.000	1.000	0.553	0.002	0.159	0.110	0.984	0.101	0.183

Tables A.1 through A.5 show out-of-sample forecast accuracy of either VIX^2 or $MOVE^2$, comparing the unrestricted model that contains either VIX^2 or MOVE2 and the additional standard predictor with the restricted model that includes only the standard predictor where this predictor can also be VIX^2 or $MOVE^2$. *RMSE* is the relative mean-squared forecasting error that compares the mean-squared forecasting error of

the restricted model and the mean-squared forecasting error of the unrestricted model. The *p*-value (*t*) and *p*-value (*F*) are the probability values associated with the two statistics given by expressions (15) and (17) testing the equal forecasting ability of the unrestricted and restricted models. They are obtained by an efficient bootstrap method for simulating asymptotic critical values. We control on an individual basis for the lagged of the dependent variable, *TERM*, *DEF*, *DY*, the *HJ* volatility bound of Nieto and Rubio (2014) and *TED*. We report the *t*-statistic from Newey-West/ HAC standard errors.