

Quantitative Easing and Financial Institution Growth and Risk-Taking

W. Scott Frame ¹ Eva Steiner ²

¹Federal Reserve Bank of Atlanta

²Cornell SC Johnson College of Business

The Hoyt Group – Weimer School
January 20, 2019

The views expressed do not necessarily reflect those of the Federal Reserve Bank of Atlanta or any other entities within the Federal Reserve System.

Outline

Introduction

Background on Mortgage REITs

Event Study

Data for Growth and Financial Risk-Taking Analysis

QE and Agency MREIT Growth and Financial Risk-Taking

Conclusion

Introduction

- ▶ Federal Reserve reduced overnight interest rate (effectively) to zero lower bound and engaged in large-scale asset purchases
- ▶ These purchases lowered long-term interest rates as intended
- ▶ But growing concern about the heightened potential for financial stability risks through financial institution risk-taking
 - ▶ Bernanke (2013) notes that “maintaining low interest rates for too long may create incentives for market participants to take on greater duration or credit risks, or to employ additional financial leverage,” in an effort to “reach for yield”
- ▶ Existing empirical evidence on “reaching for yield” exclusively focused on *credit* risk taking

This Paper

- ▶ We study Agency Mortgage REITs (MREITs) to test the hypothesis that QE influences financial institution growth and *financial* risk-taking
- ▶ Specialized investment vehicles that hold long-term, mortgage-backed securities (MBS) guaranteed by U.S. government agencies; portfolio composition limited by law
 - ▶ Directly and materially affected by QE
 - ▶ Government guarantees for Agency MBS shut-off any *credit* risk-taking response, focus on *financial* risk-taking
 - ▶ Financial risks are often more difficult to measure, such as interest rate, liquidity risk and “financial leverage risk” (i.e., the portion of insolvency risk that is unrelated to business risk)

Preview of Results

- ▶ High-frequency event study of QE announcements
 - ▶ Agency MREIT share prices react consistent with their business prospects and differently from other institutions
- ▶ Quarterly regressions (2005-2015) examining Agency MREIT asset growth, equity issuance, and share repurchases
 - ▶ Agency MREIT growth and equity issuance inversely related to Federal Reserve Agency MBS purchases (QE3 and Tapering)
 - ▶ Share repurchases positively related to Federal Reserve Agency MBS purchases (QE3 and Tapering)
- ▶ Quarterly regressions (2005-2015) examining Agency MREIT solvency risk, liquidity risk, and interest rate risk
 - ▶ Agency MREITs increased leverage in response to the Federal Reserve's Agency MBS purchases (QE3 and Tapering)
 - ▶ Also lengthened repo maturity, increased cash holdings and interest rate hedging (MEP, QE3, Tapering)

Contributions

1. QE-induced risk-taking by financial institutions
 - ▶ Prior studies on *credit* risk-taking (e.g., Chodrow-Reich, 2014; DiMaggio and Kacperzyk, 2017; Choi and Kronlund, 2018) → We look at solvency, liquidity, and interest rate risk
2. QE and investment decisions of financial institutions
 - ▶ Past literature studies loan origination and/or portfolio allocations (e.g., Rodnyanski and Darmouni, 2017; Chakraborty et al. 2017; Kandrak and Schlusche, 2017; DiMaggio et al., 2018) → We study industry growth
3. Channels of QE
 - ▶ Signaling (e.g., Clouse et al., 2003; Eggertsson and Woodford, 2003; Bauer and Rudebusch, 2014) versus portfolio balance channel (e.g., Bernanke, 2010) → Our findings on crowding out Agency MREITs are consistent with the latter
4. Ongoing policy interest given Federal Reserve's "portfolio normalization plan" and FSOC concern around MREITs

Background on Mortgage REITs

- ▶ Invest in whole mortgage loans and/or mortgage-related securities backed by properties
- ▶ Since 2006, growing share of investment in Agency MBS

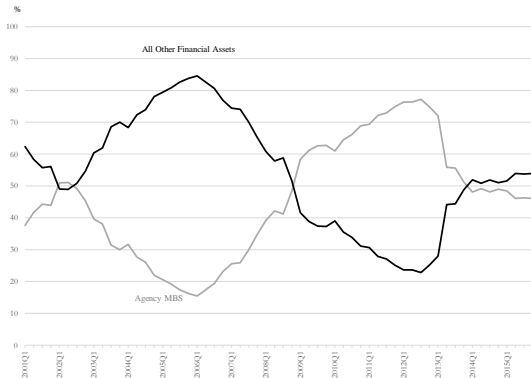
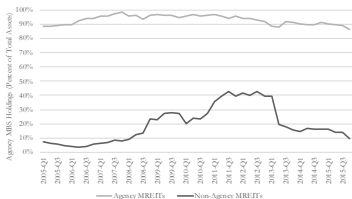


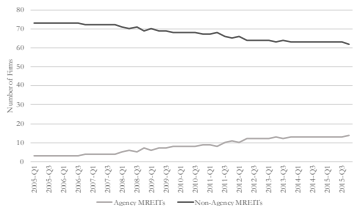
Figure 1: MREIT Investment Shares

Agency versus Non-Agency Mortgage REITs

- ▶ MREIT investment in Agency MBS concentrated in a subset of institutions
- ▶ Following the onset of the financial crisis and through the Great Recession, as many as 14 were in operation



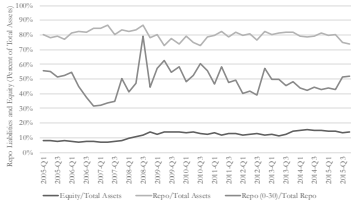
(a) Holdings of Agency MBS



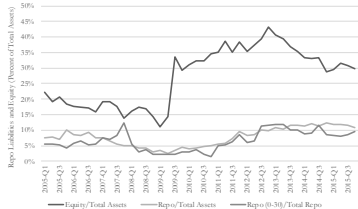
(b) Number of MREITs

Mortgage REIT Capital Structure

- ▶ Mix of equity and short-term collateralized debt in the form of bilateral repurchase agreements with broker-dealers
- ▶ No regulatory leverage limits but repo haircuts place effective limits



(a) Agency MREITs



(b) Non-Agency MREITs

Mortgage REIT Growth

- ▶ Between 2008:Q4 and 2012:Q3, Agency MREITs increased their holdings of Agency MBS from \$76.2 to \$337.6 billion

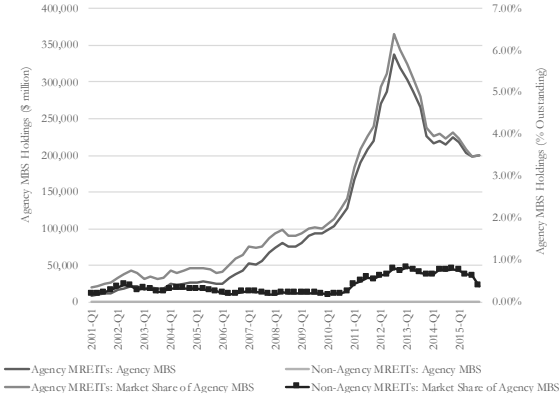
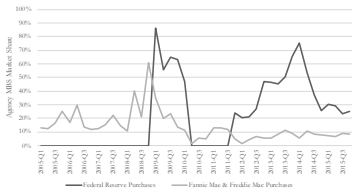


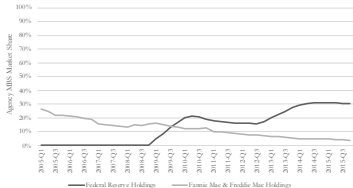
Figure 2: MREIT Agency MBS Holdings and Market Share

Federal Reserve and GSE Holdings

- ▶ Increase in Agency MREIT market share concurrent with shrinkage of GSE holdings, expansion of central bank activity



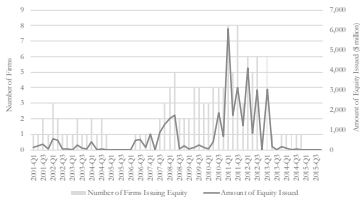
(a) Purchase Share (% of Total Agency MBS Issued)



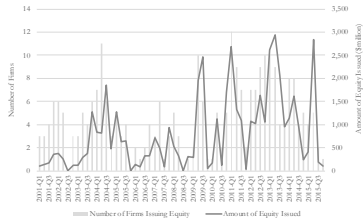
(b) Holdings Share (% of Total Agency MBS Outstanding)

MREIT Equity Issuance

- ▶ Given income distribution requirement, any significant growth requires new equity issuance
- ▶ For Agency MREITs, equity issuance clustered in 2010–2012, aligned with asset growth



(c) Agency MREITs



(d) Non-Agency MREITs

Event Study

- ▶ Equity market reaction of Agency versus Non-Agency MREITs to 14 QE-related announcements (Chodorow-Reich, 2014)
 - ▶ TAQ data to compare average prices before / after announcements (i.e., 7-2 minutes before; 18-23 minutes after)
 - ▶ Show that market participants expected MREITs to be affected by QE; contrast Agency and Non-Agency MREITs

Regime	Date	Treasury	Life Insurers	Banks	Market	Agency MREITs	Non-Agency MREITs	Difference
QE1	12/01/2008	-9.2	-0.4	-0.6***	-0.5***	0.3	-0.6	0.9*
QE1	12/16/2008	-16.8	3.6***	2.2***	1.3***	1.2***	2.2***	-1.0**
QE1	01/28/2009	3.1	-1.2***	-0.3	-0.3***	0.0	-0.7***	0.7***
QE1	03/18/2009	-22.8	4.0***	2.5***	1.5***	1.0**	1.7**	-0.7
QE1	09/23/2009	-8.9	0.6***	0.6***	0.6***	0.4***	0.6***	-0.2*
QE2	08/10/2010	-5.8	0.8***	0.9***	0.7***	0.4***	0.5***	-0.1
QE2	09/21/2010	-1.8	0.6***	0.7***	0.5***	0.1**	0.1	0.0
FG	08/09/2011	-14.4	-2.0***	-1.7***	-1.4***	1.7**	-0.4	2.1***
FG	01/25/2012	-6.3	-0.6***	0.0	0.3***	0.6***	0.3***	0.3*
QE3	09/13/2012	6.4	1.3***	1.0***	0.5***	0.3***	0.3***	0.0
QE3	05/22/2013	6.6	-0.4***	-0.5***	-0.5***	-1.2***	-0.5***	-0.7**
QE3	06/19/2013	7.8	0.1	0.2***	-0.2***	-1.3***	-0.6***	-0.7**
QE3	07/10/2013	-7.3	0.3	0.0	0.3***	0.5	0.5	0.0
QE3	09/18/2013	-14.0	0.4	0.9***	1.0***	2.8***	1.8***	1.0***
Initial QE		-39.7	7.6***	4.5***	2.9***	2.2***	4.0***	-1.9*
Taper		14.4	-0.3***	-0.4***	-0.6***	-2.5***	-1.1***	-1.3**
Sample end		-21.4	0.4	0.9***	1.2	3.2***	1.9***	1.2***

Data

- ▶ Institution-level data on 60 MREITs from S&P Global from 2005:Q1 to 2015:Q4
 - ▶ Total assets, total agency MBS, total repo debt (by tenor), total equity, equity issuance and repurchases
- ▶ Hand-collect type of Agency-MBS holding, derivative positions
- ▶ Interest rate data from FRED
 - ▶ Level (3m CMT) and slope of the term structure (10y–3m CMT), option-adjusted mortgage spread (Barclays), credit spread (Baa corporate bond yield–10y CMT), S&P/Case-Shiller House Price Index
- ▶ FOMC timeline of the Federal Reserve's policy actions
- ▶ FRB NY data on Federal Reserve Agency MBS purchases and holdings of Agency MBS, totals issued and outstanding

Method

- ▶ Examine asset growth, equity issuance, share repurchases, set of measures of solvency, liquidity and interest rate risk
- ▶ ID via comparison of Agency and Non-Agency MREITs (Rodnyansky and Darmouni, 2017; Chakraborty et al., 2017)

$$DepVar_{it} = f(AgencyMREIT_i, Int_t, L.Char_{it}, MPR_t) + \epsilon_{it}$$

- ▶ Interest rate variables: Federal Reserve's policy rate, slope of the term structure, OAS, credit spread, house price index
- ▶ Institution characteristics: Equity issuance, repurchase activity, capital structure characteristics (lagged)
- ▶ MPR: QE1, QE2, MEP, QE3, Tapering, and Federal Reserve purchase shares of Agency MBS
- ▶ Estimated using OLS, standard errors clustered by institution

Results: Asset Growth

VARIABLES	(1)	(2)	(3)	(4)
	Asset Growth	Asset Growth	Asset Growth	Asset Growth
Agency MREIT	0.038** (0.018)	0.076*** (0.027)	0.036* (0.018)	0.033 (0.021)
Fed Treasury Purchase Share	0.362 (0.239)	0.361 (0.238)	-0.075 (0.198)	-0.058 (0.199)
Fed MBS Purchase Share	-0.080** (0.035)	-0.013 (0.045)		
Agency MREIT*Fed MBS Purchase Share		-0.145** (0.063)		
Fed MBS Purchase Share QE1			-0.013 (0.040)	-0.066 (0.044)
QE2			0.099** (0.037)	-0.002 (0.041)
Fed MBS Purchase Share MEP			0.462* (0.235)	0.386 (0.465)
Fed MBS Purchase Share QE3			-0.015 (0.050)	0.052 (0.079)
Fed MBS Purchase Share Taper			0.024 (0.039)	0.113* (0.061)
Agency MREIT*Fed MBS Purchase Share QE1				0.126** (0.060)
Agency MREIT*QE2				0.207*** (0.048)
Agency MREIT*Fed MBS Purchase Share MEP				0.119 (0.497)
Agency MREIT*Fed MBS Purchase Share QE3				-0.121 (0.074)
Agency MREIT*Fed MBS Purchase Share Taper				-0.159** (0.068)
Observations	1,002	1,002	1,002	1,002
R-squared	0.443	0.448	0.449	0.467
Interest Rate Variables	Y	Y	Y	Y
Firm Characteristics	Y	Y	Y	Y
Constant	Y	Y	Y	Y
Number of Firm Clusters	50	50	50	50

Results: Equity Issuance

VARIABLES	(1) Issued Equity	(2) Issued Equity	(3) Issued Equity	(4) Issued Equity
Agency MREIT	0.111** (0.053)	0.280*** (0.058)	0.113** (0.053)	0.191*** (0.048)
Fed Treasury Purchase Share	1.707*** (0.383)	1.655*** (0.381)	1.733*** (0.506)	1.827*** (0.512)
Fed MBS Purchase Share	-0.088 (0.102)	0.212** (0.087)		
Agency MREIT*Fed MBS Purchase Share		-0.636*** (0.138)		
Fed MBS Purchase Share QE1			0.088 (0.108)	0.046 (0.074)
QE2			0.079 (0.067)	-0.053 (0.093)
Fed MBS Purchase Share MEP			(0.269) (0.283)	(0.061) (0.542)
Fed MBS Purchase Share QE3			-0.104 (0.100)	0.207 (0.151)
Fed MBS Purchase Share Taper			0.004 (0.119)	0.382** (0.157)
Agency MREIT*Fed MBS Purchase Share QE1				0.084 (0.239)
Agency MREIT*QE2				0.239** (0.105)
Agency MREIT*Fed MBS Purchase Share MEP				-0.510 (0.639)
Agency MREIT*Fed MBS Purchase Share QE3				-0.600*** (0.168)
Agency MREIT*Fed MBS Purchase Share Taper				-0.719*** (0.193)
Observations	1,002	1,002	1,002	1,002
R-squared	0.128	0.164	0.131	0.178
Interst Rate Variables	Y	Y	Y	Y
Firm Characteristics	Y	Y	Y	Y
Constant	Y	Y	Y	Y
Number of firm clusters	50	50	50	50

Results: Equity Repurchases

VARIABLES	(1)	(2)	(3)	(4)
	Repurchased Shares	Repurchased Shares	Repurchased Shares	Repurchased Shares
Agency MREIT	0.063 (0.054)	-0.048 (0.048)	0.062 (0.054)	0.053 (0.050)
Fed Treasury Purchase Share	-0.773** (0.352)	-0.738** (0.351)	-1.659*** (0.412)	-1.753*** (0.426)
Fed MBS Purchase Share	0.087 (0.075)	-0.113 (0.118)		
Agency MREIT*Fed MBS Purchase Share		0.422*** (0.126)		
Fed MBS Purchase Share QE1			0.001 (0.111)	0.150 (0.162)
QE2			0.152*** (0.043)	0.240*** (0.066)
Fed MBS Purchase Share MEP			0.293 (0.215)	1.136** (0.457)
Fed MBS Purchase Share QE3			0.206** (0.093)	-0.101 (0.062)
Fed MBS Purchase Share Taper			0.066 (0.064)	-0.247*** (0.077)
Agency MREIT*Fed MBS Purchase Share QE1				-0.335* (0.175)
Agency MREIT*QE2				-0.163** (0.070)
Agency MREIT*Fed MBS Purchase Share MEP				-1.341*** (0.499)
Agency MREIT*Fed MBS Purchase Share QE3				0.568*** (0.148)
Agency MREIT*Fed MBS Purchase Share Taper				0.342** (0.135)
Observations	1,002	1,002	1,002	1,002
R-squared	0.082	0.100	0.092	0.141
Interest Rate Variables	Y	Y	Y	Y
Firm Characteristics	Y	Y	Y	Y
Constant	Y	Y	Y	Y
Number of firm clusters	50	50	50	50

Results: Solvency Risk (Leverage)

VARIABLES	(1)	(2)	(3)	(4)
	Equity/Assets	Equity/Assets	Equity/Assets	Equity/Assets
Agency MREIT	-0.081** (0.039)	-0.068* (0.038)	-0.080* (0.040)	-0.049 (0.030)
Fed Treasury Purchase Share	0.060 (0.215)	0.057 (0.216)	-0.003 (0.199)	0.017 (0.204)
Fed MBS Purchase Share	-0.019 (0.026)	0.003 (0.043)		
Agency MREIT*Fed MBS Purchase Share		-0.046 (0.050)		
Fed MBS Purchase Share QE1			-0.071* (0.036)	-0.111 (0.066)
QE2			0.025 (0.023)	0.061 (0.043)
Fed MBS Purchase Share MEP			0.005 (0.095)	0.189 (0.270)
Fed MBS Purchase Share QE3			0.062** (0.029)	0.166** (0.064)
Fed MBS Purchase Share Taper			0.039 (0.028)	0.101* (0.059)
Agency MREIT*Fed MBS Purchase Share QE1				0.093 (0.083)
Agency MREIT*QE2				-0.077 (0.058)
Agency MREIT*Fed MBS Purchase Share MEP				(0.362) (0.356)
Agency MREIT*Fed MBS Purchase Share QE3				-0.199** (0.082)
Agency MREIT*Fed MBS Purchase Share Taper				-0.121* (0.066)
Observations	1,002	1,002	1,002	1,002
R-squared	0.443	0.444	0.451	0.466
Interest Rate Variables	Y	Y	Y	Y
Firm Characteristics	Y	Y	Y	Y
Constant	Y	Y	Y	Y
Number of Firm Clusters	50	50	50	50

Results: Liquidity Risk (Repo Debt)

VARIABLES	(1)	(2)	(3)	(4)
	Repo/Assets	Repo/Assets	Repo/Assets	Repo/Assets
Agency MREIT	0.595*** (0.045)	0.615*** (0.045)	0.594*** (0.045)	0.594*** (0.044)
Fed Treasury Purchase Share	-0.089 (0.132)	-0.094 (0.133)	-0.249 (0.198)	-0.249 (0.198)
Fed MBS Purchase Share	0.050 (0.031)	0.087 (0.058)		
Agency MREIT*Fed MBS Purchase Share		-0.079 (0.077)		
Fed MBS Purchase Share QE1			-0.016 (0.034)	-0.053 (0.048)
QE2			0.019 (0.033)	0.000 (0.041)
Fed MBS Purchase Share MEP			0.155* (0.092)	0.160* (0.149)
Fed MBS Purchase Share QE3			0.089* (0.049)	0.114 (0.092)
Fed MBS Purchase Share Taper			0.082** (0.041)	0.160* (0.085)
Agency MREIT*Fed MBS Purchase Share QE1				0.088 (0.055)
Agency MREIT*QE2				0.039 (0.039)
Agency MREIT*Fed MBS Purchase Share MEP				0.314 (0.208)
Agency MREIT*Fed MBS Purchase Share QE3				-0.045 (0.104)
Agency MREIT*Fed MBS Purchase Share Taper				-0.141 (0.102)
Observations	1,002	1,002	1,002	1,002
R-squared	0.799	0.799	0.800	0.803
Interest Rate Variables	Y	Y	Y	Y
Firm Characteristics	Y	Y	Y	Y
Constant	Y	Y	Y	Y
Number of Firm Clusters	50	50	50	50

Results: Liquidity Risk (Short-Term Repo Debt)

VARIABLES	(1) Repo (0-30)/Repo	(2) Repo (0-30)/Repo	(3) Repo (0-30)/Repo	(4) Repo (0-30)/Repo
Agency MREIT	0.215** (0.089)	0.254*** (0.088)	0.214** (0.089)	0.276*** (0.084)
Fed Treasury Purchase Share	0.374 (0.278)	0.365 (0.279)	0.361 (0.307)	0.399 (0.306)
Fed MBS Purchase Share	0.090* (0.051)	0.162* (0.094)		
Agency MREIT*Fed MBS Purchase Share		-0.153 (0.152)		
Fed MBS Purchase Share QE1			0.026 (0.079)	-0.070 (0.127)
QE2			-0.020 (0.054)	-0.003 (0.069)
Fed MBS Purchase Share MEP			0.003 (0.227)	0.622 (0.437)
Fed MBS Purchase Share QE3			0.131 (0.096)	0.406** (0.180)
Fed MBS Purchase Share Taper			0.050 (0.061)	0.196* (0.115)
Agency MREIT*Fed MBS Purchase Share QE1				0.219 (0.150)
Agency MREIT*QE2				-0.040 (0.092)
Agency MREIT*Fed MBS Purchase Share MEP				-1.169* (0.628)
Agency MREIT*Fed MBS Purchase Share QE3				-0.521** (0.238)
Agency MREIT*Fed MBS Purchase Share Taper				-0.279* (0.166)
Observations	1,002	1,002	1,002	1,002
R-squared	0.231	0.234	0.233	0.263
Interest Rate Variables	Y	Y	Y	Y
Firm Characteristics	Y	Y	Y	Y
Constant	Y	Y	Y	Y
Number of Firm Clusters	50	50	50	50

Results: Liquidity Risk (Cash Holdings)

VARIABLES	(1) Cash/Assets	(2) Cash/Assets	(3) Cash/Assets	(4) Cash/Assets
Agency MREIT	0.003 (0.005)	0.002 (0.006)	0.003 (0.005)	-0.002 (0.005)
Fed Treasury Purchase Share	-0.035 (0.032)	-0.035 (0.032)	-0.073* (0.038)	-0.075* (0.040)
Fed MBS Purchase Share	0.003 (0.006)	0.001 (0.010)		
Agency MREIT*Fed MBS Purchase Share		0.004 (0.011)		
Fed MBS Purchase Share QE1			0.011 (0.014)	0.018 (0.029)
QE2			0.000 (0.006)	-0.007 (0.009)
Fed MBS Purchase Share MEP			0.062 (0.040)	0.053 (0.070)
Fed MBS Purchase Share QE3			0.004 (0.006)	-0.011 (0.014)
Fed MBS Purchase Share Taper			-0.013 (0.009)	-0.033* (0.017)
Agency MREIT*Fed MBS Purchase Share QE1				-0.016 (0.036)
Agency MREIT*QE2				0.015 (0.011)
Agency MREIT*Fed MBS Purchase Share MEP				0.023 (0.068)
Agency MREIT*Fed MBS Purchase Share QE3				0.029 (0.019)
Agency MREIT*Fed MBS Purchase Share Taper				0.038** (0.018)
Observations	1,002	1,002	1,002	1,002
R-squared	0.230	0.230	0.237	0.245
Interest Rate Variables	Y	Y	Y	Y
Firm Characteristics	Y	Y	Y	Y
Constant	Y	Y	Y	Y
Number of Firm Clusters	50	50	50	50

Results: Interest-Rate Risk (Fixed-Rate Securities)

VARIABLES	(1)	(2)	(3)	(4)
	Fixed/Agency	Fixed/Agency	Fixed/Agency	Fixed/Agency
Agency MREIT	0.373*** (0.103)	0.376*** (0.105)	0.371*** (0.102)	0.392*** (0.105)
Fed Treasury Purchase Share	0.040 (0.338)	0.039 (0.342)	-0.819** (0.376)	-0.790** (0.383)
Fed MBS Purchase Share	0.114* (0.057)	0.125 (0.153)		
Agency MREIT*Fed MBS Purchase Share		-0.016 (0.202)		
Fed MBS Purchase Share QE1			-0.088 (0.079)	0.049 (0.264)
QE2			0.149*** (0.046)	0.062 (0.104)
Fed MBS Purchase Share MEP			0.642** (0.258)	0.727 (1.209)
Fed MBS Purchase Share QE3			0.365*** (0.080)	0.590** (0.225)
Fed MBS Purchase Share Taper			0.217*** (0.067)	0.145 (0.184)
Agency MREIT*Fed MBS Purchase Share QE1				-0.189 (0.280)
Agency MREIT*QE2				0.102 (0.128)
Agency MREIT*Fed MBS Purchase Share MEP				(0.151) (1.329)
Agency MREIT*Fed MBS Purchase Share QE3				-0.306 (0.261)
Agency MREIT*Fed MBS Purchase Share Taper				0.103 (0.217)
Observations	485	485	485	485
R-squared	0.515	0.515	0.533	0.539
Interest Rate Variables	Y	Y	Y	Y
Firm Characteristics	Y	Y	Y	Y
Constant	Y	Y	Y	Y
Number of Firm Clusters	26	26	26	26

Results: Interest-Rate Risk (Hedging)

VARIABLES	(1)	(2)	(3)	(4)
	Swaps and Swaptions/Total Liabilities	Swaps and Swaptions/Total Liabilities	Swaps and Swaptions/Total Liabilities	Swaps and Swaptions/Total Liabilities
Agency MREIT	0.205*** (0.055)	0.100 (0.061)	0.210*** (0.058)	0.138** (0.053)
Fed Treasury Purchase Share	0.012 (0.179)	0.034 (0.173)	-0.456 (0.299)	-0.502 (0.300)
Fed MBS Purchase Share	0.094 (0.074)	-0.215* (0.125)		
Agency MREIT*Fed MBS Purchase Share		0.426*** (0.142)		
Fed MBS Purchase Share QE1			-0.010 (0.050)	-0.019 (0.072)
QE2			0.072 (0.055)	-0.026 (0.091)
Fed MBS Purchase Share MEP			0.340** (0.159)	0.094 (0.361)
Fed MBS Purchase Share QE3			0.222** (0.100)	0.017 (0.198)
Fed MBS Purchase Share Taper			0.122 (0.078)	-0.288*** (0.082)
Agency MREIT*Fed MBS Purchase Share QE1				0.016 (0.103)
Agency MREIT*QE2				0.139 (0.096)
Agency MREIT*Fed MBS Purchase Share MEP				0.382 (0.407)
Agency MREIT*Fed MBS Purchase Share QE3				0.287 (0.233)
Agency MREIT*Fed MBS Purchase Share Taper				0.581*** (0.122)
Observations	474	474	474	474
R-squared	0.526	0.551	0.535	0.563
Interst Rate Variables	Y	Y	Y	Y
Firm Characteristics	Y	Y	Y	Y
Constant	Y	Y	Y	Y
Number of Firm Clusters	25	25	25	25

Conclusion

- ▶ Prolonged use of unconventional monetary policy after financial crisis resulted in concerns about financial instability
- ▶ This paper examined how QE influences financial institution growth and risk-taking in terms of financing choices
- ▶ Study Agency MREITs, institutions that invest almost exclusively in Agency MBS
 - ▶ Do not hold *credit*-risky assets → Clean test of link between QE and *financial* risk-taking
 - ▶ Specialized institutions directly affected by QE, experienced large size fluctuations
 - ▶ FSOC (2013) raised financial stability concerns about Agency MREITs; policy interest re. “balance sheet normalization plan”

Conclusion (Ctd.)

- ▶ Event study
 - ▶ Agency MREIT reaction to QE announcements consistent with their business prospects
 - Directly, materially affected by QE
- ▶ Growth
 - ▶ Asset growth, equity issuance (repurchases) inversely (positively) related to central bank's Agency MBS purchases
 - Consistent with portfolio rebalancing
- ▶ Financial risk-taking
 - ▶ Agency MREITs increased leverage during QE3 and Tapering
 - Consistent with “reaching for yield” behavior
 - ▶ Concurrently reduced liquidity and interest rate risk exposure
 - Net effect on financial risk-taking limited

Descriptive Statistics

Panel A: Agency MREITs	N	Mean	SD	P25	Median	P75	Min	Max	Difference
Total Assets	447	18.0000	25.5000	4.4600	8.6300	17.5000	0.1920	142.0000	13.6700***
Growth in Assets	447	0.0888	0.2582	-0.0263	0.0149	0.0972	-0.3471	1.6464	0.0254
Agency Securities/Assets	447	0.8364	0.1547	0.7290	0.9091	0.9608	0.4135	0.9960	0.7760***
Issued Equity	447	0.2573	0.4376	0.0000	0.0000	1.0000	0.0000	1.0000	0.1222***
Amount Issued	447	0.0864	0.2356	0.0000	0.0000	0.0032	0.0000	1.6105	0.0262
Repurchased Shares	447	0.2215	0.4157	0.0000	0.0000	0.0000	0.0000	1.0000	0.1062***
Number Repurchased	447	0.0039	0.0127	0.0000	0.0000	0.0000	0.0000	0.1275	0.0021***
Market-to-Book Value of Equity	447	0.8897	0.1636	0.774	0.8857	0.9966	0.3208	1.4137	-0.0515***
Equity/Assets	447	0.1388	0.0509	0.1053	0.1247	0.1561	0.0617	0.3770	-0.1552***
Cash/Assets	447	0.0208	0.0189	0.0073	0.0191	0.0297	0.0000	0.2201	-0.0185***
Repo Debt/Assets	447	0.7831	0.0965	0.7387	0.8077	0.8545	0.3152	0.9147	0.6211***
Repo Debt (0-30 days)/Total Repo	447	0.4661	0.3006	0.2636	0.4735	0.7232	0.0000	1.0000	0.2976***
Fixed-Rate/Agency Securities	319	0.5762	0.3872	0.0030	0.7358	0.9095	0.0000	1.0000	0.4855***
Swaps/Total Liabilities	400	0.4505	0.2254	0.3567	0.4542	0.5764	0.0000	1.2060	0.3127***
Swaps & Swaptions/Total Liabilities	400	0.4792	0.2492	0.3567	0.4629	0.6030	0.0000	1.2060	0.3414***

Panel B: Non-Agency MREITs	N	Mean	SD	P25	Median	P75	Min	Max	Difference
Total Assets	555	4.3300	7.1700	0.6910	1.9700	5.3000	0.0050	57.5000	
Growth in Assets	555	0.0634	0.2507	-0.0286	0.0103	0.0916	-0.5563	1.9771	
Agency Securities/Assets	555	0.0604	0.1378	0.0000	0.0000	0.0386	0.0000	0.8453	
Issued Equity	555	0.1351	0.3422	0.0000	0.0000	0.0000	0.0000	1.0000	
Amount Issued	555	0.0602	0.3175	0.0000	0.0000	0.0000	0.0000	4.0618	
Repurchased Shares	555	0.1153	0.3197	0.0000	0.0000	0.0000	0.0000	1.0000	
Number Repurchased	555	0.0018	0.0096	0.0000	0.0000	0.0000	0.0000	0.1452	
Market-to-Book Value of Equity	555	0.9412	0.4041	0.7361	0.9569	1.1644	-0.3463	2.0508	
Equity/Assets	555	0.2940	0.2523	0.0978	0.2197	0.4191	-0.1007	0.9945	
Cash/Assets	555	0.0393	0.0927	0.0066	0.0160	0.0384	0.0002	1.0000	
Repo Debt/Assets	555	0.1620	0.2079	0.0000	0.0625	0.2664	0.0000	0.8864	
Repo Debt (0-30 days)/Total Repo	555	0.1685	0.3279	0.0000	0.0000	0.0998	0.0000	1.0000	
Fixed-Rate/Agency Securities	166	0.0907	0.2294	0.0000	0.0000	0.0000	0.0000	1.0000	
Swaps/Total Liabilities	518	0.1378	0.2145	0.0000	0.0519	0.1938	0.0000	1.7574	
Swaps & Swaptions/Total Liabilities	518	0.1378	0.2145	0.0000	0.0519	0.1938	0.0000	1.7574	

Panel C: Macro Environment	N	Mean	SD	P25	Median	P75	Min	Max	Difference
3-Month CMT	44	1.0250	1.7187	0.0300	0.0900	1.1500	0.0100	5.0800	
CMT Term Structure	44	2.0040	1.0159	1.6100	2.1800	2.6700	-0.5200	3.5800	
Option-Adjusted Spread	44	0.4866	0.2911	0.2700	0.3800	0.5800	0.1100	1.4500	
Credit Spread	44	2.7349	0.7816	2.2600	2.7500	3.0800	1.5900	5.8200	
Case-Shiller House Price Index	44	0.0049	0.0301	-0.0078	0.0066	0.0272	-0.0696	0.0742	
Fed MBS Purchase Share	44	0.2470	0.2473	0.0000	0.2383	0.4641	0.0000	0.8622	
Fed Treasury Purchase Share	44	0.0993	0.0850	0.0364	0.0671	0.1912	0.0000	0.2815	