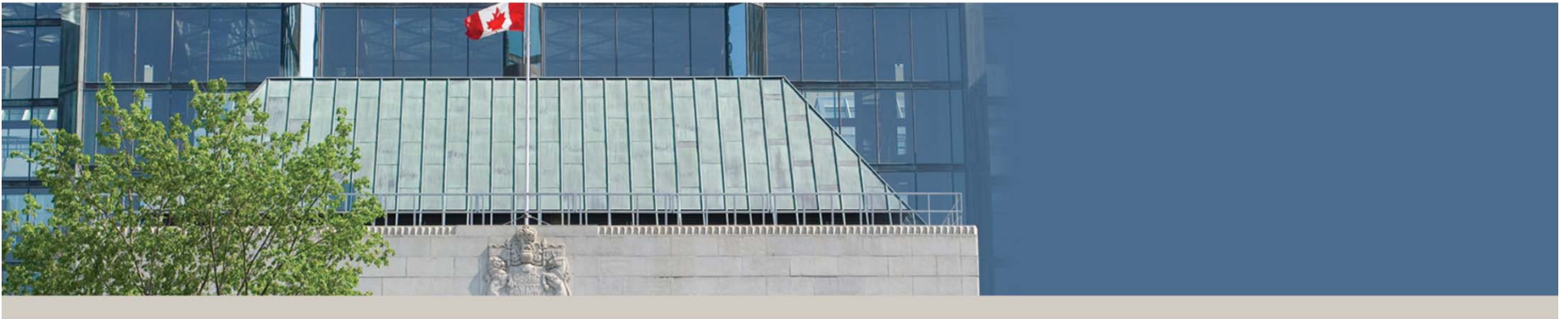


Following the money: Evidence for the Portfolio Balance Channel of Quantitative Easing

January 7, 2018



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Portfolio Balance Channel

I see the evidence as most favorable to the view that such purchases work primarily through the so-called **portfolio balance channel**, which . . .relies on the presumption that different financial assets are not perfect substitutes in investors' portfolios. . . For example, some **investors who sold MBS to the Fed may have replaced them in their portfolios with longer-term, high-quality corporate bonds**, depressing the yields on those assets as well.

- **Ben Bernanke, Jackson Hole, August 27, 2010**

Evidence from event studies

- **QE purchases could:**
 - Reduce expectations of future interest rates (signalling)
 - Induce purchases of other assets (portfolio balance)

- **Reduced yields could be supportive of both portfolio balance and signalling:** Krishnamurthy and Vissing-Jorgensen (2011, 2012); D'Amico and King (2013); Gagnon et al (2011); Glick and Leduc (2011); Bauer and Rudebusch (2014)

This study – micro study of QE

1. Examine directly quantity effects rather than the price effects of QE.
2. Study the portfolio balance effects of QE on the individual security holdings of bond mutual funds by “following the money”.
3. Examine transmission of QE outside the banking sector.

Previous work on portfolios

- **Focus on Bank of England, ECB, and Federal Reserve:**
 - Joyce et al (2014), Koijen et al (2017), Albertazzi, Becker and Boucinha (2016), Carpenter et al (2013)
- **Perform analysis at the country / sector level or at aggregate holdings level.**

Questions and Preview of Results

1. Do mutual funds sell the assets that the Federal Reserve is purchasing?
2. Do mutual funds rebalance their portfolio into other assets (corporates, international, government)?
3. Do mutual fund investors rebalance their portfolio towards other funds (corporates, international, government)?

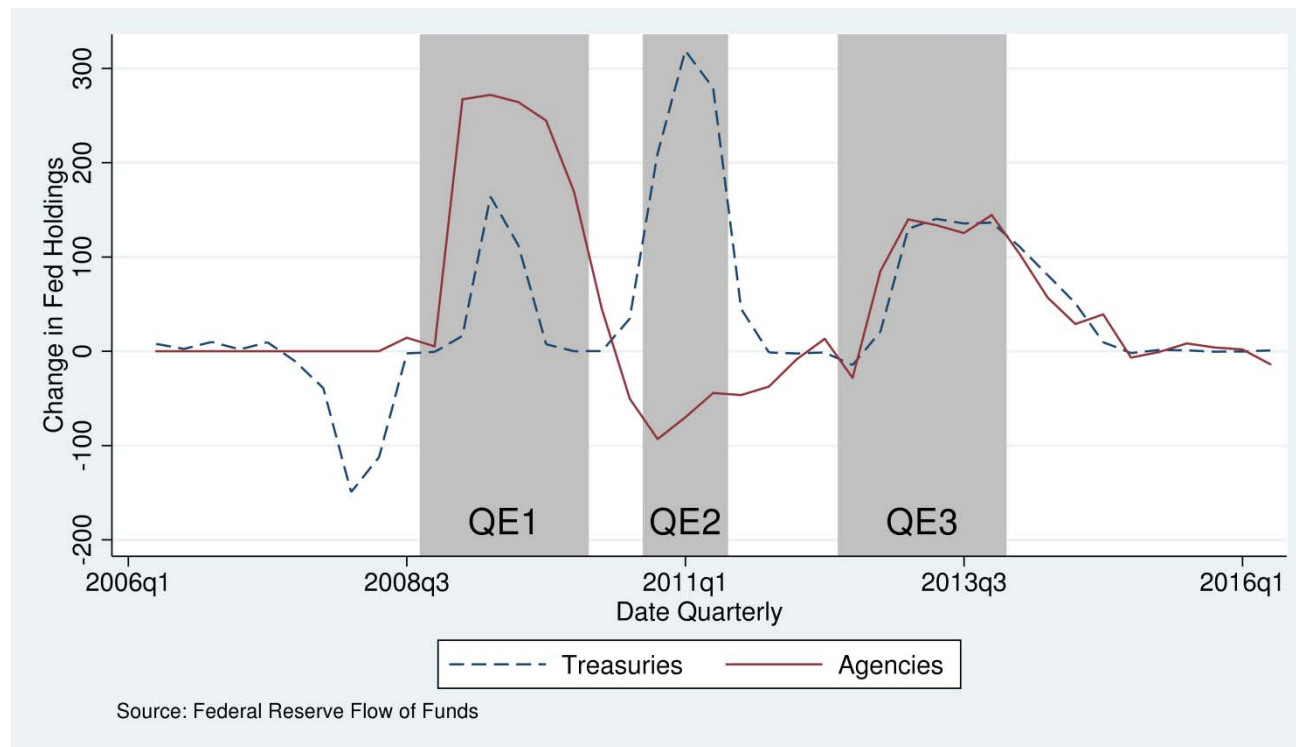
Data



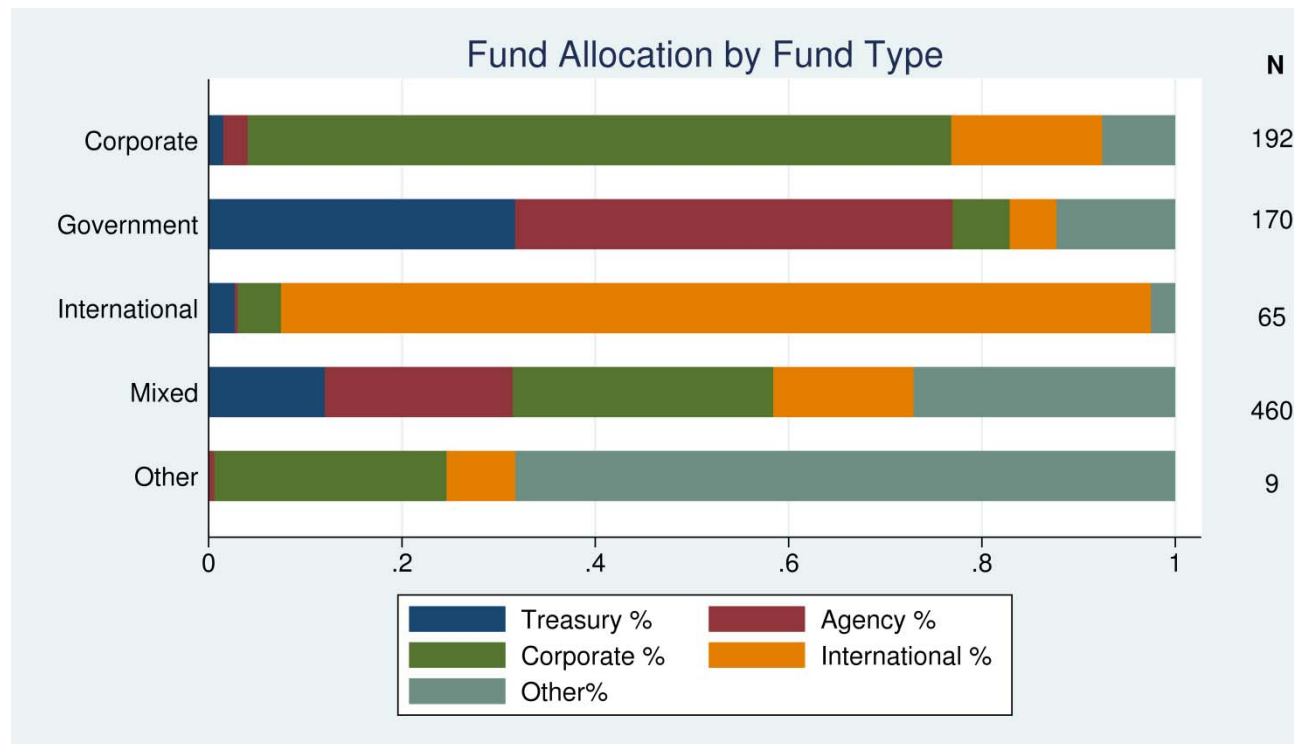
Morningstar
quarterly
bond fund
holdings data
(2006-2014)

Federal
Reserve asset
purchases

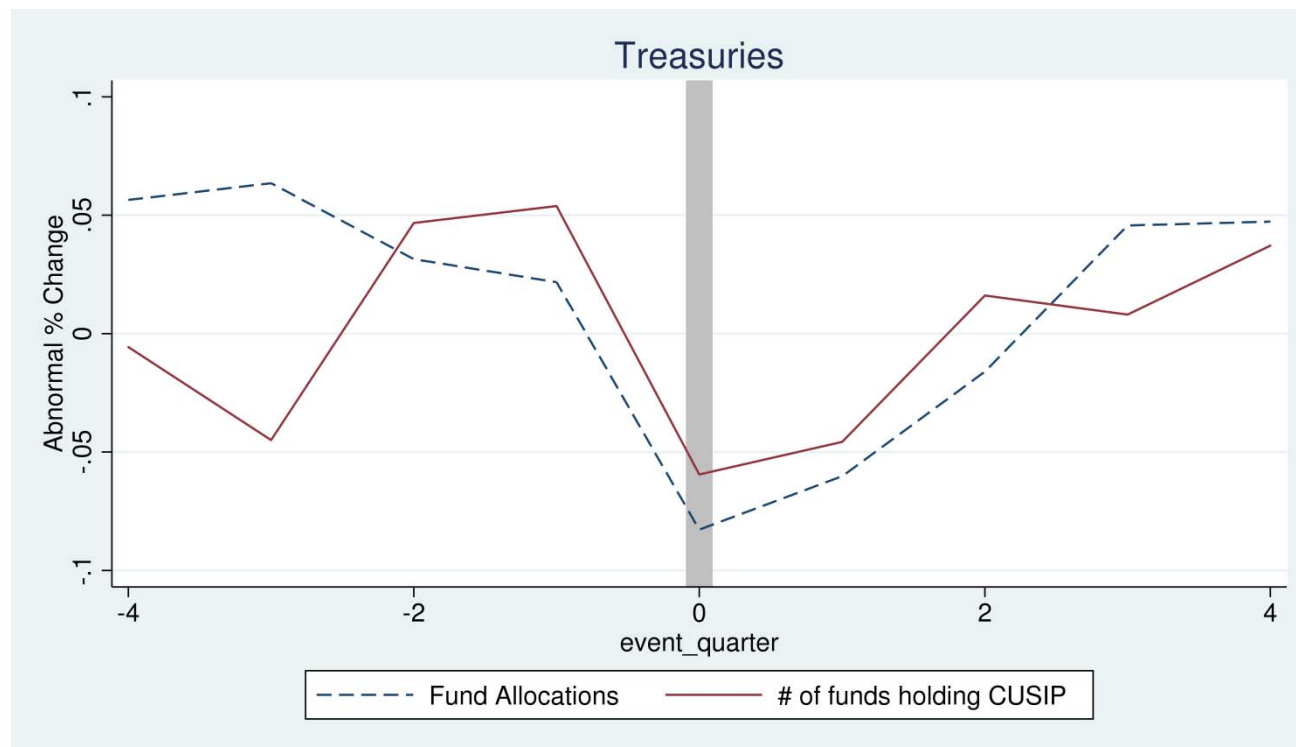
Focus on QE transactions



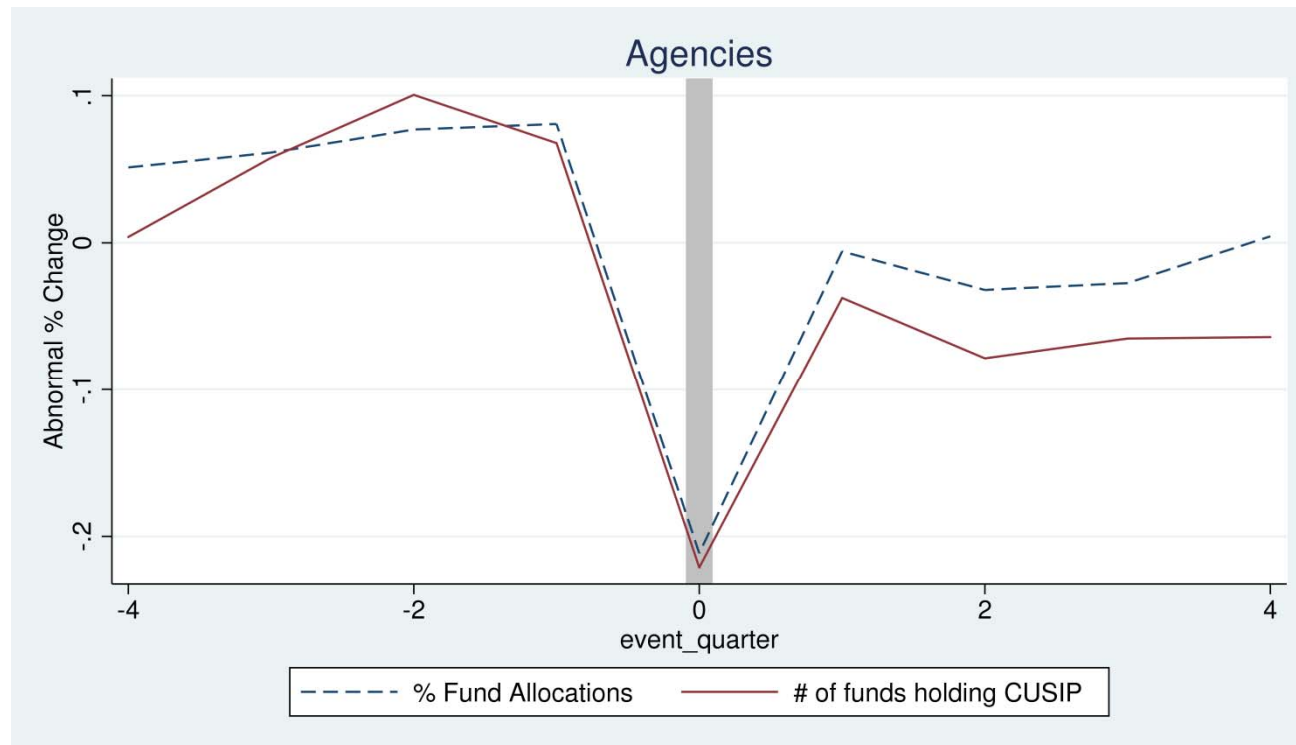
Constrained and less constrained funds



Do funds sell Treasuries when Fed is buying?



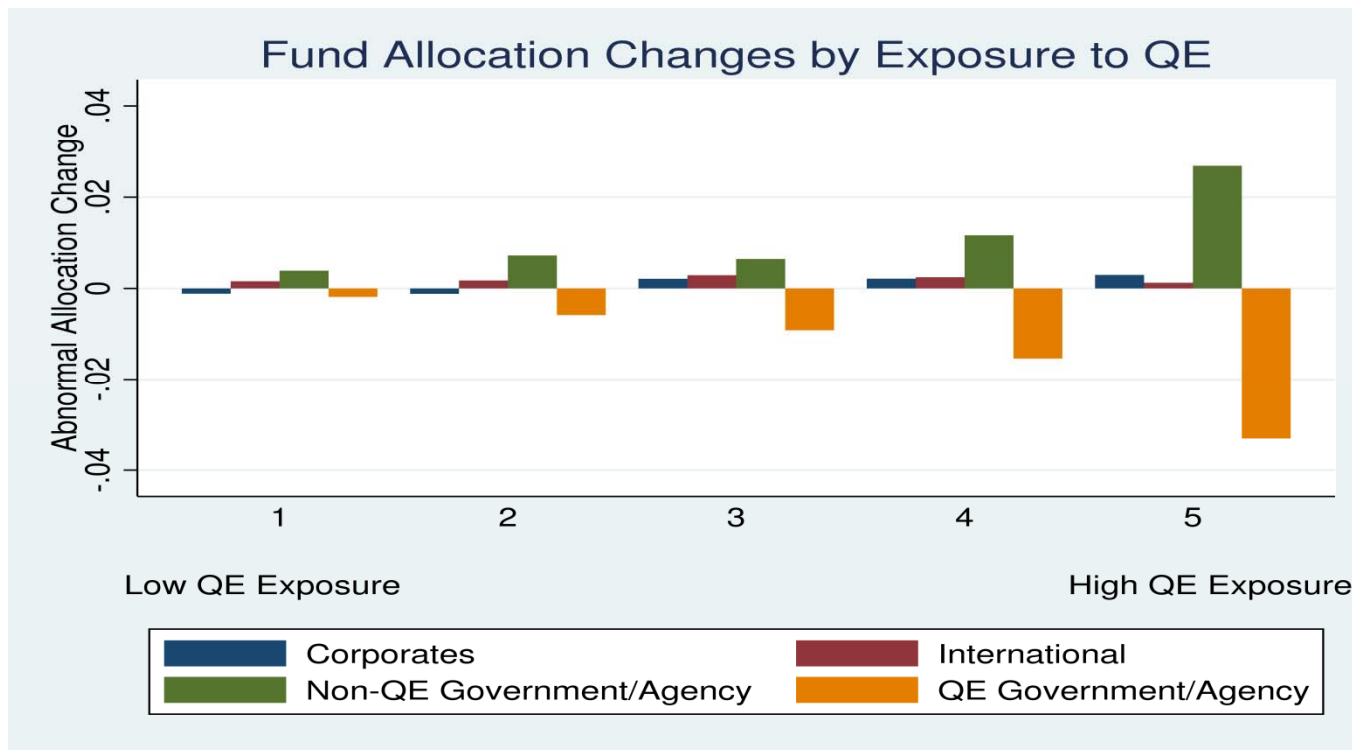
Do funds sell Agencies when Fed is buying?



Do funds sell when Fed is buying?

	Agencies		Government	
	% Δ Holdings	% Δ # Funds	% Δ Holdings	% Δ # Funds
FIFA _t	0.683 (98.36)***	0.489 (7.58)***	0.627 (9.23)***	0.096 (0.57)
SOMA Indicator * QE _t	-0.222 (44.47)***	-0.208 (6.44)***	-0.106 (6.06)***	-0.068 (4.98)***
Constant	-0.283 (64.77)***	-0.340 (8.68)***	-0.236 (11.80)***	-0.156 (6.07)***
R ²	0.24	0.00	0.07	0.03
N	104,177	107,205	7,723	8,071

Where do funds rebalance?



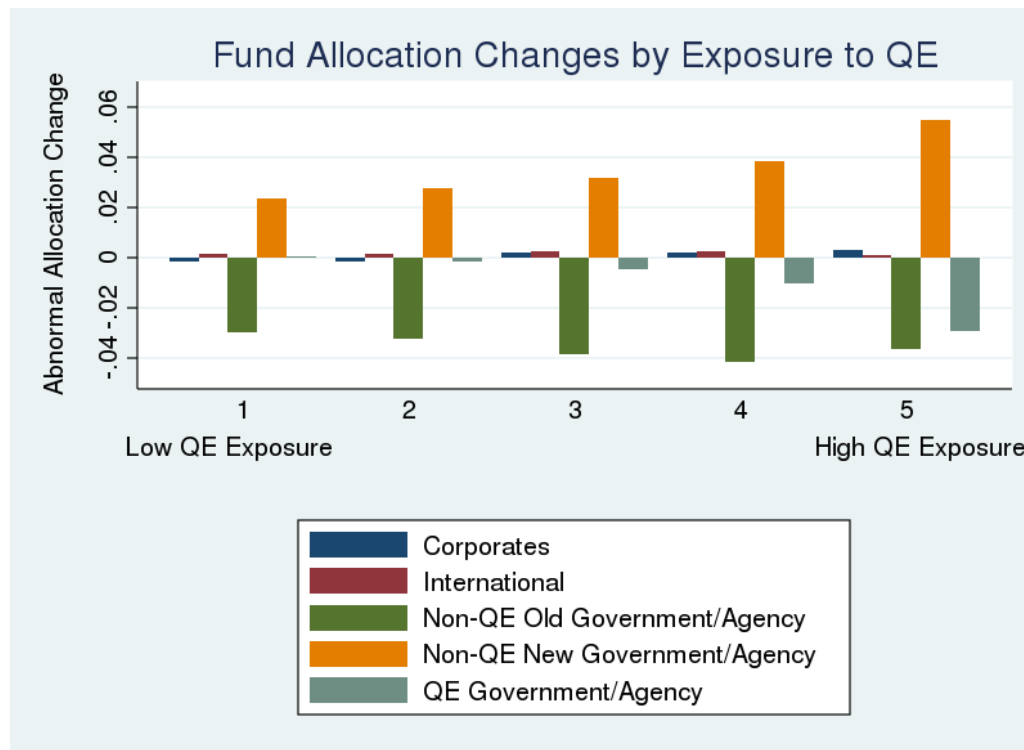
Where do pure funds rebalance?

	Abnormal Corporate Allocation	Abnormal Internationa l Allocation	Abnormal QE Allocation	Abnormal Non-QE Allocation	Abnormal Cash Allocation	Abnormal Other Allocation
% SOMA _{t-1}	0.024 (2.21)**	0.008 (2.37)**	-0.011 (1.04)	-0.051 (2.71)**	0.007 (1.60)	0.022 (3.07)***
% QE _{t-1}	-0.001 (0.24)	-0.008 (3.58)***	-0.103 (6.22)***	0.107 (5.42)***	0.006 (2.03)*	-0.000 (0.10)
Fund flows _{t-1}	-0.029 (4.32)***	-0.013 (3.26)***	-0.011 (1.97)*	0.046 (4.55)***	0.028 (4.61)***	-0.021 (3.83)***
Fund return _{t-1}	0.046 (2.27)**	0.014 (1.00)	-0.020 (0.95)	-0.045 (1.75)*	-0.023 (2.56)**	0.028 (1.58)
R ²	0.09	0.10	0.22	0.12	0.12	0.08
N	8,742	8,742	8,742	8,742	8,742	8,742

Where do mixed funds rebalance?

	Abnormal Corporate Allocation	Abnormal Internationa l Allocation	Abnormal QE Allocation	Abnormal Non-QE Allocation	Abnormal Cash Allocation	Abnormal Other Allocation
% SOMA _{t-1}	0.076 (7.86)***	0.021 (4.29)***	-0.003 (0.36)	-0.138 (10.60)***	0.011 (2.28)**	0.034 (4.22)***
% QE _{t-1}	0.017 (1.83)*	-0.005 (0.67)	-0.279 (11.96)***	0.276 (8.40)***	-0.012 (1.73)*	0.002 (0.21)
Fund flows _{t-1}	-0.083 (9.58)***	-0.032 (7.47)***	-0.006 (1.61)	0.150 (10.26)***	0.027 (4.56)***	-0.056 (7.88)***
Fund return _{t-1}	0.079 (1.36)	0.003 (0.10)	-0.023 (0.85)	-0.090 (0.78)	-0.013 (0.56)	0.044 (0.83)
R ²	0.16	0.07	0.39	0.21	0.05	0.11
N	7,781	7,781	7,781	7,781	7,781	7,781

What kind of government security?



What kind of government security (for mixed)?

	Agency Securities		Treasuries	
	Abnormal Non-QE Old Allocation	Abnormal Non-QE New Allocation	Abnormal Non-QE Old Allocation	Abnormal Non-QE New Allocation
% SOMA Agency t_{-1}	-0.159 (7.93)***	0.041 (2.00)*	0.020 (1.16)	0.014 (0.77)
% QE Agency t_{-1}	0.136 (3.84)***	-0.034 (1.22)	-0.025 (1.01)	0.108 (2.56)**
% SOMA Treasury t_{-1}	0.058 (5.18)***	0.030 (3.81)***	-0.200 (14.2)***	-0.042 (2.37)**
% QE Treasury t_{-1}	0.016 (0.53)	-0.007 (0.33)	0.156 (5.10)***	0.267 (3.94)***
Fund flows t_{-1}	0.010 (0.90)	0.055 (4.57)***	0.030 (4.31)***	0.053 (4.99)***
Fund return t_{-1}	-0.078 (1.72)*	-0.074 (1.88)*	-0.041 (0.89)	0.080 (1.83)*
R^2	0.19	0.19	0.22	0.23
N	8,233	8,233	8,233	8,233

Do investors rebalance to corporate funds?

	(1)	(2)	(3)
Fund flows $t-1$	0.112	0.109	0.129
	(4.71)***	(4.55)***	(4.92)***
Fund return $t-1$	0.205	0.202	0.130
	(0.80)	(1.00)	(0.92)
Family flows t		0.196	0.301
		(5.67)***	(7.35)***
QE			-0.014
			(1.70)*
QE * Corporate Fund	0.028	0.029	0.027
	(2.29)**	(2.36)**	(2.16)**
QE * International Fund	0.020	0.020	0.016
	(1.59)	(1.72)*	(1.34)
QE * Other Fund	0.049	0.052	0.050
	(1.78)*	(1.81)*	(1.75)*
R ²	0.23	0.24	0.20
N	7,422	6,956	6,956

Summary

- Mutual funds sold the specific securities to the Federal Reserve during QE period.
- Mutual funds mostly rebalance their portfolio into other government securities and to a lesser extent corporate and international bonds.
- Fund investors appear to do more rebalancing.

Thanks!

