

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST

Form N-Q

August 28, 2012

OMB APPROVAL

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UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549

FORM N-Q

QUARTERLY SCHEDULE OF PORTFOLIO HOLDINGS  
OF REGISTERED MANAGEMENT INVESTMENT COMPANY

Investment Company Act file number 811-21409

Pioneer Municipal High Income Advantage Trust  
(Exact name of registrant as specified in charter)

60 State Street, Boston, MA 02109  
(Address of principal executive offices) (ZIP code)

Dorothy E. Bourassa, Pioneer Investment Management, Inc.,  
60 State Street, Boston, MA 02109  
(Name and address of agent for service)

Registrant's telephone number, including area code: (617) 742-7825

Date of fiscal year end: March 31

Date of reporting period: June 30, 2012

Form N-Q is to be used by management investment companies, other than small business investment companies registered on Form N-5 (239.24 and 274.5 of this chapter), to file reports with the Commission, not later than 60 days after close of the first and third fiscal quarters, pursuant to Rule 30b1-5 under the Investment Company Act of 1940 (17 CFR 270.30b1-5). The Commission may use the information provided on Form N-Q in its regulatory, disclosure review, inspection, and policymaking roles.

A registrant is required to disclose the information specified by Form N-Q, and the Commission will make this information public. A registrant is not required to respond to the collection of information contained in Form N-Q unless the Form displays a currently valid Office of Management and Budget ("OMB") control number. Please direct comments concerning the accuracy of the information collection burden estimate and any suggestions for reducing the burden to Secretary, Securities and Exchange Commission, 450 Fifth Street, NW, Washington, DC 20549-0609. The OMB has reviewed this collection of information under the clearance requirements of 44 U.S.C. ss. 3507.

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ITEM 1. Schedule of Investments.

Pioneer Municipal High

Income Advantage Trust

June 30, 2012

Ticker Symbols: MAV

Principal Amount USD (\$)	S&P/Moody's Rating	Value
	TAX EXEMPT OBLIGATIONS - 142.6% of Net Assets	
2,500,000	B-/B2 Alabama Industrial Development Authority Solid Waste Disposal Revenue, 6.45%, 12/1/23	\$ 2,431,100
2,500,000	NR/NRHuntsville-Redstone Village Special Care Facilities Financing Authority, 5.5%, 1/1/43	2,386,425 \$ 4,817,525
5,000,000	NR/NR Arizona - 3.3% Casa Grande Industrial Development Authority Hospital Revenue, 7.625%, 12/1/29	\$ 5,153,000
1,492,000	NR/Baa3 Pima County Industrial Development Authority,	1,495,834

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	6.75%, 7/1/31	
2,640,000	NR/NRPima County Industrial Development Authority, 7.0%, 1/1/38	2,701,486
1,000,000	NR/NRSan Luis Facility Development Corp., 7.25%, 5/1/27	944,880
		\$ 10,295,200
11,990,000	California - 18.6% CCC/NRCalifornia County Tobacco Securitization Agency Revenue, 5.25%, 6/1/46	\$ 8,599,108
1,000,000	NR/NRCalifornia Enterprise Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31	1,146,170
2,425,000	A-/A1California State Various Purpose, 5.75%, 4/1/31	2,802,645
3,000,000(a)	BB/NRCalifornia Statewide Communities Development Authority, 7.25%, 10/1/38 (144A)	3,180,780
757,342(b)	NR/NRCalifornia Statewide Communities Development Authority, 9.0%, 12/1/38	7,081
2,680,000(c)	AA+/AaaGolden State Tobacco Securitization Corp., 6.75%, 6/1/39	2,839,835
2,500,000	NR/Ba1Hesperia Public Financing Authority, 5.5%, 9/1/27	2,333,925
8,575,000(a)	AA-/NRLehman Municipal Trust Receipts, 12.866%, 7/28/31	9,667,370
3,140,000(a)(d)	AA-/WRLehman Municipal Trust Receipts, 12.959%, 9/20/28 (144A)	3,800,185
1,500,000	A-/NRMadera Irrigation Financing Authority Water Revenue, 6.25%, 1/1/31	1,645,620
1,500,000	A-/NRMadera Irrigation Financing Authority Water Revenue, 6.5%, 1/1/40	1,663,110
2,500,000	A-/A2San Jose California Airport Revenue, 5.0%, 3/1/37	2,589,275
7,000,000	B-/Caa1Tobacco Securitization Authority of Northern California Revenue, 5.375%, 6/1/38	5,448,100

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10,500,000(a)(d)	AA-/NR	University of California, RIB, 13.177%, 5/15/32	11,685,240 \$ 57,408,444
		Colorado - 0.4%	
1,000,000	NR/NR	Kremmling Memorial Hospital District, 7.125%, 12/1/45	\$ 1,095,590
		Connecticut - 2.9%	
7,750,000	BBB/Baa1	Connecticut State Development Authority Revenue, 5.75%, 11/1/37	\$ 7,773,405
1,000,000	NR/NR	Hamden Connecticut Facility Revenue, 7.75%, 1/1/43	1,081,320 \$ 8,854,725
		District of Colombia - 3.2%	
2,700,000	BBB/Baa1	District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$ 2,976,588
Principal Amount USD (\$)	S&P/Moody's Rating		Value
		District of Colombia - (continued)	
6,825,000	BBB/Baa1	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	6,954,743 \$ 9,931,331
		Florida - 5.0%	
1,500,000	NR/NR	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/41	\$ 1,664,535
1,500,000	NR/NR	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	1,664,535
1,000,000	NR/Ba3	Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41	1,094,350
1,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40	1,043,320
2,000,000	NR/NR		2,231,060

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		Florida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41	
1,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42	1,102,050
1,980,000	NR/NR	Hillsborough County Industrial Development Authority, 6.75%, 7/1/29	1,980,911
1,000,000(c)	NR/WR	Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32	1,431,060
495,000	NR/NR	Miami Beach Health Facilities Authority, 5.375%, 11/15/28	495,574
2,500,000	A-/A2	Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41	2,799,100 \$ 15,506,495
		Georgia - 4.3%	
5,210,000(a)(d)	AA-/WR	Atlanta Georgia Water and Wastewater Revenue, RIB, 12.959%, 1/30/13 (144A)	\$ 5,769,606
1,000,000	CCC+/NR	Clayton County Development Authority Special Facilities Revenue, 9.0%, 6/1/35	1,084,950
900,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.0%, 9/1/30	997,884
750,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.125%, 9/1/40	827,663
3,360,000	NR/NR	Fulton County Residential Care Facilities for the Elderly Authority, 7.0%, 7/1/29	2,979,614
1,650,000	NR/NR	Savannah Georgia Economic Development Authority Revenue, 7.4%, 1/1/34	1,687,604 \$ 13,347,321
		Guam - 1.9%	
1,000,000	B/NR	Guam Government of Department Education Certificates of Participation, 6.625%,	\$ 1,075,110

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Principal Amount USD (\$)	S&P/Moody's Rating	Value
	12/1/30	
4,400,000(c)	AA+/B2Northern Mariana Islands, 6.75%, 10/1/33	4,756,532 \$ 5,831,642
	Idaho - 1.1%	
2,000,000	BBB+/Baa1Power County Industrial Development Corp., 6.45%, 8/1/32	\$ 2,002,980
1,500,000	BBB+/Baa1Power County Pollution Control Revenue, 5.625%, 10/1/14	1,501,035 \$ 3,504,015
	Illinois - 6.7%	
1,000,000	NR/Baa2City of Country Club Hills, 5.0%, 12/1/31	\$ 1,025,350
1,450,000	A+/A1Illinois Finance Authority Revenue, 5.5%, 4/1/39	1,551,848
	Illinois - (continued)	
1,605,000	AA-/Aa3Illinois Finance Authority Revenue, 6.0%, 8/15/25	1,702,231
1,000,000(b)	NR/NRIllinois Finance Authority Revenue, 6.0%, 11/15/27	240,010
280,000	BBB+/NRIllinois Finance Authority Revenue, 6.0%, 8/15/38	311,623
2,000,000	AA+/Aa2Illinois Finance Authority Revenue, 6.0%, 8/15/39	2,311,540
2,500,000	NR/NRIllinois Finance Authority Revenue, 6.125%, 11/15/25	2,581,925
6,000,000	NR/NRIllinois Finance Authority Revenue, 8.25%, 5/15/45	6,395,220
2,500,000	NR/NRIllinois Finance Authority Revenue, 8.25%, 2/15/46	2,653,175
2,270,000	NR/NRSouthwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,895,495 \$ 20,668,417
	Indiana - 0.4%	
250,000	NR/Baa3East Chicago Indiana Exempt Facilities Revenue, 7.0%, 1/1/14	\$ 250,908
1,805,000	NR/NRVincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	1,089,606 \$ 1,340,514

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1,000,000	NR/A2	Kansas - 0.4% Kansas Development Finance Authority, 5.0%, 5/15/35	\$ 1,075,120
4,390,000	BB/NR	Kentucky - 1.4% Kentucky Economic Development Finance Authority Hospital System Revenue, 5.875%, 10/1/22	\$ 4,391,537
5,000,000	BBB-/Baa2	Louisiana - 5.9% Jefferson Parish Hospital Service Revenue, 6.375%, 7/1/41	\$ 5,593,600
2,500,000	BBB-/Baa3	Louisiana Local Government Environmental Developmental Authority Facilities Revenue, 6.75%, 11/1/32	2,790,500
6,000,000	NR/Baa1	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	6,179,580
750,000	BBB-/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	772,462
2,915,000	A-/A3	Tobacco Settlement Financing Corp.,	