

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST
Form N-Q
February 27, 2015

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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)

Terrence J. Cullen, 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: December 31, 2014

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.

File the schedules as of the close of the reporting period as set forth in ss. 210.12-12 12-14 of Regulation S-X [17 CFR 210.12-12 12-14]. The schedules need not be audited.

Pioneer Municipal
High Income Advantage Trust

NQ | December 31, 2014

Ticker Symbol: MAV

Schedule of Investments | 12/31/14 (unaudited)

Principal Amount USD (\$)	Value
TAX EXEMPT OBLIGATIONS - 143.1% of Net Assets	
Alabama - 1.7%	
2,500,000	Alabama Industrial Development Authority Solid Waste Disposal Revenue, 6.45%, 12/1/23
	\$ 2,510,175
2,500,000	Huntsville-Redstone Village Special Care Facilities Financing Authority Nursing Home Revenue, 5.5%, 1/1/43
	2,507,975
	\$ 5,018,150
Arizona - 1.0%	
2,640,000(a)	Pima County Industrial Development Authority, 7.0%, 1/1/38
	\$ 2,867,990
32,000	
	32,196

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Pima County Industrial Development Authority Education Revenue, 6.75%, 7/1/31	\$ 2,900,186
California - 16.2%	
6,990,000 California County Tobacco Securitization Agency Revenue, 5.25%, 6/1/46	\$ 4,835,402
1,845,000 California Educational Facilities Authority Revenue, 5.25%, 4/1/40	2,543,997
1,550,000 California Enterprise Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31	1,795,938
5,000,000 California Pollution Control Financing Authority, 5.0%, 7/1/37 (144A)	5,169,550
3,000,000 California School Finance Authority, 7.375%, 10/1/43	3,491,580
2,425,000 California State General Obligation Various Purpose, 5.75%, 4/1/31	2,865,307
1,875,000 California Statewide Communities Development Authority, 5.875%, 11/1/43	2,002,575
757,342(b)(c) California Statewide Communities Development Authority Environmental Facilities Revenue, 9.0%, 12/1/38	8
25,000,000(d) Inland Empire Tobacco Securitization Authority Revenue, 6/1/36	4,692,250
3,140,000(e) Lehman Municipal Trust Receipts Revenue, RIB, 13.179%, 9/20/28 (144A)	4,102,630
8,575,000(e) Lehman Municipal Trust Receipts, General Obligation, 13.087%, 7/28/31	10,615,593
1,500,000 Madera Irrigation Financing Authority Water Revenue, 6.25%, 1/1/31	1,739,130
1,500,000 Madera Irrigation Financing Authority Water Revenue, 6.5%, 1/1/40	1,749,660
2,500,000 San Jose California Airport Revenue, RIB, 5.0%, 3/1/37	2,600,300
465,000 Tobacco Securitization Authority of Southern California Revenue, 5.125%, 6/1/46	363,114
	\$ 48,567,034
Colorado - 0.8%	
1,500,000 Colorado Educational & Cultural Facilities Authority, 8.0%, 9/1/43	\$ 1,540,200
1,000,000 Kremmling Memorial Hospital District Certificate of Participation, 7.125%, 12/1/45	832,780
	\$ 2,372,980
Connecticut - 2.9%	
1,000,000 Hamden Connecticut Facility Revenue, 7.75%, 1/1/43	\$ 1,029,070
7,200,000 State of Connecticut, General Obligation, 4.0%, 9/1/30	7,831,584
	\$ 8,860,654
District of Colombia - 3.4%	
2,700,000	\$ 3,287,790

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	District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	
6,825,000	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	6,824,386
		\$ 10,112,176
	Florida - 4.5%	
1,500,000	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/41	\$ 1,744,560
1,500,000	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	1,740,600
500,000	Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41	477,090
5,000,000	Florida's Turnpike Enterprise Revenue, 4.0%, 7/1/32	5,329,650
1,000,000(a)	Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32	1,303,650
2,500,000	Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41	2,844,050
		\$ 13,439,600
	Georgia - 7.4%	
5,210,000(e)	Atlanta Georgia Water and Wastewater Revenue, RIB, 12.901%, 11/1/43 (144A)	\$ 5,256,317
4,920,000	Clayton County Development Authority Revenue, 9.0%, 6/1/35	5,047,920
900,000	DeKalb County Georgia Hospital Authority Revenue, 6.0%, 9/1/30	1,005,867
750,000	DeKalb County Georgia Hospital Authority Revenue, 6.125%, 9/1/40	825,787
8,750,000	Private Colleges & Universities Authority Revenue, 5.0%, 10/1/43	10,029,600
		\$ 22,165,491
	Guam - 0.4%	
1,000,000	Guam Government of Department Education Certificates of Participation, 6.625%, 12/1/30	\$ 1,125,830
	Idaho - 0.7%	
2,000,000	Power County Industrial Development Corp., Revenue, 6.45%, 8/1/32	\$ 2,003,900
Principal Amount USD (\$)		Value
	Illinois - 4.9%	
1,000,000	City of Country Club Hills, General Obligation, 5.0%, 12/1/31	\$ 1,019,140
365,400(d)	Illinois Finance Authority Revenue, 11/15/52	32,063
417,400(e)	Illinois Finance Authority Revenue, 4.0%, 11/15/52	270,496
1,450,000	Illinois Finance Authority Revenue, 5.5%, 4/1/39	1,597,219

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1,605,000	Illinois Finance Authority Revenue, 6.0%, 8/15/25	1,640,454
280,000	Illinois Finance Authority Revenue, 6.0%, 8/15/38	316,758
2,000,000	Illinois Finance Authority Revenue, 6.0%, 8/15/39	2,342,780
45,000	Illinois Finance Authority Revenue, 7.0%, 11/15/17	45,012
3,000,000	Illinois Finance Authority Revenue, 8.125%, 2/15/40	3,201,120
2,500,000	Illinois Finance Authority Revenue, 8.25%, 2/15/46	2,674,300
1,875,000	Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,590,788
		\$ 14,730,130
	Indiana - 1.0%	
250,000	City of Carmel Indiana Nursing Home Revenue, 7.0%, 11/15/32	\$ 279,433
750,000	City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/42	834,555
500,000	City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/47	554,675
1,465,000	Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	1,295,426
		\$ 2,964,089
	Kansas - 0.4%	
1,000,000	Kansas Development Finance Authority Revenue, 5.0%, 5/15/35	\$ 1,063,620
	Louisiana - 6.0%	
7,000,000	Jefferson Parish Hospital Service District No. 2, 6.375%, 7/1/41	\$ 8,108,100
2,500,000	Louisiana Local Government Environmental Facilities & Community Development Authority Revenue, 6.75%, 11/1/32	2,866,450
6,000,000	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	6,311,640
750,000	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	752,542
		\$ 18,038,732
	Maine - 1.9%	
1,500,000	Maine Health & Higher Educational Facilities Authority Revenue, 7.5%, 7/1/32	\$ 1,823,745
3,500,000	Maine Turnpike Authority Revenue, 5.0%, 7/1/42	3,956,960
		\$ 5,780,705
	Maryland - 3.7%	
4,500,000	Maryland Health & Higher Educational Facilities Authority Revenue, 5.0%, 7/1/43	\$ 4,955,895
1,250,000	Maryland Health & Higher Educational Facilities Authority Revenue, 5.75%, 7/1/38	1,329,450

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2,000,000	Maryland Health & Higher Educational Facilities Authority Revenue, 6.25%, 1/1/45	2,261,840
2,245,000	Maryland Health & Higher Educational Facilities Authority Revenue, 6.75%, 7/1/44	2,443,840
		\$ 10,991,025
	Massachusetts - 5.4%	
2,200,000	Massachusetts Development Finance Agency Revenue, 5.0%, 7/1/39	\$ 2,506,724
8,000,000	Massachusetts Development Finance Agency Revenue, 5.75%, 1/1/42	10,328,160
2,400,000	Massachusetts Health & Educational Facilities Authority Revenue, 5.5%, 7/1/32	3,315,960
3,420,000(b)(c)	Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38	8,858
		\$ 16,159,702
	Michigan - 3.6%	
2,000,000	Flint Michigan Hospital Building Authority Revenue, 7.375%, 7/1/35	\$ 2,307,920
2,235,000	Kent Hospital Finance Authority Revenue, 6.25%, 7/1/40	2,264,323
620,000	Michigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36	631,117
5,000,000	Michigan State University Revenue, 5.0%, 8/15/41	5,717,850
		\$ 10,921,210
	Minnesota - 0.8%	
2,000,000	Port Authority of the City of Bloomington, Minnesota Recovery Zone Facility Revenue, 9.0%, 12/1/35	\$ 2,277,700
	Montana - 0.6%	
2,445,000	Hardin Increment Industrial Infrastructure Development Revenue, 6.25%, 9/1/31	\$ 1,828,493
1,000,000(b)(c)	Two Rivers Authority, Inc., Project Revenue, 7.375%, 11/1/27	78,830
		\$ 1,907,323
	Nevada - 2.3%	
2,000,000	Nevada Highway Revenue, 5.0%, 2/1/43	\$ 2,217,280
4,500,000	Reno Nevada Hospital Revenue, 5.25%, 6/1/41	4,804,740
		\$ 7,022,020

Principal
Amount
USD (\$)

	Value
	New Hampshire - 0.4%
1,125,000(a)	New Hampshire Health & Education Facilities Authority Revenue, 5.875%, 7/1/34
	\$ 1,157,006

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New Jersey - 9.1%	
7,500,000 New Jersey Economic Development Authority Revenue, 5.75%, 9/15/27	\$ 8,042,100
3,500,000 New Jersey Health Care Facilities Financing Authority, 7.25%, 7/1/27	3,504,655
3,500,000(e) New Jersey State Turnpike Authority Transportation Revenue, RIB, 13.811%, 7/1/23 (144A)	5,950,140
15,375,000(d) New Jersey Transportation Trust Fund Authority Revenue, 12/15/27	9,885,664