

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.

<PAGE>

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
		\$ 27,382,559
New York - 9.7%		
7,000,000	New York City Industrial Development Agency Revenue, 5.25%, 12/1/32	\$ 7,014,770
3,950,000	New York City Industrial Development Agency Revenue, 7.625%, 12/1/32	3,971,843
7,500,000	New York State Dormitory Authority Revenue, 5.0%, 3/15/39	8,652,750
5,000,000	New York State Dormitory Authority Revenue, 5.0%, 10/1/41	5,744,400
2,000,000	New York State Dormitory Authority Revenue, 6.125%, 12/1/29	2,219,120
1,400,463	Westchester County Healthcare Corp., Revenue, 5.0%, 11/1/44	1,569,429
		\$ 29,172,312
Ohio - 4.8%		
3,000,000	Akron Bath Copley Joint Township Hospital District Revenue, 5.0%, 1/1/31	\$ 3,223,260
2,500,000	Buckeye Tobacco Settlement Financing Authority Revenue, 5.875%, 6/1/47	2,038,650
6,945,000	Buckeye Tobacco Settlement Financing Authority Revenue, 6.5%, 6/1/47	6,137,713
3,000,000	Ohio State Water Development Authority Revenue, 3.0%, 5/15/19	3,076,740
		\$ 14,476,363
Oregon - 0.7%		
2,000,000	Oregon State Facilities Authority Revenue, 5.25%, 10/1/40	\$ 2,167,740
Pennsylvania - 9.2%		
1,965,000	Pennsylvania Economic Development Financing Authority, 8.0%, 5/1/29	\$ 2,331,728
5,000,000	Pennsylvania Economic Development Financing Authority Solid Waste Disposal Revenue, 6.0%, 6/1/31	4,999,800
5,000,000	Pennsylvania Turnpike Commission, 5.3%, 12/1/41	5,610,250
1,000,000	Philadelphia Authority for Industrial Development Revenue, 6.5%, 6/15/33 (144A)	1,027,140
2,000,000	Philadelphia Authority for Industrial Development Revenue, 6.75%, 6/15/43 (144A)	2,059,480

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6,000,000	Philadelphia Authority for Industrial Development Revenue, 8.2%, 12/1/43	6,500,280	
5,000,000	Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 5.0%, 7/1/34	5,056,150	
		\$ 27,584,828	
	Puerto Rico - 1.0%		
3,500,000	Commonwealth of Puerto Rico, General Obligation, 8.0%, 7/1/35	\$ 3,045,000	
	Rhode Island - 3.5%		
1,355,000(b)(c)	Central Falls Rhode Island Detention Facility Corp., Revenue, 7.25%, 7/15/35	\$ 544,033	
1,500,000	Rhode Island Health & Educational Building Corp., Revenue, 8.375%, 1/1/46	1,734,435	
8,285,000	Tobacco Settlement Financing Corp. Revenue, 6.25%, 6/1/42	8,305,298	
		\$ 10,583,766	
	South Carolina - 2.0%		
4,400,000(f)	Tobacco Settlement Revenue Management Authority, 6.375%, 5/15/30	\$ 6,107,904	
	South Dakota - 1.3%		
4,000,000	South Dakota Health & Educational Facilities Authority Revenue, 4.0%, 11/1/44	\$ 3,979,120	
	Tennessee - 3.0%		
5,000,000	Johnson City Health & Educational Facilities Board Hospital Revenue, 6.5%, 7/1/38	\$ 5,842,550	
3,000,000	Sullivan County Health, Educational & Housing Facilities Board Revenue, 5.25%, 9/1/36	3,145,320	
		\$ 8,987,870	
	Texas - 17.1%		
1,500,000	Arlington Higher Education Finance Corp. Revenue, 7.125%, 3/1/44	\$ 1,594,665	
1,000,000	Arlington Higher Education Finance Corp., Revenue Bonds, 7.0%, 3/1/34	1,064,540	
2,500,000	Central Texas Regional Mobility Authority Revenue, 6.75%, 1/1/41	2,945,925	
5,000,000	Goose Creek Consolidated Independent School District, General Obligation, 4.0%, 2/15/26	5,635,450	
2,663,453(b)(c)	Gulf Coast Industrial Development Authority Revenue, 7.0%, 12/1/36	27	
3,000,000	Houston Higher Education Finance Corp. Revenue, 5.0%, 9/1/38	3,262,290	
	Principal Amount USD (\$)		Value
	Texas - (continued)		
	315,000 IAH Public Facility Corp., Facilities Revenue, Series 2006, 6.0%, 5/1/16	\$	203,112



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1,000,000 IAH Public Facility Corp., Facilities Revenue, Series 2006, 6.0%, 5/1/21	549,800
1,350,000 IAH Public Facility Corp., Facilities Revenue, Series 2006, 6.125%, 5/1/26	742,230
2,000,000 Lubbock Health Facilities Development Corp., Nursing Home Revenue, 6.625%, 7/1/36	2,065,940
9,750,000 North Texas Tollway Authority Transportation Revenue, 5.75%, 1/1/33	10,794,420
1,500,000 Red River Health Facilities Development Corp., Revenue, 8.0%, 11/15/41	1,776,105
2,000,000 Richardson Independent School District Revenue, General Obligation, 5.0%, 2/15/38	2,301,940
4,000,000 Sanger Industrial Development Corp., Revenue, 8.0%, 7/1/38	4,440,840
1,000,000 Tarrant County Cultural Education Facilities Finance Corp., Revenue, 8.125%, 11/15/39	969,310
750,000 Tarrant County Cultural Education Facilities Finance Corp., Revenue, 8.25%, 11/15/44	732,030
1,000,000(b)(c)Texas Midwest Public Facility Corp., Revenue, 9.0%, 10/1/30	180,000
3,000,000 Texas Private Activity Bond Surface Transportation Corp., 7.0%, 12/31/38	3,729,390
2,500,000 Travis County Health Facilities Development Corp., Revenue, 7.125%, 1/1/46	2,719,200
5,000,000 Tyler Independent School District, General Obligation, 5.0%, 2/15/38	5,754,850
	\$ 51,462,064
Virginia - 3.4%	
3,000,000 Tobacco Settlement Financing Corp./VA Revenue, 5.0%, 6/1/47	\$ 2,109,480
5,000,000 Virginia Public School Authority Revenue, 4.0%, 8/1/25	5,734,200
2,000,000 Washington County Industrial Development Authority Revenue, 7.75%, 7/1/38	2,369,680
	\$ 10,213,360
Washington - 4.1%	
1,500,000(a)Washington State Health Care Facilities Authority Revenue, 5.5%, 12/1/39	\$ 1,846,575
2,000,000 Washington State Health Care Facilities Authority Revenue, 6.125%, 8/15/37	2,195,680
2,000,000 Washington State Health Care Facilities Authority Revenue, 6.25%, 8/15/42	2,195,020
1,100,000 Washington State Housing Finance Commission Revenue, 6.75%, 10/1/47	1,196,580
5,000,000 Washington State Housing Finance Committee Nonprofit Revenue, 5.625%, 1/1/27	5,035,150
	\$ 12,469,005
West Virginia - 0.9%	
2,000,000(c)City of Philippi WV, 7.75%, 10/1/44	\$ 2,012,320
735,000 West Virginia Hospital Finance Authority Hospital Revenue, 9.125%, 10/1/41	813,527

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		\$ 2,825,847
	Wisconsin - 3.3%	
5,000,000	Wisconsin Public Finance Authority Continuing Care Retirement Community Revenue, 8.25%, 6/1/46	\$ 5,894,300
1,500,000	Wisconsin State Health & Educational Facilities Authority Revenue, 6.625%, 2/15/39	1,747,275
400,000	Wisconsin State Public Finance Authority Revenue, 8.375%, 6/1/20	401,324
1,500,000	Wisconsin State Public Finance Authority Revenue, 8.625%, 6/1/47	1,812,720
		\$ 9,855,619
	TOTAL TAX EXEMPT OBLIGATIONS (Cost \$393,131,225)	\$ 429,892,620
	MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 0.6% of Net Assets	
13,000,000(c)(e)	Non-Profit Preferred Funding Trust I, 6.75%, 9/15/37 (144A)	\$ 1,629,420
	TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$13,000,000)	\$ 1,629,420
Shares/Interest		Value
	TAX EXEMPT MONEY MARKET MUTUAL FUND - 2.0% of Net Assets	
6,000,000	BlackRock Liquidity Funds MuniFund Portfolio	\$ 6,000,000
	TOTAL TAX EXEMPT MONEY MARKET MUTUAL FUND (Cost \$6,000,000)	\$ 6,000,000
	TOTAL INVESTMENTS IN SECURITIES - 145.7% (Cost - \$412,131,225) (g)(h)	\$ 437,522,040
	OTHER ASSETS AND LIABILITIES - 4.2% PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE - (49.9)%	\$ 12,859,516
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS -100.0%	\$ (150,001,338)
		\$ 300,380,218

(144A) Security is exempt from registration under Rule 144A of the Securities Act of 1933. Such securities may be resold normally to qualified institutional buyers in a transaction exempt from registration. At

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December 31, 2014, the value of these securities amounted to \$25,194,677, or 8.4% of total net assets applicable to common shareowners.

- RIB Residual Interest Bond. The interest rate is subject to change periodically and inversely based upon prevailing market rates. The interest rate shown is the rate at December 31, 2014.
- (a) Prerefunded bonds have been collateralized by U.S. Treasury or U.S. Government Agency securities which are held in escrow to pay interest and principal on the tax exempt issue and to retire the bonds in full at the earliest refunding date.
  - (b) Security is in default and is non income producing.
  - (c) Indicates a security that has been deemed illiquid. As of December 31, 2014 the aggregate cost of illiquid securities in the Trust's portfolio was \$22,301,009. As of that date, the aggregate value of illiquid securities in the Trust's portfolio of \$4,453,496 represented 1.5% of total net assets applicable to common shareowners.
  - (d) Security issued with a zero coupon. Income is recognized through accretion of discount.
  - (e) The interest rate is subject to change periodically. The interest rate shown is the rate at December 31, 2014.
  - (f) Escrow to maturity.

- (g) The concentration of investments by type of obligation/ market sector is as follows :

Insured	17.0%
Revenue Bonds:	
Health Revenue	19.8
Other Revenue	13.7
Tobacco Revenue	10.2
Development Revenue	9.6
Education Revenue	9.3
Facilities Revenue	8.8
Transportation Revenue	6.3
Water Revenue	2.0
Pollution Control Revenue	1.7
Airport Revenue	1.6
	100.0%

- (h) At December 31, 2014, the net unrealized appreciation on investments based on cost for federal tax purposes of \$412,413,298 was as follows:

Aggregate gross unrealized appreciation for all investments in which there is an excess of value over tax cost	\$ 46,008,292
Aggregate gross unrealized depreciation for all investments in which there	

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is an excess of tax cost over value (20,899,550)

Net unrealized appreciation \$ 25,108,742

For financial reporting purposes net unrealized appreciation on investments was \$25,390,816 and cost of investments aggregated \$437,522,040.

Various inputs are used in determining the value of the Trust's investments. These inputs are summarized in the three broad levels below.

Level 1 - quoted prices in active markets for identical securities.

Level 2 - other significant observable inputs (including quoted prices for similar securities, interest rates, prepayment speeds, credit risks, etc.).

Level 3 - significant unobservable inputs (including the Trust's own assumptions in determining fair value of investments).

Generally, equity securities are categorized as Level 1, fixed income securities and senior loans are categorized as Level 2, and securities valued using fair value methods (other than prices supplied by independent pricing services or broker dealers) as Level 3.

The following is a summary of the inputs used as of December 31, 2014, in valuing the Trust's investments.

	Level 1	Level 2	Level 3	Total
Tax Exempt Obligations	\$-	\$429,892,620	\$-	\$429,892,620
Municipal Collateralized Debt Obligation	-	1,629,420	-	1,629,420
Tax Exempt Money Market Mutual Funds	6,000,000	-	-	6,000,000
Total Investments in Securities	\$6,000,000	\$431,522,040	\$-	\$437,522,040

The following is a reconciliation of assets valued using significant unobservable inputs (Level 3):

	Balance as of 3/31/14	Realized gain (loss)	Change in unrealized appreciation (depreciation)	Purchases	Sales	Accrued discounts/premiums	Transfers in to Level 3*	Transfers out of Level 3*	Balance as of 12/31/14
Tax exempt obligations	\$2,955,000	\$339,303	\$ (156,566 )	\$-	\$(3,139,500)	\$1,763	\$-	\$-	\$-
Total	\$2,955,000	\$339,303	\$ (156,566 )	\$-	\$(3,139,500)	\$1,763	\$-	\$-	\$-

\* Transfers are calculated on the beginning of period value.

Net change in unrealized (depreciation) of Level 3 investments still held and considered Level 3 at 12/31/14: \$0.

ITEM 2. CONTROLS AND PROCEDURES.

(a) Disclose the conclusions of the registrant's principal executive and principal financial officers, or persons performing similar functions, regarding the effectiveness of the registrant's disclosure controls and procedures (as defined in Rule 30a-3(c) under the Act (17 CFR 270.30a-3(c))) as of a date within 90 days of the filing date of the report that includes the disclosure required by this paragraph, based on the evaluation of these controls and procedures required by Rule 30a-3(b) under the Act (17 CFR 270.30a-3(b)) and Rule 13a-15(b) or 15d-15(b) under the Exchange Act (17 CFR 240.13a-15(b) or 240.15d-15(b)).

The registrant's principal executive officer and principal financial officer have concluded that the registrant's disclosure controls and procedures are effective based on their evaluation of these controls and procedures as of a date within 90 days of the filing date of this report.

(b) Disclose any change in the registrant's internal controls over financial reporting (as defined in Rule 30a-3(d) under the Act (17 CFR 270.30a-3(d))) that occurred during the registrant's last fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

There were no significant changes in the registrant's internal control over financial reporting that occurred during the second fiscal quarter of the period covered by this report that have materially affected, or are reasonably likely to materially affect, the registrant's internal control over financial reporting.

ITEM 3. EXHIBITS.

File as exhibits as part of this Form a separate certification for each principal executive officer and principal financial officer of the registrant as required by Rule 30a-2(a) under the Act (17 CFR 270.30a-2(a)), exactly as set forth below:

CERTIFICATIONS

I, [identify the certifying individual], certify that:

1. I have reviewed this report on Form N-Q of [identify registrant];
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the schedules of investments included in this report fairly present in all material respects the investments of the registrant as of the end of the fiscal quarter for which the report is filed;
4. The registrants other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Rule 30a-3(c) under the Investment Company Act of 1940) and internal control over financial reporting (as defined in Rule 30a-3(d) under the Investment Company Act of 1940) for the registrant and have:

- (a) Designed such disclosure controls and procedures, or caused such

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disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrants disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of a date within 90 days prior to the filing date of this report, based on such evaluation; and

(d) Disclosed in this report any change in the registrants internal control over financial reporting that occurred during the registrants most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrants internal control over financial reporting; and

5. The registrants other certifying officer(s) and I have disclosed to the registrants auditors and the audit committee of the registrants board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrants ability to record, process, summarize, and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrants internal control over financial reporting.

Date:

[Signature] [Title]

Filed herewith.

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SIGNATURES

[See General Instruction F]

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

(Registrant) Pioneer Municipal High Income Advantage Trust

By (Signature and Title)\* /s/ Lisa M.Jones

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Lisa M.Jones, President and Chief Executive Officer

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Date February 27, 2015

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

By (Signature and Title)\* /s/ Lisa M.Jones

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Lisa M.Jones, President and Chief Executive Officer

Date February 27, 2015

By (Signature and Title)\* /s/ Mark E. Bradley

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Mark E. Bradley, Treasurer and Chief Accounting  
and Financial Officer

Date February 27, 2015

\* Print the name and title of each signing officer under his or her signature.