

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST

Form N-Q

August 28, 2013

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, 2013

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.

Pioneer Municipal High

Income Advantage Trust

June 30, 2013

Ticker Symbol: MAV

Principal Amount USD (\$)	S&P/Moody's Rating (unaudited)	Value
	TAX EXEMPT OBLIGATIONS - 146.8% of Net Assets	
2,500,000	NR/B2Alabama Industrial Development Authority Solid Waste Disposal Revenue, 6.45%, 12/1/23	\$ 2,510,550
2,500,000	NR/NRHuntsville-Redstone Village Special Care Facilities Financing Authority Nursing Home Revenue, 5.5%, 1/1/43	2,176,550
	Arizona - 3.4%	\$ 4,687,100
5,000,000	NR/NRCasa Grande Industrial Development Authority Hospital Revenue, 7.625%, 12/1/29	\$ 5,155,250
1,477,000	NR/Baa3Pima County Industrial Development Authority, 6.75%, 7/1/31	1,477,237

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2,640,000	NR/NRPima County Industrial Development Authority, 7.0%, 1/1/38	2,646,019
1,000,000	NR/NRSan Luis Facility Development Corp., 7.25%, 5/1/27	823,200
	California - 14.3%	\$ 10,101,706
6,990,000	CCC/NRCalifornia County Tobacco Securitization Agency Revenue, 5.25%, 6/1/46	\$ 5,013,577
1,550,000	NR/NRCalifornia Enterprise Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31	1,708,038
5,000,000	NR/Baa3California Pollution Control Financing Authority, 5.0%, 7/1/37	4,870,400
2,425,000	A/A1California State General Obligation Various Purpose, 5.75%, 4/1/31	2,672,617
1,875,000	NR/NRCalifornia Statewide Communities Development Authority, 5.875%, 11/1/43	1,648,950
757,342(a)	NR/NRCalifornia Statewide Communities Development Authority Environmental Facilities Revenue, 9.0%, 12/1/38	6,665
4,000,000	BB/NRCalifornia Statewide Communities Development Authority Revenue Higher Education Revenue, 7.25%, 10/1/38 (144A)	3,973,680
20,000,000(b)	NR/NRInland Empire Tobacco Securitization Authority, 0.0%, 6/1/36	3,155,800
3,140,000	AA-/WRLehman Municipal Trust Receipts Revenue, RIB, 13.124%, 9/20/28 (144A)	3,572,378
8,575,000(c)	AA-/NRLehman Municipal Trust Receipts, General Obligation, 13.031%, 7/28/31	9,534,885
1,500,000	A-/NRMadera Irrigation Financing Authority Water Revenue, 6.25%, 1/1/31	1,636,965
1,500,000	A-/NRMadera Irrigation Financing Authority Water Revenue, 6.5%, 1/1/40	1,659,615
2,500,000	A-/A2San Jose California Airport Revenue, RIB, 5.0%, 3/1/37	2,540,050

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Principal Amount USD (\$)	S&P/Moody's Rating (unaudited)	Value
		\$ 41,993,620
1,000,000	Colorado - 3.1% NR/NR Kremmling Memorial Hospital District Certificate of Participation, 7.125%, 12/1/45	\$ 1,054,450
7,500,000	AA+/Aa2 Regional Transportation District, 5.0%, 11/1/31	8,164,875 \$ 9,219,325
1,000,000	Connecticut - 0.4% NR/NR Hamden Connecticut Facility Revenue, 7.75%, 1/1/43	\$ 1,042,900
2,700,000	District of Columbia - 3.4% BBB/Baa1 District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$ 2,937,843
6,825,000	BBB/Baa1 District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	6,944,164 \$ 9,882,007
1,500,000	Florida - 5.5% NR/NR Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/41	\$ 1,656,450
1,500,000	NR/NR Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	1,652,160
500,000	NR/B1 Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41	540,050
1,000,000	NR/NR Florida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40	1,009,200
2,000,000	NR/NR Florida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41	2,177,920
1,000,000	NR/NR Florida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42	1,074,360
1,980,000	NR/NR Hillsborough County Industrial Development Authority Revenue, 6.75%, 7/1/29	1,980,614
1,000,000(d)	NR/WR Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32	1,353,850
2,200,000	BB/NR	2,047,452

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	Lee County Industrial Development Authority, 5.375%, 6/15/37	
2,500,000	A/A2Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41	2,648,825 \$ 16,140,881
	Georgia - 4.3%	
5,210,000	AA-/WRAtlanta Georgia Water and Wastewater Revenue, RIB, 12.845%, 11/1/43 (144A)	\$ 5,348,378
1,000,000	B/NRClayton County Development Authority Revenue, 9.0%, 6/1/35	1,085,890
900,000	NR/NRDeKalb County Georgia Hospital Authority Revenue, 6.0%, 9/1/30	956,412
750,000	NR/NRDeKalb County Georgia Hospital Authority Revenue, 6.125%, 9/1/40	792,570
3,360,000	NR/NRFulton County Residential Care Facilities for the Elderly Authority, 7.0%, 7/1/29	2,820,619
1,650,000	NR/NRSavannah Georgia Economic Development Authority Revenue, 7.4%, 1/1/34	1,663,612 \$ 12,667,481
	Guam - 1.9%	
1,000,000	B/NRGuam Government of Department Education Certificates of Participation, 6.625%, 12/1/30	\$ 1,041,960
4,400,000(d)	AA+/B2Northern Mariana Islands, 6.75%, 10/1/33	4,470,268 \$ 5,512,228
	Idaho - 1.2%	
2,000,000	A-/Baa1Power County Industrial Development Corp., Revenue, 6.45%, 8/1/32	\$ 2,002,080
1,500,000	A-/Baa1Power County Pollution Control Revenue, 5.625%, 10/1/14	1,500,525 \$ 3,502,605
	Illinois - 6.9%	
1,000,000	NR/Baa1City of Country Club Hills, General Obligation, 5.0%, 12/1/31	\$ 1,006,990
–	NR/NRIllinois Finance Authority Revenue, 0.0%, 11/15/52	42,026
417,400(c)	NR/NRIllinois Finance Authority Revenue, 4.0%, 11/15/52	284,583
1,450,000	A+/A1	1,510,045

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Principal Amount USD (\$)	S&P/Moody's Rating (unaudited)	Value
	Illinois Finance Authority Revenue, 5.5%, 4/1/39	
1,605,000	AA-/A3 Illinois Finance Authority Revenue, 6.0%, 8/15/25	1,661,095
280,000	BBB+/NR Illinois Finance Authority Revenue, 6.0%, 8/15/38	298,379
2,000,000	AA+/Aa2 Illinois Finance Authority Revenue, 6.0%, 8/15/39	2,272,460
2,500,000	NR/NR Illinois Finance Authority Revenue, 6.125%, 11/15/25	2,518,700
45,000	NR/NR Illinois Finance Authority Revenue, 7.0%, 11/15/17	44,282
–	NR/NR Illinois Finance Authority Revenue, 7.0%, 11/15/27	156,702
6,000,000	NR/NR Illinois Finance Authority Revenue, 8.25%, 5/15/45	6,104,220
	Illinois - (continued)	
2,500,000	NR/NR Illinois Finance Authority Revenue, 8.25%, 2/15/46	2,552,475
2,135,000	NR/NR Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,714,042
		\$ 20,165,999
	Indiana - 1.0%	
250,000	NR/NR City of Carmel Indiana Nursing Home Revenue, 7.0%, 11/15/32	\$ 264,042
750,000	NR/NR City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/42	788,370
500,000	NR/NR City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/47	522,000
250,000	NR/Baa3 East Chicago Indiana Exempt Facilities Revenue, 7.0%, 1/1/14	249,830
1,700,000	NR/NR Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	1,008,729
		\$ 2,832,971
	Kansas - 0.3%	
1,000,000	NR/A2 Kansas Development Finance Authority Revenue, 5.0%, 5/15/35	\$ 1,023,980
	Louisiana - 6.8%	
7,000,000	BBB-/Baa3	\$ 7,504,700

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		Jefferson Parish Hospital Service Revenue, 6.375%, 7/1/41	
2,500,000	BBB-/Baa3	Louisiana Local Government Environmental Facilities & Community Development Authority Revenue, 6.75%, 11/1/32	2,674,975
6,000,000	NR/Baa1	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	6,166,740
750,000	BBB-/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	759,840
2,915,000	A-/A3	Tobacco Settlement Financing Corp. Revenue, 5.875%, 5/15/39	2,907,713
			\$ 20,013,968
		Maine - 0.6%	
1,500,000	NR/Baa3	Maine Health & Higher Educational Facilities Authority Revenue, 7.5%, 7/1/32	\$ 1,784,220
		Maryland - 3.2%	
4,500,000	A-/A2	Maryland Health & Higher Educational Facilities Authority Revenue, 5.0%, 7/1/43	\$ 4,565,160
460,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.25%, 1/1/27	441,517
1,250,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.3%, 1/1/37	1,121,388
1,250,000	NR/Baa3	Maryland Health & Higher Educational Facilities Authority Revenue, 5.75%, 7/1/38	1,259,300
2,000,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 6.25%, 1/1/45	2,148,420
			\$ 9,535,785
		Massachusetts - 9.2%	
595,000	BB/NR	Massachusetts Development Finance Agency Revenue, 5.25%, 10/1/18	\$ 597,499
8,000,000	A/WR	Massachusetts Development Finance Agency Revenue, 5.75%, 1/1/42	9,044,960
1,845,000	NR/NR	Massachusetts Development Finance Agency Revenue, 7.1%, 7/1/32	1,844,982
2,195,000	BBB-/Baa3	Massachusetts Health & Educational Facilities Authority	2,178,164

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2,000,000	AAA/Aaa	Revenue, 5.375%, 7/15/28 Massachusetts Health & Educational Facilities Authority	
3,420,000(a)	NR/NR	Revenue, 5.5%, 7/1/32 Massachusetts Health & Educational Facilities Authority	2,482,040
10,760,000	AA-/Aa3	Revenue, 6.5%, 1/15/38 Massachusetts Housing Finance Agency Revenue, 5.35%, 12/1/45	15,082 10,763,228 \$ 26,925,955
Principal Amount USD (\$)	S&P/Moody's Rating (unaudited)		Value
2,000,000	NR/Ba1	Michigan - 3.6% Flint Michigan Hospital Building Authority Revenue, 7.375%, 7/1/35	\$ 2,227,940
2,235,000	BB+/NR	Kent Hospital Finance Authority Revenue, 6.25%, 7/1/40	2,319,081
675,000	NR/NR	Michigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36	664,247
5,000,000	AA/Aa1	Michigan State University, 5.0%, 8/15/41	5,369,750 \$ 10,581,018
1,000,000	NR/NR	Minnesota - 0.4% Port Authority of the City of Bloomington, Minnesota Recovery Zone Facility Revenue, 9.0%, 12/1/35	\$ 1,136,500
1,000,000	NR/NR	Missouri - 1.3% Kansas City Tax Increment Financing Commission Tax Increment Revenue, 6.5%, 6/1/25	\$ 1,011,570
1,500,000(a)(e)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.2%, 12/15/28	495,000
6,640,000(a)(e)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35	2,191,200 \$ 3,697,770
2,445,000(b)	NR/NR	Montana - 0.7% Hardin Increment Industrial Infrastructure Development Revenue, 0.0%, 9/1/31	\$ 1,945,658



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1,000,000(a)(e)	NR/NRTwo Rivers Authority Inc., Project Revenue, 7.375%, 11/1/27	146,630 \$ 2,092,288
	Nevada - 2.3%	
2,000,000	A+/A1Nevada Highway Revenue, 5.0%, 2/1/43	\$ 2,046,780
4,500,000	A-/A3Reno Nevada Hospital Revenue, 5.25%, 6/1/41	4,560,255 \$ 6,607,035
	New Hampshire - 0.4%	
1,125,000(d)	NR/NRNew Hampshire Health & Education Facilities Authority Revenue, 5.875%, 7/1/34	\$ 1,233,068
	New Jersey - 11.1%	
2,500,000	NR/NRBurlington County New Jersey Bridge Commission Revenue, 5.625%, 1/1/38	\$ 2,503,925
6,500,000	NR/NRNew Jersey Economic Development Authority Revenue, 10.5%, 6/1/32 (144A)	6,516,835
7,500,000	B/B2New Jersey Economic Development Authority Revenue, 5.75%, 9/15/27	7,239,525
3,500,000	NR/NRNew Jersey Health Care Facilities Financing Authority, 7.25%, 7/1/27	3,499,405
3,500,000	AA-/WRNew Jersey State Turnpike Authority Transportation Revenue, RIB, 13.755%, 7/1/23 (144A)	4,780,090
15,375,000(b)	AA+/Aa1New Jersey Transportation Trust Fund Authority Revenue, 0.0%, 12/15/27	7,919,201 \$ 32,458,981
	New York - 8.4%	
1,630,000	NR/NRDutchess County Industrial Development Agency, 7.5%, 3/1/29	\$ 1,656,357
7,000,000	BB/B2New York City Industrial Development Agency Revenue, 5.25%, 12/1/32	6,608,980
3,950,000	BB/B2New York City Industrial Development Agency Revenue, 7.625%, 12/1/32	3,988,947
5,000,000	AAA/AaaNew York State Dormitory Authority Revenue, 5.0%, 10/1/41	5,361,400
2,000,000	NR/Ba1New York State Dormitory Authority Revenue, 6.125%,	2,141,420

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Principal Amount USD (\$)	S&P/Moody's Rating (unaudited)	Value
5,000,000	AAA/Aaa 12/1/29 New York State Environmental Facilities Corp. Water Revenue, 5.0%, 6/15/33	5,015,500 \$ 24,772,604
5,010,000	NR/NR North Carolina - 2.5% Charlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28	\$ 5,015,160
2,575,000	NR/NR Charlotte Special Facilities Revenue, 5.6%, 7/1/27	2,408,861 \$ 7,424,021
1,500,000	NR/NR Ohio - 1.9% Adams County Hospital Facilities Revenue, 6.5%, 9/1/36	\$ 1,225,185
5,000,000	B-/B3 Buckeye Tobacco Settlement Financing Authority Revenue, 6.5%, 6/1/47	4,404,300 \$ 5,629,485
2,220,000	NR/WR Oklahoma - 1.9% Tulsa Airports Improvement Trust, 6.25%, 6/1/20	\$ 2,225,550
3,000,000(c)	NR/WR Tulsa Airports Improvement Trust, 7.75%, 6/1/35	3,212,040 \$ 5,437,590
2,000,000	A-/NR Oregon - 0.7% Oregon State Facilities Authority Revenue, 5.25%, 10/1/40	\$ 2,059,400
5,000,000	B-/Caa2 Pennsylvania - 5.8% Pennsylvania Economic Development Financing Authority Solid Waste Disposal Revenue, 6.0%, 6/1/31	\$ 4,988,850
5,000,000	A-/A3 Pennsylvania Turnpike Commission, 5.3%, 12/1/41	5,192,050
1,000,000	BB-/NR Philadelphia Authority for Industrial Development, 6.5%, 6/15/33 (144A)	1,007,750
1,000,000	BB-/NR Philadelphia Authority for Industrial Development, 6.75%, 6/15/43 (144A)	1,009,060
5,000,000	BB+/Ba1	4,676,050

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		Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 5.0%, 7/1/34	\$ 16,873,760
5,000,000	AA-/Aa3	Puerto Rico - 1.7% Puerto Rico Sales Tax Financing Corp., 5.25%, 8/1/57	\$ 5,019,250
1,385,000(e)	NR/NR	Rhode Island - 3.7% Central Falls Rhode Island Detention Facility Corp., Revenue, 7.25%, 7/15/35	\$ 1,101,269
1,500,000	NR/NR	Rhode Island Health & Educational Building Corp., Revenue, 8.375%, 1/1/46	1,682,970
8,285,000	BB/Baa1	Tobacco Settlement Financing Corp. Revenue, 6.25%, 6/1/42	8,202,150 \$ 10,986,389
–	8,000,000(d)	South Carolina - 4.7% BBB+/Baa1 South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	\$ 8,042,535
4,400,000(f)	BBB/WR	Tobacco Settlement Revenue Management Authority, 6.375%, 5/15/30	5,672,436 \$ 13,714,971
5,000,000	BBB+/Baa1	Tennessee - 2.9% Johnson City Health & Educational Facilities Board Hospital Revenue, 6.5%, 7/1/38	\$ 5,510,150
3,000,000	BBB+/NR	Sullivan County Health, Educational & Housing Facilities Board Revenue, 5.25%, 9/1/36	3,083,550 \$ 8,593,700
2,500,000	BB+/Baa3	Texas - 16.3% Central Texas Regional Mobility Authority Revenue, 6.75%, 1/1/41	\$ 2,731,850
2,663,453(a)(e)	NR/NR	Gulf Coast Industrial Development Authority Revenue, 7.0%, 12/1/36	24,504
10,000,000	B/B2	Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29	10,004,400
460,000	NR/NRIA	IAH Public Facility Corp., Facilities Revenue, Series	340,685

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		2006, 6.0%, 5/1/16	
1,000,000		NR/NRIAH Public Facility Corp., Facilities Revenue, Series 2006, 6.0%, 5/1/21	718,300
1,350,000		NR/NRIAH Public Facility Corp., Facilities Revenue, Series 2006, 6.125%, 5/1/26	953,613
3,000,000		NR/NRJefferson County Industrial Development Corp., Revenue, 8.25%, 7/1/32	3,143,400
845,000		NR/NRLubbock Health Facilities Development Corp., Nursing Home Revenue, 6.5%, 7/1/26	871,051
2,000,000		NR/NRLubbock Health Facilities Development Corp., Nursing Home Revenue, 6.625%, 7/1/36	2,034,700
Principal Amount USD (\$)	S&P/Moody's Rating (unaudited)		Value
		Texas - (continued)	
9,750,000	BBB+/A3	North Texas Tollway Authority Transportation Revenue, 5.75%, 1/1/33	\$10,577,873
1,711,000	NR/Aa1	Panhandle Regional Housing Finance Corp., Multifamily Housing Revenue, 6.6%, 7/20/31	1,781,527
1,500,000	NR/NR	Red River Health Facilities Development Corp., Revenue, 8.0%, 11/15/41	1,643,460
1,000,000	A+/A1	Richardson Hospital Authority Revenue, 6.0%, 12/1/34	1,016,660
2,000,000	AAA/Aaa	Richardson Independent School District Revenue, 5.0%, 2/15/38	2,163,440
4,000,000	NR/NR	Sanger Industrial Development Corp., 8.0%, 7/1/38	4,078,200
1,000,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., Revenue, 8.125%, 11/15/39	1,077,180
1,500,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., Revenue, 8.25%, 11/15/44	1,618,125
1,000,000(a)(e)	NR/NR		520,670

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		Texas Midwest Public Facility Corp. Revenue, 9.0%, 10/1/30	
2,500,000	NR/NR	Travis County Health Facilities Development Corp., Revenue, 7.125%, 1/1/46	2,525,600 \$ 47,825,238
		Virginia - 0.8%	
2,000,000	BBB+/Baa1	Washington County Industrial Development Authority Revenue, 7.75%, 7/1/38	\$ 2,320,340
		Washington - 4.3%	
1,025,000	BBB/A3	Tobacco Settlement Authority Revenue, 6.5%, 6/1/26	\$ 1,036,255
1,500,000	NR/Baa3	Washington State Health Care Facilities Authority Revenue, 5.5%, 12/1/39	1,521,825
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority Revenue, 6.125%, 8/15/37	2,099,620
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority Revenue, 6.25%, 8/15/42	2,103,540
1,100,000	NR/NR	Washington State Housing Finance Commission Revenue, 6.75%, 10/1/47	1,006,874
5,000,000	NR/NR	Washington State Housing Finance Committee Nonprofit Revenue, 5.625%, 1/1/27	4,761,450 \$ 12,529,564
		West Virginia - 1.0%	
750,000	NR/NR	West Virginia Hospital Finance Authority Hospital Revenue Bonds, 9.125%, 10/1/41	\$ 921,240
2,000,000	NR/NR	West Virginia Municipal Building Community College Facilities Revenue, 7.75%, 10/1/44	1,942,500 \$ 2,863,740
		Wisconsin - 3.3%	
2,900,000(g)	NR/NR	Aztalan Township, 7.5%, 5/1/18	\$ -
(h) 2,500,000	NR/NR	Wisconsin Public Finance Authority Continuing Care Retirement Community Revenue, 8.25%, 6/1/46	2,835,750
1,000,000(d)	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue,	1,042,910

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	6.125%, 4/1/24	
1,000,000(d)	NR/NRWisconsin State Health & Educational Facilities Authority Revenue, 6.25%, 4/1/34	1,043,850
1,500,000	A+/A1Wisconsin State Health & Educational Facilities Authority Revenue, 6.625%, 2/15/39	1,654,530
1,500,000	NR/NRWisconsin State Public Finance Authority Revenue, 8.375%, 6/1/20	1,507,170
1,500,000	NR/NRWisconsin State Public Finance Authority Revenue, 8.625%, 6/1/47	1,589,220
		\$ 9,673,430
	<b>TOTAL TAX EXEMPT OBLIGATIONS</b>	
	(Cost \$414,478,138)	\$ 430,562,873

Principal Amount USD (\$)	S&P/Moody's Rating (unaudited)	Value
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	MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 2.5% of Net Assets	
13,000,000(c)(e)	NR/NRNon-Profit Preferred Funding Trust I, 6.75%, 9/15/37 (144A)	\$ 7,301,060

	<b>TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION</b>	
	(Cost \$13,000,000)	\$ 7,301,060

	<b>TOTAL INVESTMENTS IN SECURITIES - 149.3%</b>	
	(Cost - \$427,478,138) (i)(j)	\$ 437,863,933
	<b>OTHER ASSETS AND LIABILITIES -1.8%</b>	\$ 5,449,920
	<b>PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE - (51.1)%</b>	\$ (150,003,949)
	<b>NET ASSETS APPLICABLE TO</b>	\$ 293,309,904

COMMON SHAREOWNERS  
-100.0%

NR	Security not rated by S&P or Moody's.
WR	Rating withdrawn by either S&P or Moody's.
(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 June 30, 2013, the value of these securities amounted to \$33,509,231, or 11.4% 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 June 30, 2013

- (a) Security is in default and is non income producing.
  - (b) Security issued with a zero coupon. Income is recognized through accretion of discount.
  - (c) The interest rate is subject to change periodically. The interest is shown is the rate at June 30, 2013.
  - (d) 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.
  - (e) Indicates a security that has been deemed as illiquid. As of June 30, 2013 the aggregate cost of illiquid securities in the Trust's portfolio was \$27,052,163. As of that date, the aggregate value of illiquid securities in the Trust's portfolio of \$11,780,333 represented 4.0% of total net assets applicable to common shareowners.
  - (f) Escrow to maturity.
  - (g) Security is valued using fair value methods (other than prices supplied by independent pricing services).
  - (h) The company is scheduled for approval of a reorganization plan.
-

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

Insured	
FSA	3.1%
FSA-CR	2.2
AMBAC GO OF INSTN	2.1
BHAC-CR MBIA	1.8
AMBAC	0.6
GO OF INSTN	0.6
PSF-GTD	0.5
ASSURED GTY	0.4
GNMA COLL	0.4
NATL-RE	0.2
Revenue Bonds:	
Health Revenue	21.4
Facilities Revenue	13.6
Development Revenue	13.3
Tobacco Revenue	9.2
Other Revenue	7.3
Education Revenue	6.8
Transportation Revenue	5.9
Airport Revenue	5.5
Water Revenue	3.0
Pollution Control Revenue	2.1
Utilities Revenue	0.0*
	100.0%

\* Amount is less than 0.1%.

(j) At June 30, 2013, the net unrealized gain on investments based on cost for federal tax purposes of \$427,478,138 was as follows:

Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost	\$ 34,646,319
Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value	(24,260,524)
Net unrealized gain	\$ 10,385,795

For financial reporting purposes net unrealized gain on investments was \$ 10,385,795 and cost of investments aggregated \$427,478,138.



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) as level 3.

The following is a summary of the inputs used as of June 30, 2013, in valuing the Trust's investments.

	Level 1	Level 2	Level 3	Total
Tax Exempt Obligations: Municipal Collateralized Debt Obligation:	\$ -	\$430,562,873		\$- \$430,562,873
	-	7,301,060	-	7,301,060
Total	\$ -	\$ 437,863,933		\$ - \$437,863,933

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

	Balance as of 3/31/13	Change in Realized gain (loss)	Unrealized appreciation (depreciation)	Purchases	Sales	Accrued discounts/ premiums	Transfers in to Level 3*	Transfers out of Level 3*	Balance as of 6/30/13
Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

\* Transfers are calculated on the end of period value

\*\* Includes security valued at \$0.

During the three months ended June 30, 2013, there were no transfers between Levels 1, 2, and 3.

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. (a) 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)). Filed herewith. <PAGE> 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/ John F. Cogan, Jr. John F. Cogan, Jr, President Date August 29, 2013 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/ John F. Cogan, Jr. John F. Cogan, Jr., President Date August 29, 2013 By (Signature and Title)\* /s/ Mark Bradley Mark Bradley, Treasurer Date August 29, 2013 \* Print the name and title of each signing officer under his or her signature.