

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST

Form N-Q

March 01, 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: January 31, 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.

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ITEM 1. Schedule of Investments.

Pioneer Municipal High

Income Advantage Trust

December 31, 2012

Ticker Symbols: MAV

Principal Amount USD (\$)	S&P/Moody's Rating		Value
TAX EXEMPT OBLIGATIONS			
- 137.9% of Net Assets			
Alabama - 1.5%			
2,500,000	B-/B2	Alabama Industrial Development Authority Solid Waste Disposal Revenue, 6.45%, 12/1/23	\$ 2,495,950
2,500,000	NR/NR	Huntsville-Redstone Village Special Care Facilities Financing Authority Nursing Home Revenue, 5.5%, 1/1/43	2,397,375 \$ 4,893,325
Arizona - 3.2%			
5,000,000	NR/NR	Casa Grande Industrial Development Authority Hospital Revenue, 7.625%, 12/1/29	\$ 5,193,550
1,487,000	NR/Baa3	Pima County Industrial Development Authority, 6.75%, 7/1/31	1,493,469
2,640,000	NR/NR	Pima County Industrial Development Authority, 7.0%, 1/1/38	2,737,627
1,000,000	NR/NR	San Luis Facility Development Corp., 7.25%, 5/1/27	958,690

		\$ 10,383,336
	California - 19.8%	
11,990,000	CCC/NRCalifornia County Tobacco Securitization Agency Revenue, 5.25%, 6/1/46	\$ 8,733,156
1,450,000	NR/NRCalifornia Enterprise Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31	1,674,793
5,000,000	NR/Baa3California Pollution Control Financing Authority, 5.0%, 7/1/37	5,181,150
2,425,000	A-/A1California State General Obligation Various Purpose, 5.75%, 4/1/31	2,861,379
757,342(a)	NR/NRCalifornia Statewide Communities Development Authority Environmental Facilities Revenue, 9.0%, 12/1/38	6,695
4,000,000	BB/NRCalifornia Statewide Communities Development Authority Revenue Higher Education Revenue, 7.25%, 10/1/38 (144A)	4,019,080
2,680,000(b)	AA+/AaaGolden State Tobacco Securitization Corp., 6.75%, 6/1/39	2,752,789
3,140,000	AA-/WRLehman Municipal Trust Receipts Revenue, RIB, 10.946%, 9/20/28 (144A)	4,179,654
8,575,000(c)	AA-/NRLehman Municipal Trust Receipts, GO, 10.853%, 7/28/31	10,582,150
1,500,000	A-/NRMadera Irrigation Financing Authority Water Revenue, 6.25%, 1/1/31	1,729,995
1,500,000	A-/NRMadera Irrigation Financing Authority Water Revenue, 6.5%, 1/1/40	1,721,070
2,500,000	A-/A2San Jose California Airport Revenue, 5.0%, 3/1/37	2,637,150
7,000,000	B-/Caa1Tobacco Securitization Authority of Northern California, Revenue, 5.375%, 6/1/38	6,144,250
10,500,000	AA-/NRUniversity of California, RIB, 11.163%, 5/15/32	11,319,945
		\$ 63,543,256
	Colorado - 0.3%	
1,000,000	NR/NRKremmling Memorial Hospital District Certificate of Participation, 7.125%, 12/1/45	\$ 1,114,240
	Connecticut - 0.3%	
1,000,000	NR/NRHamden Connecticut Facility Revenue, 7.75%, 1/1/43	\$ 1,098,240
	District of Colombia - 3.1%	

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2,700,000	BBB/Baa1	District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$ 3,156,354
6,825,000	BBB/Baa1	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	6,893,318
		Florida - 4.7%	\$ 10,049,672
1,500,000	NR/NRA	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/41	\$ 1,760,700
1,500,000	NR/NRA	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	1,760,700
500,000	NR/B1	Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41	563,410
1,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40	1,083,150
2,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41	2,338,420
Principal Amount USD (\$)	S&P/Moody's Rating		Value
		Florida - (continued)	
1,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42	\$ 1,135,790
1,980,000	NR/NR	Hillsborough County Industrial Development Authority, 6.75%, 7/1/29	1,981,762
1,000,000(b)	NR/WR	Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32	1,419,020
2,500,000	A/A2	Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41	2,849,700
			\$ 14,892,652
		Georgia - 4.3%	
5,210,000	AA-/WR	Atlanta Georgia Water and Wastewater Revenue, RIB, 10.946%, 1/30/13 (144A)	\$ 5,998,742
1,000,000	B-/NR	Clayton County Development Authority Revenue, 9.0%, 6/1/35	1,122,930
900,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.0%, 9/1/30	1,064,709
750,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.125%, 9/1/40	878,587

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3,360,000	NR/NRFulton County Residential Care Facilities for the Elderly Authority, 7.0%, 7/1/29	2,998,867
1,650,000	NR/NRSavannah Georgia Economic Development Authority Revenue, 7.4%, 1/1/34	1,690,343
	Guam - 1.8%	\$ 13,754,178
1,000,000	B/NRGuam Government of Department Education Certificates of Participation, 6.625%, 12/1/30	\$ 1,093,660
4,400,000(b)	AA+/B2Northern Mariana Islands, 6.75%, 10/1/33	4,602,136
	Idaho - 1.1%	\$ 5,695,796
2,000,000	A-/Baa1Power County Industrial Development Corp., Revenue, 6.45%, 8/1/32	\$ 2,003,300
1,500,000	A-/Baa1Power County Pollution Control Revenue, 5.625%, 10/1/14	1,501,425
		\$ 3,504,725
	Illinois - 6.6%	
1,000,000	NR/Baa2City of Country Club Hills, GO, 5.0%, 12/1/31	\$ 1,041,330
45,000	NR/NRIllinois Finance Authority, 7.0%, 11/15/17	44,940
165,000	NR/NRIllinois Finance Authority, 7.0%, 11/15/27	164,776
1,450,000	A+/A1Illinois Finance Authority Revenue, 5.5%, 4/1/39	1,600,321
1,605,000	AA-/Aa3Illinois Finance Authority Revenue, 6.0%, 8/15/25	1,704,687
1,000,000(a)	NR/NRIllinois Finance Authority Revenue, 6.0%, 11/15/27	350,000
280,000	BBB+/NRIllinois Finance Authority Revenue, 6.0%, 8/15/38	317,176
2,000,000	AA+/Aa2Illinois Finance Authority Revenue, 6.0%, 8/15/39	2,340,820
2,500,000	NR/NRIllinois Finance Authority Revenue, 6.125%, 11/15/25	2,591,050
6,000,000	NR/NRIllinois Finance Authority Revenue, 8.25%, 5/15/45	6,446,880
2,500,000	NR/NRIllinois Finance Authority Revenue, 8.25%, 2/15/46	2,726,675
2,170,000	NR/NRSouthwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,841,744
		\$ 21,170,399
	Indiana - 0.9%	
250,000	NR/NR	\$ 269,247

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		City of Carmel Indiana Nursing Home Revenue, 7.0%, 11/15/32	
750,000	NR/NR	City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/42	807,465
500,000	NR/NR	City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/47	536,390
250,000	NR/Baa3	East Chicago Indiana Exempt Facilities Revenue, 7.0%, 1/1/14	251,355
1,805,000	NR/NR	Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	1,105,563 \$ 2,970,020
		Kansas - 0.3%	
1,000,000	NR/A2	Kansas Development Finance Authority Revenue, 5.0%, 5/15/35	\$ 1,085,570
		Louisiana - 5.9%	
5,000,000	BBB-/Baa2	Jefferson Parish Hospital Service Revenue, 6.375%, 7/1/41	\$ 5,860,400
2,500,000	BBB-/Baa3	Louisiana Local Government Environmental Facilities & Community Development Authority Revenue, 6.75%, 11/1/32	2,806,250
Principal Amount USD (\$)	S&P/Moody's Rating		Value
		Louisiana - (continued)	
6,000,000	NR/Baa1	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	\$ 6,375,540
750,000	BBB-/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	768,322
2,915,000	A-/A3	Tobacco Settlement Financing Corp. Revenue, 5.875%, 5/15/39	2,973,271 \$ 18,783,783
		Maine - 0.6%	
1,500,000	NR/Baa3	Maine Health & Higher Educational Facilities Authority Revenue, 7.5%, 7/1/32	\$ 1,903,680
		Maryland - 1.7%	
460,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.25%, 1/1/27	\$ 455,957
1,250,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.3%, 1/1/37	1,187,863
1,250,000	NR/Baa3	Maryland Health & Higher Educational Facilities Authority	1,349,362

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		Revenue, 5.75%, 7/1/38	
2,000,000	NR/NR	Maryland Health & Higher Educational Facilities Authority	
		Revenue, 6.25%, 1/1/45	2,299,600
			\$ 5,292,782
		Massachusetts - 9.1%	
595,000	BB/NR	Massachusetts Development Finance Agency Revenue, 5.25%, 10/1/18	\$ 595,179
8,000,000	A/WR	Massachusetts Development Finance Agency Revenue, 5.75%, 1/1/42	10,641,600
1,845,000	NR/NR	Massachusetts Development Finance Agency Revenue, 7.1%, 7/1/32	1,845,849
2,195,000	BBB-/Baa3	Massachusetts Health & Educational Facilities Authority Revenue, 5.375%, 7/15/28	2,196,185
2,000,000	AAA/Aaa	Massachusetts Health & Educational Facilities Authority Revenue, 5.5%, 7/1/32	2,894,340
3,420,000(a)	NR/NR	Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38	17,647
10,760,000	AA-/Aa3	Massachusetts Housing Finance Agency Revenue, 5.35%, 12/1/45	10,801,749
			\$ 28,992,549
		Michigan - 1.7%	
2,000,000	NR/Ba1	Flint Michigan Hospital Building Authority Revenue, 7.375%, 7/1/35	\$ 2,343,160
2,235,000	BB+/NR	Kent Hospital Finance Authority Revenue, 6.25%, 7/1/40	2,323,842
675,000	NR/NR	Michigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36	697,079
			\$ 5,364,081
		Minnesota - 0.4%	
1,000,000	NR/NR	Port Authority of the City of Bloomington, Minnesota Recovery Zone Facility Revenue, 9.0%, 12/1/35	\$ 1,191,310
		Missouri - 1.3%	
1,000,000	NR/NR	Kansas City Tax Increment Financing Commission Tax Increment Revenue, 6.5%, 6/1/25	\$ 1,038,890
1,500,000(a)(d)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.2%, 12/15/28	569,640
6,640,000(a)(d)	NR/Ca		2,521,606

		St. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35	\$ 4,130,136
2,445,000(e)	NR/NR	Montana - 0.7% Hardin Increment Industrial Infrastructure Development Revenue, 0.0%, 9/1/31	\$ 2,079,155
1,000,000(a)(d)	NR/NR	Two Rivers Authority Inc., Project Revenue, 7.375%, 11/1/27	148,460 \$ 2,227,615
4,500,000	A-/A3	Nevada - 1.5% Reno Nevada Hospital Revenue, 5.25%, 6/1/41	\$ 4,734,810
1,125,000	NR/NR	New Hampshire - 0.4% New Hampshire Health & Education Facilities Authority Revenue, 5.875%, 7/1/34	\$ 1,165,230
2,500,000	NR/NR	New Jersey - 12.0% Burlington County New Jersey Bridge Commission Revenue, 5.625%, 1/1/38	\$ 2,597,475
Principal Amount USD (\$)	S&P/Moody's Rating		Value
1,500,000	NR/NR	New Jersey - (continued) New Jersey Economic Development Authority Revenue, 10.5%, 6/1/32 (144A)	\$ 1,650,660
7,500,000	B/B3	New Jersey Economic Development Authority Revenue, 5.75%, 9/15/27	7,729,875
3,500,000	AA-/WR	New Jersey State Turnpike Authority Transportation Revenue, RIB, 10.569%, 7/1/23 (144A)	6,419,665
15,375,000(e)	AA+/Aa1	New Jersey Transportation Trust Fund Authority Revenue, 0.0%, 12/15/27	8,730,540
1,000,000(b)	AA+/Aaa	Tobacco Settlement Financing Corp., Revenue, 6.25%, 6/1/43	1,025,080
5,000,000(b)	AA+/Aaa	Tobacco Settlement Financing Corp., Revenue, 7.0%, 6/1/41	5,140,800
2,000,000	B-/B1	Tobacco Settlement Financing Corp., Revenue, 4.625%, 6/1/26	1,940,000
3,250,000(b)	AA+/Aaa	Tobacco Settlement Financing Corp., Revenue, 6.75%, 6/1/39	3,338,042 \$ 38,572,137

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	New York - 8.1%	
1,730,000	NR/NRDutchess County Industrial Development Agency, 7.5%, 3/1/29	\$ 1,776,329
7,000,000	BB/B2New York City Industrial Development Agency Revenue, 5.25%, 12/1/32	7,000,140
3,950,000	BB/B2New York City Industrial Development Agency Revenue, 7.625%, 12/1/32	4,049,106
5,000,000	AAA/AaaNew York State Dormitory Authority Revenue, 5.0%, 10/1/41	5,829,150
2,000,000	NR/Ba1New York State Dormitory Authority Revenue, 6.125%, 12/1/29	2,230,780
5,000,000	AAA/AaaNew York State Environmental Facilities Corp. Water Revenue, 5.0%, 6/15/33	5,094,150 \$ 25,979,655
	North Carolina - 1.6%	
5,010,000	NR/NRCharlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28	\$ 5,017,315
	Ohio - 1.9%	
1,500,000	NR/NRAdams County Hospital Facilities Revenue, 6.5%, 9/1/36	\$ 1,190,970
5,000,000	B-/B3Buckeye Tobacco Settlement Financing Authority Revenue, 6.5%, 6/1/47	4,865,800 \$ 6,056,770
	Oklahoma - 1.7%	
2,220,000	NR/WRTulsa Municipal Airport Trust Revenue, 6.25%, 6/1/20	\$ 2,225,794
3,000,000(c)	NR/WRTulsa Municipal Airport Trust Revenue, 7.75%, 6/1/35	3,300,600 \$ 5,526,394
	Oregon - 0.7%	
2,000,000	A-/NROregon State Facilities Authority Revenue, 5.25%, 10/1/40	\$ 2,198,620
	Pennsylvania - 5.5%	
2,000,000	BBB-/Ba1Pennsylvania Economic Development Financing Authority Revenue, 4.625%, 12/1/18	\$ 2,032,660
5,000,000	B-/Caa2Pennsylvania Economic Development Financing Authority Solid Waste Disposal Revenue, 6.0%, 6/1/31	5,000,150
5,000,000	A-/A3	5,509,100

		Pennsylvania Turnpike Commission, 5.3%, 12/1/41	
5,000,000	BBB-/Ba1	Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 5.0%, 7/1/34	5,111,050 \$ 17,652,960
		Rhode Island - 3.6%	
1,385,000(d)	NR/NR	Central Falls Rhode Island Detention Facility Corp., Revenue, 7.25%, 7/15/35	\$ 1,193,399
1,500,000	NR/NR	Rhode Island Health & Educational Building Corp., Revenue, 8.375%, 1/1/46	1,782,510
8,285,000	BB/Ba1	Tobacco Settlement Financing Corp., Revenue, 6.25%, 6/1/42	8,396,930 \$ 11,372,839
		South Carolina - 4.6%	
8,000,000(b)	BBB+/Baa1	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	\$ 8,281,698
Principal Amount USD (\$)	S&P/Moody's Rating		Value
		South Carolina - (continued)	
4,400,000(f)	BBB/WR	Tobacco Settlement Revenue Management Authority, 6.375%, 5/15/30	\$ 6,385,632 \$ 14,667,330
		Tennessee - 2.9%	
5,000,000	BBB+/Baa1	Johnson City Health & Educational Facilities Board Hospital Revenue, 6.5%, 7/1/38	\$ 6,011,200
3,000,000	BBB+/NR	Sullivan County Health, Educational & Housing Facilities Board Revenue, 5.25%, 9/1/36	3,163,170 \$ 9,174,370
		Texas - 15.1%	
2,400,000	BB+/Ba1	Central Texas Regional Mobility Authority Revenue, 6.75%, 1/1/41	\$ 2,798,016
2,663,453(a)(d)	NR/NR	Gulf Coast Industrial Development Authority Revenue, 7.0%, 12/1/36	24,610
10,000,000	B/B3	Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29	10,040,700
595,000	NR/NRI	AH Public Facility Corp., Facilities Revenue, Series 2006, 6.0%, 5/1/16	580,554
1,000,000	NR/NRI	AH Public Facility Corp., Facilities Revenue, Series 2006, 6.0%, 5/1/21	907,870

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1,350,000	NR/NRIAH Public Facility Corp., Facilities Revenue, Series 2006, 6.125%, 5/1/26	1,187,312
3,000,000	NR/NRJefferson County Industrial Development Corp., Revenue, 8.25%, 7/1/32	3,069,240
2,240,000	AA-/Aa3Lower Colorado River Authority Power Revenue, 5.0%, 5/15/31	2,243,494
845,000	NR/NRLubbock Health Facilities Development Corp. Nursing Home Revenue, 6.5%, 7/1/26	892,903
2,000,000	NR/NRLubbock Health Facilities Development Corp., Nursing Home Revenue, 6.625%, 7/1/36	2,094,440
9,750,000	BBB+/A3North Texas Tollway Authority Transportation Revenue, 5.75%, 1/1/33	10,880,805
1,711,000	NR/AaaPanhandle Regional Housing Finance Corp., Multifamily Housing Revenue, 6.6%, 7/20/31	1,799,715
1,500,000	NR/NRRed River Health Facilities Development Corp., Revenue, 8.0%, 11/15/41	1,746,585
1,000,000	A+/A1Richardson Hospital Authority Revenue, 6.0%, 12/1/34	1,024,240
3,000,000	NR/NRSanger Industrial Development Corp., Revenue, 8.0%, 7/1/38	3,205,650
1,000,000	NR/NRTarrant County Cultural Education Facilities Finance Corp., Revenue, 8.125%, 11/15/39	1,118,130
1,500,000	NR/NRTarrant County Cultural Education Facilities Finance Corp., Revenue, 8.25%, 11/15/44	1,683,150
1,000,000(a)(d)	D/NRTexas Midwest Public Facility Corp. Revenue, 9.0%, 10/1/30	407,500
2,500,000	NR/NRTravis County Health Facilities Development Corp., Revenue, 7.125%, 1/1/46	2,672,150
	Virginia - 0.8%	\$ 48,377,064
2,000,000	BBB+/Baa1Washington County Industrial Development Authority Revenue, 7.75%, 7/1/38	\$ 2,484,580
	Washington - 4.2%	
1,125,000	BBB/A3Tobacco Settlement Authority Revenue, 6.5%, 6/1/26	\$ 1,158,728
1,500,000	NR/Baa3Washington State Health Care Facilities Authority Revenue, 5.5%,	1,606,125

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	12/1/39		
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority Revenue, 6.125%, 8/15/37	2,198,880
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority Revenue, 6.25%, 8/15/42	2,198,700
5,000,000	NR/NR	Washington State Housing Finance Committee Nonprofit Revenue, 5.625%, 1/1/27	5,066,850
1,100,000	NR/NR	Washington State Housing Finance Committee Nonprofit Revenue, 6.75%, 10/1/47	1,098,383
			\$ 13,327,666
		West Virginia - 0.9%	
2,000,000	NR/NR	City of Philippi, 7.75%, 10/1/44	\$ 2,049,060
750,000	NR/NR	West Virginia Hospital Finance Authority Hospital Revenue, 9.125%, 10/1/41	947,693
			\$ 2,996,753
Principal Amount USD (\$)	S&P/Moody's Rating		Value
		Wisconsin - 3.1%	
2,900,000(g)	NR/NR	Aztalan Township, 7.5%, 5/1/18	\$ —
2,500,000	NR/NR	Wisconsin Public Finance Authority Continuing Care Retirement Community Revenue, 8.25%, 6/1/46	3,008,575
1,000,000(b)	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.125%, 4/1/24	1,068,230
1,000,000(b)	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.25%, 4/1/34	1,069,790
1,500,000	A+/A1	Wisconsin State Health & Educational Facilities Authority Revenue, 6.625%, 2/15/39	1,761,645
1,500,000	NR/NR	Wisconsin State Public Finance Authority Revenue, 8.375%, 6/1/20	1,518,660
1,500,000	NR/NR	Wisconsin State Public Finance Authority Revenue, 8.625%, 6/1/47	1,617,615
			\$ 10,044,515
		TOTAL TAX EXEMPT OBLIGATIONS	
		(Cost \$395,863,796)	\$ 441,390,353

		MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 2.6% of Net Assets	
13,000,000(c)(d)	NR/NR	Non-Profit Preferred Funding Trust I, 6.75%, 9/15/37 (144A)	\$ 8,273,850
		TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$13,000,000)	\$ 8,273,850
		TAX EXEMPT MONEY MARKET MUTUAL FUND - 3.4% of Net Assets	
11,000,000	NR/NR	BlackRock Liquidity Funds MuniFund Portfolio	\$ 11,000,000
		TOTAL TAX EXEMPT MONEY MARKET MUTUAL FUND (Cost \$11,000,000)	\$ 11,000,000
		TOTAL INVESTMENTS IN SECURITIES - 143.9% (Cost - \$419,863,796) (h)(i)	\$ 460,664,203
		OTHER ASSETS AND LIABILITIES -3.0%	\$ 9,562,203
		PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE - (46.8)%	\$ (150,000,000)
		NET ASSETS APPLICABLE TO COMMON SHAREOWNERS -100.0%	\$ 320,226,406

NR WR (144A)	Security not rated by S&P or Moody's. Rating withdrawn by either S&P or Moody's. 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 December 31, 2012, the value of these securities amounted to \$30,541,651, or 9.5% 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, 2012.
GO	General Obligation.

- (a) Security is in default and is non income producing.
 - (b) 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.
 - (c) The interest rate is subject to change periodically. The interest is shown is the rate at December 31, 2012.
 - (d) Indicates a security that has been deemed as illiquid. The aggregate cost of illiquid securities is \$27,047,644. The aggregate fair value of \$13,139,065 represents 4.1% of total net assets applicable to common shareowners.
 - (e) Security issued with a zero coupon. Income is recognized through accretion of discount.
 - (f) Escrow to maturity.
 - (g) Security is valued using fair value methods.
-

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

Insured	
FSA	6.1%
AMBAC GO OF INSTN	2.3
FSA-CR	2.3
BHAC-CR MBIA	1.9
AMBAC	1.0
GO OF INSTN	0.6
AGM	0.5
GNMA COLL	0.4
ASSURED GTY	0.4
NATL-RE	0.2
Revenue Bonds:	
Health Revenue	18.9
Tobacco Revenue	13.7
Facilities Revenue	13.7
Development Revenue	11.2
Other Revenue	8.6
Airport Revenue	4.8
Education Revenue	4.8
Transportation Revenue	3.6
Water Revenue	3.0
Pollution Control Revenue	2.0
Utilities Revenue	0.0*
	100.0%

(i) At December 31, 2012, the net unrealized gain on investments based on cost for federal tax purposes of \$419,863,796 was as follows:

Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost	\$ 58,518,413
Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value	(17,718,006)
Net unrealized gain	\$ 40,800,407

For financial reporting purposes net unrealized gain on investments was \$ 40,800,407 and cost of investments aggregated \$419,863,796.

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 December 31, 2012, in valuing the Trust's investments.

	Level 1	Level 2	Level 3	Total
Tax exempt obligations	\$—	\$441,390,353	\$ —	\$441,390,353
Municipal collateralized debt obligation	—	8,273,850	—	8,273,850
Tax exempt money market mutual fund	11,000,000	—	—	11,000,000
Total	\$11,000,000	\$449,664,203	\$ —	\$460,664,203

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

Balance as of 3/31/2012	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 12/31/12
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Tax exempt obligations	—	\$—	\$—	\$—	\$—	—	\$—	\$—	\$—**
Total	—	\$—	\$—	\$—	\$—	—	\$—	\$—	\$—**

* Transfers are calculated on the end of period value.

** Azatlan

Township is fair valued at \$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. (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 March 1, 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 March 1, 2013 By (Signature and Title)* /s/ Mark Bradley Mark Bradley, Treasurer Date March 1, 2013 * Print the name and title of each signing officer under his or her signature.