

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST

Form N-Q

August 28, 2012

OMB APPROVAL

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

FORM N-Q

QUARTERLY SCHEDULE OF PORTFOLIO HOLDINGS  
OF REGISTERED MANAGEMENT INVESTMENT COMPANY

Investment Company Act file number 811-21409

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

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

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

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

Date of fiscal year end: March 31

Date of reporting period: June 30, 2012

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

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

<PAGE>

ITEM 1. Schedule of Investments.

Pioneer Municipal High

Income Advantage Trust

June 30, 2012

Ticker Symbols: MAV

Principal Amount USD (\$)	S&P/Moody's Rating	Value
	TAX EXEMPT OBLIGATIONS - 142.6% of Net Assets	
	Alabama - 1.6%	
2,500,000	B-/B2 Alabama Industrial Development Authority Solid Waste Disposal Revenue, 6.45%, 12/1/23	\$ 2,431,100
2,500,000	NR/NRHuntsville-Redstone Village Special Care Facilities Financing Authority, 5.5%, 1/1/43	2,386,425 \$ 4,817,525
	Arizona - 3.3%	
5,000,000	NR/NRCasa Grande Industrial Development Authority Hospital Revenue, 7.625%, 12/1/29	\$ 5,153,000
1,492,000	NR/Baa3Pima County Industrial Development Authority,	1,495,834

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

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

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

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Principal Amount USD (\$)	S&P/Moody's Rating		Value
		12/1/30	
4,400,000(c)	AA+/B2	Northern Mariana Islands, 6.75%, 10/1/33	4,756,532 \$ 5,831,642
		Idaho - 1.1%	
2,000,000	BBB+/Baa1	Power County Industrial Development Corp., 6.45%, 8/1/32	\$ 2,002,980
1,500,000	BBB+/Baa1	Power County Pollution Control Revenue, 5.625%, 10/1/14	1,501,035 \$ 3,504,015
		Illinois - 6.7%	
1,000,000	NR/Baa2	City of Country Club Hills, 5.0%, 12/1/31	\$ 1,025,350
1,450,000	A+/A1	Illinois Finance Authority Revenue, 5.5%, 4/1/39	1,551,848
		Illinois - (continued)	
1,605,000	AA-/Aa3	Illinois Finance Authority Revenue, 6.0%, 8/15/25	1,702,231
1,000,000(b)	NR/NR	Illinois Finance Authority Revenue, 6.0%, 11/15/27	240,010
280,000	BBB+/NR	Illinois Finance Authority Revenue, 6.0%, 8/15/38	311,623
2,000,000	AA+/Aa2	Illinois Finance Authority Revenue, 6.0%, 8/15/39	2,311,540
2,500,000	NR/NR	Illinois Finance Authority Revenue, 6.125%, 11/15/25	2,581,925
6,000,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 5/15/45	6,395,220
2,500,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 2/15/46	2,653,175
2,270,000	NR/NR	Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,895,495 \$ 20,668,417
		Indiana - 0.4%	
250,000	NR/Baa3	East Chicago Indiana Exempt Facilities Revenue, 7.0%, 1/1/14	\$ 250,908
1,805,000	NR/NR	Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	1,089,606 \$ 1,340,514

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		Kansas - 0.4%	
1,000,000	NR/A2	Kansas Development Finance Authority, 5.0%, 5/15/35	\$ 1,075,120
		Kentucky - 1.4%	
4,390,000	BB/NR	Kentucky Economic Development Finance Authority Hospital System Revenue, 5.875%, 10/1/22	\$ 4,391,537
		Louisiana - 5.9%	
5,000,000	BBB-/Baa2	Jefferson Parish Hospital Service Revenue, 6.375%, 7/1/41	\$ 5,593,600
2,500,000	BBB-/Baa3	Louisiana Local Government Environmental Developmental Authority Facilities Revenue, 6.75%, 11/1/32	2,790,500
6,000,000	NR/Baa1	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	6,179,580
750,000	BBB-/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	772,462
2,915,000	A-/A3	Tobacco Settlement Financing Corp., 5.875%, 5/15/39	2,976,536
			\$ 18,312,678
		Maine - 0.6%	
1,500,000	NR/Baa3	Maine Health & Higher Educational Facilities Authority Revenue, 7.5%, 7/1/32	\$ 1,826,445
		Maryland - 1.7%	
460,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.25%, 1/1/27	\$ 433,688
1,250,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.3%, 1/1/37	1,113,212
1,250,000	NR/Baa3	Maryland Health & Higher Educational Facilities Authority Revenue,	1,328,163

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Principal Amount USD (\$)	S&P/Moody's Rating	Value
2,000,000	NR/NR Maryland Health & Higher Educational Facilities Authority Revenue, 5.75%, 7/1/38 6.25%, 1/1/45	2,257,140 \$ 5,132,203
675,000	BB/NR Massachusetts Development Finance Agency, 5.25%, 10/1/18 Massachusetts - 9.5%	\$ 675,088
8,000,000	A/WR Massachusetts Development Finance Agency, 5.75%, 1/1/42 Massachusetts - (continued)	9,913,280
1,885,000	NR/NR Massachusetts Development Finance Agency, 7.1%, 7/1/32	1,752,428
2,195,000	BBB-/Baa3 Massachusetts Health & Educational Facilities Authority Revenue, 5.375%, 7/15/28	2,195,373
2,000,000	AAA/Aaa Massachusetts Health & Educational Facilities Authority Revenue, 5.5%, 7/1/32	2,766,500
1,000,000	NR/Caa1 Massachusetts Health & Educational Facilities Authority Revenue, 6.0%, 10/1/23	996,660
3,420,000(b)	NR/NR Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38	17,032
10,760,000	AA-/Aa3 Massachusetts Housing Finance Agency, 5.35%, 12/1/45	10,818,857 \$ 29,135,218
2,000,000	NR/Ba1 Flint Michigan Hospital Building Authority Revenue, 7.375%, 7/1/35 Michigan - 1.7%	\$ 2,279,080
2,235,000	BB+/NR Kent Hospital Finance Authority Revenue, Metropolitan Hospital Project Series A, 6.25%	2,297,021



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	7/1/40		
725,000(a)	NR/NRMichigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36	736,230	\$ 5,312,331
	Minnesota - 0.4%		
1,000,000	NR/NRPort Authority of the City of Bloomington, Minnesota Recovery Zone Facility Revenue, 9.0%, 12/1/35		\$ 1,178,600
	Missouri - 1.1%		
1,000,000	NR/NRKansas City Tax Increment Financing Commission Tax Increment Revenue, 6.5%, 6/1/25		\$ 1,034,790
1,500,000(b)	NR/CaSt. Louis Industrial Development Authority Revenue, 7.2%, 12/15/28	450,000	
6,640,000(b)	NR/CaSt. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35		1,992,000 \$ 3,476,790
	Montana - 0.7%		
2,445,000	NR/NRHardin Increment Industrial Infrastructure Development Revenue, 0.0%, 9/1/31		\$ 1,943,115
1,000,000(b)	NR/NRTwo Rivers Authority, Inc., Project Revenue, 7.375%, 11/1/27	148,200	\$ 2,091,315
	Nevada - 1.5%		
1,600,000(b)	NR/NRDirector of the State of Nevada Department of Business & Industry, 7.25%, 1/1/23		\$ 16
1,000,000(b)	NR/NRDirector of the State of Nevada Department of Business & Industry, 7.375%, 1/1/30		10
1,320,000(b)	NR/NRDirector of the State of Nevada Department of Business & Industry, 7.375%, 1/1/40		13
4,500,000	A-/A3Reno Nevada Hospital Revenue, 5.25%, 6/1/41	4,685,670	

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			\$ 4,685,709
1,125,000	NR/NR	New Hampshire - 0.4% New Hampshire Health & Education Facilities Authority Revenue, 5.875%, 7/1/34	\$ 1,160,055
Principal Amount USD (\$)	S&P/Moody's Rating		Value
2,500,000	NR/NR	New Jersey - 13.8% Burlington County New Jersey Bridge Commission Revenue, 5.625%, 1/1/38	\$ 2,547,900
1,500,000(a)	NR/NR	New Jersey Economic Development Authority Revenue, 10.5%, 6/1/32 (144A)	1,650,345
13,000,000	B/B3	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29	13,052,000
3,500,000(a)(d)	AA-/WR	New Jersey State Turnpike Authority, RIB, 13.555%, 7/1/23 (144A)	5,804,820
15,375,000(g)	AA+/Aa1	New Jersey Transportation Trust Fund Authority, 0.0%, 12/15/27	8,000,535
2,000,000	B-/B1	Tobacco Settlement Financing Corp., 4.625%, 6/1/26	1,770,520
1,000,000(c)	AA+/Aaa	Tobacco Settlement Financing Corp., 6.25%, 6/1/43	1,055,230
3,250,000(c)	AA+/Aaa	Tobacco Settlement Financing Corp., 6.75%, 6/1/39	3,444,480
5,000,000(c)	AA+/Aaa	Tobacco Settlement Financing Corp., 7.0%, 6/1/41	5,312,950
			\$ 42,638,780
1,730,000	NR/NR	New York - 9.9% Dutchess County Industrial Development Agency, 7.5%, 3/1/29	\$ 1,776,450
3,000,000	NR/NR	Nassau County New York Industrial Development Agency Revenue, 6.7%, 1/1/43	1,898,220
7,000,000	BB-/B2		6,683,320

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		New York City Industrial Development Agency, 5.25%, 12/1/32	
3,950,000	BB-/B2	New York City Industrial Development Agency, 7.625%, 12/1/32	4,075,136
3,000,000	NR/C	New York City Industrial Development Agency, 8.0%, 8/1/12	2,999,880
5,000,000	AAA/Aaa	New York State Dormitory Authority Revenue, 5.0%, 10/1/41	5,723,350
2,000,000	NR/Ba1	New York State Dormitory Authority Revenue, 6.125%, 12/1/29	2,178,280
5,000,000	AAA/Aaa	New York State Environmental Facilities Corp., 5.0%, 6/15/33	5,197,350
			\$ 30,531,986
		North Carolina - 1.6%	
5,010,000	NR/NR	Charlotte Special Facilities Refunding Revenue, 7.75%, 2/1/28	\$ 5,017,916
		Ohio - 1.8%	
1,500,000	NR/NR	Adams County Hospital Facilities Revenue, 6.5%, 9/1/36	\$ 1,191,465
5,000,000	B-/B3	Buckeye Tobacco Settlement Financing Authority, 6.5%, 6/1/47	4,198,150
			\$ 5,389,615
		Oklahoma - 1.7%	
2,220,000(b)	NR/WR	Tulsa Municipal Airport Trust Revenue, 6.25%, 6/1/20	\$ 2,242,200
3,000,000(b)	NR/WR	Tulsa Municipal Airport Trust Revenue, 7.75%, 6/1/35	3,120,000
			\$ 5,362,200
		Oregon - 0.7%	
2,000,000	A-/NR	Oregon State Facilities Authority Revenue, 5.25%, 10/1/40	\$ 2,158,120
		Pennsylvania - 5.2%	
3,600,000	CCC/NR	Columbia County Hospital Authority Revenue, 5.85%, 6/1/24	\$ 3,601,044
2,000,000	BBB-/Ba1	Pennsylvania Economic Development Financing	2,014,080

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Principal Amount USD (\$)	S&P/Moody's Rating	Authority Revenue, 4.625%, 12/1/18 BB/NRPennsylvania Economic Development Financing Authority Revenue, 5.125%, 6/1/18	Value
1,000,000			1,000,010
Pennsylvania - (continued)			
5,000,000	B-/Caa2	Pennsylvania Economic Development Financing Authority Solid Waste Disposal Revenue, 6.0%, 6/1/31	4,845,950
5,000,000	BBB-/Ba1	Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 5.0%, 7/1/34	4,671,100
			\$ 16,132,184
Rhode Island - 3.7%			
1,385,000	NR/NR	Central Falls Rhode Island Detention Facilities Revenue, 7.25%, 7/15/35	\$ 1,173,303
1,500,000	NR/NR	Rhode Island Health & Educational Building Corp Revenue, 8.375%, 1/1/46	1,727,070
8,285,000	BB/Ba1	Tobacco Settlement Financing Corp., 6.25%, 6/1/42	8,428,413
			\$ 11,328,786
South Carolina - 4.8%			
–	8,000,000(c)	BBB+/Baa1	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34
			\$ 8,520,490
4,400,000(e)	BBB/WR	Tobacco Settlement Revenue Management, 6.375%, 5/15/30	6,244,964
			\$ 14,765,454
Tennessee - 3.2%			
5,000,000	BBB+/Baa1	Johnson City Health & Educational Facilities Board Hospital Revenue, 6.5%, 7/1/38	\$ 5,786,050
1,000,000(c)	NR/A2	Johnson City Health & Educational Facilities Board Hospital Revenue, 7.5%, 7/1/33	1,030,310

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3,000,000	BBB+/NRSullivan County Health, Educational & Housing Facilities Board Hospital Revenue, 5.25%, 9/1/36	3,099,510 \$ 9,915,870
	Texas - 13.4%	
2,400,000	BB+/Ba1Central Texas Regional Mobility Authority Revenue, 6.75%, 1/1/41	\$ 2,689,872
2,663,453(b)	NR/NRGulf Coast Industrial Development Authority, 7.0%, 12/1/36	25,383
10,000,000	B-/B3Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29	10,041,000
595,000	NR/NRIAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/16	575,627
1,000,000	NR/NRIAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/21	894,680
1,350,000	NR/NRIAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.125%, 5/1/26	1,167,656
2,240,000	AA-/Aa3Lower Colorado River Authority, 5.0%, 5/15/31	2,242,598
845,000	NR/NRLubbock Health Facilities Development Corp., 6.5%, 7/1/26	870,747
2,000,000	NR/NRLubbock Health Facilities Development Corp., 6.625%, 7/1/36	2,042,120
9,750,000	BBB+/A3North Texas Tollway Authority Revenue, 5.75%, 1/1/33	10,615,800
1,711,000	NR/AaaPanhandle Regional Housing Finance Corp. Multifamily Housing Revenue, 6.6%, 7/20/31	1,799,031
1,500,000	NR/NRRed River Health Facilities Development Corp., Revenue, 8.0%, 11/15/41	1,639,455
1,000,000	A/Baa2Richardson Hospital Authority Revenue, 6.0%, 12/1/34	1,027,490
Principal Amount	S&P/Moody's Rating	Value

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USD (\$)

		Texas - (continued)	
1,000,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.125%, 11/15/39	1,088,440
1,500,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.25%, 11/15/44	1,639,815
1,000,000(b)	D/NR	Texas Midwest Public Facility Corp., 9.0%, 10/1/30	400,000
2,500,000	NR/NR	Travis County Health Facilities Development Corp. Revenue, 7.125%, 1/1/46	2,566,900
			\$ 41,326,614
		Virginia - 0.8%	
2,000,000	BBB+/Baa1	Washington County Industrial Development Authority Revenue, 7.75%, 7/1/38	\$ 2,456,740
		Washington - 3.8%	
1,125,000	BBB/A3	Tobacco Settlement Authority Revenue, 6.5%, 6/1/26	\$ 1,172,812
1,500,000	NR/Baa2	Washington State Health Care Facilities Authority, 5.5%, 12/1/39	1,562,490
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.125%, 8/15/37	2,146,280
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.25%, 8/15/42	2,145,320
5,000,000	NR/NR	Washington State Housing Finance Committee Nonprofit Revenue, 5.625%, 1/1/27	4,768,850
			\$ 11,795,752
		West Virginia - 0.3%	
750,000	NR/NR	West Virginia Hospital Finance Authority Hospital Revenue Bonds, 9.125%, 10/1/41	\$ 906,473
		Wisconsin - 3.2%	
2,900,000	NR/NR		\$ -

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Aztalan Township , 0.0%,

2,500,000	NR/NRWisconsin Public Finance Authority Continuing Care Retirement Community Revenue, 8.25%, 6/1/46	2,907,900
1,000,000	NR/NRWisconsin State Health & Educational Facilities Authority, 6.125%, 4/1/24	1,019,350
1,000,000	NR/NRWisconsin State Health & Educational Facilities Authority, 6.25%, 4/1/34	1,012,700
1,500,000	A+/A1Wisconsin State Health & Educational Facilities Authority, 6.625%, 2/15/39	1,727,175
1,500,000	NR/NRWisconsin State Public Finance Authority Revenue, 8.375%, 6/1/20	1,503,885
1,500,000	NR/NRWisconsin State Public Finance Authority Revenue, 8.625%, 6/1/47	1,520,235
		\$ 9,691,245
	TOTAL TAX EXEMPT OBLIGATIONS (Cost \$403,022,041)	\$ 439,796,955
	MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 2.7% of Net Assets	
13,000,000(a)	NR/NRNon-Profit Preferred Funding Trust I, 6.75%, 9/15/37 (144A)	\$ 8,240,050
	TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$13,000,000)	\$ 8,240,050
Principal Amount USD (\$)	S&P/Moody's Rating	Value
	TAX EXEMPT MONEY MARKET MUTUAL FUND - 1.2% of Net Assets	
3,700,000		\$ 3,700,000

BlackRock Liquidity  
Funds MuniFund Portfolio

TOTAL TAX EXEMPT  
MONEY MARKET  
MUTUAL FUND  
(Cost \$3,700,000) \$ 3,700,000

TOTAL INVESTMENTS  
IN SECURITIES - 146.5%  
(Cost - \$419,722,041) (h) \$ 451,737,005  
OTHER ASSETS AND  
LIABILITIES -2.2% \$ 6,684,503  
PREFERRED SHARES  
AT REDEMPTION  
VALUE,  
INCLUDING  
DIVIDENDS PAYABLE -  
(48.6)% \$ (150,007,654)  
NET ASSETS  
APPLICABLE TO  
COMMON  
SHAREHOLDERS  
-100.0% \$ 308,413,854

NR  
WR  
(144A)

Security not rated by S&P or Moody's.  
Rating Withdrawn.  
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, 2012, the value of these securities amounted to \$28,445,786, or 9.2% of total net assets applicable to common shareowners.

- (a) Indicates a security that has been deemed as illiquid. The aggregate cost of illiquid securities is \$48,654,077. The aggregate fair value of \$50,534,626 represents 16.4% of total net assets applicable to common shareholders.
- (b) Security is in default and is non income producing.
- (c) 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.
- (d) Residual Interest Bonds. The interest rate is subject to change periodically and inversely based upon prevailing market rates. The interest rate shown is the rate June 30, 2012.



(e) Escrow to maturity.

(f) Security is fair valued. (Service Note 1 A)

(g) Security issued with zero coupon. Income is recognized through accretion of discount.

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

Insured	
FSA	8.2%
AMBAC	3.2
BHAC-CR MBIA	1.8
GO OF INSTN	0.6
AGM	0.5
XLCA	0.5
GNMA COLL	0.4
ASSURED GTY	0.4
NATL-RE	0.2
Revenue Bonds:	
Health Revenue	32.3
Tobacco Revenue	13.7
Airport Revenue	7.8
Other Revenue	7.7
Development Revenue	6.4
Pollution Control Revenue	3.8
Education Revenue	3.6
Housing Revenue	2.4
Transportation Revenue	2.4
Facilities Revenue	2.2
Water Revenue	1.9
Utilities Revenue*	0.0
	100.0%

\* Amount rounds to less than 0.1%

(h) At June 30, 2012, the net unrealized gain on investments based on cost for federal tax purposes of \$419,722,041 was as follows:

Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost	\$ 55,368,204
Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value	(23,353,240)
Net unrealized gain	\$ 32,014,964

For financial reporting purposes net unrealized gain on investments was \$ 32,014,964 and cost of investments aggregated \$419,722,041.

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.

	Level 1	Level 2	Level 3	Total
Investments in Securities - Assets				
TAX EXEMPT OBLIGATIONS:	–	439,796,955	–	439,796,955
MUNICIPAL COLLATERALIZED DEBT OBLIGATION:	–	8,240,050	–	8,240,050
TAX EXEMPT MONEY MARKET MUTUAL FUND:	3,700,000	–	–	3,700,000
Total Investments in Securities - Assets	\$3,700,000	\$448,037,005	\$–	\$451,737,005

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 February 29, 2012 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

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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 February 29, 2012 By (Signature and Title)\* /s/ Mark Bradley Mark Bradley, Treasurer Date February 29, 2012 \* Print the name and title of each signing officer under his or her signature.