

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST  
Form N-Q  
August 26, 2011

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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, 2011

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 SCHEDULE OF INVESTMENTS 6/30/11 (unaudited)			
Principal Amount	S&P/ Moody's Ratings (unaudited)		Value
TAX-EXEMPT OBLIGATIONS - 147.4% of Net Assets			
\$ 2,500,000	NR/NR	Alabama - 0.6% Huntsville-Redstone Village Special Care Facilities Financing Authority, 5.5%, 1/1/43	\$ 1,789,100
5,000,000	NR/NR	Arizona - 3.3% Casa Grande Industrial Development Authority Hospital Revenue, 7.625%, 12/1/29	\$ 4,657,600
1,492,000	NR/Baa3	Pima County Industrial Development Authority, 6.75%, 7/1/31	1,413,103
2,640,000	NR/NR	Pima County Industrial Development Authority, 7.0%, 1/1/38	2,407,574
1,000,000	NR/NR	San Luis Facility Development Corp., 7.25%, 5/1/27	900,130
			\$ 9,378,407
1,000,000	NR/NR	California - 12.8% California Enterprise Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31	\$ 1,022,420
3,140,000(a)	AA+/WR	California State University Revenue, RIB, 12.808%, 11/1/39 (144A)	3,029,755
2,425,000	A-/A1	California State Various Purpose, 5.75%, 4/1/31	2,588,639
8,575,000(a)	AA+/NR	California State Various Purpose, RIB, 12.808%, 6/1/37 (144A)	8,018,482
3,000,000	BB+/NR	California Statewide Communities Development Authority, 7.25%, 10/14/38 (144A)	3,030,600
803,175(b)	NR/NR	California Statewide Communities Development Authority, 9.0%,	44,978

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2,680,000 †	AAA/Aaa	12/1/38 Golden State Tobacco Securitization Corp., 6.75%, 6/1/39	2,999,724
1,500,000	A-/NR	Madera Irrigation Financing Authority Water Revenue, 6.25%, 1/1/31	1,530,690
1,500,000	A-/NR	Madera Irrigation Financing Authority Water Revenue, 6.5%, 1/1/40	1,530,375
2,500,000	A/A2	San Jose California Airport Revenue, 5.0%, 3/1/37	2,342,025
10,500,000(a)	AA+/NR	University of California, RIB, 13.36%, 5/15/38	10,019,940
			\$ 36,157,628
2,850,000 †	NR/WR	Colorado - 1.4% Denver Health & Hospital Authority Healthcare Revenue, 6.0%, 12/1/31	\$ 2,917,659
1,000,000	NR/NR	Kremmling Memorial Hospital District, 7.125%, 12/1/45	971,240
			\$ 3,888,899
7,750,000	BBB/Baa1	Connecticut - 3.0% Connecticut State Development Authority Revenue, 5.75%, 11/1/37	\$ 7,494,405
1,000,000	NR/NR	Hamden Connecticut Facility Revenue, 7.75%, 1/1/43	1,026,230
			\$ 8,520,635
2,700,000	BBB/Baa3	District of Columbia - 3.3% District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$ 2,747,277
6,825,000	BBB/Baa3	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	6,613,971
			\$ 9,361,248
1,000,000	NR/NR	Florida - 3.9% Florida Development Finance Corp. Educational Facilities Revenue, 6.0%, 9/15/40	\$ 877,280
2,000,000	NR/NR	Florida Development Finance Corp. Educational Facilities Revenue, 7.625%, 6/15/41	1,956,600
2,000,000	BBB+/Baa1	Hillsborough County Industrial Development Authority Pollution Control Revenue, 5.5%, 10/1/23	2,032,240
1,980,000	NR/NR	Hillsborough County Industrial Development Authority Revenue, 6.75%, 7/1/29	1,806,988
1,000,000 †	NR/WR	Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32	1,396,080
500,000	NR/NR		437,515

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2,500,000	A-/A2	Miami Beach Health Facilities Authority, 5.375%, 11/15/28 Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41	2,505,025
			\$ 11,011,728
5,210,000(a)	NR/Aa3	Georgia - 4.5% Atlanta Georgia Water and Wastewater Revenue, RIB, 12.808%, 11/1/43 (144A)	\$ 4,928,764
1,000,000	CCC+/NR	Clayton County Development Authority Special Facilities Revenue, 9.0%, 6/1/35	1,074,140
900,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.0%, 9/1/30	891,828
750,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.125%, 9/1/40	719,010
1,065,000	NR/Ba2	Effingham County Industrial Development Authority, 6.5%, 6/1/31	1,065,895
3,360,000	NR/NR	Fulton County Residential Care Facilities, 7.0%, 7/1/29	2,556,288
1,650,000	NR/NR	Savannah Georgia Economic Development Authority Revenue, 7.4%, 1/1/34	1,580,502
			\$ 12,816,427
1,000,000	B/NR	Guam - 2.1% Guam Government of Department Education Certificates of Participation, 6.625%, 12/1/30	\$ 982,480
4,400,000 †	AAA/NR	Northern Mariana Islands, 6.75%, 10/1/33	4,998,136
			\$ 5,980,616
2,000,000	BBB+/Baa1	Idaho - 1.2% Power County Industrial Development Corp., 6.45%, 8/1/32	\$ 2,001,220
1,500,000	BBB+/Baa1	Power County Pollution Control Revenue, 5.625%, 10/1/14	1,503,750
			\$ 3,504,970
\$ 3,000,000(c)	NR/NR	Illinois - 8.3% Centerpoint Intermodal Center, 8.5%, 6/15/23 (144A)	\$ 3,000,420
2,000,000	NR/Caa2	City of Chicago Illinois, 5.5%, 12/1/30	1,528,340
1,450,000	A+/A1	Illinois Finance Authority Revenue, 5.5%, 4/1/39	1,394,059
2,000,000	AA+/Aa3	Illinois Finance Authority Revenue, 6.0%, 8/15/25	2,081,360
1,000,000	NR/NR	Illinois Finance Authority Revenue, 6.0%, 11/15/27	599,400
2,000,000	AA+/Aa2		2,123,840

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		Illinois Finance Authority Revenue, 6.0%, 8/15/39	
2,500,000	NR/NR	Illinois Finance Authority Revenue, 6.125%, 11/15/25	2,204,850
6,000,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 5/15/45	5,788,020
2,500,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 2/15/46	2,420,725
1,500,000(b)	NR/NR	Illinois Health Facilities Authority Revenue, 6.9%, 11/15/33	524,850
2,415,000	NR/NR	Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,822,021
			\$ 23,487,885
		Indiana - 5.9%	
250,000	NR/Baa3	East Chicago Indiana Exempt Facilities Revenue, 7.0%, 1/1/14	\$ 241,047
10,000,000	BBB-/WR	Indiana State Development Finance Authority Revenue, 5.75%, 10/1/11	10,027,900
5,000,000	NR/Ba2	Jasper County Industrial Economic Development Revenue, 5.6%, 4/1/29	4,704,900
1,900,000	NR/NR	Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	1,646,996
			\$ 16,620,843
		Kansas - 0.3%	
1,000,000	NR/A2	Kansas Development Finance Authority, 5.0%, 5/15/35	\$ 941,510
		Kentucky - 1.4%	
4,390,000	BB-/NR	Kentucky Economic Development Finance Authority Hospital System Revenue, 5.875%, 10/1/22	\$ 3,825,534
		Louisiana - 5.1%	
2,500,000	BBB-/Ba2	Louisiana Local Government Environmental Facilities Development Authority Revenue, 6.75%, 11/1/32	\$ 2,602,700
6,000,000	NR/Baa1	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	5,302,260
750,000	BBB+/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	762,465
5,915,000	A-/Baa3	Tobacco Settlement Financing Corp., 5.875%, 5/15/39	5,698,866
			\$ 14,366,291
		Maryland - 1.5%	
460,000	NR/NR	Maryland Health & Higher Educational Facilities Authority	\$ 367,149

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1,250,000	NR/NR	Revenue, 5.25%, 1/1/27 Maryland Health & Higher Educational Facilities Authority	858,712
1,250,000	NR/Baa3	Revenue, 5.3%, 1/1/37 Maryland Health & Higher Educational Facilities Authority	1,062,938
2,000,000	NR/NR	Revenue, 5.75%, 7/1/38 Maryland Health & Higher Educational Facilities Authority	2,030,020
		Revenue, 6.25%, 1/1/45	\$ 4,318,819
755,000	BB/NR	Massachusetts - 8.9% Massachusetts Development Finance Agency, 5.25%, 10/1/18	\$ 707,246
8,000,000	A/WR	Massachusetts Development Finance Agency, 5.75%, 1/1/42	8,104,000
1,930,000	NR/NR	Massachusetts Development Finance Agency, 7.1%, 7/1/32	1,701,527
2,195,000	BBB-/Baa3	Massachusetts Health & Educational Facilities Authority Revenue, 5.375%, 7/15/28	2,003,881
3,420,000	NR/NR	Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38	2,706,417
10,760,000	AA-/Aa3	Massachusetts Housing Finance Agency, 5.35%, 12/1/45	10,071,575
			\$ 25,294,646
2,000,000	NR/Ba1	Michigan - 0.9% Flint Michigan Hospital Building Authority Revenue, 7.375%, 7/1/35	\$ 2,002,860
735,000	NR/NR	Michigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36	652,790
			\$ 2,655,650
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	\$ 1,013,400
1,000,000	NR/NR	Missouri - 1.8% Kansas City Tax Increment Financing Commission Tax Increment Revenue, 6.5%, 6/1/25	\$ 990,020
1,500,000(b)(d)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.2%, 12/15/28	772,875
6,640,000(b)(d)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35	3,403,332
			\$ 5,166,227
		Montana - 0.6%	

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2,445,000(e)	NR/NR	Hardin Increment Industrial Infrastructure Development Revenue, 0.0%, 9/1/31	\$ 1,555,558
1,000,000(b)(d)	NR/NR	Two Rivers Authority, Inc., Project Revenue, 7.375%, 11/1/27	153,130
			\$ 1,708,688
1,500,000	A/A2	Nevada - 2.0% Henderson Nevada Health Care Facilities Revenue, 5.625%, 7/1/24	\$ 1,533,795
1,600,000(b)(d)	NR/NR	Nevada State Department of Business & Industry, 7.25%, 1/1/23	16
1,000,000(b)(d)	NR/NR	Nevada State Department of Business & Industry, 7.375%, 1/1/30	10
1,320,000(b)(d)	NR/NR	Nevada State Department of Business & Industry, 7.375%, 1/1/40	13
5,000,000	A-/A3	Reno Nevada Hospital Revenue, 5.25%, 6/1/41	4,243,550
			\$ 5,777,384
1,125,000	NR/NR	New Hampshire - 0.4% New Hampshire Health & Educational Facilities Authority Revenue, 5.875%, 7/1/34	\$ 1,072,564
\$ 2,500,000	NR/NR	New Jersey - 12.7% Burlington County New Jersey Bridge Commission Revenue, 5.625%, 1/1/38	\$ 2,023,275
13,000,000	B/B3	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29	12,232,220
3,500,000(a)	NR/Aa3	New Jersey State Turnpike Authority, RIB, 13.532%, 1/1/28 (144A)	4,674,530
15,375,000	AA+/Aa1	New Jersey Transportation Trust Fund Authority Revenue, 0.0%, 12/15/27	6,711,956
1,000,000 †	AAA/Aaa	Tobacco Settlement Financing Corp., 6.25%, 6/1/43	1,110,920
3,250,000 †	AAA/Aaa	Tobacco Settlement Financing Corp., 6.75%, 6/1/39	3,641,528
5,000,000 †	AAA/Aaa	Tobacco Settlement Financing Corp., 7.0%, 6/1/41	5,625,200
			\$ 36,019,629
1,730,000	NR/NR	New York - 9.7% Dutchess County Industrial Development Agency, 7.5%, 3/1/29	\$ 1,690,591
3,000,000	NR/NR	Nassau County New York Industrial Development Agency Revenue, 6.7%, 1/1/43	2,814,810

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5,000,000	BB-/B1	New York City Industrial Development Agency, 5.25%, 12/1/32	4,070,750
3,950,000	BB-/B1	New York City Industrial Development Agency, 7.625%, 12/1/32	3,986,301
3,000,000	B-/Caa2	New York City Industrial Development Agency, 8.0%, 8/1/12	3,091,680
2,000,000	NR/Ba1	New York State Dormitory Authority Revenue, 6.125%, 12/1/29	1,890,700
5,000,000	AAA/Aaa	New York State Environmental Facilities Corp., 5.0%, 6/15/33	5,064,050
2,000,000	BB/NR	Seneca Nation Indians Capital Improvement Authority Revenue, 5.25%, 12/1/16 (144A)	1,879,660
3,000,000	NR/NR	Ulster County New York Industrial Development Agency, 6.0%, 9/15/27	2,481,180
500,000	NR/NR	Ulster County New York Industrial Development Agency, 6.0%, 9/15/37	382,975
			\$ 27,352,697
5,010,000	NR/NR	North Carolina - 1.8% Charlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28	\$ 4,969,369
1,635,000	NR/NR	Ohio - 3.0% Belmont County Health System Revenue, 5.7%, 1/1/13	\$ 1,282,429
1,000,000	NR/NR	Belmont County Health System Revenue, 5.8%, 1/1/18	736,200
5,000,000	BB-/Baa3	Buckeye Tobacco Settlement Financing Authority, 6.5%, 6/1/47	3,968,950
3,000,000	CCC+/B3	Cleveland Airport Special Revenue, 5.375%, 9/15/27	2,588,700
			\$ 8,576,279
2,220,000	B-/Caa2	Oklahoma - 2.4% Tulsa Municipal Airport Trust Revenue, 6.25%, 6/1/20	\$ 2,148,671
1,500,000	B-/Caa2	Tulsa Municipal Airport Trust Revenue, 7.35%, 12/1/11	1,503,735
3,000,000(c)	NR/Caa2	Tulsa Municipal Airport Trust Revenue, 7.75%, 6/1/35	3,095,160
			\$ 6,747,566
2,000,000	A-/NR	Oregon - 0.7% Oregon State Facilities Authority Revenue, 5.25%, 10/1/40	\$ 1,973,340
3,600,000	CCC/NR	Pennsylvania - 6.2%	\$ 3,097,368

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710,000	BBB/Baa1	Columbia County Hospital Authority Revenue, 5.85%, 6/1/24	711,243
1,430,000	BB/NR	Hazleton Health Services Authority Hospital Revenue, 6.125%, 7/1/16	1,299,441
5,000,000	B/Caa2	Pennsylvania Economic Development Financing Authority Revenue, 5.125%, 6/1/18	4,301,650
5,000,000	BBB/Baa3	Pennsylvania Economic Development Financing Authority Revenue, 6.0%, 6/1/31	4,075,250
2,005,000	B-/NR	Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 5.0%, 7/1/34	2,004,880
2,245,000	B-/NR	Scranton-Lackawanna Health & Welfare Authority Revenue, 6.1%, 7/1/11	2,206,543
		Scranton-Lackawanna Health & Welfare Authority Revenue, 6.15%, 7/1/12	\$ 17,696,375
1,375,000(c)(d)	NR/NR	Rhode Island - 3.6% Central Falls Rhode Island Detention Facilities Revenue, 7.25%, 7/15/35	\$ 1,114,204
1,500,000	NR/NR	Rhode Island Health & Educational Building Corp Revenue, 8.375%, 1/1/46	1,506,120
8,285,000	BBB/Baa3	Tobacco Settlement Financing Corp., 6.25%, 6/1/42	7,502,482
			\$ 10,122,806
7,140,000 †	BBB+/Baa1	South Carolina - 5.1% South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	\$ 8,000,941
860,000 †	BBB+/Baa1	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	963,699
4,400,000(f)	BBB/WR	Tobacco Settlement Revenue Management, 6.375%, 5/15/30	5,558,564
			\$ 14,523,204
\$ 5,000,000	BBB+/Baa1	Tennessee - 5.7% Johnson City Health & Educational Facilities Board Hospital Revenue, 6.5%, 7/1/38	\$ 5,064,500
1,000,000 †	NR/A2	Johnson City Health & Educational Facilities Board Hospital Revenue, 7.5%, 7/1/33	1,085,650
7,000,000	NR/A1	Knox County Health Educational & Housing Facilities Board Hospital Revenue, 6.5%, 4/15/31	7,245,910

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3,000,000	BBB+/NR	Sullivan County Health Educational and Housing Facilities Board Hospital Revenue, 5.25%, 9/1/36	2,645,850
			\$ 16,041,910
2,400,000	BB+/Ba1	Texas - 15.6% Central Texas Regional Mobility Authority Revenue, 6.75%, 1/1/41	\$ 2,325,240
4,095,000	CCC+/Caa2	Dallas-Fort Worth International Airport Facilities Improvement Corp., 9.125%, 5/1/29	4,021,413
2,827,399(b)(d)	NR/NR	Gulf Coast Industrial Development Authority, 7.0%, 12/1/36	158,334
10,000,000	CCC+/B3	Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29	9,930,100
725,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/16	674,402
1,000,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/21	854,789
1,350,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.125%, 5/1/26	1,107,378
2,750,000	AA+/Aa3	Lower Colorado River Authority, 5.0%, 5/15/31	2,757,535
845,000	NR/NR	Lubbock Health Facilities Development Corp., 6.5%, 7/1/26	764,032
2,000,000	NR/NR	Lubbock Health Facilities Development Corp., 6.625%, 7/1/36	1,731,080
9,750,000	BBB+/A3	North Texas Tollway Authority Revenue, 5.75%, 1/1/33	9,807,720
1,711,000	NR/Aaa	Panhandle Regional Housing Finance Corp. Multifamily Housing Revenue, 6.6%, 7/20/31	1,787,875
1,000,000	BBB-/Baa2	Richardson Hospital Authority Revenue, 6.0%, 12/1/34	972,990
1,000,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.125%, 11/15/39	986,550
1,500,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.25%, 11/15/44	1,485,465
1,000,000(d)	CC/NR	Texas Midwest Public Facility Corp. Revenue, 9.0%, 10/1/30	706,270
4,700,000	NR/Ba1	Tomball Hospital Authority, 6.0%, 7/1/25	4,073,255
			\$ 44,144,428
1,600,000	NR/NR	Utah - 0.5% Spanish Fork Charter School Revenue, 5.7%, 11/15/36 (144A)	\$ 1,260,096

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		Virginia - 0.8%	
2,000,000	BBB+/Baa1	Washington County Industrial Development Authority Revenue, 7.75%, 7/1/38	\$ 2,233,260
		Washington - 3.4%	
1,140,000	BBB/Baa3	Tobacco Settlement Authority Revenue, 6.5%, 6/1/26	\$ 1,156,028
1,500,000	NR/Baa2	Washington State Health Care Facilities Authority, 5.5%, 12/1/39	1,327,740
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.125%, 8/15/37	1,925,560
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.25%, 8/15/42	1,941,180
5,000,000	NR/NR	Washington State Housing Finance Commission Nonprofit Revenue Bonds, 5.625%, 1/1/27	3,401,350
			\$ 9,751,858
		West Virginia - 0.5%	
1,500,000	NR/NR	West Virginia Hospital Finance Authority Hospital Revenue, 9.125%, 10/1/41	\$ 1,530,855
		Wisconsin - 2.1%	
2,500,000	NR/NR	Wisconsin Public Finance Authority Continuing Care Retirement Community Revenue, 8.25%, 6/1/46	\$ 2,489,775
1,000,000	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.125%, 4/1/24	964,520
1,000,000	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.25%, 4/1/34	919,900
1,500,000	A+/A1	Wisconsin State Health & Educational Facilities Authority Revenue, 6.625%, 2/15/39	1,587,555
			\$ 5,961,750
		TOTAL TAX-EXEMPT OBLIGATIONS (Cost \$415,799,849)	\$ 417,564,521
		MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 2.9% of Net Assets	
13,000,000(c)(d)	NR/NR	Non-Profit Preferred Funding Trust I, Series E, 12.0%, 9/15/37 (144A)	\$ 8,157,110
		TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION	

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	(Cost \$13,000,000)	\$ 8,157,110
Shares	COMMON STOCK - 0.4% of Net Assets	
110,442(g)	Delta Airlines, Inc.	\$ 1,012,753
	TOTAL COMMON STOCK (Cost \$3,210,349)	\$ 1,012,753
	TOTAL INVESTMENTS IN SECURITIES - 150.7% (Cost \$432,010,198) (h)(i)	\$ 426,734,384
	OTHER ASSETS AND LIABILITIES 2.3%	\$ 6,481,109
	PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE - (53.0)%	\$ (150,002,777)
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0%	\$ 283,212,716

(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, 2011, the value of these securities amounted to \$37,979,417, or 13.4% of total net assets applicable to common shareowners.

RIB Residual Interest Bonds.

NR Security not rated by S&P or Moody's.

WR Withdrawn rating.

† 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.

(a) The interest rate is subject to change periodically and inversely based upon prevailing market rates. The rate shown is the coupon rate at June 30, 2011.

(b) Security is in default and is non-income producing.

(c) The interest rate is subject to change periodically. The interest rate shown is the rate at June 30, 2011.

(d) Indicates a security that has been deemed illiquid. The aggregate cost of illiquid securities is \$30,230,377. The aggregate value is

\$14,465,294, or 5.1% of the total net assets applied to common shareowners.

- (e) Debt obligation initially issued at one coupon which converts to a higher coupon at a specific date.

The rate shown is the coupon rate at June 30, 2011.

- (f) Escrow to maturity.

- (g) Non-income producing.

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

Insured:

AGM	8.3%
AMBAC	2.1
BHAC-CR MBIA	1.6

Revenue Bonds:

Health Revenue	33.6
Tobacco Revenue	10.9
Development Revenue	10.3
Airport Revenue	8.8
Other Revenue	7.4
Pollution Control Revenue	4.3
Housing Revenue	2.8
Education Revenue	2.6
Transportation Revenue	2.3
Facilities Revenue	2.2
Water Revenue	1.9
Power Revenue	0.5
Gaming Authority Revenue	0.4
Utilities Revenue*	0.0
	100.0%

\*Amount is less than 0.1%

- (i) At June 30, 2011 the net unrealized loss on investments based on cost for federal income tax purposes of \$426,768,587 was as follows:

Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost	\$ 34,237,643
Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value	(34,271,846)
Net unrealized loss	\$ (34,203)

For financial reporting purposes net unrealized loss on investments was \$5,275,814 and cost of investments aggregated \$432,010,198.

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Purchases and sales of securities (excluding temporary cash investments) for the period ended June 30, 2011 aggregated \$17,667,683 and \$15,560,595, respectively.

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

Highest priority is given to Level 1 inputs and lowest priority is given to Level 3.

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 risk, 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 using fair value methods are categorized as Level 3.

The following is a summary of the inputs used as of June 30, 2011, in valuing the Trust's Investments:

	Level 1	Level 2	Level 3	Total
Tax exempt obligations	\$-	\$417,564,521	\$-	\$417,564,521
Municipal collateralized debt obligation	-	8,157,110	-	8,157,110
Common stock	1,012,753	-	-	1,012,753
Total	\$1,012,753	\$425,721,631	\$-	\$426,734,384

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

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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.

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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/ John F. Cogan, Jr.  
John F. Cogan, Jr, President

Date August 29, 2011

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, 2011

By (Signature and Title)\* /s/ Mark Bradley  
Mark Bradley, Treasurer

Date August 29, 2011

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