

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST  
Form N-Q  
February 29, 2012

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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: December 31, 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.

Principal Amount USD \$	S&P / Moody's Ratings		Value
		TAX-EXEMPT OBLIGATIONS — 141.5% OF NET ASSETS	
		ALABAMA — 1.4%	
2,500,000	B-/B2	Alabama Industrial Development Authority Revenue, 6.45%, 12/1/23	\$ 2,210,475
2,500,000	NR/NR	Huntsville-Redstone Village Special Care Facilities Financing Authority, 5.5%, 1/1/43	1,901,325
			\$ 4,111,800
		ARIZONA — 3.4%	
5,000,000	NR/NR	Casa Grande Industrial Development Authority Hospital Revenue, 7.625%, 12/1/29	\$ 5,003,300
2,640,000	NR/NR	Pima County Industrial Development Authority, 7.0%, 1/1/38	2,484,214
1,492,000	NR/Baa3	Pima County Industrial Development Authority, 6.75%, 7/1/31	1,465,845
1,000,000	NR/NR	San Luis Facility Development Corp., 7.25%, 5/1/27	905,270
			\$ 9,858,629
		CALIFORNIA — 13.7%	
1,000,000	NR/NR	California Enterprise Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31	\$ 1,046,070
3,140,000(a)	AA+/NR	California State University Revenue, RIB, 11.087%, 9/20/28 (144A)	3,525,372
2,425,000	A-/A1	California State Various Purpose, 5.75%, 4/1/31	2,717,261
8,575,000(a)	AA+/NR	California State Various Purpose, RIB, 11.031%, 7/28/31 (144A)	9,250,453
3,000,000	BB+/NR	California Statewide Communities Development Authority, 7.25%, 10/1/38 (144A)	3,062,760
757,342(b)	NR/NR	California Statewide Communities Development Authority, 9.0%, 12/1/38	7,339
2,680,000†	AA+/Aaa	Golden State Tobacco Securitization Corp., 6.75%, 6/1/39	2,919,136
1,500,000	A-/NR	Madera Irrigation Financing Authority Water Revenue, 6.5%, 1/1/40	1,612,125
1,500,000	A-/NR	Madera Irrigation Financing Authority Water Revenue, 6.25%, 1/1/31	1,599,000
2,500,000	A-/A2		2,511,125

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		San Jose California Airport Revenue, 5.0%, 3/1/37	
10,500,000(a)	AA+/NR	University of California, RIB, 11.304%, 5/15/32	11,255,580
			\$ 39,506,221
		COLORADO — 0.4%	
1,000,000	NR/NR	Kremmling Memorial Hospital District, 7.125%, 12/1/45	\$ 1,022,750
		CONNECTICUT — 3.1%	
7,750,000	NR/NR	Connecticut State Development Authority Revenue, 5.75%, 11/1/37	\$ 7,772,475
1,000,000	NR/NR	Hamden Connecticut Facility Revenue, 7.75%, 1/1/43	1,046,610
			\$ 8,819,085
		DISTRICT OF COLUMBIA — 3.4%	
2,700,000	BBB/Baa1	District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$ 2,844,396
6,825,000	BBB/Baa1	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	6,841,243
			\$ 9,685,639
		FLORIDA — 5.0%	
1,500,000	NR/NR	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/41	\$ 1,499,445
1,500,000	NR/NR	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	1,499,430
1,000,000	NR/Ba3	Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41	1,037,050
1,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42	1,001,110
2,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41	2,059,840
1,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40	951,400
1,980,000	NR/NR	Hillsborough County Industrial Development Authority Revenue, 6.75%, 7/1/29	1,901,236
1,000,000†	NR/NR	Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32	1,448,230
500,000	NR/NR	Miami Beach Health Facilities Authority, 5.375%, 11/15/28	489,925
2,500,000	A-/A2	Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41	2,649,000
			\$ 14,536,666
		GEORGIA — 4.8%	
5,210,000(a)	NR/Aa3	Atlanta Georgia Water and Wastewater Revenue, RIB, 11.087%, 1/30/13 (144A)	\$ 5,491,809
1,000,000	CCC+/NR	Clayton County Development Authority Special Facilities Revenue, 9.0%, 6/1/35	1,077,080
900,000	NR/NR		947,736

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		DeKalb County Georgia Hospital Authority Revenue, 6.0%, 9/1/30	
750,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.125%, 9/1/40	771,495
1,065,000	NR/Baa3	Effingham County Industrial Development Authority, 6.5%, 6/1/31	1,068,685
3,360,000	NR/NR	Fulton County Residential Care Facilities, 7.0%, 7/1/29	2,910,633
1,650,000	NR/NR	Savannah Georgia Economic Development Authority Revenue, 7.4%, 1/1/34	1,586,112
			\$ 13,853,550
		GUAM — 2.0%	
1,000,000	B/NR	Guam Government of Department Education Certificates of Participation, 6.625%, 12/1/30	\$ 1,029,550
4,400,000†	AA+/NR	Northern Mariana Islands, 6.75%, 10/1/33	4,888,312
			\$ 5,917,862
		IDAHO — 1.2%	
2,000,000	BBB+/Baa1	Power County Industrial Development Corp., 6.45%, 8/1/32	\$ 2,001,820
1,500,000	BBB+/Baa1	Power County Pollution Control Revenue, 5.625%, 10/1/14	1,500,165
			\$ 3,501,985
		ILLINOIS — 6.8%	
1,450,000	A+/A1	Illinois Finance Authority Revenue, 5.5%, 4/1/39	\$ 1,492,645
2,000,000	AA-/Aa3	Illinois Finance Authority Revenue, 6.0%, 8/15/25	2,115,640
1,000,000(b)	NR/NR	Illinois Finance Authority Revenue, 6.0%, 11/15/27	519,870
280,000	BBB+/NR	Illinois Finance Authority Revenue, 6.0%, 8/15/38	287,577
2,000,000	AA+/Aa2	Illinois Finance Authority Revenue, 6.0%, 8/15/39	2,217,560
2,500,000	NR/NR	Illinois Finance Authority Revenue, 6.125%, 11/15/25	2,287,250
6,000,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 5/15/45	5,985,540
2,500,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 2/15/46	2,520,875
1,500,000(b)	NR/NR	Illinois Health Facilities Authority Revenue, 6.9%, 11/15/33	524,835
2,310,000	NR/NR	Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,715,937
			\$ 19,667,729
		INDIANA — 2.2%	
250,000	NR/Baa3	East Chicago Indiana Exempt Facilities Revenue, 7.0%, 1/1/14	\$ 244,310
5,000,000	NR/Baa3		4,999,550

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1,900,000	NR/NR	Jasper County Industrial Economic Development Revenue, 5.6%, 4/1/29 Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	1,142,033
			\$ 6,385,893
1,000,000	NR/A2	KANSAS — 0.3% Kansas Development Finance Authority, 5.0%, 5/15/35	\$ 1,010,390
4,390,000	BB/NR	KENTUCKY — 1.4% Kentucky Economic Development Finance Authority Hospital System Revenue, 5.875%, 10/1/22	\$ 4,104,518
5,000,000	BBB-/Baa2	LOUISIANA — 7.1% Jefferson Parish Hospital Service Revenue, 6.375%, 7/1/41	\$ 5,130,650
2,500,000	BBB-/Baa3	Louisiana Local Government Environmental Facilities Development Authority Revenue, 6.75%, 11/1/32	2,639,300
6,000,000	NR/Baa1	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	6,018,120
750,000	BBB-/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	771,293
5,915,000	A-/A3	Tobacco Settlement Financing Corp., 5.875%, 5/15/39	5,917,011
			\$ 20,476,374
1,500,000	NR/Baa3	MAINE — 0.6% Maine Health & Higher Educational Facilities Authority Revenue, 7.5%, 7/1/32	\$ 1,663,470
460,000	NR/NR	MARYLAND — 1.6% Maryland Health & Higher Educational Facilities Authority Revenue, 5.25%, 1/1/27	\$ 392,435
1,250,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.3%, 1/1/37	946,963
1,250,000	NR/Baa3	Maryland Health & Higher Educational Facilities Authority Revenue, 5.75%, 7/1/38	1,166,512
2,000,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 6.25%, 1/1/45	2,125,820
			\$ 4,631,730
675,000	BB/NR	MASSACHUSETTS — 8.7% Massachusetts Development Finance Agency, 5.25%, 10/1/18	\$ 662,175
1,885,000	NR/NR	Massachusetts Development Finance Agency, 7.1%, 7/1/32	1,648,904
8,000,000	A/NR	Massachusetts Development Finance Agency, 5.75%, 1/1/42	9,173,760
1,000,000	NR/Caa1	Massachusetts Health & Educational Facilities Authority Revenue, 6.0%, 10/1/23	769,280
2,195,000	BBB-/Baa3		2,126,033

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		Massachusetts Health & Educational Facilities Authority Revenue, 5.375%, 7/15/28	
3,420,000(b)	NR/NR	Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38	34,200
10,760,000	AA-/Aa3	Massachusetts Housing Finance Agency, 5.35%, 12/1/45	10,769,361
			\$ 25,183,713
		MICHIGAN — 1.7%	
2,000,000	NR/Ba1	Flint Michigan Hospital Building Authority Revenue, 7.375%, 7/1/35	\$ 2,071,640
2,235,000	BB+/NR	Kent Hospital Finance Authority Revenue, Metropolitan Hospital PJ-Series A, 6.25%, 7/1/40	2,201,386
725,000	NR/NR	Michigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36	675,156
			\$ 4,948,182
		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	\$ 1,033,680
		MISSOURI — 1.2%	
1,000,000	NR/NR	Kansas City Tax Increment Financing Commission Tax Increment Revenue, 6.5%, 6/1/25	\$ 1,014,840
1,500,000(b)(c)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.2%, 12/15/28	449,985
6,640,000(b)(c)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35	1,991,934
			\$ 3,456,759
		MONTANA — 0.7%	
2,445,000(d)	NR/NR	Hardin Increment Industrial Infrastructure Development Revenue, 0.0%, 9/1/31	\$ 1,774,116
1,000,000(b)(c)	NR/NR	Two Rivers Authority, Inc., Project Revenue, 7.375%, 11/1/27	139,810
			\$ 1,913,926
		NEVADA — 1.5%	
1,320,000(b)(c)	NR/NR	Director of the State of Nevada State Department of Business & Industry, 7.375%, 1/1/40	\$ 1,584
1,600,000(b)(c)	NR/NR	Nevada State Department of Business & Industry, 7.25%, 1/1/23	1,920
1,000,000(b)(c)	NR/NR	Nevada State Department of Business & Industry, 7.375%, 1/1/30	1,200
4,500,000	A-/A3	Reno Nevada Hospital Revenue, 5.25%, 6/1/41	4,433,490
			\$ 4,438,194
		NEW HAMPSHIRE — 0.4%	
1,125,000	NR/NR	New Hampshire Health & Educational Facilities Authority Revenue, 5.875%, 7/1/34	\$ 1,132,234

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		NEW JERSEY — 13.1%	
2,500,000	NR/NR	Burlington County New Jersey Bridge Commission Revenue, 5.625%, 1/1/38	\$ 2,288,500
13,000,000	B/B3	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29	12,532,520
3,500,000(a)	NR/Aa3	New Jersey State Turnpike Authority, RIB, 8.746%, 7/1/23 (144A)	5,381,355
15,375,000	AA+/Aa1	New Jersey Transportation Trust Fund Authority Revenue, 0.01%, 12/15/27	7,546,050
3,250,000†	AA+/Aaa	Tobacco Settlement Financing Corp., 6.75%, 6/1/39	3,548,642
5,000,000†	AA+/Aaa	Tobacco Settlement Financing Corp., 7.0%, 6/1/41	5,476,400
1,000,000†	AA+/Aaa	Tobacco Settlement Financing Corp., 6.25%, 6/1/43	1,084,810
			\$ 37,858,277
		NEW YORK — 10.2%	
1,730,000	NR/NR	Dutchess County Industrial Development Agency, 7.5%, 3/1/29	\$ 1,726,090
3,000,000	NR/NR	Nassau County New York Industrial Development Agency Revenue, 6.7%, 1/1/43	2,301,990
5,000,000	BB-/B1	New York City Industrial Development Agency, 5.25%, 12/1/32	3,952,050
3,950,000	BB-/B1	New York City Industrial Development Agency, 7.625%, 12/1/32	3,906,945
3,000,000	NR/C	New York City Industrial Development Agency, 8.0%, 8/1/12	2,735,430
2,000,000	NR/Ba1	New York State Dormitory Authority Revenue, 6.125%, 12/1/29	2,015,780
5,000,000	AAA/Aaa	New York State Dormitory Authority Revenue,, 5.0%, 10/1/41	5,609,200
5,000,000	AAA/Aaa	New York State Environmental Facilities Corp., 5.0%, 6/15/33	5,206,200
2,000,000	BB/NR	Seneca Nation Indians Capital Improvement Authority Revenue, 5.25%, 12/1/16 (144A)	1,881,460
			\$ 29,335,145
		NORTH CAROLINA — 1.7%	
5,010,000	NR/NR	Charlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28	\$ 5,016,613
		OHIO — 1.4%	
5,000,000	BB-/B3	Buckeye Tobacco Settlement Financing Authority, 6.5%, 6/1/47	\$ 3,939,100
		OKLAHOMA — 1.4%	
2,220,000(b)	NR/NR	Tulsa Municipal Airport Revenue, 6.25%, 6/1/20	\$ 1,644,110