PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST

Form N-Q August 28, 2013

OMB APPROVAL

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

FORM N-O

QUARTERLY SCHEDULE OF PORTFOLIO HOLDINGS OF REGISTERED MANAGEMENT INVESTMENT COMPANY

Investment Company Act file number 811-21409

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

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

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

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

Date of fiscal year end: March 31

Date of reporting period: June 30, 2013

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

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

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ITEM 1. Schedule of Investments.

Pioneer Municipal High

Income Advantage Trust

| June 30, 2013

Ticker Symbol: MAV

Principal Amount USD (\$)	S&P/Moody's Rating (unaudited)	Value
2,500,000	TAX EXEMPT OBLIGATION Net Assets Alabama - 1.6% NR/B2Alabama Indust Development A	S - 146.8% of
2,500,000	Waste Disposal 6.45%, 12/1/23	Revenue, \$ 2,510,550 stone Village cilities ority Nursing
		2,176,550 \$ 4,687,100
5,000,000	Arizona - 3.4% NR/NRCasa Grande In Development A Hospital Reven	uthority
1,477,000	12/1/29 NR/Baa3Pima County In Development A 6.75%, 7/1/31	

2,640,000	NR/NRPima County Industrial Development Authority, 7.0%,	,
1,000,000	1/1/38 NR/NRSan Luis Facility	2,646,019
, ,	Development Corp., 7.25%,	
	5/1/27	823,200
	O-1'f' 14 20	\$ 10,101,706
6 000 000	CCC/NP California County Tabasas	
6,990,000	CCC/NRCalifornia County Tobacco	
	Securitization Agency Revenue, 5.25%, 6/1/46	\$ 5,013,577
1,550,000	NR/NRCalifornia Enterprise	φ 5,015,577
1,550,000	Development Authority	
	Recovery Zone Facility	
	Revenue, 8.5%, 4/1/31	1,708,038
5,000,000	NR/Baa3California Pollution Control	1,700,000
-,,	Financing Authority, 5.0%,	
	7/1/37	4,870,400
2,425,000	A/A1California State General	
	Obligation Various Purpose,	
	5.75%, 4/1/31	2,672,617
1,875,000	NR/NRCalifornia Statewide	
	Communities Development	
	Authority, 5.875%, 11/1/43	1,648,950
757,342(a)	NR/NRCalifornia Statewide	
	Communities Development	
	Authority Environmental	
	Facilities Revenue, 9.0%,	
4 000 000	12/1/38	6,665
4,000,000	BB/NRCalifornia Statewide	
	Communities Development	
	Authority Revenue Higher Education Revenue, 7.25%,	
	10/1/38 (144A)	3,973,680
20,000,000(b)	NR/NRInland Empire Tobacco	3,973,000
20,000,000(0)	Securitization Authority,	
	0.0%, 6/1/36	3,155,800
3,140,000	AA-/WRLehman Municipal Trust	2,122,000
-, -,	Receipts Revenue, RIB,	
	13.124%, 9/20/28 (144A)	3,572,378
8,575,000(c)	AA-/NRLehman Municipal Trust	
	Receipts, General Obligation,	
	13.031%, 7/28/31	9,534,885
1,500,000	A-/NRMadera Irrigation Financing	
	Authority Water Revenue,	
	6.25%, 1/1/31	1,636,965
1,500,000	A-/NRMadera Irrigation Financing	
	Authority Water Revenue,	
0.500.000	6.5%, 1/1/40	1,659,615
2,500,000	A-/A2San Jose California Airport	2.540.050
	Revenue, RIB, 5.0%, 3/1/37	2,540,050

	:	\$ 41,993,620
	Colorado - 3.1%	ψ ·11,>>>,020
1,000,000		
, ,	Hospital District Certificate of	
	Participation, 7.125%, 12/1/45	
		\$ 1,054,450
7,500,000	AA+/Aa2Regional Transportation	ψ 1,00 i, ie o
7,200,000	District, 5.0%, 11/1/31	8,164,875
	District , 3.0 %, 11/1/31	\$ 9,219,325
	Connecticut - 0.4%	Ψ 7,217,323
1,000,000		
1,000,000	Revenue, 7.75%, 1/1/43	\$ 1,042,900
	Revenue, 1.75 /0, 1/1/45	\$ 1,042,900
	District of Colombia - 3.4%	
2.700.000		
2,700,000		
	Settlement Financing Corp.,	A 2 027 042
6 0 0 7 000	6.5%, 5/15/33	\$ 2,937,843
6,825,000		
	Settlement Financing Corp.,	
	6.75%, 5/15/40	6,944,164
		\$ 9,882,007
Principal	S&P/Moody's	
Amount	Rating	
USD (\$)	(unaudited)	Value
	FI 11 5.50	
1 500 000	Florida - 5.5%	
1,500,000	NR/NRAlachua County Health	
1,500,000	NR/NRAlachua County Health Facilities Authority Revenue,	
	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41	\$ 1,656,450
1,500,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health	\$ 1,656,450
	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue,	
1,500,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	1,652,160
	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	1,652,160
1,500,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	1,652,160
1,500,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41	1,652,160
1,500,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41	1,652,160
1,500,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance	1,652,160
1,500,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40	1,652,160 540,050
1,500,000 500,000 1,000,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance	1,652,160 540,050
1,500,000 500,000 1,000,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities	1,652,160 540,050 1,009,200
1,500,000 500,000 1,000,000 2,000,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41	1,652,160 540,050
1,500,000 500,000 1,000,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41	1,652,160 540,050 1,009,200
1,500,000 500,000 1,000,000 2,000,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41 NR/NRFlorida Development Finance Corp., Educational Facilities	1,652,160 540,050 1,009,200 2,177,920
1,500,000 500,000 1,000,000 2,000,000 1,000,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42	1,652,160 540,050 1,009,200 2,177,920 1,074,360
1,500,000 500,000 1,000,000 2,000,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRHillsborough County Industria	1,652,160 540,050 1,009,200 2,177,920 1,074,360
1,500,000 500,000 1,000,000 2,000,000 1,000,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRHillsborough County Industria Development Authority	1,652,160 540,050 1,009,200 2,177,920 1,074,360
1,500,000 500,000 1,000,000 2,000,000 1,000,000 1,980,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRHillsborough County Industria Development Authority Revenue, 6.75%, 7/1/29	1,652,160 540,050 1,009,200 2,177,920 1,074,360 1
1,500,000 500,000 1,000,000 2,000,000 1,000,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRHillsborough County Industria Development Authority Revenue, 6.75%, 7/1/29 NR/WRHillsborough County Industria	1,652,160 540,050 1,009,200 2,177,920 1,074,360 1
1,500,000 500,000 1,000,000 2,000,000 1,000,000 1,980,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRHillsborough County Industria Development Authority Revenue, 6.75%, 7/1/29 NR/WRHillsborough County Industria Development Authority	1,652,160 540,050 1,009,200 2,177,920 1,074,360 1 1,980,614
1,500,000 500,000 1,000,000 2,000,000 1,000,000 1,980,000	NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 NR/NRAlachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 NR/B1Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRFlorida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42 NR/NRHillsborough County Industria Development Authority Revenue, 6.75%, 7/1/29 NR/WRHillsborough County Industria Development Authority Revenue, 8.0%, 8/15/32	1,652,160 540,050 1,009,200 2,177,920 1,074,360 1

2,500,000	Lee County Industrial Development Authority, 5.375%, 6/15/37 A/A2Miami-Dade County Florida Aviation Revenue, 5.5%,
	10/1/41 2,648,825 \$ 16,140,881
	Georgia - 4.3%
5,210,000 A	A-/WRAtlanta Georgia Water and
	Wastewater Revenue, RIB,
1 000 000	12.845%, 11/1/43 (144A) \$ 5,348,378
1,000,000	B/NRClayton County Development Authority Revenue, 9.0%, 6/1/35
	1,085,890
900,000	NR/NRDeKalb County Georgia
*	Hospital Authority Revenue,
	6.0%, 9/1/30 956,412
750,000	NR/NRDeKalb County Georgia
	Hospital Authority Revenue,
	6.125%, 9/1/40 792,570
3,360,000	NR/NRFulton County Residential Care
	Facilities for the Elderly
1.650.000	Authority, 7.0%, 7/1/29 2,820,619
1,650,000	NR/NRSavannah Georgia Economic Development Authority
	Revenue, 7.4%, 1/1/34 1,663,612
	\$ 12,667,481
	Guam - 1.9%
1,000,000	B/NRGuam Government of
	Department Education
	Certificates of Participation,
	6.625%, 12/1/30 \$ 1,041,960
4,400,000(d)	AA+/B2Northern Mariana Islands,
	6.75%, 10/1/33 4,470,268
	\$ 5,512,228
2,000,000	Idaho - 1.2%
2,000,000 F	A-/Baa1Power County Industrial Development Corp., Revenue,
	6.45%, 8/1/32 \$ 2,002,080
1,500,000 A	A-/Baa1Power County Pollution Control
1,000,000	Revenue, 5.625%, 10/1/14 1,500,525
	\$ 3,502,605
	Illinois - 6.9%
1,000,000 N	R/Baa1City of Country Club Hills,
	General Obligation, 5.0%,
	12/1/31 \$ 1,006,990
– 365,400(b)	NR/NRIllinois Finance Authority
417 4007	Revenue, 0.0%, 11/15/52 42,026
417,400(c)	NR/NRIllinois Finance Authority
1,450,000	Revenue, 4.0%, 11/15/52 284,583 A+/A1 1,510,045
1,430,000	1,510,045

		Illinois Finance Authority	
		Revenue, 5.5%, 4/1/39	
	1,605,000	•	
		Revenue, 6.0%, 8/15/25	1,661,095
	280,000	•	
	•	Revenue, 6.0%, 8/15/38	298,379
	2,000,000	•	2 272 460
	2 500 000	Revenue, 6.0%, 8/15/39	2,272,460
	2,500,000	•	2.510.700
	45,000	Revenue, 6.125%, 11/15/25	2,518,700
	45,000	•	44 292
	165 000	Revenue, 7.0%, 11/15/17	44,282
_	165,000	•	156 702
	6,000,000	Revenue, 7.0%, 11/15/27 NR/NRIllinois Finance Authority	156,702
	0,000,000	Revenue, 8.25%, 5/15/45	6,104,220
Drin	ncipal	S&P/Moody's	0,104,220
	ount	Rating	
	D (\$)	(unaudited)	Value
USI	D (4)	(unaudited)	v aruc
		Illinois - (continued)	
	2,500,000		
	_,000,000	Revenue, 8.25%, 2/15/46	2,552,475
	2,135,000		_,-,-,-,-
	_,,	Development Authority	
		Revenue, 5.625%, 11/1/26	1,714,042
			\$ 20,165,999
		Indiana - 1.0%	. , ,
	250,000	NR/NRCity of Carmel Indiana Nursing	
		Home Revenue, 7.0%, 11/15/32	
			\$ 264,042
	750,000	NR/NRCity of Carmel Indiana Nursing	
		Home Revenue, 7.125%,	
		11/15/42	788,370
	500,000	NR/NRCity of Carmel Indiana Nursing	
		Home Revenue, 7.125%,	
		11/15/47	522,000
	250,000	NR/Baa3East Chicago Indiana Exempt	
		Facilities Revenue, 7.0%, 1/1/14	
			249,830
	1,700,000		
		Development Revenue, 6.25%,	
		1/1/24	1,008,729
			\$ 2,832,971
	4 000	Kansas - 0.3%	
	1,000,000	*	
		Authority Revenue, 5.0%,	4.000
		5/15/35	\$ 1,023,980
	7 000 000	Louisiana - 6.8%	¢ 7 504 700
	7,000,000	BBB-/Baa3	\$ 7,504,700

2,500,000

Jefferson Parish Hospital Service Revenue, 6.375%, 7/1/41 BBB-/Baa3Louisiana Local Government Environmental Facilities &

Community Development Authority Revenue, 6.75%,

11/1/32 2,674,975