

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST
Form N-Q
March 01, 2019

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)

Terrence J. Cullen, 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, 2018

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.

ITEM 1. Schedule of Investments.

File the schedules as of the close of the reporting period as set forth in ss. 210.12-12 – 12-14 of Regulation S-X [17 CFR 210.12-12 – 12-14]. The schedules need not be audited.

Pioneer Municipal High
Income Advantage Trust

NQ | December 31, 2018

Ticker Symbol: MAV

Principal Amount USD (\$)	Value
	UNAFFILIATED ISSUERS
	- 155.8%
	DEBTOR IN POSSESSION
	FINANCING - 2.1% of Net
	Assets
	Building
	Materials - 2.1%
	Texas Pellets,
	Inc./German
4,432,000^	Pellets Texas \$4,432,000
	LLC, 8.0%,
	9/30/18 (144A)
	Texas Pellets,
	Inc./German
1,310,000	Pellets Texas 1,310,000
	LLC, 8.0%,
	3/29/19 (144A)
	Total Building \$5,742,000
	Materials
	TOTAL DEBTOR IN
	POSSESSION FINANCING
	(Cost \$5,742,000) \$5,742,000
	TAX EXEMPT
	OBLIGATIONS - 153.7% of
	Net Assets (a)
	Alabama - 0.9%
	Alabama
	Industrial
2,500,000	Development \$2,512,475
	Authority, Pine
	City Fiber Co.,
	6.45%, 12/1/23
	Total Alabama \$2,512,475
	Arizona - 2.5%
4,000,000(b)	City of Phoenix, \$4,748,680
	5.0%, 7/1/27
	City of Phoenix,
	Industrial
	Development
2,000,000	Authority, 3rd & 2,063,400
	Indian School
	Assisted Living
	Project, 5.4%,
	10/1/36
27,000	27,138

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	County of Pima, Industrial Development Authority, Arizona Charter Schools Project, Series C, 6.75%, 7/1/31	
	Total Arizona	\$6,839,218
	California - 13.6%	
	California County Tobacco Securitization Agency, Asset-Backed, Gold County Funding Corp., 5.25%, 6/1/46	\$6,808,260
6,990,000	California County Tobacco Securitization Agency, Capital Appreciation, Stanislaus County, Subordinated, Series A, 6/1/46	6,093,816
38,610,000(c)	California Educational Facilities Authority, Stanford University, 5.25%, 4/1/40	2,407,891
1,845,000	California Enterprise Development Authority, Sunpower Corp., 8.5%, 4/1/31	1,627,020
1,550,000	California Pollution Control Financing Authority, 5.0%, 7/1/37 (144A)	5,032,700
5,000,000	California School Finance Authority, Classical	3,481,166
2,975,000(d)		

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1,875,000	Academies Project, Series A, 7.375%, 10/1/43 California Statewide Communities Development Authority, Lancer Plaza Project, 5.875%, 11/1/43 California Statewide Communities Development Authority,	2,057,156
757,342(e)	Microgy Holdings Project, 9.0%, 12/1/38 City of Madera, Irrigation	8
1,500,000(d)	Financing Authority, 6.25%, 1/1/31 City of Madera, Irrigation	1,568,085
1,500,000(d)	Financing Authority, 6.5%, 1/1/40 Coast Community	1,571,610
2,695,000(b)	College District, Election, Series D, 5.0%, 8/1/31 State of California,	3,235,240
2,425,000(b)	Various Purposes, 5.75%, 4/1/31 Tobacco Securitization Authority of	2,447,843
465,000	Southern California, Series A-1, 5.125%, 6/1/46 Total California Colorado - 0.7%	464,991
1,500,000(d)		\$1,893,225

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	Colorado Educational & Cultural Facilities Authority, Rocky Mountain Classical Academy Project, 8.0%, 9/1/43	
	Total Colorado	\$1,893,225
	Connecticut - 3.9%	
2,035,000	Mohegan Tribal Finance Authority, 7.0%, 2/1/45 (144A)	\$2,064,996
7,200,000(b)	State of Connecticut, Series E, 4.0%, 9/1/30	7,450,560
1,000,000	Town of Hamden, Whitney Center Project, Series A, 7.75%, 1/1/43	1,025,860
	Total Connecticut	\$10,541,416
	District of Columbia - 4.9%	
	District of Columbia Tobacco	
1,995,000	Settlement Financing Corp., Asset-Backed, 6.5%, 5/15/33	\$2,143,847
	District of Columbia Tobacco	
6,825,000	Settlement Financing Corp., Asset-Backed, 6.75%, 5/15/40	7,053,023
	District of Columbia, Housing Product	
3,975,000	Trust Fund, Series A, 4.25%, 6/1/37 (NATL Insured)	3,979,293
		\$13,176,163

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	Total District of Columbia Florida - 9.1% Alachua County Health Facilities Authority, Terraces Bonita Springs Project, Series A, 8.125%, 11/15/41	\$1,637,415
1,500,000	Alachua County Health Facilities Authority, Terraces Bonita Springs Project, Series A, 8.125%, 11/15/46	1,633,215
1,500,000	County of Miami-Dade, Aviation Revenue, Series B, 5.5%, 10/1/41	2,568,200
2,500,000(d)	County of Miami-Dade, Water & Sewer System Revenue, Series A, 4.0%, 10/1/44	5,092,250
5,000,000	Florida's Turnpike Enterprise, Department of Transportation, Series A, 4.0%, 7/1/32	5,282,700
5,000,000	Hillsborough County Industrial Development Authority, Various Health Facilities, 8.0%, 8/15/32	1,047,390
1,000,000(d)	State of Florida, Capital Outlay, Series A, 4.0%, 6/1/38	7,436,276
7,035,000(b)	Total Florida Georgia - 6.4%	\$24,697,446

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5,000,000	City of Atlanta, Water & Wastewater Revenue, Series A, 5.0%, 11/1/34 DeKalb County Georgia Hospital Authority,	\$5,850,650
900,000(d)	DeKalb Medical Center, Inc., Project, 6.0%, 9/1/30 DeKalb County Georgia Hospital Authority,	958,500
750,000(d)	DeKalb Medical Center, Inc., Project, 6.125%, 9/1/40 Private Colleges & Universities Authority,	800,272
8,750,000	Emory University, Series A, 5.0%, 10/1/43 Total Georgia Guam - 0.4% Guam Department of Education, Certificates of Participation,	9,664,813
1,000,000	John F. Kennedy High School, Series A, 6.625%, 12/1/30 Total Guam	\$17,274,235 \$1,021,720 \$1,021,720
Principal Amount USD (\$)		Value
2,000,000	Idaho - 0.7% Power County Industrial Development Corp., FMC Corp. Project, 6.45%, 8/1/32 Total Idaho Illinois - 2.8%	\$2,007,320 \$2,007,320

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1,000,000(b)	Chicago Board of Education, Series A, 7.0%, 12/1/46 (144A) Illinois Finance Authority, Clare	\$1,160,290
417,400(f)	Oaks Project, Series B, 4.0%, 11/15/52 Illinois Finance Authority, Clare	359,724
261,000(c)	Oaks Project, Series C-1, 11/15/52 Illinois Finance Authority, Clare	7,217
52,200	Oaks Project, Series C-2, 4.0%, 11/15/52 Illinois Finance Authority, Clare	15,203
52,200	Oaks Project, Series C-3, 11/15/52 Illinois Finance Authority,	8,821
1,450,000	Memorial Health System, 5.5%, 4/1/39 Illinois Finance Authority, Northwestern	1,461,701
2,000,000(d)	Memorial Hospital, Series A, 6.0%, 8/15/39 Illinois Finance Authority,	2,051,240
280,000(d)	Swedish Covenant, Series A, 6.0%, 8/15/38 Metropolitan Pier & Exposition Authority,	292,586
1,000,000	McCormick Place, Series B, 5.0%, 6/15/52 (ST APPROP Insured)	1,012,920

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1,210,000	Southwestern Illinois Development Authority, Village of Sauget Project, 5.625%, 11/1/26	1,140,062
	Total Illinois	\$7,509,764
	Indiana - 0.9%	
250,000	City of Carmel, Barrington Carmel Project, Series A, 7.0%, 11/15/32	\$236,635
750,000	City of Carmel, Barrington Carmel Project, Series A, 7.125%, 11/15/42	679,748
500,000	City of Carmel, Barrington Carmel Project, Series A, 7.125%, 11/15/47	447,855
1,000,000	Indiana Finance Authority, Educational Facilities, 5.125%, 7/1/37	954,580
	Total Indiana	\$2,318,818
	Kansas - 0.4%	
1,000,000(d)	Kansas Development Finance Authority, Hayes Medical Center, Inc., Series Q, 5.0%, 5/15/35	\$1,011,760
	Total Kansas	\$1,011,760
7,000,000	Louisiana - 2.7% Jefferson Parish Hospital Service District No. 2, East Jefferson General Hospital, 6.375%, 7/1/41	\$6,671,770

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	Opelousas Louisiana General Hospital Authority, Opelousas	751,103
750,000	General Health System Project, 5.75%, 10/1/23	
	Total Louisiana	\$7,422,873
	Maine - 2.0%	
	Maine Health & Higher Educational Facilities Authority, Maine General Medical Center, 7.5%, 7/1/32	\$1,645,890
1,500,000	Maine Turnpike Authority, Series A, 5.0%, 7/1/42	3,774,015
3,500,000	Total Maine	\$5,419,905
	Maryland - 3.9%	
	Maryland Health & Higher Educational Facilities Authority, Charlestown Community, 6.25%, 1/1/45	\$2,167,420
2,000,000(d)	Maryland Health & Higher Educational Facilities Authority, City Neighbors, Series A, 6.75%, 7/1/44	2,228,672
2,090,000	Maryland Health & Higher Educational Facilities Authority, Doctor's Community Hospital, 5.75%, 7/1/38	1,321,525
1,250,000(d)	Maryland Health & Higher	4,818,060
4,500,000		

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	Educational Facilities Authority, Maryland University Medical System, Series A, 5.0%, 7/1/43	
	Total Maryland	\$10,535,677
	Massachusetts - 9.8%	
	Massachusetts Bay	
7,000,000(c)	Transportation Authority, Series A, 7/1/28 Massachusetts Development	\$5,172,300
2,575,000(d)	Finance Agency, Broad Institute, Inc., Series A, 5.25%, 4/1/37 Massachusetts Development	2,768,897
2,200,000	Finance Agency, Partner's Healthcare System, Series M-4, 5.0%, 7/1/39 Massachusetts Development	2,365,506
8,000,000	Finance Agency, WGBH Foundation, Series A, 5.75%, 1/1/42 (AMBAC Insured) Massachusetts Health & Educational Facilities	10,578,640
4,325,000	Authority, Massachusetts Institute of Technology, Series K, 5.5%, 7/1/32	5,733,177
	Total Massachusetts	\$26,618,520
	Michigan - 3.0%	

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2,000,000	Flint Michigan Hospital Building Authority, Hurley Medical Center, 7.375%, 7/1/35	\$2,116,080
560,000	Michigan Public Educational Facilities Authority, Crescent Academy, 7.0%, 10/1/36	560,224
5,000,000	Michigan State University, Series A, 5.0%, 8/15/41	5,427,950
	Total Michigan Minnesota - 2.7%	\$8,104,254
2,000,000	Bloomington Port Authority, Radisson Blu Mall of America, 9.0%, 12/1/35	\$2,173,620
1,000,000	City of Ham Lake, DaVinci Academy, Series A, 5.0%, 7/1/47	960,400
3,755,000(b)	State of Minnesota, Series B, 4.0%, 8/1/27	4,202,070
	Total Minnesota Montana - 0.1%	\$7,336,090
2,445,000(e)	City of Hardin, Tax Allocation, Rocky Mountain Power, Inc., Project, 6.25%, 9/1/31	\$317,850
1,000,000(e)	Two Rivers Authority, Inc., 7.375%, 11/1/27	42,000
	Total Montana Nevada - 0.7%	\$359,850
2,000,000	County of Washoe, Fuel Tax, 5.0%,	\$2,005,140

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	2/1/43	
	Total Nevada	\$2,005,140
	New Hampshire	
	- 0.7%	
	New Hampshire	
	Health &	
	Education	
2,000,000	Facilities	\$1,950,920
	Authority Act,	
	Catholic	
	Medical Centre,	
	3.75%, 7/1/40	
	Total New	\$1,950,920
	Hampshire	
Principal		
Amount		
USD (\$)	Value	
	New Jersey -	
	9.8%	
	New Jersey	
	Economic	
	Development	
7,500,000	Authority,	\$8,214,075
	Continental	
	Airlines, 5.75%,	
	9/15/27	
	New Jersey	
	Economic	
	Development	
	Authority,	
1,000,000	Marion P.	960,960
	Thomas Charter	
	School, Inc.,	
	Project, 5.375%,	
	10/1/50 (144A)	
	New Jersey State	
	Turnpike	
3,500,000(f)	Authority, RIB,	5,696,705
	10.729%, 1/1/28	
	(144A) (AGM	
	Insured)	
	New Jersey	
	Transportation	
	Trust Fund	
15,375,000(c)	Authority,	11,746,961
	12/15/27	
	(BHAC-CR	
	MBIA Insured)	
	Total New Jersey	\$26,618,701
	New York - 9.1%	

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	New York State Dormitory Authority, Columbia University, 5.0%, 10/1/41	\$5,287,850
5,000,000		
	New York State Dormitory Authority, Series A, 4.0%, 7/1/37	7,862,550
7,500,000		
	New York State Dormitory Authority, Series C, 5.0%, 3/15/39	8,316,000
7,500,000		
	New York State Dormitory Authority, Trustees of Columbia University, 5.0%, 10/1/45	1,953,825
1,500,000		
	Westchester County Healthcare Corp., Series A, 5.0%, 11/1/44	1,393,274
1,308,828		
	Total New York North Carolina - 0.7%	\$24,813,499
	City of Charlotte, Airport Revenue, Series A, 5.0%, 7/1/42	\$568,870
500,000		
	City of Charlotte, Airport Revenue, Series A, 5.0%, 7/1/47	1,418,188
1,250,000		
	Total North Carolina Ohio - 6.7%	\$1,987,058
	Akron Bath Copley Joint Township Hospital District, Akron General Health System, 5.0%, 1/1/31	\$3,246,660
3,000,000(d)		
	Buckeye Tobacco Settlement Financing	2,371,850
2,500,000		

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9,945,000	Authority, Asset-Backed, Series A-2, 5.875%, 6/1/47 Buckeye Tobacco Settlement Financing Authority,	9,920,237
2,500,000(b)(d)	Asset-Backed, Series A-2, 6.5%, 6/1/47 State of Ohio, Common Schools, Series B, 5.0%, 6/15/29 Total Ohio	2,754,950 \$18,293,697
1,000,000	Oregon - 1.2% Oregon Health & Science University, Series A, 5.0%, 7/1/42 Oregon State Facilities	\$1,133,750
2,000,000	Authority, Samaritan Health Services, Series A, 5.25%, 10/1/40 Total Oregon	2,080,340 \$3,214,090
1,000,000	Pennsylvania - 8.6% Chester County Industrial Development Authority, Collegium Charter School, Series A, 5.25%, 10/15/47 Pennsylvania Economic Development	\$1,005,920
1,965,000	Financing Authority, US Airways Group, Series B, 8.0%, 5/1/29	2,095,810
5,000,000	Pennsylvania Economic Development	5,000,150

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	Financing Authority, USG Corp. Project, 6.0%, 6/1/31 Pennsylvania Turnpike	
1,555,000(d)	Commission, Series D, 5.3%, 12/1/41 Pennsylvania Turnpike	1,602,365
3,445,000(d)	Commission, Series D, 5.3%, 12/1/41 Philadelphia Authority for Industrial Development, Greater Philadelphia Health Action, Inc., Project, Series A, 6.625%, 6/1/50 Philadelphia Authority for Industrial Development, Nueva Esperanze, Inc., 8.2%, 12/1/43 Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.5%, 6/15/33 (144A) Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.75%, 6/15/43 (144A)	3,553,104
500,000	Philadelphia Health Action, Inc., Project, Series A, 6.625%, 6/1/50 Philadelphia Authority for Industrial Development, Nueva Esperanze, Inc., 8.2%, 12/1/43 Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.5%, 6/15/33 (144A) Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.75%, 6/15/43 (144A)	512,125
6,000,000	Philadelphia Health Action, Inc., Project, Series A, 6.625%, 6/1/50 Philadelphia Authority for Industrial Development, Nueva Esperanze, Inc., 8.2%, 12/1/43 Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.5%, 6/15/33 (144A) Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.75%, 6/15/43 (144A)	6,551,400
1,000,000	Philadelphia Health Action, Inc., Project, Series A, 6.625%, 6/1/50 Philadelphia Authority for Industrial Development, Nueva Esperanze, Inc., 8.2%, 12/1/43 Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.5%, 6/15/33 (144A) Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.75%, 6/15/43 (144A)	1,033,140
2,000,000	Philadelphia Health Action, Inc., Project, Series A, 6.625%, 6/1/50 Philadelphia Authority for Industrial Development, Nueva Esperanze, Inc., 8.2%, 12/1/43 Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.5%, 6/15/33 (144A) Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.75%, 6/15/43 (144A)	2,064,400
	Total Pennsylvania Puerto Rico - 1.3%	\$23,418,414

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6,500,000(b)(e)	Commonwealth of Puerto Rico, Series A, 8.0%, 7/1/35 Total Puerto Rico	\$3,493,750 \$3,493,750
	Rhode Island - 1.9% Central Falls Detention Facility Corp., 7.25%, 7/15/35	\$243,900
1,355,000(e)	Rhode Island Health & Educational Building Corp., Brown University, Series A, 4.0%, 9/1/37	3,152,370
3,000,000	Rhode Island Health & Educational Building Corp., Tockwatten Home Issue, 8.375%, 1/1/46	1,687,620
1,500,000(d)	Total Rhode Island South Carolina - 2.2% Tobacco Settlement Revenue Management Authority, Series B, 6.375%, 5/15/30	\$5,083,890
4,400,000(g)	Total South Carolina South Dakota - 1.5% South Dakota Health & Educational Facilities Authority, Sanford Health, Series B, 4.0%, 11/1/44	\$5,852,132
4,000,000	Total South Dakota Tennessee - 2.0%	\$4,016,360

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	Johnson City Health & Educational Facilities Board,	\$5,336,550
5,000,000(d)	Mountain States Health Alliance, 6.5%, 7/1/38 Total Tennessee	\$5,336,550
	Texas - 16.9% Arlington Higher Education Finance Corp.,	\$1,021,070
1,000,000	Universal Academy, Series A, 7.0%, 3/1/34 Arlington Higher Education Finance Corp.,	
1,500,000	Universal	1,523,985
	Academy, Series A, 7.125%, 3/1/44 Central Texas Regional Mobility Authority, Sub	2,730,525
2,500,000(d)	Lien, 6.75%, 1/1/41 County of Harris, Series A, 5.0%, 10/1/26	2,914,275
2,500,000(b)	Goose Creek Consolidated Independent School District, Series C, 4.0%, 2/15/26 (PSF-GTD Insured)	5,418,050
5,000,000(b)	Grand Parkway Transportation Corp., Series A, 5.5%, 4/1/53 Gulf Coast Industrial Development Authority,	5,496,448
5,020,000	Microgy Holdings Project, 7.0%, 12/1/36	27
2,663,453(e)		
3,000,000		3,235,620

	Houston Higher Education Finance Corp., St. John's School Project, Series A, 5.0%, 9/1/38 North Texas Tollway Authority, Series A, 5.0%, 1/1/30 Red River Health Facilities Development Corp., MRC Crestview, Series A, 8.0%, 11/15/41 Richardson Independent School District, School Building, 5.0%, 2/15/38 (PSF-GTD Insured) Sanger Industrial Development Corp., Texas Pellets Project, Series B, 8.0%, 7/1/38	3,767,598
3,355,000		
1,500,000(d)		1,747,650
2,000,000(b)		2,192,740
6,960,000+(e)		2,672,640

Principal
Amount
USD (\$)

Value

	Texas - (continued) Tarrant County Cultural Education Facilities Finance Corp., Mirador Project, Series A, 4.875%, 11/15/48 Tarrant County Cultural Education Facilities Finance Corp., Mirador	\$493,480
1,000,000(e)		
750,000(e)		370,125

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	Project, Series	
	A, 5.0%,	
	11/15/55	
	Texas Midwest	
	Public Facility	
	Corp., Secure	
1,000,000(e)	Treatment	230,000
	Facility	
	Project, 9.0%,	
	10/1/30	
	Texas Private	
	Activity Bond	
	Surface	
3,365,000	Transportation	3,892,329
	Corp., NTE	
	Mobility	
	Partners LLC,	
	7.0%, 12/31/38	
	Travis County	
	Health	
	Facilities	
	Development	
2,500,000(d)	Corp.,	2,749,275
	Longhorn	
	Village	
	Project,	
	7.125%, 1/1/46	
	Tyler	
	Independent	
	School	
	District,	
5,000,000(b)	School	5,481,850
	Building,	
	5.0%, 2/15/38	
	(PSF-GTD	
	Insured)	
	Total Texas	\$45,937,687
	Utah - 2.3%	
	County of	
	Utah, IHC	
5,000,000	Health	\$5,047,950
	Services, Inc.,	
	Series B, 4.0%,	
	5/15/47	
	Salt Lake City	
	Corp., Airport	
1,000,000	Revenue,	1,140,140
	Series B, 5.0%,	
	7/1/36	
	Total Utah	\$6,188,090

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	Virginia -	
	8.5%	
	County of	
2,275,000(b)	Arlington,	\$2,432,271
	4.0%, 8/15/35	
	County of	
	Washington,	
	Industrial	
	Development	
2,000,000(d)	Authority,	2,000,000
	Mountain	
	States Health	
	Alliance,	
	Series C,	
	7.75%, 7/1/38	
	Tobacco	
	Settlement	
4,550,000	Financing	4,339,653
	Corp., Series	
	B-1, 5.0%,	
	6/1/47	
	University of	
	Virginia, Multi	
5,000,000	Year Capital	5,193,600
	Project, Series	
	A, 4.0%,	
	8/1/48	
	University of	
5,000,000	Virginia,	5,737,200
	Series A,	
	5.0%, 4/1/42	
	Virginia Public	
	School	
	Authority	
3,000,000	Revenue,	3,288,570
	4.0%, 8/1/25	
	(ST AID	
	WITHHLDG	
	Insured)	
	Total Virginia	\$22,991,294
	Washington -	
	4.3%	
	City of Seattle,	
3,000,000	Water System	\$3,224,880
	Revenue,	
	4.0%, 8/1/32	
2,500,000(b)	King County,	2,678,700
	Issaquah	
	School District	
	No. 411, 4.0%,	
	12/1/31 (SCH	

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2,500,000	BD GTY Insured) University of Washington, Series B, 5.0%, 6/1/29 Washington State Health Care Facilities Authority,	2,895,325
1,500,000(d)	Kadlec Regional Medical Center, 5.5%, 12/1/39 Washington State Housing Finance Commission, Mirabella Project, Series A, 6.75%, 10/1/47 (144A)	1,600,845
1,100,000	Total Washington Wisconsin - 3.9% Public Finance Authority, Glenridge Palmer Ranch, Series A, 8.25%, 6/1/46 (144A) Public Finance Authority, Roseman University Health Sciences Project, 5.875%, 4/1/45 Public Finance Authority, SearStone CCRC Project, Series A, 5.3%, 6/1/47	1,172,226
5,000,000		\$11,571,976
750,000		\$5,599,100
1,000,000		792,165
1,490,000(d)		941,310
		1,788,432

CCRC Project,
 Series A,
 8.625%, 6/1/47
 Wisconsin
 Health &
 Educational
 Facilities
 1,500,000(d) Authority, Pro 1,508,490
 Healthcare,
 Inc., Group,
 6.625%,
 2/15/39
 Total
 Wisconsin \$10,629,497
 TOTAL TAX EXEMPT
 OBLIGATIONS
 (Cost
 \$405,338,196) \$416,799,260
 TOTAL INVESTMENTS IN
 UNAFFILIATED ISSUERS -
 155.8%
 (Cost
 \$411,080,196) \$422,541,260
 OTHER
 ASSETS AND
 LIABILITIES \$8,582,797
 - 3.2%
 VARIABLE
 RATE
 MUNIFUND \$(159,987,460)
 TERM
 PREFERRED
 SHARES AT REDEMPTION
 VALUE - (59.0)%
 NET ASSETS
 APPLICABLE \$271,136,597
 TO
 COMMON SHAREOWNERS
 - 100.0%

(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 December 31, 2018, the value of these securities amounted to \$30,526,517, or 11.3% of net assets applicable to common shareowners.

RIB Residual Interest Bond is purchased in a secondary market. 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, 2018.

AGM Assured Guarantee Corp.

AMBAC Ambac Assurance Corp.

Berkshire Hathaway Assurance Corp.

BHAC-CR

MBIA

NATL National Public Finance Guarantee Corp.

PSF-GTD Permanent School Fund Guaranteed

SCH-BD GTY School Bond Guaranty

ST AID

WITHHLDG State Aid Withholding

ST APPROP State Appropriations

+ Securities that used significant unobservable inputs to determine their value.

^ Security is valued using fair value methods (other than supplied by independent pricing services).

(a) Consists of Revenue Bonds unless otherwise indicated.

(b) Represents a General Obligation Bond.

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

Prerefunded bonds have been collateralized by U.S. Treasury or U.S. Government Agency securities which are

(d) 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.

(e) Security is in default.

(f) The interest rate is subject to change periodically. The interest rate and/or reference index and spread shown at

December 31, 2018.

(g) Escrow to maturity.

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).

The following is a summary of the inputs used as of December 31, 2018, in valuing the Trust's investments.

	Level			
	1	Level 2	Level 3	Total
Debtor In Possession Financing	\$ --	\$5,742,000	\$--	\$5,742,000
Tax Exempt Obligation				
Texas	--	43,265,047	2,672,640	45,937,687
All Other Tax Exempt Obligation	--	370,861,573		370,861,573
Total Investments in Securities	\$ --	\$419,868,620	\$2,672,640	\$422,541,260

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

	Tax
	Exempt
	Obligation
Balance as of 3/31/18	\$2,610,000
Realized gain (loss)	--

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Change in unrealized appreciation (depreciation)	65,012
Accrued discounts/premiums	(2,372)
Purchases	--
Sales	--
Transfers in to Level 3*	--
Transfers out of Level 3*	--
Balance as of 12/31/18	\$2,672,640

* Transfers are calculated on the beginning of period value. During nine months ended December 31, 2018 there were no transfers between Levels 1, 2 and 3.

Net change in unrealized appreciation (depreciation) of Level 3 investments still held and considered Level 3 at December 31, 2018: \$65,012

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.

File as exhibits as part of this Form 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)), exactly as set forth below:

CERTIFICATIONS

I, [identify the certifying individual], certify that:

1. I have reviewed this report on Form N-Q of [identify registrant];
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the schedules of investments included in this report fairly present in all material respects the investments of the registrant as of the end of the fiscal quarter for which the report is filed;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Rule 30a-3(c) under the Investment Company Act of 1940) and internal control over financial reporting (as defined in Rule 30a-3(d) under the Investment Company Act of 1940) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of a date within 90 days prior to the filing date of this report, based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize, and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: [Signature] [Title]

Filed herewith.

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/ Lisa M. Jones

Lisa M. Jones, President and Chief Executive Officer

Date March 1, 2019

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/ Lisa M. Jones

Lisa M. Jones, President and Chief Executive Officer

Date March 1, 2019

By (Signature and Title)* /s/ Mark E. Bradley

Mark E. Bradley, Treasurer and Chief Accounting and Financial Officer

Date March 1, 2019

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