

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST  
Form N-Q  
August 29, 2017

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: June 30, 2017

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.

File the schedules as of the close of the reporting period as set forth in

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

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 | June 30, 2017

Ticker Symbol: MAV

Schedule of Investments | 6/30/17 (unaudited)

| Principal<br>Amount<br>USD (\$) |  | Value                    |
|---------------------------------|--|--------------------------|
|                                 | <b>TAX EXEMPT OBLIGATIONS</b>  |                          |
|                                 | - 151.5% of Net Assets (a)   |                          |
|                                 | Alabama - 1.7%   |                          |
| 2,500,000                       | Alabama Industrial Development<br>Authority, Pine City Fiber Co., 6.45%,<br>12/1/23  | \$2,500,300              |
| 2,500,000                       | Huntsville-Redstone Village Special Care<br>Facilities Financing Authority, Redstone<br>Village Project, 5.5%, 1/1/43      | 2,378,450<br>\$4,878,750 |
|                                 | Arizona - 0.7%   |                          |
| 2,000,000                       | City of Phoenix, AZ, Industrial<br>Development Authority, 3rd & Indian<br>School Assisted Living Project, 5.4%,<br>10/1/36 | \$1,913,560              |
| 32,000                          | County of Pima, AZ, Industrial<br>Development Authority, Arizona Charter<br>Schools Project, Series C, 6.75%, 7/1/31       | 32,222<br>\$1,945,782    |
|                                 | California - 14.9%   |                          |

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

|               |   |              |
|---------------|---|--------------|
| 6,990,000     | California County Tobacco Securitization Agency, Asset-Backed, Gold County Funding Corp., 5.25%, 6/1/46                         | \$6,939,253  |
| 38,610,000(b) | California County Tobacco Securitization Agency, Capital Appreciation, Stanislaus County, Subordinated, Series A, 6/1/46        | 5,629,724    |
| 1,845,000     | California Educational Facilities Authority, Stanford University, 5.25%, 4/1/40   | 2,478,112    |
| 1,550,000     | California Enterprise Development Authority, Sunpower Corp., 8.5%, 4/1/31   | 1,700,520    |
| 5,000,000     | California Pollution Control Financing Authority, 5.0%, 7/1/37 (144A)   | 5,009,400    |
| 3,000,000     | California School Finance Authority, Classical Academies Project, Series A, 7.375%, 10/1/43                                     | 3,497,550    |
| 1,875,000     | California Statewide Communities Development Authority, Lancer Plaza Project, 5.875%, 11/1/43                                   | 2,014,031    |
| 757,342(c)    | California Statewide Communities Development Authority, Microgy Holdings Project, 9.0%, 12/1/38                                 | 8            |
| 1,500,000(d)  | City of Madera, CA, Irrigation Financing Authority, 6.25%, 1/1/31   | 1,691,385    |
| 1,500,000(d)  | City of Madera, CA, Irrigation Financing Authority, 6.5%, 1/1/40  | 1,700,610    |
| 2,695,000(e)  | Coast Community College District, Election, Series D, 5.0%, 8/1/31  | 3,290,757    |
| 1,000,000     | Golden State Tobacco Securitization Corp., Asset-Backed, Series A-1, 5.125%, 6/1/47   | 996,160      |
| 3,140,000(f)  | Lehman Municipal Trust Receipts, RIB, 11.729%, 11/1/39 (144A) (AGM Insured)   | 3,451,300    |
| 1,000,000     | River Islands Public Financing Authority, Community Facilities, 5.5%, 9/1/45  | 1,064,040    |
| 2,425,000(e)  | State of California, Various Purposes, 5.75%, 4/1/31  | 2,620,406    |
| 465,000       | Tobacco Securitization Authority of Southern California, Series A-1, 5.125%, 6/1/46   | 464,986      |
|               |   | \$42,548,242 |
| 1,500,000     | Colorado - 0.6%<br>Colorado Educational & Cultural Facilities Authority, Rocky Mountain Classical Academy Project, 8.0%, 9/1/43 | \$1,668,930  |
| 2,035,000     | Connecticut - 3.7%<br>Mohegan Tribal Finance Authority, 7.0%, 2/1/45 (144A)   | \$2,126,310  |
| 7,200,000(e)  | State of Connecticut, Series E, 4.0%, 9/1/30  | 7,505,136    |

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

|                                 |  |                            |       |
|---------------------------------|--|----------------------------|-------|
| 1,000,000                       | Town of Hamden, CT, Whitney Center<br>Project, Series A, 7.75%, 1/1/43   | 1,035,750<br>\$10,667,196  |       |
|                                 | District of Columbia - 3.5%  |                            |       |
| 2,355,000                       | District of Columbia Tobacco Settlement<br>Financing Corp., Asset-Backed, 6.5%,<br>5/15/33                                   | \$2,658,866                |       |
| 6,825,000                       | District of Columbia Tobacco Settlement<br>Financing Corp., Asset-Backed, 6.75%,<br>5/15/40                                  | 7,370,727<br>\$10,029,593  |       |
|                                 | Florida - 4.4%   |                            |       |
| 1,500,000                       | Alachua County Health Facilities<br>Authority, Terraces Bonita Springs<br>Project, Series A, 8.125%, 11/15/41                | \$1,730,685                |       |
| 1,500,000                       | Alachua County Health Facilities<br>Authority, Terraces Bonita Springs<br>Project, Series A, 8.125%, 11/15/46                | 1,727,460                  |       |
| 2,500,000(d)                    | County of Miami-Dade, FL, Aviation<br>Revenue, Series B, 5.5%, 10/1/41   | 2,742,575                  |       |
| 5,000,000                       | Florida's Turnpike Enterprise, Department<br>of Transportation, Series A, 4.0%, 7/1/32                                       | 5,313,700                  |       |
| 1,000,000(d)                    | Hillsborough County Industrial<br>Development Authority, Various Health<br>Facilities, 8.0%, 8/15/32                         | 1,152,850<br>\$12,667,270  |       |
|                                 | Georgia - 6.2%   |                            |       |
| 5,000,000                       | City of Atlanta, GA, Water & Wastewater<br>Revenue, Series A, 5.0%, 11/1/34  | \$5,976,150                |       |
| 900,000                         | DeKalb County Georgia Hospital<br>Authority, DeKalb Medical Center, Inc.<br>Project, 6.0%, 9/1/30                            | 988,443                    |       |
| 750,000                         | DeKalb County Georgia Hospital<br>Authority, DeKalb Medical Center, Inc.<br>Project, 6.125%, 9/1/40                          | 816,997                    |       |
| 8,750,000                       | Private Colleges & Universities Authority,<br>Emory University, Series A, 5.0%,<br>10/1/43                                   | 10,063,288<br>\$17,844,878 |       |
| Principal<br>Amount<br>USD (\$) |  |                            | Value |
|                                 | Guam - 0.4%  |                            |       |
| 1,000,000                       | Guam Department of Education,<br>Certificates of Participation, John F.<br>Kennedy High School, Series A, 6.625%,<br>12/1/30 | \$1,047,890                |       |
|                                 | Idaho - 0.7%   |                            |       |
| 2,000,000                       | Power County Industrial Development<br>Corp., FMC Corp. Project, 6.45%, 8/1/32   | \$2,003,800                |       |

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

|              |  |                          |
|--------------|--|--------------------------|
|              | Illinois - 3.5%  |                          |
| 417,400(f)   | Illinois Finance Authority, Clare Oaks Project, Series B, 4.0%, 11/15/52                               | \$293,486                |
| 261,000(b)   | Illinois Finance Authority, Clare Oaks Project, Series C-1, 11/15/52                                   | 9,005                    |
| 52,200(b)    | Illinois Finance Authority, Clare Oaks Project, Series C-2, 11/15/52                                   | 13,703                   |
| 52,200(b)    | Illinois Finance Authority, Clare Oaks Project, Series C-3, 11/15/52                                   | 8,483                    |
| 3,000,000(c) | Illinois Finance Authority, Greenfields of Geneva Project, Series A, 8.125%, 2/15/40                   | 1,800,000                |
| 2,500,000(c) | Illinois Finance Authority, Greenfields of Geneva Project, Series A, 8.25%, 2/15/46                    | 1,500,000                |
| 1,450,000    | Illinois Finance Authority, Memorial Health System, 5.5%, 4/1/39                                       | 1,526,893                |
| 2,000,000    | Illinois Finance Authority, Northwestern Memorial Hospital, Series A, 6.0%, 8/15/39                    | 2,191,920                |
| 280,000(d)   | Illinois Finance Authority, Swedish Covenant, Series A, 6.0%, 8/15/38                                  | 314,661                  |
| 1,000,000    | Metropolitan Pier & Exposition Authority, McCormick Place, Series B, 5.0%, 6/15/52 (ST APPROP Insured) | 938,290                  |
| 1,530,000    | Southwestern Illinois Development Authority, Village of Sauget Project, 5.625%, 11/1/26                | 1,358,135<br>\$9,954,576 |
|              | Indiana - 0.9%   |                          |
| 250,000      | City of Carmel, IN, Barrington Carmel Project, Series A, 7.0%, 11/15/32                                | \$272,875                |
| 750,000      | City of Carmel, IN, Barrington Carmel Project, Series A, 7.125%, 11/15/42                              | 819,307                  |
| 500,000      | City of Carmel, IN, Barrington Carmel Project, Series A, 7.125%, 11/15/47                              | 544,980                  |
| 1,000,000    | Indiana Finance Authority, Educational Facilities, 5.125%, 7/1/37                                      | 974,370<br>\$2,611,532   |
|              | Kansas - 0.4%  |                          |
| 1,000,000(d) | Kansas Development Finance Authority, Hayes Medical Center, Inc., Series Q, 5.0%, 5/15/35              | \$1,072,470              |
|              | Louisiana - 3.8%   |                          |
| 7,000,000    | Jefferson Parish Hospital Service District No. 2, East Jefferson General Hospital, 6.375%, 7/1/41      | \$7,680,610              |
| 2,500,000    | Louisiana Local Government Environmental Facilities & Community Development Authority, Westlake        | 2,537,525                |

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

|              |   |                           |
|--------------|---|---------------------------|
| 750,000      | Chemical Corp. Project, 6.75%, 11/1/32<br>Opelousas Louisiana General Hospital<br>Authority, Opelousas General Health<br>System Project, 5.75%, 10/1/23 | 752,872<br>\$10,971,007   |
| 1,500,000    | Maine - 2.0%<br>Maine Health & Higher Educational<br>Facilities Authority, Maine General<br>Medical Center, 7.5%, 7/1/32                                | \$1,709,070               |
| 3,500,000    | Maine Turnpike Authority, Series A,<br>5.0%, 7/1/42   | 3,923,115<br>\$5,632,185  |
| 2,000,000(d) | Maryland - 3.9%<br>Maryland Health & Higher Educational<br>Facilities Authority, Charlestown<br>Community, 6.25%, 1/1/45                                | \$2,340,920               |
| 2,160,000    | Maryland Health & Higher Educational<br>Facilities Authority, City Neighbors,<br>Series A, 6.75%, 7/1/44  | 2,376,842                 |
| 1,250,000(d) | Maryland Health & Higher Educational<br>Facilities Authority, Doctor's Community<br>Hospital, 5.75%, 7/1/38   | 1,415,663                 |
| 4,500,000    | Maryland Health & Higher Educational<br>Facilities Authority, Maryland University<br>Medical System, Series A, 5.0%, 7/1/43                             | 4,943,745<br>\$11,077,170 |
| 7,000,000(b) | Massachusetts - 9.8%<br>Massachusetts Bay Transportation<br>Authority, Series A, 7/1/28   | \$5,030,690               |
| 2,575,000    | Massachusetts Development Finance<br>Agency, Broad Institute, Inc., Series A,<br>5.25%, 4/1/37  | 2,887,708                 |
| 975,142      | Massachusetts Development Finance<br>Agency, Linden Ponds, Inc., Series A-1,<br>5.5%, 11/15/46  | 910,022                   |
| 2,200,000    | Massachusetts Development Finance<br>Agency, Partner's Healthcare System,<br>Series M-4, 5.0%, 7/1/39   | 2,434,960                 |
| 8,000,000    | Massachusetts Development Finance<br>Agency, WGBH Foundation, Series A,<br>5.75%, 1/1/42 (AMBAC Insured)  | 10,912,320                |
| 4,325,000    | Massachusetts Health & Educational<br>Facilities Authority, Massachusetts<br>Institute of Technology, Series K, 5.5%,<br>7/1/32                         | 5,772,707<br>\$27,948,407 |
| 2,000,000    | Michigan - 3.0%<br>Flint Michigan Hospital Building<br>Authority, Hurley Medical Center,<br>7.375%, 7/1/35  | \$2,188,020               |
| Principal    |   | Value                     |

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

| Amount<br>USD (\$) |   |                            |
|--------------------|---|----------------------------|
|                    | Michigan - (continued)  |                            |
| 560,000            | Michigan Public Educational Facilities Authority, Crescent Academy, 7.0%, 10/1/36     | \$575,641                  |
| 5,000,000          | Michigan State University, Series A, 5.0%, 8/15/41                                    | 5,748,550<br>\$8,512,211   |
|                    | Minnesota - 2.6%  |                            |
| 2,000,000          | Bloomington Port Authority, Radisson Blu Mall of America, 9.0%, 12/1/35               | \$2,114,200                |
| 1,000,000          | City of Ham Lake, MN, DaVinci Academy, Series A, 5.0%, 7/1/47                         | 1,000,000                  |
| 3,755,000(e)       | State of Minnesota, Series B, 4.0%, 8/1/27  | 4,350,167<br>\$7,464,367   |
|                    | Montana - 0.2%  |                            |
| 2,445,000(c)       | City of Hardin, MT, Tax Allocation, Rocky Mountain Power, Inc. Project, 6.25%, 9/1/31 | \$488,169                  |
| 1,000,000(c)       | Two Rivers Authority, Inc., 7.375%, 11/1/27   | 29,380<br>\$517,549        |
|                    | Nevada - 0.7%   |                            |
| 2,000,000          | County of Washoe, NV, Fuel Tax, 5.0%, 2/1/43  | \$2,105,020                |
|                    | New Jersey - 9.0%   |                            |
| 7,500,000          | New Jersey Economic Development Authority, Continental Airlines, 5.75%, 9/15/27       | \$8,266,650                |
| 3,500,000(f)       | New Jersey State Turnpike Authority, RIB, 12.345%, 1/1/28 (144A) (AGM Insured)        | 6,079,080                  |
| 15,375,000(b)      | New Jersey Transportation Trust Fund Authority, 12/15/27 (BHAC Insured)               | 11,393,336<br>\$25,739,066 |
|                    | New York - 6.9%   |                            |
| 5,000,000          | New York State Dormitory Authority, Columbia University, 5.0%, 10/1/41                | \$5,610,400                |
| 2,000,000(d)       | New York State Dormitory Authority, Orange Medical Center, 6.125%, 12/1/29            | 2,143,500                  |
| 7,500,000          | New York State Dormitory Authority, Series C, 5.0%, 3/15/39                           | 8,527,050                  |
| 1,500,000          | New York State Dormitory Authority, Trustees of Columbia University, 5.0%, 10/1/45    | 2,006,355                  |
| 1,357,463          | Westchester County Healthcare Corp., Series A, 5.0%, 11/1/44                          | 1,451,603<br>\$19,738,908  |
|                    | North Carolina - 0.7%   |                            |

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

|              |   |              |
|--------------|---|--------------|
| 500,000      | City of Charlotte, NC, Airport Revenue, Series A, 5.0%, 7/1/42  | \$586,805    |
| 1,250,000    | City of Charlotte, NC, Airport Revenue, Series A, 5.0%, 7/1/47  | 1,464,487    |
|              |   | \$2,051,292  |
|              | Ohio - 6.5%   |              |
| 3,000,000(d) | Akron Bath Copley Joint Township Hospital District, Akron General Health System, 5.0%, 1/1/31                                 | \$3,466,860  |
| 2,500,000    | Buckeye Tobacco Settlement Financing Authority, Asset-Backed, Series A-2, 5.875%, 6/1/47                                      | 2,434,650    |
| 9,945,000    | Buckeye Tobacco Settlement Financing Authority, Asset-Backed, Series A-2, 6.5%, 6/1/47  | 9,885,927    |
| 2,500,000(e) | State of Ohio, Common Schools, Series B, 5.0%, 6/15/29  | 2,895,275    |
|              |   | \$18,682,712 |
|              | Oregon - 1.1%   |              |
| 1,000,000    | Oregon Health & Science University, Series A, 5.0%, 7/1/42  | \$1,169,840  |
| 2,000,000    | Oregon State Facilities Authority, Samaritan Health Services, Series A, 5.25%, 10/1/40  | 2,123,060    |
|              |   | \$3,292,900  |
|              | Pennsylvania - 10.5%  |              |
| 1,000,000    | Chester County Industrial Development Authority, Collegium Charter School, Series A, 5.25%, 10/15/47                          | \$1,010,520  |
| 800,000(f)   | Geisinger Authority, Geisinger Health System, Series B, 0.9%, 8/1/22  | 800,000      |
| 1,965,000    | Pennsylvania Economic Development Financing Authority, US Airways Group, Series B, 8.0%, 5/1/29                               | 2,223,791    |
| 5,000,000    | Pennsylvania Economic Development Financing Authority, USG Corp. Project, 6.0%, 6/1/31  | 5,009,850    |
| 1,555,000(d) | Pennsylvania Turnpike Commission, Series D, 5.3%, 12/1/41   | 1,711,993    |
| 3,445,000(d) | Pennsylvania Turnpike Commission, Series D, 5.3%, 12/1/41   | 3,785,848    |
| 500,000      | Philadelphia Authority for Industrial Development, Greater Philadelphia Health Action, Inc. Project, Series A, 6.625%, 6/1/50 | 519,440      |
| 6,000,000    | Philadelphia Authority for Industrial Development, Nueva Esperanza, Inc., 8.2%, 12/1/43                                       | 6,870,360    |
| 1,000,000    | Philadelphia Authority for Industrial Development, Performing Arts Charter School Project, 6.5%, 6/15/33 (144A)               | 1,049,990    |



Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

|                 |  |              |
|-----------------|--|--------------|
| 5,000,000(e)    | Goose Creek Consolidated Independent School District, Series C, 4.0%, 2/15/26 (PSF-GTD Insured)              | 5,666,500    |
| 5,020,000       | Grand Parkway Transportation Corp., Series A, 5.5%, 4/1/53   | 5,721,194    |
| 2,663,453(c)    | Gulf Coast Industrial Development Authority, Microgy Holdings Project, 7.0%, 12/1/36                         | 27           |
| 2,400,000(f)    | Harris County Health Facilities Development Corp., The Methodist Hospital System, Series A-1, 0.95%, 12/1/41 | 2,400,000    |
| 3,000,000       | Houston Higher Education Finance Corp., St. John's School Project, Series A, 5.0%, 9/1/38                    | 3,267,210    |
| 5,535,000(f)    | Lower Neches Valley Authority Industrial Development Corp., Exxon Capital Ventures, Inc., 0.9%, 11/1/38      | 5,535,000    |
| 3,355,000       | North Texas Tollway Authority, Series A, 5.0%, 1/1/30  | 3,933,066    |
| 9,750,000(d)    | North Texas Tollway Authority, Series F, 5.75%, 1/1/33   | 9,986,145    |
| 1,500,000(d)    | Red River Health Facilities Development Corp., MRC Crestview, Series A, 8.0%, 11/15/41                       | 1,913,175    |
| 2,000,0009(e)   | Richardson Independent School District, School Building, 5.0%, 2/15/38 (PSF-GTD Insured)                     | 2,268,660    |
| 6,960,000(c)(h) | Sanger Industrial Development Corp., Texas Pellets Project, Series B, 8.0%, 7/1/38                           | 3,306,000    |
| 1,000,000       | Tarrant County Cultural Education Facilities Finance Corp., Mirador Project, Series A, 4.875%, 11/15/48      | 837,230      |
| 750,000         | Tarrant County Cultural Education Facilities Finance Corp., Mirador Project, Series A, 5.0%, 11/15/55        | 626,370      |
| 1,000,000(c)    | Texas Midwest Public Facility Corp., Secure Treatment Facility Project, 9.0%, 10/1/30                        | 737,480      |
| 3,365,000       | Texas Private Activity Bond Surface Transportation Corp., NTE Mobility Partners LLC, 7.0%, 12/31/38          | 3,854,271    |
| 2,500,000       | Travis County Health Facilities Development Corp., Longhorn Village Project, 7.125%, 1/1/46                  | 2,721,025    |
| 5,000,000(e)    | Tyler Independent School District, School Building, 5.0%, 2/15/38 (PSF-GTD Insured)                          | 5,671,650    |
|                 | Utah - 2.2%  | \$66,992,453 |

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

|                           |  |              |
|---------------------------|--|--------------|
| 5,000,000                 | County of Utah, UT, IHC Health Services, Inc., Series B, 4.0%, 5/15/47   | \$5,139,100  |
| 1,000,000                 | Salt Lake City Corp., Airport Revenue, Series B, 5.0%, 7/1/36  | 1,174,560    |
|                           |  | \$6,313,660  |
|                           | Virginia - 5.2%  |              |
| 2,275,000(e)              | County of Arlington, VA, 4.0%, 8/15/35   | \$2,491,057  |
| 2,000,000                 | County of Washington, VA, Industrial Development Authority, Mountain States Health Alliance, Series C, 7.75%, 7/1/38 | 2,153,620    |
| 4,550,000                 | Tobacco Settlement Financing Corp., Series B-1, 5.0%, 6/1/47   | 4,453,039    |
| 5,000,000                 | Virginia Public School Authority Revenue, 4.0%, 8/1/25 (State Aid Withholding)                                       | 5,703,700    |
|                           |  | \$14,801,416 |
|                           | Washington - 5.6%  |              |
| 3,000,000                 | City of Seattle, WA, Water System Revenue, 4.0%, 8/1/32  | \$3,266,520  |
| 2,500,000(e)              | King County, Issaquah School District No. 411, 4.0%, 12/1/31 (SCH BD GTY Insured)                                    | 2,731,175    |
| 2,500,000                 | University of Washington, Series B, 5.0%, 6/1/29   | 2,972,350    |
| 1,500,000(d)              | Washington State Health Care Facilities Authority, Kadlec Regional Medical Center, 5.5%, 12/1/39                     | 1,712,820    |
| Principal Amount USD (\$) |  | Value        |
|                           | Washington - (continued)   |              |
| 2,000,000                 | Washington State Health Care Facilities Authority, VA Mason Medical, Series A, 6.125%, 8/15/37                       | \$2,010,940  |
| 2,000,000                 | Washington State Health Care Facilities Authority, VA Mason Medical, Series A, 6.25%, 8/15/42                        | 2,011,180    |
| 1,100,000                 | Washington State Housing Finance Commission, Mirabella Project, Series A, 6.75%, 10/1/47 (144A)                      | 1,201,376    |
|                           |  | \$15,906,361 |
|                           | West Virginia - 0.6%   |              |
| 2,000,000(c)              | City of Philippi, WV, Alderson-Broadus College, Inc., Series A, 7.75%, 10/1/44                                       | \$1,200,000  |
| 725,000(c)                | West Virginia Hospital Finance Authority, Highland Hospital Group, 9.125%, 10/1/41                                   | 670,190      |
|                           |  | \$1,870,190  |
|                           | Wisconsin - 3.5%   |              |
| 5,000,000                 | Public Finance Authority, Glenridge Palmer Ranch, Series A, 8.25%, 6/1/46  | \$5,926,950  |

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

|               |  |                 |
|---------------|--|-----------------|
| 750,000       | Public Finance Authority, Roseman University Health Sciences Project, 5.875%, 4/1/45             | 786,278         |
| 1,500,000     | Public Finance Authority, SearStone CCRC Project, Series A, 8.625%, 6/1/47 (144A)                | 1,733,040       |
| 1,500,000(d)  | Wisconsin Health & Educational Facilities Authority, Pro Healthcare, Inc. Group, 6.625%, 2/15/39 | 1,634,115       |
|               |  | \$10,080,383    |
|               | TOTAL TAX EXEMPT OBLIGATIONS<br>(Cost \$411,111,669)   | \$433,732,481   |
|               | MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 0.1% of Net Assets                                    |                 |
| 13,000,000(f) | Non-Profit Preferred Funding Trust I, Series E, 0.0%, 9/15/37 (144A)                             | \$227,500       |
|               | TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION<br>(Cost \$13,000,000)                            | \$227,500       |
|               | TOTAL INVESTMENTS IN SECURITIES - 151.6%<br>(Cost - \$424,111,669) (i)                           | \$433,959,981   |
|               | OTHER ASSETS AND LIABILITIES - 0.8%  | \$2,272,230     |
|               | PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE - (52.4)%                      | \$(150,007,114) |
|               | NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0%   | \$286,225,097   |

(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, 2017, the value of these securities amounted to \$22,987,416, or 8.0% of total 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 June 30, 2017

- (a) Consists of Revenue Bonds unless otherwise indicated. Security issued with a zero coupon. Income is recognized through accretion of discount.
- (b)

- (c) Security is in default.
- (d) 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.
- (e) Represents a General Obligation Bond.  
The interest rate is subject to change periodically. The interest rate
- (f) shown is the rate at June 30, 2017.
- (g) Escrow to maturity.  
Security is valued using fair value methods (other than prices supplied
- (h) by independent pricing services).
  
- (i) At June 30, 2017, the net unrealized appreciation on investments based on cost for federal tax purposes of \$417,328,714 was as follows:

|  |    |              |
|--|----|--------------|
| Aggregate gross unrealized appreciation for all investments in which there is an excess of value over tax cost | \$ | 39,289,800   |
| Aggregate gross unrealized depreciation for all investments in which there is an excess of tax cost over value |    | (22,658,533) |
| Net unrealized appreciation  | \$ | 16,631,267   |

For financial reporting purposes net unrealized appreciation on investments was \$9,848,312 and cost of investments aggregated \$424,111,669.

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 June 30, 2017, in valuing the Trust's investments.

| Level 1 | Level 2 | Level 3 | Total |
|---------|---------|---------|-------|
|---------|---------|---------|-------|

Edgar Filing: PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST - Form N-Q

|  |     |               |             |               |
|--|-----|---------------|-------------|---------------|
| Tax Exempt Obligations                   |     |               |             |               |
| Texas                                    | \$- | \$63,686,453  | \$3,306,000 | \$66,992,453  |
| All Other Tax Exempt Obligations         | -   | 366,740,028   | -           | 366,740,028   |
| Municipal Collateralized Debt Obligation | -   | 227,500       | -           | 227,500       |
| Total                                    | \$- | \$430,653,981 | \$3,306,000 | \$433,959,981 |

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

|  |                        |   |
|--|------------------------|---|
|  | Tax Exempt Obligations |   |
| Balance as of 3/31/17                            | \$4,176,000            |   |
| Realized gain (loss)                             |                        | - |
| Change in unrealized appreciation (depreciation) | (869,274)              |   |
| Purchases  |                        | - |
| Sales  |                        | - |
| Accrued discounts/premiums                       | (726)                  |   |
| Changes between Level 3*                         |                        | - |
| Balance as of 6/30/17                            | \$3,306,000            |   |

\* Transfers are calculated on the beginning of period value. During the three months ended June 30, 2017, there were no transfers between Levels 1, 2 and 3.

Net change in unrealized depreciation of Level 3 investments still held and considered Level 3 at June 30, 2017: \$869,274.

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 registrants 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 registrants 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 registrants internal control over financial reporting that occurred during the registrants most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrants internal control over financial reporting; and 5. The registrants other certifying officer(s) and I have disclosed to the registrants auditors and the audit committee of the registrants 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 registrants 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 registrants internal control over financial reporting. Date: [Signature] [Title] 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/ Lisa M.Jones ----- Lisa M.Jones, President and Chief Executive Officer Date August 29, 2017 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 August 29, 2017 By (Signature and Title)\* /s/ Mark E. Bradley ----- Mark E. Bradley, Treasurer and Chief Accounting and Financial Officer Date August 29, 2017 \* Print the name and title of each signing officer under his or her signature.