

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<br>Amount<br>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                       |

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

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

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

|              |                                                                                                                                                                                                                                                                                                                                         |              |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|              | Academies<br>Project, Series<br>A, 7.375%,<br>10/1/43<br>California<br>Statewide<br>Communities<br>Development<br>Authority,<br>Lancer Plaza<br>Project, 5.875%,<br>11/1/43<br>California<br>Statewide<br>Communities<br>Development<br>Authority,<br>Microgy<br>Holdings<br>Project, 9.0%,<br>12/1/38<br>City of Madera,<br>Irrigation | 2,057,156    |
| 1,875,000    |                                                                                                                                                                                                                                                                                                                                         |              |
| 757,342(e)   |                                                                                                                                                                                                                                                                                                                                         | 8            |
| 1,500,000(d) | Financing<br>Authority,<br>6.25%, 1/1/31<br>City of Madera,<br>Irrigation                                                                                                                                                                                                                                                               | 1,568,085    |
| 1,500,000(d) | Financing<br>Authority, 6.5%,<br>1/1/40<br>Coast<br>Community<br>College District,<br>Election, Series<br>D, 5.0%, 8/1/31<br>State of<br>California,                                                                                                                                                                                    | 1,571,610    |
| 2,695,000(b) | Various<br>Purposes,<br>5.75%, 4/1/31<br>Tobacco<br>Securitization<br>Authority of<br>Southern<br>California,<br>Series A-1,<br>5.125%, 6/1/46                                                                                                                                                                                          | 3,235,240    |
| 2,425,000(b) |                                                                                                                                                                                                                                                                                                                                         | 2,447,843    |
| 465,000      | Total California<br>Colorado - 0.7%                                                                                                                                                                                                                                                                                                     | 464,991      |
| 1,500,000(d) |                                                                                                                                                                                                                                                                                                                                         | \$36,795,786 |
|              |                                                                                                                                                                                                                                                                                                                                         | \$1,893,225  |

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

|               |                  |              |
|---------------|------------------|--------------|
|               | 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%  |              |

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

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

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

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



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

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

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

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

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

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

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

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

Principal  
Amount  
USD (\$)

Value

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

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

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

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

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

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

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

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 Bord Guaranty

ST AID

WITHHLDG State Aid Witholding

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

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

|                                                  |             |
|--------------------------------------------------|-------------|
| 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.