

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST

Form N-Q

August 26, 2008

OMB APPROVAL

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

FORM N-Q

CERTIFIED SHAREHOLDER REPORT OF REGISTERED  
MANAGEMENT INVESTMENT COMPANIES

Investment Company Act file number 811-21409

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

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

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

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

Date of fiscal year end: March 31

Date of reporting period: June 30, 2008

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 270.30b-5). The Commission may use the information provided on Form N-Q in its regulatory, disclosure review, inspection, and policymaking roles.

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

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## ITEM 1. Schedule of Investments.

| Pioneer Municipal High Income Advantage Trust |                                                                      |
|-----------------------------------------------|----------------------------------------------------------------------|
| SCHEDULE OF INVESTMENTS 6/30/08 (unaudited)   |                                                                      |
| Principal Amount (\$)                         | Value (\$)                                                           |
| TAX-EXEMPT OBLIGATIONS - 140.3% of Net Assets |                                                                      |
| Arizona - 4.3%                                |                                                                      |
| 5,000,000                                     | Casa Grande Industrial Development Authority, Hospital 5,000,500     |
| 1,000,000                                     | Pima County Industrial Development Authority, 6.3%, 7/1 972,810      |
| 1,551,000                                     | Pima County Industrial Development Authority, 6.75%, 7/ 1,561,841    |
| 2,640,000                                     | Pima County Industrial Development Authority, 7.0%, 1/1 2,492,978    |
| 1,000,000                                     | + Pima County Industrial Development Authority, 7.5%, 7/1 1,183,970  |
| 2,000,000                                     | San Luis Facility Development Corp., 7.25%, 5/1/27 1,794,020         |
|                                               | 13,006,119                                                           |
| California - 11.1%                            |                                                                      |
| 2,680,000                                     | + Golden State Tobacco Securitization Corp., 6.75%, 6/1/3 3,036,467  |
| 8,170,000                                     | (a)Lehman Municipal Trust Receipts, RIB, 11.121%, 6/1/37 ( 8,326,864 |
| 3,140,000                                     | (a)Lehman Municipal Trust Receipts, RIB, 11.451%, 11/1/39 3,299,606  |
| 2,500,000                                     | San Jose California Airport Revenue, 5.0%, 3/1/37 2,433,000          |
| 9,520,000                                     | (a)University of California, RIB, 11.757%, 5/15/38 (144A) 9,745,814  |
| 9,015,000                                     | Valley Health System Hospital Revenue, 6.875%, 5/15/23 6,610,699     |
|                                               | 33,452,450                                                           |
| Colorado - 2.3%                               |                                                                      |
| 2,850,000                                     | + Denver Health & Hospital Authority Healthcare Revenue, 3,105,103   |
| 3,520,000                                     | + Northwest Parkway Public Highway Authority, 7.125%, 6/1 3,940,253  |
|                                               | 7,045,356                                                            |
| District of Columbia - 2.2%                   |                                                                      |
| 2,700,000                                     | District of Columbia Tobacco Settlement Financing Corp. 2,594,754    |
| 4,000,000                                     | District of Columbia Tobacco Settlement Financing Corp. 4,010,360    |
|                                               | 6,605,114                                                            |
| Florida - 5.5%                                |                                                                      |
| 1,000,000                                     | Greater Orlando Aviation Authority, 6.5%, 11/15/36 706,750           |
| 4,500,000                                     | Hillsborough County Florida Industrial Development Authority         |
| Pollution                                     | Control Revenue, 5.5%, 10/1/23 4,408,650                             |
| 1,980,000                                     | Hillsborough County Florida Industrial Development Authority         |
| Pollution                                     | Control Revenue, 6.75%, 7/1/29 1,923,827                             |
| 6,890,000                                     | (a)Lehman Municipal Trust Receipts, RIB, 11.619%, 7/1/37 ( 7,456,565 |
| 500,000                                       | Miami Beach Health Facilities Authority, 5.375%, 11/15/ 434,640      |
| 1,500,000                                     | Miami Beach Health Facilities Authority, 6.7%, 11/15/19 1,529,250    |
|                                               | 16,459,682                                                           |
| Georgia - 7.0%                                |                                                                      |
| 4,000,000                                     | (a)Atlanta Georgia Water and Wastewater Revenue, RIB, 11.9 3,977,440 |
| 1,065,000                                     | Effingham County Industrial Development Authority, 6.5% 979,395      |
| 3,360,000                                     | Fulton County Residential Care Facilities, 7.0%, 7/1/29 2,850,086    |
| 7,500,000                                     | Main Street Natural Gas, Inc., Gas Project Revenue Bond 7,153,800    |
| 4,500,000                                     | Main Street Natural Gas, Inc., Gas Project Revenue Bond 4,317,300    |
| 1,650,000                                     | Savannah Georgia Economic Development Authority Revenue 1,694,781    |
|                                               | 20,972,802                                                           |
| Guam - 2.7%                                   |                                                                      |
| 3,000,000                                     | Northern Mariana Islands, 5.0%, 6/1/30 2,459,760                     |
| 4,600,000                                     | + Northern Mariana Islands, 6.75%, 10/1/33 5,234,708                 |
| 400,000                                       | Northern Mariana Islands, 6.75%, 10/1/33 405,932                     |
|                                               | 8,100,400                                                            |
| Idaho - 2.6%                                  |                                                                      |
| 2,000,000                                     | Power County Industrial Development Corp., 6.45%, 8/1/3 1,992,580    |

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|            |                                                            |                         |
|------------|------------------------------------------------------------|-------------------------|
| 5,920,000  | Power County Pollution Control Revenue, 5.625% 10/1/14     | 5,948,179<br>7,940,759  |
|            | Illinois - 5.9%                                            |                         |
| 4,000,000  | Centerpoint Intermodal Center, 8.0%, 6/15/23 (144A)        | 3,699,640               |
| 1,100,000  | Illinois Finance Authority Revenue, 5.5%, 5/15/26          | 964,590                 |
| 2,350,000  | Illinois Finance Authority Revenue, 5.75%, 5/15/38         | 2,003,211               |
| 1,000,000  | Illinois Finance Authority Revenue, 6.0%, 11/15/27         | 922,540                 |
| 3,000,000  | Illinois Finance Authority Revenue, 6.0%, 11/15/39         | 2,658,450               |
| 2,500,000  | Illinois Finance Authority Revenue, 6.125%, 11/15/25       | 2,330,450               |
| 1,645,000  | Illinois Health Facilities Authority Revenue, 5.5%, 11/    | 1,489,449               |
| 1,500,000  | Illinois Health Facilities Authority Revenue, 6.9%, 11/    | 1,288,950               |
| 2,700,000  | Southwestern Illinois Development Authority Revenue, 5.    | 2,384,235<br>17,741,515 |
|            | Indiana - 5.3%                                             |                         |
| 10,000,000 | Indiana State Development Finance Authority Revenue, 5.10  | 120,000                 |
| 5,000,000  | Jasper County Industrial Economic Development Revenue,     | 3,945,950               |
| 2,170,000  | Vincennes Industrial Economic Development Revenue, 6.25    | 1,967,843<br>16,033,793 |
|            | Kentucky - 1.5%                                            |                         |
| 500,000    | Kentucky Economic Development Finance Authority Hospita    | 496,105                 |
| 4,400,000  | Kentucky Economic Development Finance Authority Hospita    | 4,059,968<br>4,556,073  |
|            | Louisiana - 4.0%                                           |                         |
| 2,500,000  | Louisiana Local Government Environmental Facilities Dev    | 2,490,225               |
| 750,000    | Opelousas Louisiana General Hospital Authority Revenue,    | 760,920                 |
| 9,415,000  | Tobacco Settlement Financing Corp., 5.875%, 5/15/39        | 8,728,552<br>11,979,697 |
|            | Maryland - 0.5%                                            |                         |
| 710,000    | Maryland Health & Higher Educational Facilities Authori    | 602,733                 |
| 1,250,000  | Maryland Health & Higher Educational Facilities Authori    | 1,007,050<br>1,609,783  |
|            | Massachusetts - 4.8%                                       |                         |
| 2,195,000  | Massachusetts Health & Educational Facilities Authority    | 2,048,308               |
| 1,000,000  | + Massachusetts Health & Educational Facilities Authority  | 1,117,140               |
| 900,000    | Massachusetts State Development Finance Agency, 5.25%,     | 807,318                 |
| 2,920,000  | Massachusetts State Development Finance Agency, 6.0%, 1    | 2,743,720               |
| 4,540,000  | Massachusetts State Development Finance Agency, 7.1%, 7    | 4,574,005               |
| 3,335,000  | (a)Massachusetts State Housing Finance Agency, RIB, 11.947 | 3,097,481<br>14,387,972 |
|            | Michigan - 3.9%                                            |                         |
| 1,650,000  | Crescent Academy Project Full Term Certificates of Part    | 1,237,203               |
| 1,500,000  | + Delta County Michigan Economic Development Corp., 6.25%  | 1,651,740               |
| 3,000,000  | Macomb County Hospital Finance Authority Revenue, 5.875    | 2,755,140               |
| 4,130,000  | Michigan State Hospital Finance Authority Revenue, 5.5%    | 3,784,071               |
| 1,000,000  | Michigan State Strategic Fund Solid Waste Disposal Reve    | 1,006,570               |
| 1,470,000  | Star International Academy Full Term Certificates of Pa    | 1,316,606<br>11,751,330 |
|            | Missouri - 3.0%                                            |                         |
| 1,850,000  | Kansas City Industrial Development Authority Revenue, 5    | 1,625,281               |
| 1,500,000  | St. Louis Industrial Development Authority Revenue, 7.2    | 1,374,450               |
| 6,640,000  | St. Louis Industrial Development Authority Revenue, 7.2    | 6,096,250<br>9,095,981  |
|            | Montana - 0.8%                                             |                         |
| 2,445,000  | (b)Hardin Increment Industrial Infrastructure Development  | 1,541,988               |
| 1,000,000  | Two Rivers Authority, Inc., Project Revenue, 7.375%, 11    | 725,590<br>2,267,578    |
|            | Nevada - 1.0%                                              |                         |
| 2,425,000  | Clark County Industrial Development Revenue, 5.5%, 10/1    | 2,090,617               |
| 1,600,000  | Nevada State Department of Business & Industry, 7.25%,     | 477,984                 |
| 1,000,000  | Nevada State Department of Business & Industry, 7.375%,    | 298,660                 |
| 70,000     | Nevada State Department of Business & Industry, 7.375%,    | 20,907<br>2,888,168     |

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|            |                                                              |            |
|------------|--------------------------------------------------------------|------------|
|            | New Hampshire - 0.6%                                         |            |
| 1,000,000  | New Hampshire Health & Educational Facilities Authority      | 864,120    |
| 1,125,000  | New Hampshire Health & Educational Facilities Authority      | 1,081,586  |
|            |                                                              | 1,945,706  |
|            | New Jersey - 9.4%                                            |            |
| 2,500,000  | Burlington County New Jersey Bridge Commission Revenue,      | 2,246,575  |
| 13,000,000 | New Jersey Economic Development Authority Revenue, 6.25      | 9,639,630  |
| 2,500,000  | New Jersey Health Care Facilities Financing Authority R      | 2,345,025  |
| 2,495,000  | (a) New Jersey State Turnpike Authority, RIB, 15.746%, 1/1/  | 3,389,383  |
| 1,000,000  | + Tobacco Settlement Financing Corp., 6.25%, 6/1/43          | 1,122,680  |
| 3,250,000  | + Tobacco Settlement Financing Corp., 6.75%, 6/1/39          | 3,721,543  |
| 5,000,000  | + Tobacco Settlement Financing Corp., 7.0%, 6/1/41           | 5,779,000  |
|            |                                                              | 28,243,836 |
|            | New York - 9.3%                                              |            |
| 3,000,000  | Dutchess County Industrial Development Agency Revenue,       | 3,190,590  |
| 1,000,000  | Nassau County New York Industrial Development Agency Re      | 999,730    |
| 6,980,000  | New York City Industrial Development Agency, 5.25%, 12/      | 4,327,460  |
| 2,000,000  | New York City Industrial Development Agency, 5.375%, 6/      | 1,881,560  |
| 2,000,000  | New York City Industrial Development Agency, 6.9%, 8/1/      | 959,980    |
| 3,950,000  | New York City Industrial Development Agency, 7.625%, 12      | 3,397,158  |
| 2,300,000  | New York City Industrial Development Agency, 7.8%, 1/1/      | 2,303,059  |
| 5,000,000  | New York State Environmental Facilities Corp., 5.0%, 6/      | 5,058,950  |
| 4,500,000  | Suffolk County New York Industrial Development Agency,       | 3,525,210  |
| 500,000    | Ulster County New York Industrial Development Agency, 6      | 445,995    |
| 2,000,000  | Yonkers Industrial Development Agency Civic Facilities       | 1,986,520  |
|            |                                                              | 28,076,212 |
|            | North Carolina - 4.7%                                        |            |
| 11,350,000 | Charlotte North Carolina Special Facilities Revenue, 5.      | 7,867,025  |
| 7,140,000  | Charlotte North Carolina Special Facilities Revenue, 7.      | 6,324,255  |
|            |                                                              | 14,191,280 |
|            | Ohio - 2.2%                                                  |            |
| 3,800,000  | Belmont County Health System Revenue, 5.7%, 1/1/13           | 3,745,318  |
| 1,000,000  | Belmont County Health System Revenue, 5.8%, 1/1/18           | 922,940    |
| 3,000,000  | Cleveland Airport Special Revenue, 5.375%, 9/15/27           | 1,993,800  |
|            |                                                              | 6,662,058  |
|            | Oklahoma - 1.7%                                              |            |
| 1,875,000  | Jackson County Memorial Hospital Authority Revenue, 7.3      | 1,883,663  |
| 2,220,000  | Tulsa Municipal Airport Transportation Revenue, 6.25%,       | 1,765,233  |
| 1,500,000  | Tulsa Municipal Airport Transportation Revenue, 7.35%,       | 1,432,560  |
|            |                                                              | 5,081,456  |
|            | Pennsylvania - 9.2%                                          |            |
| 3,000,000  | + Allegheny County Hospital Development Authority Revenue    | 3,486,240  |
| 500,000    | + Allegheny County Hospital Development Authority Revenue    | 581,040    |
| 1,000,000  | Clarion County Hospital Authority Revenue, 5.625%, 7/1/      | 1,001,800  |
| 3,600,000  | Columbia County Hospital Authority Revenue, 5.85%, 6/1/      | 3,099,096  |
| 3,110,000  | (c) Delaware County Industrial Development Authority Revenue | 2,379,865  |
| 1,050,000  | Hazleton Health Services Authority Hospital Revenue, 6.      | 1,045,737  |
| 2,415,000  | Montgomery County Higher Education & Health Authority H      | 2,419,733  |
| 1,430,000  | Pennsylvania Economic Development Financing Authority R      | 1,299,799  |
| 1,805,000  | Pennsylvania Economic Development Financing Authority R      | 1,782,311  |
| 2,330,000  | Pennsylvania Economic Development Financing Authority R      | 2,288,643  |
| 5,000,000  | Philadelphia Hospitals & Higher Education Facilities Au      | 4,207,450  |
| 2,005,000  | Scranton-Lackawanna Health & Welfare Authority Revenue,      | 1,999,587  |
| 2,245,000  | Scranton-Lackawanna Health & Welfare Authority Revenue,      | 2,237,143  |
|            |                                                              | 27,828,444 |
|            | Rhode Island - 4.1%                                          |            |
| 4,485,000  | Central Falls Rhode Island Detention Facilities Revenue      | 4,543,754  |
| 8,285,000  | Tobacco Settlement Financing Corp., 6.25%, 6/1/42            | 7,819,052  |
|            |                                                              | 12,362,806 |
|            | South Carolina - 6.6%                                        |            |
| 1,500,000  | Connector 2000 Association, Inc., Toll Road Revenue, 5.      | 964,155    |
| 1,600,000  | Loris Community Hospital District, 5.625%, 1/1/29            | 1,574,208  |

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|            |     |                                                                   |             |
|------------|-----|-------------------------------------------------------------------|-------------|
| 7,140,000  | +   | South Carolina Jobs Economic Development Authority Reve           | 8,069,771   |
| 860,000    | +   | South Carolina Jobs Economic Development Authority Reve           | 969,426     |
| 3,000,000  | +   | South Carolina Jobs Economic Development Authority Reve           | 3,393,720   |
| 4,400,000  | (d) | Tobacco Settlement Revenue Management, 6.375%, 5/15/30            | 4,970,196   |
|            |     |                                                                   | 19,941,476  |
|            |     | Tennessee - 2.8%                                                  |             |
| 1,000,000  | +   | Johnson City Health & Educational Facilities Board Hosp           | 1,173,890   |
| 7,000,000  |     | Knox County Health Educational & Housing Facilities Boa           | 7,201,670   |
|            |     |                                                                   | 8,375,560   |
|            |     | Texas - 14.6%                                                     |             |
| 8,650,000  |     | Brazos River Authority Pollution Control Revenue, 6.75%           | 7,138,672   |
| 4,000,000  |     | Brazos River Authority Pollution Control Revenue, 7.7%            | 3,760,200   |
| 7,350,000  |     | Gulf Coast Industrial Development Authority, 7.0%, 12/1           | 6,482,773   |
| 10,000,000 |     | Houston Texas Airport System Special Facilities Revenue           | 7,893,500   |
| 1,000,000  |     | IAH Public Facility Corp., Project Revenue Bonds, Serie           | 940,920     |
| 1,000,000  |     | IAH Public Facility Corp., Project Revenue Bonds, Serie           | 909,010     |
| 1,350,000  |     | IAH Public Facility Corp., Project Revenue Bonds, Serie           | 1,202,877   |
| 845,000    |     | Lubbock Health Facilities Development Corp., 6.5%, 7/1/           | 814,665     |
| 2,000,000  |     | Lubbock Health Facilities Development Corp., 6.625%, 7/           | 1,931,020   |
| 7,750,000  |     | Matagorda County Navigation District Number 1 Revenue,            | 6,985,075   |
| 5,000,000  |     | Tomball Hospital Authority, 6.0%, 7/1/25                          | 5,021,750   |
| 810,000    | (d) | Willacy County Local Government Corp., 6.0%, 3/1/09               | 830,039     |
|            |     |                                                                   | 43,910,501  |
|            |     | Utah - 0.5%                                                       |             |
| 1,600,000  |     | Spanish Fork Charter School Revenue, 5.7%, 11/15/36 (14           | 1,369,920   |
|            |     | Washington - 4.7%                                                 |             |
| 5,500,000  |     | Port Seattle Washington Special Facilities Revenue, 7.2           | 4,587,055   |
| 1,290,000  |     | Tobacco Settlement Authority Revenue, 6.5%, 6/1/26                | 1,304,474   |
| 2,000,000  |     | Washington State Health Care Facilities Authority, 6.12           | 1,899,840   |
| 2,000,000  |     | Washington State Health Care Facilities Authority, 6.25           | 1,922,580   |
| 5,000,000  |     | Washington State Housing Finance Commission Nonprofit R           | 4,490,900   |
|            |     |                                                                   | 14,204,849  |
|            |     | Wisconsin - 1.5%                                                  |             |
| 3,000,000  |     | Aztalan Wisconsin Exempt Facilities Revenue, 7.50%, 5/1           | 2,532,660   |
| 1,000,000  |     | Wisconsin State Health & Educational Facilities Authori           | 964,680     |
| 1,000,000  |     | Wisconsin State Health & Educational Facilities Authori           | 927,740     |
|            |     |                                                                   | 4,425,080   |
|            |     | TOTAL TAX-EXEMPT OBLIGATIONS                                      |             |
|            |     | (Cost \$430,929,675)                                              | 422,513,756 |
|            |     | MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 4.1% of Net Assets     |             |
| 13,000,000 | (e) | Non-Profit Preferred Funding Trust I, Series E, 12.0%, 12,420,850 |             |
|            |     | TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION                    |             |
|            |     | (Cost \$13,000,000)                                               | 12,420,850  |
| Shares     |     | COMMON STOCK - 0.2% of Net Assets                                 |             |
| 83,773     | (f) | Northwest Airlines Corp.                                          | 557,928     |
|            |     | TOTAL COMMON STOCK                                                |             |
|            |     | (Cost \$3,210,349)                                                | 557,928     |
|            |     | TAX-EXEMPT MONEY MARKET MUTUAL FUND - 2.7% of Net Assets          |             |
| 8,000,000  |     | BlackRock Liquidity Funds MuniFund Portfolio                      | 8,000,000   |
|            |     | TOTAL TAX-EXEMPT MONEY MARKET MUTUAL FUND                         |             |
|            |     | (Cost \$8,000,000)                                                | 8,000,000   |
|            |     | TOTAL INVESTMENTS IN SECURITIES - 147.3%                          |             |
|            |     | (Cost \$455,140,024) (g) (h)                                      | 443,492,534 |

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|                                                      |               |
|------------------------------------------------------|---------------|
| OTHER ASSETS AND LIABILITIES - 2.5%                  | 7,579,975     |
| PREFERRED SHARES AT REDEMPTION VALUE,                |               |
| INCLUDING DIVIDENDS PAYABLE - (49.8)%                | (150,006,099) |
| NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0% | 301,066,410   |

(144A) Securities Security is exempt from registration under Rule 144A of the Act of 1933. Such securities may be resold normally to qualified institutional buyers in a transaction exempt from registration. At June 30, 2008, the value of these securities amounted to \$59,381,654, or 19.7% of total net assets applicable to common shareowners.

RIB Residual Interest Bonds.

NR Security not rated by S&P or Moody's.

+ 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.

(a) based The interest rate is subject to change periodically and inversely upon prevailing market rates. The rate shown is the coupon rate at June 30, 2008.

(b) Debt obligation initially issued at one coupon which converts to a higher coupon at a specific date. The rate shown is the coupon rate at June 30, 2008.

(c) Security is in default and is non-income producing.

(d) Escrow to maturity.

(e) Indicates a security that has been deemed illiquid. The aggregate cost of illiquid securities is \$13,000,000. The aggregate value is \$12,420,850, or 4.1% of the net assets.

(f) Non-income producing.

(g) The concentration of investments by type of obligation/market sector is as follows:

|                           |      |
|---------------------------|------|
| Insured                   |      |
| FSA                       | 5.7% |
| ACA                       | 1.4  |
| AMBAC                     | 0.6  |
| General Obligation        | 5.5  |
| Revenue Bonds:            |      |
| Health Revenue            | 27.2 |
| Development Revenue       | 11.1 |
| Tobacco Revenue           | 9.7  |
| Airport Revenue           | 8.7  |
| Facilities Revenue        | 7.0  |
| Pollution Control Revenue | 6.1  |
| Other Revenue             | 5.6  |
| Transportation Revenue    | 4.4  |
| Utilities Revenue         | 2.6  |
| Housing Revenue           | 1.7  |
| Education Revenue         | 1.3  |

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|               |        |
|---------------|--------|
| Water Revenue | 1.1    |
| Power Revenue | 0.3    |
|               | 100.0% |

(h) At June 30, 2008, the net unrealized loss on investments based on cost for federal income tax purposes of \$451,177,623 was as follows:

|                                                                                                        |               |
|--------------------------------------------------------------------------------------------------------|---------------|
| Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost | \$19,478,863  |
| Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value | (27,163,952)  |
| Net unrealized gain                                                                                    | \$(7,685,089) |

For financial reporting purposes net unrealized loss on investments was \$11,647,490 and cost of investments aggregated \$455,140,024.

## FAS 157 Footnote Disclosures

Various inputs are used in determining the value of the Fund's investments. These inputs are summarized in the three broad levels listed below.

Highest priority is given to Level 1 inputs and lowest priority is given to Level 3.

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 risk, etc.)

Level 3 - significant unobservable inputs (including the Fund's own assumptions in determining fair value of investments)

The following is a summary of the inputs used as of June 30, 2008, in valuing the Fund's assets:

| Valuation Inputs                              | Investments<br>in Securities | Other Financial<br>Instruments |
|-----------------------------------------------|------------------------------|--------------------------------|
| Level 1 - Quoted Prices                       | 557,928                      | 0                              |
| Level 2 - Other Significant Observable Inputs | 442,934,606                  | (329,607)                      |
| Level 3 - Significant Unobservable Inputs     | 0                            | 0                              |
| Total                                         | 443,492,534                  | (329,607)                      |

## ITEM 2. CONTROLS AND PROCEDURES.

(a) Disclose the conclusions of the registrant's principal executive officer or officers and principal financial officer or officers, or persons performing similar functions, about 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 their 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

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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.

(a) A separate certification for each principal executive officer and principal financial officer of the registrant as required by Rule 30a-2 under the Act (17 CFR 270.30a-2).

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/ John F. Cogan, Jr.  
John F. Cogan, Jr, President

Date August 29, 2008

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/ John F. Cogan, Jr.  
John F. Cogan, Jr., President

Date August 29, 2008

By (Signature and Title)\* /s/ Mark Bradley  
Mark Bradley, Treasurer

Date August 29, 2008

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