

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST

Form N-CSR

November 29, 2010

OMB APPROVAL

OMB Number: 3235-0570
Expires: August 31, 2013
Estimated average burden
hours per response.....18.9

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

FORM N-CSR

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)

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: April 1, 2010 through September 30, 2010

Form N-CSR is to be used by management investment companies to file reports with the Commission not later than 10 days after the transmission to stockholders of any report that is required to be transmitted to stockholders under Rule 30e-1 under the Investment Company Act of 1940 (17 CFR 270.30e-1). The Commission may use the information provided on Form N-CSR in its regulatory, disclosure review, inspection, and policymaking roles.

A registrant is required to disclose the information specified by Form N-CSR, and the Commission will make this information public. A registrant is not required to respond to the collection of information contained in Form N-CSR 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.

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

ITEM 1. REPORTS TO SHAREOWNERS.

Pioneer Municipal High
Income Advantage Trust

Semiannual Report | September 30, 2010

Ticker Symbol: MAV

[LOGO] PIONEER
Investments (R)

visit us: pioneerinvestments.com

Table of Contents

Letter to Shareowners	2
Portfolio Management Discussion	4
Portfolio Summary	7
Prices and Distributions	8
Performance Update	9
Schedule of Investments	10
Financial Statements	21
Notes to Financial Statements	26
Trustees, Officers and Service Providers	36

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 1

President's Letter

Dear Shareowner,

Through the first nine months of 2010, the U.S. economy moved forward on a slow path to recovery. But with the memory of a deep recession still lingering, businesses and consumers remained cautious about both investing and spending. While business fundamentals showed signs of improvement, there was still a reluctance to hire, and high unemployment remains a problem. Wary investors, concerned about risk, gravitated towards cash and bonds. We remain generally optimistic about the prospects for economic recovery, although it may occur more slowly than many would like.

At Pioneer, we have long advocated the benefits of staying diversified and investing for the long term. This strategy has generally performed well for many investors. Bond markets certainly rewarded investors in the first nine months of 2010. While the equity markets barely budged, equities at the end of September 2010 were inexpensive relative to bonds, compared with historic levels, and represented potentially good value for long-term investors.

Pioneer has not changed the basic approach to investing that we have used for more than 80 years. We remain focused on company fundamentals and risk management. Our investment process is based on careful research into individual companies, quantitative analysis, and active portfolio management. This three-pillared process, which we apply to each of our portfolios, is supported by an integrated team approach and is designed to carefully balance risk and reward. Our experienced professionals devote themselves to the careful research needed to identify investment opportunities in markets around the world.

Our advice, as always, is to work closely with a trusted financial advisor to discuss your goals and work together to develop an investment strategy that meets your individual needs. There is no single best strategy that works for every investor.

2 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

We invite you to learn more about Pioneer and our time-tested approach to investing by consulting with your financial advisor or visiting us online at www.pioneerinvestments.com. We greatly appreciate your trust in us and we thank you for investing with Pioneer.

Sincerely,

/s/ Daniel K. Kingsbury

Daniel K. Kingsbury
President and CEO
Pioneer Investment Management USA, Inc.

Any information in this shareowner report regarding market or economic trends or the factors influencing the Trust's historical or future performance are statements of the opinion of Trust management as of the date of this report. These statements should not be relied upon for any other purposes. Past performance is no guarantee of future results, and there is no guarantee that market forecasts discussed will be realized.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 3

Portfolio Management Discussion | 9/30/10

In the following interview, David Eurkus, who is responsible for the daily management of Pioneer Municipal High Income Advantage Trust, discusses some of the factors that affected the municipal bond market and the Trust over the six-month period ended September 30, 2010.

Q How did the Trust perform over the six months ended September 30, 2010?

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

A For the six-month period ended September 30, 2010, Pioneer Municipal High Income Advantage Trust produced a total return of 10.73% at net asset value and 11.88% at market price, and the Trust's shares were selling at an 8.1% premium of market price to net asset value on September 30, 2010. Over the same six-month period, the Trust's benchmarks, the Barclays Capital Municipal Bond Index, which tracks the performance of investment-grade bonds, returned 5.51%; and the Barclays Capital High Yield Municipal Bond Index returned 7.78%. Unlike the Trust, the two Barclays Capital indices are not leveraged. On September 30, 2010, the Trust held 151 issues in 36 states, territories and the District of Columbia.

The Trust's 30-day SEC yield was 8.07% on September 30, 2010, and its taxable equivalent yield was 11.80%, based on the maximum Federal income tax rate of 35%. As of September 30, 2010, roughly 19% of the Trust's investments were subject to the Federal Alternative Minimum Tax (AMT).

Q What was the investment environment like during the six-month period ended September 30, 2010?

A The investment environment for both the municipal bond market and the Trust was positive over the six months ended September 30, 2010, as market interest rates continued to decline. In a slow-growing economy, inflation remained subdued and the Federal Reserve Board (the Fed) maintained an accommodative monetary policy designed to stimulate economic growth. Against that backdrop, demand for municipal securities was robust, as traditional and non-traditional buyers came into the market.

Q How did you position the Trust in that environment over the six months ended September 30, 2010, and what factors most affected the Trust's performance during the period?

A We did not make any significant changes to the Trust's portfolio over the six months ended September 30, 2010. More than a year ago, we had positioned the Trust's portfolio in an effort to take advantage of market areas that had

4 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

become oversold in the financial crisis. We were particularly drawn to sectors that typically support the U.S. economy, and that approach benefited the Trust. Over the six months ended September 30, 2010, the Trust remained fully invested and diversified.

At September 30, 2010, 57.8% of the Trust's total investment portfolio was invested in investment-grade bonds, and 39.9% of the Trust's total investment portfolio was invested in below investment-grade bonds. The Trust also had a 2.3% cash position.

In general, the higher-rated bonds in the Trust's portfolio underperformed the lower-rated securities. While most of the Trust's holdings did well, there were some that fell short of our expectations. Examples are: California Statewide Environmental Facility; and two positions (one in California and one in Texas) in Microgy Holdings Alternative Energy Facility. Those positions declined in value, and have been liquidated from the Trust.

As of September 30, 2010, health care (35.6% of the Trust's total investment portfolio) was the Trust's biggest position, followed by transportation (13.8% of the Trust's total investment portfolio), tobacco (11.0% of the Trust's total investment portfolio) and pollution control (6.5% of the Trust's total investment portfolio). The Trust also held bonds in the housing, pollution control, power and water and sewer sectors. Most of the

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

Trust's assets were held in revenue bonds. The payment of interest and principal on revenue bonds is covered by revenues generated from the particular asset the bond was issued to finance. For example, a bond issued to fund a continuing care retirement community is backed by the revenue that accrues from users of that facility.

Q What is your outlook?

A As we look ahead, we believe the environment for municipal bonds in which the Trust invests should continue to be positive. We expect economic growth to be slow, but steady, and believe that the Fed will keep interest rates at current levels into 2011. Personal income tax rates on higher-income earners may go up, depending on Congressional actions, and it appears possible that the Build America Bonds (BAB) program could be extended into 2011. BABs are taxable municipal debt instruments that are subsidized by the U.S. Treasury. Continued issuance of these bonds could dampen the supply of tax-exempt bonds. We believe all of those factors are likely to drive investment in municipal securities and should benefit the Trust. We believe municipal bonds in which the Trust invests should continue to provide investors with a relatively stable and competitive stream of income.

Please refer to the Schedule of Investments on pages 10-20 for a full listing of Trust securities.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 5

Investments in high-yield or lower-rated securities are subject to greater-than-average risk. The Trust may invest in securities of issuers that are in default or that are in bankruptcy.

A portion of income may be subject to state, federal, and/or alternative minimum tax. Capital gains, if any, are subject to a capital gains tax. When interest rates rise, the prices of fixed-income securities in the Trust will generally fall. Conversely, when interest rates fall, the prices of fixed-income securities in the Trust will generally rise. By concentrating in municipal securities, the portfolio is more susceptible to adverse economic, political or regulatory developments than is a portfolio that invests more broadly. Investments in the Trust are subject to possible loss due to the financial failure of the issuers of the underlying securities and their inability to meet their debt obligations.

The Trust uses leverage through the issuance of preferred shares. Leverage creates significant risks, including the risk that the Trust's income or capital appreciation will not be sufficient to cover the cost of leverage, which may adversely affect the return for the holders of common shares. Since February of 2008, regularly scheduled auctions for the Trust's preferred shares have failed and preferred shareowners have not been able to sell their shares at auction. The Board of Trustees of the Trust has considered, and continues to consider, this issue.

The Trust is required to maintain certain regulatory and rating agency asset coverage requirements in connection with its outstanding preferred shares. In order to maintain required asset coverage levels, the Trust may be required to alter the composition of its investment portfolio or take other actions, such as redeeming preferred shares with the proceeds from portfolio transactions, at what might be inopportune times in the market. Such actions could reduce the net earnings or returns to holders of the Trust's common shares over time.

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

Risks of investing in the Trust are discussed in greater detail in the Trust's original offering documents relating to its common shares and shareowner reports issued from time to time.

Past performance is no guarantee of future results, and there is no guarantee that market forecasts discussed will be realized.

Any information in this shareowner report regarding market or economic trends or the factors influencing the Trust's historical or future performance are statements of the opinion of Trust management as of the date of this report. These statements should not be relied upon for any other purposes.

6 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Portfolio Summary | 9/30/10

Portfolio Diversification

(As a percentage of total investment portfolio)

[The following data was represented as a pie chart in the printed material]

Health Revenue	35.6%
Insured	12.0%
Airport Revenue	11.4%
Tobacco Revenue	11.0%
Other Revenue	7.5%
Pollution Control Revenue	6.5%
Development Revenue	4.8%
Housing Revenue	2.9%
Facilities Revenue	2.5%
Transportation Revenue	2.4%
Water Revenue	1.2%
Education Revenue	1.1%
Power Revenue	1.1%

Portfolio Maturity

(As a percentage of long-term holdings)

[The following data was represented as a pie chart in the printed material]

1-3 years	17.5%
3-6 years	15.5%
6-8 years	10.4%
8-10 years	12.7%
10+ years	38.3%

Quality Distribution

(As a percentage of total investment portfolio; based on S&P ratings)

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

[The following data was represented as a pie chart in the printed material]

AAA	13.5%
AA	4.6%
A	6.0%
BBB	24.8%
BB	5.9%
B	5.9%
CCC	3.9%
D	1.4%
Not Rated	34.0%

The portfolio is actively managed and current holdings may be different.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 7

Prices and Distributions | 9/30/10

Share Prices and Distributions

Market Value per Common Share

9/30/10	3/31/10
\$ 14.08	\$ 13.10

Net Asset Value per Common Share

9/30/10	3/31/10
\$ 13.02	\$ 12.24

Distributions per Common Share

Net Investment Income	Short-Term Capital Gains	Long-Term Capital Gains
-----------------------	--------------------------	-------------------------

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

 4/1/10-9/30/10 \$ 0.520 \$ -- \$ --

10 Largest Holdings

(As a percentage of long-term holdings)*

1.	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29	2.83%
2.	University of California, RIB, 12.988%, 5/15/38	2.64
3.	Massachusetts Housing Finance Agency, 5.35%, 12/1/45	2.45
4.	North Texas Tollway Authority Revenue, 5.75%, 1/1/33	2.38
5.	Indiana State Development Finance Authority Revenue, 5.75%, 10/1/11	2.31
6.	Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29	2.28
7.	California State Various Purpose, RIB, 12.641%, 6/1/37 (144A)	2.06
8.	Non-Profit Preferred Funding Trust I, Series E, 12.0%, 9/15/37 (144A)	1.99
9.	Tobacco Settlement Financing Corp., 6.25%, 6/1/42	1.87
10.	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	1.87

* This list excludes temporary cash investments. The portfolio is actively managed, and current holdings may be different. The holdings listed should not be considered recommendations to buy or sell any security listed.

8 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Performance Update | 9/30/10

Investment Returns

 The mountain chart on the right shows the change in market value, including reinvestment of dividends and distributions, of a \$10,000 investment made in common shares of Pioneer Municipal High Income Advantage Trust, compared to that of the Barclays Capital Municipal Bond Index and the Barclays Capital High Yield Municipal Bond Index.

Cumulative Total Returns
 (As of September 30, 2010)

Period	Net Asset Value	Market Price
Life-of-Trust (10/17/2003)	50.60%	55.58%
5 Years	27.18	37.26
1 Year	16.68	25.04

[The following data was represented as a mountain chart in the printed material]

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

Value of \$10,000 Investment

	Pioneer Municipal High Income Advantage Trust	Barclays Capital Municipal Bond Index	Barclays Capital High Yield Municipal Bond Index
10/03	10,000	10,000	10,000
9/04	9,965	10,513	11,043
9/05	11,335	10,939	12,231
9/06	12,310	11,425	13,544
9/07	13,392	11,779	13,932
9/08	9,595	11,559	12,533
9/09	12,443	13,275	13,104
9/10	15,558	14,046	14,694

Call 1-800-225-6292 or visit www.pioneerinvestments.com for the most recent month-end performance results. Current performance may be lower or higher than the performance data quoted.

Performance data shown represents past performance. Past performance is no guarantee of future results. Investment return and market price will fluctuate, and your shares may trade below net asset value (NAV) due to such factors as interest rate changes and the perceived credit quality of borrowers.

Total investment return does not reflect broker sales charges or commissions. All performance is for common shares of the Trust.

Closed-end funds, unlike open-end funds, are not continuously offered. There is a one-time public offering and, once issued, shares of closed-end funds are sold in the open market through a stock exchange, and frequently trade at prices lower than their NAV. NAV per common share is total assets less total liabilities, which includes preferred shares, divided by the number of common shares outstanding.

When NAV is lower than market price, dividends are assumed to be reinvested at the greater of NAV or 95% of the market price. When NAV is higher, dividends are assumed to be reinvested at prices obtained under the Trust's dividend reinvestment plan.

The performance table and graph do not reflect the deduction of fees and taxes that a shareowner would pay on Trust distributions or the sale of Trust shares.

Index comparison begins October 31, 2003. The Barclays Capital Municipal Bond Index is a broad measure of the municipal bond market. Barclays Capital High Yield Municipal Bond Index totals over \$26 billion in market value and maintains over 1300 securities. Municipal bonds in this index have the following requirements: maturities of one year or greater, sub investment grade (below Baa or non-rated), fixed coupon rate, issue date later than 12/31/90, deal size over \$20 million, maturity size of at least \$3 million. Index returns are calculated monthly, assume reinvestment of dividends and, unlike Trust returns, do not reflect any fees, expenses or sales charges. The indices are not leveraged. You cannot invest directly in the indices.

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

Schedule of Investments | 9/30/10 (unaudited)

Principal Amount	S&P/Moody's Ratings (unaudited)		Value

		TAX-EXEMPT OBLIGATIONS -- 143.2% of Net Assets	
		Alabama -- 0.7%	
\$ 2,500,000	NR/NR	Huntsville-Redstone Village Special Care Facilities Financing Authority, 5.5%, 1/1/43	\$ 2,

		Arizona -- 3.4%	
5,000,000	NR/NR	Casa Grande Industrial Development Authority Hospital Revenue, 7.625%, 12/1/29	\$ 5,
1,521,000	NR/Baa3	Pima County Industrial Development Authority, 6.75%, 7/1/31	1,
2,640,000	NR/NR	Pima County Industrial Development Authority, 7.0%, 1/1/38	2,
1,000,000	NR/NR	San Luis Facility Development Corp., 7.25%, 5/1/27	
			----- \$ 10,

		California -- 12.8%	
3,140,000 (a)	AAA/Aaa	California State University Revenue, RIB, 12.715%, 11/1/39 (144A)	\$ 3,
2,425,000	A-/A1	California State Various Purpose, 5.75%, 4/1/31	2,
8,575,000 (a)	AAA/NR	California State Various Purpose, RIB, 12.678%, 6/1/37 (144A)	9,
803,175 (b)	NR/NR	California Statewide Communities Development Authority, 9.0%, 12/1/38	
2,680,000+	AAA/Aaa	Golden State Tobacco Securitization Corp., 6.75%, 6/1/39	3,
2,500,000	A/A2	San Jose California Airport Revenue, 5.0%, 3/1/37	2,
10,500,000 (a)	AAA/NR	University of California, RIB, 13.025%, 5/15/38	11,
7,670,000 (b)	D/NR	Valley Health System Hospital Revenue, 6.875%, 5/15/23	5,
			----- \$ 38,

		Colorado -- 1.0%	
2,850,000+	NR/NR	Denver Health & Hospital Authority Healthcare Revenue, 6.0%, 12/1/31	\$ 3,

		Connecticut -- 2.6%	
7,750,000	BBB/NR	Connecticut State Development Authority Revenue, 5.75%, 11/1/37	\$ 7,

		District of Columbia -- 3.1%	
2,700,000	BBB/Baa3	District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$ 2,
6,825,000	BBB/Baa3	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	6,
			----- \$ 9,

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

4,500,000	BBB/Baa1	Florida -- 3.7% Hillsborough County Industrial Development Authority Pollution Control Revenue, 5.5%, 10/1/23	\$ 4,
-----------	----------	---	-------

The accompanying notes are an integral part of these financial statements.

10 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Principal Amount	S&P/Moody's Ratings (unaudited)		Value

\$ 1,980,000	NR/NR	Florida -- (continued) Hillsborough County Industrial Development Authority Revenue, 6.75%, 7/1/29	\$ 1,9
1,000,000	BBB/Aaa	Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32	1,4
500,000	NR/NR	Miami Beach Health Facilities Authority, 5.375%, 11/15/28	4
2,500,000	A-/A2	Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41	2,6

			\$ 11,1

5,210,000 (a)	NR/Aaa	Georgia -- 4.5% Atlanta Georgia Water and Wastewater Revenue, RIB, 12.715%, 11/1/43 (144A)	\$ 5,4
1,000,000	CCC+/NR	Clayton County Development Authority Special Facilities Revenue, 9.0%, 6/1/35	1,0
900,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.0%, 9/1/30	9
750,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.125%, 9/1/40	7
1,065,000	NR/Ba3	Effingham County Industrial Development Authority, 6.5%, 6/1/31	1,0
3,360,000	NR/NR	Fulton County Residential Care Facilities, 7.0%, 7/1/29	2,5
1,650,000	NR/NR	Savannah Georgia Economic Development Authority Revenue, 7.4%, 1/1/34	1,6

			\$ 13,5

1,000,000	B/NR	Guam -- 2.0% Guam Government Department Education Certificates Participation, 6.625%, 12/1/30	\$ 1,0
4,400,000+	AAA/B2	Northern Mariana Islands, 6.75%, 10/1/33	5,0

			\$ 6,1

2,000,000	BBB+/Baa1	Idaho -- 1.7% Power County Industrial Development Corp., 6.45%, 8/1/32	\$ 2,0
3,000,000	BBB+/Baa1	Power County Pollution Control Revenue, 5.625%, 10/1/14	3,0

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

Principal Amount	S&P/Moody's Ratings (unaudited)	Description	Value
3,000,000 (c)	NR/NR	Illinois -- 8.2% Centerpoint Intermodal Center, 7.5%, 6/15/23 (144A)	\$ 3,000,000
2,000,000	NR/Caa2	City of Chicago Illinois, 5.5%, 12/1/30	1,600,000
1,450,000	A+/A1	Illinois Finance Authority Revenue, 5.5%, 4/1/39	1,450,000
2,000,000	AAA/Aa3	Illinois Finance Authority Revenue, 6.0%, 8/15/25	2,100,000
1,000,000	NR/NR	Illinois Finance Authority Revenue, 6.0%, 11/15/27	700,000

The accompanying notes are an integral part of these financial statements.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 11

Schedule of Investments | 9/30/10 (unaudited) (continued)

Principal Amount	S&P/Moody's Ratings (unaudited)	Description	Value
Illinois -- (continued)			
\$ 2,000,000	AA+/Aa2	Illinois Finance Authority Revenue, 6.0%, 8/15/39	\$ 2,000,000
2,500,000	NR/NR	Illinois Finance Authority Revenue, 6.125%, 11/15/25	2,500,000
6,000,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 5/15/45	5,000,000
2,500,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 2/15/46	2,500,000
1,500,000 (b)	NR/NR	Illinois Health Facilities Authority Revenue, 6.9%, 11/15/33	1,500,000
2,525,000	NR/NR	Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,500,000
\$ 24,000,000			
Indiana -- 5.6%			
250,000	BBB/Baa2	East Chicago Indiana Exempt Facilities Revenue, 7.0%, 1/1/14	\$ 250,000
10,000,000	BBB/NR	Indiana State Development Finance Authority Revenue, 5.75%, 10/1/11	10,000,000
5,000,000	NR/Ba3	Jasper County Industrial Economic Development Revenue, 5.6%, 4/1/29	4,000,000
1,995,000	NR/NR	Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	1,995,000
\$ 16,000,000			
Kentucky -- 1.5%			
500,000	BB-/NR	Kentucky Economic Development Finance Authority Hospital System Revenue, 5.7%, 10/1/10	\$ 500,000
4,400,000	BB-/NR	Kentucky Economic Development Finance Authority Hospital System Revenue, 5.875%, 10/1/22	4,400,000
\$ 4,900,000			
Louisiana -- 5.0%			
2,500,000	BB+/Ba2	Louisiana Local Government Environmental Facilities	2,500,000

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

6,000,000	NR/Baa1	Development Authority Revenue, 6.75%, 11/1/32 Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	\$ 2,
750,000	BBB+/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	6,
5,915,000	BBB/Baa3	Tobacco Settlement Financing Corp., 5.875%, 5/15/39	5,
			----- \$ 15,

460,000	NR/NR	Maryland -- 0.8% Maryland Health & Higher Educational Facilities Authority Revenue, 5.25%, 1/1/27	\$
1,250,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.3%, 1/1/37	
1,250,000	NR/Baa3	Maryland Health & Higher Educational Facilities Authority Revenue, 5.75%, 7/1/38	1,
			----- \$ 2,

The accompanying notes are an integral part of these financial statements.

12 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Principal Amount	S&P/Moody's Ratings (unaudited)		
\$ 755,000	BB/NR	Massachusetts -- 8.5% Massachusetts Development Finance Agency, 5.25%, 10/1/18	
5,000,000	A/NR	Massachusetts Development Finance Agency, 5.75%, 1/1/42	
1,930,000	NR/NR	Massachusetts Development Finance Agency, 7.1%, 7/1/32	
2,195,000	BBB-/Baa3	Massachusetts Health & Educational Facilities Authority Revenue, 5.375%, 7/15/28	
1,000,000+	AAA/Aaa	Massachusetts Health & Educational Facilities Authority Revenue, 6.35%, 7/15/32	
3,420,000	NR/NR	Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38	
10,760,000	AA-/Aa3	Massachusetts Housing Finance Agency, 5.35%, 12/1/45	

1,500,000+	AAA/A3	Michigan -- 3.5% Delta County Michigan Economic Development Corp., 6.25%, 4/15/27	
500,000	NR/Bal	Flint Michigan Hospital Building Authority Revenue, 7.375%, 7/1/35	
3,000,000+	NR/NR	Macomb County Hospital Finance Authority Revenue, 5.875%, 11/15/34	

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

735,000	NR/NR	Michigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36
4,130,000	BB-/Ba3	Michigan State Hospital Finance Authority Revenue, 5.5%, 8/15/23
3,405,000 (d) (e)	NR/NR	Wayne Charter Escrow, 0.0%, 12/1/15

1,500,000 (b)	NR/Ca	Missouri -- 0.8% St. Louis Industrial Development Authority Revenue, 7.2%, 12/15/28
6,640,000 (b)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35

2,445,000 (f)	NR/NR	Montana -- 0.5% Hardin Increment Industrial Infrastructure Development Revenue, 0.0%, 9/1/31
1,000,000 (b)	NR/NR	Two Rivers Authority, Inc., Project Revenue, 7.375%, 11/1/27

1,500,000	A/A2	Nevada -- 2.2% Henderson Nevada Health Care Facilities Revenue, 5.625%, 7/1/24

The accompanying notes are an integral part of these financial statements.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 13

Schedule of Investments | 9/30/10 (unaudited) (continued)

Principal Amount	S&P/Moody's Ratings (unaudited)	

\$ 1,600,000 (b)	NR/NR	Nevada -- (continued) Nevada State Department of Business & Industry, 7.25%, 1/1/23
1,000,000 (b)	NR/NR	Nevada State Department of Business & Industry, 7.375%, 1/1/30
1,320,000 (b) (g)	NR/NR	Nevada State Department of Business & Industry, 7.375%, 1/1/40
5,000,000	A-/A3	Reno Nevada Hospital Revenue, 5.25%, 6/1/41

1,125,000	NR/NR	New Hampshire -- 0.4% New Hampshire Health & Educational Facilities Authority Revenue, 5.875%, 7/1/34

2,500,000	NR/NR	New Jersey -- 12.6% Burlington County New Jersey Bridge Commission

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

		Revenue, 5.625%, 1/1/38	
13,000,000	B/B3	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29	
3,500,000 (a)	NR/Aaa	New Jersey State Turnpike Authority, RIB, 13.439%, 1/1/28 (144A)	
15,375,000	AA+/Aa1	New Jersey Transportation Trust Fund Authority Revenue, 0.0%, 12/15/27	
1,000,000+	AAA/Aaa	Tobacco Settlement Financing Corp., 6.25%, 6/1/43	
3,250,000+	AAA/Aaa	Tobacco Settlement Financing Corp., 6.75%, 6/1/39	
5,000,000+	AAA/Aaa	Tobacco Settlement Financing Corp., 7.0%, 6/1/41	

		New York -- 7.8%	
1,800,000	NR/NR	Dutchess County Industrial Development Agency, 7.5%, 3/1/29	
3,000,000	NR/NR	Nassau County New York Industrial Development Agency Revenue, 6.7%, 1/1/43	
5,000,000	BB-/B1	New York City Industrial Development Agency, 5.25%, 12/1/32	
3,950,000	BB-/B1	New York City Industrial Development Agency, 7.625%, 12/1/32	
2,000,000	NR/Ba1	New York State Dormitory Authority Revenue, 6.125%, 12/1/29	
5,000,000	AAA/Aaa	New York State Environmental Facilities Corp., 5.0%, 6/15/33	
3,000,000	NR/NR	Ulster County New York Industrial Development Agency, 6.0%, 9/15/27	
500,000	NR/NR	Ulster County New York Industrial Development Agency, 6.0%, 9/15/37	

The accompanying notes are an integral part of these financial statements.

14 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Principal Amount	S&P/Moody's Ratings (unaudited)		Value
		North Carolina -- 1.7%	
\$ 5,010,000	NR/NR	Charlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28	\$ 5,

		Ohio -- 3.0%	
2,375,000	NR/NR	Belmont County Health System Revenue, 5.7%, 1/1/13	\$ 1,
1,000,000	NR/NR	Belmont County Health System Revenue, 5.8%, 1/1/18	
5,000,000	BBB/Baa3	Buckeye Tobacco Settlement Financing Authority, RB, Asset-Backed, 6.5%, 6/1/47	4,
3,000,000	CCC+/B3	Cleveland Airport Special Revenue, 5.375%, 9/15/27	2,

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

Principal Amount	S&P/Moody's Ratings (unaudited)	State	Yield	Maturity	Value
		Oklahoma -- 2.7%			
1,295,000	BB/NR	Jackson County Memorial Hospital Authority Revenue,	7.3%	8/1/15	\$ 1,
2,220,000	B-/Caa2	Tulsa Municipal Airport Trust Revenue,	6.25%	6/1/20	2,
1,500,000	B-/Caa2	Tulsa Municipal Airport Trust Revenue,	7.35%	12/1/11	1,
3,000,000 (c)	NR/Caa2	Tulsa Municipal Airport Trust Revenue,	7.75%	6/1/35	3,
		Oregon -- 1.0%			
3,000,000	A-/NR	Oregon State Facilities Authority Revenue,	5.25%	10/1/40	\$ 3,
		Pennsylvania -- 8.3%			
3,000,000+	AAA/NR	Allegheny County Hospital Development Authority Revenue,	9.25%	11/15/22	\$ 3,
500,000+	AAA/NR	Allegheny County Hospital Development Authority Revenue,	9.25%	11/15/30	
3,600,000	CCC/NR	Columbia County Hospital Authority Revenue,	5.85%	6/1/24	3,
830,000	BBB/Ba2	Hazleton Health Services Authority Hospital Revenue,	6.125%	7/1/16	
1,430,000	BB/NR	Pennsylvania Economic Development Financing Authority Revenue,	5.125%	6/1/18	1,
2,330,000	BB/NR	Pennsylvania Economic Development Financing Authority Revenue,	5.35%	6/1/11	2,
5,000,000	B+/Caa2	Pennsylvania Economic Development Financing Authority Revenue,	6.0%	6/1/31	4,
5,000,000	BBB/Baa3	Philadelphia Hospitals & Higher Education Facilities Authority Revenue,	5.0%	7/1/34	4,
2,005,000	B-/NR	Scranton-Lackawanna Health & Welfare Authority Revenue,	6.1%	7/1/11	1,
2,245,000	B-/NR	Scranton-Lackawanna Health & Welfare Authority Revenue,	6.15%	7/1/12	2,
					\$ 24,

The accompanying notes are an integral part of these financial statements.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 15

Schedule of Investments | 9/30/10 (unaudited) (continued)

Principal Amount	S&P/Moody's Ratings (unaudited)	State	Yield	Maturity	Value
		Rhode Island -- 3.1%			
\$ 1,385,000	NR/NR	Central Falls Rhode Island Detention Facilities Revenue,	7.25%	7/15/35	\$ 1,2
8,285,000	BBB/Baa3	Tobacco Settlement Financing Corp.,	6.25%	6/1/42	8,2

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

				\$ 9,4
1,500,000 (b)	D/NR	South Carolina -- 5.1%	Connector 2000 Association, Inc., Toll Road Revenue, 5.375%, 1/1/38	\$ 2
7,140,000+	BBB+/Baa1	South Carolina Jobs Economic Development Authority	Revenue, 6.375%, 8/1/34	8,2
860,000+	BBB+/Baa1	South Carolina Jobs Economic Development Authority	Revenue, 6.375%, 8/1/34	9
4,400,000 (h)	BBB/Baa3	Tobacco Settlement Revenue Management,	6.375%, 5/15/30	5,7
				\$ 15,1
1,000,000+	NR/Baa1	Tennessee -- 3.7%	Johnson City Health & Educational Facilities Board Hospital Revenue, 7.5%, 7/1/33	\$ 1,1
7,000,000	NR/A1	Knox County Health Educational & Housing Facilities Board Hospital Revenue, 6.5%, 4/15/31		7,4
2,400,000	BBB+/NR	Sullivan County Health Educational and Housing Facilities Board Hospital Revenue, 5.25%, 9/1/36		2,3
				\$ 10,9
2,827,399 (b)	NR/NR	Texas -- 16.1%	Gulf Coast Industrial Development Authority, 7.0%, 12/1/36	\$ 2
10,000,000	CCC+/B3	Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29		10,0
845,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/16		7
1,000,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/21		8
1,350,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.125%, 5/1/26		1,1
2,750,000	AAA/Aa3	Lower Colorado River Authority, 5.0%, 5/15/31		2,7
845,000	NR/NR	Lubbock Health Facilities Development Corp., 6.5%, 7/1/26		8
2,000,000	NR/NR	Lubbock Health Facilities Development Corp., 6.625%, 7/1/36		1,9
7,750,000 (c)	BBB-/Ba1	Matagorda County Navigation District Number 1 Revenue, 5.95%, 5/1/30		7,7
9,750,000	BBB+/A3	North Texas Tollway Authority Revenue, 5.75%, 1/1/33		10,4
1,711,000	NR/Aaa	Panhandle Regional Housing Finance Corp. Multifamily Housing Revenue, 6.6%, 7/20/31		1,8

The accompanying notes are an integral part of these financial statements.

16 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Principal Amount	S&P/Moody's Ratings (unaudited)
------------------	---------------------------------

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

			Texas -- (continued)
\$	1,000,000	BBB-/Baa2	Richardson Hospital Authority Revenue, 6.0%, 12/1/34
	1,000,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.125%, 11/15/39
	1,500,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.25%, 11/15/44
	1,000,000	BB/NR	Texas Midwest Public Facility Corp. Revenue, 9.0%, 10/1/30
	4,700,000	NR/Baa3	Tomball Hospital Authority, 6.0%, 7/1/25

	1,600,000	NR/NR	Utah -- 0.5% Spanish Fork Charter School Revenue, 5.7%, 11/15/36 (144A)

	2,000,000	BBB+/Baa1	Virginia -- 0.8% Washington County Industrial Development Authority Revenue, 7.75%, 7/1/38

	1,155,000	BBB/Baa3	Washington -- 3.0% Tobacco Settlement Authority Revenue, 6.5%, 6/1/26
	2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.125%, 8/15/37
	2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.25%, 8/15/42
	5,000,000	NR/NR	Washington State Housing Finance Commission Nonprofit Revenue Bonds, 5.625%, 1/1/27

	2,900,000 (b) (g)	NR/NR	Wisconsin -- 1.3% Aztalan Wisconsin Exempt Facilities Revenue, 7.50%, 5/1/18
	1,000,000	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.125%, 4/1/24
	1,000,000	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.25%, 4/1/34
	1,500,000	A+/A1	Wisconsin State Health & Educational Facilities Authority Revenue, 6.625%, 2/15/39

			TOTAL TAX-EXEMPT OBLIGATIONS (Cost \$409,712,820)

	13,000,000 (c) (g)	NR/NR	MUNICIPAL COLLATERALIZED DEBT OBLIGATION -- 2.9% of Non-Profit Preferred Funding Trust I, Series E, 12.0%, 9/15/37 (144A)

			TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$13,000,000)

The accompanying notes are an integral part of these financial statements.

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

Schedule of Investments | 9/30/10 (unaudited) (continued)

Shares		Value
109,889 (d)	COMMON STOCK -- 0.4% of Net Assets Delta Airlines, Inc.	\$ 1,279,108
	TOTAL COMMON STOCK (Cost \$3,210,349)	\$ 1,279,108
	TOTAL INVESTMENTS IN SECURITIES -- 146.5% (Cost \$425,923,169) (i) (j)	\$ 439,692,522
	OTHER ASSETS AND LIABILITIES -- 3.5%	\$ 10,323,570
	PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE -- (50.0)%	\$ (150,007,264)
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS -- 100.0%	\$ 300,008,828

(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 September 30, 2010, the value of these securities amounted to \$36,676,534, or 12.2% 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) The interest rate is subject to change periodically and inversely based upon prevailing market rates. The rate shown is the coupon rate at September 30, 2010.

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

(c) The interest rate is subject to change periodically. The interest rate shown is the rate at September 30, 2010.

(d) Non-income producing.

(e) Security is fair valued (See Note A).

(f) 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 September 30, 2010.

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

(g) Indicates a security that has been deemed illiquid. The aggregate cost of illiquid securities is \$16,342,114. The aggregate value is \$9,147,100, or 3.0% of the total net assets applied to common shareowners.

(h) Escrow to maturity.

The accompanying notes are an integral part of these financial statements.

18 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

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

Insured	
FSA	7.2%
AMBAC	1.9
MBIA	1.6
AGM	1.1
Q-SBLF	0.2
Revenue Bonds:	
Health Revenue	35.6
Airport Revenue	11.4
Tobacco Revenue	11.0
Other Revenue	7.5
Pollution Control Revenue	6.5
Development Revenue	4.8
Housing Revenue	2.9
Facilities Revenue	2.5
Transportation Revenue	2.4
Water Revenue	1.2
Education Revenue	1.1
Power Revenue	1.1
Utilities Revenue*	0.0

	100.0%
	=====

* Amount is less than 0.1%

(j) At September 30, 2010, the net unrealized gain on investments based on cost for federal income tax purposes of \$419,793,749 was as follows:

Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost	\$49,888,681
Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value	(29,989,908)

Net unrealized gain	\$19,898,773
	=====

For financial reporting purposes net unrealized gain on investments was \$13,769,353 and cost of investments aggregated \$425,923,169.

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

Purchases and sales of securities (excluding temporary cash investments) for the year ended September 30, 2010 aggregated \$23,390,525 and \$17,404,880, respectively.

The accompanying notes are an integral part of these financial statements.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 19

Schedule of Investments | 9/30/10 (unaudited) (continued)

Various inputs are used in determining the value of the Trust'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 Trust's own assumptions in determining fair value of investments)

The following is a summary of the inputs used as of September 30, 2010, in valuing the Trust's Investments:

	Level 1	Level 2	Level 3	Total
Tax-exempt obligations	\$ --	\$429,645,530	\$--	\$429,645,530
Tax-exempt obligations (Michigan)	--	--	34	34
Municipal collateralized debt obligation	--	8,767,850	--	8,767,850
Common stock	1,279,108	--	--	1,279,108
Total	\$1,279,108	\$438,413,380	\$34	\$439,726,482

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

	Tax-Exempt Obligations
Balance as of 3/31/10	\$ --
Realized gain (loss)	--
Change in unrealized appreciation (depreciation)	--
Net purchases (sales)	--
Transfers in and out of Level 3*	34
Balance as of 9/30/10	\$ 34

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

* Transfers are calculated on the date of transfer.

The accompanying notes are an integral part of these financial statements.

20 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Statement of Assets and Liabilities | 9/30/10 (unaudited)

ASSETS:

Investments in securities, at value (cost \$425,923,169)	\$439,692,522
Cash	130,847
Receivables --	
Investment securities sold	3,245,000
Interest	9,322,903
Prepaid expenses	47,837

Total assets	\$452,439,109
--------------	---------------

LIABILITIES:

Payable --	
Dividends payable to common shareowners	\$ 2,074,495
Due to affiliates	231,878
Administration fee payable	25,867
Accrued expenses	90,777

Total liabilities	\$ 2,423,017
-------------------	--------------

PREFERRED SHARES AT REDEMPTION VALUE:

\$25,000 liquidation value per share applicable to 6,000 shares, including dividends payable of \$7,264	\$150,007,264
--	---------------

NET ASSETS APPLICABLE TO COMMON SHAREOWNERS:

Paid-in capital	\$327,448,915
Undistributed net investment income	13,846,865
Accumulated net realized loss on investments	(55,056,305)
Net unrealized gain on investments	13,769,353

Net assets applicable to common shareowners	\$300,008,828
---	---------------

NET ASSET VALUE PER SHARE:

No par value (unlimited number of shares authorized)	
Based on \$300,008,828/23,049,949 common shares	\$ 13.02

The accompanying notes are an integral part of these financial statements.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

21

Statement of Operations (unaudited)

For the Six Months Ended 9/30/10

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

INVESTMENT INCOME:		
Interest		\$15,312,389

EXPENSES:		
Management fees	\$1,383,047	
Administrative fees	154,340	
Transfer agent fees and expenses	6,050	
Shareowner communication expenses	12,434	
Auction agent fees	188,230	
Custodian fees	7,758	
Registration fees	11,437	
Professional fees	58,831	
Printing expense	18,932	
Trustees' fees	6,564	
Pricing fees	9,455	
Miscellaneous	24,793	

Total expenses		\$ 1,881,871

Net investment income		\$13,430,518

REALIZED AND UNREALIZED GAIN (LOSS) ON INVESTMENTS:		
Net realized gain from investments	\$1,047,965	
Change in net unrealized loss from investments	15,615,778	

Net gain on investments		\$16,663,743

DISTRIBUTIONS TO PREFERRED SHAREOWNERS FROM NET INVESTMENT INCOME		\$ (369,137)

Net increase in net assets applicable to common shareowners resulting from operations		\$29,725,124
=====		

The accompanying notes are an integral part of these financial statements.

22 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Statement of Changes in Net Assets

For the Six Months Ended 9/30/10 and the Year Ended 3/31/10, respectively

	Six Months Ended 9/30/10 (unaudited)	Year End 3/31/10

FROM OPERATIONS:		
Net investment income	\$ 13,430,518	\$ 27,143
Net realized gain (loss) on investments and interest rate swaps	1,047,965	(7,488)
Change in net unrealized gain (loss) on investments and interest		

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

rate swaps	15,615,778	72,295
Distributions to preferred shareowners from net investment income	(369,137)	(847)

Net increase in net assets applicable to common shareowners resulting from operations	\$ 29,725,124	\$ 91,103

DISTRIBUTIONS TO COMMON SHAREOWNERS:		
Net investment income (\$0.52 and \$0.96 per share, respectively)	\$ (11,971,750)	\$ (22,013)

Total distributions to common shareowners	\$ (11,971,750)	\$ (22,013)

FROM TRUST SHARE TRANSACTIONS:		
Reinvestment of distributions	\$ 704,445	\$ 1,313

Net increase in net assets applicable to common shareowners resulting from Trust share transactions	\$ 704,445	\$ 1,313

Net increase in net assets applicable to common shareowners	\$ 18,457,819	\$ 70,404
NET ASSETS APPLICABLE TO COMMON SHAREOWNERS:		
Beginning of year	281,551,009	211,146

End of year	\$ 300,008,828	\$281,551

Undistributed net investment income	\$ 13,846,865	\$ 12,757

The accompanying notes are an integral part of these financial statements.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

23

Financial Highlights

	Six Months Ended 9/30/10 (unaudited)	Year Ended 3/31/10

Per Common Share Operating Performance		
Net asset value, beginning of period	\$ 12.24	\$ 9.

Increase (decrease) from investment operations:(a)		
Net investment income	\$ 0.58	\$ 1.
Net realized and unrealized gain (loss) on investments and interest rate swaps	0.74	2.
Dividends and distributions to preferred shareowners from: Net investment income	(0.02)	(0.

Net increase (decrease) from investment operations	\$ 1.30	\$ 3.
Dividends and distributions to common shareowners from: Net investment income	(0.52)	(0.

Net increase (decrease) in net asset value	\$ 0.78	\$ 3.

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

Net asset value, end of period(b)	\$ 13.02	\$ 12.
Market value, end of period(b)	\$ 14.08	\$ 13.
Total return at market value(c)	11.88%	57.
Ratios to average net assets of common shareowners		
Net expenses(d)	1.30% (f)	1.
Net investment income before preferred share dividends	9.24% (f)	10.
Preferred share dividends	0.25% (f)	0.
Net investment income available to common shareowners	8.99% (f)	10.
Portfolio turnover	4%	

	Year Ended 3/31/09	Year Ended 3/31/08	Year Ended 3/31/07
Per Common Share Operating Performance			
Net asset value, beginning of period	\$ 13.54	\$ 15.91	\$ 13.54
Increase (decrease) from investment operations:(a)			
Net investment income	\$ 1.22	\$ 1.29	\$ 1.22
Net realized and unrealized gain (loss) on investments and interest rate swaps	(4.43)	(2.51)	(4.43)
Dividends and distributions to preferred shareowners from:			
Net investment income	(0.20)	(0.26)	(0.20)
Net increase (decrease) from investment operations			
	\$ (3.41)	\$ (1.48)	\$ (3.41)
Dividends and distributions to common shareowners from:			
Net investment income	(0.90)	(0.89)	(0.90)
Net increase (decrease) in net asset value	\$ (4.31)	\$ (2.37)	\$ (4.31)
Net asset value, end of period(b)	\$ 9.23	\$ 13.54	\$ 9.23
Market value, end of period(b)	\$ 9.04	\$ 13.74	\$ 9.04
Total return at market value(c)	(28.40)%	(6.51)%	(28.40)%
Ratios to average net assets of common shareowners			
Net expenses(d)	1.38%	1.13%	1.38%
Net investment income before preferred share dividends	10.70%	8.27%	10.70%
Preferred share dividends	1.76%	1.64%	1.76%
Net investment income available to common shareowners	8.94%	6.63%	8.94%
Portfolio turnover	24%	12%	24%

The accompanying notes are an integral part of these financial statements.

24 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Six Months Ended 9/30/10 (unaudited)	Year Ended 3/31/10
--------------------------------------	--------------------

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

Net assets of common shareowners, end of period (in thousands)	\$300,009	\$2
Preferred shares outstanding (in thousands)	\$150,000	\$1
Asset coverage per preferred share, end of period	\$ 75,003	\$
Average market value per preferred share(e)	\$ 25,000	\$
Liquidation value, including dividends payable, per preferred share	\$ 25,001	\$
Ratios to average net assets of common shareowners before waivers and reimbursement of expenses		
Net expenses(d)	1.30% (f)	
Net investment income before preferred share dividends	9.24% (f)	
Preferred share dividends	0.25% (f)	
Net investment income available to common shareowners	8.99% (f)	

	Year Ended 3/31/09	Year Ended 3/31/08
Net assets of common shareowners, end of period (in thousands)	\$211,147	\$308,500
Preferred shares outstanding (in thousands)	\$150,000	\$150,000
Asset coverage per preferred share, end of period	\$ 60,192	\$ 76,427
Average market value per preferred share(e)	\$ 25,000	\$ 25,000
Liquidation value, including dividends payable, per preferred share	\$ 25,001	\$ 25,010
Ratios to average net assets of common shareowners before waivers and reimbursement of expenses		
Net expenses(d)	1.38%	1.13%
Net investment income before preferred share dividends	10.70%	8.27%
Preferred share dividends	1.76%	1.64%
Net investment income available to common shareowners	8.94%	6.63%

- (a) The per common share data presented above is based upon the average common shares outstanding for the periods presented.
- (b) Net asset value and market value are published in Barron's on Saturday, The Wall Street Journal on Monday and The New York Times on Monday and Saturday.
- (c) Total investment return is calculated assuming a purchase of common shares at the current market value on the first day and a sale at the current market value on the last day of the periods reported. Dividends and distributions, if any, are assumed for purposes of this calculation to be reinvested at prices obtained under the Trust's dividend reinvestment plan. Total investment return does not reflect brokerage commissions. Total investment returns covering less than a full period are not annualized. Past performance is not a guarantee of future results.
- (d) Expense ratios do not reflect the effect of dividend payments to preferred shareowners.
- (e) Market value is redemption value without an active market.
- (f) Annualized.

The information above represents the audited operating performance data for a common share outstanding, total investment return, ratios to average net assets and other supplemental data for the periods indicated. This information has been determined based upon financial information provided in the financial statements and market value data for the Trust's common shares.

The accompanying notes are an integral part of these financial statements.

Notes to Financial Statements | 9/30/10 (unaudited)

1. Organization and Significant Accounting Policies

Pioneer Municipal High Income Advantage Trust (the Trust) was organized as a Delaware statutory trust on August 6, 2003. Prior to commencing operations on October 20, 2003, the Trust had no operations other than matters relating to its organization and registration as a diversified, closed-end management investment company under the Investment Company Act of 1940, as amended. The investment objective of the Trust is to seek a high level of current income exempt from regular federal income tax, and the Trust may seek capital appreciation to the extent that it is consistent with its primary investment objective.

At times, the Trust's investments may represent industries or industry sectors that are interrelated or have common risks, making it more susceptible to any economic, political, or regulatory developments or other risks affecting those industries and sectors. Information regarding the Trust's principal risks is contained in the Trust's original offering prospectus, with additional information included in the Trust's shareowner reports from time to time. Please refer to those documents when considering the Trust's risks.

The Trust may invest in both investment and below investment grade (high-yield) municipal securities with a broad range of maturities and credit ratings. Debt securities rated below investment grade are commonly referred to as "junk bonds" and are considered speculative. These securities involve greater risk of loss, are subject to greater price volatility, and are less liquid, especially during periods of economic uncertainty or change, than higher rated debt securities.

The Trust's financial statements have been prepared in conformity with U.S. generally accepted accounting principles that require the management of the Trust to, among other things, make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of income, expenses and gain or loss on investments during the reporting year. Actual results could differ from those estimates.

The following is a summary of significant accounting policies followed by the Trust in the preparation of its financial statements, which are consistent with those policies generally accepted in the investment company industry:

A. Security Valuation

Security transactions are recorded as of trade date. The net asset value of the Trust is computed once daily, on each day the New York Stock Exchange (NYSE) is open, as of the close of regular trading on the NYSE. Fixed

26 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

income securities with remaining maturity of more than sixty days are valued at prices supplied by independent pricing services, which consider such factors as market prices, market events, quotations from one or more brokers, Treasury spreads, yields, maturities and ratings. Valuations may be supplemented by dealers and other sources, as required. The values of interest rate swaps are determined by obtaining dealer quotations. Equity securities that have traded on an exchange are valued at the last sale price on the principal exchange where they are traded. Equity securities that have not traded on the date of valuation, or securities for which sale prices are not available, generally are valued using the mean between the last bid and

asked prices. Securities for which independent pricing services are unable to supply prices or for which market prices and/or quotations are not readily available or are considered to be unreliable are valued using fair value methods pursuant to procedures adopted by the Board of Trustees.

The Trust may use fair value methods if it is determined that a significant event has occurred after the close of the exchange or market on which the security trades and prior to the determination of the Trust's net asset value. Thus, the valuation of the Trust's securities may differ from exchange prices. At September 30, 2010, one security was valued using fair value methods (in addition to securities valued using prices supplied by independent pricing services) representing 0.00% of net assets. Inputs used when applying fair value methods to value a security may include credit ratings, the financial condition of the company, current market conditions and comparable securities. Short-term fixed income securities with remaining maturities of sixty days or less generally are valued at amortized cost. Money market mutual funds are valued at net asset value.

Discount and premium on debt securities are accreted or amortized, respectively, daily into interest income on a yield-to-maturity basis with a corresponding increase or decrease in the cost basis of the security. Interest income, including interest-bearing cash accounts, is recorded on an accrual basis.

Dividend income is recorded on the ex-dividend date, except that certain dividends from foreign securities where the ex-dividend date may have passed are recorded as soon as the Trust becomes aware of the ex-dividend data in the exercise of reasonable diligence.

Gains and losses on sales of investments are calculated on the identified cost method for both financial reporting and federal income tax purposes.

B. Federal Income Taxes

It is the Trust's policy to comply with the requirements of the Internal Revenue Code applicable to regulated investment companies and to distribute all of its taxable income and net realized capital gains, if any, to its shareowners. Therefore, no federal income tax provision is required. Tax years for the prior three fiscal years remain subject to examination by tax authorities.

The amounts and characterizations of distributions to shareowners for financial reporting purposes are determined in accordance with federal income tax rules. Therefore, the sources of the Trust's distributions may be shown in the accompanying financial statements as from or in excess of net investment income or net realized gain (loss) on investment transactions, or as from paid-in capital, depending on the type of book/tax differences that may exist.

The tax character of current year distributions paid to common and preferred shareowners will be determined at the end of the fiscal year. Distributions paid during the year ended March 31, 2010 were as follows:

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

2010

Distributions paid from:	
Tax exempt income	\$22,779,781
Ordinary income	80,715

Total	\$22,860,496
=====	

The following shows the components of distributable earnings (losses) on a federal income tax basis at March 31, 2010:

2010	

Distributable earnings:	
Undistributed tax-exempt income	\$ 8,020,971
Undistributed ordinary income	30,783
Capital loss carryforward	(50,523,623)
Post-October-loss deferred	(5,465,720)
Dividends payable	(5,267)
Unrealized appreciation	2,749,395

Total	\$ (45,193,461)
=====	

The difference between book-basis and tax-basis unrealized appreciation is primarily attributable to the difference between book and tax amortization methods for premiums and discounts on fixed income securities, the difference between book and tax accounting for swap agreements, book/tax difference in accrual of income on securities in default, and other temporary differences.

28 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

C. Automatic Dividend Reinvestment Plan

All common shareowners whose shares are registered in their own names automatically participate in the Automatic Dividend Reinvestment Plan (the Plan), under which participants receive all dividends and capital gain distributions (collectively, dividends) in full and fractional common shares of the Trust in lieu of cash. Shareowners may elect not to participate in the Plan. Shareowners not participating in the Plan receive all dividends and capital gain distributions in cash. Participation in the Plan is completely voluntary and may be terminated or resumed at any time without penalty by notifying American Stock Transfer & Trust Company, the agent for shareowners in administering the Plan (the Plan Agent), in writing prior to any dividend record date; otherwise such termination or resumption will be effective with respect to any subsequently declared dividend or other distribution.

If a shareowner's shares are held in the name of a brokerage firm, bank or other nominee, the shareowner can ask the firm or nominee to participate in

the Plan on the shareowner's behalf. If the firm or nominee does not offer the Plan, dividends will be paid in cash to the shareowner of record. A firm or nominee may reinvest a shareowner's cash dividend in common shares of the Trust on terms that differ from the terms of the Plan.

Whenever the Trust declares a dividend on common shares payable in cash, participants in the Plan will receive the equivalent in common shares acquired by the Plan Agent either (i) through receipt of additional unissued but authorized common shares from the Trust or (ii) by purchase of outstanding common shares on the New York Stock Exchange or elsewhere. If, on the payment date for any dividend, the net asset value per common share is equal to or less than the market price per share plus estimated brokerage trading fees (market premium), the Plan Agent will invest the dividend amount in newly issued common shares. The number of newly issued common shares to be credited to each account will be determined by dividing the dollar amount of the dividend by the net asset value per common share on the date the shares are issued, provided that the maximum discount from the then current market price per share on the date of issuance does not exceed 5%. If, on the payment date for any dividend, the net asset value per common share is greater than the market value (market discount), the Plan Agent will invest the dividend amount in common shares acquired in open-market purchases. There are no brokerage charges with respect to newly issued common shares. However, each participant will pay a pro rata share of brokerage trading fees incurred with respect to the Plan Agent's open-market purchases. Participating in the Plan does not relieve shareowners from any federal, state or local taxes which may be due on dividends paid in any taxable year. Shareowners holding Plan shares in a brokerage account may not be able to transfer the shares to another broker and continue to participate in the Plan.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 29

2. Management Agreement

Pioneer Investment Management, Inc. (PIM), the Trust's investment adviser, a wholly owned indirect subsidiary of UniCredit S.p.A. (UniCredit), manages the Trust's portfolio. Management fees payable under the Trust's Advisory Agreement with PIM are calculated daily at the annual rate of 0.60% of the Trust's average daily managed assets. "Managed assets" means (a) the total assets of the Trust, including any form of investment leverage, minus (b) all accrued liabilities incurred in the normal course of operations, which shall not include any liabilities or obligations attributable to investment leverage obtained through (i) indebtedness of any type (including, without limitation, borrowing through a credit facility of the issuance of debt securities), (ii) the issuance of preferred stock or other similar preference securities, and/or (iii) any other means. For the six months ended September 30, 2010, the net management fee was equivalent to 0.60% of the Trust's average daily managed assets, which was equivalent to 0.95% of the Trust's average daily net assets attributable to the common shareowners.

In addition, under PIM's management and administration agreements, certain other services and costs are paid by PIM and reimbursed by the Trust. At September 30, 2010, \$231,878 was payable to PIM related to management costs, administrative costs and certain other services and is included in "Due to affiliates" on the Statement of Assets and Liabilities.

Effective September 1, 2010 PIM has retained State Street Bank and Trust Company (State Street) to provide certain administrative and accounting services to the Trust on its behalf. For administrative services, PIM pays State Street a monthly fee at an annual rate of 0.07% of the Trust's managed assets up to \$500

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

million and 0.03% for managed assets in excess of \$500 million, subject to a minimum monthly fee of \$10,000. Previously, PIM had retained Princeton Administrators, LLC (Princeton) to provide such services. PIM paid Princeton a monthly fee at an annual rate of 0.07% of the Trust's average daily managed assets up to \$500 million and 0.03% for average daily managed assets in excess of \$500 million, subject to a minimum monthly fee of \$10,000. Neither State Street nor Princeton received compensation directly from the Trust for providing such services.

3. Transfer Agents

Pioneer Investment Management Shareholder Services, Inc. (PIMSS), a wholly owned indirect subsidiary of UniCredit, through a sub-transfer agency agreement with American Stock Transfer & Trust Company, provides substantially all transfer agent and shareowner services related to the Trust's common shares at negotiated rates. Deutsche Bank Trust Company Americas (Deutsche Bank) is the transfer agent, registrar, dividend paying agent and auction agent with respect to the Trust's Auction Preferred Shares (APS). The Trust pays Deutsche

30 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Bank an annual fee, as is agreed to from time to time by the Trust and Deutsche Bank, for providing such services.

4. Interest Rate Swaps

The Trust may enter into interest rate swap transactions to attempt to protect itself from increasing dividend or interest expense on its leverage resulting from increasing short-term interest rates. The cost of leverage may rise with an increase in interest rates, generally having the effect of lower yields and potentially lower dividends to common shareowners. Interest rate swaps can be used to "lock in" the cost of leverage and reduce the negative impact that rising short-term interest rates would have on the Trust's leveraging costs.

An interest rate swap is an agreement between two parties, which involves exchanging floating rate and fixed rate interest payments for a specified period of time. Interest rate swaps involve the accrual of the net interest payments between the parties on a daily basis, with the net amount recorded within the unrealized appreciation/depreciation of interest rate swaps on the Statement of Assets and Liabilities. Once the interim payments are settled in cash, at the pre-determined dates specified in the agreement, the net amount is recorded as realized gain or loss from interest rate swaps on the Statement of Operations. During the term of the swap, changes in the value of the swap are recognized as unrealized gains and losses by "marking-to-market" the value of the swap based on values obtained from dealer quotations. When the swap is terminated, the Trust will record a realized gain or loss equal to the difference, if any, between the proceeds from (or cost of) closing the contract and the cost basis of the contract. The Trust is exposed to credit risk in the event of non-performance by the other party to the interest rate swap. Risk may also arise with regard to market movements in the value of the swap arrangement that do not exactly offset the changes in the related dividend requirement or interest expense on the Trust's leverage.

There were no interest rate swap contracts outstanding at September 30, 2010.

5. Trust Shares

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

There are an unlimited number of common shares of beneficial interest authorized.

Transactions in common shares of beneficial interest for the six months ended September 30, 2010 and the year ended March 31, 2010 were as follows:

	9/10	3/10
Shares outstanding at beginning of period	22,995,047	22,879,496
Reinvestment of distributions	54,902	115,551
Shares outstanding at end of period	23,049,949	22,995,047

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 31

The Trust may classify or reclassify any unissued common shares of beneficial interest into one or more series of preferred shares of beneficial interest. As of September 30, 2010, there were 6,000 APS as follows: Series A -- 3,000 and Series B -- 3,000.

Dividends on Series A and Series B are cumulative at a rate, which is reset every seven days based on the results of an auction. An auction fails if there are more APS offered for sale than there are buyers. When an auction fails, the dividend rate for the period will be the maximum rate on the auction dates described in the prospectus for the APS. Preferred shareowners will not be able to sell their APS at an auction if the auction fails. Since February 2008, the Trust's auctions related to the APS have failed. The maximum rate for the 7-Day Series is 125% of the 7 day commercial paper rate or adjusted Kenny rate. Dividend rates on APS ranged from 0.398% to 0.571% during the six months ended September 30, 2010.

The Trust may not declare dividends or make other distributions on its common shares or purchase any such shares if, at the time of the declaration, distribution or purchase, the Trust does not comply with the asset coverage ratios described in the prospectus for the APS.

The APS are redeemable at the option of the Trust, in whole or in part, on any dividend payment date at \$25,000 per share plus any accumulated or unpaid dividends, whether or not declared. The APS are also subject to mandatory redemption at \$25,000 per share plus any accumulated or unpaid dividends, whether or not declared, if certain requirements relating to the composition of the assets and liabilities of the Trust as set forth in the Statement of Preferences are not satisfied.

The holders of APS have voting rights equal to the holders of the Trust's common shares (one vote per share) and will vote together with holders of the common shares as a single class. Holders of APS are also entitled to elect two of the Trust's Trustees. In addition, the Investment Company Act of 1940, as amended, requires that along with approval by shareowners that might otherwise be required, the approval of the holders of a majority of any outstanding preferred shares, voting separately as a class, would be required to (a) adopt any plan of reorganization that would adversely affect the preferred shares and (b) take any

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

action requiring a vote of security holders, including, among other things, changes in the Trust's subclassification as a closed-end management investment company or changes in its fundamental investment restrictions.

6. Subsequent Events

Subsequent to September 30, 2010 the Board of Trustees of the Trust declared a dividend from undistributed net investment income of \$0.090 per common share payable October 29, 2010, to common shareowners of record on October 15, 2010.

32 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Subsequent to September 30, 2010, dividends declared and paid on preferred shares totaled \$108,810 in aggregate for the two outstanding preferred share series through November 24, 2010.

In preparing these financial statements, PIM has evaluated the impact of all events and transactions for potential recognition or disclosure and has determined that other than disclosed above, there were no subsequent events requiring recognition or disclosure in the financial statements.

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 33

ADDITIONAL INFORMATION (unaudited)

During the period, there have been no material changes in the Trust's investment objective or fundamental policies that have not been approved by the shareowners. There have been no changes in the Trust's charter or By-Laws that would delay or prevent a change in control of the Trust which has not been approved by the shareowners. There have been no changes in the principal risk factors associated with investment in the Trust. Day-to-day management of the Trust's portfolio is the responsibility of David Eurkus. Mr. Eurkus is supported by the fixed income team. Members of this team manage other Pioneer funds investing primarily in fixed income securities. The portfolio manager and the team also may draw upon the research and investment management expertise of Pioneer's affiliate, Pioneer Investment Management Limited. Mr. Eurkus joined Pioneer as a senior vice president in January 2000 and has been an investment professional since 1969.

Notice is hereby given in accordance with Section 23(c) of the Investment Company Act of 1940 that the Trust may purchase, from time to time, its common shares in the open market.

34 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

Results of Shareholder Meeting (unaudited)

At the annual meeting of shareowners held on September 22, 2010 shareowners of Pioneer Municipal High Income Advantage Trust were asked to consider the proposal described below. A report of the total votes cast by the Trust's shareholders follows:

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

Proposal 1 -- To elect Class I Trustees.

Nominee	For	Withheld
David R. Bock	10,912,800	808,819
Stephen K. West	10,912,800	867,503
John F. Cogan, Jr.+	2,055	191

+ Elected by Preferred Shares only

Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10 35

Trustees, Officers and Service Providers

Trustees

John F. Cogan, Jr., Chairman
David R. Bock
Mary K. Bush
Benjamin M. Friedman
Margaret B.W. Graham
Daniel K. Kingsbury
Thomas J. Perna
Marguerite A. Piret
Stephen K. West

Officers

John F. Cogan, Jr., President
Daniel K. Kingsbury, Executive
Vice President
Mark E. Bradley, Treasurer
Christopher J. Kelley, Secretary

Investment Adviser

Pioneer Investment Management, Inc.

Custodian

Brown Brothers Harriman & Co.

Legal Counsel

Bingham McCutchen LLP

Transfer Agent

Pioneer Investment Management Shareholder Services, Inc.

Shareowner Services and Sub-Transfer Agent

American Stock Transfer & Trust Company

Preferred Share Auction/Transfer Agent and Registrar

Deutsche Bank Trust Company Americas

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

Sub-Administrator
State Street Bank and Trust Company

Proxy Voting Policies and Procedures of the Trust are available without charge, upon request, by calling our toll free number (1-800-225-6292). Information regarding how the Trust voted proxies relating to portfolio securities during the most recent 12-month period ended June 30 is publicly available to shareowners at pioneerinvestments.com. This information is also available on the Securities and Exchange Commission's web site at <http://www.sec.gov>.

36 Pioneer Municipal High Income Advantage Trust | Semiannual Report | 9/30/10

How to Contact Pioneer

We are pleased to offer a variety of convenient ways for you to contact us for assistance or information.

You can call American Stock Transfer & Trust Company (AST) for:

Account Information 1-800-710-0935

Or write to AST:

For	Write to
General inquiries, lost dividend checks, change of address, lost stock certificates, stock transfer	American Stock Transfer & Trust Operations Center 6201 15th Ave. Brooklyn, NY 11219
Dividend reinvestment plan (DRIP)	American Stock Transfer & Trust Wall Street Station P.O. Box 922 New York, NY 10269-0560
Website	www.amstock.com

For additional information, please contact your investment advisor or visit our web site www.pioneerinvestments.com.

The Trust files a complete statement of investments with the Securities and Exchange Commission for the first and third quarters for each fiscal year on Form N-Q. Shareowners may view the filed Form N-Q by visiting the Commission's web site at <http://www.sec.gov>. The filed form may also be viewed and copied at the Commission's Public Reference Room in Washington, DC. Information regarding the operations of the Public Reference Room may be obtained by calling 1-800-SEC-0330.

ITEM 2. CODE OF ETHICS.

(a) Disclose whether, as of the end of the period covered by the report, the registrant has adopted a code of ethics that applies to the registrant's

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

principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, regardless of whether these individuals are employed by the registrant or a third party. If the registrant has not adopted such a code of ethics, explain why it has not done so.

The registrant has adopted, as of the end of the period covered by this report, a code of ethics that applies to the registrant's principal executive officer, principal financial officer, principal accounting officer and controller.

(b) For purposes of this Item, the term "code of ethics" means written standards that are reasonably designed to deter wrongdoing and to promote:

- (1) Honest and ethical conduct, including the ethical handling of actual or apparent conflicts of interest between personal and professional relationships;
- (2) Full, fair, accurate, timely, and understandable disclosure in reports and documents that a registrant files with, or submits to, the Commission and in other public communications made by the registrant;
- (3) Compliance with applicable governmental laws, rules, and regulations;
- (4) The prompt internal reporting of violations of the code to an appropriate person or persons identified in the code; and
- (5) Accountability for adherence to the code.

(c) The registrant must briefly describe the nature of any amendment, during the period covered by the report, to a provision of its code of ethics that applies to the registrant's principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, regardless of whether these individuals are employed by the registrant or a third party, and that relates to any element of the code of ethics definition enumerated in paragraph (b) of this Item. The registrant must file a copy of any such amendment as an exhibit pursuant to Item 10(a), unless the registrant has elected to satisfy paragraph (f) of this Item by posting its code of ethics on its website pursuant to paragraph (f)(2) of this Item, or by undertaking to provide its code of ethics to any person without charge, upon request, pursuant to paragraph (f)(3) of this Item.

The registrant has made no amendments to the code of ethics during the period covered by this report.

(d) If the registrant has, during the period covered by the report, granted a waiver, including an implicit waiver, from a provision of the code of ethics to the registrant's principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, regardless of whether these individuals are employed by the registrant or a third party, that relates to one or more of the items set forth in paragraph (b) of this Item, the registrant must briefly describe the nature of the waiver, the name of the person to whom the waiver was granted, and the date of the waiver.

Not applicable.

(e) If the registrant intends to satisfy the disclosure requirement under paragraph (c) or (d) of this Item regarding an amendment to, or a waiver from, a provision of its code of ethics that applies to the registrant's principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions and that relates to any

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

element of the code of ethics definition enumerated in paragraph (b) of this Item by posting such information on its Internet website, disclose the registrant's Internet address and such intention.

Not applicable.

(f) The registrant must:

(1) File with the Commission, pursuant to Item 10(a), a copy of its code of ethics that applies to the registrant's principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, as an exhibit to its annual report on this Form N-CSR;

(2) Post the text of such code of ethics on its Internet website and disclose, in its most recent report on this Form N-CSR, its Internet address and the fact that it has posted such code of ethics on its Internet website; or

(3) Undertake in its most recent report on this Form N-CSR to provide to any person without charge, upon request, a copy of such code of ethics and explain the manner in which such request may be made.

See Item 10(2)

ITEM 3. AUDIT COMMITTEE FINANCIAL EXPERT.

(a) (1) Disclose that the registrant's board of trustees has determined that the registrant either:

(i) Has at least one audit committee financial expert serving on its audit committee; or

(ii) Does not have an audit committee financial expert serving on its audit committee.

The registrant's Board of Trustees has determined that the registrant has at least one audit committee financial expert.

(2) If the registrant provides the disclosure required by paragraph (a)(1)(i) of this Item, it must disclose the name of the audit committee financial expert and whether that person is "independent." In order to be considered "independent" for purposes of this Item, a member of an audit committee may not, other than in his or her capacity as a member of the audit committee, the board of trustees, or any other board committee:

(i) Accept directly or indirectly any consulting, advisory, or other compensatory fee from the issuer; or

(ii) Be an "interested person" of the investment company as defined in Section 2(a)(19) of the Act (15 U.S.C. 80a-2(a)(19)).

Ms. Marguerite A. Piret, an independent trustee, is such an audit committee financial expert.

(3) If the registrant provides the disclosure required by paragraph (a)(1)(ii) of this Item, it must explain why it does not have an audit committee financial expert.

Not applicable.

ITEM 4. PRINCIPAL ACCOUNTANT FEES AND SERVICES.

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

(a) Disclose, under the caption AUDIT FEES, the aggregate fees billed for each of the last two fiscal years for professional services rendered by the principal accountant for the audit of the registrant's annual financial statements or services that are normally provided by the accountant in connection with statutory and regulatory filings or engagements for those fiscal years.

N/A

(b) Disclose, under the caption AUDIT-RELATED FEES, the aggregate fees billed in each of the last two fiscal years for assurance and related services by the principal accountant that are reasonably related to the performance of the audit of the registrant's financial statements and are not reported under paragraph (a) of this Item. Registrants shall describe the nature of the services comprising the fees disclosed under this category.

N/A

(c) Disclose, under the caption TAX FEES, the aggregate fees billed in each of the last two fiscal years for professional services rendered by the principal accountant for tax compliance, tax advice, and tax planning. Registrants shall describe the nature of the services comprising the fees disclosed under this category.

N/A

(d) Disclose, under the caption ALL OTHER FEES, the aggregate fees billed in each of the last two fiscal years for products and services provided by the principal accountant, other than the services reported in paragraphs (a) through (c) of this Item. Registrants shall describe the nature of the services comprising the fees disclosed under this category.

N/A

(e) (1) Disclose the audit committee's pre-approval policies and procedures described in paragraph (c) (7) of Rule 2-01 of Regulation S-X.

PIONEER FUNDS

APPROVAL OF AUDIT, AUDIT-RELATED, TAX AND OTHER SERVICES PROVIDED BY THE INDEPENDENT AUDITOR

SECTION I - POLICY PURPOSE AND APPLICABILITY

The Pioneer Funds recognize the importance of maintaining the independence of their outside auditors. Maintaining independence is a shared responsibility involving Pioneer Investment Management, Inc ("PIM"), the audit committee and the independent auditors.

The Funds recognize that a Fund's independent auditors: 1) possess knowledge of the Funds, 2) are able to incorporate certain services into the scope of the audit, thereby avoiding redundant work, cost and disruption of Fund personnel and processes, and 3) have expertise that has value to the Funds. As a result, there are situations where it is desirable to use the Fund's independent auditors for services in addition to the annual audit and where the potential for conflicts of interests are minimal. Consequently, this policy, which is intended to comply with Rule 210.2-01(C) (7), sets forth guidelines and procedures to be followed by the Funds when retaining the independent audit firm to perform audit, audit-related tax and other services under those circumstances, while also maintaining independence.

Approval of a service in accordance with this policy for a Fund shall also

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

constitute approval for any other Fund whose pre-approval is required pursuant to Rule 210.2-01(c) (7) (ii).

In addition to the procedures set forth in this policy, any non-audit services that may be provided consistently with Rule 210.2-01 may be approved by the Audit Committee itself and any pre-approval that may be waived in accordance with Rule 210.2-01(c) (7) (i) (C) is hereby waived.

Selection of a Fund's independent auditors and their compensation shall be determined by the Audit Committee and shall not be subject to this policy.

SECTION II - POLICY

SERVICE CATEGORY	SERVICE CATEGORY DESCRIPTION	SPECIFIC PRE-APPROVED SERVICE SUBCATEGORIES
I. AUDIT SERVICES	Services that are directly related to performing the independent audit of the Funds	<ul style="list-style-type: none"> o Accounting research assistance o SEC consultation, registration statements, and reporting o Tax accrual related matters o Implementation of new accounting standards o Compliance letters (e.g. rating agency letters) o Regulatory reviews and assistance regarding financial matters o Semi-annual reviews (if requested) o Comfort letters for closed end offerings
II. AUDIT-RELATED SERVICES	Services which are not prohibited under Rule 210.2-01(C) (4) (the "Rule") and are related extensions of the audit services support the audit, or use the knowledge/expertise gained from the audit procedures as a foundation to complete the project. In most cases, if the Audit-Related Services are not performed by the Audit firm, the scope of the Audit Services would likely increase. The Services are typically well-defined and governed by accounting professional standards (AICPA, SEC, etc.)	<ul style="list-style-type: none"> o AICPA attest and agreed-upon procedures o Technology control assessments o Financial reporting control assessments o Enterprise security architecture assessment
AUDIT COMMITTEE APPROVAL POLICY		AUDIT COMMITTEE REPORTING POLICY

o "One-time" pre-approval

o A summary of all such

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

for the audit period for all pre-approved specific service subcategories. Approval of the independent auditors as auditors for a Fund shall constitute pre approval for these services.

services and related fees reported at each regularly scheduled Audit Committee meeting.

o "One-time" pre-approval for the fund fiscal year within a specified dollar limit for all pre-approved specific service subcategories

o A summary of all such services and related fees (including comparison to specified dollar limits) reported quarterly.

o Specific approval is needed to exceed the pre-approved dollar limit for these services (see general Audit Committee approval policy below for details on obtaining specific approvals)

o Specific approval is needed to use the Fund's auditors for Audit-Related Services not denoted as "pre-approved", or to add a specific service subcategory as "pre-approved"

SECTION III - POLICY DETAIL, CONTINUED

SERVICE CATEGORY	SERVICE CATEGORY DESCRIPTION	SPECIFIC PRE-APPROVED SERVICE SUBCATEGORIES
III. TAX SERVICES	Services which are not prohibited by the Rule, if an officer of the Fund determines that using the Fund's auditor to provide these services creates significant synergy in the form of efficiency, minimized disruption, or the ability to maintain a desired level of confidentiality.	<ul style="list-style-type: none"> o Tax planning and support o Tax controversy assistance o Tax compliance, tax returns, excise tax returns and support o Tax opinions

AUDIT COMMITTEE APPROVAL POLICY

AUDIT COMMITTEE REPORTING POLICY

o "One-time" pre-approval for the fund fiscal year

o A summary of all such services and

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

within a specified dollar limit related fees (including comparison to specified dollar limits) reported quarterly.

- o Specific approval is needed to exceed the pre-approved dollar limits for these services (see general Audit Committee approval policy below for details on obtaining specific approvals)
- o Specific approval is needed to use the Fund's auditors for tax services not denoted as pre-approved, or to add a specific service subcategory as "pre-approved"

SECTION III - POLICY DETAIL, CONTINUED

SERVICE CATEGORY	SERVICE CATEGORY DESCRIPTION	SPECIFIC PRE-APPROVED SERVICE SUBCATEGORIES
IV. OTHER SERVICES A. SYNERGISTIC, UNIQUE QUALIFICATIONS	Services which are not prohibited by the Rule, if an officer of the Fund determines that using the Fund's auditor to provide these services creates significant synergy in the form of efficiency, minimized disruption, the ability to maintain a desired level of confidentiality, or where the Fund's auditors possess unique or superior qualifications to provide these services, resulting in superior value and results for the Fund.	<ul style="list-style-type: none"> o Business Risk Management support o Other control and regulatory compliance projects

AUDIT COMMITTEE APPROVAL POLICY	AUDIT COMMITTEE REPORTING POLICY
o "One-time" pre-approval for the fund fiscal year within a specified dollar limit	o A summary of all such services and related fees (including comparison to specified dollar

limits) reported quarterly.

- o Specific approval is needed to exceed the pre-approved dollar limits for these services (see general Audit Committee approval policy below for details on obtaining specific approvals)
- o Specific approval is needed to use the Fund's auditors for "Synergistic" or "Unique Qualifications" Other Services not denoted as pre-approved to the left, or to add a specific service subcategory as "pre-approved"

SECTION III - POLICY DETAIL, CONTINUED

SERVICE CATEGORY	SERVICE CATEGORY DESCRIPTION	SPECIFIC PROHIBITED SERVICE SUBCATEGORIES
PROHIBITED SERVICES	Services which result in the auditors losing independence status under the Rule.	<ol style="list-style-type: none"> 1. Bookkeeping or other services related to the accounting records or financial statements of the audit client* 2. Financial information systems design and implementation* 3. Appraisal or valuation services, fairness* opinions, or contribution-in-kind reports 4. Actuarial services (i.e., setting actuarial reserves versus actuarial audit work)* 5. Internal audit outsourcing services* 6. Management functions or human resources 7. Broker or dealer, investment advisor, or investment banking services 8. Legal services and expert services unrelated to the audit 9. Any other service that the Public Company Accounting Oversight Board determines, by regulation, is impermissible

AUDIT COMMITTEE APPROVAL POLICY	AUDIT COMMITTEE REPORTING POLICY
o These services are not to be performed with the exception of the(*) services that may be permitted	o A summary of all services and related fees reported at each

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

if they would not be subject to audit procedures at the audit client (as defined in rule 2-01(f)(4)) level the firm providing the service.

regularly scheduled Audit Committee meeting will serve as continual confirmation that has not provided any restricted services.

GENERAL AUDIT COMMITTEE APPROVAL POLICY:

- o For all projects, the officers of the Funds and the Fund's auditors will each make an assessment to determine that any proposed projects will not impair independence.
- o Potential services will be classified into the four non-restricted service categories and the "Approval of Audit, Audit-Related, Tax and Other Services" Policy above will be applied. Any services outside the specific pre-approved service subcategories set forth above must be specifically approved by the Audit Committee.
- o At least quarterly, the Audit Committee shall review a report summarizing the services by service category, including fees, provided by the Audit firm as set forth in the above policy.

(2) Disclose the percentage of services described in each of paragraphs (b) through (d) of this Item that were approved by the audit committee pursuant to paragraph (c)(7)(i)(C) of Rule 2-01 of Regulation S-X.

N/A

(f) If greater than 50 percent, disclose the percentage of hours expended on the principal accountant's engagement to audit the registrant's financial statements for the most recent fiscal year that were attributed to work performed by persons other than the principal accountant's full-time, permanent employees.

N/A

(g) Disclose the aggregate non-audit fees billed by the registrant's accountant for services rendered to the registrant, and rendered to the registrant's investment adviser (not including any sub-adviser whose role is primarily portfolio management and is subcontracted with or overseen by another investment adviser), and any entity controlling, controlled by, or under common control with the adviser that provides ongoing services to the registrant for each of the last two fiscal years of the registrant.

N/A

(h) Disclose whether the registrant's audit committee of the board of trustees has considered whether the provision of non-audit services that were rendered to the registrant's investment adviser (not including any subadviser whose role is primarily portfolio management and is subcontracted with or overseen by another investment adviser), and any entity controlling, controlled by, or under common control with the investment adviser that provides ongoing services to the registrant that were not pre-approved pursuant to paragraph (c)(7)(ii) of Rule 2-01 of Regulation S-X is compatible with maintaining the principal accountant's independence.

The Fund's audit committee of the Board of Trustees has considered whether the provision of non-audit services that were rendered to the

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

Affiliates (as defined) that were not pre-approved pursuant to paragraph (c)(7)(ii) of Rule 2-01 of Regulation S-X is compatible with maintaining the principal accountant's independence.

Item 5. Audit Committee of Listed Registrants

(a) If the registrant is a listed issuer as defined in Rule 10A-3 under the Exchange Act (17 CFR 240.10A-3), state whether or not the registrant has a separately-designated standing audit committee established in accordance with Section 3(a)(58)(A) of the Exchange Act (15 U.S.C. 78c(a)(58)(A)). If the registrant has such a committee, however designated, identify each committee member. If the entire board of directors is acting as the registrant's audit committee as specified in Section 3(a)(58)(B) of the Exchange Act (15 U.S.C. 78c(a)(58)(B)), so state.

The registrant has a separately-designated standing audit committee established in accordance with Section 3(a)(58)(A) of the Exchange Act (15 U.S.C. 78c(a)(58)(A)).

(b) If applicable, provide the disclosure required by Rule 10A-3(d) under the Exchange Act (17 CFR 240.10A-3(d)) regarding an exemption from the listing standards for audit committees.

N/A

Item 6. Schedule of Investments.

File Schedule I Investments in securities of unaffiliated issuers as of the close of the reporting period as set forth in 210.12-12 of Regulation S-X [17 CFR 210.12-12], unless the schedule is included as part of the report to shareholders filed under Item 1 of this Form.

Included in Item 1

ITEM 7. DISCLOSURE OF PROXY VOTING POLICIES AND PROCEDURES FOR CLOSED-END MANAGEMENT INVESTMENT COMPANIES.

A closed-end management investment company that is filing an annual report on this Form N-CSR must, unless it invests exclusively in non-voting securities, describe the policies and procedures that it uses to determine how to vote proxies relating to portfolio securities, including the procedures that the company uses when a vote presents a conflict between the interests of its shareholders, on the one hand, and those of the company's investment adviser; principal underwriter; or any affiliated person (as defined in Section 2(a)(3) of the Investment Company Act of 1940 (15 U.S.C. 80a-2(a)(3)) and the rules thereunder) of the company, its investment adviser, or its principal underwriter, on the other. Include any policies and procedures of the company's investment adviser, or any other third party, that the company uses, or that are used on the company's behalf, to determine how to vote proxies relating to portfolio securities.

Proxy Voting Policies and Procedures of
Pioneer Investment Management, Inc.

VERSION DATED July, 2004

Overview

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

Pioneer Investment Management, Inc. ("Pioneer") is a fiduciary that owes each of its client's duties of care and loyalty with respect to all services undertaken on the client's behalf, including proxy voting. When Pioneer has been delegated proxy-voting authority for a client, the duty of care requires Pioneer to monitor corporate events and to vote the proxies. To satisfy its duty of loyalty, Pioneer must place its client's interests ahead of its own and must cast proxy votes in a manner consistent with the best interest of its clients. Pioneer will vote all proxies presented in a timely manner.

The Proxy Voting Policies and Procedures are designed to complement Pioneer's investment policies and procedures regarding its general responsibility to monitor the performance and/or corporate events of companies that are issuers of securities held in accounts managed by Pioneer. Pioneer's Proxy Voting Policies summarize Pioneer's position on a number of issues solicited by companies held by Pioneer's clients. The policies are guidelines that provide a general indication on how Pioneer would vote but do not include all potential voting scenarios.

Pioneer's Proxy Voting Procedures detail monitoring of voting, exception votes, and review of conflicts of interest and ensure that case-by-case votes are handled within the context of the overall guidelines (i.e. best interest of client). The overriding goal is that all proxies for US and non-US companies that are received promptly will be voted in accordance with Pioneer's policies or specific client instructions. All shares in a company held by Pioneer-managed accounts will be voted alike, unless a client has given us specific voting instructions on an issue or has not delegated authority to us or the Proxy Voting Oversight Group determines that the circumstances justify a different approach.

Pioneer does not delegate the authority to vote proxies relating to its clients to any of its affiliates, which include other subsidiaries of UniCredito.

Any questions about these policies and procedures should be directed to the Proxy Coordinator.

1

Proxy Voting Procedures

Proxy Voting Service

Pioneer has engaged an independent proxy voting service to assist in the voting of proxies. The proxy voting service works with custodians to ensure that all proxy materials are received by the custodians and are processed in a timely fashion. To the extent applicable, the proxy voting service votes all proxies in accordance with the proxy voting policies established by Pioneer. The proxy voting service will refer proxy questions to the Proxy Coordinator (described below) for instructions under circumstances where: (1) the application of the proxy voting guidelines is unclear; (2) a particular proxy question is not covered by the guidelines; or (3) the guidelines call for specific instructions on a case-by-case basis. The proxy voting service is also requested to call to the Proxy Coordinator's attention specific proxy questions that, while governed by a guideline, appear to involve unusual or controversial issues. Pioneer reserves the right to attend a meeting in person and may do so when it determines that the company or the matters to be voted on at the meeting are strategically important to its clients.

Proxy Coordinator

Pioneer's Director of Investment Operations (the "Proxy Coordinator")

coordinates the voting, procedures and reporting of proxies on behalf of Pioneer's clients. The Proxy Coordinator will deal directly with the proxy voting service and, in the case of proxy questions referred by the proxy voting service, will solicit voting recommendations and instructions from the Director of Portfolio Management US or, to the extent applicable, investment sub-advisers. The Proxy Coordinator is responsible for ensuring that these questions and referrals are responded to in a timely fashion and for transmitting appropriate voting instructions to the proxy voting service. The Proxy Coordinator is responsible for verifying with the Compliance Department whether Pioneer's voting power is subject to any limitations or guidelines issued by the client (or in the case of an employee benefit plan, the plan's trustee or other fiduciaries).

Referral Items

From time to time, the proxy voting service will refer proxy questions to the Proxy Coordinator that are described by Pioneer's policy as to be voted on a case-by-case basis, that are not covered by Pioneer's guidelines or where Pioneer's guidelines may be unclear with respect to the matter to be voted on. Under such certain circumstances, the Proxy Coordinator will seek a written voting recommendation from the Director of Portfolio Management US. Any such recommendation will include: (i) the manner in which the proxies should be voted; (ii) the rationale underlying any such decision; and (iii) the disclosure of any contacts or communications made between Pioneer and any outside parties concerning the proxy proposal prior to the time that the voting instructions are provided. In addition, the Proxy Coordinator will ask the Compliance Department to review the question for any actual or apparent conflicts of interest as described below under "Conflicts of

2

Interest." The Compliance Department will provide a "Conflicts of Interest Report," applying the criteria set forth below under "Conflicts of Interest," to the Proxy Coordinator summarizing the results of its review. In the absence of a conflict of interest, the Proxy Coordinator will vote in accordance with the recommendation of the Director of Portfolio Management US.

If the matter presents a conflict of interest for Pioneer, then the Proxy Coordinator will refer the matter to the Proxy Voting Oversight Group for a decision. In general, when a conflict of interest is present, Pioneer will vote according to the recommendation of the Director of Portfolio Management US where such recommendation would go against Pioneer's interest or where the conflict is deemed to be immaterial. Pioneer will vote according to the recommendation of its proxy voting service when the conflict is deemed to be material and the Pioneer's internal vote recommendation would favor Pioneer's interest, unless a client specifically requests Pioneer to do otherwise. When making the final determination as to how to vote a proxy, the Proxy Voting Oversight Group will review the report from the Director of Portfolio Management US and the Conflicts of Interest Report issued by the Compliance Department.

Conflicts of Interest

A conflict of interest occurs when Pioneer's interests interfere, or appear to interfere with the interests of Pioneer's clients. Occasionally, Pioneer may have a conflict that can affect how its votes proxies. The conflict may be actual or perceived and may exist when the matter to be voted on concerns:

- o An affiliate of Pioneer, such as another company belonging to the UniCredito Italiano S.p.A. banking group (a "UniCredito

Affiliate");

- o An issuer of a security for which Pioneer acts as a sponsor, advisor, manager, custodian, distributor, underwriter, broker, or other similar capacity (including those securities specifically declared by PGAM to present a conflict of interest for Pioneer);
- o An issuer of a security for which UniCredito has informed Pioneer that a UniCredito Affiliate acts as a sponsor, advisor, manager, custodian, distributor, underwriter, broker, or other similar capacity; or
- o A person with whom Pioneer (or any of its affiliates) has an existing, material contract or business relationship that was not entered into in the ordinary course of Pioneer's business.
- o Pioneer will abstain from voting with respect to companies directly or indirectly owned by UniCredito Italiano Group, unless otherwise directed by a client. In addition, Pioneer will inform PGAM Global Compliance and the PGAM Independent Directors before exercising such rights.

Any associate involved in the proxy voting process with knowledge of any apparent or actual conflict of interest must disclose such conflict to the Proxy Coordinator and the Compliance Department. The Compliance Department will review each item referred to Pioneer to determine whether an actual or potential conflict of interest with Pioneer exists in connection with the proposal(s) to be voted upon. The review will be conducted by comparing the apparent parties affected by the proxy proposal being

3

voted upon against the Compliance Department's internal list of interested persons and, for any matches found, evaluating the anticipated magnitude and possible probability of any conflict of interest being present. For each referral item, the determination regarding the presence or absence of any actual or potential conflict of interest will be documented in a Conflicts of Interest Report to the Proxy Coordinator.

Securities Lending

In conjunction with industry standards Proxies are not available to be voted when the shares are out on loan through either Pioneer's lending program or a client's managed security lending program. However, Pioneer will reserve the right to recall lent securities so that they may be voted according to the Pioneer's instructions. If a portfolio manager would like to vote a block of previously lent shares, the Proxy Coordinator will work with the portfolio manager and Investment Operations to recall the security, to the extent possible, to facilitate the vote on the entire block of shares.

Share-Blocking

"Share-blocking" is a market practice whereby shares are sent to a custodian (which may be different than the account custodian) for record keeping and voting at the general meeting. The shares are unavailable for sale or delivery until the end of the blocking period (typically the day after general meeting date).

Pioneer will vote in those countries with "share-blocking." In the event a manager would like to sell a security with "share-blocking", the Proxy Coordinator will work with the Portfolio Manager and Investment Operations

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

Department to recall the shares (as allowable within the market time-frame and practices) and/or communicate with executing brokerage firm. A list of countries with "share-blocking" is available from the Investment Operations Department upon request.

Record Keeping

The Proxy Coordinator shall ensure that Pioneer's proxy voting service:

- o Retains a copy of the proxy statement received (unless the proxy statement is available from the SEC's Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system);
- o Retains a record of the vote cast;
- o Prepares Form N-PX for filing on behalf of each client that is a registered investment company; and
- o Is able to promptly provide Pioneer with a copy of the voting record upon its request.

4

The Proxy Coordinator shall ensure that for those votes that may require additional documentation (i.e. conflicts of interest, exception votes and case-by-case votes) the following records are maintained:

- o A record memorializing the basis for each referral vote cast;
- o A copy of any document created by Pioneer that was material in making the decision on how to vote the subject proxy; and
- o A copy of any conflict notice, conflict consent or any other written communication (including emails or other electronic communications) to or from the client (or in the case of an employee benefit plan, the plan's trustee or other fiduciaries) regarding the subject proxy vote cast by, or the vote recommendation of, Pioneer.
- o Pioneer shall maintain the above records in the client's file for a period not less than ten (10) years.

Disclosure

Pioneer shall take reasonable measures to inform its clients of the process or procedures clients must follow to obtain information regarding how Pioneer voted with respect to assets held in their accounts. In addition, Pioneer shall describe to clients its proxy voting policies and procedures and will furnish a copy of its proxy voting policies and procedures upon request. This information may be provided to clients through Pioneer's Form ADV (Part II) disclosure, by separate notice to the client, or through Pioneer's website.

Proxy Voting Oversight Group

The members of the Proxy Voting Oversight Group are Pioneer's: Director of Portfolio Management US, Head of Investment Operations, and Director of Compliance. Other members of Pioneer will be invited to attend meetings and otherwise participate as necessary. The Head of Investment Operations will chair the Proxy Voting Oversight Group.

The Proxy Voting Oversight Group is responsible for developing, evaluating, and changing (when necessary) Pioneer's Proxy Voting Policies and Procedures. The group meets at least annually to evaluate and review these

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

policies and procedures and the services of its third-party proxy voting service. In addition, the Proxy Voting Oversight Group will meet as necessary to vote on referral items and address other business as necessary.

Amendments

Pioneer may not amend its Proxy Voting Policies And Procedures without the prior approval of the Proxy Voting Oversight Group and its corporate parent, Pioneer Global Asset Management S.p.A

5

Proxy Voting Policies

Pioneer's sole concern in voting proxies is the economic effect of the proposal on the value of portfolio holdings, considering both the short- and long-term impact. In many instances, Pioneer believes that supporting the company's strategy and voting "for" management's proposals builds portfolio value. In other cases, however, proposals set forth by management may have a negative effect on that value, while some shareholder proposals may hold the best prospects for enhancing it. Pioneer monitors developments in the proxy-voting arena and will revise this policy as needed.

All proxies that are received promptly will be voted in accordance with the specific policies listed below. All shares in a company held by Pioneer-managed accounts will be voted alike, unless a client has given us specific voting instructions on an issue or has not delegated authority to us. Proxy voting issues will be reviewed by Pioneer's Proxy Voting Oversight Group, which consists of the Director of Portfolio Management US, the Director of Investment Operations (the Proxy Coordinator), and the Director of Compliance.

Pioneer has established Proxy Voting Procedures for identifying and reviewing conflicts of interest that may arise in the voting of proxies.

Clients may request, at any time, a report on proxy votes for securities held in their portfolios and Pioneer is happy to discuss our proxy votes with company management. Pioneer retains a proxy voting service to provide research on proxy issues and to process proxy votes.

Administrative

While administrative items appear infrequently in U.S. issuer proxies, they are quite common in non-U.S. proxies.

We will generally support these and similar management proposals:

- o Corporate name change.
- o A change of corporate headquarters.
- o Stock exchange listing.
- o Establishment of time and place of annual meeting.
- o Adjournment or postponement of annual meeting.
- o Acceptance/approval of financial statements.
- o Approval of dividend payments, dividend reinvestment plans and other dividend-related proposals.
- o Approval of minutes and other formalities.

- o Authorization of the transferring of reserves and allocation of income.
- o Amendments to authorized signatories.
- o Approval of accounting method changes or change in fiscal year-end.
- o Acceptance of labor agreements.
- o Appointment of internal auditors.

Pioneer will vote on a case-by-case basis on other routine business; however, Pioneer will oppose any routine business proposal if insufficient information is presented in advance to allow Pioneer to judge the merit of the proposal. Pioneer has also instructed its proxy voting service to inform Pioneer of its analysis of any administrative items inconsistent, in its view, with supporting the value of Pioneer portfolio holdings so that Pioneer may consider and vote on those items on a case-by-case basis.

Auditors

We normally vote for proposals to:

- o Ratify the auditors. We will consider a vote against if we are concerned about the auditors' independence or their past work for the company. Specifically, we will oppose the ratification of auditors and withhold votes from audit committee members if non-audit fees paid by the company to the auditing firm exceed the sum of audit fees plus audit-related fees plus permissible tax fees according to the disclosure categories proposed by the Securities and Exchange Commission.
- o Restore shareholder rights to ratify the auditors.

We will normally oppose proposals that require companies to:

- o Seek bids from other auditors.
- o Rotate auditing firms, except where the rotation is statutorily required or where rotation would demonstrably strengthen financial disclosure.
- o Indemnify auditors.
- o Prohibit auditors from engaging in non-audit services for the company.

Board of Directors

On issues related to the board of directors, Pioneer normally supports management. We will, however, consider a vote against management in instances where corporate performance has been very poor or where the board appears to lack independence.

General Board Issues

Pioneer will vote for:

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

- o Audit, compensation and nominating committees composed of independent directors exclusively.
- o Indemnification for directors for actions taken in good faith in accordance with the business judgment rule. We will vote against proposals for broader indemnification.
- o Changes in board size that appear to have a legitimate business purpose and are not primarily for anti-takeover reasons.
- o Election of an honorary director.

We will vote against:

- o Minimum stock ownership by directors.
- o Term limits for directors. Companies benefit from experienced directors, and shareholder control is better achieved through annual votes.
- o Requirements for union or special interest representation on the board.
- o Requirements to provide two candidates for each board seat.

We will vote on a case-by case basis on these issues:

- o Separate chairman and CEO positions. We will consider voting with shareholders on these issues in cases of poor corporate performance.

Elections of Directors

In uncontested elections of directors we will vote against:

- o Individual directors with absenteeism above 25% without valid reason. We support proposals that require disclosure of director attendance.
- o Insider directors and affiliated outsiders who sit on the audit, compensation, stock option or nominating committees. For the purposes of our policy, we accept the definition of affiliated directors provided by our proxy voting service.

We will also vote against:

- o Directors who have failed to act on a takeover offer where the majority of shareholders have tendered their shares.
- o Directors who appear to lack independence or are associated with very poor corporate performance.

8

We will vote on a case-by case basis on these issues:

- o Re-election of directors who have implemented or renewed a dead-hand or modified dead-hand poison pill (a "dead-hand poison pill" is a shareholder rights plan that may be altered only by incumbent or "dead " directors. These plans prevent a potential acquirer from disabling a poison pill by obtaining control of the board through a proxy vote).

- o Contested election of directors.
- o Prior to phase-in required by SEC, we would consider supporting election of a majority of independent directors in cases of poor performance.
- o Mandatory retirement policies.
- o Directors who have ignored a shareholder proposal that has been approved by shareholders for two consecutive years.

Takeover-Related Measures

Pioneer is generally opposed to proposals that may discourage takeover attempts. We believe that the potential for a takeover helps ensure that corporate performance remains high.

Pioneer will vote for:

- o Cumulative voting.
- o Increase ability for shareholders to call special meetings.
- o Increase ability for shareholders to act by written consent.
- o Restrictions on the ability to make greenmail payments.
- o Submitting rights plans to shareholder vote.
- o Rescinding shareholder rights plans ("poison pills").
- o Opting out of the following state takeover statutes:
 - o Control share acquisition statutes, which deny large holders voting rights on holdings over a specified threshold.
 - o Control share cash-out provisions, which require large holders to acquire shares from other holders.
 - o Freeze-out provisions, which impose a waiting period on large holders before they can attempt to gain control.
 - o Stakeholder laws, which permit directors to consider interests of non-shareholder constituencies.

9

- o Disgorgement provisions, which require acquirers to disgorge profits on purchases made before gaining control.
- o Fair price provisions.
- o Authorization of shareholder rights plans.
- o Labor protection provisions.
- o Mandatory classified boards.

We will vote on a case-by-case basis on the following issues:

- o Fair price provisions. We will vote against provisions requiring

supermajority votes to approve takeovers. We will also consider voting against proposals that require a supermajority vote to repeal or amend the provision. Finally, we will consider the mechanism used to determine the fair price; we are generally opposed to complicated formulas or requirements to pay a premium.

- o Opting out of state takeover statutes regarding fair price provisions. We will use the criteria used for fair price provisions in general to determine our vote on this issue.
- o Proposals that allow shareholders to nominate directors.

We will vote against:

- o Classified boards, except in the case of closed-end mutual funds.
- o Limiting shareholder ability to remove or appoint directors. We will support proposals to restore shareholder authority in this area. We will review on a case-by-case basis proposals that authorize the board to make interim appointments.
- o Classes of shares with unequal voting rights.
- o Supermajority vote requirements.
- o Severance packages ("golden" and "tin" parachutes). We will support proposals to put these packages to shareholder vote.
- o Reimbursement of dissident proxy solicitation expenses. While we ordinarily support measures that encourage takeover bids, we believe that management should have full control over corporate funds.
- o Extension of advance notice requirements for shareholder proposals.
- o Granting board authority normally retained by shareholders (e.g., amend charter, set board size).
- o Shareholder rights plans ("poison pills"). These plans generally allow shareholders to buy additional shares at a below-market price in the event of a change in control and may deter some bids.

10

Capital Structure

Managements need considerable flexibility in determining the company's financial structure, and Pioneer normally supports managements' proposals in this area. We will, however, reject proposals that impose high barriers to potential takeovers.

Pioneer will vote for:

- o Changes in par value.
- o Reverse splits, if accompanied by a reduction in number of shares.
- o Share repurchase programs, if all shareholders may participate on equal terms.
- o Bond issuance.

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

- o Increases in "ordinary" preferred stock.
- o Proposals to have blank-check common stock placements (other than shares issued in the normal course of business) submitted for shareholder approval.
- o Cancellation of company treasury shares.

We will vote on a case-by-case basis on the following issues:

- o Reverse splits not accompanied by a reduction in number of shares, considering the risk of delisting.
- o Increase in authorized common stock. We will make a determination considering, among other factors:
 - o Number of shares currently available for issuance;
 - o Size of requested increase (we would normally approve increases of up to 100% of current authorization);
 - o Proposed use of the additional shares; and
 - o Potential consequences of a failure to increase the number of shares outstanding (e.g., delisting or bankruptcy).
 - o Blank-check preferred. We will normally oppose issuance of a new class of blank-check preferred, but may approve an increase in a class already outstanding if the company has demonstrated that it uses this flexibility appropriately.
 - o Proposals to submit private placements to shareholder vote.
 - o Other financing plans.

We will vote against preemptive rights that we believe limit a company's financing flexibility.

11

Compensation

Pioneer supports compensation plans that link pay to shareholder returns and believes that management has the best understanding of the level of compensation needed to attract and retain qualified people. At the same time, stock-related compensation plans have a significant economic impact and a direct effect on the balance sheet. Therefore, while we do not want to micromanage a company's compensation programs, we will place limits on the potential dilution these plans may impose.

Pioneer will vote for:

- o 401(k) benefit plans.
- o Employee stock ownership plans (ESOPs), as long as shares allocated to ESOPs are less than 5% of outstanding shares. Larger blocks of stock in ESOPs can serve as a takeover defense. We will support proposals to submit ESOPs to shareholder vote.
- o Various issues related to the Omnibus Budget and Reconciliation Act of 1993 (OBRA), including:

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

- o Amendments to performance plans to conform with OBRA;
- o Caps on annual grants or amendments of administrative features;
- o Adding performance goals; and
- o Cash or cash-and-stock bonus plans.
 - o Establish a process to link pay, including stock-option grants, to performance, leaving specifics of implementation to the company.
 - o Require that option repricings be submitted to shareholders.
 - o Require the expensing of stock-option awards.
 - o Require reporting of executive retirement benefits (deferred compensation, split-dollar life insurance, SERPs, and pension benefits).
 - o Employee stock purchase plans where the purchase price is equal to at least 85% of the market price, where the offering period is no greater than 27 months and where potential dilution (as defined below) is no greater than 10%.

12

We will vote on a case-by-case basis on the following issues:

- o Executive and director stock-related compensation plans. We will consider the following factors when reviewing these plans:
 - o The program must be of a reasonable size. We will approve plans where the combined employee and director plans together would generate less than 15% dilution. We will reject plans with 15% or more potential dilution.
$$\text{Dilution} = (A + B + C) / (A + B + C + D), \text{ where}$$

A = Shares reserved for plan/amendment,
B = Shares available under continuing plans,
C = Shares granted but unexercised and
D = Shares outstanding.
 - o The plan must not:
 - o Explicitly permit unlimited option repricing authority or that have repriced in the past without shareholder approval.
 - o Be a self-replenishing "evergreen" plan, plans that grant discount options and tax offset payments.
- o We are generally in favor of proposals that increase participation beyond executives.
- o We generally support proposals asking companies to adopt rigorous vesting provisions for stock option plans such as those that vest incrementally over, at least, a three- or four-year period with a pro rata portion of the shares becoming exercisable on an annual basis

following grant date.

- o We generally support proposals asking companies to disclose their window period policies for stock transactions. Window period policies ensure that employees do not exercise options based on insider information contemporaneous with quarterly earnings releases and other material corporate announcements.
- o We generally support proposals asking companies to adopt stock holding periods for their executives.
 - o All other employee stock purchase plans.
 - o All other compensation-related proposals, including deferred compensation plans, employment agreements, loan guarantee programs and retirement plans.
 - o All other proposals regarding stock compensation plans, including extending the life of a plan, changing vesting restrictions, repricing options, lengthening exercise periods or accelerating distribution of awards and pyramiding and cashless exercise programs.

13

We will vote against:

- o Pensions for non-employee directors. We believe these retirement plans reduce director objectivity.
- o Elimination of stock option plans.

We will vote on a case-by case basis on these issues:

- o Limits on executive and director pay.
- o Stock in lieu of cash compensation for directors.

Corporate Governance

Pioneer will vote for:

- o Confidential Voting.
- o Equal access provisions, which allow shareholders to contribute their opinion to proxy materials.
- o Proposals requiring directors to disclose their ownership of shares in the company.

We will vote on a case-by-case basis on the following issues:

- o Change in the state of incorporation. We will support reincorporations supported by valid business reasons. We will oppose those that appear to be solely for the purpose of strengthening takeover defenses.
- o Bundled proposals. We will evaluate the overall impact of the proposal.
- o Adopting or amending the charter, bylaws or articles of association.

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

- o Shareholder appraisal rights, which allow shareholders to demand judicial review of an acquisition price.

We will vote against:

- o Shareholder advisory committees. While management should solicit shareholder input, we prefer to leave the method of doing so to management's discretion.
- o Limitations on stock ownership or voting rights.
- o Reduction in share ownership disclosure guidelines.

14

Mergers and Restructurings

Pioneer will vote on the following and similar issues on a case-by-case basis:

- o Mergers and acquisitions.
- o Corporate restructurings, including spin-offs, liquidations, asset sales, joint ventures, conversions to holding company and conversions to self-managed REIT structure.
- o Debt restructurings.
- o Conversion of securities.
- o Issuance of shares to facilitate a merger.
- o Private placements, warrants, convertible debentures.
- o Proposals requiring management to inform shareholders of merger opportunities.

We will normally vote against shareholder proposals requiring that the company be put up for sale.

Mutual Funds

Many of our portfolios may invest in shares of closed-end mutual funds or exchange-traded funds. The non-corporate structure of these investments raises several unique proxy voting issues.

Pioneer will vote for:

- o Establishment of new classes or series of shares.
- o Establishment of a master-feeder structure.

Pioneer will vote on a case-by-case on:

- o Changes in investment policy. We will normally support changes that do not affect the investment objective or overall risk level of the fund. We will examine more fundamental changes on a case-by-case basis.
- o Approval of new or amended advisory contracts.
- o Changes from closed-end to open-end format.

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

- o Authorization for, or increase in, preferred shares.
- o Disposition of assets, termination, liquidation, or mergers.
- o Classified boards of closed-end mutual funds, but will typically support such proposals.

15

Social Issues

Pioneer will abstain on stockholder proposals calling for greater disclosure of corporate activities with regard to social issues. "Social Issues" may generally be described as shareholder proposals for a company to:

- o Conduct studies regarding certain issues of public concern and interest;
- o Study the feasibility of the company taking certain actions with regard to such issues; or
- o Take specific action, including ceasing certain behavior and adopting company standards and principles, in relation to issues of public concern and interest.

We believe these issues are important and should receive management attention.

Pioneer will vote against proposals calling for substantial changes in the company's business or activities. We will also normally vote against proposals with regard to contributions, believing that management should control the routine disbursement of funds.

16

Item 8. Portfolio Managers of Closed-End Management Investment Companies.

(a) If the registrant is a closed-end management investment company that is filing an annual report on this Form N-CSR, provide the following information:

(1) State the name, title, and length of service of the person or persons employed by or associated with the registrant or an investment adviser of the registrant who are primarily responsible for the day-to-day management of the registrant's portfolio (Portfolio Manager). Also state each Portfolio Manager's business experience during the past 5 years.

Additional Information About the Portfolio Managers

Other Accounts Managed by the Portfolio Managers. The table below indicates, for the portfolio manager of the fund, information about the accounts other than the fund over which the portfolio manager has day-to-day investment responsibility. All information on the number of accounts and total assets in the table is as of September 30, 2010. For purposes of the table, "Other Pooled Investment Vehicles" may include investment partnerships, undertakings for collective investments in transferable securities ("UCITS") and other non-U.S. investment funds and group trusts, and "Other Accounts" may include separate accounts for institutions or individuals, insurance company general or separate accounts, pension funds and other similar institutional accounts but generally do not include the portfolio manager's personal investment accounts or those which the manager may be deemed

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

to own beneficially under the code of ethics. Certain funds and other accounts managed by the portfolio manager may have substantially similar investment strategies.

Name of Portfolio Manager	Type of Account	Number of Accounts Managed	Total Assets Managed	Number of Accounts Managed for which Advisory Fee is Performance-Based
David Eurkus	Other Registered Investment Companies	3	\$1,644,212,000	N/A
	Other Pooled Investment Vehicles	0	\$0	N/A
	Other Accounts	1	\$10,612,000	N/A

Potential Conflicts of Interest. When a portfolio manager is responsible for the management of more than one account, the potential arises for the portfolio manager to favor one account over another. The principal types of potential conflicts of interest that may arise are discussed below. For the reasons outlined below, Pioneer does not believe that any material conflicts are likely to arise out of a portfolio manager's responsibility for the management of the fund as well as one or more other accounts. Although Pioneer has adopted procedures that it believes are reasonably designed to detect and prevent violations of the federal securities laws and to mitigate the potential for conflicts of interest to affect its portfolio management decisions, there can be no assurance that all conflicts will be identified or that all procedures will be effective in mitigating the potential for such risks. Generally, the risks of such conflicts of interest are increased to the extent that a portfolio manager has a financial incentive to favor one account over another. Pioneer has structured its compensation arrangements in a manner that is intended to limit such potential for conflicts of interest. See "Compensation of Portfolio Managers" below.

- o A portfolio manager could favor one account over another in allocating new investment opportunities that have limited supply, such as initial public offerings and private placements. If, for example, an initial public offering that was expected to appreciate in value significantly shortly after the offering was allocated to a single account, that account may be expected to have better investment performance than other accounts that did not receive an allocation of the initial public offering. Generally, investments for which there is limited availability are allocated based upon a range of factors including available cash and consistency with the accounts' investment objectives and policies. This allocation methodology necessarily involves some subjective elements but is intended over time to treat each client in an equitable and fair manner. Generally, the investment opportunity is allocated among participating accounts on a pro rata basis. Although Pioneer believes that its practices are reasonably designed to treat each client in an equitable and fair manner, there may be

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

instances where a fund may not participate, or may participate to a lesser degree than other clients, in the allocation of an investment opportunity.

- o A portfolio manager could favor one account over another in the order in which trades for the accounts are placed. If a portfolio manager determines to purchase a security for more than one account in an aggregate amount that may influence the market price of the security, accounts that purchased or sold the security first may receive a more favorable price than accounts that made subsequent transactions. The less liquid the market for the security or the greater the percentage that the proposed aggregate purchases or sales represent of average daily trading volume, the greater the potential for accounts that make subsequent purchases or sales to receive a less favorable price. When a portfolio manager intends to trade the same security on the same day for more than one account, the trades typically are "bunched," which means that the trades for the individual accounts are aggregated and each account receives the same price. There are some types of accounts as to which bunching may not be possible for contractual reasons (such as directed brokerage arrangements). Circumstances may also arise where the trader believes that bunching the orders may not result in the best possible price. Where those accounts or circumstances are involved, Pioneer will place the order in a manner intended to result in as favorable a price as possible for such client.
- o A portfolio manager could favor an account if the portfolio manager's compensation is tied to the performance of that account to a greater degree than other accounts managed by the portfolio manager. If, for example, the portfolio manager receives a bonus based upon the performance of certain accounts relative to a benchmark while other accounts are disregarded for this purpose, the portfolio manager will have a financial incentive to seek to have the accounts that determine the portfolio manager's bonus achieve the best possible performance to the possible detriment of other accounts. Similarly, if Pioneer receives a performance-based advisory fee, the portfolio manager may favor that account, whether or not the performance of that account directly determines the portfolio manager's compensation.
- o A portfolio manager could favor an account if the portfolio manager has a beneficial interest in the account, in order to benefit a large client or to compensate a client that had poor returns. For example, if the portfolio manager held an interest in an investment partnership that was one of the accounts managed by the portfolio manager, the portfolio manager would have an economic incentive to favor the account in which the portfolio manager held an interest.
- o If the different accounts have materially and potentially conflicting investment objectives or strategies, a conflict of interest could arise. For example, if a portfolio manager purchases a security for one account and sells the same security for another account, such trading pattern may disadvantage either the account that is long or short. In making portfolio manager assignments, Pioneer seeks to avoid such potentially conflicting situations. However, where a portfolio manager is responsible for accounts with differing investment objectives and policies, it is possible that the portfolio manager will conclude that it is in the best interest of one account to sell a portfolio security while another account continues to hold or increase the holding in such security.

Compensation of Portfolio Managers. Pioneer has adopted a system of compensation for portfolio managers that seeks to align the financial interests of the portfolio managers with those of shareholders of the accounts (including Pioneer funds) the portfolio managers manage, as well as with the financial performance of Pioneer. The compensation program for all Pioneer portfolio managers includes a base salary (determined by the rank and tenure of the employee) and an annual

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

bonus program, as well as customary benefits that are offered generally to all full-time employees. Base compensation is fixed and normally reevaluated on an annual basis. Pioneer seeks to set base compensation at market rates, taking into account the experience and responsibilities of the portfolio manager. The bonus plan is intended to provide a competitive level of annual bonus compensation that is tied to the portfolio manager achieving superior investment performance and align the interests of the investment professional with those of shareholders, as well as with the financial performance of Pioneer. Any bonus under the plan is completely discretionary, with a maximum annual bonus that may be in excess of base salary. The annual bonus is based upon a combination of the following factors:

- o Quantitative Investment Performance. The quantitative investment performance calculation is based on pre-tax investment performance of all of the accounts managed by the portfolio manager (which includes the fund and any other accounts managed by the portfolio manager) over a one-year period (20% weighting) and four-year period (80% weighting), measured for periods ending on December 31. The accounts, which include the fund, are ranked against a group of mutual funds with similar investment objectives and investment focus (60%) and a broad-based securities market index measuring the performance of the same type of securities in which the accounts invest (40%), which, in the case of the fund, is the Barclays Capital Municipal Bond Index and the Barclays Capital High Income Municipal Bond Index. As a result of these two benchmarks, the performance of the portfolio manager for compensation purposes is measured against the criteria that are relevant to the portfolio manager's competitive universe.
- o Qualitative Performance. The qualitative performance component with respect to all of the accounts managed by the portfolio manager includes objectives, such as effectiveness in the areas of teamwork, leadership, communications and marketing, that are mutually established and evaluated by each portfolio manager and management.
- o Pioneer Results and Business Line Results. Pioneer's financial performance, as well as the investment performance of its investment management group, affect a portfolio manager's actual bonus by a leverage factor of plus or minus (+/-) a predetermined percentage.

The quantitative and qualitative performance components comprise 80% and 20%, respectively, of the overall bonus calculation (on a pre-adjustment basis). A portion of the annual bonus is deferred for a specified period and may be invested in one or more Pioneer funds.

Certain portfolio managers may participate in other programs designed to reward and retain key contributors. Senior executives or other key employees may be granted performance units based on the stock price performance of UniCredit and the financial performance of Pioneer Global Asset Management S.p.A., which are affiliates of Pioneer. Portfolio managers also may participate in a deferred compensation program, whereby deferred amounts are invested in one or more Pioneer funds.

Share Ownership by Portfolio Manager. The following table indicates as of March 31, 2010 the value, within the indicated range, of shares beneficially owned by the portfolio manager of the fund.

Name of Portfolio Manager

Beneficial Ownership of the Fund*

*Key to Dollar Ranges

- A. None
- B. \$1 - \$10,000
- C. \$10,001 - \$50,000
- D. \$50,001 - \$100,000
- E. \$100,001 - \$500,000
- F. \$500,001 - \$1,000,000
- G. Over \$1,000,000

Item 9. Purchases of Equity Securities by Closed-End Management Investment Company and Affiliated Purchasers.

(a) If the registrant is a closed-end management investment company, in the following tabular format, provide the information specified in paragraph (b) of this Item with respect to any purchase made by or on behalf of the registrant or any affiliated purchaser, as defined in Rule 10b-18(a)(3) under the Exchange Act (17 CFR 240.10b-18(a)(3)), of shares or other units of any class of the registrants equity securities that is registered by the registrant pursuant to Section 12 of the Exchange Act (15 U.S.C. 781). Instruction to paragraph (a). Disclose all purchases covered by this Item, including purchases that do not satisfy the conditions of the safe harbor of Rule 10b-18 under the Exchange Act (17 CFR 240.10b-18), made in the period covered by the report. Provide disclosures covering repurchases made on a monthly basis. For example, if the reporting period began on January 16 and ended on July 15, the chart would show repurchases for the months from January 16 through February 15, February 16 through March 15, March 16 through April 15, April 16 through May 15, May 16 through June 15, and June 16 through July 15.

During the period covered by this report, there were no purchases made by or on behalf of the registrant or any affiliated purchaser as defined in Rule 10b-18(a)(3) under the Securities Exchange Act of 1934 (the Exchange Act), of shares of the registrants equity securities that are registered by the registrant pursuant to Section 12 of the Exchange Act.

Item 10. Submission of Matters to a Vote of Security Holders.

Describe any material changes to the procedures by which shareholders may recommend nominees to the registrants board of directors, where those changes were implemented after the registrant last provided disclosure in response to the requirements of Item 7(d)(2)(ii)(G) of Schedule 14A (17 CFR 240.14a-101), or this Item.

There have been no material changes to the procedures by which the shareholders may recommend nominees to the registrants board of directors since the registrant last provided disclosure in response to the requirements of Item 7(d)(2)(ii)(G) of Schedule 14(A) in its definitive proxy statement, or this Item.

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

ITEM 11. 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-2(c) under the Act (17 CFR 270.30a-2(c))) based on their evaluation of these controls and procedures as of a date within 90 days of the filing date of the report that includes the disclosure required by this paragraph.

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 whether or not there were significant changes in the registrant's internal controls or in other factors that could significantly affect these controls subsequent to the date of their evaluation, including any corrective actions with regard to significant deficiencies and material weaknesses.

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.

The registrant's principal executive officer and principal financial officer, however, voluntarily are reporting the following information:

In August of 2006 the registrant's investment adviser enhanced its internal procedures for reporting performance information required to be included in prospectuses. Those enhancements involved additional internal controls over the appropriateness of performance data generated for this purpose. Such enhancements were made following an internal review which identified prospectuses relating to certain classes of shares of a limited number of registrants where, inadvertently, performance information not reflecting the deduction of applicable sales charges was included. Those prospectuses were revised, and the revised prospectuses were distributed to shareholders.

ITEM 12. EXHIBITS.

File the exhibits listed below as part of this Form. Letter or number the exhibits in the sequence indicated.

(a) Any code of ethics, or amendment thereto, that is the subject of the disclosure required by Item 2, to the extent that the registrant intends to satisfy the Item 2 requirements through filing of an exhibit.

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

(b) 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 November 29, 2010

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 November 29, 2010

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

Date November 29, 2010

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