

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST

Form N-CSR

May 29, 2009

OMB APPROVAL

OMB Number: 3235-0570
Expires: August 31, 2010
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)

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

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

Date of fiscal year end: March 31

Date of reporting period: April 1, 2008 through March 31, 2009

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.

ITEM 1. REPORTS TO SHAREOWNERS.

Pioneer Municipal High
Income Advantage Trust

Annual Report | March 31, 2009

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
Report of Independent Registered Public Accounting Firm	33
Approval of Investment Advisory Agreement	36
Trustees, Officers and Service Providers	39

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 1

President's Letter

Dear Shareowner,

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

Stock and bond markets around the globe have been experiencing one of their most tumultuous periods in history. Investors have witnessed volatility of a magnitude that many have never before seen. Distance often provides the best vantage point for perspective. Still, we believe that the benefits of basic investment principles that have stood the test of time -- even in the midst of market turmoil -- cannot be underestimated.

First, invest for the long term. The founder of Pioneer Investments, Philip L. Carret, began his investment career during the 1920s. One lesson he learned is that while great prosperity affords an advantageous time for selling stocks, extreme economic slumps can create opportunities for purchase. Indeed, many of our portfolio managers, who follow the value-conscious investing approach of our founder, are looking at recent market conditions as an opportunity to buy companies whose shares we believe have been unjustifiably beaten down by indiscriminate selling, but that we have identified as having strong prospects over time. While investors may be facing a sustained market downturn, we continue to believe that patience, along with staying invested in the market, are important considerations for long-term investors.

A second principle is to stay diversified across different types of investments. The global scope of the current market weakness poses challenges for this basic investment axiom. But the turbulence makes now a good time to reassess your portfolio and make sure that your investments continue to meet your needs. We believe you should work closely with your financial advisor to find the mix of stocks, bonds and money market assets that is best aligned to your particular risk tolerance and investment objective.

As the investment markets sort through the continuing crisis in the financial industry, we are staying focused on the fundamentals and risk management. With more than 80 years of experience behind us, we have learned how to navigate turbulent markets. At Pioneer Investments, risk management has always been a critical part of our culture -- not just during periods of extraordinary volatility. Our investment process is based on fundamental research, 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. While we

2 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

see potential chances for making money in many corners of the market, it takes research and experience to separate solid investment opportunities from speculation.

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. Thank you for investing with Pioneer.

Respectfully,

/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.

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

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 | Annual Report | 3/31/09 3

Portfolio Management Discussion | 3/31/09

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 had an impact on the municipal bond market and the Trust during the 12 months ended March 31, 2009.

Q How did the Trust perform over the 12 months ended March 31, 2009?

A For the 12-month period ended March 31, 2009, Pioneer Municipal High Income Advantage Trust produced a total return of -25.82% at net asset value and -28.40% at market price. As of March 31, 2009, the Trust was selling at a 2.1% discount of market price to net asset value. Over the same 12-month period, the Barclays Capital (formerly Lehman Brothers) Municipal Bond Index, which tracks the performance of investment-grade bonds, returned 2.27%, and the Barclays Capital High Yield Municipal Bond Index, which tracks the performance of below investment-grade bonds, returned -19.16%. On March 31, 2009, the Trust's 30-day SEC yield was 11.87%, and its current dividend yield, based on market close, was 9.96%.

Q What was the investment environment like during the 12-month period ended March 31, 2009?

A It was an environment of substantial capital market unrest, as the credit crisis led to one of the most volatile and illiquid periods in the history of the fixed-income markets. The seizing up of the credit markets, the bankruptcy of Lehman Brothers, the AIG fiasco, and the mergers of Merrill Lynch with Bank of America, and Bear Stearns with JPMorgan Chase, were just some of the events that led to the great disruption in the financial markets. In this environment, the municipal bond market saw liquidity dry up, new issuance come to a halt, forced selling by several financial institutions, and a huge number of redemptions as investors fled to the safety of the Treasury market. As a result of the turmoil, municipal bond yields rose to historic levels above Treasury yields. Rarely in history has the ratio of municipal bond yields to Treasury yields been so high. The typical rate of municipal yields to Treasury yields has been at around 90%. In December of 2008, the ratio increased to more than 200%. In the first quarter of 2009, municipal bonds rebounded: there was a slight improvement in liquidity; and municipal bond yields declined, although they remained higher than Treasury yields.

Q What affected the Trust's performance during the 12-month period ended March 31, 2009?

A The Trust's underperformance relative to its benchmarks can be attributed to defaults in some of the Trust's holdings, including: exposure to Lehman

4 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

Brothers through a municipal bond issued by Main Street Natural Gas in Georgia; a position in the Las Vegas Monorail System, whose large debt service reserve fund was discontinued when the plans for monorail expansion to the airport failed to materialize; and the bankruptcy of the St. Louis Convention

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

Center. The Trust's performance was marginally affected by the calling away of a small position in Continuing Care Retirement Communities (CCRC). The Trust's position in airline bonds also held back returns. Despite the steep decline in fuel prices, airline bonds lost value, reflecting concerns that airline revenues would continue to contract in the weak global economy. In recent weeks, leading up to the end of the first quarter, we have seen a slight upturn in the value of airline bonds.

While the Trust had a setback over the past 12 months, its portfolio comprises what we believe are solid investments that should weather the problems in the economy and financial markets.

Q How did you manage the Trust during the 12-month period ended March 31, 2009?

A We made no material changes to the Trust's portfolio and maintained our emphasis on sectors that underpin the U.S. economy. At 29.5% of total investment portfolio, health care, which includes hospitals and life-care facilities, was the Trust's biggest sector position. Other relatively large positions included tobacco (11.0% of total investment portfolio), other revenue bonds (9.9% of total investment portfolio), development bonds (9.6% of total investment portfolio) and airport bonds (8.2% of total investment portfolio). In terms of quality distribution, 47.6% of total investment portfolio was positioned in investment-grade securities; 50.7% of total investment portfolio in below-investment-grade securities; and 1.7% of total investment portfolio in cash equivalents. At the end of the 12 months, at March 31, 2009, the Trust held 138 issues in 34 states, territories and the District of Columbia, and its average credit quality was BBB+.

Q What is your outlook?

A The municipal bond market has begun to recover from the recent market turmoil. Investors are beginning to return to the market, and we have seen prices increase and yields decline. For the first quarter of 2009, the Barclays Municipal Bond Index and the Barclays High Yield Municipal Bond Index rose by 4.22% and 7.65%, respectively.

As we look ahead, we believe the municipal market could continue to be attractive as states and municipalities begin to receive Federal government stimulus money that can be used for infrastructure repair, education and health care programs. We are closely monitoring developments in Washington regarding the health care sector. "Build America Bonds" are also part of the government's stimulus. Under the program, the U.S. Treasury will subsidize 35% of issuers' net interest costs. We believe the program will result in a

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 5

large amount of new issuance of taxable municipal debt and a reduction in the new issuance of tax-exempt debt. That could be a positive for tax-exempt municipal bonds. At a time when tax rates are likely to rise, we expect to see demand increase and supply contract. The supply/demand dynamic could increase the value of tax-exempt municipal bonds over time.

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

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 underlying securities and their inability to meet their debt obligations.

The Trust may use 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.

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.

Risks of investing in the Trust are discussed in greater detail in the Trust's registration statement on Form N-2 relating to its common shares.

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.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 6

Portfolio Summary | 3/31/09

Portfolio Diversification

(As a percentage of total investment portfolio)

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

Health Revenue 29.5%
Tobacco Revenue 11.0%
Other Revenue 9.9%
Development Revenue 9.6%
Insured 9.4%
Airport Revenue 8.2%
Pollution Control Revenue 7.1%
Transportation Revenue 5.2%
Housing Revenue 4.1%
Facilities Revenue 3.9%
Water Revenue 1.4%
Education Revenue 0.5%
Airlines Revenue 0.2%

Portfolio Maturity

(As a percentage of long-term holdings)

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

0-1 year 4.2%
1-3 years 11.7%
3-6 years 18.6%
6-8 years 14.1%
8-10 years 21.9%
10+ years 29.5%

Quality Distribution

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

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

AAA 15.5%
AA 4.1%
A 2.7%
BBB 25.3%
BB 6.1%
B 9.0%
CCC 1.9%
CC 0.1%
C 1.4%
Not Rated 32.2%
Cash Equivalents 1.7%

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 7

Prices and Distributions | 3/31/09

Share Prices and Distributions

Market Value per Common Share

3/31/09	3/31/08
\$9.04	\$13.74

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

Net Asset Value per Common Share

	3/31/09	3/31/08
	\$9.23	\$13.54

Distributions per Common Share

	Net Investment Income	Short-Term Capital Gains	Long-Term Capital Gains
4/1/08-3/31/09	\$0.9000	\$ --	\$ --

10 Largest Holdings

(As a percentage of long-term holdings)*

1.	Indiana State Development Finance Authority Revenue, 5.75%, 10/1/11	2.75
2.	Massachusetts Housing Finance Agency, 5.35%, 12/1/45	2.69
3.	University of California, RIB, 9.916%, 5/15/38	2.63
4.	North Texas Tollway Authority Revenue, 5.75%, 1/1/33	2.62
5.	Non-Profit Preferred Funding Trust I, Series E, 12.0%, 9/15/37 (144A)	2.46
6.	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	2.41
7.	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29	2.27
8.	Knox County Health Educational & Housing Facilities Board Hospital Revenue, 6.5%, 4/15/31	1.92
9.	Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29	1.89
10.	Tobacco Settlement Financing Corp., 7.0%, 6/1/41	1.75

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

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

Performance Update | 3/31/09

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 Barclays Capital High Yield Municipal Bond Index.

Cumulative Total Returns (As of March 31, 2009)

Period	Net Asset Value ("NAV")	Market Price
Life-of-Trust (10/20/03)	-5.79%	-11.85%
5 Year	-9.30	-14.36
1 Year	-25.82	-28.40

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

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
3/04	10,293	10,364	9,996
3/05	10,712	10,641	10,006
3/06	11,949	11,046	10,050
3/07	13,169	11,645	10,013
3/08	12,312	11,867	10,048
3/09	8,815	12,137	9,959

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

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

sold in the open market through a stock exchange, and frequently trade at prices lower than their NAV. NAV 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.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 9

Schedule of Investments | 3/31/09

Principal Amount	S&P/Moody's Ratings (unaudited)		Value
		TAX-EXEMPT OBLIGATIONS -- 159.3% of Net Assets	
		Arizona -- 4.0%	
\$ 5,000,000	NR/NR	Casa Grande Industrial Development Authority, Hospital Revenue, 7.625%, 12/1/29	\$ 3,8
1,541,000	NR/Baa3	Pima County Industrial Development Authority, 6.75%, 7/1/31	1,0
2,640,000	NR/NR	Pima County Industrial Development Authority, 7.0%, 1/1/38	1,9
2,000,000	NR/NR	San Luis Facility Development Corp., 7.25%, 5/1/27	1,5
			\$ 8,5
		California -- 16.6%	
3,140,000 (a)	AAA/NR	California State University Revenue, RIB, 8.956%, 11/1/39 (144A)	\$ 2,7
2,425,000	A/A2	California State Various Purpose, 5.75%, 4/1/31	2,3
8,575,000 (a)	AAA/NR	California State Various Purpose, RIB, 8.25%, 6/1/37 (144A)	5,9
6,000,000	NR/NR	California Statewide Communities Development Authority, 9.0%, 12/1/38	4,7
2,680,000+	AAA/NR	Golden State Tobacco Securitization Corp., 6.75%, 6/1/39	3,1
2,500,000	A/A2	San Jose California Airport Revenue, 5.0%, 3/1/37	2,1

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

10,500,000 (a)	AAA/NR	University of California, RIB, 9.916%, 5/15/38	9,0
7,670,000	C/NR	Valley Health System Hospital Revenue, 6.875%, 5/15/23	4,8
			\$ 35,0
2,850,000+	NR/NR	Colorado -- 1.5% Denver Health & Hospital Authority Healthcare Revenue, 6.0%, 12/1/31	\$ 3,1
7,750,000	BBB/Baa1	Connecticut -- 2.8% Connecticut State Development Authority Revenue, 5.75%, 11/1/37	\$ 5,9
2,700,000	BBB/Baa3	District of Columbia -- 3.1% District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$ 1,8
6,825,000	BBB/Baa3	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	4,7
			\$ 6,5
4,500,000	BBB-/Baa2	Florida -- 2.8% Hillsborough County Florida Industrial Development Authority Pollution Control Revenue, 5.5%, 10/1/23	\$ 4,1
1,980,000	NR/NR	Hillsborough County Florida Industrial Development Authority Pollution Control Revenue, 6.75%, 7/1/29	1,4

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

10 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

Principal Amount	S&P/Moody's Ratings (unaudited)		Value
\$ 500,000	BB/NR	Florida -- (continued) Miami Beach Health Facilities Authority, 5.375%, 11/15/28	\$ 2
			\$ 5,8
5,210,000 (a)	NR/Aa3	Georgia -- 4.1% Atlanta Georgia Water and Wastewater Revenue, RIB, 5.613%, 11/1/43 (144A)	\$ 4,3
1,065,000	NR/B2	Effingham County Industrial Development Authority, 6.5%, 6/1/31	6
3,360,000	NR/NR	Fulton County Residential Care Facilities, 7.0%, 7/1/29	2,2
1,650,000	NR/NR	Savannah Georgia Economic Development Authority Revenue, 7.4%, 1/1/34	1,3
			\$ 8,6
		Guam -- 3.6%	

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

3,000,000	NR/NR	Northern Mariana Islands, 5.0%, 6/1/30	\$ 1,8
4,600,000+	AAA/Ba3	Northern Mariana Islands, 6.75%, 10/1/33	5,4
400,000	B+/Ba3	Northern Mariana Islands, 6.75%, 10/1/33	3

			\$ 7,6

		Idaho -- 2.2%	
2,000,000	BBB/Baa2	Power County Industrial Development Corp., 6.45%, 8/1/32	\$ 1,6
3,000,000	BBB/Baa2	Power County Pollution Control Revenue, 5.625%, 10/1/14	2,8

			\$ 4,5

		Illinois -- 6.3%	
3,000,000	NR/NR	Centerpoint Intermodal Center, 10.0%, 6/15/23 (144A)	\$ 2,3
3,000,000	AA-/Aa3	City of Chicago Illinois, 5.0%, 1/1/28	2,9
1,000,000	NR/NR	Illinois Finance Authority Revenue, 6.0%, 11/15/27	6
2,000,000	AA+/Aa2	Illinois Finance Authority Revenue, 6.0%, 8/15/39	1,9
2,500,000	NR/NR	Illinois Finance Authority Revenue, 6.125%, 11/15/25	1,7
1,645,000	NR/NR	Illinois Health Facilities Authority Revenue, 5.5%, 11/15/19	1,3
1,500,000 (b)	NR/NR	Illinois Health Facilities Authority Revenue, 6.9%, 11/15/33	6
2,700,000	NR/NR	Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,6

			\$ 13,3

		Indiana -- 7.7%	
10,000,000	BBB+/NR	Indiana State Development Finance Authority Revenue, 5.75%, 10/1/11	\$ 9,5
5,000,000	NR/B2	Jasper County Industrial Economic Development Revenue, 5.6%, 4/1/29	2,7

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 11

Schedule of Investments | 3/31/09 (continued)

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

		Indiana -- (continued)	
\$ 2,500,000 (c)	BBB/Baa2	Rockport Indiana Pollution Control Revenue, 6.25%, 6/2/25	\$ 2,5
2,085,000	NR/NR	Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	1,5

			\$ 16,2

		Kentucky -- 1.7%	

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

500,000	BB-/NR	Kentucky Economic Development Finance Authority Hospital System Revenue, 5.7%, 10/1/10	\$ 4
4,400,000	BB-/NR	Kentucky Economic Development Finance Authority Hospital System Revenue, 5.875%, 10/1/22	3,1
			\$ 3,5

2,500,000	BB+/Ba3	Louisiana -- 5.9% Louisiana Local Government Environmental Facilities Development Authority Revenue, 6.75%, 11/1/32	\$ 1,6
6,000,000	NR/A3	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	4,2
750,000	BBB+/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	6
9,415,000	BBB/Baa3	Tobacco Settlement Financing Corp., 5.875%, 5/15/39	5,9
			\$ 12,5

460,000	NR/NR	Maryland -- 0.4% Maryland Health & Higher Educational Facilities Authority Revenue, 5.25%, 1/1/27	\$ 2
1,250,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.3%, 1/1/37	6
			\$ 9

2,195,000	BBB-/Baa3	Massachusetts -- 6.7% Massachusetts Health & Educational Facilities Authority Revenue, 5.375%, 7/15/28	\$ 1,5
1,000,000+	NR/Baa3	Massachusetts Health & Educational Facilities Authority Revenue, 6.35%, 7/15/32	1,1
10,760,000	AA-/Aa3	Massachusetts Housing Finance Agency, 5.35%, 12/1/45	9,2
900,000	BB/NR	Massachusetts Development Finance Agency, 5.25%, 10/1/18	6
2,000,000	NR/NR	Massachusetts Development Finance Agency, 7.1%, 7/1/32	1,5
			\$ 14,2

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

12 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

Principal Amount	S&P/Moody's Ratings (unaudited)		Value
\$ 1,500,000+	AAA/A3	Michigan -- 4.4% Delta County Michigan Economic Development Corp., 6.25%, 4/15/27	\$ 1,7
3,000,000+	NR/NR	Macomb County Hospital Finance Authority Revenue, 5.875%, 11/15/34	3,5

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

745,000	NR/NR	Michigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36	5
4,130,000	BB-/Ba3	Michigan State Hospital Finance Authority Revenue, 5.5%, 8/15/23	2,6
1,000,000	NR/NR	Michigan State Strategic Fund Solid Waste Disposal Revenue, 7.375%, 1/15/22	7
			----- \$ 9,2
		Missouri -- 1.4%	
1,850,000	NR/NR	Kansas City Industrial Development Authority Revenue, 5.875%, 1/1/37 (144A)	\$ 1,1
1,500,000 (b)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.2%, 12/15/28	3
6,640,000 (b)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35	1,4
			----- \$ 2,9
		Montana -- 0.7%	
2,445,000 (d)	NR/NR	Hardin Increment Industrial Infrastructure Development Revenue, 0.0%, 9/1/31	\$ 1,0
1,000,000 (b)	NR/NR	Two Rivers Authority, Inc., Project Revenue, 7.375%, 11/1/27	4
			----- \$ 1,4
		Nevada -- 2.5%	
1,500,000	A/A2	Henderson Nevada Health Care Facilities Revenue, 5.625%, 7/1/24	\$ 1,3
1,600,000	NR/NR	Nevada State Department of Business & Industry, 7.25%, 1/1/23	1
1,000,000	NR/NR	Nevada State Department of Business & Industry, 7.375%, 1/1/30	
1,320,000	NR/NR	Nevada State Department of Business & Industry, 7.375%, 1/1/40	1
5,000,000	A-/A3	Reno Nevada Hospital Revenue, 5.25%, 6/1/41	3,6
			----- \$ 5,2
		New Hampshire -- 0.4%	
1,125,000	NR/NR	New Hampshire Health & Educational Facilities Authority Revenue, 5.875%, 7/1/34	\$ 8
		New Jersey -- 11.5%	
2,500,000	NR/NR	Burlington County New Jersey Bridge Commission Revenue, 5.625%, 1/1/38	\$ 1,4

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 13

Schedule of Investments | 3/31/09 (continued)

S&P/Moody's

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

Principal Amount	Ratings (unaudited)		Value
<hr/>			
		New Jersey -- (continued)	
\$13,000,000	B/B3	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29	\$ 7,8
3,500,000 (a)	NR/Aa3	New Jersey State Turnpike Authority, RIB, 8.797%, 1/1/28 (144A)	3,8
1,000,000+	AAA/Aaa	Tobacco Settlement Financing Corp., 6.25%, 6/1/43	1,1
3,250,000+	AAA/Aaa	Tobacco Settlement Financing Corp., 6.75%, 6/1/39	3,9
5,000,000+	AAA/Aaa	Tobacco Settlement Financing Corp., 7.0%, 6/1/41	6,0
			<hr/> \$ 24,3
<hr/>			
		New York -- 7.3%	
1,000,000	NR/NR	Nassau County New York Industrial Development Agency Revenue, 6.7%, 1/1/43	\$ 7
5,000,000	BB-/Ba1	New York City Industrial Development Agency, 5.25%, 12/1/32	2,5
2,000,000	NR/Baa1	New York City Industrial Development Agency, 5.375%, 6/1/23	1,6
2,000,000	CCC+/Caa2	New York City Industrial Development Agency, 6.9%, 8/1/24	7
3,950,000	BB-/Ba1	New York City Industrial Development Agency, 7.625%, 12/1/32	2,8
5,000,000	AAA/Aaa	New York State Environmental Facilities Corp., 5.0%, 6/15/33	4,9
500,000	NR/NR	Ulster County New York Industrial Development Agency, 6.0%, 9/15/37	3
1,800,000	NR/NR	Yonkers Industrial Development Agency Civic Facilities Revenue, 6.15%, 3/1/15	1,5
			<hr/> \$ 15,3
<hr/>			
		North Carolina -- 1.9%	
6,000,000	NR/NR	Charlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28	\$ 4,0
<hr/>			
		Ohio -- 2.4%	
3,115,000	B-/NR	Belmont County Health System Revenue, 5.7%, 1/1/13	\$ 2,7
1,000,000	B-/NR	Belmont County Health System Revenue, 5.8%, 1/1/18	7
3,000,000	B-/B3	Cleveland Airport Special Revenue, 5.375%, 9/15/27	1,6
			<hr/> \$ 5,0
<hr/>			
		Oklahoma -- 3.2%	
1,695,000	BB/NR	Jackson County Memorial Hospital Authority Revenue, 7.3%, 8/1/15	\$ 1,6
2,220,000	B-/Caa2	Tulsa Municipal Airport Trust Revenue, 6.25%, 6/1/20	1,4
1,500,000	B-/Caa2	Tulsa Municipal Airport Trust Revenue, 7.35%, 12/1/11	1,3
3,000,000 (c)	B-/Caa2	Tulsa Municipal Airport Trust Revenue, 7.75%, 6/1/35	2,3
			<hr/> \$ 6,8

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

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

Principal Amount	S&P/Moody's Ratings (unaudited)		Value
		Pennsylvania -- 11.0%	
\$ 3,000,000+	AAA/Baa3	Allegheny County Hospital Development Authority Revenue, 9.25%, 11/15/22	\$ 3,4
500,000+	AAA/NR	Allegheny County Hospital Development Authority Revenue, 9.25%, 11/15/30	5
1,000,000	BBB-/NR	Clarion County Hospital Authority Revenue, 5.625%, 7/1/21	1,0
3,600,000	B-/NR	Columbia County Hospital Authority Revenue, 5.85%, 6/1/24	2,6
1,050,000	BBB/Baa2	Hazleton Health Services Authority Hospital Revenue, 6.125%, 7/1/16	8
2,415,000	NR/Baa3	Montgomery County Higher Education & Health Authority Hospital Revenue, 6.6%, 7/1/10	2,4
1,430,000	BB+/NR	Pennsylvania Economic Development Financing Authority Revenue, 5.125%, 6/1/18	1,0
1,805,000	BB+/NR	Pennsylvania Economic Development Financing Authority Revenue, 5.3%, 6/1/10	1,7
2,330,000	BB+/NR	Pennsylvania Economic Development Financing Authority Revenue, 5.35%, 6/1/11	2,1
5,000,000	BBB/Baa3	Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 5.0%, 7/1/34	3,2
2,005,000	B-/NR	Scranton-Lackawanna Health & Welfare Authority Revenue, 6.1%, 7/1/11	1,8
2,245,000	B-/NR	Scranton-Lackawanna Health & Welfare Authority Revenue, 6.15%, 7/1/12	2,0
			\$ 23,1
		Rhode Island -- 3.0%	
1,385,000	NR/NR	Central Falls Rhode Island Detention Facilities Revenue, 7.25%, 7/15/35	\$ 9
8,285,000	BBB/Baa3	Tobacco Settlement Financing Corp., 6.25%, 6/1/42	5,3
			\$ 6,2
		South Carolina -- 8.7%	
1,500,000	CC/NR	Connector 2000 Association, Inc., Toll Road Revenue, 5.375%, 1/1/38	\$ 5
7,140,000+	BBB+/Baa1	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	8,3
860,000+	BBB+/Baa1	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	1,0
3,000,000+	AAA/NR	South Carolina Jobs Economic Development Authority Revenue, 8.0%, 10/1/31	3,3
4,400,000 (e)	BBB/Baa3	Tobacco Settlement Revenue Management, 6.375%, 5/15/30	5,1
			\$ 18,3

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

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 15

Schedule of Investments | 3/31/09 (continued)

Principal Amount	S&P/Moody's Ratings (unaudited)		Value
		Tennessee -- 4.4%	
\$ 1,000,000+	NR/A2	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	6,6
2,400,000	BBB+/NR	Sullivan County Health Educational & Housing Facilities Board Hospital Revenue, 5.25%, 9/1/36	1,4

			\$ 9,1
		Texas -- 21.4%	
8,650,000	CCC/Caa1	Brazos River Authority Pollution Control Revenue, 6.75%, 10/1/38	\$ 3,9
4,000,000	CCC/Caa1	Brazos River Authority Pollution Control Revenue, 7.7%, 4/1/33	2,0
7,350,000	NR/NR	Gulf Coast Industrial Development Authority, 7.0%, 12/1/36	4,0
10,000,000	B-/B3	Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29	6,5
1,000,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/16	8
1,000,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/21	7
1,350,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.125%, 5/1/26	9
2,750,000	AAA/Aa3	Lower Colorado River Authority, 5.0%, 5/15/31	2,6
845,000	NR/NR	Lubbock Health Facilities Development Corp., 6.5%, 7/1/26	6
2,000,000	NR/NR	Lubbock Health Facilities Development Corp., 6.625%, 7/1/36	1,3
7,750,000	BBB-/Ba1	Matagorda County Navigation District Number 1 Revenue, 5.95%, 5/1/30	5,9
10,000,000	BBB+/A3	North Texas Tollway Authority Revenue, 5.75%, 1/1/33	9,0
1,711,000	NR/Aaa	Panhandle Regional Housing Finance Corp. Multifamily Housing Revenue, 6.6%, 7/20/31	1,7
1,000,000	BB+/Baa2	Richardson Hospital Authority Revenue, 6.0%, 12/1/34	7
5,000,000	NR/Baa3	Tomball Hospital Authority, 6.0%, 7/1/25	3,8

			\$ 45,1
		Utah -- 0.5%	
1,600,000	NR/NR	Spanish Fork Charter School Revenue, 5.7%, 11/15/36 (144A)	\$ 1,0
		Virginia -- 0.9%	
2,000,000	BBB+/Baa1	Washington County Industrial Development Authority	

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

Revenue, 7.75%, 7/1/38

\$ 1,9

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

16 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

Principal Amount	S&P/Moody's Ratings (unaudited)		Value
		Washington -- 3.5%	
\$ 1,285,000	BBB/Baa3	Tobacco Settlement Authority Revenue, 6.5%, 6/1/26	\$ 1,1
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.125%, 8/15/37	1,5
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.25%, 8/15/42	1,4
5,000,000	NR/NR	Washington State Housing Finance Commission Nonprofit Revenue Bonds, 5.625%, 1/1/27	3,2
			\$ 7,4
		Wisconsin -- 0.8%	
2,900,000	NR/NR	Aztalan Wisconsin Exempt Facilities Revenue, 7.50%, 5/1/18	\$ 1
1,000,000	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.125%, 4/1/24	7
1,000,000	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.25%, 4/1/34	6
			\$ 1,6
		TOTAL TAX-EXEMPT OBLIGATIONS (Cost \$403,242,855)	\$336,3
		MUNICIPAL COLLATERALIZED DEBT OBLIGATION -- 4.0% of Net Assets	
13,000,000 (c) (f)	NR/NR	Non-Profit Preferred Funding Trust I, Series E, 12.0%, 9/15/37 (144A)	\$ 8,4
		TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$13,000,000)	\$ 8,4

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 17

Schedule of Investments | 3/31/09 (continued)

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

Shares	S&P/Moody's Ratings (unaudited)	Value
109,377 (g)	COMMON STOCK -- 0.3% of Net Assets Delta Airlines, Inc.	\$ 6
	TOTAL COMMON STOCK (Cost \$3,210,349)	\$ 6
6,000,000	TAX-EXEMPT MONEY MARKET MUTUAL FUND -- 2.8% of Net Assets BlackRock Liquidity Funds MuniFund Portfolio	\$ 6,0
	TOTAL TAX-EXEMPT MONEY MARKET MUTUAL FUND (Cost \$6,000,000)	\$ 6,0
	TOTAL INVESTMENTS IN SECURITIES -- 166.4% (Cost \$425,453,204) (h) (i)	\$ 351,4
	OTHER ASSETS AND LIABILITIES -- 4.6%	\$ 9,7
	PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE -- (71.0)%	\$(150,0
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS -- 100.0%	\$ 211,1

(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 March 31, 2009, the value of these securities amounted to \$29,954,936, or 14.2% 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 March 31, 2009.

(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 March 31, 2009.

(d) 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 March 31, 2009.

(e) Escrow to maturity.

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

- (f) Indicates a security that has been deemed illiquid. The aggregate cost of illiquid securities is \$13,000,000. The aggregate value is \$8,491,730, or 4.0% of the total net assets applied to common shareowners.
- (g) Non-income producing.

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

18 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

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

Insured	
FSA	7.4%
AMBAC	1.5
ACA	0.5
Q-SBLF	0.1
Revenue Bonds:	
Health Revenue	29.5
Tobacco Revenue	11.0
Other Revenue	9.9
Development Revenue	9.6
Airport Revenue	8.2
Pollution Control Revenue	7.1
Transportation Revenue	5.2
Housing Revenue	4.2
Facilities Revenue	3.9
Water Revenue	1.4
Education Revenue	0.5

	100.0%
	=====

- (i) At March 31, 2009, the net unrealized loss on investments based on cost for federal income tax purposes of \$421,230,592 was as follows:

Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost	\$ 16,687,424
Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value	(86,475,658)

Net unrealized loss	\$ (69,788,234)
	=====

For financial reporting purposes net unrealized loss on investments was \$74,010,846 and cost of investments aggregated \$425,453,204.

Purchases and sales of securities (excluding temporary cash investments) for the year ended March 31, 2009, aggregated \$93,596,469 and \$100,369,163, respectively.

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

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 19

Schedule of Investments | 3/31/09 (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 March 31, 2009, in valuing the Trust's Investments:

Valuation Inputs	Investments in Securities	Other Financial Instruments*
Level 1 -- Quoted Prices	\$ 6,615,793	\$ --
Level 2 -- Other Significant Observable Inputs	344,826,565	(131,406)
Level 3 -- Significant Unobservable Inputs	--	--
Total	\$351,442,358	\$ (131,406)

* Other financial instruments include interest rate swaps.

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

20 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

Statement of Assets and Liabilities | 3/31/09

ASSETS:	
Investments in securities, at value (cost \$425,453,204)	\$351,442,358
Cash	2,463,277
Receivables --	
Investment securities sold	2,734,609
Interest	9,243,677
Prepaid expenses	43,440
Total assets	\$365,927,361

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

=====	
LIABILITIES:	
Payable --	
Investment securities purchased	\$ 4,311,690
Due to affiliates	197,296
Administration fee payable	21,579
Unrealized depreciation on interest rate swaps	131,406
Accrued expenses	113,109

Total liabilities	\$ 4,775,080
=====	
PREFERRED SHARES AT REDEMPTION VALUE:	
\$25,000 liquidation value per share applicable to 6,000 shares, including dividends payable of \$5,409	\$150,005,409

NET ASSETS APPLICABLE TO COMMON SHAREOWNERS:	
Paid-in capital	\$325,430,500
Undistributed net investment income	8,734,794
Accumulated net realized loss on investments and interest rate swaps	(48,876,170)
Net unrealized loss on investments	(74,010,846)
Net unrealized loss on interest rate swaps	(131,406)

Net assets applicable to common shareowners	\$211,146,872
=====	
NET ASSET VALUE PER SHARE:	
No par value, (unlimited number of shares authorized)	
Based on \$211,146,872/22,879,496 common shares	\$ 9.23
=====	

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 21

Statement of Operations

For the Year Ended 3/31/09

INVESTMENT INCOME:	
Interest	\$ 31,323,61

EXPENSES:	
Management fees	\$ 2,456,581
Administrative fees	394,437
Transfer agent fees and expenses	40,311
Auction agent fees	390,428
Custodian fees	29,186
Registration fees	24,098
Professional fees	124,823
Printing expense	38,305
Trustees' fees	15,541
Pricing fees	22,596
Miscellaneous	31,138

Total expenses	\$ 3,567,44

Net investment income	\$ 27,756,16

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

REALIZED AND UNREALIZED GAIN (LOSS) ON INVESTMENTS AND INTEREST RATE SWAPS:

Net realized loss from:

Investments	\$ (30,303,446)	
Interest rate swaps	(566,835)	\$ (30,870,281)

Change in net unrealized loss from:

Investments	\$ (70,604,465)	
Interest rate swaps	387,729	\$ (70,216,736)

Net loss on investments and interest rate swaps		\$ (101,087,017)
---	--	------------------

DISTRIBUTIONS TO PREFERRED SHAREOWNERS FROM NET INVESTMENT INCOME

\$ (4,573,950)

Net decrease in net assets applicable to common shareowners resulting from operations

\$ (77,904,799)

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

22 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

Statement of Changes in Net Assets

For the Years Ended 3/31/09 and 3/31/08, respectively

	Year Ended 3/31/09	Year Ended 3/31/08
FROM OPERATIONS:		
Net investment income	\$ 27,756,168	\$ 29,331,433
Net realized loss on investments and interest rate swaps	(30,870,281)	(4,089,389)
Change in net unrealized loss on investments and interest rate swaps	(70,216,736)	(53,215,821)
Distributions to preferred shareowners from net investment income	(4,573,950)	(5,823,201)
Net decrease in net assets applicable to common shareowners resulting from operations	\$ (77,904,799)	\$ (33,796,978)
DISTRIBUTIONS TO COMMON SHAREOWNERS:		
Net investment income (\$0.90 and \$0.89 per share, respectively)	\$ (20,552,506)	\$ (20,246,811)
Total distributions to common shareowners	\$ (20,552,506)	\$ (20,246,811)
FROM TRUST SHARE TRANSACTIONS:		
Reinvestment of distributions	\$ 1,103,907	\$ 655,590
Net increase in net assets applicable to common shareowners resulting from Trust share transactions	\$ 1,103,907	\$ 655,590

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

Net decrease in net assets applicable to common shareowners	\$ (97,353,398)	\$ (53,388,199)
NET ASSETS APPLICABLE TO COMMON SHAREOWNERS:		
Beginning of year	308,500,270	361,888,469
End of year	\$211,146,872	\$308,500,270
Undistributed net investment income	\$ 8,734,794	\$ 7,025,273

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 23

Financial Highlights

	Year Ended 3/31/09	Year Ended 3/31/08
Per Common Share Operating Performance		
Net asset value, beginning of period	\$ 13.54	\$ 15.91
Increase (decrease) from investment operations:(a)		
Net investment income	\$ 1.22	\$ 1.29
Net realized and unrealized gain (loss) on investments and interest rate swaps	(4.43)	(2.51)
Dividends and distributions to preferred shareowners from:		
Net investment income	(0.20)	(0.26)
Net realized gains	--	--
Net increase (decrease) from investment operations	\$ (3.41)	\$ (1.48)
Dividends and distributions to common shareowners from:		
Net investment income	(0.90)	(0.89)
Net realized gains	--	--
Capital charge with respect to issuance of common shares:	--	--
Net increase (decrease) in net asset value	\$ (4.31)	\$ (2.37)
Net asset value, end of period(b)	\$ 9.23	\$ 13.54
Market value, end of period(b)	\$ 9.04	\$ 13.74
Total return at market value(c)	(28.40)%	(6.51)%
Ratios to average net assets of common shareowners		
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%
Portfolio turnover	24%	12%

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

	Year Ended 3/31/07	Year Ended 3/31/06	Year Ended 3/31/05
Per Common Share Operating Performance			
Net asset value, beginning of period	\$ 15.04	\$ 14.64	\$ 14.24
Increase (decrease) from investment operations:(a)			
Net investment income	\$ 1.16	\$ 1.17	\$ 1.17
Net realized and unrealized gain (loss) on investments and interest rate swaps	0.80	0.39	0.39
Dividends and distributions to preferred shareowners from:			
Net investment income	(0.23)	(0.17)	(0.17)
Net realized gains	--	--	--
Net increase (decrease) from investment operations	\$ 1.73	\$ 1.39	\$ 1.39
Dividends and distributions to common shareowners from:			
Net investment income	(0.86)	(0.99)	(0.99)
Net realized gains	--	--	--
Capital charge with respect to issuance of common shares:	--	--	--
Net increase (decrease) in net asset value	\$ 0.87	\$ 0.40	\$ 0.40
Net asset value, end of period(b)	\$ 15.91	\$ 15.04	\$ 14.64
Market value, end of period(b)	\$ 15.61	\$ 14.99	\$ 14.64
Total return at market value(c)	10.21%	11.55%	11.55%
Ratios to average net assets of common shareowners			
Net expenses(d)	1.16%	1.16%	1.16%
Net investment income before preferred share dividends	7.47%	7.88%	7.88%
Preferred share dividends	1.47%	1.17%	1.17%
Net investment income available to common shareowners	6.00%	6.71%	6.71%
Portfolio turnover	17%	19%	19%

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

24 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

	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		

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

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%

	Year Ended 3/31/07	Year Ended 3/31/06
Net assets of common shareowners, end of period (in thousands)	\$361,888	\$342,012
Preferred shares outstanding (in thousands)	\$150,000	\$150,000
Asset coverage per preferred share, end of period	\$ 85,328	\$ 82,011
Average market value per preferred share(e)	\$ 25,000	\$ 25,000
Liquidation value, including dividends payable, per preferred share	\$ 25,013	\$ 25,009
Ratios to average net assets of common shareowners before waivers and reimbursement of expenses		
Net expenses(d)	1.18%	1.16%
Net investment income before preferred share dividends	7.45%	7.88%
Preferred share dividends	1.47%	1.17%
Net investment income available to common shareowners	5.98%	6.71%

- (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. 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.

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.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 25

Notes to Financial Statements | 3/31/09

1. Organization and Significant Accounting Policies

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

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.

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.

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. 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.

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, and the reported amounts of income, expenses and gains and losses 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:

26 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

A. Security Valuation

Security transactions are recorded as of trade date. Securities are valued at prices supplied by independent pricing services, which consider such factors as Treasury spreads, yields, maturities and ratings. Valuations may be supplemented by values obtained from dealers and other sources, as required. The values of interest rate swaps are determined by obtaining dealer quotations. Securities for which there are no other readily available valuation methods are valued using fair value methods pursuant to procedures adopted by the Board of Trustees ("board determined"). The Trust may also use fair value methods to value a security including a non-U.S. security, when the closing market price on the principal exchange where the security is traded no longer reflects the value of the security. At March 31, 2009, there were no securities that were board determined. Temporary cash investments are valued at net asset value.

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. Discount and premium on debt securities are accreted or amortized, respectively, daily on an effective yield to

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

maturity basis and are included in interest income. Interest income, including interest-bearing cash accounts, is recorded on an accrual basis.

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 as from net realized gain (loss) on investments transactions, or as from paid-in capital, depending on the type of book/tax differences that may exist.

At March 31, 2009, the Trust reclassified \$920,191 to decrease undistributed net investment income and to decrease net realized loss on investments to reflect permanent book/tax differences. The reclassification has no impact

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 27

on the net asset value of the Trust and presents the Trust's capital accounts on a tax basis.

At March 31, 2009, the Trust had a net capital loss carryforward of \$32,280,990 which is comprised of \$14,156,085 which will expire in 2014, \$311,368 which will expire in 2016 and \$17,813,537 which will expire in 2017 if not utilized.

The Trust has elected to defer approximately \$16,483,090 of capital losses recognized between November 1, 2008 and March 31, 2009 to its fiscal year ending March 31, 2010.

The tax character of distributions paid to common and preferred shareowners during the years ended March 31, 2009 and March 31, 2008 was as follows:

	2009	2008
Distributions paid from:		
Tax exempt income	\$24,983,891	\$25,232,182
Ordinary income	142,565	837,830
Total	\$25,126,456	\$26,070,012

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

The following shows the components of distributable earnings (losses) on a federal income tax basis at March 31, 2009:

		2009

Distributable earnings:		
Undistributed tax-exempt income	\$	4,256,946
Undistributed ordinary income		29,674
Capital loss carryforward		(32,280,990)
Post-October-loss deferred		(16,483,090)
Dividends payable		(5,409)
Unrealized depreciation		(69,800,759)

Total		\$(114,283,628)
=====		

The difference between book-basis and tax-basis unrealized depreciation 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.

C. Automatic Dividend Reinvestment Plan

All common shareowners 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

28 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

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.

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.

2. Management Agreement

Pioneer Investment Management, Inc. ("PIM"), 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" is the average daily value of the Trust's total assets minus the sum of the Trust's liabilities, which liabilities exclude debt related to leverage, short-term debt and the aggregate liquidation preference of any outstanding preferred shares. For the year ended March 31, 2009, 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.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 29

In addition, under PIM's management and administration agreements, certain other services and costs are paid by PIM and reimbursed by the Trust. At March 31, 2009, \$197,296 was payable to PIM related to management costs, administrative cost and certain other services and is included in "Due to affiliates" on the Statement of Assets and Liabilities.

The Trust has retained Princeton Administrators, LLC ("Princeton") to provide certain administrative and accounting services to the Trust on its behalf. The Trust pays Princeton a monthly fee equal to 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.

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 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

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

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

30 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

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. However, at March 31, 2009, the Trust does not anticipate non-performance by any counterparty. 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.

Under the terms of the agreement entered into by the Trust, the Trust receives a floating rate of interest and pays a fixed rate of interest for the term. Details of the swap agreement outstanding as of March 31, 2009 were as follows:

Counterparty	Termination Date	Notional Amount (000)	Fixed Rate	Floating Rate	Unrealized Depreciation
UBS AG	April 5, 2009	\$75,000	2.665%	1 month BMA	\$(131,406)

5. Trust Shares

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

Transactions in common shares of beneficial interest for the years ended March 31, 2009 and March 31, 2008 were as follows:

	2009	2008

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

Shares outstanding at beginning of year	22,786,930	22,740,627
Reinvestment of distributions	92,566	46,303

Shares outstanding at end of year	22,879,496	22,786,930
=====		

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 March 31, 2009, 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 ranged from 0.675% to 12.894% during the year ended March 31, 2009.

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.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 31

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. However, 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 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. New Pronouncement

In March 2008, Statement of Financial Accounting Standards No. 161, Disclosures about Derivative Instruments and Hedging Activities ("SFAS 161"), was issued and is effective for fiscal years beginning after November 15, 2008. SFAS 161 requires enhanced disclosures about an entity's derivative and hedging activities. Management is currently evaluating the impact the adoption of SFAS 161 will have on the Trust's financial statement disclosures.

7. Subsequent Events

Subsequent to March 31, 2009, the Board of Trustees of the Trust declared a dividend from undistributed net investment income of \$0.075 per common share payable April 30, 2009, to common shareowners of record on April 15, 2009.

Subsequent to March 31, 2009, dividends declared and paid on preferred shares totaled \$108,060 in aggregate for the two outstanding preferred share series through May 5, 2009.

32 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

Report of Independent Registered Public Accounting Firm

To the Board of Trustees and the Shareowners of
Pioneer Municipal High Income Advantage Trust:

We have audited the accompanying statement of assets and liabilities of Pioneer Municipal High Income Advantage Trust (the "Trust"), including the schedule of investments, as of March 31, 2009, and the related statement of operations for the year then ended, the statements of changes in net assets for each of the two years in the period then ended, and the financial highlights for each of the five years in the period then ended. These financial statements and financial highlights are the responsibility of the Trust's management. Our responsibility is to express an opinion on these financial statements and financial highlights based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements and financial highlights are free of material misstatement. We were not engaged to perform an audit of the Trust's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Trust's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements and financial highlights, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our procedures included confirmation of securities owned as of March 31, 2009, by correspondence with the custodian and brokers or by other appropriate auditing procedures where replies from brokers were not received. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements and financial highlights referred to above present fairly, in all material respects, the financial position of Pioneer Municipal High Income Advantage Trust at March 31, 2009, the results of its operations for the year then ended, the changes in its net assets for each of the two years in the period then ended, and the financial highlights for each of the five years in the period then ended, in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

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

Boston, Massachusetts
May 21, 2009

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 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. During the period, there were 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.

CEO CERTIFICATION DISCLOSURE (unaudited)

The Trust's Chief Executive Officer has submitted to the New York Stock Exchange the annual CEO certification as required by Section 303A.12(a) of the NYSE Listed Company Manual. In addition, the Trust has filed with the Securities and Exchange Commission the certification of its Chief Executive Officer and Chief Financial Officer required by Section 302 of the Sarbanes-Oxley Act.

Results of Shareholder Meeting (unaudited)

On September 22, 2008, Pioneer Municipal High Income Advantage Trust held its annual meeting of shareowners to elect Class II Trustees. All Class II Trustees were elected. Here are the detailed results of the votes.

Proposal 1 -- To elect Class II Trustees.

Nominee	For	Withheld
Benjamin M. Friedman	20,892,223	426,821
Margaret B.W. Graham	20,896,922	422,122
Daniel K. Kingsbury	20,901,339	417,705

34 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

IMPORTANT TAX INFORMATION (unaudited)

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

The following summarizes the taxable per share distributions paid by Pioneer Municipal High Income Advantage Trust during the taxable year ended March 31, 2009:

	Payable Date	Ordinary Income
Common Shareowners	12/19/08	\$0.004818
Preferred Shareowners		
Series A	12/16/08	\$ 5.34
Series B	12/22/08	\$ 5.48

All of the other net investment income distributions paid by the Trust qualify as tax-exempt interest dividends for federal income tax purposes.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 35

Approval of Investment Advisory Agreement (unaudited)

Pioneer Investment Management, Inc. (PIM) serves as the Trust's investment adviser pursuant to an investment advisory agreement between PIM and the Trust. The Trustees of the Trust, as required by law, determine annually whether to continue the investment advisory agreement for the Trust.

The contract renewal process began in March 2008 as the Trustees of the Trust agreed on, among other things, an overall approach and timeline for the process. In July, the Trustees approved the format of the contract renewal materials and submitted their formal request to PIM to furnish information necessary to evaluate the terms of the investment advisory agreement. The contract renewal materials were provided to the Trustees in August. After reviewing and discussing the materials, the Trustees submitted a request for additional information to PIM in September, and materials were provided in response to this request later that month. Meetings of the Independent Trustees of the Trust were held in September and October to review and discuss the contract renewal materials.

At a meeting held on November 11, 2008, based on their evaluation of the information provided by PIM, the Trustees of the Trust, including the independent Trustees voting separately, unanimously approved the continuation of the investment advisory agreement for another year. In considering the continuation of the investment advisory agreement, the Trustees considered various factors that they determined were relevant, including the factors described below. The Trustees did not identify any single factor as the controlling factor in determining to approve the continuation of the investment advisory agreement.

Nature, Extent and Quality of Services

The Trustees considered the nature, extent and quality of the services that had provided by PIM to the Trust, taking into account the investment objective and strategy of the Trust and the information related to the Trust provided to the Trustees at each quarterly meeting. The Trustees reviewed the terms of the investment advisory agreement. The Trustees also reviewed PIM's investment

approach for the Trust and its research process. The Trustees considered the resources of PIM and the personnel of PIM who provide investment management services to the Trust. They also considered PIM's compliance and legal resources and personnel.

The Trustees also considered that, as administrator, PIM is responsible for the administration of the Trust's business and other affairs. It was noted that PIM supervises and monitors the performance of the Trust's service providers and provides the Trust with personnel (including officers) as are necessary for the

36 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

Trust's operations. The Trustees considered the fees paid to PIM for the provision of such services.

Based on these considerations, the Trustees concluded that the nature, extent and quality of services that had provided by PIM to the Trust were satisfactory and consistent with the terms of the investment advisory agreement.

Performance of the Trust

The Trustees considered the performance results of the Trust over various time periods. They reviewed information comparing the Trust's performance with the average performance of its peer group of funds as classified by Morningstar, Inc. (Morningstar), an independent provider of investment company data, and with the performance of the Trust's benchmark index. The Trustees considered that the Trust's annualized total return was in the fifth quintile of its Morningstar category for the one year period ended June 30, 2008 and in the fourth quintile of its Morningstar category for the three year period ending June 30, 2008. (In all quintile rankings referred to throughout this disclosure, first quintile is most favorable to the Trust's shareowners. Thus, highest relative performance would be first quintile and lowest relative expenses would also be first quintile.) The Trustees noted that the yield (gross of expenses) to the Trust's common shareowners for the twelve months ended June 30, 2008 trailed the yield of the Trust's benchmark index for the same period. The Trustees discussed the reasons for the Trust's underperformance with PIM, and believed the Trust's performance was materially affected by the unfavorable market conditions. The Trustees agreed that they would continue to monitor the performance of the Trust closely.

Management Fee and Expenses

The Trustees considered information on the fees and expenses of the Trust in comparison to the management fees and the expense ratios of a peer group of funds selected on the basis of criteria determined by the independent Trustees for this purpose using data provided by Strategic Insight Mutual Trust Research and Consulting, LLC (Strategic Insight), an independent third party.

The Trustees considered that the Trust's management fee for the twelve months ended June 30, 2008 was in the second quintile relative to the management fees paid by other funds in its Strategic Insight peer group for the comparable period. The Trustees also considered that the Trust's expense ratio for the twelve months ended June 30, 2008 was in the third quintile relative to its Strategic Insight peer group for the comparable period. It was noted that PIM did not currently manage any separate accounts with an investment objective and strategies that were similar to the Trust.

The Trustees concluded that the management fee payable by the Trust to PIM was reasonable in relation to the nature and quality of the services provided by PIM. The Trustees also concluded that the Trust's expense ratio was reasonable in relation to the nature and quality of services provided by PIM.

Profitability

The Trustees considered information provided by PIM regarding the profitability of PIM with respect to the advisory services provided by PIM to the Trust, including the methodology used by PIM in allocating certain of its costs to the management of the Trust. The Trustees also considered PIM's profit margin in connection with the overall operation of the Trust. They further reviewed the financial results realized by PIM and its affiliates from non-fund businesses. The Trustees considered PIM's profit margins with respect to the Trust in comparison to the limited industry data available and noted that the profitability of any adviser was affected by numerous factors, including its organizational structure and method for allocating expenses. The Trustees recognized that PIM should be entitled to earn a reasonable level of profit for the services provided to the Trust. The Trustees concluded that PIM's profitability with respect to the management of the Trust was not unreasonable.

Economies of Scale

The Trustees considered the extent to which PIM may realize economies of scale or other efficiencies in managing and supporting the Trust. Since the Trust is a closed-end fund and its size is relatively stable at an asset level that was anticipated when the management fee was initially set, the Trustees concluded that economies of scale were not a relevant consideration.

Other Benefits

The Trustees also considered the character and amount of fees paid by the Trust, other than under the investment advisory agreement, for services provided by PIM and its affiliates. The Trustees further considered the revenues and profitability of PIM's businesses other than the fund business. The Trustees concluded that the receipt of these benefits was reasonable in the context of the overall relationship between PIM and the Trust.

Conclusion

After consideration of the factors described above as well as other factors, the Trustees, including all of the independent Trustees, concluded that the investment advisory agreement between PIM and the Trust, including the fees payable thereunder, was fair and reasonable and voted to approve the proposed continuation of the investment advisory agreement for the Trust.

Trustees, Officers and Service Providers

Investment Adviser

Pioneer Investment Management, Inc.

Custodian

Brown Brothers Harriman & Co.

Independent Registered Public Accounting Firm

Ernst & Young LLP

Legal Counsel

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

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

Sub-Administrator
Princeton Administrators, LLC

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 www.pioneerinvestments.com. This information is also available on the Securities and Exchange Commission's web site at <http://www.sec.gov>.

Trustees and Officers

The Board of Trustees provides broad supervision over the Trust's affairs. The officers of the Trust are responsible for the Trust's operations. The Trustees and officers are listed below, together with their principal occupations during the past five years. Trustees who are interested persons of the Trust within the meaning of the 1940 Act are referred to as Interested Trustees. Trustees who are not interested persons of the Trust are referred to as Independent Trustees. Each of the Trustees serves as a Trustee of each of the 76 U.S. registered investment portfolios for which Pioneer serves as investment adviser (the "Pioneer Funds"). The address for all Trustees and all officers of the Trust is 60 State Street, Boston, Massachusetts 02109.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 39

Interested Trustees

Name and Age	Position Held With the Trust	Length of Service and Term of Office
John F. Cogan, Jr. (82)*	Chairman of the Board, Trustee and President	Class I Trustee since 2003. Term expires in 2010. Elected by Preferred Shares only.

Daniel K. Kingsbury (50)*	Trustee and Executive Vice President	Class II Trustee since 2007. Term expires in 2011.
---------------------------	--	--

Name and Age	Principal Occupation During Past Five Years
--------------	---

John F. Cogan, Jr. (82)*	Deputy Chairman and a Director of Pioneer Global Asset Management S.p.A. ("PGAM"); Non-Executive Chairman and a Director of Pioneer Investment Management USA Inc. ("PIM-USA"); Chairman and a Director of Pioneer; Chairman and Director of Pioneer Institutional Asset Management, Inc. (since 2006); Director of Pioneer Alternative Investment Management Limited (Dublin); President and a Director of Pioneer Alternative Investment Management (Bermuda) Limited and affiliated funds; Director of PLOGLOBAL Real Estate Investment Fund (Russia) (until June 2006); Director of Nano-C, Inc. (since 2003); Director of Cole Management Inc. (since 2004); Director of Fiduciary Counseling, Inc.; President and Director of Pioneer Fund Distributor, Inc. ("PFD") (until May 2006); President of all of the Pioneer Funds; and Of Counsel, Wilmer Cutler Pickering Hale and Dorr LLP
--------------------------	---

Daniel K. Kingsbury (50)*	Director, CEO and President of Pioneer Investment Management USA Inc. (since February 2007); Director and President of Pioneer Investment Management, Inc. and Pioneer Institutional Asset Management, Inc. (since February 2007); Executive Vice President of all of the Pioneer Funds (since March 2007); Director of Pioneer Global Asset Management S.p.A. (since April 2007); Head of New Markets Division, Pioneer Global Asset Management S.p.A. (2000 - 2007)
---------------------------	---

* Mr. Cogan and Mr. Kingsbury are Interested Trustees because they are officers or directors of the adviser and certain of its affiliates.

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

Name and Age	Position Held With the Trust	Length of Service and Term of Office	Principal Occupation
David R. Bock (65)	Trustee	Class I Trustee since 2005. Term expires in 2010.	Managing Partner, F (boutique merchant present); and Executive Financial Officer, health care service
Mary K. Bush (60)	Trustee	Class III Trustee since 2003. Term expires in 2009.	President, Bush International financial advisory

Name and Age	Other Directorships Held by this Trustee
David R. Bock (65)	Director of Enterprise Community Investment, Inc. (privately-held finance company); Director of New York Mortgage Trust (publicly traded) and Director of Oxford Analytica, Inc. (privately-held research and analytics)
Mary K. Bush (60)	Director of Marriott International, Inc.; Director of Discover Financial Services (credit card issuer and electronic payment services); Director of Briggs & Stratton (aircraft engine manufacturer); Director of UAL Corporation (airline holding company); Director of International Security, Defense, and Intelligence Corporation (national security, defense, and intelligence); and Member, Board of Governors, Investment Company Institute

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09
41

Independent Trustees (continued)

Name and Age	Position Held with the Trust	Length of Service and Term of Office
Benjamin M. Friedman (64)	Trustee	Class II Trustee since 2008. Term expires in 2011.

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

Margaret B.W. Graham (61)	Trustee	Class II Trustee since 2003. Term expires in 2011.
Thomas J. Perna (58)	Trustee	Class III Trustee since 2006. Term expires in 2009.
Marguerite A. Piret (60)	Trustee	Class III Trustee since 2003. Term expires in 2009. Elected by Preferred Shares only.
Stephen K. West (80)	Trustee	Class I Trustee since 2003. Term expires in 2010.

Name and Age	Principal Occupation During Past Five Years
--------------	---

Benjamin M. Friedman (64)	Professor, Harvard University
---------------------------	-------------------------------

Margaret B.W. Graham (61)	Founding Director, Vice President and Corporate Secretary, The Winthrop Group, Inc. (consulting firm); and Desautels Faculty of Management, McGill University
---------------------------	---

Thomas J. Perna (58)	Chief Executive Officer, Quadriserv, Inc. (technology products for securities lending industry) (2008 - present); Private investor (2004 - 2008); and Senior Executive Vice President, The Bank of New York (financial and securities services) (1986 - 2004)
----------------------	---

Marguerite A. Piret (60)	President and Chief Executive Officer, Newbury, Piret & Company, Inc. (investment banking firm)
--------------------------	---

Stephen K. West (80)	Senior Counsel, Sullivan & Cromwell LLP (law firm)
----------------------	--

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

Trust Officers

Name and Age	Position Held with the Trust	Length of Service and Term of Office
Dorothy E. Bourassa (61)	Secretary	Since 2003. Serves at the discretion of the Board
Christopher J. Kelley (44)	Assistant Secretary	Since 2003. Serves at the discretion of the Board
Mark E. Bradley (49)	Treasurer	Since 2008. Serves at the discretion of the Board
Luis I. Presutti (43)	Assistant Treasurer	Since 2003. Serves at the discretion of the Board
Gary Sullivan (50)	Assistant Treasurer	Since 2003. Serves at the discretion of the Board
David F. Johnson (29)	Assistant Treasurer	Since 2009. Serves at the discretion of the Board

Name and Age	Principal Occupation During Past Five Years
Dorothy E. Bourassa (61)	Secretary of PIM-USA; Senior Vice President -- Legal of Pioneer; Secretary/Clerk of most of PIM-USA's subsidiaries; and Secretary of all of the Pioneer Funds since September 2003 (Assistant Secretary from November 2000 to September 2003)
Christopher J. Kelley (44)	Associate General Counsel of Pioneer since January 2008 and Assistant Secretary of all of the Pioneer Funds since September 2003; Vice President and Senior Counsel of Pioneer from July 2002 to December 2007
Mark E. Bradley (49)	Vice President -- Fund Accounting, Administration and Controllersh Services of Pioneer; and Treasurer of all of the Pioneer Funds

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

since March 2008; Deputy Treasurer of Pioneer from March 2004 to February 2008; Assistant Treasurer of all of the Pioneer Funds from March 2004 to February 2008; and Treasurer and Senior Vice President, CDC IXIS Asset Management Services from 2002 to 2003

Luis I. Presutti (43)

Assistant Vice President -- Fund Accounting, Administration and Controllershship Services of Pioneer; and Assistant Treasurer of all of the Pioneer Funds

Gary Sullivan (50)

Fund Accounting Manager -- Fund Accounting, Administration and Controllershship Services of Pioneer; and Assistant Treasurer of all of the Pioneer Funds

David F. Johnson (29)

Fund Administration Manager -- Fund Accounting, Administration and Controllershship Services since November 2008 and Assistant Treasurer of all of the Pioneer Funds since January 2009; Client Service Manager -- Institutional Investor Services at State Street Bank from March 2003 to March 2007

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09 43

Trust Officers (continued)

Name and Age	Position Held with the Trust	Length of Service and Term of Office
Teri W. Anderholm (49)	Chief Compliance Officer	Since 2007. Serves at the discretion of the Board

Name and Age	Principal Occupation During Past Five Years
Teri W. Anderholm (49)	Chief Compliance Officer of Pioneer since December 2006 and of all the Pioneer Funds since January 2007; Vice President and Compliance Officer, MFS Investment Management (August 2005 to December 2006); Consultant, Fidelity Investments (February 2005 to July 2005); Independent Consultant (July 1997 to February 2005)

The outstanding capital stock of PFD, Pioneer and Pioneer Investment Management Shareholder Services, is indirectly wholly owned by UniCredit S.p.A. ("UniCredit"), one of the largest banking groups in Italy. UniCredit, an investment adviser, provides investment management and financial services to mutual funds, instit

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

44 Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/09

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
General inquiries, lost dividend checks,
change of address, lost stock certificates,
stock transfer

Write to
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.

The Trust's Chief Executive Officer is required by the New York Stock Exchange's Listing Standards to file annually with the Exchange a certification that he is not aware of any violation by the Trust of the Exchange's Corporate Governance Standards applicable to the Trust. The Trust has filed such certification.

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 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.

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

(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 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

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

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.

(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.

Audit Fees

Fees for audit services provided to the Trust, including fees

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

associated with the filings to update its Form N-2 and issuance of comfort letters, totaled approximately \$41,300 in 2009 and \$38,545 in 2008.

(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.

Audit-Related Fees and Other Fees

Audit related fees for the Trust's audit related services totaled approximately \$9,652 and \$9,285 in 2009 and 2008, respectively.

(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.

Tax Fees

Fees for tax compliance services, primarily for tax returns, totaled approximately \$8,290 and \$7,820 for 2009 and 2008, respectively.

(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.

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

Approval of a service in accordance with this policy for a Fund shall also 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 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.
 - o A summary of all such 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

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

- 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 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

o A summary of all

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

performed with the exception of the(*) services that may be permitted 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.	services and related fees reported at each 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.

Non-Audit Services

Beginning with non-audit service contracts entered into on or after May 6, 2003, the effective date of the new SEC pre-approval rules, the Trust's audit committee is required to pre-approve services to affiliates defined by SEC rules to the extent that the services are determined to have a direct impact on the operations or financial reporting of the Trust. For the years ended March 31, 2009 and 2008, there were no services provided to an affiliate that required the Trust's audit committee pre-approval.

(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.

The aggregate non-audit fees for the Trust and affiliates, as previously defined, totaled approximately \$17,942 in 2009 and \$17,105 in 2008.

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

(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 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)

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

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

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

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

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

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

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

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

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 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

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

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 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.

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

- 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.

6

- 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.

7

General Board Issues

Pioneer will vote for:

- 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

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

- 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.

Capital Structure

Managements need considerable flexibility in determining the company's financial structure, and Pioneer normally supports managements' proposals

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

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.
- 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

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

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:
 - 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:

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

- 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.
- 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.
- 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 registrants portfolio (Portfolio Manager). Also state each Portfolio

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

Managers business experience during the past 5 years.

Pioneer Municipal High Income Advantage Trust

PORTFOLIO MANAGEMENT

Additional Information About the Portfolio Managers

Other Accounts Managed by the Portfolio Managers. The table below indicates, for each 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 March 31, 2008. 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 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-Base
David Eurkus	Other Registered Investment Companies	5	\$1,310,590,000	N/A
	Other Pooled Investment Vehicles	0	\$0	N/A
	Other Accounts	1	\$10,496,000	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

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

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 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

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

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 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 Non-investment Grade 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

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

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 August 31, 2009 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*
David Eurkus	A

*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

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

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 registrant's 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 registrant's 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.

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

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

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.

(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 May 29, 2009

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 May 29, 2009

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

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

Mark Bradley, Treasurer

Date May 29, 2009

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