

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST

Form N-CSR

May 30, 2012

OMB APPROVAL

OMB Number: 3235-0570

Expires: August 31, 2013

Estimated average burden
hours per response.....18.9

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

FORM N-CSR

CERTIFIED SHAREHOLDER REPORT OF REGISTERED
MANAGEMENT INVESTMENT COMPANIES

Investment Company Act file number 811-21409

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

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

Terrence J. Cullen, Pioneer Investment Management, Inc.,
60 State Street, Boston, MA 02109
(Name and address of agent for service)

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

Date of fiscal year end: March 31

Date of reporting period: April 1, 2011 through March 31, 2012

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

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

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

ITEM 1. REPORTS TO SHAREOWNERS.

Pioneer Municipal High
Income Advantage Trust

Annual Report | March 31, 2012

Ticker Symbol: MAV

[LOGO]PIONEER
Investments (R)

visit us: us.pioneerinvestments.com

Table of Contents

Letter to Shareowners	2
Portfolio Management Discussion	4
Portfolio Summary	9
Prices and Distributions	10
Performance Update	11
Schedule of Investments	12
Financial Statements	23
Notes to Financial Statements	28
Report of Independent Registered Public Accounting Firm	36
Approval of Investment Advisory Agreement	38
Trustees, Officers and Service Providers	42
Pioneer Municipal High Income Advantage Trust Annual Report 3/31/12	1

President's Letter

Dear Shareowner,

The U.S. economy continued its recovery through the first quarter of 2012, even as broader global concerns weighed on investors. The U.S. unemployment rate fell to 8.1% in April, and some indicators suggest that it may continue to trend down. The housing market continued to improve, fueled in part by record-low mortgage rates. The risk of rising oil prices appeared to recede. The improved outlook helped U.S. equity markets to perform well in the first quarter, with the Standard & Poor's 500 Index rising by 12%. For bond investors, the riskier sectors of the bond market fared the best. The broad bond market, as measured by the Barclays Capital Aggregate Bond Index, rose by just 0.3%, while the high-yield bond market, as measured by the Bank of America Merrill Lynch High Yield Master II Index, rose by 5.15%.

We are cautiously optimistic that the U.S. economy will continue to improve. But we are also closely monitoring macroeconomic concerns that could change the market's direction, such as the lingering debt woes in Europe, the state of the Chinese economy, and the U.S. government's fiscal situation. Clouds have continued to hover over Europe, as the exit of Greece from the Euro-zone remains a possibility. Meanwhile, China continues to face a potential slowdown in

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

economic growth. In the U.S., tax increases and spending cuts scheduled to take effect at year-end should, unless fiscal policy changes, sharply reduce the budget deficit -- which would be very good for the country in the longer run -- but also could potentially stall U.S. economic growth in 2013. All of these considerations may lead to further market volatility.

At Pioneer, we have long advocated the benefits of staying diversified and investing for the long term. The strategy has generally performed well for many investors. Our advice, as always, is to work closely with a trusted financial advisor to discuss your goals and work together to develop an investment strategy that meets your individual needs. There is no single best strategy that works for every investor.

Pioneer's investment professionals focus on finding good opportunities to invest in both equity and bond markets using the same disciplined investment approach we have used since 1928. Our strategy is to identify undervalued individual securities with the greatest potential for success, carefully weighing risk against reward. Our teams of investment professionals continually

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

monitor and analyze the relative valuations of different sectors and securities globally to help build portfolios that we believe can help you achieve your investment goals.

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 us.pioneerinvestments.com. We greatly appreciate your trust in us, and we thank you for investing with Pioneer.

Sincerely,

/s/Daniel K. Kingsbury

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

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

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

Portfolio Management Discussion | 3/31/12

Both investment-grade and high-yield municipal bonds turned in solid performances during the 12 months ended March 31, 2012, as investors gained confidence that the domestic economy had entered a sustained growth period. In the following interview, David Eurkus discusses the factors that influenced the performance of Pioneer Municipal High Income Advantage Trust over the 12-month period. Mr. Eurkus, senior vice president and portfolio manager at Pioneer, is responsible for the daily management of the Trust.

Q How did Pioneer Municipal High Income Advantage Trust perform during the 12 months ended March 31, 2012?

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

- A Pioneer Municipal High Income Advantage Trust produced a total return of 23.04% at net asset value, and 28.48% at market price, during the 12-month period ended March 31, 2012. During the same 12-month period, the Trust's benchmarks, the Barclays Capital Municipal Bond Index and the Barclays Capital High Yield Municipal Bond Index, returned 12.07% and 15.48%, respectively. The Barclays Capital Municipal Bond Index is designed to track the performance of investment-grade municipal bonds, while the Barclays Capital High Yield Municipal Bond Index is designed to track the performance of lower-rated municipal bonds. During the same 12-month period, the average return (at market price) of the 14 closed end funds in Lipper's High Yield Municipal Debt Closed End Funds category (which are or may be leveraged) was 6.79%.

The shares of the Trust were selling at a 14.4% premium to net asset value at the end of the 12-month period.

Unlike the Trust, the two Barclays Capital municipal bond indices do not use leverage. While the use of leverage can increase investment opportunity, it can also increase investment risk.

On March 31, 2012, the standardized 30-day SEC yield on the Trust's shares was 6.27%.

- Q What were the principal factors that affected the Trust's performance during the 12 months ended March 31, 2012?

- A Municipal bonds, both investment-grade and higher-yielding securities, generated strong results over the 12-month period, and the Trust's healthy exposure to both groups helped support performance relative to the Barclays Capital benchmarks. Municipal bond prices were close to cycle bottoms at the start of the Trust's fiscal year in April 2011, largely due to short-term market reactions to the well-publicized comments made by one analyst that had predicted widespread defaults of municipal securities. We disagreed strongly with those comments at the time, and believed that there

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

were both excellent values and opportunities available for municipal bond investors who conducted thorough credit research on the underlying securities. As the Trust's fiscal year began in April 2011, municipal securities started gaining ground and they continued to perform well for virtually the entire 12-month period.

Several factors supported the favorable environment for municipals during the period. First, the supply of new municipal bond issues began shrinking -- new issuance for 2011 was about 40% lower than in 2010. One of the main reasons for the contraction in the municipal market during 2011 was the end of the U.S. government's Build America Bonds (BAB) program on December 31, 2010. As 2010 wound down, the probability that Congress would not renew the BAB program increased. Realizing this, many municipalities rushed to get government-subsidized deals done before the expiration of the BAB program, particularly in October, November and December of 2010, and the market became flooded with new issues. The late-2010 spike in new issuance caused 2011's supply of municipals to be pulled forward, resulting in significantly less new issuance during the 2011 calendar year. Second, investor demand for tax-advantaged municipal investments was rising. Traditional buyers started increasing their stakes and non-traditional municipal investors, such as taxable bond fund managers, jumped into the market because of the higher yields that municipal securities offered relative to taxable securities. At the same time, U.S.

economic growth was persisting, albeit modestly, while inflationary pressures remained subdued and the Federal Reserve System signaled its intention to keep short-term interest rates at low levels into 2014. With all of these factors contributing to the favorable backdrop, both investment-grade and high-yield, lower rated municipals flourished during the 12-month period, with high-yield debt performing better.

Q How was the Trust's portfolio positioned over the 12 months ended March 31, 2012, and how did the positioning affect the Trust's performance?

A We kept the Trust fully invested during the 12-month period, with solid exposure to both high-yield and investment-grade municipal bonds. The Trust's investments in both areas fared very well. In addition, we maintained a somewhat longer duration in the Trust's portfolio than that of the Barclays Capital Municipal Bond Index (duration is a measure of price sensitivity to changes in interest rates). The Trust's duration positioning also helped relative returns as longer-maturity bonds outperformed during the 12-month period. We emphasized revenue bonds over general obligation bonds in the Trust's portfolio. Revenue bonds are securities that rely on revenues from specific funding sources and that have their own fees or revenue streams, such as hospital or health care facilities, higher education institutions or transportation projects. We focus on these types of securities when selecting investments for the Trust because of the reliability of their funding sources.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 5

General obligation bonds, on the other hand, do not require a dedicated stream of revenues and can more easily be affected by credit rating downgrades or related fiscal problems encountered by state and/or local governments.

By sector, the Trust's largest allocation was to the hospitals and health care group, which accounted for 33.1% of the Trust's total investment portfolio at the end of the fiscal year on March 31, 2012. We also maintained good Trust exposure to other sectors that we have traditionally favored, such as transportation (including airports and airport facilities revenue bonds), which represented 14.1% of the Trust's total investment portfolio as of March 31, 2012. Education, another sector which we've traditionally favored, represented 3.6% of the Trust's total investment portfolio as of March 31, 2012. We generally favor those groups because they provide essential services and are likely to continue to receive support, regardless of economic conditions. The Trust's greatest weighting was in hospitals and health care bonds because within the sectors we saw attractive values in securities throughout the credit-quality spectrum. We also saw some interesting opportunities opening up in the sector due to the new Federal health care regulations.

At the end of the Trust's fiscal year, on March 31, 2012, about 43% of the Trust's total investment portfolio was invested in high-yield municipal bonds, with the remaining 57% held in investment-grade debt. We invested the Trust's portfolio in a total of 159 different securities, issued in 39 different states, territories and the District of Columbia.

Q Did any particular investments have notable effects on the Trust's performance during the 12 months ended March 31, 2012?

A The Trust enjoyed strong results virtually across the board from investments in different sectors and with different credit-quality ratings, with most bond holdings gaining in value amidst the favorable investment backdrop that prevailed over the 12-month period. The only

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

serious underperformer during the period was the Trust's holding in an airport facility security backed by revenues from American Airlines. That security declined in value when AMR, the parent company of the airline, filed for bankruptcy at the end of November 2011. However, the Trust's position was not large and the effect on overall Trust performance was not notable.

Q How did the level of leverage employed by the Trust change over the 12-month period ended March 31, 2012?

A At the end of the 12-month period, on March 31, 2012, 33.4% of the Trust's total managed assets were financed by leverage, compared with 36.0% of the Trust's total managed assets financed by leverage at the start of the period

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

on April 1, 2011. The decrease was due to changes in the values of the bonds in which the Trust invested.

Q What is your investment outlook?

A The general economic outlook continues to favor investments in municipal bonds. We believe the global and domestic economies both should maintain their growth paths, albeit at modest expansion rates. The U.S. economy, the largest in the world, appears to be strengthening. Inflationary pressures have remained muted and monetary policy should remain in pro-growth mode. Nevertheless, we will continue to be alert for any potential developments that could affect the municipal market. The European economy, hobbled by the sovereign-credit crises in Greece, Spain and some other countries, is heading toward recession, while growth in China has slowed. On the domestic scene, highly partisan political quarrels have led to stalemate and uncertainty, which has worried many investors. That said, the potential end of the Bush-era tax cuts next January still could benefit the municipal market by increasing demand for tax-advantaged opportunities.

We have a very positive, long-term outlook for the municipal market, particularly as state and local governments rebalance their budgets. The trend towards greater fiscal discipline can only benefit the quality of municipal credits in our opinion. Going forward, we will remain focused on credit research when selecting investments for the Trust's portfolio, analyzing both the credit-worthiness of each issuer and the reliability and sustainability of each security's revenue stream.

Please refer to the Schedule of Investments on pages 12-22 for a full listing of Trust securities.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 7

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

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

will generally fall. Conversely, when interest rates fall, the prices of fixed-income securities in the Trust will generally rise.

By concentrating in municipal securities, the portfolio is more susceptible to adverse economic, political or regulatory developments than is a portfolio that invests more broadly.

Investments in the Trust are subject to possible loss due to the financial failure of the issuers of the underlying securities and the issuers' inability to meet their debt obligations.

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

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

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

These risks may increase share price volatility.

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 opinion as of the date of this report. These statements should not be relied upon for any other purposes.

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

Portfolio Summary | 3/31/12

Portfolio Diversification

(As a percentage of total investment portfolio)

[THE FOLLOWING DATA IS A REPRESENTATION OF A PIE CHART IN THE PRINTED MATERIAL]

Health Revenue	33.1%
Insured	14.5%
Tobacco Revenue	12.8%
Other Revenue	9.5%
Airport Revenue	7.8%
Development Revenue	5.7%
Education Revenue	3.6%

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

Pollution Control Revenue	3.6%
Housing Revenue	2.8%
Transportation Revenue	2.3%
Facilities Revenue	2.2%
Water Revenue	1.9%
Airline Revenue	0.2%
Utilities Revenue*	0.0%

* Amount is less than 0.1%

Portfolio Maturity

(As a percentage of long-term holdings)

[THE FOLLOWING DATA IS A REPRESENTATION OF A PIE CHART IN THE PRINTED MATERIAL]

0-2 year	33.0%
2-5 years	7.6%
5-7 years	12.7%
7-10 years	19.9%
10-20 years	14.1%
20+ years	12.7%

Quality Distribution

(As a percentage of total investment portfolio; based on Standard & Poor's ratings)

[THE FOLLOWING DATA IS A REPRESENTATION OF A PIE CHART IN THE PRINTED MATERIAL]

AAA	3.0%
AA	17.7%
A	8.5%
BBB	18.1%
BB	7.7%
B	8.9%
CCC	0.2%
CC	1.7%
D	0.1%
Not Rated	34.1%

Bond ratings are ordered highest to lowest in portfolio. Based on Standard & Poor's measures AAA (highest possible rating) through BBB are considered investment grade; BB or lower ratings are considered non-investment grade. Cash equivalents and some bonds may not be rated.

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 9

Prices and Distributions | 3/31/12

Share Prices and Distributions

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

Market Value per Common Share

	3/31/12	3/31/11
	\$ 14.72	\$ 12.64
Premium	14.4%	9.5%

Net Asset Value per Common Share

	3/31/12	3/31/11
	\$ 12.87	\$ 11.54

Distributions per Common Share

	Net Investment Income	Short-Term Capital Gains	Long-Term Capital Gains
4/1/11-3/31/12	\$ 1.31	\$ --	\$ --

10 Largest Holdings

(As a percentage of long-term holdings)*

1. New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29	2.95%
2. University of California, RIB, 13.269%, 5/15/32	2.64
3. Massachusetts Housing Finance Agency, 5.35%, 12/1/45	2.44
4. North Texas Tollway Authority Revenue, 5.75%, 1/1/33	2.38
5. Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29	2.27
6. Massachusetts Development Finance Agency, 5.75%, 1/1/42	2.17
7. California State Various Purpose, RIB, 12.996%, 7/28/31 (144A)	2.15
8. Non-Profit Preferred Funding Trust I, 6.75%, 9/15/37 (144A)	2.09
9. Tobacco Settlement Financing Corp., 6.25%, 6/1/42	1.89
10. Connecticut State Development Authority Revenue, 5.75%, 11/1/37	1.76

* This list excludes temporary cash investments. The portfolio is actively

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

managed, and current holdings may be different. The holdings listed should not be considered recommendations to buy or sell any security listed.

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

Performance Update | 3/31/12

Investment Returns

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

Average Annual Total Returns
(As of March 31, 2012)

Period	Net Asset Value (NAV)	Market Price
Life-of-Trust (10/17/2003)	6.62%	7.75%
5 Years	2.40	4.28
1 Year	23.04	28.48

[THE FOLLOWING DATA IS A REPRESENTATION OF A MOUNTAIN CHART IN THE PRINTED MATERIAL]

Market Value of \$10,000 Investment

	Pioneer Municipal High Income Advantage Trust	Barclays Capital Municipal Bond Index	Barclays Capital High Yield Municipal Bond Index
10/31/2003	\$10,000	\$10,000	\$10,000
3/31/2004	\$10,293	\$10,364	\$10,740
3/31/2005	\$10,712	\$10,641	\$11,728
3/31/2006	\$11,949	\$11,046	\$12,796
3/31/2007	\$13,169	\$11,645	\$14,056
3/31/2008	\$12,312	\$11,867	\$13,143
3/31/2009	\$8,815	\$12,137	\$10,625
3/31/2010	\$13,906	\$13,313	\$13,633
3/31/2011	\$14,598	\$13,530	\$14,081
3/31/2012	\$18,756	\$15,162	\$16,261

Call 1-800-225-6292 or visit us.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 NAV due to such factors as interest rate changes and the perceived credit quality of borrowers.

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

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

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

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

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

Index comparison begins October 31, 2003. The Barclays Capital Municipal Bond Index is a broad measure of the municipal bond market. The 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 do not employ leverage. You cannot invest directly in the indices.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 11

Schedule of Investments | 3/31/12

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

		TAX-EXEMPT OBLIGATIONS -- 144.1% of Net Assets	
		Alabama -- 1.5%	
\$ 2,500,000	B-/B2	Alabama Industrial Development Authority Solid Waste Disposal Revenue, 6.45%, 12/1/23	\$
2,500,000	NR/NR	Huntsville-Redstone Village Special Care Facilities Financing Authority, 5.5%, 1/1/43	

		Arizona -- 3.4%	
5,000,000	NR/NR	Casa Grande Industrial Development Authority Hospital Revenue, 7.625%, 12/1/29	\$
1,492,000	NR/Baa3	Pima County Industrial Development Authority, 6.75%, 7/1/31	
2,640,000	NR/NR	Pima County Industrial Development Authority, 7.0%, 1/1/38	
1,000,000	NR/NR	San Luis Facility Development Corp., 7.25%, 5/1/27	

			\$

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

6,000,000	CC/NR	California -- 17.4%	California County Tobacco Securitization Agency Revenue, 5.25%, 6/1/46	\$
1,000,000	NR/NR		California Enterprise Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31	
3,140,000 (a)	AA-/NR		California State University Revenue, RIB, 13.052%, 11/1/39 (144A)	
2,425,000	A-/A1		California State Various Purpose, 5.75%, 4/1/31	
8,575,000 (a)	AA-/NR		California State Various Purpose, RIB, 12.996%, 6/1/37 (144A)	
3,000,000	BB+/NR		California Statewide Communities Development Authority, 7.25%, 10/1/38 (144A)	
757,342 (b)	NR/NR		California Statewide Communities Development Authority, 9.0%, 12/1/38	
2,680,000+	AA+/Aaa		Golden State Tobacco Securitization Corp., 6.75%, 6/1/39	
2,500,000	NR/Baa1		Hesperia Public Financing Authority, 5.5%, 9/1/27	
1,500,000	A-/NR		Madera Irrigation Financing Authority Water Revenue, 6.25%, 1/1/31	
1,500,000	A-/NR		Madera Irrigation Financing Authority Water Revenue, 6.5%, 1/1/40	
2,500,000	A-/A2		San Jose California Airport Revenue, 5.0%, 3/1/37	
7,000,000	B-/Caa1		Tobacco Securitization Authority of Northern California Revenue, 5.375%, 6/1/38	
10,500,000 (a)	AA-/NR		University of California, RIB, 13.269%, 5/15/38	\$

1,000,000	NR/NR	Colorado -- 0.3%	Kremmling Memorial Hospital District, 7.125%, 12/1/45	\$

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

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

Principal Amount	S&P/Moody's Ratings (unaudited)			Va
\$ 7,750,000	BBB/Baa1	Connecticut -- 2.9%	Connecticut State Development Authority Revenue, 5.75%, 11/1/37	\$
1,000,000	NR/NR		Hamden Connecticut Facility Revenue, 7.75%, 1/1/43	\$

2,700,000	BBB/Baa1	District of Columbia -- 3.3%	District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$
6,825,000	BBB/Baa1		District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	\$

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

		Florida -- 5.0%	
1,500,000	NR/NR	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/41	\$
1,500,000	NR/NR	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	
1,000,000	NR/Ba3	Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41	
1,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 6.0%, 9/15/40	
2,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 7.625%, 6/15/41	
1,000,000	NR/NR	Florida Development Finance Corp., Educational Facilities Revenue, 7.75%, 6/15/42	
1,980,000	NR/NR	Hillsborough County Industrial Development Authority Revenue, 6.75%, 7/1/29	
1,000,000+	NR/NR	Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32	
495,000	NR/NR	Miami Beach Health Facilities Authority, 5.375%, 11/15/28	
2,500,000	A-/A2	Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41	

			\$
		Georgia -- 4.4%	
5,210,000 (a)	AA-/NR	Atlanta Georgia Water and Wastewater Revenue, RIB, 13.052%, 11/1/43 (144A)	\$
1,000,000	CCC+/NR	Clayton County Development Authority Special Facilities Revenue, 9.0%, 6/1/35	
900,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.0%, 9/1/30	
750,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.125%, 9/1/40	
3,360,000	NR/NR	Fulton County Residential Care Facilities, 7.0%, 7/1/29	
1,650,000	NR/NR	Savannah Georgia Economic Development Authority Revenue, 7.4%, 1/1/34	

			\$

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 13

Schedule of Investments | 3/31/12 (continued)

Principal Amount	S&P/Moody's Ratings (unaudited)		Va
		Guam -- 2.0%	
\$ 1,000,000	B/NR	Guam Government of Department Education Certificates of Participation, 6.625%, 12/1/30	\$
4,400,000+	AA+/NR	Northern Mariana Islands, 6.75%, 10/1/33	

			\$

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

		Idaho -- 1.2%	
2,000,000	BBB+/Baa1	Power County Industrial Development Corp., 6.45%, 8/1/32	\$
1,500,000	BBB+/Baa1	Power County Pollution Control Revenue, 5.625%, 10/1/14	\$
		Illinois -- 6.5%	
1,450,000	A+/A1	Illinois Finance Authority Revenue, 5.5%, 4/1/39	\$
2,000,000	AA-/Aa3	Illinois Finance Authority Revenue, 6.0%, 8/15/25	
1,000,000 (b)	NR/NR	Illinois Finance Authority Revenue, 6.0%, 11/15/27	
280,000	BBB+/NR	Illinois Finance Authority Revenue, 6.0%, 8/15/38	
2,000,000	AA+/Aa2	Illinois Finance Authority Revenue, 6.0%, 8/15/39	
2,500,000	NR/NR	Illinois Finance Authority Revenue, 6.125%, 11/15/25	
6,000,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 5/15/45	
2,500,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 2/15/46	
2,310,000	NR/NR	Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	\$
		Indiana -- 0.4%	
250,000	NR/Baa3	East Chicago Indiana Exempt Facilities Revenue, 7.0%, 1/1/14	\$
1,805,000	NR/NR	Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	\$
		Kansas -- 0.3%	
1,000,000	NR/A2	Kansas Development Finance Authority, 5.0%, 5/15/35	\$
		Kentucky -- 1.5%	
4,390,000	BB/NR	Kentucky Economic Development Finance Authority Hospital System Revenue, 5.875%, 10/1/22	\$
		Louisiana -- 7.0%	
5,000,000	BBB-/Baa2	Jefferson Parish Hospital Service Revenue, 6.375%, 7/1/41	\$
2,500,000	BBB-/Baa3	Louisiana Local Government Environmental Developmental Authority Facilities Revenue, 6.75%, 11/1/32	
6,000,000	NR/Baa1	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	

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

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

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

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

		Louisiana -- (continued)	
\$ 750,000	BBB-/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	\$
5,915,000	A-/A3	Tobacco Settlement Financing Corp., 5.875%, 5/15/39	\$

		Maine -- 0.6%	
1,500,000	NR/Baa3	Maine Health & Higher Educational Facilities Authority Revenue, 7.5%, 7/1/32	\$

		Maryland -- 1.6%	
460,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.25%, 1/1/27	\$
1,250,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 5.3%, 1/1/37	\$
1,250,000	NR/Baa3	Maryland Health & Higher Educational Facilities Authority Revenue, 5.75%, 7/1/38	\$
2,000,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 6.25%, 1/1/45	\$

		Massachusetts -- 9.6%	
675,000	BB/NR	Massachusetts Development Finance Agency, 5.25%, 10/1/18	\$
8,000,000	A/NR	Massachusetts Development Finance Agency, 5.75%, 1/1/42	\$
1,885,000	NR/NR	Massachusetts Development Finance Agency, 7.1%, 7/1/32	\$
2,195,000	BBB-/Baa3	Massachusetts Health & Educational Facilities Authority Revenue, 5.375%, 7/15/28	\$
2,000,000	AAA/Aaa	Massachusetts Health & Educational Facilities Authority Revenue, 5.5%, 7/1/32	\$
1,000,000	NR/Caa1	Massachusetts Health & Educational Facilities Authority Revenue, 6.0%, 10/1/23	\$
3,420,000 (b)	NR/NR	Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38	\$
10,760,000	AA-/Aa3	Massachusetts Housing Finance Agency, 5.35%, 12/1/45	\$

		Michigan -- 1.7%	
2,000,000	NR/Ba1	Flint Michigan Hospital Building Authority Revenue, 7.375%, 7/1/35	\$
2,235,000	BB+/NR	Kent Hospital Finance Authority Revenue, Metropolitan Hospital Project Series A, 6.25%, 7/1/40	\$
725,000	NR/NR	Michigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36	\$

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)		Va
\$ 1,000,000	NR/NR	Minnesota -- 0.4% Port Authority of the City of Bloomington, Minnesota Recovery Zone Facility Revenue, 9.0%, 12/1/35	\$
1,000,000	NR/NR	Missouri -- 1.4% Kansas City Tax Increment Financing Commission Tax Increment Revenue, 6.5%, 6/1/25	\$
1,500,000 (b) (c)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.2%, 12/15/28	
6,640,000 (b) (c)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35	\$
2,445,000 (d)	NR/NR	Montana -- 0.7% Hardin Increment Industrial Infrastructure Development Revenue, 0.0%, 9/1/31	\$
1,000,000 (b) (c)	NR/NR	Two Rivers Authority, Inc., Project Revenue, 7.375%, 11/1/27	\$
1,320,000 (b) (c)	NR/NR	Nevada-- 1.5% Director of the State of Nevada Department of Business & Industry, 7.375%, 1/1/40	\$
1,600,000 (b) (c)	NR/NR	Director of the State of Nevada State Department of Business & Industry, 7.25%, 1/1/23	
1,000,000 (b) (c)	NR/NR	Director of the State of Nevada State Department of Business & Industry, 7.375%, 1/1/30	
4,500,000	A-/A3	Reno Nevada Hospital Revenue, 5.25%, 6/1/41	\$
1,125,000	NR/NR	New Hampshire -- 0.4% New Hampshire Health & Educational Facilities Authority Revenue, 5.875%, 7/1/34	\$
2,500,000	NR/NR	New Jersey -- 12.9% Burlington County New Jersey Bridge Commission Revenue, 5.625%, 1/1/38	\$
13,000,000	B/B3	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29	
3,500,000 (a)	AA-/NR	New Jersey State Turnpike Authority, RIB, 13.722%, 11/1/28 (144A)	
15,375,000 (h)	AA+/Aa1	New Jersey Transportation Trust Fund Authority Revenue, 0.0%, 12/15/27	
1,000,000+	AA+/Aaa	Tobacco Settlement Financing Corp., 6.25%, 6/1/43	
3,250,000+	AA+/Aaa	Tobacco Settlement Financing Corp., 6.75%, 6/1/39	
5,000,000+	AA+/Aaa	Tobacco Settlement Financing Corp., 7.0%, 6/1/41	\$

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

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

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

Principal Amount	S&P/Moody's Ratings (unaudited)		Va
		New York -- 10.7%	
\$ 1,730,000	NR/NR	Dutchess County Industrial Development Agency, 7.5%, 3/1/29	\$
3,000,000	NR/NR	Nassau County New York Industrial Development Agency Revenue, 6.7%, 1/1/43	
7,000,000	BB-/B2	New York City Industrial Development Agency, 5.25%, 12/1/32	
3,950,000	BB-/B2	New York City Industrial Development Agency, 7.625%, 12/1/32	
3,000,000	NR/C	New York City Industrial Development Agency, 8.0%, 8/1/12	
5,000,000	AAA/Aaa	New York State Dormitory Authority Revenue, 5.0%, 10/1/41	
2,000,000	NR/Ba1	New York State Dormitory Authority Revenue, 6.125%, 12/1/29	
5,000,000	AAA/Aaa	New York State Environmental Facilities Corp., 5.0%, 6/15/33	
2,000,000	BB/NR	Seneca Nation Indians Capital Improvement Authority Revenue, 5.25%, 12/1/16 (144A)	
			\$
		North Carolina -- 1.7%	
5,010,000	NR/NR	Charlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28	\$
		Ohio -- 1.8%	
1,500,000	NR/NR	Adams County Hospital Facilities Revenue, 6.5%, 9/1/36	\$
5,000,000	B-/B3	Buckeye Tobacco Settlement Financing Authority, 6.5%, 6/1/47	\$
		Oklahoma -- 1.4%	
2,220,000 (b)	NR/NR	Tulsa Municipal Airport Trust Revenue, 6.25%, 6/1/20	\$
3,000,000 (b) (e)	NR/NR	Tulsa Municipal Airport Trust Revenue, 7.75%, 6/1/35	\$
		Oregon -- 0.7%	
2,000,000	A-/NR	Oregon State Facilities Authority Revenue, 5.25%, 10/1/40	\$
		Pennsylvania -- 5.2%	
3,600,000	CC/NR	Columbia County Hospital Authority Revenue, 5.85%, 6/1/24	\$
2,000,000	BBB-/Ba1	Pennsylvania Economic Development Financing	

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

1,000,000	BB/NR	Authority Revenue, 4.625%, 12/1/18 Pennsylvania Economic Development Financing Authority Revenue, 5.125%, 6/1/18
5,000,000	B-/Caa2	Pennsylvania Economic Development Financing Authority Solid Waste Disposal Revenue, 6.0%, 6/1/31

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 17

Schedule of Investments | 3/31/12 (continued)

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

\$ 5,000,000	BBB-/Baa3	Pennsylvania -- (continued) Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 5.0%, 7/1/34	\$ \$

1,385,000 (c) (e)	NR/NR	Rhode Island -- 3.7% Central Falls Rhode Island Detention Facilities Revenue, 7.25%, 7/15/35	\$
1,500,000	NR/NR	Rhode Island Health & Educational Building Corp Revenue, 8.375%, 1/1/46	
8,285,000	BB/Baa1	Tobacco Settlement Financing Corp., 6.25%, 6/1/42	\$

7,140,000+	BBB+/Baa1	South Carolina -- 4.8% South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	\$
860,000+	BBB+/Baa1	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	
4,400,000 (f)	BBB/NR	Tobacco Settlement Revenue Management, 6.375%, 5/15/30	\$

5,000,000	BBB+/Baa1	Tennessee -- 5.6% Johnson City Health & Educational Facilities Board Hospital Revenue, 6.5%, 7/1/38	\$
1,000,000+	NR/A2	Johnson City Health & Educational Facilities Board Hospital Revenue, 7.5%, 7/1/33	
7,000,000	NR/A1	Knox County Health Educational & Housing Facilities Board Hospital Revenue, Baptist Health System East Tennessee, 6.5%, 4/15/31	
3,000,000	BBB+/NR	Sullivan County Health, Educational & Housing Facilities Board Hospital Revenue, 5.25%, 9/1/36	\$

2,400,000	BB+/Baa1	Texas -- 13.8% Central Texas Regional Mobility Authority Revenue,	

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

		6.75%, 1/1/41	\$
2,663,453 (b) (c)	NR/NR	Gulf Coast Industrial Development Authority, 7.0%, 12/1/36	
10,000,000	B-/B3	Houston Texas Airport System Special Facilities Revenue, 6.75%, 7/1/29	
725,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/16	
1,000,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.0%, 5/1/21	
1,350,000	NR/NR	IAH Public Facility Corp., Project Revenue Bonds, Series 2006, 6.125%, 5/1/26	
510,000	AA-/Aa3	Lower Colorado River Authority, 5.0%, 5/15/31	
2,240,000	AA-/Aa3	Lower Colorado River Authority, 5.0%, 5/15/31	

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

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

Principal Amount	S&P/Moody's Ratings (unaudited)		Va
Texas -- (continued)			
\$ 845,000	NR/NR	Lubbock Health Facilities Development Corp., 6.5%, 7/1/26	\$
2,000,000	NR/NR	Lubbock Health Facilities Development Corp., 6.625%, 7/1/36	
9,750,000	BBB+/A3	North Texas Tollway Authority Revenue, 5.75%, 1/1/33	
1,711,000	NR/Aaa	Panhandle Regional Housing Finance Corp. Multifamily Housing Revenue, 6.6%, 7/20/31	
1,500,000	NR/NR	Red River Health Facilities Development Corp., Revenue, 8.0%, 11/15/41	
1,000,000	A/Baa2	Richardson Hospital Authority Revenue, 6.0%, 12/1/34	
1,000,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.125%, 11/15/39	
1,500,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.25%, 11/15/44	
1,000,000 (b) (c)	D/NR	Texas Midwest Public Facility Corp., Revenue, 9.0%, 10/1/30	
2,500,000	NR/NR	Travis County Health Facilities Development Corp. Revenue, 7.125%, 1/1/46	
Virginia -- 0.8%			
2,000,000	BBB+/Baa1	Washington County Industrial Development Authority Revenue, 7.75%, 7/1/38	\$
Washington -- 3.6%			
1,140,000	BBB/A3	Tobacco Settlement Authority Revenue, 6.5%, 6/1/26	\$
1,500,000	NR/Baa2	Washington State Health Care Facilities Authority, 5.5%, 12/1/39	
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.125%, 8/15/37	

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

2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority, 6.25%, 8/15/42	\$
5,000,000	NR/NR	Washington State Housing Finance Committee Nonprofit Revenue, 5.625%, 1/1/27	\$
750,000	NR/NR	West Virginia -- 0.3% West Virginia Hospital Finance Authority Hospital Revenue Bonds, 9.125%, 10/1/41	\$
2,500,000	NR/NR	Wisconsin -- 2.1% Wisconsin Public Finance Authority Continuing Care Retirement Community Revenue, 8.25%, 6/1/46	\$
1,000,000	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.125%, 4/1/24	\$

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 19

Schedule of Investments | 3/31/12 (continued)

Principal Amount	S&P/Moody's Ratings (unaudited)		Va
\$ 1,000,000	NR/NR	Wisconsin -- (continued) Wisconsin State Health & Educational Facilities Authority Revenue, 6.25%, 4/1/34	\$
1,500,000	A+/A1	Wisconsin State Health & Educational Facilities Authority Revenue, 6.625%, 2/15/39	\$
TOTAL TAX-EXEMPT OBLIGATIONS (Cost \$405,007,401)			\$
13,000,000 (c) (e)	NR/NR	MUNICIPAL COLLATERALIZED DEBT OBLIGATION -- 3.1% of Net Assets Non-Profit Preferred Funding Trust I, 6.75%, 9/15/37 (144A)	\$
TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$13,000,000)			\$
Shares			
110,735 (g)		COMMON STOCK -- 0.4% of Net Assets TRANSPORTATION -- 0.4% Airlines -- 0.4% Delta Air Lines, Inc.	\$
TOTAL COMMON STOCKS (Cost \$3,210,349)			\$

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

6,000,000	TAX-EXEMPT MONEY MARKET MUTUAL FUND -- 2.0% of Net Assets BlackRock Liquidity Funds MuniFund Portfolio	\$
	TOTAL TAX-EXEMPT MONEY MARKET MUTUAL FUND (Cost \$6,000,000)	\$
	TOTAL INVESTMENTS IN SECURITIES -- 149.6% (Cost \$427,217,750) (h) (i)	\$
	OTHER ASSETS AND LIABILITIES -- 0.5%	\$
	PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE -- (50.1)%	\$ (
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS -- 100.0%	\$

(144A) Security is exempt from registration under Rule 144A of the Securities Act of 1933. Such securities may be resold normally to qualified institutional buyers in a transaction exempt from registration. At March 31, 2012, the value of these securities amounted to \$38,826,738 or 13.0% of total net assets applicable to common shareowners.

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

RIB Residual Interest Bonds

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

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

+ 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 interest rate shown is the coupon rate at March 31, 2012.

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

(c) Indicates a security that has been deemed illiquid. The aggregate cost of illiquid securities is \$30,080,659. The aggregate fair value of \$14,315,759 represents 4.8% of the total net assets applicable to common shareowners.

(d) Debt obligation initially issued at one coupon which converts to a higher coupon at a specific date. The rate shown is the rate at March 31, 2012.

(e) The interest rate is subject to change periodically. The interest rate shown is the rate at March 31, 2012.

(f) Escrow to maturity.

(g) Non-income producing.

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

- (h) Security issued with a zero coupon. Income is recognized through accretion of discount.
- (i) The concentration of investments by type of obligation/market sector is as follows:

Insured:	
FSA	8.1%
AMBAC	3.1
BHAC-CR MBIA	1.7
AGM	1.1
Syncora Guarantee	0.5
Revenue Bonds:	
Health Revenue	33.2
Tobacco Revenue	12.8
Other Revenue	9.6
Airport Revenue	7.8
Development Revenue	5.7
Education Revenue	3.6
Pollution Control Revenue	3.6
Housing Revenue	2.8
Transportation Revenue	2.3
Facilities Revenue	2.2
Water Revenue	1.9
Utilities Revenue	0.0*

	100.0%
	=====

* Amount rounds to less than 0.1%

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 21

Schedule of Investments | 3/31/12 (continued)

- (i) At March 31, 2012, the net unrealized gain on investments based on cost for federal income tax purposes of \$426,949,767 was as follows:

Aggregate gross unrealized gain in which there is an excess of value over tax cost	\$47,430,927
Aggregate gross unrealized loss in which there is an excess of tax cost over value	(26,252,432)

Net unrealized gain	\$21,178,495
	=====

For financial reporting purposes, net unrealized gain on investments was \$20,910,512 and cost of investments aggregated \$427,217,750.

Purchases and sales of securities (excluding temporary cash investments) for the period ended March 31, 2012 aggregated \$63,492,307 and \$64,988,494, respectively.

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

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

- Level 1 -- quoted prices in active markets for identical securities
- Level 2 -- other significant observable inputs (including quoted prices for similar securities, interest rates, prepayment speeds, credit risk, etc.)
- Level 3 -- significant unobservable inputs (including the Trust's own assumptions in determining fair value of investments)

Generally, equity securities are categorized as Level 1, fixed income securities and senior loans are categorized as Level 2 and securities valued using fair value methods (other than prices supplied by independent pricing services) are categorized as Level 3. See Notes to Financials Statements -- Note 1A.

The following is a summary of the inputs used as of March 31, 2012, in valuing the Trust's investments:

	Level 1	Level 2	Level 3	Total
Tax-exempt obligations	\$ --	\$431,771,628	\$--	\$431,771,628
Municipal collateralized debt obligation	--	9,259,250	--	9,259,250
Common stock	1,097,384	--	--	1,097,384
Tax-exempt money market mutual fund	6,000,000	--	--	6,000,000

Total	\$7,097,384	\$441,030,878	\$--	\$448,128,262
=====				

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

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

Statement of Assets and Liabilities | 3/31/12

ASSETS:

Investments in securities, at value (cost \$427,217,750)	\$448,128,262
Receivables --	
Investment securities sold	1,130,115
Interest receivable	8,637,868
Reinvestment of distributions	160,984
Prepaid expenses	48,890

Total assets	\$458,106,119

LIABILITIES:

Due to custodian	\$ 7,998,712
Due to affiliates	237,107
Administration fee payable	77,873
Accrued expenses	147,465

Total liabilities	\$ 8,461,157

PREFERRED SHARES AT REDEMPTION VALUE:

\$25,000 liquidation value per share applicable to 6,000 shares, including dividends payable of \$7,736	\$150,007,736

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

NET ASSETS APPLICABLE TO COMMON SHAREOWNERS:

Paid-in capital	\$330,445,184
Undistributed net investment income	9,057,163
Accumulated net realized loss on investments	(60,775,633)
Net unrealized gain on investments	20,910,512

Net assets applicable to common shareowners	\$299,637,226
---	---------------

NET ASSET VALUE PER COMMON SHARE:

No par value (unlimited number of shares authorized)	
Based on \$299,637,226 /23,282,302 common shares	\$ 12.87

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 23

Statement of Operations

For the Year Ended 3/31/12

INVESTMENT INCOME:

Interest	\$29,044,561
----------	--------------

EXPENSES:

Management fees	\$ 2,626,371
Administrative fees	411,374
Transfer agent fees and expenses	12,600
Shareowner communication expenses	9,516
Auction agent fees	391,457
Custodian fees	14,406
Registration fees	24,645
Professional fees	336,562
Printing expenses	3,246
Trustees' fees	15,440
Pricing fees	35,040
Miscellaneous	36,020

Total expenses	\$ 3,916,677
----------------	--------------

Net investment income	\$25,127,884
-----------------------	--------------

REALIZED AND UNREALIZED GAIN (LOSS) ON INVESTMENTS:

Net realized loss from investments	\$ (5,391,166)
Change in net unrealized gain from investments	41,794,771

Net gain on investments	\$36,403,605
-------------------------	--------------

DISTRIBUTIONS TO PREFERRED SHAREOWNERS FROM NET

INVESTMENT INCOME: \$ (417,488)

Net increase in net assets applicable to common shareowners resulting from operations	\$61,114,001
--	--------------

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

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

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

Statement of Changes in Net Assets

	Year Ended 3/31/12	Year Ended 3/31/11
FROM OPERATIONS:		
Net investment income	\$ 25,127,884	\$ 27,151,232
Net realized gain (loss) on investments	(5,391,166)	632,300
Change in unrealized gain (loss) on investments	41,794,771	(19,037,834)
Distributions to preferred shareowners from net investment income	(417,488)	(725,370)
Net increase in net assets applicable to common shareowners resulting from operations	\$ 61,114,001	\$ 8,020,328
DISTRIBUTIONS TO COMMON SHAREOWNERS:		
Net investment income (\$1.31 and \$1.06 per share, respectively)	\$ (30,307,904)	\$ (24,440,922)
Total distributions to common shareowners	\$ (30,307,904)	\$ (24,440,922)
FROM TRUST SHARE TRANSACTIONS:		
Reinvestment in distributions	\$ 1,961,141	\$ 1,739,573
Net increase in net assets applicable to common shareowners from Trust share transactions	\$ 1,961,141	\$ 1,739,573
Net increase (decrease) in net assets applicable to common shareowners	\$ 32,767,238	\$ (14,681,021)
NET ASSETS APPLICABLE TO COMMON SHAREOWNERS:		
Beginning of year	266,869,988	281,551,009
End of year	\$299,637,226	\$266,869,988
Undistributed net investment income	\$ 9,057,163	\$ 14,720,868

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 25

Financial Highlights

	Year Ended 3/31/12	Year Ended 3/31/11	Year Ended 3/31/10
Per Common Share Operating Performance			
Net asset value, beginning of period	\$ 11.54	\$ 12.24	\$ 12.24

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

Increase (decrease) from investment operations:(a)			
Net investment income	\$ 1.08	\$ 1.18	\$
Net realized and unrealized gain (loss) on investments and interest rate swaps	1.58	(0.79)	
Distributions to preferred shareowners from:			
Net investment income	(0.02)	(0.03)	

Net increase (decrease) from investment operations	\$ 2.64	\$ 0.36	\$
Distributions to common shareowners from:			
Net investment income	(1.31)	(1.06)	

Net increase (decrease) in net asset value	\$ 1.33	\$ (0.70)	\$

Net asset value, end of period(b)	\$ 12.87	\$ 11.54	\$

Market value, end of period(b)	\$ 14.72	\$ 12.64	\$
=====			
Total return at market value(c)	28.48%	4.97%	
Ratios to average net assets of common shareowners			
Net expenses(d)	1.36%	1.35%	
Net investment income before preferred share distributions	8.73%	9.54%	
Preferred share distributions	0.15%	0.25%	
Net investment income available to common shareowners	8.58%	9.29%	
Portfolio turnover	15%	10%	

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

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

	Year Ended 3/31/12	Year Ended 3/31/11	Year Ended 3/31/10

Net assets of common shareowners, end of period (in thousands)	\$299,637	\$266,870	\$233,100
Preferred shares outstanding (in thousands)	\$150,000	\$150,000	\$150,000
Asset coverage per preferred share, end of period	\$ 74,941	\$ 69,479	\$ 65,333
Average market value per preferred share(e)	\$ 25,000	\$ 25,000	\$ 25,000
Liquidation value, including dividends payable, per preferred share	\$ 25,001	\$ 25,001	\$ 25,001
Ratios to average net assets of common shareowners before waivers and reimbursements of expenses			
Net expenses	1.36%	1.35%	1.34%
Net investment income before preferred share distribution	8.73%	9.54%	10.35%
Preferred share distribution	0.15%	0.25%	0.35%
Net investment income available to common shareowners	8.58%	9.29%	10.00%
=====			

- (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

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

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 distribution 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 share of common stock outstanding, total investment return, ratios to average net assets of common shareowners 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 | 3/31/12 27

Notes to Financial Statements | 3/31/12

1. Organization and Significant Accounting Policies

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

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

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

A. Security Valuation

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

amortized cost. Money market mutual funds are valued at net asset value.

Securities for which independent pricing services are unable to supply prices or for which market prices and/or quotations are not readily available or are considered to be unreliable are valued using fair value methods pursuant to

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

procedures adopted by the Board of Trustees. The Trust may use fair value methods if it is determined that a significant event has occurred after the close of the exchange or market on which the security trades and prior to the determination of the Trust's net asset value. Examples of a significant event might include political or economic news, corporate restructurings, natural disasters, terrorist activity or trading halts. Thus, the valuation of the Trust's securities may differ from exchange prices.

At March 31, 2012, no securities were valued using fair value methods (other than securities valued using prices supplied by independent pricing services). Inputs used when applying fair value methods to value a security may include credit ratings, the financial condition of the company, current market conditions and comparable securities.

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

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

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

B. Federal Income Taxes

It is the Trust's policy to comply with the requirements of the Internal Revenue Code applicable to regulated investment companies and to distribute all of its taxable income and net realized capital gains, if any, to its shareowners. Therefore, no federal income tax provision is required. Tax years for the prior three fiscal years remain subject to examination by federal and state 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 investment transactions, or as from paid-in capital, depending on the type of book/tax differences that may exist.

At March 31, 2012, the Trust reclassified \$66,197 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

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

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

At March 31, 2012, the Trust was permitted to carry forward \$36,701 of short term losses and \$2,563,520 of long term losses under the Regulated Investment Company Modernization Act of 2010 without limitation. Additionally, at March 31, 2012, the Trust had a net capital loss carryforward of \$53,183,034 of which the following amounts will expire between 2014 and 2019 if not utilized: \$14,156,085 in 2014, \$311,368 in 2016, \$17,813,537 in 2017, \$18,242,633 in 2018 and \$2,659,411 in 2019. Since unlimited losses are required to be utilized prior to losses incurred in pre-enactment years, pre-enactment capital loss carryforwards may be more likely to expire unused.

The Trust has elected to defer \$6,203,339 of capital losses recognized between November 1, 2011 and March 31, 2012 to its fiscal year ending March 31, 2013.

The tax character of distributions paid to common and preferred shareowners during the years ended March 31, 2012 and March 31, 2011 was as follows:

	2012	2011
Distribution paid from:		
Tax exempt income	\$26,664,988	\$24,632,869
Ordinary income	4,060,404	533,423
Total taxable distribution	\$30,725,392	\$25,166,292

The following shows the components of distributable earnings (losses) on a federal income tax basis at March 31, 2012.

	2012
Distributable earnings:	
Undistributed tax-exempt income	\$ 9,047,860
Undistributed ordinary income	960,017
Capital loss carryforward	(55,783,255)
Post-October loss deferred	(6,203,339)
Dividends payable	(7,736)
Unrealized appreciation	21,178,495
Total	\$(30,807,958)

The difference between book-basis and tax-basis unrealized appreciation is primarily attributable to the difference between book and tax amortization methods for premiums and discounts on fixed income securities, the

difference between book and tax accounting for swap agreements, book/tax difference in accrual of income on securities in default, and other temporary differences.

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

C. Automatic Dividend Reinvestment Plan

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

If a shareowner's shares are held in the name of a brokerage firm, bank or other nominee, the shareowner can ask the firm or nominee to participate in the Plan on the shareowner's behalf. If the firm or nominee does not offer the Plan, dividends will be paid in cash to the shareowner of record. A firm or nominee may reinvest a shareowner's cash dividends in common shares of the Trust on terms that differ from the terms of the Plan.

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

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

D. Risks

At times, the Trust's investments may represent industries or industry

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

The Trust may invest in both investment grade 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.

2. Management Agreement

Pioneer Investment Management, Inc. (PIM), the Trust's investment adviser, a wholly owned indirect subsidiary of UniCredit S.p.A. (UniCredit), manages the Trust's portfolio. Management fees payable under the Trust's Advisory Agreement with PIM are calculated daily at the annual rate of 0.60% of the Trust's average daily managed assets. "Managed assets" means (a) the total assets of the Trust, including any form of investment leverage, minus (b) all accrued liabilities incurred in the normal course of operations, which shall not include any liabilities or obligations attributable to investment leverage obtained through (i) indebtedness of any type (including, without limitation, borrowing through a credit facility of the issuance of debt securities), (ii) the issuance of preferred stock or other similar preference securities, and/or (iii) any other means. For the year ended March 31, 2012, the net management fee was 0.60% of the Trust's average daily managed assets, which was equivalent to 0.91% of the Trust's average daily net assets attributable to the common shareowners.

In addition, under PIM's management and administration agreements, certain other services and costs are paid by PIM and reimbursed by the Trust. At March 31, 2012, \$237,107 was payable to PIM related to management costs, administrative costs and certain other reimbursements and is included in "Due to affiliates" on the Statement of Assets and Liabilities.

Effective September 1, 2010, PIM has retained State Street Bank and Trust Company (State Street) to provide certain administrative and accounting services to the Trust on its behalf. For such services, PIM pays State Street a monthly fee at an annual rate of 0.07% of the Trust's average daily managed assets up to \$500 million and 0.03% for average daily managed assets in excess

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

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

3. Transfer Agents

Pioneer Investment Management Shareholder Services, Inc. (PIMSS), a wholly owned indirect subsidiary of UniCredit, through a sub-transfer agency agreement with American Stock Transfer & Trust Company, provides substantially all transfer agent and shareowner services related to the Trust's common shares at negotiated

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

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.

In addition, the Trust reimburses PIMSS for out-of-pocket expenses incurred by PIMSS related to shareowner communications activities such as proxy and statement mailings and outgoing phone calls.

4. Expense Offset Agreements

The Trust has entered into an arrangement with its custodian whereby credits realized as a result of uninvested cash balances are used to reduce a portion of the Trust's custodian expenses. For the year ended March 31, 2012, the Trust expenses were not reduced under such arrangement.

5. Interest Rate Swaps

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

An interest rate swap is an agreement between two parties, which involves exchanging floating rate and fixed rate interest payments for a specified period of time. Interest rate swaps involve the accrual of the net interest payments between the parties on a daily basis, with the net amount recorded within the unrealized appreciation/depreciation of interest rate swaps on the Statement of Assets and Liabilities. Once the interim payments are settled in cash, at the pre-determined dates specified in the agreement, the net amount is recorded as

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 33

realized gain or loss from interest rate swaps on the Statement of Operations. During the term of the swap, changes in the value of the swap are recognized as unrealized gains and losses by "marking-to-market" the value of the swap based on values obtained from dealer quotations. When the swap is terminated, the Trust will record a realized gain or loss equal to the difference, if any, between the proceeds from (or cost of) closing the contract and the cost basis of the contract. The Trust is exposed to credit risk in the event of non-performance by the other party to the interest rate swap. Risk may also arise with regard to market movements in the value of the swap arrangement that do not exactly offset the changes in the related dividend requirement or interest expense on the Trust's leverage.

There were no interest rate swap contracts open during the year end March 31, 2012 or outstanding at March 31, 2012.

6. 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, 2012 and March 31, 2011 were as follows:

	3/31/12	3/31/11
Shares outstanding at beginning of year	23,133,791	22,995,047
Reinvestment of distributions	148,511	138,744
Shares outstanding at end of year	23,282,302	23,133,791

The Trust may classify or reclassify any unissued shares of beneficial interest into one or more series of preferred shares of beneficial interest. As of March 31, 2012, 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 to be 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 are not 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 each series is 125% of the 7 day commercial paper rate or adjusted Kenny rate. Dividend rates on APS ranged from 0.121% to 0.497% during the year ended March 31, 2012.

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.

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

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

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

7. Subsequent Events

The Board of Trustees of the Trust declared on April 4, 2012 a dividend from undistributed net investment income of \$0.095 per common share payable April 30, 2012, to common shareowners of record on April 16, 2012.

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

Subsequent to March 31, 2012, dividends declared and paid on preferred shares totaled \$87,510 in aggregate for the two outstanding preferred share series through May 22, 2012.

On May 2, 2012, Moody's announced that it placed all securities issued by closed-end funds on review for a possible downgrade as a result of an update of its rating methodology. If the ratings of the Trust's preferred securities were downgraded, the Trust's financing costs may increase slightly. A more definite determination of any potential impact cannot be made at this time.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 35

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, 2012, 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, 2012, 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, 2012, 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.

Ernst + Young LLP

Boston, Massachusetts
May 24, 2012

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

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

ADDITIONAL INFORMATION (unaudited)

During the period, there have been no material changes in the Trust's investment objective or fundamental policies that have not been approved by the shareowners. There have been no changes in the Trust's charter or By-Laws that would delay or prevent a change in control of the Trust which has not been approved by the shareowners. There have been no changes in the principal risk factors associated with investment in the Trust. There were no changes in the persons who are primarily responsible for the day-to-day management of the Trust's portfolio.

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.

IMPORTANT TAX INFORMATION (unaudited)

The following summarizes the taxable per share distributions paid by Pioneer Municipal High Income Advantage Trust during the taxable year ended March 31, 2012.

	Payable Date	Ordinary Income
Common Shareowners	12/29/2011	0.171100
Preferred Shareowners		
Series A	1/31/2012	0.800000
	2/07/2012	0.870000
	2/14/2012	1.400000
	2/21/2012	1.690000
	2/28/2012	1.790000
	3/06/2012	1.500000
	3/13/2012	1.290000
	3/20/2012	1.290000
	3/27/2012	2.380000
	4/03/2012*	1.500000
Series B	1/30/2012	0.700000
	2/06/2012	0.870000
	2/13/2012	1.090000
	2/21/2012	1.710000
	2/27/2012	1.540000
	3/05/2012	1.600000
	3/12/2012	1.400000
	3/19/2012	1.290000
	3/26/2012	1.400000
	4/02/2012*	1.600000
	4/09/2012*	1.420000

* Subsequent to March 31, 2012.

All 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 | 3/31/12 37

Approval of Investment Advisory Agreement

Pioneer Investment Management, Inc. (PIM) serves as the investment adviser to

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

Pioneer Municipal High Income Advantage Trust (the Trust) pursuant to an investment advisory agreement between PIM and the Trust. In order for PIM to remain the investment adviser of the Trust, the Trustees of the Trust must determine annually whether to renew the investment advisory agreement for the Trust.

The contract review process began in March 2011 as the Trustees of the Trust agreed on, among other things, an overall approach and timeline for the process. In July 2011, the Trustees approved the format of the contract review materials and submitted their formal request to PIM to furnish information necessary to evaluate the terms of the investment advisory agreement. The contract review materials were provided to the Trustees in July 2011 and September 2011. After reviewing and discussing the materials, the Trustees submitted a request for additional information to PIM, and materials were provided in response to this request. Meetings of the Independent Trustees of the Trust were held in July, September, October, and November, 2011 to review and discuss the contract review materials. In addition, the Trustees took into account the information related to the Trust provided to the Trustees at each regularly scheduled meeting.

At a meeting held on November 29, 2011, based on their evaluation of the information provided by PIM and third parties, the Trustees of the Trust, including the Independent Trustees voting separately, unanimously approved the renewal of the investment advisory agreement for another year. In considering the renewal 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 renewal of the agreement.

Nature, Extent and Quality of Services

The Trustees considered the nature, extent and quality of the services that had been provided by PIM to the Trust, taking into account the investment objective and strategy of the Trust. The Trustees reviewed the terms of the investment advisory agreement. The Trustees also reviewed PIM's investment approach for the Trust, its research process and its process for trade execution. The Trustees considered the resources of PIM and the personnel of PIM who provide investment management services to the Trust. The Trustees considered the non-investment resources and personnel of PIM involved in PIM's services to the Trust, including PIM's compliance and legal resources and personnel. The Trustees also considered the substantial attention and high priority given

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

by PIM's senior management to the Pioneer fund complex. In addition, the Trustees considered PIM's plans to increase resources in its investment management function and other enhancements to PIM's advisory capabilities.

The Trustees considered that PIM supervises and monitors the performance of the Trust's service providers and provides the Trust with personnel (including Trust officers) and other resources that are necessary for the Trust's business management and operations. The Trustees also considered that, as administrator, PIM is responsible for the administration of the Trust's business and other affairs. The Trustees considered the fees paid to PIM for the provision of administration services.

Based on these considerations, the Trustees concluded that the nature, extent and quality of services that had been 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

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 first quintile of its Morningstar category for the one and three year periods ended June 30, 2011 and in the third quintile of its Morningstar category for the five year period ended June 30, 2011. (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 considered that the Trust's twelve month average gross portfolio yield (using month end 30 day effective yields) exceeded the twelve month average yield of the Trust's benchmark index. The Trustees also reviewed data provided by PIM showing how leverage had benefited the Trust's common shareholders. The Trustees concluded that the investment performance of the Trust was satisfactory.

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 Fund Research and Consulting, LLC (Strategic Insight), an independent third party. The Trustees considered that the Trust's management fee rate (based on managed assets) for the twelve months ended June 30, 2011 was in the third 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 (based on managed assets) for the twelve months ended

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 39

June 30, 2011 was in the third quintile relative to its Strategic Insight peer group for the comparable period.

The Trustees reviewed gross and net management fees charged by PIM to its institutional and other clients, including publicly offered European funds, U.S. registered investment companies (in a sub-advisory capacity), and unaffiliated foreign and domestic separate accounts. The Trustees also considered PIM's costs in providing services to the Trust and to its other clients and considered the differences in management fees and profit margins for PIM's Trust and non-Trust services. In evaluating the fees associated with PIM's client accounts, the Trustees took into account the respective demands, resources and complexity associated with the Trust and client accounts. The Trustees noted that in some instances the fee rates for those clients were lower than the management fee for the Trust and considered that, under the investment advisory agreement with the Trust, PIM performs additional services for the Trust that it does not provide to those other clients or services that are broader in scope, including oversight of the Trust's other service providers and activities related to compliance and the extensive regulatory and tax regimes to which the Trust is subject. The Trustees also considered the different entrepreneurial risks associated with PIM's management of the Trust and the other client accounts. 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.

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.

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

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 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 that has not raised additional capital, the Trustees concluded that economies of scale were not a relevant consideration in the renewal of the investment advisory agreement.

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

Other Benefits

The Trustees considered the other benefits to PIM from its relationship with the Trust. The Trustees 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 considered the intangible benefits to PIM by virtue of its relationship with the Trust and the other Pioneer funds. 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 renewal of the investment advisory agreement for the Trust.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 41

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

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

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

State Street Bank and Company

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

Trustees and Officers

The Trust's Trustees and officers are listed on the following pages, together with their principal occupations during at least 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, except Mr. West, serves as a trustee of each of the 56 U.S. registered investment portfolios for which Pioneer serves as investment adviser (the "Pioneer Funds"). Mr. West serves as a trustee of 44 U.S. registered investment portfolios for which Pioneer serves as investment adviser. The address for all Trustees and all officers of the Trust is 60 State Street, Boston, Massachusetts 02109.

The Statement of Additional Information of the Trust includes additional information about the Trustees and is available, without charge, upon request, by calling 1-800-225-6292.

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

Interested Trustees

Name and Age	Position Held With the Trust	Term of Office and Length of Service
John F. Cogan, Jr. (85)*	Chairman of the Board, Trustee and President	Class I Trustee since 2003. Term expires in 2013. Elected by Preferred Shares only.
Daniel K. Kingsbury (53)*	Trustee and Executive Vice President	Class II Trustee since 2007. Term expires in 2014.

Interested Trustees

Name and Age	Principal Occupation
John F. Cogan, Jr. (85)*	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) (until October 2011); President and a director of Pioneer Alternative Investment Man-

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

agement (Bermuda) Limited and affiliated funds; Deputy Chairman and a director of Pioneer Global Asset Management S.p.A. ("PGAM") (until April 2010); Director of PIONGLOBAL Real Estate Investment Fund (Russia) (until June 2006); Director of Nano-C, Inc. (since 2003); Director of Cole Management Inc. (2004 - 2011); Director of Fiduciary Counseling, Inc. (until December 2001); President and Director of Pioneer Funds Distributor, Inc. ("PFD") (until May 2006); President of all of the Pioneer Funds; and Retired Partner, Wilmer Cutler Pickering Hale and Dorr LLP

 Daniel K. Kingsbury (53)* Director, CEO and President of PIM-USA (since February 2007); Director and President of Pioneer and Pioneer Institutional Asset Management, Inc. (since February 2007); Executive Vice President of all of the Pioneer Funds (since March 2007); Director of PGAM (2007 - 2010); Head of New Europe Division, PGAM (2000 - 2005); and Head of New Markets Division, PGAM (2005 - 2007)

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 43

Independent Trustees

Name and Age	Position Held With the Trust	Term of Office and Length of Service
David R. Bock (68)	Trustee	Class I Trustee since 2005. Term expires in 2013.
Mary K. Bush (63)	Trustee	Class III Trustee since 2003. Term expires in 2012.

Independent Trustees

Name and Age	Principal Occupation
David R. Bock (68)	Managing Partner, Federal City Capital Advisors (corporate advisory services company) (1997 - 2004 and 2008 - present); Interim Chief Executive Officer, Oxford Analytica, Inc. (privately held research and consulting company) (2010); Executive Vice President and Chief Financial Officer, I-trax, Inc. (publicly traded health care services company) (2004 - 2007); and Executive Vice President and Chief Financial Officer, Pedestal Inc. (internet-based mortgage trading company) (2000 - 2002)

Mary K. Bush (63) Chairman, Bush International, LLC (international financial advisory firm) (1991 - present); Senior Managing Director, Brock Capital Group, LLC (strategic business advisors) (2010 - present); Managing Director, Federal Housing Finance Board (oversight of Federal Home Loan Bank system) (1989 - 1991); Vice President and Head of International Finance, Federal National Mortgage Association (1988 - 1989); U.S. Alternate Executive Director, International Monetary Fund (1984 - 1988); Executive Assistant to Deputy Secretary of the U.S. Treasury, U.S. Treasury Department (1982 - 1984); and Vice President and Team Leader in Corporate Banking, Bankers Trust Co. (1976 - 1982)

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

Name and Age	Position Held With the Trust	Term of Office and Length of Service
Mary K. Bush (continued)		
Benjamin M. Friedman (67)	Trustee	Class II Trustee since 2008. Term expires in 2011.
Margaret B.W. Graham (64)	Trustee	Class II Trustee since 2003. Term expires in 2014.

Name and Age	Principal Occupation
Mary K. Bush (continued)	

 Benjamin M. Friedman (67) William Joseph Maier Professor of Political Economy, Harvard University (1972 - present)

 Margaret B.W. Graham (64) Founding Director, Vice President and Corporate Secretary, The Winthrop Group, Inc. (consulting firm) (1982 - present); Desautels Faculty of Management, McGill University (1999 - present); and Manager of Research Operations and Organizational Learning, Xerox PARC, Xerox's Advance Research Center (1990 - 1994)

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12
 45

Independent Trustees (continued)

Name and Age	Position Held With the Trust	Term of Office and Length of Service
Thomas J. Perna (61)	Trustee	Class III Trustee since 2006. Term expires in 2012.
Marguerite A. Piret (63)	Trustee	Class III Trustee since 2003. Term expires in 2012. Elected by Preferred Shares only.
Stephen K. West (83)	Trustee	Class I Trustee since 2003. Term expires in 2013.

Name and Age	Principal Occupation
Thomas J. Perna (61)	Chairman and 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 (63) President and Chief Executive Officer, Newbury, Piret & Company, Inc. (investment banking firm) (1981 - present)

 Stephen K. West (83) Senior Counsel, Sullivan & Cromwell LLP (law firm) (1998 - present); and Partner, Sullivan & Cromwell LLP (prior to 1998)

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

Trust Officers

Name and Age	Position Held With the Trust	Length of Service and Term of Office
Christopher J. Kelley (47)	Secretary	Since 2010. Serves at the discretion of the Board.
Carol B. Hannigan (51)	Assistant Secretary	Since 2010. Serves at the discretion of the Board.
Thomas Reyes (49)	Assistant Secretary	Since 2010. Serves at the discretion of the Board.
Mark E. Bradley (52)	Treasurer	Since 2008. Serves at the discretion of the Board.
Luis I. Presutti (47)	Assistant Treasurer	Since 2003. Serves at the discretion of the Board.
Gary Sullivan (54)	Assistant Treasurer	Since 2003. Serves at the discretion of the Board.

Trust Officers

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

Name and Age	Principal Occupation
Christopher J. Kelley (47)	Vice President and Associate General Counsel of Pioneer since January 2008 and Secretary of all of the Pioneer Funds since June 2010; Assistant Secretary of all of the Pioneer Funds from September 2003 to May 2010; and Vice President and Senior Counsel of Pioneer from July 2002 to December 2007
Carol B. Hannigan (51)	Fund Governance Director of Pioneer since December 2006 and Assistant Secretary of all the Pioneer Funds since June 2010; Manager -- Fund Governance of Pioneer from December 2003 to November 2006; and Senior Paralegal of Pioneer from January 2000 to November 2003
Thomas Reyes (49)	Counsel of Pioneer since June 2007 and Assistant Secretary of all the Pioneer Funds since June 2010; and Vice President and Counsel at State Street Bank from October 2004 to June 2007
Mark E. Bradley (52)	Vice President -- Fund Accounting, Administration and Controllershship Services of Pioneer; Treasurer of all of the Pioneer Funds since March 2008; Deputy Treasurer of Pioneer from March 2004 to February 2008; and Assistant Treasurer of all of the Pioneer Funds from March 2004 to February 2008
Luis I. Presutti (47)	Assistant Vice President -- Fund Accounting, Administration and Controllershship Services of Pioneer; and Assistant Treasurer of all of the Pioneer Funds
Gary Sullivan (54)	Fund Accounting Manager -- Fund Accounting, Administration and Controllershship Services of Pioneer; and Assistant Treasurer of all of the Pioneer Funds

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 47

Trust Officers (continued)

Name and Age	Position Held With the Trust	Length of Service and Term of Office
David F. Johnson (32)	Assistant Treasurer	Since 2009. Serves at the discretion of the Board.
Jean M. Bradley (59)	Chief Compliance Officer	Since 2010. Serves at the discretion of the Board.

Name and Age	Principal Occupation
--------------	----------------------

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

David F. Johnson (32) Fund Administration Manager -- Fund Accounting, Administration and Controllershship Services since November 2008; Assistant Treasurer of all of the Pioneer Funds since January 2009; and Client Service Manager -- Institutional Investor Services at State Street Bank from March 2003 to March 2007

Jean M. Bradley (59) Chief Compliance Officer of Pioneer and of all the Pioneer Funds since March 2010; Director of Adviser and Portfolio Compliance at Pioneer since October 2005; and Senior Compliance Officer for Columbia Management Advisers, Inc. from October 2003 to October 2005

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

This page for your notes.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 49

This page for your notes.

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

This page for your notes.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/12 51

This page for your notes.

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

How to Contact Pioneer

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

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

Account Information 1-800-710-0935
Or write to AST:

For

Write to

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

American Stock
Transfer & Trust
Operations Center
6201 15th Ave.
Brooklyn, NY 11219

Dividend reinvestment plan (DRIP)

American Stock
Transfer & Trust
Wall Street Station
P.O. Box 922

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

New York, NY 10269-0560

Website

www.amstock.com

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

The Trust files a complete schedule 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 www.sec.gov. The filed form may also be viewed and copied at the Commission's Public Reference Room in Washington, DC. Information regarding the operations of the Public Reference Room may be obtained by calling 1-800-SEC-0330.

ITEM 2. CODE OF ETHICS.

(a) Disclose whether, as of the end of the period covered by the report, the registrant has adopted a code of ethics that applies to the registrant's principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, regardless of whether these individuals are employed by the registrant or a third party. If the registrant has not adopted such a code of ethics, explain why it has not done so.

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

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

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

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

The registrant has made no amendments to the code of ethics during the period

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

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 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 (see attachment);

(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

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

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 associated with the filings to update its Form N-2 and issuance of comfort letters, totaled approximately \$42,086 in 2012 and \$42,086 in 2011.

(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 \$9,652 in 2012 and 2011, 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 \$8,290 for 2012 and 2011, 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.

Audit-Related Fees and Other Fees

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

Audit related fees for the Trust's audit related services totaled approximately \$9,652 and \$9,652 in 2012 and 2011, respectively.

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

PIONEER FUNDS

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

SECTION I - POLICY PURPOSE AND APPLICABILITY

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

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

Approval of a service in accordance with this policy for a Fund shall also 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 assistanceo SEC consultation, registration statements, and reportingo Tax accrual related matterso Implementation of new accounting standardso Compliance letters (e.g. rating agency letters)o Regulatory reviews and assistance regarding financial matterso 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.)

- 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
<ul style="list-style-type: none"> o "One-time" pre-approval for the fund fiscal year within a specified dollar limit 	<ul style="list-style-type: none"> o A summary of all such services and related fees (including comparison to specified dollar limits) reported quarterly.
<ul style="list-style-type: none"> 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) 	
<ul style="list-style-type: none"> 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
------------------	------------------------------	---

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

<p>IV. OTHER SERVICES</p> <p>A. SYNERGISTIC, UNIQUE QUALIFICATIONS</p>	<p>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.</p>	<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

- | | |
|---|---|
| <ul style="list-style-type: none"> o "One-time" pre-approval for the fund fiscal year within a specified dollar limit 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" | <ul style="list-style-type: none"> o A summary of all such services and related fees (including comparison to specified dollar limits) reported quarterly. |
|---|---|

SECTION III - POLICY DETAIL, CONTINUED

SERVICE CATEGORY	SERVICE CATEGORY DESCRIPTION	SPECIFIC PROHIBITED SERVICE SUBCATEGORIES
PROHIBITED SERVICES	Services which result	1. Bookkeeping or other services

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

in the auditors losing independence status under the Rule.

related to the accounting records or financial statements of the audit client*

2. Financial information systems design and implementation*
3. Appraisal or valuation services, fairness* opinions, or contribution-in-kind reports
4. Actuarial services (i.e., setting actuarial reserves versus actuarial audit work)*
5. Internal audit outsourcing services*
6. Management functions or human resources
7. Broker or dealer, investment advisor, or investment banking services
8. Legal services and expert services unrelated to the audit
9. Any other service that the Public Company Accounting Oversight Board determines, by regulation, is impermissible

AUDIT COMMITTEE APPROVAL POLICY

AUDIT COMMITTEE REPORTING POLICY

-
- o These services are not to be performed with the exception of the(*) services that may be permitted 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.

-
- o A summary of all 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.

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

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, 2012 and 2011, 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 2012 and \$17,942 in 2011.

(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 Trust'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 registrants 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

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

committee established in accordance with Section 3(a)(58)(A) of the Exchange Act (15 U.S.C. 78c(a)(58)(A)).

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

N/A

Item 6. Schedule of Investments.

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

Included in Item 1

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

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

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

VERSION DATED July, 2004

Overview

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

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

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

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

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

1

Proxy Voting Procedures

Proxy Voting Service

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

Proxy Coordinator

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

Referral Items

From time to time, the proxy voting service will refer proxy questions to the Proxy Coordinator that are described by Pioneer's policy as to be voted on a case-by-case basis, that are not covered by Pioneer's guidelines or where Pioneer's guidelines may be unclear with respect to the matter to be

voted on. Under such certain circumstances, the Proxy Coordinator will seek a written voting recommendation from the Director of Portfolio Management US. Any such recommendation will include: (i) the manner in which the proxies should be voted; (ii) the rationale underlying any such decision; and (iii) the disclosure of any contacts or communications made between Pioneer and any outside parties concerning the proxy proposal prior to the time that the voting instructions are provided. In addition, the Proxy Coordinator will ask the Compliance Department to review the question for any actual or apparent conflicts of interest as described below under "Conflicts of

2

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

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

Conflicts of Interest

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

- o An affiliate of Pioneer, such as another company belonging to the UniCredito Italiano S.p.A. banking group (a "UniCredito Affiliate");
- o An issuer of a security for which Pioneer acts as a sponsor, advisor, manager, custodian, distributor, underwriter, broker, or other similar capacity (including those securities specifically declared by PGAM to present a conflict of interest for Pioneer);
- o An issuer of a security for which UniCredito has informed Pioneer that a UniCredito Affiliate acts as a sponsor, advisor, manager, custodian, distributor, underwriter, broker, or other similar capacity; or
- o A person with whom Pioneer (or any of its affiliates) has an existing, material contract or business relationship that was not entered into in the ordinary course of Pioneer's business.
- o Pioneer will abstain from voting with respect to companies directly or indirectly owned by UniCredito Italiano Group, unless

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

otherwise directed by a client. In addition, Pioneer will inform PGAM Global Compliance and the PGAM Independent Directors before exercising such rights.

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

3

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

Securities Lending

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

Share-Blocking

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

Pioneer will vote in those countries with "share-blocking." In the event a manager would like to sell a security with "share-blocking", the Proxy Coordinator will work with the Portfolio Manager and Investment Operations Department to recall the shares (as allowable within the market time-frame and practices) and/or communicate with executing brokerage firm. A list of countries with "share-blocking" is available from the Investment Operations Department upon request.

Record Keeping

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

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

record upon its request.

4

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

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

Disclosure

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

Proxy Voting Oversight Group

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

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

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

portfolio value. In other cases, however, proposals set forth by management may have a negative effect on that value, while some shareholder proposals may hold the best prospects for enhancing it. Pioneer monitors developments in the proxy-voting arena and will revise this policy as needed.

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

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

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

Administrative

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

We will generally support these and similar management proposals:

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

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

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

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

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

annual votes.

- o Requirements for union or special interest representation on the board.
- o Requirements to provide two candidates for each board seat.

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

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

Elections of Directors

In uncontested elections of directors we will vote against:

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

We will also vote against:

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

8

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

- o Re-election of directors who have implemented or renewed a dead-hand or modified dead-hand poison pill (a "dead-hand poison pill" is a shareholder rights plan that may be altered only by incumbent or "dead " directors. These plans prevent a potential acquirer from disabling a poison pill by obtaining control of the board through a proxy vote).
- o Contested election of directors.
- o Prior to phase-in required by SEC, we would consider supporting election of a majority of independent directors in cases of poor performance.
- o Mandatory retirement policies.
- o Directors who have ignored a shareholder proposal that has been approved by shareholders for two consecutive years.

Takeover-Related Measures

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

Pioneer will vote for:

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

9

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

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

- o Fair price provisions. We will vote against provisions requiring supermajority votes to approve takeovers. We will also consider voting against proposals that require a supermajority vote to repeal or amend the provision. Finally, we will consider the mechanism used to determine the fair price; we are generally opposed to complicated formulas or requirements to pay a premium.
- o Opting out of state takeover statutes regarding fair price provisions. We will use the criteria used for fair price provisions in general to determine our vote on this issue.
- o Proposals that allow shareholders to nominate directors.

We will vote against:

- o Classified boards, except in the case of closed-end mutual funds.
- o Limiting shareholder ability to remove or appoint directors. We will support proposals to restore shareholder authority in this

area. We will review on a case-by-case basis proposals that authorize the board to make interim appointments.

- o Classes of shares with unequal voting rights.
- o Supermajority vote requirements.
- o Severance packages ("golden" and "tin" parachutes). We will support proposals to put these packages to shareholder vote.
- o Reimbursement of dissident proxy solicitation expenses. While we ordinarily support measures that encourage takeover bids, we believe that management should have full control over corporate funds.
- o Extension of advance notice requirements for shareholder proposals.
- o Granting board authority normally retained by shareholders (e.g., amend charter, set board size).
- o Shareholder rights plans ("poison pills"). These plans generally allow shareholders to buy additional shares at a below-market price in the event of a change in control and may deter some bids.

10

Capital Structure

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

Pioneer will vote for:

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

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

- o Size of requested increase (we would normally approve increases of up to 100% of current authorization);
- o Proposed use of the additional shares; and
- o Potential consequences of a failure to increase the number of shares outstanding (e.g., delisting or bankruptcy).
 - o Blank-check preferred. We will normally oppose issuance of a new class of blank-check preferred, but may approve an increase in a class already outstanding if the company has demonstrated that it uses this flexibility appropriately.
 - o Proposals to submit private placements to shareholder vote.
 - o Other financing plans.

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

11

Compensation

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

Pioneer will vote for:

- o 401(k) benefit plans.
- o Employee stock ownership plans (ESOPs), as long as shares allocated to ESOPs are less than 5% of outstanding shares. Larger blocks of stock in ESOPs can serve as a takeover defense. We will support proposals to submit ESOPs to shareholder vote.
- o Various issues related to the Omnibus Budget and Reconciliation Act of 1993 (OBRA), including:
 - o Amendments to performance plans to conform with OBRA;
 - o Caps on annual grants or amendments of administrative features;
 - o Adding performance goals; and
 - o Cash or cash-and-stock bonus plans.
 - o Establish a process to link pay, including stock-option grants, to performance, leaving specifics of implementation to the company.
 - o Require that option repricings be submitted to shareholders.
 - o Require the expensing of stock-option awards.
 - o Require reporting of executive retirement benefits (deferred compensation, split-dollar life insurance, SERPs, and pension benefits).

- o Employee stock purchase plans where the purchase price is equal to at least 85% of the market price, where the offering period is no greater than 27 months and where potential dilution (as defined below) is no greater than 10%.

12

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

- o Executive and director stock-related compensation plans. We will consider the following factors when reviewing these plans:
- o The program must be of a reasonable size. We will approve plans where the combined employee and director plans together would generate less than 15% dilution. We will reject plans with 15% or more potential dilution.

$$\text{Dilution} = (A + B + C) / (A + B + C + D), \text{ where}$$

A = Shares reserved for plan/amendment,

B = Shares available under continuing plans,

C = Shares granted but unexercised and

D = Shares outstanding.

- o The plan must not:
 - o Explicitly permit unlimited option repricing authority or that have repriced in the past without shareholder approval.
 - o Be a self-replenishing "evergreen" plan, plans that grant discount options and tax offset payments.
- o We are generally in favor of proposals that increase participation beyond executives.
- o We generally support proposals asking companies to adopt rigorous vesting provisions for stock option plans such as those that vest incrementally over, at least, a three- or four-year period with a pro rata portion of the shares becoming exercisable on an annual basis following grant date.
- o We generally support proposals asking companies to disclose their window period policies for stock transactions. Window period policies ensure that employees do not exercise options based on insider information contemporaneous with quarterly earnings releases and other material corporate announcements.
- o We generally support proposals asking companies to adopt stock holding periods for their executives.
 - o All other employee stock purchase plans.
 - o All other compensation-related proposals, including deferred compensation plans, employment agreements, loan guarantee programs and retirement plans.
 - o All other proposals regarding stock compensation plans, including

extending the life of a plan, changing vesting restrictions, repricing options, lengthening exercise periods or accelerating distribution of awards and pyramiding and cashless exercise programs.

13

We will vote against:

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

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

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

Corporate Governance

Pioneer will vote for:

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

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

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

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 Managers business experience during the past 5 years.

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, 2012. 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-BASED	ASSETS MANAGED FOR WHICH ADVISORY FEE IS PERFORMANCE-BASED	

David Eurkus

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

Other Registered Investment Companies	3	\$2,043,017,000	N/A
-----	-	-----	---
N/A			

Other Pooled Investment Vehicles	0	\$0	N/A
-----	-	--	---
Other Accounts	1	\$9,647,000	N/A
-----	-	-----	---

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

- 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.

- 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

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

are involved, Pioneer will place the order in a manner intended to result in as favorable a price as possible for such client.

- 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.

- A portfolio manager could favor an account if the portfolio manager has a beneficial interest in the account, in order to benefit a large client or to compensate a client that had poor returns. For example, if the portfolio manager held an interest in an investment partnership that was one of the accounts managed by the portfolio manager, the portfolio manager would have an economic incentive to favor the account in which the portfolio manager held an interest.

- 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:

- 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, are the Barclays Capital Municipal Bond Index and the Barclays Capital

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

High Income Municipal Bond Index. As a result of these two benchmarks, the performance of the portfolio manager for compensation purposes is measured against the criteria that are relevant to the portfolio manager's competitive universe.

- 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.

- Pioneer Results and Business Line Results. Pioneer's financial performance, as well as the investment performance of its investment management group, affect a portfolio manager's actual bonus by a leverage factor of plus or minus (+/-) a predetermined percentage.

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

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

SHARE OWNERSHIP BY PORTFOLIO MANAGER. The following table indicates as of March 31, 2012 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

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

Exchange Act (17 CFR 240.10b-18), made in the period covered by the report. Provide disclosures covering repurchases made on a monthly basis. For example, if the reporting period began on January 16 and ended on July 15, the chart would show repurchases for the months from January 16 through February 15, February 16 through March 15, March 16 through April 15, April 16 through May 15, May 16 through June 15, and June 16 through July 15.

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

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

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

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

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

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

registrant's internal control over financial reporting.

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

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

ITEM 12. EXHIBITS.

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

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

(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 30, 2012

Pursuant to the requirements of the Securities Exchange Act of 1934 and the

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

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 30, 2012

By (Signature and Title)* /s/ Mark Bradley
Mark Bradley, Treasurer & Chief Accounting & Financial Officer

Date May 30, 2012

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