

PIONEER MUNICIPAL HIGH INCOME ADVANTAGE TRUST
Form N-CSR
May 29, 2014

OMB APPROVAL
OMB Number: 3235-0570
Expires: January 31, 2017
Estimated average burden
hours per response.....20.6

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, 2013 through March 31, 2014

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

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

under the clearance requirements of 44 U.S.C. ss. 3507.

ITEM 1. REPORTS TO STOCKHOLDERS.

Pioneer Municipal High
Income Advantage Trust

Annual Report | March 31, 2014

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	10
Prices and Distributions	11
Performance Update	12
Schedule of Investments	13
Financial Statements	24
Notes to Financial Statements	29
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 | 3/31/14 1

President's Letter

Dear Shareowner,

A few months into 2014, we still expect U.S. economic growth for the year to be in the 2.5% to 3% range, despite some weaker economic data releases during the winter months driven in large part by harsh weather across much of the continental U.S. While unemployment remains high, employment has been rising steadily. Consumer incomes, savings, wealth, and debt-servicing capacity have been solid buttresses for the recovering housing and auto industries. Industrial

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

activity is growing only moderately, but current corporate profits are generally solid and balance sheets appear able to support needed capital spending and dividend* payouts. A modestly improving European economy and continuing economic improvement in Japan appear likely to result in improving global growth in 2014, further supporting the U.S. economy. In addition, we feel that continuing slack in labor markets and capacity utilization offer the potential for continuing growth without bottlenecks and rising inflation.

After observing the strengthening economic trends, the Federal Reserve System (the Fed) has begun scaling back its QE (quantitative easing) program, but short-term interest rates remain near zero, and while Fed Chair Janet Yellen has suggested that rates may be raised roughly six months after the QE program is fully tapered, that would still place the potential rate hike sometime in 2015.

There are certainly risks and uncertainties still facing the global economy as 2014 moves along. The European economy, while improving, remains weak, the Japanese economy faced a tax hike this spring, and a number of emerging market countries are experiencing difficulties. There are also geopolitical worries abroad, such as Russia's aggressive move against the Ukraine, and more potential political fights at home, especially during a mid-term election year. While most of the widely recognized risks we have outlined may already be "priced into" the market, we believe investors should continue to expect market volatility.

At Pioneer, we have long advocated the benefits of staying diversified and investing for the long term. And while diversification does not assure a profit or protect against loss in a declining market, we believe there are still opportunities for prudent investors to earn attractive returns. 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, keeping in mind that there is no single best strategy that works for every investor.

* Dividends are not guaranteed.

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

Pioneer's investment teams have, since 1928, sought out attractive opportunities in equity and bond markets, using in-depth research to identify undervalued individual securities, and using thoughtful risk management to construct portfolios which seek to balance potential risks and rewards in an ever-changing world.

We encourage 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.

Portfolio Management Discussion | 3/31/14

Investors' confidence in municipal debt strongly rebounded during the second half of the 12-month period ended March 31, 2014, although the municipal market's performance for the Trust's full fiscal year remained modest. In the following interview, David Eurkus and Jonathan Chirunga discuss the factors that influenced the performance of Pioneer Municipal High Income Advantage Trust during the 12-month period ended March 31, 2014. Mr. Eurkus, Director of Municipals, a senior vice president and a portfolio manager at Pioneer, and Mr. Chirunga, a vice president and portfolio manager at Pioneer, are responsible for the day-to-day management of the Trust.

Q How did Pioneer Municipal High Income Advantage Trust perform during the 12-month period ended March 31, 2014?

A Pioneer Municipal High Income Advantage Trust returned -2.78% at net asset value and 2.59% at market price during the 12-month period ended March 31, 2014. During the same 12-month period, the Trust's benchmarks, the Barclays Municipal Bond Index and the Barclays High Yield Municipal Bond Index, returned 0.39% and -1.87% at net asset value, respectively. The Barclays Municipal Bond Index is an unmanaged measure of the performance of investment-grade municipal bonds, while the Barclays High Yield Municipal Bond Index is an unmanaged measure of the performance of lower-rated municipal bonds. Unlike the Trust, the two Barclays indices do not use leverage. While use of leverage increases investment opportunity, it also increases investment risk. During the same 12-month period, the average return (at market price) of the 11 closed end funds in Lipper's High Yield Municipal Debt Closed End Funds category (which may or may not be leveraged) was -4.53%.

The shares of the Trust were selling at a 21.0% premium to net asset value at the end of the period, on March 31, 2014.

On March 31, 2014, the standardized 30-day SEC yield of the Trust's shares was 8.40%*.

Q How would you describe the investment environment in the municipal bond market during the 12-month period ended March 31, 2014?

A Municipal bonds, particularly higher-yielding, lower-rated issues, rebounded strongly during the second half of the 12-month period, but the rally was not sufficient to overcome the negative effects of market volatility

* The 30-day SEC yield is a standardized formula that is based on the hypothetical annualized earning power (investment income only) of the Trust's portfolio securities during the period indicated.

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

over the first half of the period. The Trust's fiscal year began on April 1, 2013, with municipal bonds, including high-yield securities, performing well. The environment changed, however, starting in May and June of 2013. First, then-U.S. Federal Reserve System (the Fed) Chair Ben Bernanke suggested that the Fed might begin tapering its quantitative easing (QE) bond-buying program, which had been a key part of the Fed's accommodative monetary policies that had helped to keep interest rates low and provided a measure of support to

overall economic growth. In response, the fixed-income market, including municipals, sold off in the second quarter of 2013 on fears of the potential negative effects of rising interest rates in the wake of any tapering of QE. The Fed ended up delaying its official announcement regarding the tapering of QE until December of 2013, and began reducing its monthly bond purchases in 2014, with the eventual goal being to fully draw down the QE program by the end of the current calendar year.

Later in the spring of 2013, the municipal market received another blow when the City of Detroit filed for bankruptcy protection. Then, before the effects of the Detroit announcement had subsided, new fears arose in the market about the ability of the Commonwealth of Puerto Rico to pay its debts. As the concerns grew widespread, the three major bond rating agencies all lowered the credit ratings of bonds issued by Puerto Rico. This had the effect of undermining the reputation of municipal bonds in general, but especially of lower-rated municipals that carried more credit risk than higher-quality municipals. In that environment, municipal bond prices continued to fall for most of the remainder of 2013, with higher-yielding municipals underperforming investment-grade municipal debt.

The sell-off in the municipal bond market continued into the first week of 2014, before market sentiment abruptly changed and municipal bond prices started snapping back, led by high-yield municipal debt. The primary factor in the market's turnaround was the growing recognition by investors that municipal bond prices had fallen to low levels, and offered relatively low prices combined with highly attractive yields, especially when compared with other types of fixed-income investments, including taxable bonds. Non-traditional investors, including property-and-casualty insurers and other financial institutions, began buying up municipal bonds. The increased buying activity came as financial institutions published their calendars of expected new-bond issuance, which indicated that the number of new municipal bonds issued in 2014 could be as much as 20% lower than the amount issued in 2013. The imbalance caused by increasing demand and decreasing supply led to a brisk rally in municipal bond prices during January, February and March of 2014, with the high-yield sector leading the

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 5

way. The rally was sustained by a supportive domestic economic backdrop featuring slow growth and relatively tame inflation. As investors moved back into the high-yield municipal market, even bonds issued by the Commonwealth of Puerto Rico saw new demand. In the first three months of 2014, the Barclays Municipal Bond Index returned 3.32%, while the Barclays High Yield Municipal Bond Index rose by 5.91%.

Q What factors had the most influence on the Trust's performance during the 12-month period ended March 31, 2014?

A During the 12-month period, the Trust's overall performance was hurt in large part by the municipal market sell-off starting in the spring of 2013 and lasting through the end of the 2013 calendar year. Performance bounced back significantly as the market environment improved in early 2014. The portfolio's high-yield investments fared particularly well, led by securities issued by hospital and health care institutions, and by tobacco lawsuit settlement bonds. The Trust also invested in derivative securities known as municipal residual interest rate bonds. The exposure to those securities had a positive impact on the Trust's performance during the period.

Two portfolio securities that detracted from the Trust's performance during the period were project revenue bonds backed by the Illinois State Housing

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

Finance Authority. Both bonds are backed by continuing care retirement communities, and each posted a modest negative return over the 12-month period.

The Trust's use of leverage held back total returns when the market declined early in the fiscal year, as leverage tends to amplify the effects of market trends. Conversely, the use of leverage helped boost the Trust's return during the market's comeback early in 2014.

Consistent with our longer-term investment themes, at the end of the Trust's fiscal year on March 31, 2014, the bulk of the Trust's portfolio securities were bonds from four sectors: hospital/health care; education; power and energy; and transportation. The Trust suffered no defaults during the 12-month period, had no exposure to City of Detroit bonds, and had only a small position in Commonwealth of Puerto Rico bonds during the early part of the period. This Commonwealth of Puerto Rico bond was an investment in highly-rated senior debt backed by sales tax revenues.

Virtually all of the investments in the Trust's portfolio were securities backed by the revenues of specific projects, as we believe such bonds have less risk than general obligation bonds, which are more vulnerable to changes in the general financial health of a state, municipality, or public agency. At the end of the period, only 3% of Trust total investment portfolio was invested in general obligation bonds.

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

Q How did the level of leverage employed by the Trust change over the 12-month period ended March 31, 2014?

A At the end of the 12-month period on March 31, 2014, 34.5% of the Trust's total managed assets were financed by leverage (or borrowed funds), compared with 32.1% of the Trust's total managed assets financed by leverage at the start of the period on April 1, 2013. The increase was due to an decrease in the values of securities in which the Trust had invested.

Q What is your investment outlook?

A We think the outlook is favorable for municipal bonds in general, and especially for high-yield municipal securities. The supply of new municipal securities has shrunk from the levels of the previous two years, while demand is rising. Traditional investors attracted by the tax advantages of municipal securities are being joined by non-traditional investors who see attractive values in the tax-exempt market, especially relative to the taxable bond market. Given the widespread expectation that the Fed will keep short-term interest rates at near-zero at least through the end of 2014 and into 2015, the yields offered by municipal bonds look even more compelling.

Going forward, we intend to continue to focus on individual security selection and to emphasize project revenue bonds in the Trust's portfolio. We believe project-specific bonds to be more reliable than general obligation bonds backed by municipal revenues. The segments of the project-revenue municipal market on which we are currently focused include bonds backed by charter school revenues, transportation projects, tobacco settlement lawsuits, and industrial development projects.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 7

Please refer to the Schedule of Investments on pages 13-23 for a full listing of

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

Trust securities.

Investments in high-yield or lower-rated securities are subject to greater-than-average risk.

The Trust may invest in securities of issuers that are in default or that are in bankruptcy.

A portion of income may be subject to state, federal, and/or alternative minimum tax. Capital gains, if any, are subject to a capital gains tax.

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

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

Investments in the Trust are subject to possible loss due to the financial failure of 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 incremental income or capital appreciation for investments purchased with the proceeds of leverage 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.

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

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.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 9

Portfolio Summary | 3/31/14

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

Portfolio Diversification

(As a percentage of total investment portfolio)

[THE FOLLOWING DATA WAS REPRESENTED AS A PIE CHART IN THE PRINTED MATERIAL]

Insured:

FSA	3.5%
FSA-CR	2.4%
AMBAC GO OF INSTN	2.2%
BHAC-CR MBIA	2.1%
PSF-GTD	1.8%
AMBAC	0.6%
GO OF INSTN	0.6%
ASSURED GTY	0.4%
GNMA COLL	0.4%
NATL-RE	0.2%

Revenue Bonds:

Health Revenue	20.6%
Development Revenue	15.9%
Facilities Revenue	10.3%
Tobacco Revenue	8.6%
Education Revenue	8.6%
Other Revenue	8.3%
Transportation Revenue	6.0%
Airport Revenue	3.4%
Pollution Control Revenue	2.1%
Water Revenue	2.0%

Portfolio Maturity

(As a percentage of long-term holdings)

[THE FOLLOWING DATA WAS REPRESENTED AS A PIE CHART IN THE PRINTED MATERIAL]

0-2 years	0.4%
2-5 years	0.1%
5-7 years	0.7%
7-10 years	2.4%
10-20 years	32.8%
20+ years	63.6%

Quality Distribution

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

[THE FOLLOWING DATA WAS REPRESENTED AS A PIE CHART IN THE PRINTED MATERIAL]

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

AAA	3.7%
AA	15.0%
A	10.4%
BBB	12.0%
BB	10.9%
B	7.0%
CCC	1.2%
Not Rated	39.8%

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.

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

Prices and Distributions | 3/31/14

Share Prices and Distributions

Market Value per Common Share

	3/31/14	3/31/13
Market Value	\$14.60	\$15.51
Premium	21.0%	14.6%

Net Asset Value per Common Share

	3/31/14	3/31/13
Net Asset Value	\$12.07	\$13.54

Distributions per Common Share*

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

	Net Investment Income	Short-Term Capital Gains	Long-Term Capital Gains
4/1/13 - 3/31/14	\$1.14	\$--	\$--

10 Largest Holdings

(As a percentage of long-term holdings)**

1.	Massachusetts Housing Finance Agency Revenue, 5.35%, 12/1/45	2.56%
2.	North Texas Tollway Authority Transportation Revenue, 5.75%, 1/1/33	2.51
3.	Philadelphia Authority for Industrial Development, 8.2%, 12/1/43	2.45
4.	Lehman Municipal Trust Receipts, General Obligation, 13.06%, 7/28/31	2.38
5.	Massachusetts Development Finance Agency Revenue, 5.75%, 1/1/42	2.22
6.	New Jersey Transportation Trust Fund Authority Revenue, 12/15/27	2.07
7.	Tobacco Settlement Financing Corp., Revenue, 6.25%, 6/1/42	1.93
8.	New Jersey Economic Development Authority Revenue, 5.75%, 9/15/27	1.82
9.	Jefferson Parish Hospital Service District No. 2, 6.375%, 7/1/41	1.78
10.	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	1.61

* The amount of distributions made to shareowners during the period was in excess of the net investment income earned by the Trust during the period. The Trust has accumulated undistributed net investment income which is part of the Trust's NAV. A portion of this accumulated net investment income was distributed to shareowners during the period.

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 11

Performance Update | 3/31/14

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 during the periods shown, compared to that of the Barclays Municipal Bond Index and the Barclays High Yield Municipal Bond Index.

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

Average Annual Total Returns
(As of March 31, 2014)

Period	Net Asset Value (NAV)	Market Price	Barclays Municipal Bond Index (NAV)	Barclays High Yield Municipal Bond Index (NAV)
10 Years	6.19%	7.83%	4.45%	5.44%
5 Years	14.98	19.94	5.71	11.41
1 Year	-2.78	2.59	0.39	-1.87

[THE FOLLOWING DATA WAS REPRESENTED AS A MOUNTAIN CHART IN THE PRINTED MATERIAL]

Value of \$10,000 Investment

	Pioneer Municipal High Income Advantage Trust	Barclays Municipal Bond Index	Barclays High Yield Municipal Bond Index
3/31/2004	\$ 10,000	\$ 10,000	\$ 10,000
3/31/2005	\$ 10,407	\$ 10,267	\$ 10,919
3/31/2006	\$ 11,609	\$ 10,657	\$ 11,915
3/31/2007	\$ 12,794	\$ 11,236	\$ 13,088
3/31/2008	\$ 11,961	\$ 11,450	\$ 12,238
3/31/2009	\$ 8,564	\$ 11,710	\$ 9,893
3/31/2010	\$ 13,510	\$ 12,845	\$ 12,694
3/31/2011	\$ 14,182	\$ 13,054	\$ 13,110
3/31/2012	\$ 18,259	\$ 14,629	\$ 15,141
3/31/2013	\$ 20,730	\$ 15,397	\$ 17,306
3/31/2014	\$ 21,266	\$ 15,457	\$ 16,982

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.

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 include preferred shares, divided by the number of common shares outstanding.

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

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.

The Barclays Municipal Bond Index is an unmanaged, broad measure of the municipal bond market. The Barclays High Yield Municipal Bond Index is unmanaged, 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.

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

Schedule of Investments | 3/31/14

Principal Amount USD (\$)	S&P/Moody's Ratings (unaudited)		Value
		TAX EXEMPT OBLIGATIONS -- 146.8% of Net Assets	
		Alabama -- 1.7%	
2,500,000	NR/B2	Alabama Industrial Development Authority Solid Waste Disposal Revenue, 6.45%, 12/1/23	\$ 2,506,7
2,500,000	NR/NR	Huntsville-Redstone Village Special Care Facilities Financing Authority Nursing Home Revenue, 5.5%, 1/1/43	2,196,7
			<hr/> \$ 4,703,5
		Arizona -- 3.1%	
5,000,000 (a)	NR/NR	Casa Grande Industrial Development Authority Hospital Revenue, 7.625%, 12/1/29	\$ 4,924,8
2,640,000	NR/NR	Pima County Industrial Development Authority, 7.0%, 1/1/38	2,984,9
32,000	NR/Baa3	Pima County Industrial Development Authority Education Revenue, 6.75%, 7/1/31	32,0
1,000,000	NR/NR	San Luis Facility Development Corp., 7.25%, 5/1/27	932,3
			<hr/> \$ 8,874,0
		California -- 15.9%	
6,990,000	CCC/NR	California County Tobacco Securitization Agency Revenue, 5.25%, 6/1/46	\$ 4,874,6
1,550,000	NR/NR	California Enterprise Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31	1,688,5
5,000,000	NR/Baa3	California Pollution Control Financing Authority, 5.0%, 7/1/37 (144A)	5,010,0

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

3,000,000	BB+/NR	California School Finance Authority, 7.375%, 10/1/43	3,152,9
2,425,000	A/A1	California State General Obligation Various Purpose, 5.75%, 4/1/31	2,803,1
1,875,000	NR/NR	California Statewide Communities Development Authority, 5.875%, 11/1/43	1,814,9
757,342 (a) (b)	NR/NR	California Statewide Communities Development Authority Environmental Facilities Revenue, 9.0%, 12/1/38	6,5
4,000,000	B+/NR	California Statewide Communities Development Authority Revenue Higher Education Revenue, 7.25%, 10/1/38 (144A)	2,366,0
20,000,000 (c)	NR/NR	Inland Empire Tobacco Securitization Authority Revenue, 0.0%, 6/1/36	3,525,2
3,140,000 (d)	AA/WR	Lehman Municipal Trust Receipts Revenue, RIB, 0.0%, 9/20/28 (144A)	3,933,0
8,575,000 (d)	AA/NR	Lehman Municipal Trust Receipts, General Obligation, 13.06%, 7/28/31	10,002,2
1,500,000	A-/NR	Madera Irrigation Financing Authority Water Revenue, 6.25%, 1/1/31	1,657,1

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 13

Schedule of Investments | 3/31/14 (continued)

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

		California -- (continued)	
1,500,000	A-/NR	Madera Irrigation Financing Authority Water Revenue, 6.5%, 1/1/40	\$ 1,668,0
2,500,000	A-/A2	San Jose California Airport Revenue, RIB, 5.0%, 3/1/37	2,538,5

			\$ 45,040,8

		Colorado -- 0.8%	
1,500,000	B+/NR	Colorado Educational & Cultural Facilities Authority, 8.0%, 9/1/43	\$ 1,503,7
1,000,000	NR/NR	Kremmling Memorial Hospital District Certificate of Participation, 7.125%, 12/1/45	856,3

			\$ 2,360,1

		Connecticut -- 0.4%	
1,000,000	NR/NR	Hamden Connecticut Facility Revenue, 7.75%, 1/1/43	\$ 1,028,6

		District of Columbia -- 3.4%	
2,700,000	BBB/Baa1	District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$ 2,844,2
6,825,000	BBB/Baa1	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40	6,767,1

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

Principal Amount	S&P/Moody's Ratings	Description	Value
			\$ 9,611,3
1,500,000	NR/NR	Florida -- 3.5% Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/41	\$ 1,699,4
1,500,000	NR/NR	Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/46	1,695,2
500,000	NR/B1	Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41	508,7
1,000,000 (e)	NR/WR	Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32	1,338,1
2,200,000	BB/NR	Lee County Industrial Development Authority, 5.375%, 6/15/37	2,147,1
2,500,000	A/A2	Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41	2,686,0
			\$ 10,074,7
5,210,000 (d)	AA/WR	Georgia -- 6.7% Atlanta Georgia Water and Wastewater Revenue, RIB, 12.827%, 11/1/43 (144A)	\$ 5,288,2
5,000,000	B+/NR	Clayton County Development Authority Revenue, 9.0%, 6/1/35	5,292,9
900,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.0%, 9/1/30	924,4
750,000	NR/NR	DeKalb County Georgia Hospital Authority Revenue, 6.125%, 9/1/40	763,1

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

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

Principal Amount	S&P/Moody's Ratings	Description	Value
3,360,000	NR/NR	Georgia -- (continued) Fulton County Residential Care Facilities for the Elderly Authority, 7.0%, 7/1/29	\$ 3,370,0
3,100,000	AA/Aa2	Private Colleges & Universities Authority Revenue, 5.0%, 10/1/43	3,373,6
			\$ 19,012,5
1,000,000	B+/NR	Guam -- 0.4% Guam Government of Department Education Certificates of Participation, 6.625%, 12/1/30	\$ 1,028,4
2,000,000	A-/Baa1	Idaho -- 1.2% Power County Industrial Development Corp., Revenue, 6.45%, 8/1/32	\$ 2,002,4
1,500,000	A-/Baa1	Power County Pollution Control Revenue, 5.625%, 10/1/14	1,500,6
			\$ 3,503,0

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

1,000,000	NR/Baa1	Illinois -- 6.4% City of Country Club Hills, General Obligation, 5.0%, 12/1/31	\$ 1,010,7
3,000,000	NR/NR	Illinois Finance Authority Revenue, 8.125%, 2/15/40	3,057,4
365,400 (c)	NR/NR	Illinois Finance Authority Revenue, 11/15/52	24,6
417,400 (d)	NR/NR	Illinois Finance Authority Revenue, 4.0%, 11/15/52	137,7
1,450,000	A+/A1	Illinois Finance Authority Revenue, 5.5%, 4/1/39	1,514,2
1,605,000	AA/A3	Illinois Finance Authority Revenue, 6.0%, 8/15/25	1,646,5
280,000	BBB+/NR	Illinois Finance Authority Revenue, 6.0%, 8/15/38	295,0
2,000,000	AA+/Aa2	Illinois Finance Authority Revenue, 6.0%, 8/15/39	2,287,2
45,000	NR/NR	Illinois Finance Authority Revenue, 7.0%, 11/15/17	43,2
160,000	NR/NR	Illinois Finance Authority Revenue, 7.0%, 11/15/27	145,0
6,000,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 5/15/45	3,967,5
2,500,000	NR/NR	Illinois Finance Authority Revenue, 8.25%, 2/15/46	2,554,5
1,985,000	NR/NR	Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,572,6
			\$ 18,256,8

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 15

Schedule of Investments | 3/31/14 (continued)

Principal Amount USD (\$)	S&P/Moody's Ratings (unaudited)		Value
250,000	NR/NR	Indiana -- 0.9% City of Carmel Indiana Nursing Home Revenue, 7.0%, 11/15/32	\$ 259,7
750,000	NR/NR	City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/42	775,8
500,000	NR/NR	City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/47	515,8
1,585,000	NR/NR	Vincennes Industrial Economic Development Revenue, 6.25%, 1/1/24	966,2
			\$ 2,517,6
1,000,000	NR/A2	Kansas -- 0.4% Kansas Development Finance Authority Revenue, 5.0%, 5/15/35	\$ 1,030,9

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

7,000,000	BB+/Ba1	Louisiana -- 6.0% Jefferson Parish Hospital Service District No. 2, 6.375%, 7/1/41	\$ 7,477,7
2,500,000	BBB/Baa3	Louisiana Local Government Environmental Facilities & Community Development Authority Revenue, 6.75%, 11/1/32	2,764,2
6,000,000	NR/Baa1	Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	6,089,9
750,000	BBB-/NR	Opelousas Louisiana General Hospital Authority Revenue, 5.75%, 10/1/23	755,1
			\$ 17,086,9
1,500,000	NR/Ba1	Maine -- 1.9% Maine Health & Higher Educational Facilities Authority Revenue, 7.5%, 7/1/32	\$ 1,701,1
3,500,000	AA-/Aa3	Maine Turnpike Authority Revenue, 5.0%, 7/1/42	3,753,8
			\$ 5,455,0
2,245,000	NR/NR	Maryland -- 3.6% Maryland Health & Higher Educational Facilities Authority Revenue, 6.75%, 7/1/44	\$ 2,293,4
4,500,000	A-/A2	Maryland Health & Higher Educational Facilities Authority Revenue, 5.0%, 7/1/43	4,600,3
1,250,000	NR/Baa3	Maryland Health & Higher Educational Facilities Authority Revenue, 5.75%, 7/1/38	1,232,1
2,000,000	NR/NR	Maryland Health & Higher Educational Facilities Authority Revenue, 6.25%, 1/1/45	2,153,4
			\$ 10,279,4
2,200,000	AA/Aa2	Massachusetts -- 9.4% Massachusetts Development Finance Agency Revenue, 5.0%, 7/1/39	\$ 2,370,3
8,000,000	A/WR	Massachusetts Development Finance Agency Revenue, 5.75%, 1/1/42	9,309,8

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

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

Principal Amount USD (\$)	S&P/Moody's Ratings (unaudited)		Value
1,800,000	NR/NR	Massachusetts -- (continued) Massachusetts Development Finance Agency Revenue, 7.1%, 7/1/32	\$ 1,800,0
2,000,000	AAA/Aaa	Massachusetts Health & Educational Facilities Authority Revenue, 5.5%, 7/1/32	2,586,6
3,420,000 (a) (b)	NR/NR	Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38	9,9

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

10,760,000	AA-/Aa3	Massachusetts Housing Finance Agency Revenue, 5.35%, 12/1/45	10,760,9
			\$ 26,837,8
<hr/>			
2,000,000	NR/Ba1	Michigan -- 3.7% Flint Michigan Hospital Building Authority Revenue, 7.375%, 7/1/35	\$ 2,123,1
2,235,000	BB+/NR	Kent Hospital Finance Authority Revenue, 6.25%, 7/1/40	2,331,4
675,000	NR/NR	Michigan Public Educational Facilities Authority Revenue, 7.0%, 10/1/36	651,3
5,000,000	AA/Aa1	Michigan State University Revenue, 5.0%, 8/15/41	5,411,7
			\$ 10,517,7
<hr/>			
3,500,000	NR/NR	Minnesota -- 1.4% Port Authority of the City of Bloomington, Minnesota Recovery Zone Facility Revenue, 9.0%, 12/1/35	\$ 3,855,7
<hr/>			
1,500,000 (a) (b)	NR/Ca	Missouri -- 0.9% St. Louis Industrial Development Authority Revenue, 7.2%, 12/15/28	\$ 462,3
6,640,000 (a) (b)	NR/Ca	St. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35	2,046,6
			\$ 2,508,9
<hr/>			
2,445,000 (c)	NR/NR	Montana -- 0.7% Hardin Increment Industrial Infrastructure Development Revenue, 9/1/31	\$ 1,927,4
1,000,000 (a) (b)	NR/NR	Two Rivers Authority Inc., Project Revenue, 7.375%, 11/1/27	79,7
			\$ 2,007,1
<hr/>			
2,000,000	A+/A1	Nevada -- 2.3% Nevada Highway Revenue, 5.0%, 2/1/43	\$ 2,071,5
4,500,000	A-/A3	Reno Nevada Hospital Revenue, 5.25%, 6/1/41	4,550,6
			\$ 6,622,1
<hr/>			
1,125,000 (e)	NR/NR	New Hampshire -- 0.4% New Hampshire Health & Education Facilities Authority Revenue, 5.875%, 7/1/34	\$ 1,203,6

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 17

Schedule of Investments | 3/31/14 (continued)

Principal Amount	S&P/Moody's Ratings
------------------	---------------------

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

USD (\$)	(unaudited)		Value
1,500,000	NR/NR	New Jersey -- 11.2% Burlington County New Jersey Bridge Commission Revenue, 5.625%, 1/1/38	\$ 1,377,6
5,500,000	NR/NR	New Jersey Economic Development Authority Revenue, 10.5%, 6/1/32 (144A)	5,276,1
7,500,000	B/B2	New Jersey Economic Development Authority Revenue, 5.75%, 9/15/27	7,625,1
3,500,000	NR/NR	New Jersey Health Care Facilities Financing Authority, 7.25%, 7/1/27	3,500,0
3,500,000 (d)	AA/WR	New Jersey State Turnpike Authority Transportation Revenue, RIB, 13.52%, 7/1/23 (144A)	5,319,7
15,375,000 (c)	AA+/Aa1	New Jersey Transportation Trust Fund Authority Revenue, 12/15/27	8,687,6
			\$ 31,786,4
1,630,000 (a)	NR/NR	New York -- 6.9% Dutchess County Industrial Development Agency, 7.5%, 3/1/29	\$ 1,483,3
7,000,000	BB/B2	New York City Industrial Development Agency Revenue, 5.25%, 12/1/32	6,733,6
3,950,000	BB/B2	New York City Industrial Development Agency Revenue, 7.625%, 12/1/32	3,969,7
5,000,000	AAA/Aaa	New York State Dormitory Authority Revenue, 5.0%, 10/1/41	5,429,7
2,000,000	NR/Ba1	New York State Dormitory Authority Revenue, 6.125%, 12/1/29	2,017,1
			\$ 19,633,6
5,010,000	NR/NR	North Carolina -- 2.7% Charlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28	\$ 5,015,5
2,575,000	NR/NR	Charlotte Special Facilities Revenue, 5.6%, 7/1/27	2,574,8
			\$ 7,590,4
5,000,000	B-/B3	Ohio -- 1.5% Buckeye Tobacco Settlement Financing Authority Revenue, 6.5%, 6/1/47	\$ 4,347,3
3,000,000 (d)	NR/WR	Oklahoma -- 1.9% Tulsa Airports Improvement Trust, 7.75%, 6/1/35	\$ 3,102,9
2,220,000	NR/WR	Tulsa Airports Improvement Trust Revenue, 6.25%, 6/1/20	2,227,3
			\$ 5,330,2
2,000,000	BBB+/NR	Oregon -- 0.7% Oregon State Facilities Authority Revenue, 5.25%, 10/1/40	\$ 2,033,0

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

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

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

Principal Amount USD (\$)	S&P/Moody's Ratings (unaudited)		Value
1,965,000	B-/NR	Pennsylvania -- 11.0% Pennsylvania Economic Development Financing Authority, 8.0%, 5/1/29	\$ 2,228,9
5,000,000	B-/Caa2	Pennsylvania Economic Development Financing Authority Solid Waste Disposal Revenue, 6.0%, 6/1/31	5,000,4
5,000,000	A-/A3	Pennsylvania Turnpike Commission, 5.3%, 12/1/41	5,263,9
10,000,000	NR/NR	Philadelphia Authority for Industrial Development Revenue, 8.2%, 12/1/43	10,293,0
1,000,000	BB-/NR	Philadelphia Authority for Industrial Development Revenue, 6.5%, 6/15/33 (144A)	1,005,4
3,000,000	BB-/NR	Philadelphia Authority for Industrial Development Revenue, 6.75%, 6/15/43 (144A)	3,017,6
5,000,000	BB+/Ba2	Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 5.0%, 7/1/34	4,318,0
			\$ 31,127,3
1,355,000 (a)	NR/NR	Rhode Island -- 3.8% Central Falls Rhode Island Detention Facility Corp., Revenue, 7.25%, 7/15/35	\$ 1,016,3
1,500,000	NR/NR	Rhode Island Health & Educational Building Corp., Revenue, 8.375%, 1/1/46	1,676,6
8,285,000	BB/Ba1	Tobacco Settlement Financing Corp. Revenue, 6.25%, 6/1/42	8,099,5
			\$ 10,792,5
4,400,000 (f)	BBB/WR	South Carolina -- 2.0% Tobacco Settlement Revenue Management Authority, 6.375%, 5/15/30	\$ 5,744,7
5,000,000	BBB+/Baa1	Tennessee -- 3.0% Johnson City Health & Educational Facilities Board Hospital Revenue, 6.5%, 7/1/38	\$ 5,599,7
3,000,000	BBB+/NR	Sullivan County Health, Educational & Housing Facilities Board Revenue, 5.25%, 9/1/36	3,021,4
			\$ 8,621,2
1,000,000	BB/NR	Texas -- 17.0% Arlington Higher Education Finance Corp. Revenue, 7.0%, 3/1/34	\$ 999,9
2,500,000	BB+/Baa3	Central Texas Regional Mobility Authority Revenue, 6.75%, 1/1/41	2,770,4
2,663,453 (a) (b)	NR/NR	Gulf Coast Industrial Development Authority Revenue, 7.0%, 12/1/36	23,9
3,000,000	NR/A3	Houston Higher Education Finance Corp. Revenue, 5.0%, 9/1/38	3,101,8
460,000	NR/NR	IAH Public Facility Corp., Facilities Revenue,	

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

Series 2006, 6.0%, 5/1/16

321,8

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 19

Schedule of Investments | 3/31/14 (continued)

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

		Texas -- (continued)	
1,000,000	NR/NR	IAH Public Facility Corp., Facilities Revenue, Series 2006, 6.0%, 5/1/21	\$ 649,7
1,350,000	NR/NR	IAH Public Facility Corp., Facilities Revenue, Series 2006, 6.125%, 5/1/26	809,6
3,000,000 (a) (g)	NR/NR	Jefferson County Industrial Development Corp., Revenue, 8.25%, 7/1/32	2,955,0
2,000,000	NR/NR	Lubbock Health Facilities Development Corp., Nursing Home Revenue, 6.625%, 7/1/36	2,042,0
9,750,000	BBB+/A3	North Texas Tollway Authority Transportation Revenue, 5.75%, 1/1/33	10,560,5
1,711,000	NR/Aa1	Panhandle Regional Housing Finance Corp., Multifamily Housing Revenue, 6.6%, 7/20/31	1,781,4
1,500,000	NR/NR	Red River Health Facilities Development Corp., Revenue, 8.0%, 11/15/41	1,713,7
2,000,000	AAA/Aaa	Richardson Independent School District Revenue, 5.0%, 2/15/38	2,193,4
4,000,000	NR/NR	Sanger Industrial Development Corp., Revenue, 8.0%, 7/1/38	4,135,5
1,000,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., Revenue, 8.125%, 11/15/39	941,2
1,500,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., Revenue, 8.25%, 11/15/44	1,420,2
1,000,000 (a) (b)	NR/NR	Texas Midwest Public Facility Corp., Revenue, 9.0%, 10/1/30	421,2
3,000,000	BBB-/Baa3	Texas Private Activity Bond Surface Transportation Corp., 7.0%, 12/31/38	3,414,6
2,500,000	NR/NR	Travis County Health Facilities Development Corp., Revenue, 7.125%, 1/1/46	2,592,5
5,000,000	AAA/NR	Tyler Independent School District, 5.0%, 2/15/38	5,483,6
			\$ 48,332,6

		Virginia -- 0.8%	
2,000,000	BBB+/Baa1	Washington County Industrial Development Authority Revenue, 7.75%, 7/1/38	\$ 2,298,9

		Washington -- 4.1%	
1,500,000	NR/Baa3	Washington State Health Care Facilities Authority Revenue, 5.5%, 12/1/39	\$ 1,548,8
2,000,000	BBB/Baa2	Washington State Health Care Facilities Authority Revenue, 6.125%, 8/15/37	2,080,2
2,000,000	BBB/Baa2	Washington State Health Care Facilities	

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

1,100,000	NR/NR	Authority Revenue, 6.25%, 8/15/42 Washington State Housing Finance	2,083,4
5,000,000	NR/NR	Commission Revenue, 6.75%, 10/1/47 Washington State Housing Finance Committee Nonprofit Revenue, 5.625%, 1/1/27	1,075,1 4,731,8
			\$ 11,519,4

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

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

Principal Amount USD (\$)	S&P/Moody's Ratings (unaudited)		Value
2,000,000 (a)	NR/NR	West Virginia -- 0.9%	
740,000	NR/NR	City of Philippi WV, 7.75%, 10/1/44	\$ 1,934,3
		West Virginia Hospital Finance Authority Hospital Revenue, 9.125%, 10/1/41	723,6
			\$ 2,658,0
5,000,000	NR/NR	Wisconsin -- 4.2%	
		Wisconsin Public Finance Authority Continuing Care Retirement Community Revenue, 8.25%, 6/1/46	\$ 5,615,4
1,000,000 (e)	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.125%, 4/1/24	1,000,0
1,000,000 (e)	NR/NR	Wisconsin State Health & Educational Facilities Authority Revenue, 6.25%, 4/1/34	1,000,0
1,500,000	A+/A1	Wisconsin State Health & Educational Facilities Authority Revenue, 6.625%, 2/15/39	1,649,6
920,000	NR/NR	Wisconsin State Public Finance Authority Revenue, 8.375%, 6/1/20	922,2
1,500,000	NR/NR	Wisconsin State Public Finance Authority Revenue, 8.625%, 6/1/47	1,743,7
			\$ 11,931,0
		TOTAL TAX EXEMPT OBLIGATIONS (Cost \$403,622,616)	\$ 417,164,5
		MUNICIPAL COLLATERALIZED DEBT OBLIGATION -- 1.0% of Net Assets	
13,000,000 (a) (d)	NR/NR	Non-Profit Preferred Funding Trust I, 0.0%, 9/15/37 (144A)	\$ 2,763,2
		TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$13,000,000)	\$ 2,763,2
		TOTAL INVESTMENTS IN SECURITIES -- 147.8% (Cost -- \$416,622,616) (h) (i)	\$ 419,927,8

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

OTHER ASSETS AND LIABILITIES -- 5.0%	\$ 14,280,5
PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE -- (52.8)%	\$ (150,000,2
NET ASSETS APPLICABLE TO COMMON SHAREOWNERS -- 100.0%	\$ 284,208,1

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

WR Rating withdrawn by either S&P or Moody's.

(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, 2014, the value of these securities amounted to \$33,979,500, or 12.0% of total net assets applicable to common shareowners.

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 21

Schedule of Investments | 3/31/14 (continued)

RIB Residual Interest Bond. The interest rate is subject to change periodically and inversely based upon prevailing market rates. The interest rate shown is the rate at March 31, 2014.

- (a) Indicates a security that has been deemed illiquid. As of March 31, 2014 the aggregate cost of illiquid securities in the Trust's portfolio was \$26,839,186. As of that date, the aggregate value of illiquid securities in the Trust's portfolio of \$18,127,555 represented 6.4% of total net assets applicable to common shareowners.
- (b) Security is in default and is non income producing.
- (c) Security issued with a zero coupon. Income is recognized through accretion of discount.
- (d) The interest rate is subject to change periodically. The interest rate shown is the rate at March 31, 2014.
- (e) 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.
- (f) Escrow to maturity.
- (g) Security is valued using fair value methods (other than prices supplied by independent pricing services). See Notes to Financial Statements -- Note 1A.
- (h) The concentration of investments by type of obligation/ market sector is as follows:

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

Insured	
FSA	3.5%
FSA-CR	2.4
AMBAC GO OF INSTN	2.2
BHAC-CR MBIA	2.1
PSF-GTD	1.8
AMBAC	0.6
GO OF INSTN	0.6
ASSURED GTY	0.4
GNMA COLL	0.4
NATL-RE	0.2
Revenue Bonds:	
Health Revenue	20.6
Development Revenue	15.9
Facilities Revenue	10.3
Tobacco Revenue	8.6
Education Revenue	8.6
Other Revenue	8.3
Transportation Revenue	6.0
Airport Revenue	3.4
Pollution Control Revenue	2.1
Water Revenue	2.0

	100.0%
	=====

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

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

- (i) At March 31, 2014, the net unrealized appreciation on investments based on cost for federal tax purposes of \$412,480,181 was as follows:

Aggregate gross unrealized appreciation for all investments in which there is an excess of value over tax cost	\$ 39,574,617
Aggregate gross unrealized depreciation for all investments in which there is an excess of tax cost over value	(32,126,975)
Net unrealized appreciation	\$ 7,447,642

For financial reporting purposes net unrealized appreciation on investments was \$3,305,207 and cost of investments aggregated \$416,622,616.

Purchases and sales of securities (excluding temporary cash investments) for the year ended March 31, 2014 aggregated \$103,372,839 and \$122,659,673, respectively.

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

Level 1 -- quoted prices in active markets for identical securities.

Level 2 -- other significant observable inputs (including quoted prices

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

for similar securities, interest rates, prepayment speeds credit risks, etc.). See Notes to Financial Statements -- Note 1A.

Level 3 -- significant unobservable inputs (including the Trust's own assumptions in determining fair value of investments. See Notes to Financial Statements -- Note 1A.

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) as Level 3. See Notes to Financial Statements -- Note 1A.

The following is a summary of the inputs used as of March 31, 2014, in valuing the Trust's investments.

	Level 1	Level 2	Level 3	Total
Tax Exempt Obligations	\$ --	\$414,209,543	\$2,955,000	\$417,164,543
Municipal Collateralized Debt Obligation	--	2,763,280	--	2,763,280
Total Investments in Securities	\$ --	\$416,972,823	\$2,955,000	\$419,927,823

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

	Balance as of 3/31/13	Realized gain (loss) (1)	Change in Unrealized appreciation (depreciation) (2)	Purchases	Sales	Accrued discounts/premiums	Tr in Le
Tax exempt obligations	\$ --**	\$12,900	\$ (105,870)	\$ --	\$ (12,900)	\$4,260	\$3
Total	\$ --	\$12,900	\$ (105,870)	\$ --	\$ (12,900)	\$4,260	\$3

* Transfers are calculated on the beginning of period values.

** Includes a security that is fair valued fair valued at \$0.

(1) Realized gain (loss) on these securities is included in the realized gain (loss) from investments in the Statement of Operations.

(2) Unrealized appreciation (depreciation) on these securities is included in the change in unrealized appreciation (depreciation) from investments in the Statement of Operations.

Net change in unrealized depreciation of Level 3 investments still held and considered Level 3 at 3/31/14: \$(105,870).

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

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 23

Statement of Assets and Liabilities | 3/31/14

ASSETS:

Investments in securities, at value (cost \$416,622,616)	\$419,927,823
Cash	5,373,295
Receivables --	
Investment securities sold	1,033,083
Interest receivable	8,096,203
Reinvestment of distributions	160,770
Prepaid expenses	2,508
<hr/>	
Total assets	\$434,593,682

LIABILITIES:

Payables --	
Due to affiliates	211,412
Administration fee payable	70,826
Accrued expenses	102,589
Other liabilities	514
<hr/>	
Total liabilities	\$ 385,341

PREFERRED SHARES AT REDEMPTION VALUE:

\$25,000 liquidation value per share applicable to 6,000 shares, including dividends payable of \$229	\$150,000,229
----------------------------------------------------------------------------------------------------------	---------------

NET ASSETS APPLICABLE TO COMMON SHAREOWNERS:

Paid-in capital	\$319,940,042
Undistributed net investment income	8,291,054
Accumulated net realized loss on investments	(47,328,191)
Net unrealized appreciation on investments	3,305,207
<hr/>	
Net assets applicable to common shareowners	\$284,208,112

NET ASSET VALUE PER COMMON SHARE:

No par value (unlimited number of shares authorized)	
Based on \$284,208,112/23,543,462 common shares	\$ 12.07

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

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

Statement of Operations

For the Year Ended 3/31/14

INVESTMENT INCOME:

Interest	\$ 28,720,626
----------	---------------

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

EXPENSES:		
Management fees	\$ 2,621,830	
Administrative reimbursements	213,913	
Transfer agent fees and expenses	19,818	
Shareholder communications expenses	12,866	
Auction agent fees	378,514	
Custodian fees	5,939	
Professional fees	64,642	
Printing expenses	4,233	
Trustees' fees	12,563	
Pricing fees	22,155	
Miscellaneous	69,905	
Total expenses		3,426,378
Net investment income		\$ 25,294,248
REALIZED AND UNREALIZED GAIN (LOSS) ON INVESTMENTS:		
Net realized gain on Investments	\$ 1,349,154	
Change in net unrealized depreciation on Investments	(34,120,415)	
Net loss on investments		\$ (32,771,261)
DISTRIBUTIONS TO PREFERRED SHAREOWNERS FROM NET INVESTMENT INCOME:		
		\$ (238,258)
Net decrease in net assets resulting from operations		\$ (7,715,271)

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 25

Statements of Changes in Net Assets

	Year Ended 3/31/14	Year Ended 3/31/13
FROM OPERATIONS:		
Net investment income	\$ 25,294,248	\$ 25,500,104
Net realized gain on investments	1,349,154	418,450
Change in unrealized appreciation (depreciation) on investments	(34,120,415)	16,515,110
Distributions to preferred shareowners from net investment income	(238,258)	(436,645)
Net increase (decrease) in net assets resulting from operations	\$ (7,715,271)	\$ 41,997,019
DISTRIBUTIONS TO COMMON SHAREOWNERS:		
Net investment income and previously undistributed net investment income (\$1.14 and \$1.14 per share, respectively)	\$ (26,754,525)	\$ (26,607,280)

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

Total distributions to common shareowners	\$ (26,754,525)	\$ (26,607,280)

FROM TRUST SHARE TRANSACTIONS:		
Reinvestment of distributions	\$ 1,804,149	\$ 1,846,794

Net increase in net assets applicable to common shareowners from Trust share transactions	\$ 1,804,149	\$ 1,846,794

Net increase (decrease) in net assets applicable to common shareowners	\$ (32,665,647)	\$ 17,236,533
NET ASSETS APPLICABLE TO COMMON SHAREOWNERS:		
Beginning of year	316,873,759	299,637,226

End of year	\$ 284,208,112	\$ 316,873,759

Undistributed net investment income	\$ 8,291,054	\$ 9,129,089
=====		

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

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

Financial Highlights

	Year Ended 3/31/14	Year Ended 3/31/13	Year Ended 3/31/12

Per Share Operating Performance			
Net asset value, beginning of period	\$ 13.54	\$ 12.87	\$ 11.54

Increase (decrease) from investment operations:(a)			
Net investment income	\$ 1.08	\$ 1.07	\$ 1.07
Net realized and unrealized gain (loss) on investments	(1.40)	0.76	1.07

Distributions to preferred shareowners from:			
Net investment income	(0.01)	(0.02)	(0.02)

Net increase (decrease) from investment operations	\$ (0.33)	\$ 1.81	\$ 2.12

Distributions to common shareowners from:			
Net investment income and previously undistributed net investment income	(1.14)*	(1.14)*	(1.14)

Net increase (decrease) in net asset value	\$ (1.47)	\$ 0.67	\$ 1.00

Net asset value, end of period(b)	\$ 12.07	\$ 13.54	\$ 12.54

Market value, end of period(b)	\$ 14.60	\$ 15.51	\$ 14.51
=====			
Total return at market value(c)	2.59%	13.53%	28.53%
Ratios to average net assets of common shareowners:			
Net expenses(d)	1.19%	1.23%	1.19%
Net investment income before preferred share distributions	8.81%	8.08%	8.34%
Preferred share distributions	0.08%	0.14%	0.08%
Net investment income available to common shareowners	8.73%	7.94%	8.26%

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

Portfolio turnover	24%	14%	
Net assets of common shareowners, end of period (in thousands)	\$284,208	\$316,874	\$299,6

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 27

Financial Highlights (continued)

	Year Ended 3/31/14	Year Ended 3/31/13
Preferred shares outstanding (in thousands)	\$150,000	\$150,000
Asset coverage per preferred share, end of period	\$ 72,367	\$ 77,813
Average market value per preferred share(e)	\$ 25,000	\$ 25,000
Liquidation value, including dividends payable, per preferred share	\$ 25,001	\$ 25,001

* The amount of distributions made to shareowners during the period were in excess of the net investment income earned by the Trust during the period. The Trust has accumulated undistributed net investment income which is part of the Trust's NAV. A portion of this accumulated net investment income was distributed to shareowners during the period.

- (a) The per common share data presented above is based upon the average common shares outstanding for the periods presented.
- (b) Net asset value and market value are published in Barron's on Saturday, The Wall Street Journal on Monday and The New York Times on Monday and Saturday.
- (c) Total investment return is calculated assuming a purchase of common shares at the current market value on the first day and a sale at the current market value on the last day of the periods reported. Dividends and distributions, if any, are assumed for purposes of this calculation to be reinvested at prices obtained under the Trust's dividend reinvestment plan. Total investment return does not reflect brokerage commissions. Past performance is not a guarantee of future results.
- (d) Expense ratios do not reflect the effect of 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 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.

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

Notes to Financial Statements | 3/31/14

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. Shares of money market mutual funds are valued at such funds' 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 by a fair valuation team comprised of

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 29

certain personnel of Pioneer Investment Management, Inc. (PIM), the Trust's investment adviser, pursuant to procedures adopted by the Trust's Board of Trustees. PIM's fair valuation team uses fair value methods approved by the Valuation Committee of the Board of Trustees. PIM's valuation team is responsible for monitoring developments that may impact fair valued securities and for discussing and assessing fair value on an ongoing basis, and at least quarterly, with the Valuation Committee of the Board of Trustees.

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

At March 31, 2014, one security was valued using fair value methods (in addition to securities valued using prices supplied by independent pricing services or broker-dealers) representing 1.0% of net assets applicable to common shareowners. The value of this fair valued security is \$2,955,000.

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. As of March 31, 2014, the Trust did not accrue any interest or penalties with respect to uncertain tax positions, which if applicable, would be recorded as an income tax expense in the Statement of Operations. Tax returns filed within the prior three years remain subject to examination by federal and state tax authorities.

The amount and character of income and capital gain distributions to shareowners are determined in accordance with federal income tax rules, which may differ from U.S. generally accepted accounting principles. Distributions in excess of net investment income or net realized gains are temporary overdistributions for financial statement purposes resulting from differences in the recognition or classification of income or distributions for financial statement and tax purposes. Capital accounts within the financial statements are adjusted for permanent book/tax differences to reflect tax character, but are not adjusted for temporary differences.

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

At March 31, 2014, the Trust reclassified \$860,500 to decrease undistributed net investment income, \$13,295,585 to increase net realized loss on investments and \$14,156,085 to decrease paid in-capital to reflect permanent book/tax differences. The reclassification has no impact on the net assets of the Trust and presents the Trust's capital accounts on a tax basis.

At March 31, 2014, the Trust was permitted to carry forward \$1,050,845 of short-term capital losses and \$8,295,018 of long term capital losses without limitation. Additionally, at March 31, 2014, the Trust had a net capital loss carryforward of \$39,026,949 of which the following amounts will expire between 2016 and 2019 if not utilized: \$311,368 in 2016, \$17,813,537 in 2017, \$18,242,633 in 2018 and \$2,659,411 in 2019. During the year ended March 31, 2014, the Trust had \$14,156,085 of capital loss carryforward that expired.

The Trust has elected to defer \$606,703 of short-term capital losses and \$2,044,170 of long-term capital gains recognized between November 1, 2013 and March 31, 2014 to its fiscal year ending March 31, 2015.

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

The tax character of distributions paid to shareowners during the years ended March 31, 2014 and March 31, 2013 was as follows:

	2014	2013
Distribution paid from:		
Tax exempt income	\$25,927,367	\$25,637,813
Ordinary income	1,065,416	1,406,112
Total	\$26,992,783	\$27,043,925

The following shows the components of distributable earnings (losses) on a federal income tax basis at March 31, 2014.

	2014
Distributable earnings:	
Undistributed tax-exempt income	\$ 7,163,321
Undistributed ordinary income	681,021
Capital loss carryforward	(48,372,812)
Post-October loss deferred	(2,650,873)
Dividends payable	(229)
Unrealized appreciation	7,447,642
Total	\$ (35,731,930)

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.

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

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

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

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.

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. Below investment grade securities involve greater risk of loss, are subject to greater price volatility, and are less liquid and more difficult to value especially during periods of economic uncertainty or change, than higher rated debt securities.

2. Management Agreement

PIM, the Trust's investment adviser, a wholly owned indirect subsidiary of UniCredit S.p.A. (UniCredit), manages the Trust's portfolio. Management fees

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

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 or 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, 2014, 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, 2014, \$289,704 was payable to PIM related to management costs, administrative costs and certain other services is included in "Due to affiliates" and "Administration fee payable" on the Statement of Assets and Liabilities.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 33

3. Transfer Agents

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

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 Agreement

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, 2014, the Trust expenses were not reduced under such arrangement.

5. Trust Shares

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

Transactions in common shares of beneficial interest for the year ended March 31, 2014 and March 31, 2013 were as follows:

	3/31/14	3/31/13
Shares outstanding at beginning of year	23,406,918	23,282,302
Reinvestment of distributions	136,544	124,616
Shares outstanding at end of year	23,543,462	23,406,918

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

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, 2014, 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 0.075% to 0.429% during the year ended March 31, 2014.

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

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

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

The holders of APS have voting rights equal to the holders of the Trust's common shares (one vote per share) and will vote together with holders of the common shares as a single class. Holders of APS are also entitled to elect two of the Trust's Trustees. In addition, the Investment Company Act of 1940, as amended, requires that along with approval by shareowners that might otherwise be required, the approval of the holders of a majority of any outstanding preferred shares, voting separately as a class, would be required to (a) adopt any plan of reorganization that would adversely affect the preferred shares and (b) take any action requiring a vote of security holders, including, among other things, changes in the Trust's subclassification as a closed-end management investment company or changes in its fundamental investment restrictions.

6. Subsequent Events

The Board of Trustees of the Trust declared on April 2, 2014 a dividend from undistributed and accumulated net investment income of \$0.095 per common share payable April 30, 2014, to common shareowners of record on April 16, 2014.

Subsequent to March 31, 2014, dividends declared and paid on preferred shares totaled \$2,503 in aggregate for the two outstanding preferred share series through April 30, 2014.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 35

Report of Independent Registered Public Accounting Firm

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

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

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, 2014, 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, 2014, 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, 2014, the results of its operations for the year then ended, the changes in its net assets for each of the two years in the period then ended, and the financial highlights for each of the five years in the period then ended, in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

Boston, Massachusetts
May 22, 2014

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

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)

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

The following summarizes the taxable per share distributions paid by Pioneer Municipal High Income Advantage Trust during the taxable year ended March 31, 2014.

	Payable Date	Ordinary Income
Common Shareowners	12/19/13	0.044827
Preferred Shareowners		
Series A	12/17/13	0.5400
	12/24/13	0.6400
	12/31/13	0.6400
	1/7/14	0.3500
Series B	12/16/13	0.5800
	12/23/13	0.6400
	12/30/13	0.6400
	1/6/14	0.3500

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 | 3/31/14 37

Approval of Investment Advisory Agreement

Pioneer Investment Management, Inc. (PIM) serves as the investment adviser to 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 2013 as the Trustees of the Trust agreed on, among other things, an overall approach and timeline for the process. In July 2013, 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 2013 and September 2013. 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, and November, 2013 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 regularly scheduled meetings.

At a meeting held on November 12, 2013, 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. 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 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 and its research process. The Trustees considered the resources of PIM and the personnel of PIM who provide investment management services to the Trust. They also reviewed the amount of non-Trust assets managed by the portfolio managers of the Trust. The Trustees

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

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 noted the substantial attention and high priority given by PIM's senior management to the Pioneer fund complex.

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 review the Trust's performance on a regular basis, based on analysis and data prepared by PIM for this purpose and discuss performance issues with PIM on an ongoing basis. For purposes of their contract renewal deliberations, 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 fourth quintile of its Morningstar category for the one year period ended June 30, 2013, in the second quintile of its Morningstar category for the three year period ended June 30, 2013, and in the first quintile of its Morningstar category for the five year period ended June 30, 2013. The Trustees also considered that the Trust's yield (for the twelve months ended June 30, 2013) lagged the yield of the Barclays High Yield Municipal Bond Index and exceeded the yield of the Barclays Municipal Bond Index for the same period. The Trustees also reviewed data provided by PIM showing how leverage had benefited the Trust's common shareholders. The Trustees noted the discussions held throughout the year regarding the Trust's performance and confirmed that those discussions were factored into the Trustees' deliberations concerning the renewal of the advisory agreement. The Trustees indicated that they were satisfied with the discussions with PIM with respect to the Trust's performance.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 39

Management Fee and Expenses

The Trustees considered information showing the fees and expenses of the Trust in comparison to the management fees 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 (based on managed assets) for the twelve months ended June 30, 2013 was in the fourth quintile relative to the management fees paid by other funds in its Strategic Insight peer group for the comparable period. The Trustees noted that the Trust's management fee was approximately seven basis points higher than the median management fee of its Strategic Insight peer group, and that there were only eight funds in the Strategic Insight peer group. The Trustees also considered that the Trust's expense ratio (based on managed assets) for the twelve months ended June 30, 2013 was in the third quintile relative to its Strategic Insight peer group for the comparable period.

The Trustees reviewed management fees charged by PIM and PIM's affiliate, Pioneer Institutional Asset Management, Inc. (together with PIM, "Pioneer") to institutional and other clients, including publicly offered European funds sponsored by affiliates of Pioneer, unaffiliated 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 Pioneer's costs in providing services to the other clients and considered the differences in management fees and profit margins for Trust and non-Trust services. In evaluating the fees associated with Pioneer'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 Pioneer's management of 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.

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

Profitability

The Trustees considered information provided by PIM regarding the profitability of PIM with respect to the advisory services provided by PIM to the Trust, including the methodology used by PIM in allocating certain of its costs to the management of the Trust. The Trustees also considered PIM's profit margin in connection with the overall operation of the Trust. They further reviewed the financial results realized by PIM and its affiliates from non-fund businesses. The Trustees considered PIM's profit margins with respect to the Trust in comparison to the limited industry data available and noted that the profitability of any adviser was affected by numerous factors, including its organizational structure and method for allocating expenses. The Trustees 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

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

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.

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 | 3/31/14 41

Trustees, Officers and Service Providers

Investment Adviser

Pioneer Investment Management, Inc.

Custodian and Sub-Administrator

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

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 below, together with their principal occupations during at least the past five years. Trustees who are

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

interested persons of the Trust within the meaning of the 1940 Act are referred to as Interested Trustees. Trustees who are not interested persons of the Trust are referred to as Independent Trustees. Each of the Trustees serves as a Trustee of each of the 55 U.S. registered investment portfolios for which Pioneer serves as investment adviser (the "Pioneer Funds"). The address for all Trustees and all officers of the Trust is 60 State Street, Boston, Massachusetts 02109.

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 | 3/31/14

Independent Trustees

Name, Age and Position Held with the Trust	Term of Office and Length of Service	Principal Occupation
Thomas J. Perna (63) Chairman of the Board and Trustee	Class III Trustee since 2006. Term expires in 2015.	Private investor (2004-2008 and 2013-present); Chairman (2008 - 2013) Chief Executive Officer (2008 - 2012), Quadriserv, Inc. (technology products securities lending industry); and Senior Executive Vice President, The Bank of New York (financial and securities services) (1986 - 2004)
David R. Bock (70) Trustee	Class I Trustee since 2005. Term expires in 2016. Elected by Preferred Shares only.	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 - present); 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)
Benjamin M. Friedman (69) Trustee	Class II Trustee since 2008. Term expires in 2014.	William Joseph Maier Professor of Political Economy, Harvard University (1972 - present)

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

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 43

Independent Trustees (continued)

Name, Age and Position Held with the Trust	Term of Office and Length of Service	Principal Occupation
Margaret B.W. Graham (66) Trustee	Class II Trustee since 2003. Term expires in 2014.	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)
Marc O. Mayer (56)+ Trustee	Class II Trustee since 2014. Term expires in 2014.	Founding Partner and Chief Executive Officer, Alignment Financial Services (investment management) (2013- present); Chief Executive Officer and Director, G LLC (investment management) (2009-2011); Executive Vice President, Alliance Bernstein LP (investment management) (2000-2009); and Executive Vice President and Director, Sanford C. Bernstein & Co., LLC (investment management) (1989-2000)
Marguerite A. Piret (65) Trustee	Class III Trustee since 2003. Term expires in 2015. Elected by Preferred Shares only.	President and Chief Executive Officer, Newbury, Piret & Company, Inc. (investment banking firm) (1981 - present)

+ Mr. Mayer resigned as a Trustee of the Trust effective May 6, 2014.

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

Interested Trustees

Name, Age and Position Held with the Trust	Term of Office and Length of Service	Principal Occupation
Daniel K. Kingsbury (55)* Trustee, President and Chief	Class I Trustee since 2013; Class II Trustee	Chairman (2013 - present), Director, CEO and President of PIM-USA (since February 2014)

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

Executive Officer of the Trust	from 2007-2013. Term expires in 2016.	2007); Chairman (2013 - present), Director and President of Pioneer and Pioneer Institutional Asset Management, Inc. (since February 2007); Executive Vice President of all of the Pioneer Funds (2007 - 2013); Director of PGAM (2007 - 2010); Head of New Europe Division, PGAM (2000 - 2005); and Head of New Markets Division, PGAM (2005 - 2007)
--------------------------------	---------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Kenneth J. Taubes (55)* Trustee	Class III Trustee since 2014. Term expires in 2014.	Director and Executive Vice President (since 2008) and Chief Investment Officer, U.S. (since 2010), of PIM-USA; Executive Vice President of Pioneer (since 2008); Executive Vice President of Pioneer Institutional Asset Management, Inc. (since 2009); Portfolio Manager of Pioneer (since 1999)
------------------------------------	-----------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

* Mr. Kingsbury and Mr. Taubes 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 | 3/31/14 45

Trust Officers

Name, Age and Position Held with the Trust	Term of Office and Length of Service	Principal Occupation
Mark D. Goodwin (49) Executive Vice President	Since 2014. Serves at the discretion of the Board.	Executive Vice President and Chief Operating Officer of Pioneer since 2005 and Executive Vice President of all the Pioneer funds since 2014
Christopher J. Kelley (49) Secretary and Chief Legal Officer	Since 2003. Serves at the discretion of the Board.	Vice President and Associate General Counsel of Pioneer since January 2008; Secretary and Chief Legal Officer 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 (53) Assistant Secretary	Since 2010. Serves at the discretion of the Board.	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 (51)	Since 2010. Serves	Senior Counsel of Pioneer since May 2010

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

Assistant Secretary	at the discretion of the Board.	and Assistant Secretary of all the Pioneer Funds since June 2010; Counsel of Pioneer from June 2007 to May 2013
Mark E. Bradley (54) Treasurer and Chief Financial and Accounting Officer of the Fund	Since 2008. Serves at the discretion of the Board.	Vice President - Fund Treasury 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

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

Name, Age and Position Held with the Trust	Term of Office and Length of Service	Principal Occupation
Luis I. Presutti (48) Assistant Treasurer	Since 2002. Serves at the discretion of the Board.	Director - Fund Treasury of Pioneer; and Assistant Treasurer of all of the Pioneer Funds
Gary Sullivan (55) Assistant Treasurer	Since 2002. Serves at the discretion of the Board.	Fund Accounting Manager - Fund Treasury of Pioneer; and Assistant Treasurer of all of the Pioneer Funds
David F. Johnson (34) Assistant Treasurer	Since 2009. Serves at the discretion of the Board.	Fund Administration Manager - Fund Treasury of Pioneer 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 (61) Chief Compliance Officer	Since 2010. Serves at the discretion of the Board.	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
Kelly O'Donnell (43) Anti-Money Laundering Officer	Since 2006. Serves at the discretion of the Board.	Director - Transfer Agency Compliance of Pioneer and Anti-Money Laundering Officer of all the Pioneer funds since 2006

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 47

This page for your notes.

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

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

This page for your notes.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 49

This page for your notes.

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

This page for your notes.

Pioneer Municipal High Income Advantage Trust | Annual Report | 3/31/14 51

This page for your notes.

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

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

1-800-225-6292

Or write to AST:

For

Write to

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

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

Dividend reinvestment plan (DRIP)

American Stock
Transfer & Trust
Wall Street Station
P.O. Box 922
New York, NY 10269-0560

Website

www.amstock.com

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

[LOGO] PIONEER
Investments (R)

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

Pioneer Investment Management, Inc.
60 State Street
Boston, MA 02109
us.pioneerinvestments.com

Securities offered through Pioneer Funds Distributor, Inc.
60 State Street, Boston, MA 02109
Underwriter of Pioneer Mutual Funds, Member SIPC
(C) 2014 Pioneer Investments 19205-08-0514

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 covered by this report.

(d) If the registrant has, during the period covered by the report, granted a

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

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 12(a)(1), 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 committee, the board of trustees, or any other board committee:

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

- (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.

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 \$38,581 in 2014 and \$42,076 in 2013.

(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 for the Trust's audit related services totaled approximately \$9,650 and \$9,652 in 2014 and 2013, 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.

PFees for tax compliance services, primarily for tax returns, totaled approximately \$8,131 and \$8,290 for 2014 and 2013, 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 for the Trust's audit related services totaled approximately \$9,650 and \$9,652 in 2014 and 2013, respectively.

(e) (1) Disclose the audit committee's pre-approval policies and procedures

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

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 assistance o SEC consultation, registration statements, and reporting o Tax accrual related matters o Implementation of new accounting standards o Compliance letters (e.g. rating agency letters) o Regulatory reviews and assistance regarding financial matters o Semi-annual reviews (if requested) o Comfort letters for closed end offerings
II. AUDIT-RELATED	Services which are not prohibited under Rule	<ul style="list-style-type: none"> o AICPA attest and agreed-upon procedures o Technology control assessments

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

SERVICES	210.2-01(C)(4) (the "Rule") and are related extensions of the audit services support the audit, or use the knowledge/expertise gained from the audit procedures as a foundation to complete the project. In most cases, if the Audit-Related Services are not performed by the Audit firm, the scope of the Audit Services would likely increase. The Services are typically well-defined and governed by accounting professional standards (AICPA, SEC, etc.)	<ul style="list-style-type: none">o Financial reporting control assessmentso 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

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

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 o Specific approval is needed to exceed the pre-approved dollar limits for these services (see general Audit Committee approval policy below for details on obtaining specific approvals) o Specific approval is needed to use the Fund's auditors for tax services not denoted as pre-approved, or to add a specific service subcategory as "pre-approved" 	<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 PRE-APPROVED SERVICE SUBCATEGORIES
IV. OTHER SERVICES A. SYNERGISTIC, UNIQUE QUALIFICATIONS	Services which are not prohibited by the Rule, if an officer of the Fund determines that using the	<ul style="list-style-type: none"> o Business Risk Management support o Other control and regulatory compliance projects

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.

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 in the auditors losing independence status under the Rule.	<ol style="list-style-type: none"> 1. Bookkeeping or other services related to the accounting records or financial statements of the audit client* 2. Financial information systems design and implementation*

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

AUDIT COMMITTEE APPROVAL POLICY

- 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.

AUDIT COMMITTEE REPORTING POLICY

- 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.

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

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

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, 2014 and 2013, 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 accountants 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 registrants accountant for services rendered to the registrant, and rendered to the registrants 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 \$17,781 in 2014 and \$17,942 in 2013.

(h) Disclose whether the registrants audit committee of the board of trustees has considered whether the provision of non-audit services that were rendered to the registrants 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 registrant's audit committee as specified in Section 3(a)(58)(B) of the Exchange Act (15 U.S.C. 78c(a)(58)(B)), so state.

N/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

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

from the listing standards for audit committees.

N/A

ITEM 6. SCHEDULE OF INVESTMENTS.

File Schedule of Investments in securities of unaffiliated issuers as of the close of the reporting period as set forth in 210.1212 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 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

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

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

Proxy Voting Policies

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

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

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 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.

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

Auditors

We normally vote for proposals to:

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

We will normally oppose proposals that require companies to:

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

Board of Directors

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

7

General Board Issues

Pioneer will vote for:

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

We will vote against:

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

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

- 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.

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

- 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;
 - 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

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

- 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%.

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.

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.

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

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

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 registrant's portfolio ("Portfolio Manager"). Also state each Portfolio Manager's business experience during the past 5 years.

ADDITIONAL INFORMATION ABOUT THE PORTFOLIO MANAGER

OTHER ACCOUNTS MANAGED BY THE PORTFOLIO MANAGER

The table below indicates, for the portfolio manager of the fund, information about the accounts other than the fund over which the portfolio manager has day-to-day investment responsibility. All information on the number of accounts and total assets in the table is as of March 31, 2014. 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 (000'S)	PERFORMANCE
David Eurkus	Other Registered Investment Companies	3	\$1,654,573	
	Other Pooled Investment Vehicles	0	\$ 0	
	Other Accounts	0	\$ 0	

Jonathan Chirunga	Other Registered		
	Investment Companies	3	\$1,654,573
	Other Pooled Investment Vehicles	0	\$ 0
	Other Accounts	0	\$ 0

POTENTIAL CONFLICTS OF INTEREST

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

- o A portfolio manager could favor one account over another in allocating new investment opportunities that have limited supply, such as initial public offerings and private placements. If, for example, an initial public offering that was expected to appreciate in value significantly shortly after the offering was allocated to a single account, that account may be expected to have better investment performance than other accounts that did not receive an allocation of the initial public offering. Generally, investments for which there is limited availability are allocated based upon a range of factors including available cash and

0

consistency with the accounts' investment objectives and policies. This allocation methodology necessarily involves some subjective elements but is intended over time to treat each client in an equitable and fair manner. Generally, the investment opportunity is allocated among participating accounts on a pro rata basis. Although Pioneer believes that its practices are reasonably designed to treat each client in an equitable and fair manner, there may be instances where a fund may not participate, or may participate to a lesser degree than other clients, in the allocation of an investment opportunity.

- o A portfolio manager could favor one account over another in the order in which trades for the accounts are placed. If a portfolio manager determines to purchase a security for more than one account in an aggregate amount that may influence the market price of the security, accounts that purchased or sold the security first may receive a more favorable price than accounts that made subsequent transactions. The less liquid the market for the security or the greater the percentage that the proposed aggregate purchases or sales represent of average daily trading volume, the greater the potential for accounts that make subsequent purchases or sales to receive a less favorable price. When a portfolio manager intends to trade the same security on the same day for more than one account, the trades typically are "bunched," which means that the trades for the individual accounts are

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

aggregated and each account receives the same price. There are some types of accounts as to which bunching may not be possible for contractual reasons (such as directed brokerage arrangements). Circumstances may also arise where the trader believes that bunching the orders may not result in the best possible price. Where those accounts or circumstances are involved, Pioneer will place the order in a manner intended to result in as favorable a price as possible for such client.

- o A portfolio manager could favor an account if the portfolio manager's compensation is tied to the performance of that account to a greater degree than other accounts managed by the portfolio manager. If, for example, the portfolio manager receives a bonus based upon the performance of certain accounts relative to a benchmark while other accounts are disregarded for this purpose, the portfolio manager will have a financial incentive to seek to have the accounts that determine the portfolio manager's bonus achieve the best possible performance to the possible detriment of other accounts. Similarly, if Pioneer receives a performance-based advisory fee, the portfolio manager may favor that account, whether or not the performance of that account directly determines the portfolio manager's compensation.
- o A portfolio manager could favor an account if the portfolio manager has a beneficial interest in the account, in order to benefit a large client or to compensate a client that had poor returns. For example, if the portfolio manager held an interest in an investment partnership that was one of the accounts managed by the portfolio manager, the portfolio manager would have an economic incentive to favor the account in which the portfolio manager held an interest.
- o If the different accounts have materially and potentially conflicting investment objectives or strategies, a conflict of interest could arise. For example, if a portfolio manager purchases a security for one account and sells the same security for another account, such trading pattern may disadvantage either the account that is long or short. In making portfolio manager assignments, Pioneer seeks to avoid such potentially conflicting situations. However, where a portfolio manager is responsible for accounts with differing investment objectives and policies, it is possible that the portfolio manager will conclude that it is in the best interest of one account to sell a portfolio security while another account continues to hold or increase the holding in such security.

COMPENSATION OF PORTFOLIO MANAGER

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

1

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

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

discretionary, with a maximum annual bonus that may be in excess of base salary. The annual bonus is based upon a combination of the following factors:

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

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

Certain portfolio managers participate in other programs designed to reward and retain key contributors. Senior executives or other key employees are 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 MANAGERS

The following table indicates as of March 31, 2014 the value, within the indicated range, of shares beneficially owned by the portfolio managers of the fund.

NAME OF PORTFOLIO MANAGER	BENEFICIAL OWNERSHIP OF THE FUND*
David Eurkus	A
Jonathan Chirunga	A

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

* 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

2

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 registrant's equity securities that is registered by the registrant pursuant to Section 12 of the Exchange Act (15 U.S.C. 781).

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 registrant's board of directors, where those changes were implemented after the registrant last provided disclosure in response to the requirements of Item 407(c)(2)(iv) of Regulation S-R(17 CFR 229.407) (as required by Item 22(b)(15)) of Schedule 14A (17 CFR 240.14a-101), or this Item.

There have been no material changes to the procedures by which the shareholders may recommend nominees to the registrant's board of directors since the registrant last provided disclosure in response to the requirements of Item 407(c)(2)(iv) of Regulation S-R 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 and principal financial officers, or persons performing similar functions, regarding the effectiveness of the registrant's disclosure controls and procedures (as defined in Rule 30a-3(c) under the Act (17 CFR 270.30a-3(c))) as of a date within 90 days of the filing date of the report that includes the disclosure required by this paragraph,

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

based on the evaluation of these controls and procedures required by Rule 30a-3(b) under the Act (17 CFR 270.30(a)-3(b) and Rules 13a-15(b) or 15d-15(b) under the Exchange Act (17 CFR 240.13a-15(b) or 240.15d-15(b)).

The registrant's principal executive officer and principal financial officer have concluded that the registrant's disclosure controls and procedures are effective based on the evaluation of these controls and procedures as of a date within 90 days of the filing date of this report.

(b) Disclose any change in the registrant's internal control over financial reporting (as defined in Rule 30a-3(d) under the Act (17CFR 270.30a-3(d)) that occurred during the second fiscal quarter of the period covered by this report that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

There were no significant changes in the registrant's internal control over financial reporting that occurred during the second fiscal quarter of the period covered by this report that have materially affected, or are reasonably likely to materially affect, the registrant's internal control over financial reporting.

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.

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

(1) 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.

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

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/ Daniel K. Kingsbury
Daniel K. Kingsbury, President

Date May 29, 2014

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

By (Signature and Title)* /s/ Daniel K. Kingsbury
Daniel K. Kingsbury, President

Date May 29, 2014

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

Date May 29, 2014

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