

Pioneer Municipal High Income Opportunities Fund, Inc.

Schedule of Investments | July 31, 2023

Ticker Symbol: MIO

Schedule of Investments | 7/31/23

(unaudited)

Principal Amount USD (\$)		Value
UNAFFILIATED ISSUERS — 110.9%		
MUNICIPAL BONDS — 110.9% of Net Assets(a)		
Arizona — 3.0%		
1,675,000	Arizona Industrial Development Authority, Doral Academy Nevada Fire Mesa, Series A, 5.00%, 7/15/49	\$ 1,520,766
1,000,000	Arizona Industrial Development Authority, Doral Academy Of Northern Nevada Project, Series A, 4.00%, 7/15/51 (144A)	746,640
950,000	Arizona Industrial Development Authority, Doral Academy Of Northern Nevada Project, Series A, 4.00%, 7/15/56 (144A)	685,102
4,000,000	Maricopa County Industrial Development Authority, Commercial Metals Company, 4.00%, 10/15/47 (144A)	3,462,360
Total Arizona		\$ 6,414,868
Arkansas — 4.9%		
9,500,000	Arkansas Development Finance Authority, Big River Steel Project, 4.50%, 9/1/49 (144A)	\$ 8,708,175
1,750,000	Arkansas Development Finance Authority, Green Bond, 5.45%, 9/1/52	1,729,298
Total Arkansas		\$ 10,437,473
California — 8.2%		
1,000,000	California County Tobacco Securitization Agency, Golden Gate Tobacco Settlement, Series A, 5.00%, 6/1/47	\$ 927,100
1,000,000	California Statewide Communities Development Authority, Baptist University, Series A, 5.00%, 11/1/41 (144A)	994,070
1,500,000	California Statewide Communities Development Authority, Loma Linda University Medical Center, Series A, 5.00%, 12/1/46 (144A)	1,470,000
3,315,000	California Statewide Communities Development Authority, Loma Linda University Medical Center, Series A, 5.25%, 12/1/56 (144A)	3,319,973
750,000	City of Oroville, Oroville Hospital, 5.25%, 4/1/39	664,875
3,865,000	City of Oroville, Oroville Hospital, 5.25%, 4/1/49	3,197,630
8,550,000	City of Oroville, Oroville Hospital, 5.25%, 4/1/54	6,806,056
Total California		\$ 17,379,704
Colorado — 8.9%		
5,180,000	Aerotropolis Regional Transportation Authority, 4.25%, 12/1/41	\$ 4,382,850
2,660,000	Aerotropolis Regional Transportation Authority, 5.00%, 12/1/51	2,344,923

Principal Amount USD (\$)		Value
Colorado — (continued)		
1,900,000(b)	Cottonwood Highlands Metropolitan District No. 1, Series A, 5.00%, 12/1/49	\$ 1,773,422
7,000,000	Dominion Water & Sanitation District, 5.875%, 12/1/52	6,952,820
3,475,000	Prairie Center Metropolitan District No 3, Series A, 5.00%, 12/15/41 (144A)	3,417,801
	Total Colorado	\$ 18,871,816
Delaware — 0.3%		
1,015,000	Delaware State Economic Development Authority, Aspira of Delaware Charter, 4.00%, 6/1/57	\$ 748,228
	Total Delaware	\$ 748,228
Florida — 0.9%		
2,425,000	Florida Development Finance Corp., Glenridge On Palmer Ranch Project, 5.00%, 6/1/51 (144A)	\$ 1,931,319
	Total Florida	\$ 1,931,319
Georgia — 2.5%		
8,440,000(c)	Tender Option Bond Trust Receipts/Certificates, Series 2021, 7/15/50 (ST GTD) (144A)	\$ 5,355,537
	Total Georgia	\$ 5,355,537
Illinois — 10.5%		
4,260,000(b)	Chicago Board of Education, Series A, 5.00%, 12/1/42	\$ 4,173,948
2,000,000(b)	Chicago Board of Education, Series D, 5.00%, 12/1/46	1,971,620
5,000,000(b)	Chicago Board of Education, Series D, 5.00%, 12/1/46	4,929,050
2,255,000(b)	City of Chicago, Series A, 5.50%, 1/1/33	2,294,327
9,500,000	Metropolitan Pier & Exposition Authority, McCormick Place Expansion, 4.00%, 6/15/50	8,847,350
	Total Illinois	\$ 22,216,295
Iowa — 3.9%		
8,600,000	Iowa Finance Authority, Alcoa Inc. Projects, 4.75%, 8/1/42	\$ 8,394,460
	Total Iowa	\$ 8,394,460
Kentucky — 0.5%		
1,010,000	City of Henderson, 4.70%, 1/1/52 (144A)	\$ 963,227
	Total Kentucky	\$ 963,227

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(unaudited) (continued)

Principal Amount USD (\$)		Value
	Massachusetts — 0.9%	
2,000,000	Massachusetts Development Finance Agency, Lowell General Hospital, Series G, 5.00%, 7/1/44	\$ 1,936,800
	Total Massachusetts	\$ 1,936,800
	Minnesota — 0.6%	
1,430,000	City of Rochester, Rochester Math & Science Academy, Series A, 5.125%, 9/1/38	\$ 1,371,341
	Total Minnesota	\$ 1,371,341
	New Jersey — 0.9%	
1,865,000	Tobacco Settlement Financing Corp., Series B, 5.00%, 6/1/46	\$ 1,859,405
	Total New Jersey	\$ 1,859,405
	New York — 24.1%	
5,300,000	Chautauqua Tobacco Asset Securitization Corp., 5.00%, 6/1/48	\$ 4,964,033
1,000,000	Dutchess County Local Development Corp., Health Quest Systems Inc., Series B, 5.00%, 7/1/46	1,001,990
8,885,000	Erie Tobacco Asset Securitization Corp., Asset-Backed, Series A, 5.00%, 6/1/45	8,397,213
3,505,000	Nassau County Tobacco Settlement Corp., Asset-Backed, Series A-3, 5.00%, 6/1/35	3,252,430
2,895,000	Nassau County Tobacco Settlement Corp., Asset-Backed, Series A-3, 5.125%, 6/1/46	2,669,393
1,730,000	New York Counties Tobacco Trust IV, Series A, 5.00%, 6/1/42	1,636,182
7,915,000	New York Counties Tobacco Trust IV, Settlement pass through, Series A, 5.00%, 6/1/45	7,403,533
12,325,000	TSASC, Inc., Series B, 5.00%, 6/1/48	11,558,631
8,000,000	Westchester County Local Development Corp., Purchase Senior Learning Community, 4.50%, 7/1/56 (144A)	5,681,040
5,775,000	Westchester County Local Development Corp., Purchase Senior Learning Community, 5.00%, 7/1/56 (144A)	4,562,250
	Total New York	\$ 51,126,695
	Ohio — 5.1%	
11,600,000	Buckeye Tobacco Settlement Financing Authority, Senior Class 2, Series B2, 5.00%, 6/1/55	\$ 10,814,216
	Total Ohio	\$ 10,814,216

Principal Amount USD (\$)		Value
5,900,000	Oklahoma — 2.8% Tulsa Airports Improvement Trust, Series C, 5.50%, 12/1/35	\$ 5,903,658
	Total Oklahoma	\$ 5,903,658
750,000	Pennsylvania — 0.3% Philadelphia Authority for Industrial Development, 4.00%, 6/1/41	\$ 619,980
	Total Pennsylvania	\$ 619,980
7,673,960(b)	Puerto Rico — 19.9% Commonwealth of Puerto Rico, Restructured Series A1, 4.00%, 7/1/37	\$ 6,956,368
1,796,000(b)	Commonwealth of Puerto Rico, Restructured Series A1, 4.00%, 7/1/41	1,544,560
3,624,000(b)	Commonwealth of Puerto Rico, Restructured Series A1, 4.00%, 7/1/46	3,072,971
3,220,000	Puerto Rico Commonwealth Aqueduct & Sewer Authority, Series A, 5.00%, 7/1/37 (144A)	3,238,193
8,500,000	Puerto Rico Commonwealth Aqueduct & Sewer Authority, Series A, 5.00%, 7/1/47 (144A)	8,382,870
9,000,000	Puerto Rico Highway & Transportation Authority, Restructured Series A, 5.00%, 7/1/62	8,842,500
10,844,000	Puerto Rico Sales Tax Financing Corp. Sales Tax Revenue, Restructured Series A-1, 4.75%, 7/1/53	10,317,415
	Total Puerto Rico	\$ 42,354,877
3,000,000	Texas — 1.3% City of Houston Airport System Revenue, 4.00%, 7/15/41	\$ 2,685,330
	Total Texas	\$ 2,685,330
7,315,000	Virginia — 3.1% Tobacco Settlement Financing Corp., Series A-1, 6.706%, 6/1/46	\$ 6,536,026
	Total Virginia	\$ 6,536,026
15,000,000	West Virginia — 5.5% Tobacco Settlement Finance Authority, Series A, 4.306%, 6/1/49	\$ 11,670,600
	Total West Virginia	\$ 11,670,600

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(unaudited) (continued)

Principal Amount USD (\$)		Value
8,000,000	Wisconsin — 2.8% Public Finance Authority, Searstone CCRC Project, 4.00%, 6/1/41 (144A)	\$ 6,043,440
	Total Wisconsin	\$ 6,043,440
	TOTAL MUNICIPAL BONDS (Cost \$237,500,350)	\$235,635,295
	TOTAL INVESTMENTS IN UNAFFILIATED ISSUERS — 110.9% (Cost \$237,500,350)	\$235,635,295
	OTHER ASSETS AND LIABILITIES — (10.9)%	\$(23,173,496)
	NET ASSETS — 100.0%	\$212,461,799

ST GTD State Guaranteed.

(144A) The resale of such security is exempt from registration under Rule 144A of the Securities Act of 1933. Such securities may be resold normally to qualified institutional buyers. At July 31, 2023, the value of these securities amounted to \$58,961,997, or 27.8% of net assets.

- (a) Consists of Revenue Bonds unless otherwise indicated.
- (b) Represents a General Obligation Bond.
- (c) The interest rate is subject to change periodically. The interest rate and/or reference index and spread shown at July 31, 2023.

FUTURES CONTRACTS

FIXED INCOME INDEX FUTURES CONTRACTS

Number of Contracts Long	Description	Expiration Date	Notional Amount	Market Value	Unrealized (Depreciation)
38	U.S. Ultra Bond (CBT)	9/20/23	\$5,138,416	\$5,024,313	\$(114,103)
	TOTAL FUTURES CONTRACTS		\$5,138,416	\$5,024,313	\$(114,103)

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

Level 1 – unadjusted quoted prices in active markets for identical securities.

Level 2 – other significant observable inputs (including quoted prices for similar securities, interest rates, prepayment speeds, credit risks, etc.).

Level 3 – significant unobservable inputs (including the Adviser's own assumptions in determining fair value of investments).

The following is a summary of the inputs used as of July 31, 2023, in valuing the Fund's investments:

	Level 1	Level 2	Level 3	Total
Municipal Bonds	\$ –	\$235,635,295	\$–	\$235,635,295
Total Investments in Securities	\$ –	\$235,635,295	\$–	\$235,635,295
Other Financial Instruments				
Net unrealized depreciation on futures contracts	\$(114,103)	\$ –	\$–	\$ (114,103)
Total Other Financial Instruments	\$(114,103)	\$ –	\$–	\$ (114,103)

During the period ended July 31, 2023, there were no transfers in or out of Level 3.