

Pioneer Municipal High Income Opportunities Fund, Inc.

Schedule of Investments | July 31, 2024

Ticker Symbol: MIO

Schedule of Investments | 7/31/24

(unaudited)

Principal Amount USD (\$)		Value
	UNAFFILIATED ISSUERS — 110.7%	
	MUNICIPAL BONDS — 110.7% of Net Assets(a)	
	Alabama — 0.5%	
1,100,000	Mobile County Industrial Development Authority, Calvert LLC Project, Series A, 5.00%, 6/1/54	\$ 1,131,108
	Total Alabama	\$ 1,131,108
	Arizona — 3.2%	
1,675,000	Arizona Industrial Development Authority, Doral Academy Nevada Fire Mesa, Series A, 5.00%, 7/15/49	\$ 1,677,278
1,000,000	Arizona Industrial Development Authority, Doral Academy Of Northern Nevada Project, Series A, 4.00%, 7/15/51 (144A)	832,930
950,000	Arizona Industrial Development Authority, Doral Academy Of Northern Nevada Project, Series A, 4.00%, 7/15/56 (144A)	766,612
4,000,000	Maricopa County Industrial Development Authority, Commercial Metals Company, 4.00%, 10/15/47 (144A)	3,665,000
	Total Arizona	\$ 6,941,820
	Arkansas — 5.2%	
9,500,000	Arkansas Development Finance Authority, Big River Steel Project, 4.50%, 9/1/49 (144A)	\$ 9,531,540
1,750,000	Arkansas Development Finance Authority, Green Bond, 5.45%, 9/1/52	1,771,472
	Total Arkansas	\$ 11,303,012
	California — 3.2%	
1,000,000	California County Tobacco Securitization Agency, Golden Gate Tobacco Settlement, Series A, 5.00%, 6/1/47	\$ 961,200
1,900,000(b)	California Infrastructure & Economic Development Bank, Brightline West Passenger Rail Project, Series A-4, 8.00%, 1/1/50 (144A)	1,922,743
750,000	California Municipal Finance Authority, Westside Neighborhood School Project, 6.375%, 6/15/64 (144A)	814,935
300,000(c)	California School Finance Authority, Envision Education - Obligated Group, Series A, 5.00%, 6/1/54 (144A)	305,445

Principal Amount USD (\$)		Value
	California — (continued)	
2,315,000	California Statewide Communities Development Authority, Loma Linda University Medical Center, Series A, 5.25%, 12/1/56 (144A)	\$ 2,335,812
740,000	Chino Community Facilities District, Series 3, 5.00%, 9/1/54	755,118
	Total California	\$ 7,095,253
	Colorado — 9.5%	
5,180,000	Aerotropolis Regional Transportation Authority, 4.25%, 12/1/41	\$ 4,791,966
3,500,000	Aerotropolis Regional Transportation Authority, 4.375%, 12/1/52	3,113,320
2,620,000	Aerotropolis Regional Transportation Authority, 5.00%, 12/1/51	2,533,776
3,000,000	Colorado High Performance Transportation Enterprise, 5.00%, 12/31/56	3,001,680
1,897,000(d)	Cottonwood Highlands Metropolitan District No. 1, Series A, 5.00%, 12/1/49	1,904,000
2,000,000	Dominion Water & Sanitation District, 5.875%, 12/1/52	2,011,740
3,475,000	Prairie Center Metropolitan District No 3, Series A, 5.00%, 12/15/41 (144A)	3,487,093
	Total Colorado	\$ 20,843,575
	Delaware — 0.4%	
1,015,000	Delaware State Economic Development Authority, Aspira of Delaware Charter, 4.00%, 6/1/57	\$ 816,710
	Total Delaware	\$ 816,710
	District of Columbia — 0.2%	
500,000	District of Columbia, Union Market Project, Series A, 5.125%, 6/1/34 (144A)	\$ 502,755
	Total District of Columbia	\$ 502,755
	Florida — 5.2%	
1,335,000	Capital Trust Authority, Series A, 5.50%, 12/15/33 (144A)	\$ 1,361,926
1,320,000	Capital Trust Authority, Series A, 6.50%, 12/15/53 (144A)	1,375,638
2,000,000	Florida Development Finance Corp., Brightline Florida Passenger Rail Project, 5.50%, 7/1/53	2,079,300
1,000,000(b)	Florida Development Finance Corp., Brightline Florida Passenger Rail Project, 12.00%, 7/15/32 (144A)	1,063,260
4,425,000	Florida Development Finance Corp., Glenridge On Palmer Ranch Project, 5.00%, 6/1/51 (144A)	4,169,279

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(unaudited) (continued)

Principal Amount USD (\$)		Value
	Florida — (continued)	
400,000	Florida Development Finance Corp., The Henry Project, Series A-1, 5.25%, 6/1/54 (144A)	\$ 409,884
900,000	Florida Development Finance Corp., The Henry Project, Series B, 6.50%, 6/1/59 (144A)	924,228
	Total Florida	\$ 11,383,515
	Illinois — 6.1%	
4,260,000(d)	Chicago Board of Education, Series A, 5.00%, 12/1/42	\$ 4,261,235
9,500,000	Metropolitan Pier & Exposition Authority, McCormick Place Expansion, 4.00%, 6/15/50	8,991,845
	Total Illinois	\$ 13,253,080
	Indiana — 1.7%	
1,250,000	City of Valparaiso, Pratt Paper LLC Project, 5.00%, 1/1/54 (144A)	\$ 1,300,550
2,500,000	Indiana Finance Authority, Multipurpose Educational Facilities, Avondale Meadows Academy Project, 5.375%, 7/1/47	2,506,075
	Total Indiana	\$ 3,806,625
	Iowa — 3.0%	
6,600,000	Iowa Finance Authority, Alcoa Inc. Projects, 4.75%, 8/1/42	\$ 6,594,588
	Total Iowa	\$ 6,594,588
	Massachusetts — 0.9%	
2,000,000	Massachusetts Development Finance Agency, Lowell General Hospital, Series G, 5.00%, 7/1/44	\$ 2,000,060
	Total Massachusetts	\$ 2,000,060
	Minnesota — 0.6%	
1,430,000	City of Rochester, Rochester Math & Science Academy, Series A, 5.125%, 9/1/38	\$ 1,301,286
	Total Minnesota	\$ 1,301,286
	New Jersey — 0.8%	
1,745,000	Tobacco Settlement Financing Corp., Series B, 5.00%, 6/1/46	\$ 1,753,428
	Total New Jersey	\$ 1,753,428
	New York — 27.7%	
5,300,000	Chautauqua Tobacco Asset Securitization Corp., 5.00%, 6/1/48	\$ 5,169,302
1,000,000	Dutchess County Local Development Corp., Health Quest Systems Inc., Series B, 5.00%, 7/1/46	1,000,810

Principal Amount USD (\$)		Value
New York — (continued)		
8,885,000	Erie Tobacco Asset Securitization Corp., Asset-Backed, Series A, 5.00%, 6/1/45	\$ 8,427,423
3,505,000	Nassau County Tobacco Settlement Corp., Asset-Backed, Series A-3, 5.00%, 6/1/35	3,274,126
2,895,000	Nassau County Tobacco Settlement Corp., Asset-Backed, Series A-3, 5.125%, 6/1/46	2,669,653
1,730,000	New York Counties Tobacco Trust IV, Series A, 5.00%, 6/1/42	1,638,327
7,915,000	New York Counties Tobacco Trust IV, Settlement pass through, Series A, 5.00%, 6/1/45	7,326,124
5,000,000	New York Transportation Development Corp., Series A, 5.25%, 1/1/50	5,002,050
3,000,000	New York Transportation Development Corp., Green Bond, 5.375%, 6/30/60	3,102,090
3,000,000	New York Transportation Development Corp., Green Bond, 5.50%, 6/30/60	3,191,070
900,000	Suffolk Regional Off-Track Betting Co., 6.00%, 12/1/53	944,550
6,715,000	TSASC, Inc., Series B, 5.00%, 6/1/48	6,014,693
5,775,000	Westchester County Local Development Corp., Purchase Senior Learning Community, 5.00%, 7/1/56 (144A)	5,676,998
8,000,000	Westchester County Local Development Corp., Purchase Senior Learning Community, Inc. Project, 4.50%, 7/1/56 (144A)	7,096,640
	Total New York	\$ 60,533,856
North Carolina — 0.6%		
1,200,000	North Carolina Medical Care Commission, Carolina Meadows, 5.25%, 12/1/49	\$ 1,280,796
	Total North Carolina	\$ 1,280,796
Ohio — 5.3%		
12,500,000	Buckeye Tobacco Settlement Financing Authority, Senior Class 2, Series B-2, 5.00%, 6/1/55	\$ 11,575,875
	Total Ohio	\$ 11,575,875
Oklahoma — 2.7%		
5,900,000	Tulsa Airports Improvement Trust, Series C, 5.50%, 12/1/35	\$ 5,903,068
	Total Oklahoma	\$ 5,903,068
Pennsylvania — 3.0%		
600,000	Allentown Commercial and Industrial Development Authority, 5.75%, 6/15/43	\$ 622,962

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(unaudited) (continued)

Principal Amount USD (\$)		Value
Pennsylvania — (continued)		
1,600,000	Allentown Commercial and Industrial Development Authority, 6.00%, 6/15/53	\$ 1,645,040
1,100,000	Allentown Neighborhood Improvement Zone Development Authority, Waterfront - 30 E. Allen Street Project, Series B, 6.00%, 5/1/42 (144A)	1,169,938
750,000	Philadelphia Authority for Industrial Development, 4.00%, 6/1/41	676,275
2,500,000(b)	Philadelphia Authority for Industrial Development, 5.125%, 12/15/44 (144A)	2,374,225
Total Pennsylvania		\$ 6,488,440
Puerto Rico — 15.3%		
2,574,442(b)	Commonwealth of Puerto Rico, 11/1/43	\$ 1,576,846
5,000,000(b)	Commonwealth of Puerto Rico, 11/1/51	1,482,500
7,673,960(d)	Commonwealth of Puerto Rico, Restructured Series A-1, 4.00%, 7/1/37	7,461,852
1,796,000(d)	Commonwealth of Puerto Rico, Restructured Series A-1, 4.00%, 7/1/41	1,682,852
3,624,000(d)	Commonwealth of Puerto Rico, Restructured Series A-1, 4.00%, 7/1/46	3,312,336
1,900,000	GDB Debt Recovery Authority of Puerto Rico, 7.50%, 8/20/40	1,843,000
3,220,000	Puerto Rico Commonwealth Aqueduct & Sewer Authority, Series A, 5.00%, 7/1/37 (144A)	3,350,442
6,000,000	Puerto Rico Commonwealth Aqueduct & Sewer Authority, Series A, 5.00%, 7/1/47 (144A)	6,037,380
6,844,000	Puerto Rico Sales Tax Financing Corp. Sales Tax Revenue, Series A-1, 4.75%, 7/1/53	6,782,404
Total Puerto Rico		\$ 33,529,612
Texas — 2.9%		
400,000	Arlington Higher Education Finance Corp., BASIS Texas Charter Schools, Inc., 4.875%, 6/15/59 (144A)	\$ 396,432
300,000	Arlington Higher Education Finance Corp., Great Hearts America, Series A, 5.00%, 8/15/54	300,987
3,000,000	City of Houston Airport System Revenue, 4.00%, 7/15/41	2,850,060
2,200,000	Greater Texas Cultural Education Facilities Finance Corp., Texas Bipomedical Research Institute Project, Series A, 5.25%, 6/1/54	2,322,232
450,000	Port of Beaumont Navigation District, Jefferson Gulf Coast Energy Project, Series A, 5.125%, 1/1/44 (144A)	455,062
Total Texas		\$ 6,324,773

Principal Amount USD (\$)		Value
9,440,000	Virginia — 3.8% Tobacco Settlement Financing Corp., Series A-1, 6.706%, 6/1/46	\$ 8,220,163
	Total Virginia	\$ 8,220,163
15,000,000	West Virginia — 5.5% Tobacco Settlement Finance Authority, Series A, 4.306%, 6/1/49	\$ 12,113,700
	Total West Virginia	\$ 12,113,700
1,115,000	Wisconsin — 3.4% Public Finance Authority, Coral Academy Science Reno, 5.00%, 6/1/39 (144A)	\$ 1,092,299
8,000,000	Public Finance Authority, SearStone CCRC Project, 4.00%, 6/1/41 (144A)	6,399,600
	Total Wisconsin	\$ 7,491,899
	TOTAL MUNICIPAL BONDS (Cost \$228,375,814)	\$242,188,997
	TOTAL INVESTMENTS IN UNAFFILIATED ISSUERS — 110.7% (Cost \$228,375,814)	\$242,188,997
	OTHER ASSETS AND LIABILITIES — (10.7)%	\$(23,334,863)
	NET ASSETS — 100.0%	\$218,854,134

(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, 2024, the value of these securities amounted to \$68,818,646, or 31.4% of net assets.

- (a) Consists of Revenue Bonds unless otherwise indicated.
- (b) The interest rate is subject to change periodically. The interest rate and/or reference index and spread shown at July 31, 2024.
- (c) Securities purchased on a when-issued basis. Rates do not take effect until settlement date.
- (d) Represents a General Obligation Bond.

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(unaudited) (continued)

FUTURES CONTRACTS

FIXED INCOME INDEX FUTURES CONTRACTS

Number of Contracts Long	Description	Expiration Date	Notional Amount	Market Value	Unrealized Appreciation
38	U.S. Ultra Bond (CBT)	9/19/24	\$4,708,542	\$4,862,813	\$154,271
TOTAL FUTURES CONTRACTS			\$4,708,542	\$4,862,813	\$154,271

CBT Chicago Board of Trade.

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, 2024 in valuing the Fund's investments:

	Level 1	Level 2	Level 3	Total
Municipal Bonds	\$ —	\$242,188,997	\$—	\$242,188,997
Total Investments in Securities	\$ —	\$242,188,997	\$—	\$242,188,997
Other Financial Instruments				
Net unrealized appreciation on futures contracts	\$154,271	\$ —	\$—	\$ 154,271
Total Other Financial Instruments	\$154,271	\$ —	\$—	\$ 154,271

During the period ended July 31, 2024, there were no transfers in or out of Level 3.