

BLACKROCK MUNIVEST FUND, INC.

Form N-Q

July 27, 2016

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM N-Q

QUARTERLY SCHEDULE OF PORTFOLIO HOLDINGS OF REGISTERED

MANAGEMENT INVESTMENT COMPANY

Investment Company Act file number: 811-05611

Name of Fund: BlackRock MuniVest Fund, Inc. (MVF)

Fund Address: 100 Bellevue Parkway, Wilmington, DE 19809

Name and address of agent for service: John M. Perlowski, Chief Executive Officer, BlackRock MuniVest Fund, Inc., 55 East 52nd Street, New York, NY 10055

Registrant's telephone number, including area code: (800) 882-0052, Option 4

Date of fiscal year end: 08/31/2016

Date of reporting period: 05/31/2016

Item 1 Schedule of Investments

Schedule of Investments May 31, 2016 (Unaudited)

BlackRock MuniVest Fund, Inc. (MVF)

(Percentages shown are based on Net Assets)

	Par	
	(000)	Value
Municipal Bonds		
Alabama 1.9%		
City of Selma Alabama IDB, RB, Gulf Opportunity Zone, International Paper Co. Project, Series A:		
5.80%, 5/01/34	\$ 1,850	\$ 2,147,572
5.38%, 12/01/35	1,000	1,116,370
State of Alabama Docks Department, Refunding RB, 6.00%, 10/01/40	7,610	9,057,194
		12,321,136
Alaska 0.7%		
City of Anchorage Alaska Electric Revenue, Refunding RB, Series A, 5.00%, 12/01/41	3,000	3,520,950
Northern Tobacco Securitization Corp., Refunding RB, Tobacco Settlement, Asset-Backed, Series A, 5.00%, 6/01/46	1,250	1,188,575
		4,709,525
Arizona 3.5%		
City of Phoenix Arizona Civic Improvement Corp., Refunding RB, Junior Lien, Series A, 5.00%, 7/01/40	2,000	2,250,860
City of Phoenix Arizona IDA, RB, Candeo School, Inc. Project:		
6.63%, 7/01/33	2,245	2,559,614
6.88%, 7/01/44	3,440	3,963,912
City of Phoenix Arizona IDA, Refunding RB (a):		
Basis Schools, Inc. Projects,		
5.00%, 7/01/35	600	637,314
Basis Schools, Inc. Projects,		
5.00%, 7/01/45	760	793,812
Legacy Traditional School Projects,		
5.00%, 7/01/45	700	728,483
County of Maricopa Arizona IDA, RB, Arizona Charter Schools Project, Series A, 6.75%, 7/01/29	1,150	1,150,000
County of Maricopa Arizona Pollution Control Corp., Refunding RB, Southern California Edison Co., Series A, 5.00%, 6/01/35	3,300	3,720,981
	Par	
	(000)	Value
Municipal Bonds		
Arizona (continued)		
Salt Verde Financial Corp., RB, Senior, 5.00%, 12/01/37	\$ 5,725	\$ 7,144,228
		22,949,204
California 7.2%		
California Health Facilities Financing Authority, RB:		
St. Joseph Health System, Series A, 5.75%, 7/01/39	5,000	5,727,500
Sutter Health, Series B, 6.00%, 8/15/42	5,600	6,737,416
California Health Facilities Financing Authority, Refunding RB, Dignity Health, Series A, 6.00%, 7/01/34	1,055	1,210,243
City of Los Angeles California Department of Airports, Refunding ARB, Los Angeles International Airport, Series A, 5.25%, 5/15/39	1,200	1,342,908
Golden Empire Schools Financing Authority, Refunding RB, Kern High School District Projects, 0.90%, 5/01/17 (b)	5,710	5,708,230
Los Angeles Community College District California, GO, Refunding, Election of 2008, Series A, 6.00%, 8/01/19 (c)	9,585	11,099,909
Oakland Unified School District/Alameda County, GO, Series A, 5.00%, 8/01/40	1,000	1,165,310
Poway Unified School District, GO, Refunding, CAB, School Facilities Improvement District No. 2007-1, Election of 2008, Series B, 0.00%, 8/01/46 (d)	10,000	3,320,700
State of California, GO, Various Purposes, 6.50%, 4/01/33	9,675	11,193,105
		47,505,321
Colorado 1.8%		

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Colorado Health Facilities Authority, RB, Catholic Health Initiatives, Series D, 6.25%, 10/01/33	2,500	2,793,600
Colorado Health Facilities Authority, Refunding RB, Evangelical Lutheran Good Samaritan Society Project, 5.00%, 6/01/45	7,000	7,821,870
Copperleaf Metropolitan District No 2, GO, Refunding, 5.75%, 12/01/45	1,000	1,059,050

BLACKROCK MUNIVEST FUND, INC.

MAY 31, 2016

1

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

	Par	
	(000)	Value
Municipal Bonds		
Colorado (continued)		
Regional Transportation District, COP, Refunding, Series A, 5.38%, 6/01/31	\$ 385	\$ 441,002
		12,115,522
Delaware 0.4%		
County of Sussex Delaware, RB, NRG Energy, Inc., Indian River Power LLC Project, 6.00%, 10/01/40	2,500	2,736,450
District of Columbia 0.2%		
Metropolitan Washington Airports Authority, Refunding RB, Dulles Toll Road, 1st Senior Lien, Series A:		
5.00%, 10/01/39	415	460,434
5.25%, 10/01/44	650	723,892
		1,184,326
Florida 9.2%		
City of Jacksonville Florida, Refunding RB, Brooks Rehabilitation Project, 4.00%, 11/01/40	1,770	1,834,003
City of Tampa Florida, RB, Baycare Health System, Series A, 4.00%, 11/15/46	2,345	2,492,383
County of Miami-Dade Florida, GO, Building Better Communities Program (c):		
Series B, 6.38%, 7/01/18	4,630	5,163,237
Series B-1, 5.63%, 7/01/18	5,000	5,498,500
County of Miami-Dade Florida, Refunding RB, Transit System Sales Surtax, 5.00%, 7/01/42	3,750	4,367,100
County of Miami-Dade Florida Aviation, Refunding ARB, Miami International Airport:		
Series A, AMT (AGC), 5.00%, 10/01/40	10,000	10,417,400
Series A-1, 5.38%, 10/01/41	10,290	11,758,795
County of Miami-Dade Florida Educational Facilities Authority, Refunding RB, University of Miami, Series A, 5.00%, 4/01/45	4,625	5,388,680
County of Miami-Dade Florida Expressway Authority, RB, Toll System, Series A (AGM), 5.00%, 7/01/35	8,900	10,140,660
Orange County Health Facilities Authority, Refunding RB:		
Series A, 5.00%, 10/01/39	2,000	2,380,500
	Par	
	(000)	Value
Municipal Bonds		
Florida (continued)		
Orange County Health Facilities Authority, Refunding RB (continued):		
Series B, 5.00%, 10/01/44	\$ 1,000	\$ 1,182,390
		60,623,648
Georgia 1.4%		
City of Atlanta Georgia Department of Aviation, Refunding GARB, Series B, AMT, 5.00%, 1/01/29	1,070	1,202,905
County of DeKalb Georgia Hospital Authority, Refunding RB, DeKalb Medical Center, Inc. Project, 6.13%, 9/01/40	3,570	4,080,795
DeKalb Private Hospital Authority, Refunding RB, Children's Healthcare, 5.25%, 11/15/39	3,335	3,747,406
		9,031,106
Hawaii 0.9%		
State of Hawaii Harbor System, RB, Series A, 5.50%, 7/01/35	5,000	5,710,300
Illinois 9.6%		
City of Chicago Illinois, Refunding RB, Sales Tax Receipts, Series A, 5.00%, 1/01/41	4,640	4,846,341
City of Chicago Illinois Transit Authority, RB, Sales Tax Receipts, 5.25%, 12/01/36	2,110	2,329,925
City of Chicago Illinois Wastewater Transmission, Refunding RB, 2nd Lien, Series C, 5.00%, 1/01/39	1,000	1,120,590
City of Chicago Illinois Waterworks, Refunding RB, 2nd Lien (AGM), 5.25%, 11/01/33	1,330	1,422,994
County of Cook Illinois Community College District No. 508, GO, University & College Improvements, 5.25%, 12/01/31	5,000	5,678,650

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Illinois Finance Authority, RB:

Advocate Health Care Network, Series D, 6.50%, 11/01/18 (c)	9,700	11,007,172
Memorial Health System, Series A, 5.25%, 7/01/44	1,785	2,000,824
Illinois Finance Authority, Refunding RB, Series A:		
Northwestern Memorial Hospital, 6.00%, 8/15/39	9,000	10,415,970
OSF Healthcare System, 6.00%, 5/15/39	4,990	5,772,183

2

BLACKROCK MUNIVEST FUND, INC.

MAY 31, 2016

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

	Par	
	(000)	Value
Municipal Bonds		
Illinois (continued)		
Railsplitter Tobacco Settlement Authority, RB, 6.00%, 6/01/28	\$ 2,645	\$3,150,671
Regional Transportation Authority, RB: Series A (AMBAC), 7.20%, 11/01/20	1,930	2,199,235
Series C (NPFGC), 7.75%, 6/01/20	2,865	3,239,398
Village of Hodgkins Illinois, RB, Metropolitan Biosolids Management LLC Project, AMT, 6.00%, 11/01/23	10,000	10,019,800
		63,203,753
Indiana 1.4%		
City of Valparaiso Indiana, RB, Exempt Facilities, Pratt Paper LLC Project, AMT, 6.75%, 1/01/34	2,250	2,763,563
Indiana Finance Authority, RB, Private Activity Bond, Ohio River Bridges, Series A, AMT, 5.00%, 7/01/40	2,640	2,891,671
Indiana Finance Authority, Refunding RB, Deaconess Health System, Series A, 5.00%, 3/01/39	3,000	3,481,140
		9,136,374
Iowa 1.3%		
Iowa Finance Authority, Refunding RB, Midwestern Disaster Area, Iowa Fertilizer Co. Project, 5.25%, 12/01/25	4,500	4,801,320
Iowa Tobacco Settlement Authority, Refunding RB, Asset-Backed: CAB, Series B, 5.60%, 6/01/34	1,500	1,503,885
Series C, 5.63%, 6/01/46	2,500	2,496,750
		8,801,955
Kansas 0.6%		
Wyandotte County-Kansas City Unified Government Utility System, RB, Series A, 5.00%, 9/01/40	3,700	4,332,848
Kentucky 2.7%		
County of Owen Kentucky, RB, Kentucky American Water Co. Project, Series B, 5.63%, 9/01/39	1,000	1,112,030
	Par	
	(000)	Value
Municipal Bonds		
Kentucky (continued)		
Kentucky Economic Development Finance Authority, Refunding RB, Hospital Facilities, St. Elizabeth Medical Center, Inc., Series A, 5.50%, 5/01/19 (c)	\$ 8,000	\$ 9,048,720
Lexington-Fayette Urban County Airport Board, Refunding GARB, Series A, 5.00%, 7/01/27	7,000	7,784,770
		17,945,520
Louisiana 3.3%		
Louisiana Local Government Environmental Facilities & Community Development Authority, RB, Westlake Chemical Corp. Project, Series A-1, 6.50%, 11/01/35	2,615	3,143,152
Parish of St. Charles Louisiana, RB, Valero Energy Corp., 4.00%, 12/01/40 (b)	2,210	2,415,287
Tobacco Settlement Financing Corp., Refunding RB, Asset-Backed, Series A: 5.25%, 5/15/31	3,420	3,865,284
5.25%, 5/15/32	4,375	5,015,981
5.25%, 5/15/33	4,750	5,406,592
5.25%, 5/15/35	1,500	1,713,465
		21,559,761
Maine 1.0%		
Maine Health & Higher Educational Facilities Authority, RB, Series A, 5.00%, 7/01/39	5,000	5,511,800
Portland Housing Development Corp., Refunding RB, Senior Living, Retirement Facilities, Series A, 6.00%, 2/01/34	1,190	1,191,880
		6,703,680
Maryland 2.9%		
Maryland Community Development Administration, HRB, S/F Housing, Series H, AMT, 5.10%, 9/01/37	1,605	1,623,393

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Maryland Community Development Administration, Refunding, HRB, Residential, Series D, AMT, 4.90%, 9/01/42	3,250	3,279,608
Maryland Health & Higher Educational Facilities Authority, Refunding RB: Charlestown Community Project, 6.25%, 1/01/41	2,000	2,308,760

BLACKROCK MUNIVEST FUND, INC.

MAY 31, 2016

3

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

	Par	
	(000)	Value
Municipal Bonds		
Maryland (continued)		
Maryland Health & Higher Educational Facilities Authority, Refunding RB (continued):		
Meritus Medical Center Issue, 5.00%, 7/01/40	\$ 6,350	\$ 7,293,165
University of Maryland Medical System, 5.00%, 7/01/34	2,100	2,278,899
University of Maryland Medical System, 5.13%, 7/01/39	2,100	2,272,956
		19,056,781
Massachusetts 3.5%		
Massachusetts Bay Transportation Authority, Refunding RB, General Transportation System, Series A, 7.00%, 3/01/19		
	1,100	1,163,503
Massachusetts HFA, RB, AMT:		
M/F Housing, Series A, 5.20%, 12/01/37	2,865	2,967,481
S/F Housing, Series 130, 5.00%, 12/01/32	2,105	2,126,681
Massachusetts HFA, Refunding RB, Series C, AMT, 5.35%, 12/01/42	6,550	6,902,783
Massachusetts Water Resources Authority, RB, Series A, 6.50%, 7/15/19 (e)	9,240	9,897,611
		23,058,059
Michigan 3.6%		
City of Detroit Michigan Water Supply System, RB, 2nd Lien, Series B (AGM), 6.25%, 7/01/36		
	2,500	2,812,125
Michigan State Hospital Finance Authority, Refunding RB, Series A:		
Henry Ford Health System, 5.25%, 11/15/46	7,950	8,110,908
McLaren Health Care, 5.75%, 5/15/18 (c)	7,285	7,978,823
Royal Oak Hospital Finance Authority Michigan, Refunding RB, William Beaumont Hospital, Series V, 8.25%, 9/01/18 (c)	4,100	4,776,623
		23,678,479
Minnesota 0.2%		
City of Cologne Minnesota Charter School, LRB, Cologne Academy Project, Series A, 5.00%, 7/01/45		
	1,500	1,557,915
	Par	
Municipal Bonds		
	(000)	Value
Mississippi 4.7%		
County of Lowndes Mississippi, Refunding RB, Solid Waste Disposal & Pollution Control, Weyerhaeuser Co. Project:		
Series A, 6.80%, 4/01/22	\$ 9,160	\$ 11,411,986
Series B, 6.70%, 4/01/22	4,500	5,561,055
Mississippi Business Finance Corp., Refunding RB, System Energy Resource, Inc. Project, 5.88%, 4/01/22	9,305	9,602,202
Mississippi Development Bank, Refunding RB, Municipal Energy Agency Of Mississippi, Series A (AGM), 4.00%, 3/01/41	4,500	4,745,250
		31,320,493
Nebraska 1.0%		
Central Plains Energy Project Nebraska, RB, Gas Project No. 3, 5.00%, 9/01/42		
	6,200	6,901,592
New Hampshire 0.7%		
New Hampshire Housing Finance Authority, Refunding RB, S/F Housing, Acquisition, Series H, AMT, 5.15%, 1/01/40		
	4,875	4,952,854
New Jersey 9.3%		
Casino Reinvestment Development Authority, Refunding RB, 5.25%, 11/01/44		
	1,400	1,454,936
New Jersey EDA, RB:		
Continental Airlines, Inc. Project, Series A, AMT, 5.63%, 11/15/30	1,530	1,757,526
Goethals Bridge Replacement Project, Private Activity Bond, AMT, 5.38%, 1/01/43	10,000	11,526,700
	1,050	1,211,847

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Private Activity Bond, The Goethals Bridge Replacement Project, AMT, 5.13%, 1/01/34		
School Facilities Construction, Series UU, 5.00%, 6/15/40	3,390	3,659,708
New Jersey EDA, Refunding RB: 5.25%, 6/15/19 (c)	2,650	2,986,418
5.25%, 12/15/33	7,350	7,868,763
New Jersey Housing & Mortgage Finance Agency, RB, S/F Housing, Series AA, 6.38%, 10/01/28	270	279,339

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

	Par	
	(000)	Value
Municipal Bonds		
New Jersey (continued)		
New Jersey Transportation Trust Fund Authority, RB:		
CAB, Transportation System, Series A, 0.00%, 12/15/38 (d)	\$ 7,260	\$ 2,503,538
Transportation Program, Series AA, 5.25%, 6/15/33	8,750	9,657,725
Transportation Program, Series AA, 5.25%, 6/15/41	780	860,122
Transportation Program, Series AA, 5.00%, 6/15/44	8,075	8,700,086
Transportation System, Series B, 5.50%, 6/15/31	8,000	8,908,960
		61,375,668
New York 6.4%		
Build NYC Resource Corp., Refunding RB, Pratt Paper, Inc. Project, AMT, 5.00%, 1/01/35 (a)	545	593,707
City of New York New York Municipal Water Finance Authority, Refunding RB, Water & Sewer System, Series FF-2, 5.50%, 6/15/40	4,150	4,695,600
County of New York Tobacco Trust IV, Refunding RB, Settlement Pass-Through Turbo, Series A, 6.25%, 6/01/41 (a)	3,500	3,691,555
Erie Tobacco Asset Securitization Corp., Refunding RB, Asset-Backed, Series A, 5.00%, 6/01/45	4,435	4,434,601
Metropolitan Transportation Authority, RB, Series C:		
6.25%, 11/15/18 (c)	2,595	2,931,753
6.50%, 11/15/18 (c)	11,135	12,647,467
6.25%, 11/15/23	650	736,470
6.50%, 11/15/28	3,790	4,316,204
New York Liberty Development Corp., Refunding RB, 3 World Trade Center Project, Class 2 (a):		
5.15%, 11/15/34	460	513,346
5.38%, 11/15/40	1,145	1,282,263
New York Transportation Development Corp., RB, Laguardia Airport Terminal B Redevelopment Project, Series A (AMT), 5.00%, 7/01/46 (f)	2,400	2,694,576
	Par	
	(000)	Value
Municipal Bonds		
New York (continued)		
Port Authority of New York & New Jersey, ARB, Special Project, JFK International Air Terminal LLC Project, Series 8, 6.00%, 12/01/36	\$ 3,165	\$ 3,717,672
		42,255,214
North Carolina 0.6%		
County of Gaston North Carolina Industrial Facilities & Pollution Control Financing Authority, RB, Exempt Facilities, National Gypsum Co. Project, AMT, 5.75%, 8/01/35	4,105	4,117,849
Ohio 3.9%		
Buckeye Tobacco Settlement Financing Authority, RB, Asset-Backed, Senior Turbo Term, Series A-2, 6.50%, 6/01/47	1,125	1,144,687
County of Allen Ohio Hospital Facilities, Refunding RB, Catholic Healthcare Partners, Series A, 5.25%, 6/01/38	2,875	3,230,120
County of Franklin Ohio, RB, Health Care Facilities Improvement, OPRS Communities Obligation Group, Series A, 6.13%, 7/01/40	1,690	1,871,574
County of Lucas Ohio, Refunding RB, Promedica Healthcare, Series A, 6.50%, 11/15/37	1,915	2,382,930
County of Montgomery Ohio, RB, Catholic Health Initiatives, Series D-2, 5.45%, 10/01/38	9,230	10,804,269
County of Montgomery Ohio, Refunding RB, Catholic Health, Series A, 5.50%, 5/01/34	5,470	6,109,334
		25,542,914
Pennsylvania 2.7%		
City of Philadelphia Pennsylvania IDA, RB, Retirement Facilities, Rieder House Project, Series A, 6.10%, 7/01/33	1,255	1,256,832
County of Delaware Pennsylvania IDA, Refunding RB, Covanta Project, 5.00%, 7/01/43	5,000	5,103,350
County of Montgomery Pennsylvania IDA, Refunding RB, Whitmarsh Continuing Care Retirement Community, 5.25%, 1/01/40	4,170	4,240,390

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

	Par	
	(000)	Value
Municipal Bonds		
Pennsylvania (continued)		
Delaware River Port Authority, RB, Series D, 5.00%, 1/01/40	\$ 195	\$ 219,231
Pennsylvania Economic Development Financing Authority, RB, Pennsylvania Bridge Finco LP, AMT, 5.00%, 12/31/38	2,565	2,922,202
Pennsylvania HFA, RB, S/F Housing Mortgage, Series 118B, 4.05%, 10/01/40	3,850	4,075,610
		17,817,615
Rhode Island 1.4%		
Tobacco Settlement Financing Corp., Refunding RB, Series B: 4.50%, 6/01/45	6,820	7,154,521
5.00%, 6/01/50	2,000	2,140,560
		9,295,081
South Carolina 0.7%		
State of South Carolina Public Service Authority, Refunding RB, Series E, 5.25%, 12/01/55	3,800	4,495,324
Texas 11.9%		
Brazos River Authority, Refunding RB, Texas Utility Co., Series A, AMT, 7.70%, 4/01/33 (g)(h)	3,055	53,432
Central Texas Regional Mobility Authority, RB, Senior Lien, Series A: 5.00%, 1/01/40	1,215	1,412,170
5.00%, 1/01/45	3,500	4,049,850
Central Texas Regional Mobility Authority, Refunding RB: 5.00%, 1/01/36 (f)	915	1,080,624
5.00%, 1/01/40 (f)	2,810	3,287,756
Senior Lien, 5.75%, 1/01/21 (c)	1,000	1,200,820
Senior Lien, 6.00%, 1/01/21 (c)	4,300	5,211,299
Senior Lien, Series A, 5.00%, 1/01/43	6,925	7,729,131
City of Houston Texas Airport System, Refunding ARB, United Airlines, Inc. Terminal E Project, AMT, 5.00%, 7/01/29	2,665	2,976,059
County of Harris Texas Cultural Education Facilities Finance Corp., RB, 1st Mortgage, Brazos Presbyterian Homes, Inc. Project, Series B, 7.00%, 1/01/43	850	1,013,404
	Par	
	(000)	Value
Municipal Bonds		
Texas (continued)		
County of Harris Texas Health Facilities Development Corp., Refunding RB, Memorial Hermann Healthcare System, Series B (c): 7.13%, 12/01/18	\$ 3,500	\$ 4,034,555
7.25%, 12/01/18	5,400	6,241,428
County of Tarrant Texas Cultural Education Facilities Finance Corp., RB, Scott & White Healthcare (c): 6.00%, 8/15/20	370	443,508
6.00%, 8/15/20	4,630	5,556,139
County of Tarrant Texas Cultural Education Facilities Finance Corp., Refunding RB, Trinity Terrace Project, 5.00%, 10/01/44	875	980,534
La Vernia Higher Education Finance Corp., RB, KIPP, Inc., Series A, 6.25%, 8/15/19 (c)	925	1,076,136
Love Field Airport Modernization Corp., RB, Southwest Airlines Co. Project, 5.25%, 11/01/40	1,100	1,230,713
New Hope Cultural Education Facilities Corp., RB, Collegiate Housing Tarleton State University Project, 5.00%, 4/01/35	500	554,135
New Hope Cultural Education Facilities Corp., Refunding RB, 1st Mortgage, Morningside Ministries Project, 6.25%, 1/01/33	1,600	1,867,920
North Texas Education Finance Corp., ERB, Uplift Education, Series A, 5.13%, 12/01/42	1,000	1,065,520
North Texas Tollway Authority, Refunding RB, Series A: 1st Tier, 6.25%, 1/01/39	3,500	3,927,245
5.00%, 1/01/38	5,000	5,800,900
5.00%, 1/01/39 (f)	2,605	3,098,205
Texas Private Activity Bond Surface Transportation Corp., RB, Senior Lien:		

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LBJ Infrastructure Group LLC, 7.00%, 6/30/40	8,000	9,567,680
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6 BLACKROCK MUNIVEST FUND, INC. MAY 31, 2016

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

	Par	
	(000)	Value
Municipal Bonds		
Texas (continued)		
Texas Private Activity Bond Surface Transportation Corp., RB, Senior Lien (continued):		
NTE Mobility Partners LLC, North Tarrant Express Managed Lanes Project, 6.88%, 12/31/39	\$ 4,710	\$ 5,542,963
		79,002,126
Vermont 0.0%		
Vermont Educational & Health Buildings Financing Agency, RB, Developmental & Mental Health, Series A, 6.38%, 6/15/22	30	30,692
Virginia 3.7%		
City of Portsmouth Virginia, GO, Refunding Series D:		
5.00%, 7/15/20 (c)	3,030	3,511,073
5.00%, 7/15/34	75	85,858
County of Fairfax Virginia EDA, Refunding RB, Goodwin House, Inc.:		
5.13%, 10/01/37	2,000	2,070,760
5.13%, 10/01/42	6,015	6,224,622
Tobacco Settlement Financing Corp., Refunding RB, Convertible, Senior, Series B2, 5.20%, 6/01/46	3,750	3,565,050
Virginia Small Business Financing Authority, RB, Senior Lien, Elizabeth River Crossings OpCo LLC Project, AMT:		
6.00%, 1/01/37	2,620	3,110,071
5.50%, 1/01/42	5,140	5,895,683
		24,463,117
Washington 4.2%		
Energy Northwest, Refunding RB, Series B, 7.13%, 7/01/16 (e)	14,320	14,398,044
Washington Health Care Facilities Authority, RB, Catholic Health Initiatives, Series A, 5.75%, 1/01/45	4,010	4,793,795
Washington Health Care Facilities Authority, Refunding RB, Catholic Health Initiatives, Series D, 6.38%, 10/01/36	7,000	7,818,860
Washington State Housing Finance Commission, RB, Heron s Key, Series A (a): 6.75%, 7/01/35	265	280,455
	Par	
	(000)	Value
Municipal Bonds		
Washington (continued)		
Washington State Housing Finance Commission, RB, Heron s Key, Series A (a) (continued): 7.00%, 7/01/45	\$ 590	\$ 621,948
		27,913,102
West Virginia 0.4%		
West Virginia Hospital Finance Authority, Refunding RB, Improvement, Charleston Area Medical Center, Inc., Series A, 5.63%, 9/01/32	2,500	2,775,375
Wisconsin 1.0%		
Wisconsin Health & Educational Facilities Authority, Refunding RB, Froedtert & Community Health, Inc., Series C, 5.25%, 4/01/39	6,100	6,623,929
Wyoming 1.2%		
County of Sweetwater Wyoming, Refunding RB, Idaho Power Co. Project, Remarketing, 5.25%, 7/15/26	4,500	5,064,975
Wyoming Community Development Authority, Refunding RB, Series 2 & 3, 4.05%, 12/01/38	2,525	2,621,480
		7,686,455
Total Municipal Bonds - 111.1%		734,491,063

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Municipal Bonds Transferred to

Tender Option Bond Trusts (i)

Arizona 0.6%		
City of Phoenix Arizona Civic Improvement Corp., Refunding RB, Water System, Junior Lien, Series A, 5.00%, 7/01/34	3,500	3,889,585
California 3.4%		
University of California, RB, General, Series O:		
5.25%, 5/15/19 (c)	8,910	10,004,415
5.25%, 5/15/39	11,090	12,452,185
		22,456,600
Connecticut 1.9%		
Connecticut State Health & Educational Facility Authority, RB, Yale University, Series Z-3, 5.05%, 7/01/42	12,000	12,537,000

BLACKROCK MUNIVEST FUND, INC.

MAY 31, 2016

7

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

Municipal Bonds Transferred to	Par	
Tender Option Bond Trusts (i)	(000)	Value
District of Columbia 1.3%		
District of Columbia Water & Sewer Authority, Refunding RB, Senior Lien, Series A, 5.50%, 10/01/18 (c)	\$ 7,495	\$ 8,303,520
Florida 2.5%		
County of Miami-Dade Florida Water & Sewer System, (AGC), 5.00%, 10/01/39	14,747	16,820,856
Illinois 4.8%		
State of Illinois Finance Authority, RB, University of Chicago, Series B, 6.25%, 7/01/18 (c)	10,000	11,119,300
State of Illinois Toll Highway Authority, RB, Series B, Senior: Priority, 5.50%, 1/01/18 (c)	6,999	7,515,305
5.00%, 1/01/40	10,976	12,952,729
		31,587,334
Kentucky 1.6%		
County of Louisville & Jefferson Kentucky Metropolitan Government Parking Authority, RB, River City, Inc., 1st Mortgage, Series A, 5.38%, 12/01/39	9,195	10,442,210
Maryland 0.8%		
State of Maryland Transportation Authority, RB, Transportation Facilities Project (AGM), 5.00%, 7/01/41	4,710	5,077,144
Nevada 2.7%		
County of Clark Nevada Water Reclamation District, GO, Limited Tax, Series B, 5.75%, 7/01/34	15,789	18,073,987
New York 5.8%		
City of New York New York Municipal Water Finance Authority, Refunding RB, Water & Sewer System, Series DD: 5.00%, 6/15/18 (c)	3,556	3,844,534
5.00%, 6/15/37	20,643	22,319,350
New York Liberty Development Corp., Refunding RB, 4 World Trade Center Project, 5.75%, 11/15/51 (j)	10,001	11,969,645
		38,133,529
North Carolina 2.8%		
North Carolina Capital Facilities Finance Agency, Refunding RB: Duke University Project, Series A, 5.00%, 10/01/41	12,678	12,853,557
Municipal Bonds Transferred to	Par	
Tender Option Bond Trusts (i)	(000)	Value
North Carolina (continued)		
North Carolina Capital Facilities Finance Agency, Refunding RB (continued): Wake Forest University, 5.00%, 1/01/38	\$ 5,000	\$ 5,488,550
		18,342,107
Ohio 2.1%		
Ohio Higher Educational Facility Commission, RB, Cleveland Clinic Health, Series A, 5.25%, 1/01/33	4,400	4,712,488
State of Ohio, RB, Cleveland Clinic Health Obligated Group, Series B, 5.50%, 1/01/34	8,500	9,510,055
		14,222,543
Oregon 1.8%		
State of Oregon Housing & Community Services Department, HRB, M/F Housing, Series A, AMT, 4.95%, 7/01/30	11,425	12,158,624
Texas 7.4%		
City of Houston Texas, Refunding RB, Airport System, Senior Lien, Series A, 5.50%, 7/01/34	8,333	9,105,504
City of Houston Texas Higher Education Finance Corp., RB, Rice University Project, Series A, 5.00%, 5/15/40	10,000	11,367,381
County of Harris Texas Health Facilities Development Corp., Refunding RB, School Health Care System, Series B, 5.75%, 7/01/27 (e)	20,970	27,080,448
Texas Department of Housing & Community Affairs, RB, S/F Mortgage, Series B, AMT, 5.25%, 9/01/32	1,457	1,477,019

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		49,030,352
Virginia 2.6%		
County of Fairfax Virginia IDA, Refunding RB, Health Care, Inova Health System, Series A, 5.50%, 5/15/35	2,099	2,370,566
Virginia Commonwealth Transportation Board, RB, Capital Projects, 5.00%, 5/15/32	7,999	9,361,026

8

BLACKROCK MUNIVEST FUND, INC.

MAY 31, 2016

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

	Par	Value
	(000)	
Municipal Bonds Transferred to		
Tender Option Bond Trusts (i)		
Virginia (continued)		
Virginia Small Business Financing Authority, Refunding RB, Sentara Healthcare, 5.00%, 11/01/40	\$ 5,002	\$ 5,620,759
		17,352,351
Washington 5.9%		
Central Puget Sound Regional Transit Authority, RB, Series A (c):		
5.00%, 11/01/17	11,000	11,659,560
(AGM), 5.00%, 11/01/17	14,007	14,847,219
Washington Health Care Facilities Authority, Refunding RB, Seattle Children's Hospital, Series B, 5.00%, 10/01/38	10,000	12,626,800
		39,133,579
Total Municipal Bonds Transferred to		
Tender Option Bond Trusts 48.0%		317,561,321
Total Long-Term Investments		
(Cost \$951,782,660) 159.1%		1,052,052,384
Short-Term Securities		
Shares		
BlackRock Liquidity Funds, MuniCash, 0.21% (k)(l)	10,349,444	10,349,444
Total Short-Term Securities		
(Cost \$10,349,444) 1.6%		10,349,444
Total Investments		
(Cost \$962,132,104*) 160.7%		1,062,401,828
Other Assets Less Liabilities 0.3%		1,758,291
Liability for TOB Trust Certificates, Including Interest Expense and Fees Payable (24.1)%		(159,293,737)
VMTP Shares, at Liquidation Value (36.9)%		(243,800,000)
Net Assets Applicable to Common		
Shares 100.0%		\$ 661,066,382

* As of period end, gross unrealized appreciation and depreciation based on cost for federal income tax purposes were as follows:

Tax cost	\$ 805,133,025
Gross unrealized appreciation	\$ 103,278,176
Gross unrealized depreciation	(5,206,922)
Net unrealized appreciation	\$ 98,071,254

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

Notes to Schedule of Investments

- (a) Security exempt from registration pursuant to Rule 144A under the Securities Act of 1933, as amended. These securities may be resold in transactions exempt from registration to qualified institutional investors.
- (b) Variable rate security. Rate as of period end.
- (c) U.S. Government securities, held in escrow, are used to pay interest on this security, as well as to retire the bond in full at the date indicated, typically at a premium to par.
- (d) Zero-coupon bond.
- (e) Security is collateralized by municipal bonds or U.S. Treasury obligations.
- (f) When-issued security.
- (g) Non-income producing security.
- (h) Issuer filed for bankruptcy and/or is in default of interest payments.
- (i) Represent bonds transferred to a TOB Trust in exchange of cash and residual certificates received by the Trust. These bonds serve as collateral in a secured borrowing.
- (j) All or a portion of security is subject to a recourse agreement. The aggregate maximum potential amount the Trust could ultimately be required to pay under the agreement, which expires on November, 15, 2019 is \$5,295,502.
- (k) During the period ended May 31, 2016, investments in issuers considered to be affiliates of the Trust for purposes of Section 2(a)(3) of the Investment Company Act of 1940, as amended, were as follows:

Affiliate	Shares Held at August 31, 2015	Net Activity	Shares Held at May 31, 2016	Value at	
				May 31, 2016	Income
BlackRock Liquidity Funds, MuniCash		10,349,444	10,349,444	\$ 10,349,444	\$ 3,730
FFI Institutional Tax-Exempt Fund	8,611,512	(8,611,512)			459
Total				\$ 10,349,444	\$ 4,189

- (l) Current yield as of period end.

Derivative Financial Instruments Outstanding as of Period End

Futures Contracts

			Notional	Unrealized
			Value	Appreciation
Contracts	Issue	Expiration		(Depreciation)
Short				
(68)	5-Year U.S. Treasury Note	September 2016	\$ 8,167,969	\$ (6,912)
(62)	10-Year U.S. Treasury Note	September 2016	\$ 8,040,625	1,842
(26)	Long U.S. Treasury Bond	September 2016	\$ 4,246,125	(4,118)
(6)	Ultra U.S. Treasury Bond	September 2016	\$ 1,050,750	885
Total				\$ (8,303)

Portfolio Abbreviations

AGC	Assured Guarantee Corp.
AGM	Assured Guaranty Municipal Corp.
AMBAC	American Municipal Bond Assurance Corp.
AMT	Alternative Minimum Tax (subject to)

Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)

ARB	Airport Revenue Bonds
CAB	Capital Appreciation Bonds
COP	Certificates of Participation
EDA	Economic Development Authority
ERB	Education Revenue Bonds
GARB	General Airport Revenue Bonds
GO	General Obligation Bonds
HFA	Housing Finance Agency
HRB	Housing Revenue Bonds
IDA	Industrial Development Authority
IDB	Industrial Development Board
LRB	Lease Revenue Bonds
M/F	Multi-Family
NPFGC	National Public Finance Guarantee Corp.
RB	Revenue Bonds
S/F	Single-Family

Fair Value Hierarchy as of Period End

Various inputs are used in determining the fair value of investments and derivative financial instruments. These inputs to valuation techniques are categorized into a fair value hierarchy consisting of three broad levels for financial reporting purposes as follows:

Level 1 unadjusted price quotations in active markets/exchanges for identical assets or liabilities that the Trust has the ability to access

Level 2 other observable inputs (including, but not limited to, quoted prices for similar assets or liabilities in markets that are active, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable for the assets or liabilities (such as interest rates, yield curves, volatilities, prepayment speeds, loss severities, credit risks and default rates) or other market-corroborated inputs)

Level 3 unobservable inputs based on the best information available in the circumstances, to the extent observable inputs are not available (including the Trust's own assumptions used in determining the fair value of investments and derivative financial instruments)

The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). Accordingly, the degree of judgment exercised in determining fair value is greatest for instruments categorized in Level 3. The inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, for disclosure purposes, the fair value hierarchy classification is determined based on the lowest level input that is significant to the fair value measurement in its entirety. The significant unobservable inputs used by the Global Valuation Committee in determining the price for Fair Valued Investments are typically categorized as level 3.

Changes in valuation techniques may result in transfers into or out of an assigned level within the hierarchy. In accordance with the Trust's policy, transfers between different levels of the fair value hierarchy are deemed to have occurred as of the beginning of the reporting period. The categorization of a value determined for investments and derivative financial instruments is based on the pricing transparency of the investments and derivative financial instruments and is not necessarily an indication of the risks associated with investing in those securities. For information about the Trust's policy regarding valuation of investments and derivative financial instruments, refer to the Trust's most recent financial statements as contained in its semi-annual report.

The following tables summarize the Trust's investments and derivative financial instruments categorized in the disclosure hierarchy:

Schedule of Investments (concluded)

BlackRock MuniVest Fund, Inc. (MVF)

	Level 1	Level 2	Level 3	Total
Assets:				
Investments:				
Long-Term Investments ¹		\$ 1,052,052,384		\$ 1,052,052,384
Short-Term Securities	\$ 10,349,444			10,349,444
Total Investments	\$ 10,349,444	\$ 1,052,052,384		\$ 1,062,401,828

Derivative Financial Instruments ²

Assets:				
Interest rate contracts	\$ 2,727			\$ 2,727
Liabilities:				
Interest rate contracts	(11,030)			(11,030)
Total	\$ (8,303)			\$ (8,303)

¹ See above Schedule of Investments for values in each state of political subdivision.

² Derivative financial instruments are futures contracts. Futures contracts are valued at the unrealized appreciation (depreciation) on the instrument.

The Trust may hold assets and/or liabilities in which the fair value approximates the carrying amount for financial reporting purposes. As of period end, such assets and/or liabilities are categorized within the disclosure hierarchy as follows:

	Level 1	Level 2	Level 3	Total
Assets:				
Cash pledged for futures contracts	\$ 253,500			\$ 253,500
Liabilities:				
Bank overdraft		\$ (26,303)		(26,303)
TOB Trust Certificates		(159,197,549)		(159,197,549)
VMTP Shares		(243,800,000)		(243,800,000)
Total	\$ 253,500	\$ (403,023,852)		\$ (402,770,352)

During the period ended May 31, 2016, there were no transfers between levels.

Item 2 Controls and Procedures

- 2(a) The registrant's principal executive and principal financial officers, or persons performing similar functions, have concluded that the registrant's disclosure controls and procedures (as defined in Rule 30a-3(c) under the Investment Company Act of 1940, as amended (the "1940 Act")) are effective as of a date within 90 days of the filing of this report based on the evaluation of these controls and procedures required by Rule 30a-3(b) under the 1940 Act and Rule 13a-15(b) under the Securities Exchange Act of 1934, as amended.
- 2(b) There were no changes in the registrant's internal control over financial reporting (as defined in Rule 30a-3(d) under the 1940 Act) that occurred during the registrant's last fiscal quarter that have materially affected, or are reasonably likely to materially affect, the registrant's internal control over financial reporting.

Item 3 Exhibits

Certifications Attached hereto

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.

BlackRock MuniVest Fund, Inc.

By: /s/ John M. Perlowski

John M. Perlowski

Chief Executive Officer (principal executive officer) of

BlackRock MuniVest Fund, Inc.

Date: July 22, 2016

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: /s/ John M. Perlowski

John M. Perlowski

Chief Executive Officer (principal executive officer) of

BlackRock MuniVest Fund, Inc.

Date: July 22, 2016

By: /s/ Neal J. Andrews

Neal J. Andrews

Chief Financial Officer (principal financial officer) of

BlackRock MuniVest Fund, Inc.

Date: July 22, 2016