

BLACKROCK MUNIVEST FUND INC  
Form N-Q  
July 29, 2010  
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: Anne F. Ackerley, Chief Executive Officer, BlackRock MuniVest Fund, Inc., 55 East 52<sup>nd</sup> Street, New York, NY 10055.

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

Date of fiscal year end: 08/31/2010

Date of reporting period: 05/31/2010

Item 1 – Schedule of Investments

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Schedule of Investments May 31, 2010 (Unaudited)

BlackRock MuniVest Fund, Inc. (MVF)  
(Percentages shown are based on Net Assets)

Municipal Bonds	Par (000)	Value
<b>Alabama 2.6%</b>		
Camden IDB Alabama, RB, Weyerhaeuser Co. Project, Series A, 6.13%, 12/01/13 (a)	\$ 2,550	\$ 2,976,360
Prattville IDB Alabama, RB, International Paper Co. Project, Series A, AMT, 4.75%, 12/01/30	6,500	5,562,310
Selma IDB Alabama, RB, Gulf Opportunity Zone, International Paper, 5.80%, 5/01/34	1,850	1,870,350
Selma IDB Alabama, Refunding RB, International Paper Co. Project, Series B, 5.50%, 5/01/20	5,000	5,071,900
		15,480,920
<b>Arizona 2.1%</b>		
Maricopa County IDA Arizona, RB, Arizona Charter Schools Project, Series A, 6.75%, 7/01/29	4,100	2,830,107
Maricopa County Pollution Control Corp., Refunding RB, Southern California Edison Co., Series A, 5.00%, 6/01/35	3,400	3,415,946
Pima County IDA, RB, Arizona Charter Schools Project, Series E, 7.25%, 7/01/31	2,025	2,033,525
Pima County IDA, Refunding RB: Arizona Charter Schools Project, Series I, 6.10%, 7/01/24 (b)	490	460,869
Arizona Charter Schools Project, Series I, 6.30%, 7/01/31 (b)	985	902,014
Arizona Charter Schools Project, Series O, 5.00%, 7/01/26	1,545	1,260,983
Charter Schools II, Series A, 6.75%, 7/01/21	925	926,702
State of Arizona, COP, Department of Administration, Series A (AGM), 5.25%, 10/01/28	750	794,820
		12,624,966
<b>California 10.4%</b>		
California HFA, RB, Home Mortgage, Series K, AMT, 5.50%, 2/01/42	4,115	4,192,568

Municipal Bonds	Par (000)	Value
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**California (concluded)**

California Health Facilities Financing Authority, Refunding RB, Series A: Catholic Healthcare West, 6.00%, 7/01/34	\$ 1,055	\$ 1,138,461
St. Joseph Health System, 5.75%, 7/01/39	5,000	5,215,350
California State Public Works Board, RB: Department of Corrections, Series C, 5.50%, 6/01/22	5,000	5,127,950
Department of Corrections, Series C, 5.50%, 6/01/23	6,000	6,135,660
Department of Mental Health, Coalinga, Series A, 5.13%, 6/01/29	10,460	10,132,811
California Statewide Communities Development Authority, RB, Health Facility, Memorial Health Services, Series A, 6.00%, 10/01/23	5,240	5,470,560
Golden State Tobacco Securitization Corp. California, RB, ARS, Asset-Backed, Series A-3, 7.88%, 6/01/13 (a)	10,725	12,768,970
Los Angeles Department of Airports, RB, Series A, 5.25%, 5/15/39	1,200	1,252,272
State of California, GO, Various Purpose, 6.50%, 4/01/33	9,700	10,959,545
		<u>62,394,147</u>

**Colorado 3.1%**

City of Aurora Colorado, RB, Children s Hospital Association, 5.00%, 12/01/40	4,000	3,975,200
Colorado Health Facilities Authority, RB, Catholic Health Initiatives, Series D, 6.25%, 10/01/33	2,500	2,768,300
Colorado Health Facilities Authority, Refunding RB, Series A: Evangelical Lutheran, 5.25%, 6/01/34	3,000	2,850,900
Sisters of Leavenworth, 5.00%, 1/01/40	8,705	8,711,181

**Portfolio Abbreviations**

To simplify the listings of portfolio holdings in the Schedule of Investments, the names and descriptions of many of the securities have been abbreviated according to the following list:

AGC	Assured Guaranty Corp.
AGM	Assured Guaranty Municipal Corp.
AMBAC	American Municipal Bond Assurance Corp.
AMT	Alternative Minimum Tax (subject to)
ARB	Airport Revenue Bonds
ARS	Auction Rate Securities
CAB	Capital Appreciation Bonds
COP	Certificates of Participation
EDA	Economic Development Authority

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FHA	Federal Housing Administration
GNMA	Government National Mortgage Association
GO	General Obligation Bonds
HDA	Housing Development Authority
HFA	Housing Finance Agency
HRB	Housing Revenue Bonds
IDA	Industrial Development Authority
IDB	Industrial Development Board
MRB	Mortgage Revenue Bonds
NPFGC	National Public Finance Guarantee Corp.
RB	Revenue Bonds
S/F	Single Family

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BLACKROCK MUNIVEST FUND, INC.

MAY 31, 2010

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## Schedule of Investments (continued)

**BlackRock MuniVest Fund, Inc. (MVF)**  
 (Percentages shown are based on Net Assets)

Municipal Bonds	Par (000)	Value
<b>Colorado (concluded)</b>		
Colorado Housing & Finance Authority, Refunding RB, S/F Program, Senior Series A-2, AMT:		
6.60%, 5/01/28	\$ 375	\$ 386,805
7.50%, 4/01/31	140	148,862
		<u>18,841,248</u>
<b>Connecticut 0.4%</b>		
Mohegan Tribe of Indians of Connecticut, RB, Public Improvement, Priority Distribution, 6.25%, 1/01/31	2,810	2,266,855
<b>District of Columbia 0.2%</b>		
Metropolitan Washington Airports Authority, RB, First Senior Lien, Series A:		
5.00%, 10/01/39	415	430,658
5.25%, 10/01/44	650	684,372
		<u>1,115,030</u>
<b>Florida 6.7%</b>		
County of Miami-Dade Florida, GO, Building Better Communities Program:		
Series B, 6.38%, 7/01/28	4,630	5,326,584
Series B-1, 5.63%, 7/01/38	5,000	5,335,800
County of Miami-Dade Florida, Refunding RB, Miami International Airport:		
AMT (AGC), 5.00%, 10/01/40	10,000	9,563,500
Series A-1, 5.38%, 10/01/41	10,290	10,481,394
Hillsborough County IDA, RB, H. Lee Moffitt Cancer Center Project, Series A, 5.25%, 7/01/37	6,500	6,193,070
Miami-Dade County IDA, RB, Waste Management Inc. Project, Series 1, Mandatory Put Bonds, AMT, 7.00%, 12/01/18	3,200	3,251,552
		<u>40,151,900</u>
<b>Georgia 3.0%</b>		
De Kalb County Hospital Authority Georgia, RB, DeKalb Medical Center	3,570	3,584,423

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Inc. Project, 6.13%, 9/01/40 De Kalb Private Hospital Authority, Refunding RB, Children s Healthcare, 5.25%, 11/15/39	3,335	3,453,126
Gainesville Redevelopment Authority, Refunding RB, Riverside Military Academy, 5.13%, 3/01/37	1,100	712,635
Monroe County Development Authority Georgia, Refunding RB, Oglethorpe Power Corp.-Scherer, Series A, 6.80%, 1/01/11	4,785	4,925,009

Municipal Bonds	Par (000)	Value
<b>Georgia (concluded)</b>		
Municipal Electric Authority of Georgia, RB, Series W: 6.60%, 1/01/18	\$ 4,565	\$ 5,340,365
6.60%, 1/01/18 (c)	250	285,577
		<u>18,301,135</u>

<b>Idaho 0.0%</b>		
Idaho Housing & Finance Association, Refunding RB, S/F Mortgage, Senior Series E-2, AMT, 6.90%, 1/01/27	135	135,244

<b>Illinois 10.0%</b>		
City of Chicago Illinois, ARB, General, Third Lien, Series B-2, AMT (NPFGC), 6.00%, 1/01/27	17,080	17,782,159
City of Chicago Illinois, RB, Series C, AMT (GNMA), 7.00%, 3/01/32	60	61,668
Illinois Finance Authority, RB: Advocate Health Care Network, Series D, 6.50%, 11/01/38	9,700	10,788,631
Community Rehabilitation Providers Facilities, Series A, 6.50%, 7/01/22	2,140	2,155,836
Illinois Finance Authority, Refunding RB, Northwestern Memorial Hospital, Series A, 6.00%, 8/15/39	9,000	9,823,860
Regional Transportation Authority, RB: Series A (AMBAC), 7.20%, 11/01/20	3,500	4,301,570
Series C (NPFGC), 7.75%, 6/01/20	4,000	5,145,560
Village of Hodgkins Illinois, RB, MBM Project, AMT, 6.00%, 11/01/23	10,000	10,006,100
		<u>60,065,384</u>

<b>Indiana 5.7%</b>		
Indiana Finance Authority, Refunding RB, Duke Energy Indiana Inc., Series C, 4.95%, 10/01/40	2,380	2,374,645
Indiana Health & Educational Facilities Financing Authority, RB, Clarian Health Obligation, Series A, 5.25%, 2/15/40	8,980	8,729,279

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Indiana Transportation Finance Authority, RB, Series A, 6.80%, 12/01/16	8,195	9,332,220
Indianapolis Local Public Improvement Bond Bank, Refunding RB, Series D, 6.75%, 2/01/14	12,875	14,096,580
		<u>34,532,724</u>
<b>Kansas 0.4%</b>		
Sedgwick & Shawnee Counties Kansas, RB, Mortgage-Backed Securities Program, Series A-4, AMT (GNMA), 5.95%, 12/01/33	2,145	2,233,503

## Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)  
(Percentages shown are based on Net Assets)

Municipal Bonds	Par (000)	Value
<b>Kentucky 1.9%</b>		
Kentucky Economic Development Finance Authority, Refunding RB, Owensboro Medical Health System, Series A, 6.38%, 6/01/40	\$ 2,000	\$ 2,049,760
Kentucky Housing Corp., Refunding RB, Series L, AMT, 5.25%, 1/01/38	7,235	7,429,115
Louisville & Jefferson County Metropolitan Sewer District, RB, Series A (AGC), 4.25%, 5/15/38	1,940	1,887,329
		<u>11,366,204</u>
<b>Maine 1.2%</b>		
Maine Health & Higher Educational Facilities Authority, RB, Series A, 5.00%, 7/01/39	5,000	5,139,550
Portland New Public Housing Authority Maine, Refunding RB, Senior Living, Series A:		
5.70%, 8/01/21	775	782,401
6.00%, 2/01/34	1,190	1,151,932
		<u>7,073,883</u>
<b>Maryland 1.5%</b>		
Maryland Community Development Administration, RB, AMT, 5.10%, 9/01/37	1,835	1,848,414
Maryland Community Development Administration, Refunding RB, Residential, Series D, AMT, 4.90%, 9/01/42	3,250	3,152,402
Maryland Health & Higher Educational Facilities Authority, Refunding RB, University of Maryland Medical System:		
5.00%, 7/01/34	2,100	2,115,162
5.13%, 7/01/39	2,100	2,129,610
		<u>9,245,588</u>
<b>Massachusetts 7.2%</b>		
Boston Water & Sewer Commission, RB, 9.25%, 1/01/11 (c)	985	1,033,137
Massachusetts Bay Transportation Authority, Refunding RB, General	3,010	3,701,818



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Transportation System, Series A, 7.00%, 3/01/19		
Massachusetts HFA, HRB, Series A, AMT, 5.20%, 12/01/37	3,000	3,021,000
Massachusetts HFA, RB, S/F, Series 130, AMT, 5.00%, 12/01/32	2,500	2,499,975
Massachusetts HFA, Refunding HRB, Series D, AMT, 4.85%, 6/01/40	3,000	2,847,420
Massachusetts School Building Authority, RB, Series A (AGM), 5.00%, 8/15/37	10,000	10,454,800

Municipal Bonds	Par (000)	Value
<b>Massachusetts (concluded)</b>		
Massachusetts Water Resources Authority, RB, Series A, 6.50%, 7/15/19 (c)	\$ 16,000	\$ 19,531,840
		<u>43,089,990</u>

<b>Michigan 5.3%</b>		
City of Detroit Michigan, RB, Second Lien, Series B (AGM): 6.25%, 7/01/36	2,500	2,739,325
7.00%, 7/01/36	1,250	1,444,625
Michigan State Hospital Finance Authority, Refunding RB: Henry Ford Health System, Series A, 5.25%, 11/15/46	7,950	7,341,428
Hospital, Crittenton, Series A, 5.63%, 3/01/27	1,900	1,892,685
Hospital, Oakwood Obligation Group, Series A, 5.00%, 7/15/25	905	892,574
Hospital, Sinai Hospital, 6.70%, 1/01/26	1,000	957,390
McLaren Health Care, 5.75%, 5/15/38	7,285	7,481,258
Trinity Health, Series A, 6.00%, 12/01/20	4,200	4,283,832
Royal Oak Hospital Finance Authority Michigan, Refunding RB, William Beaumont Hospital, 8.25%, 9/01/39	4,100	4,893,924
		<u>31,927,041</u>

<b>Mississippi 5.3%</b>		
County of Lowndes Mississippi, Refunding RB, Weyerhaeuser Co. Project: Series A, 6.80%, 4/01/22	9,160	9,846,359
Series B, 6.70%, 4/01/22	4,500	4,799,250
Mississippi Business Finance Corp., Refunding RB, System Energy Resource Inc. Project: 5.88%, 4/01/22	15,000	15,038,100
5.90%, 5/01/22	2,250	2,255,715

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31,939,424

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**Nevada 0.9%**

County of Clark Nevada, RB, Series B, 5.75%, 7/01/42	5,000	5,317,950
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**New Hampshire 0.4%**

New Hampshire Health & Education Facilities Authority, Refunding RB, Elliot Hospital, Series B, 5.60%, 10/01/22	2,525	2,534,696
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**New Jersey 5.8%**

New Jersey EDA, RB, Cigarette Tax: 5.50%, 6/15/24	9,080	9,006,997
5.75%, 6/15/29	2,885	2,878,278
5.75%, 6/15/34	3,695	3,642,790

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BLACKROCK MUNIVEST FUND, INC.

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## Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)  
(Percentages shown are based on Net Assets)

Municipal Bonds	Par (000)	Value
<b>New Jersey (concluded)</b>		
New Jersey EDA, Refunding RB, School Facilities Construction, Series AA, 5.25%, 12/15/33	\$ 10,000	\$ 10,728,900
New Jersey State Housing & Mortgage Finance Agency, RB, Series AA, 6.38%, 10/01/28	1,520	1,684,510
Tobacco Settlement Financing Corp. New Jersey, RB, 7.00%, 6/01/13 (a)	5,980	7,024,526
		<u>34,966,001</u>
<b>New York 3.5%</b>		
Metropolitan Transportation Authority, RB, Series 2008-C: 6.25%, 11/15/23	3,245	3,828,127
6.50%, 11/15/28	14,925	17,476,279
		<u>21,304,406</u>
<b>North Carolina 0.7%</b>		
City of Charlotte North Carolina, Refunding RB, Series A, 5.50%, 7/01/34	800	854,904
Gaston County Industrial Facilities & Pollution Control Financing Authority North Carolina, RB, Exempt Facilities, National Gypsum Co. Project, AMT, 5.75%, 8/01/35	4,105	3,137,082
		<u>3,991,986</u>
<b>Ohio 3.5%</b>		
Buckeye Tobacco Settlement Financing Authority, RB, Asset-Backed, Senior Series A-2, 6.50%, 6/01/47	15,970	12,573,500
Ohio Higher Educational Facility Commission, Refunding RB, Kenyon College Project, 5.25%, 7/01/44	8,000	8,310,880
		<u>20,884,380</u>
<b>Pennsylvania 1.0%</b>		
Lycoming County Authority, Refunding RB, Susquehanna Health System Project, Series A, 5.75%, 7/01/39	3,950	4,011,225

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<b>Philadelphia Authority for Industrial Development, RB:</b>		
Arbor House Inc. Project, Series E, 6.10%, 7/01/33	1,000	960,510
Rieder House Project, Series A, 6.10%, 7/01/33	1,355	1,301,491
		6,273,226

<b>Puerto Rico 2.8%</b>		
Puerto Rico Sales Tax Financing Corp., RB, First Sub-Series A, 6.38%, 8/01/39	13,000	14,596,400
Puerto Rico Sales Tax Financing Corp., Refunding RB, CAB, Series A (NPFGC), 5.71%, 8/01/41 (d)	15,000	2,358,600
		16,955,000

Municipal Bonds	Par (000)	Value
<b>South Carolina 1.0%</b>		
County of Georgetown South Carolina, Refunding RB, International Paper Co. Project, Series A, AMT, 5.55%, 12/01/29	\$ 1,000	\$ 956,410
County of Richland South Carolina, Refunding RB, International Paper Co. Project, AMT, 6.10%, 4/01/23	5,000	5,061,150
		6,017,560

<b>Texas 12.1%</b>		
Brazos River Authority, Refunding RB, Texas Utility Co., Series, AMT, 7.70%, 4/01/33	3,055	1,784,670
Brazos River Harbor Navigation District, Refunding RB, Dow Chemical Co. Project, Series A7, AMT, 6.63%, 5/15/33	11,460	11,659,862
City of Houston Texas, RB, Senior Lien, Series A, 5.50%, 7/01/34	8,335	8,982,546
Guadalupe-Blanco River Authority, RB, EI du Pont de Nemours & Co. Project, AMT, 6.40%, 4/01/26	10,250	10,258,815
Gulf Coast Waste Disposal Authority, Refunding RB, Series A, AMT, 6.10%, 8/01/24	4,000	4,009,080
Harris County Health Facilities Development Corp., Refunding RB, Memorial Hermann Healthcare System, Series B: 7.13%, 12/01/31	3,500	3,945,655
7.25%, 12/01/35	5,400	6,101,838
Harris County-Houston Sports Authority, Refunding RB, Senior Lien, Series G (NPFGC), 5.75%, 11/15/20	5,130	5,214,389

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Houston Industrial Development Corp., RB, Senior, Air Cargo, AMT, 6.38%, 1/01/23	1,790	1,748,311
La Vernia Higher Education Finance Corp., RB, KIPP Inc., 6.25%, 8/15/39	925	956,959
Matagorda County Navigation District No. 1 Texas, Refunding RB, CenterPoint Energy Project, 5.60%, 3/01/27	9,355	9,333,951
North Texas Tollway Authority, Refunding RB, First Tier, Series A, 6.25%, 1/01/39	3,500	3,856,265
Texas Private Activity Bond Surface Transportation Corp., RB, Senior Lien, Note Mobility, 6.88%, 12/31/39	4,710	4,950,775
		72,803,116
<b>U.S. Virgin Islands 1.4%</b>		
United States Virgin Islands, Refunding RB, Senior Secured, Hovensa Coker Project, AMT, 6.50%, 7/01/21	8,000	8,118,960

## Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)  
(Percentages shown are based on Net Assets)

Municipal Bonds	Par (000)	Value
<b>Vermont 0.2%</b>		
Vermont Educational & Health Buildings Financing Agency, RB, Developmental & Mental Health, Series A, 6.38%, 6/15/22	\$ 1,000	\$ 979,830
<b>Virginia 4.3%</b>		
Chesterfield County IDA, Refunding RB, Virginia Electric & Power Co., Series A, 5.88%, 6/01/17	1,425	1,469,132
City of Norfolk Virginia, Refunding RB, Series B (AMBAC), 5.50%, 2/01/31	4,225	4,214,311
Fairfax County EDA, Refunding RB, Goodwin House Inc.:		
5.13%, 10/01/37	2,000	1,941,180
5.13%, 10/01/42	7,015	6,814,932
Tobacco Settlement Financing Corp. Virginia, Refunding RB, Senior Series B1, 5.00%, 6/01/47	15,000	9,958,050
Virginia HDA, Refunding RB, Sub-Series A3, AMT, 5.05%, 7/01/26	1,325	1,355,846
		<u>25,753,451</u>
<b>Washington 4.6%</b>		
Energy Northwest, Refunding RB, Series B, 7.13%, 7/01/16	14,320	18,040,336
Seattle Housing Authority Washington, HRB, Replacement Housing Projects, 6.13%, 12/01/32	2,265	2,124,683
Washington Health Care Facilities Authority, Refunding RB, Catholic Health Initiatives, Series D, 6.38%, 10/01/36	7,000	7,719,600
		<u>27,884,619</u>
<b>West Virginia 0.4%</b>		
West Virginia Hospital Finance Authority, Refunding RB, Charleston, Series A, 5.63%, 9/01/32	2,500	2,565,975
<b>Wisconsin 2.1%</b>		
City of Milwaukee Wisconsin, RB, Senior, Air Cargo, AMT, 6.50%, 1/01/25	1,605	1,572,354

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Wisconsin Health & Educational Facilities Authority, MRB, Hudson Memorial Hospital (FHA), 5.70%, 1/15/29	4,500	4,568,040
Wisconsin Health & Educational Facilities Authority, RB, SynergyHealth Inc., 6.00%, 11/15/32	3,040	3,127,978
Wisconsin Housing & EDA, Refunding RB, Series A, AMT, 5.63%, 3/01/31	3,390	3,523,634
		<u>12,792,006</u>

<b>Municipal Bonds</b>	<b>Par (000)</b>	<b>Value</b>
<b>Wyoming 0.8%</b>		
County of Sweetwater Wyoming, Refunding RB, Idaho Power Co. Project, 5.25%, 7/15/26	\$ 4,500	\$ 4,776,750
<b>Total Municipal Bonds 112.5%</b>		<u>676,705,098</u>

**Municipal Bonds Transferred to Tender Option Bond Trusts (e)**

<b>Arizona 0.6%</b>		
Phoenix Civic Improvement Corp., RB, Junior Lien, Series A, 5.00%, 7/01/34	3,500	3,674,545
<b>California 5.4%</b>		
Los Angeles Community College District California, GO, Election of 2008, Series A, 6.00%, 8/01/33	9,586	10,802,526
University of California, RB, Series O, 5.25%, 5/15/39	20,000	21,477,600
		<u>32,280,126</u>
<b>Connecticut 2.1%</b>		
Connecticut State Health & Educational Facility Authority, RB, Yale University, Series Z-3, 5.05%, 7/01/42	12,000	12,664,680
<b>District of Columbia 1.4%</b>		
District of Columbia Water & Sewer Authority, RB, Series A, 5.50%, 10/01/39	7,495	8,119,470
<b>Florida 2.5%</b>		
County of Miami-Dade Florida, RB, Water & Sewer System (AGM), 5.00%, 10/01/39	14,747	15,276,236

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**Illinois 3.4%**

City of Chicago Illinois, Refunding RB, Second Lien (AGM), 5.25%, 11/01/33	1,330	1,415,133
Illinois Finance Authority, RB, University of Chicago, Series B, 6.25%, 7/01/38	10,000	11,564,300
Illinois State Toll Highway Authority, RB, Series B, 5.50%, 1/01/33	6,999	7,627,525
		<u>20,606,958</u>

**Kentucky 4.2%**

Kentucky Economic Development Finance Authority, Refunding RB, St. Elizabeth, Series A, 5.50%, 5/01/39	8,003	8,352,409
Lexington-Fayette Urban County Airport Board, Refunding RB, Series A, 5.00%, 7/01/27	7,001	7,497,662

BLACKROCK MUNIVEST FUND, INC.

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## Schedule of Investments (continued)

BlackRock MuniVest Fund, Inc. (MVF)  
(Percentages shown are based on Net Assets)

Municipal Bonds Transferred to Tender Option Bond Trusts (e)	Par (000)	Value
<b>Kentucky (concluded)</b>		
Louisville & Jefferson County Metropolitan Government Parking Authority, RB, Series A, 5.38%, 12/01/39	\$ 9,195	\$ 9,652,083
		<u>25,502,154</u>
<b>Maryland 0.8%</b>		
Maryland State Transportation Authority, RB, Transportation Facility Project (AGM), 5.00%, 7/01/41	4,710	4,982,615
<b>Nevada 2.9%</b>		
Clark County Water Reclamation District, GO, Series B, 5.75%, 7/01/34	15,789	17,597,820
<b>New York 5.0%</b>		
New York City Municipal Water Finance Authority, RB: Series DD, 5.00%, 6/15/37	24,199	25,323,503
Series FF-2, 5.50%, 6/15/40	4,154	4,633,002
		<u>29,956,505</u>
<b>North Carolina 3.1%</b>		
North Carolina Capital Facilities Finance Agency, Refunding RB: Duke University Project, Series A, 5.00%, 10/01/41	12,678	13,201,370
Wake Forest University, 5.00%, 1/01/38	5,000	5,296,900
		<u>18,498,270</u>
<b>Ohio 3.7%</b>		
County of Allen Ohio, Refunding RB, Catholic Healthcare, Series A, 5.25%, 6/01/38	2,870	2,939,569
County of Montgomery Ohio, Refunding RB, Catholic Healthcare, Series A, 5.50%, 5/01/34	5,470	5,859,901
Ohio Higher Educational Facility Commission, Refunding RB, Hospital, Cleveland Clinic Health, Series A,	4,400	4,575,604

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5.25%, 1/01/33		
State of Ohio, RB, Cleveland Clinic Health, Series B, 5.50%, 1/01/34	8,500	8,969,625
		<u>22,344,699</u>

**South Carolina 0.6%**

South Carolina State Housing Finance & Development Authority, Refunding RB, Series B-1, 5.55%, 7/01/39	3,269	3,381,059
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**Texas 8.3%**

Harris County Health Facilities Development Corp., Refunding RB, School Health Care System, Series B, 5.75%, 7/01/27 (c)	20,970	25,783,034
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**Municipal Bonds Transferred to Tender Option Bond Trusts (e)**

**Par  
(000)**

**Value**

**Texas (concluded)**

Houston Higher Education Finance Corp., RB, Rice University Project, Series A, 5.00%, 5/15/40	\$ 10,000	\$ 10,612,604
Texas Department of Housing & Community Affairs, MRB, Series B, AMT (GNMA), 5.25%, 9/01/32	7,453	7,557,884
Texas State University Systems, Refunding RB (AGM), 5.00%, 3/15/30	5,667	5,885,719
		<u>49,839,241</u>

**Virginia 0.4%**

Fairfax County IDA Virginia, Refunding RB, Health Care, Inova Health System, Series A, 5.50%, 5/15/35	2,099	2,224,952
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**Washington 4.4%**

Central Puget Sound Regional Transit Authority, RB, Series A:		
5.00%, 11/01/34	5,500	5,770,875
5.00%, 11/01/36	5,500	5,770,875
(AGM), 5.00%, 11/01/32	14,007	14,806,870
		<u>26,348,620</u>

**Wisconsin 1.0%**

Wisconsin Health & Educational Facilities Authority, Refunding RB, Froedtert & Community Health Inc., 5.25%, 4/01/39	6,099	6,254,269
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**Total Municipal Bonds Transferred to Tender Option Bond Trusts 49.8%**

299,552,219

976,257,317

**Total Long-Term Investments**  
 (Cost \$934,831,747) 162.3%

**Short-Term Securities**

**Shares**

FII Institutional Tax-Exempt Fund,  
 0.25% (f)(g)

13,511,328

13,511,328

**Total Short-Term Securities**  
 (Cost \$13,511,328) 2.2%

13,511,328

**Total Investments**

(Cost \$948,343,075\*) 164.5%

989,768,645

**Other Assets Less Liabilities** 1.7%

10,368,234

**Liability for Trust Certificates, Including Interest**

**Expense and Fees Payable** (25.7)%

(154,732,820)

**Preferred Shares, at Redemption Value** (40.5)%

(243,862,908)

**Net Assets Applicable to Common Shares** 100.0%

\$ 601,541,151

## Schedule of Investments (concluded)

BlackRock MuniVest Fund, Inc. (MVF)

\* The cost and unrealized appreciation (depreciation) of investments as of May 31, 2010, as computed for federal income tax purposes, were as follows:

Aggregate cost	\$ 794,200,972
Gross unrealized appreciation	\$ 53,712,803
Gross unrealized depreciation	(12,772,665)
Net unrealized appreciation	\$ 40,940,138

- (a) US 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.
- (b) Security exempt from registration under Rule 144A of the Securities Act of 1933. These securities may be resold in transactions exempt from registration to qualified institutional investors.
- (c) Security is collateralized by Municipal or US Treasury obligations.
- (d) Represents a zero-coupon bond. Rate shown reflects the current yield as of report date.
- (e) Securities represent bonds transferred to a tender option bond trust in exchange for which the Fund acquired residual interest certificates. These securities serve as collateral in a financing transaction.
- (f) Investments in companies considered to be an affiliate of the Fund, 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, 2009	Net Activity	Shares Held at May 31, 2010	Income
FFI Institutional Tax-Exempt Fund	4,104,364	9,406,964	13,511,328	\$ 16,669

- (g) Represents the current yield as of report date.

Fair Value Measurements - Various inputs are used in determining the fair value of investments, which are as follows:

Level 1 price quotations in active markets/exchanges for identical assets and liabilities

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)

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

The inputs or methodologies used for valuing securities are not necessarily an indication of the risk associated with investing in those securities. For information about the Fund's policy regarding valuation of investments and other significant accounting policies, please refer to the Fund's most recent financial statements as contained in its semi-annual report.

The following table summarizes the inputs used as of May 31, 2010 in determining the fair valuation of the Fund's investments:

Valuation Inputs	Investments in Securities			Total
	Level 1	Level 2	Level 3	
<b>Assets:</b>				
Long-Term Investments <sup>1</sup>		\$ 976,257,317		\$ 976,257,317
Short-Term Securities	\$ 13,511,328			13,511,328
<b>Total</b>	\$ 13,511,328	\$ 976,257,317		\$ 989,768,645

<sup>1</sup> See above Schedule of Investments for values in each state or political subdivision.

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### 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 13(a)-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/ Anne F. Ackerley  
Anne F. Ackerley  
Chief Executive Officer of  
BlackRock MuniVest Fund, Inc.

Date: July 23, 2010

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/ Anne F. Ackerley  
Anne F. Ackerley  
Chief Executive Officer (principal executive officer) of  
BlackRock MuniVest Fund, Inc.

Date: July 23, 2010

By: /s/ Neal J. Andrews  
Neal J. Andrews  
Chief Financial Officer (principal financial officer) of  
BlackRock MuniVest Fund, Inc.

Date: July 23, 2010

