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# Putnam Variable Trust

## **Putnam VT Research Fund**

**Semiannual report**

**6 | 30 | 23**

# Message from the Trustees

August 7, 2023

Dear Shareholder:

Stocks have generally advanced through the first half of 2023. Recently, a strong pulse of innovation has been gaining investors' attention, and the technology sector has started to rebound from a difficult 2022. More broadly, international markets are performing well, even though the reopening of China's economy lacked the dynamism many had anticipated.

Bond markets have experienced more ups and downs, but performance has improved compared with 2022. U.S. inflation has been trending downward, while the country's economic growth has remained positive. Against this backdrop, investors are weighing the impact of high borrowing costs, stress in the banking system, and a weaker housing market.

As active managers, your investment team continues to research attractive opportunities for your fund while monitoring risks. This report offers an update on their efforts.

Thank you for investing with Putnam.

Respectfully yours,



**Robert L. Reynolds**  
President and Chief Executive Officer  
Putnam Investments



**Kenneth R. Leibler**  
Chair, Board of Trustees

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*The views expressed in this report are exclusively those of Putnam Management and are subject to change. They are not meant as investment advice. Please note that the holdings discussed in this report may not have been held by the fund for the entire period. Portfolio composition is subject to review in accordance with the fund's investment strategy and may vary in the future. Current and future portfolio holdings are subject to risk.*

**Consider these risks before investing:** Growth stocks may be more susceptible to earnings disappointments, and value stocks may fail to rebound. The value of investments in the fund's portfolio may fall or fail to rise over extended periods of time for a variety of reasons, including general economic, political, or financial market conditions; investor sentiment and market perceptions; government actions; geopolitical events or changes; and factors related to a specific issuer, geography, industry, or sector. These and other factors may lead to increased volatility and reduced liquidity in the fund's portfolio holdings.

From time to time, the fund may invest a significant portion of its assets in companies in one or more related industries or sectors, which would make the fund more vulnerable to adverse developments affecting those industries or sectors. For example, the fund may invest a significant portion of its assets in companies in the information technology sector. The information technology sector may be significantly affected by technological obsolescence or innovation, short product cycles, falling prices and profits, competitive pressures, and general market conditions.

Our investment techniques, analyses, and judgments may not produce the outcome we intend. The investments we select for the fund may not perform as well as other securities that we do not select for the fund. We, or the fund's other service providers, may experience disruptions or operating errors that could have a negative effect on the fund. You can lose money by investing in the fund.

## Performance summary (as of 6/30/23)

### Investment objective

Capital appreciation

### Net asset value June 30, 2023

Class IA: \$31.87

Class IB: \$31.71

### Annualized total return at net asset value (as of 6/30/23)

	Class IA shares (9/30/98)	Class IB shares (9/30/98)	S&P 500 Index
6 months	17.91%	17.79%	16.89%
1 year	21.47	21.13	19.59
5 years	12.56	12.28	12.31
10 years	13.13	12.85	12.86
Life of fund	7.92	7.66	8.14

Returns for periods of less than one year are not annualized.

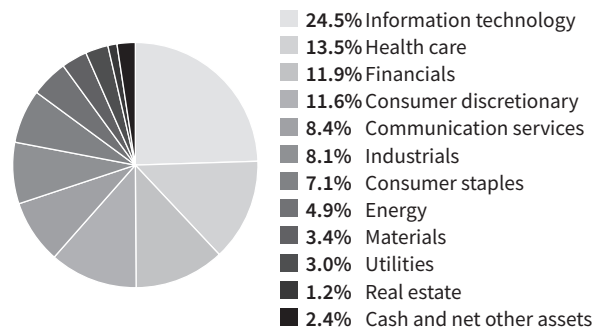
For a portion of the periods, the fund had expense limitations, without which returns would have been lower.

Recent performance may have benefited from one or more legal settlements.

The S&P 500® Index is an unmanaged index of common stock performance.

**Data represent past performance. Past performance does not guarantee future results. More recent returns may be less or more than those shown. Investment return and principal value will fluctuate, and you may have a gain or a loss when you sell your shares. Performance information does not reflect any deduction for taxes a shareholder may owe on fund distributions or on the redemption of fund shares. All total return figures are at net asset value and exclude contract charges and expenses, which are added to the variable annuity contracts to determine total return at unit value. Had these charges and expenses been reflected, performance would have been lower. For more recent performance, contact your variable annuity provider who can provide you with performance that reflects the charges and expenses at your contract level.**

### Portfolio composition



Allocations are shown as a percentage of the fund's net assets. Cash and net other assets, if any, represent the market value weights of cash, derivatives, short-term securities, and other unclassified assets in the portfolio. Summary information may differ from the portfolio schedule included in the financial statements due to the inclusion of derivative securities, any interest accruals, the exclusion of as-of trades, if any, the use of different classifications of securities for presentation purposes, and rounding. Holdings and allocations may vary over time. Due to rounding, percentages may not equal 100%.

## Understanding your fund's expenses

As an investor in a variable annuity product that invests in a registered investment company, you pay ongoing expenses, such as management fees, distribution fees (12b-1 fees), and other expenses. Using the following information, you can estimate how these expenses affect your investment and compare them with the expenses of other funds. You may also pay one-time transaction expenses, which are not shown in this section and would result in higher total expenses. Charges and expenses at the insurance company separate account level are not reflected. For more information, see your fund's prospectus or talk to your financial representative.

### Review your fund's expenses

The two left-hand columns of the Expenses per \$1,000 table show the expenses you would have paid on a \$1,000 investment in your fund from 1/1/23 to 6/30/23. They also show how much a \$1,000 investment would be worth at the close of the period, assuming *actual returns* and expenses. To estimate the ongoing expenses you paid over the period, divide your account value by \$1,000, then multiply the result by the number in the first line for the class of shares you own.

### Compare your fund's expenses with those of other funds

The two right-hand columns of the Expenses per \$1,000 table show your fund's expenses based on a \$1,000 investment, assuming a *hypothetical 5% annualized return*. You can use this information to compare the ongoing expenses (but not transaction expenses or total costs) of investing in the fund with those of other funds. All shareholder reports of mutual funds and funds serving as variable annuity vehicles will provide this information to help you make this comparison. Please note that you cannot use this information to estimate your actual ending account balance and expenses paid during the period.

### Expense ratios

	Class IA	Class IB
Total annual operating expenses for the fiscal year ended 12/31/22*	0.75%	1.00%
Annualized expense ratio for the six-month period ended 6/30/23	0.75%	1.00%

Fiscal year expense information in this table is taken from the most recent prospectus, is subject to change, and may differ from that shown for the annualized expense ratio and in the financial highlights of this report.

Expenses are shown as a percentage of average net assets.

\*Restated to reflect current fees.

### Expenses per \$1,000

	Expenses and value for a \$1,000 investment, assuming actual returns for the 6 months ended 6/30/23		Expenses and value for a \$1,000 investment, assuming a hypothetical 5% annualized return for the 6 months ended 6/30/23	
	Class IA	Class IB	Class IA	Class IB
Expenses paid per \$1,000*†	\$4.05	\$5.40	\$3.76	\$5.01
Ending value (after expenses)	\$1,179.10	\$1,177.90	\$1,021.08	\$1,019.84

\*Expenses for each share class are calculated using the fund's annualized expense ratio for each class, which represents the ongoing expenses as a percentage of average net assets for the six months ended 6/30/23. The expense ratio may differ for each share class.

†Expenses based on actual returns are calculated by multiplying the expense ratio by the average account value for the period; then multiplying the result by the number of days in the period (181); and then dividing that result by the number of days in the year (365). Expenses based on a hypothetical 5% return are calculated by multiplying the expense ratio by the average account value for the six-month period; then multiplying the result by the number of days in the six-month period (181); and then dividing that result by the number of days in the year (365).

## Your fund's managers



Portfolio Manager **Kathryn B. Lakin** is Director of Equity Research. She joined Putnam in 2012 and has been in the investment industry since 2008.

Jacquelyne J. Cavanaugh; Matthew J. LaPlant, CFA; Andrew N. O'Brien, CFA; William C. Rives, CFA; and Walter D. Scully, CPA, are also Portfolio Managers of the fund.

Your fund's managers also manage other accounts advised by Putnam Management or an affiliate, including retail mutual fund counterparts to the funds in Putnam Variable Trust.

## The fund's portfolio 6/30/23 (Unaudited)

COMMON STOCKS (97.6%)*	Shares	Value
<b>Aerospace and defense (1.6%)</b>		
Howmet Aerospace, Inc.	3,745	\$185,602
Northrop Grumman Corp.	1,075	489,985
Raytheon Technologies Corp.	5,552	543,874
		<b>1,219,461</b>
<b>Air freight and logistics (0.5%)</b>		
FedEx Corp.	1,479	366,644
		<b>366,644</b>
<b>Automobiles (1.8%)</b>		
General Motors Co.	2,704	104,266
Tesla, Inc. †	4,656	1,218,801
		<b>1,323,067</b>
<b>Banks (1.9%)</b>		
Bank of America Corp.	17,263	495,275
Citigroup, Inc.	19,254	886,454
		<b>1,381,729</b>
<b>Beverages (2.6%)</b>		
Coca-Cola Co. (The)	12,418	747,812
Constellation Brands, Inc. Class A	293	72,116
PepsiCo, Inc.	5,900	1,092,798
		<b>1,912,726</b>
<b>Biotechnology (1.7%)</b>		
AbbVie, Inc.	2,420	326,047
Alkermes PLC †	6,392	200,070
Ascendis Pharma A/S ADR (Denmark) †	3,686	328,976
Biogen, Inc. †	729	207,656
Regeneron Pharmaceuticals, Inc. †	259	186,102
		<b>1,248,851</b>
<b>Broadline retail (3.4%)</b>		
Amazon.com, Inc. †	19,220	2,505,519
		<b>2,505,519</b>
<b>Building products (0.8%)</b>		
Johnson Controls International PLC	8,401	572,444
		<b>572,444</b>
<b>Capital markets (3.4%)</b>		
Charles Schwab Corp. (The)	9,661	547,585
Goldman Sachs Group, Inc. (The)	2,532	816,671
KKR & Co., Inc.	9,608	538,048
Quilter PLC (United Kingdom)	117,886	118,574
S&P Global, Inc.	1,177	471,848
		<b>2,492,726</b>
<b>Chemicals (2.2%)</b>		
Corteva, Inc.	5,542	317,557
DuPont de Nemours, Inc.	6,375	455,430
Eastman Chemical Co.	2,233	186,947
Linde PLC	204	77,740
PPG Industries, Inc.	1,612	239,060
Sherwin-Williams Co. (The)	1,324	351,548
		<b>1,628,282</b>
<b>Construction materials (0.4%)</b>		
CRH PLC ADR (Ireland)	4,772	265,944
		<b>265,944</b>
<b>Consumer finance (0.2%)</b>		
Capital One Financial Corp.	1,437	157,165
		<b>157,165</b>
<b>Consumer staples distribution and retail (2.2%)</b>		
BJ's Wholesale Club Holdings, Inc. †	1,178	74,226
Costco Wholesale Corp.	797	429,089
Target Corp.	2,550	336,345
Walmart, Inc.	4,923	773,797
		<b>1,613,457</b>

COMMON STOCKS (97.6%)* cont.	Shares	Value
<b>Containers and packaging (0.4%)</b>		
Avery Dennison Corp.	918	\$157,712
Berry Global Group, Inc.	2,136	137,430
		<b>295,142</b>
<b>Electric utilities (2.7%)</b>		
Exelon Corp.	9,896	403,163
NextEra Energy, Inc.	5,016	372,187
NRG Energy, Inc.	25,678	960,100
PG&E Corp. †	12,951	223,793
		<b>1,959,243</b>
<b>Electrical equipment (0.1%)</b>		
Emerson Electric Co.	1,031	93,192
		<b>93,192</b>
<b>Electronic equipment, instruments, and components (1.0%)</b>		
CDW Corp./DE	2,030	372,505
Vontier Corp.	11,023	355,051
		<b>727,556</b>
<b>Energy equipment and services (0.4%)</b>		
Diamond Offshore Drilling, Inc. †	22,639	322,379
		<b>322,379</b>
<b>Entertainment (0.9%)</b>		
Netflix, Inc. †	1,326	584,090
Sea, Ltd. ADR (Singapore) †	1,639	95,128
		<b>679,218</b>
<b>Financial services (3.9%)</b>		
Apollo Global Management, Inc.	9,395	721,630
Mastercard, Inc. Class A	3,743	1,472,122
Visa, Inc. Class A	2,834	673,018
		<b>2,866,770</b>
<b>Food products (0.3%)</b>		
General Mills, Inc.	3,154	241,912
		<b>241,912</b>
<b>Ground transportation (1.7%)</b>		
CSX Corp.	6,195	211,250
Hertz Global Holdings, Inc. † §	11,103	204,184
Union Pacific Corp.	4,121	843,239
		<b>1,258,673</b>
<b>Health care equipment and supplies (2.6%)</b>		
Abbott Laboratories	1,848	201,469
Becton, Dickinson and Co.	1,179	311,268
Boston Scientific Corp. †	7,434	402,105
Dexcom, Inc. †	1,804	231,832
IDEXX Laboratories, Inc. †	249	125,055
Intuitive Surgical, Inc. †	1,206	412,380
Medtronic PLC	929	81,845
Stryker Corp.	610	186,105
		<b>1,952,059</b>
<b>Health care providers and services (4.0%)</b>		
Cigna Group (The)	2,582	724,509
Elevance Health, Inc.	219	97,300
Humana, Inc.	505	225,801
McKesson Corp.	1,465	626,009
UnitedHealth Group, Inc.	2,681	1,288,596
		<b>2,962,215</b>
<b>Hotels, restaurants, and leisure (2.2%)</b>		
Aramark	3,863	166,302
Booking Holdings, Inc. †	239	645,379
Chipotle Mexican Grill, Inc. †	166	355,074
Hilton Worldwide Holdings, Inc.	2,310	336,221
Penn Entertainment, Inc. †	3,736	89,776
		<b>1,592,752</b>
<b>Household durables (0.9%)</b>		
PulteGroup, Inc.	8,457	656,940
		<b>656,940</b>

<b>COMMON STOCKS (97.6%)* cont.</b>	<b>Shares</b>	<b>Value</b>
<b>Household products (1.7%)</b>		
Procter & Gamble Co. (The)	8,426	\$1,278,561
		<b>1,278,561</b>
<b>Independent power and renewable electricity producers (0.1%)</b>		
Vistra Corp.	2,765	72,581
		<b>72,581</b>
<b>Industrial conglomerates (0.9%)</b>		
General Electric Co.	1,307	143,574
Honeywell International, Inc.	2,423	502,773
		<b>646,347</b>
<b>Insurance (2.5%)</b>		
AIA Group, Ltd. (Hong Kong)	29,000	295,892
Assured Guaranty, Ltd.	13,699	764,404
AXA SA (France)	11,390	335,888
Prudential PLC (United Kingdom)	34,081	479,790
		<b>1,875,974</b>
<b>Interactive media and services (6.2%)</b>		
Alphabet, Inc. Class A †	23,450	2,806,965
Meta Platforms, Inc. Class A †	6,276	1,801,086
		<b>4,608,051</b>
<b>Life sciences tools and services (1.5%)</b>		
Bio-Rad Laboratories, Inc. Class A †	455	172,500
Danaher Corp.	1,377	330,480
ICON PLC (Ireland) †	101	25,270
Thermo Fisher Scientific, Inc.	1,052	548,881
		<b>1,077,131</b>
<b>Machinery (1.6%)</b>		
Deere & Co.	459	185,982
Ingersoll Rand, Inc.	4,960	324,186
Otis Worldwide Corp.	7,201	640,961
		<b>1,151,129</b>
<b>Media (0.2%)</b>		
Charter Communications, Inc. Class A †	399	146,581
		<b>146,581</b>
<b>Metals and mining (0.4%)</b>		
Agnico-Eagle Mines, Ltd. (Canada)	3,038	151,699
Glencore PLC (United Kingdom)	28,911	163,207
		<b>314,906</b>
<b>Multi-utilities (0.3%)</b>		
Ameren Corp.	2,457	200,663
		<b>200,663</b>
<b>Office REITs (0.2%)</b>		
Vornado Realty Trust <sup>R</sup>	7,626	138,336
		<b>138,336</b>
<b>Oil, gas, and consumable fuels (4.5%)</b>		
BP PLC (United Kingdom)	52,443	305,273
Cenovus Energy, Inc. (Canada)	40,763	692,333
ConocoPhillips	4,186	433,711
Exxon Mobil Corp.	13,930	1,493,993
Shell PLC (United Kingdom)	13,908	413,759
		<b>3,339,069</b>
<b>Passenger airlines (0.3%)</b>		
Southwest Airlines Co.	7,071	256,041
		<b>256,041</b>
<b>Personal care products (0.1%)</b>		
Kenvue, Inc. † <sup>S</sup>	3,647	96,354
		<b>96,354</b>
<b>Pharmaceuticals (3.7%)</b>		
4Front Ventures Corp. †	252,907	39,428
Eli Lilly and Co.	1,775	832,440
Innoviva, Inc. †	23,267	296,189
Johnson & Johnson	4,144	685,915
Merck & Co., Inc.	6,290	725,803

<b>COMMON STOCKS (97.6%)* cont.</b>	<b>Shares</b>	<b>Value</b>		
<b>Pharmaceuticals cont.</b>				
TerrAscend Corp. (Canada) †	17,486	\$31,650		
Zoetis, Inc.	812	139,835		
		<b>2,751,260</b>		
<b>Semiconductors and semiconductor equipment (6.2%)</b>				
Advanced Micro Devices, Inc. †	7,115	810,470		
Broadcom, Inc.	1,265	1,097,299		
NVIDIA Corp.	4,624	1,956,044		
Qualcomm, Inc.	6,222	740,667		
		<b>4,604,480</b>		
<b>Software (12.2%)</b>				
Intuit, Inc.	1,534	702,860		
Microsoft Corp.	15,598	5,311,743		
Oracle Corp.	16,847	2,006,309		
Salesforce, Inc. †	4,734	1,000,105		
		<b>9,021,017</b>		
<b>Specialized REITs (1.0%)</b>				
American Tower Corp. <sup>R</sup>	1,696	328,922		
Gaming and Leisure Properties, Inc. <sup>R</sup>	8,438	408,905		
		<b>737,827</b>		
<b>Specialty retail (2.7%)</b>				
CarMax, Inc. †	2,423	202,805		
Home Depot, Inc. (The)	4,206	1,306,552		
O'Reilly Automotive, Inc. †	328	313,338		
TJX Cos., Inc. (The)	1,585	134,392		
Warby Parker, Inc. Class A †	1,766	20,645		
		<b>1,977,732</b>		
<b>Technology hardware, storage, and peripherals (5.0%)</b>				
Apple, Inc.	19,192	3,722,672		
		<b>3,722,672</b>		
<b>Textiles, apparel, and luxury goods (0.7%)</b>				
Levi Strauss & Co. Class A <sup>S</sup>	4,018	57,980		
Lululemon Athletica, Inc. (Canada) †	319	120,742		
Nike, Inc. Class B	2,946	325,150		
		<b>503,872</b>		
<b>Tobacco (0.1%)</b>				
Altria Group, Inc.	1,516	68,675		
		<b>68,675</b>		
<b>Trading companies and distributors (0.6%)</b>				
United Rentals, Inc.	959	427,110		
		<b>427,110</b>		
<b>Wireless telecommunication services (1.1%)</b>				
T-Mobile US, Inc. †	5,787	803,814		
		<b>803,814</b>		
<b>Total common stocks (cost \$51,139,358)</b>		<b>\$72,116,249</b>		
<b>PURCHASED OPTIONS</b>	<b>Expiration</b>	<b>Notional</b>	<b>Contract</b>	<b>Value</b>
<b>OUTSTANDING (—%)*</b>	<b>date/strike</b>	<b>amount</b>	<b>amount</b>	
<b>Counterparty</b>	<b>price</b>			
<b>Barclays Bank PLC</b>				
Becton, Dickinson and Co. (Call)	Jan-24/\$290.00	\$303,347	\$1,149	\$5,478
<b>UBSAG</b>				
Hertz Global Holdings, Inc. (Call)	Jun-24/25.00	126,891	6,900	8,229
<b>Total purchased options outstanding (cost \$13,794)</b>				<b>\$13,707</b>

	Principal amount/shares	Value
<b>SHORT-TERM INVESTMENTS (3.0%)*</b>		
Putnam Cash Collateral Pool, LLC 5.28% <sup>d</sup> Shares	285,030	\$285,030
Putnam Short Term Investment Fund Class P 5.23% <sup>L</sup>	Shares 1,799,260	1,799,260
U.S. Treasury Bills 5.324%, 11/16/23 <sup>#</sup>	\$100,000	98,043
<b>Total short-term investments (cost \$2,182,333)</b>		<b>\$2,182,333</b>

**Total investments (cost \$53,335,485) \$74,312,289**

#### Key to holding's abbreviations

ADR American Depository Receipts: Represents ownership of foreign securities on deposit with a custodian bank.

#### Notes to the fund's portfolio

Unless noted otherwise, the notes to the fund's portfolio are for the close of the fund's reporting period, which ran from January 1, 2023 through June 30, 2023 (the reporting period). Within the following notes to the portfolio, references to "Putnam Management" represent Putnam Investment Management, LLC, the fund's manager, an indirect wholly-owned subsidiary of Putnam Investments, LLC and references to "ASC 820" represent Accounting Standards Codification 820 *Fair Value Measurements and Disclosures*.

\* Percentages indicated are based on net assets of \$73,889,666.

† This security is non-income-producing.

# This security, in part or in entirety, was pledged and segregated with the broker to cover margin requirements for futures contracts at the close of the reporting period. Collateral at period end totaled \$59,762 and is included in Investments in securities on the Statement of assets and liabilities (Notes 1 and 8).

<sup>d</sup> Affiliated company. See Notes 1 and 5 to the financial statements regarding securities lending. The rate quoted in the security description is the annualized 7-day yield of the fund at the close of the reporting period.

<sup>L</sup> Affiliated company (Note 5). The rate quoted in the security description is the annualized 7-day yield of the fund at the close of the reporting period.

<sup>R</sup> Real Estate Investment Trust.

<sup>S</sup> Security on loan, in part or in entirety, at the close of the reporting period (Note 1).

Unless otherwise noted, the rates quoted in Short-term investments security descriptions represent the weighted average yield to maturity.

The dates shown on debt obligations are the original maturity dates.

#### FORWARD CURRENCY CONTRACTS at 6/30/23 (aggregate face value \$6,436,493) (Unaudited)

Counterparty	Currency	Contract type*	Delivery date	Value	Aggregate face value	Unrealized appreciation/(depreciation)
<b>Bank of America N.A.</b>						
	British Pound	Sell	9/20/23	\$255,071	\$248,633	\$(6,438)
	Canadian Dollar	Buy	7/19/23	340,284	340,905	(621)
	Canadian Dollar	Sell	7/19/23	340,284	336,115	(4,169)
	Canadian Dollar	Sell	10/18/23	160,296	159,931	(365)
	Danish Krone	Sell	9/20/23	172,128	169,677	(2,451)
	Euro	Sell	9/20/23	104,718	103,642	(1,076)
<b>Barclays Bank PLC</b>						
	British Pound	Sell	9/20/23	158,022	154,098	(3,924)
	Euro	Sell	9/20/23	153,571	152,020	(1,551)
<b>Citibank, N.A.</b>						
	Canadian Dollar	Buy	7/19/23	214,877	214,396	481
	Canadian Dollar	Sell	7/19/23	214,877	212,249	(2,628)
	Canadian Dollar	Sell	10/18/23	215,190	214,714	(476)
	Danish Krone	Sell	9/20/23	174,366	171,872	(2,494)
<b>Goldman Sachs International</b>						
	British Pound	Sell	9/20/23	601,473	586,612	(14,861)
	Euro	Sell	9/20/23	119,177	117,958	(1,219)
<b>JPMorgan Chase Bank N.A.</b>						
	Canadian Dollar	Buy	7/19/23	321,334	320,612	722
	Canadian Dollar	Sell	7/19/23	321,334	317,417	(3,917)
	Canadian Dollar	Sell	10/18/23	321,803	321,088	(715)
	Euro	Sell	9/20/23	93,654	92,703	(951)
	Singapore Dollar	Sell	8/16/23	131,816	133,687	1,871
<b>Morgan Stanley &amp; Co. International PLC</b>						
	British Pound	Sell	9/20/23	186,603	181,911	(4,692)
	Hong Kong Dollar	Sell	8/16/23	166,033	166,228	195
<b>NatWest Markets PLC</b>						
	Canadian Dollar	Buy	7/19/23	145,189	144,831	358
	Canadian Dollar	Sell	7/19/23	145,189	143,399	(1,790)
	Canadian Dollar	Sell	10/18/23	145,401	145,038	(363)

FORWARD CURRENCY CONTRACTS at 6/30/23 (aggregate face value \$6,436,493) (Unaudited) cont.						
Counterparty	Currency	Contract type*	Delivery date	Value	Aggregate face value	Unrealized appreciation/(depreciation)
<b>State Street Bank and Trust Co.</b>						
	British Pound	Sell	9/20/23	\$183,554	\$178,969	\$(4,585)
	Hong Kong Dollar	Sell	8/16/23	118,889	119,024	135
<b>UBSAG</b>						
	Canadian Dollar	Buy	7/19/23	169,123	168,759	364
	Canadian Dollar	Sell	7/19/23	169,123	167,058	(2,065)
	Canadian Dollar	Sell	10/18/23	169,370	169,001	(369)
	Euro	Sell	9/20/23	127,173	125,887	(1,286)
<b>WestPac Banking Corp.</b>						
	Canadian Dollar	Buy	7/19/23	180,222	176,844	3,378
	Canadian Dollar	Sell	7/19/23	180,222	181,215	993
<b>Unrealized appreciation</b>						<b>8,497</b>
<b>Unrealized (depreciation)</b>						<b>(63,006)</b>
<b>Total</b>						<b>\$(54,509)</b>

\* The exchange currency for all contracts listed is the United States Dollar.

FUTURES CONTRACTS OUTSTANDING at 6/30/23 (Unaudited)	Number of contracts	Notional amount	Value	Expiration date	Unrealized appreciation
S&P 500 Index E-Mini (Long)	5	\$1,112,595	\$1,122,063	Sep-23	\$13,389
<b>Unrealized appreciation</b>					<b>13,389</b>
<b>Unrealized (depreciation)</b>					<b>—</b>
<b>Total</b>					<b>\$13,389</b>

WRITTEN OPTIONS OUTSTANDING at 6/30/23 (premiums \$7,184) (Unaudited)					
Counterparty	Expiration date/strike price	Notional Amount	Contract amount	Value	
<b>Barclays Bank PLC</b>					
Becton, Dickinson and Co. (Call)	Jan-24/\$300.00	\$303,347	\$1,149	\$3,008	
<b>UBSAG</b>					
Hertz Global Holdings, Inc. (Call)	Jun-24/30.00	126,891	6,900	3,355	
<b>Total</b>					<b>\$6,363</b>



ASC 820 establishes a three-level hierarchy for disclosure of fair value measurements. The valuation hierarchy is based upon the transparency of inputs to the valuation of the fund's investments. The three levels are defined as follows:

Level 1: Valuations based on quoted prices for identical securities in active markets.

Level 2: Valuations based on quoted prices in markets that are not active or for which all significant inputs are observable, either directly or indirectly.

Level 3: Valuations based on inputs that are unobservable and significant to the fair value measurement.

The following is a summary of the inputs used to value the fund's net assets as of the close of the reporting period:

Investments in securities:	Valuation inputs		
	Level 1	Level 2	Level 3
Common stocks*:			
Communication services	\$6,237,664	\$—	\$—
Consumer discretionary	8,559,882	—	—
Consumer staples	5,211,685	—	—
Energy	3,661,448	—	—
Financials	8,478,472	295,892	—
Health care	9,991,516	—	—
Industrials	5,991,041	—	—
Information technology	18,075,725	—	—
Materials	2,504,274	—	—
Real estate	876,163	—	—
Utilities	2,232,487	—	—
<b>Total common stocks</b>	<b>71,820,357</b>	<b>295,892</b>	<b>—</b>
Purchased options outstanding	—	13,707	—
Short-term investments	—	2,182,333	—
<b>Totals by level</b>	<b>\$71,820,357</b>	<b>\$2,491,932</b>	<b>\$—</b>

Other financial instruments:	Valuation inputs		
	Level 1	Level 2	Level 3
Forward currency contracts	\$—	\$(54,509)	\$—
Futures contracts	13,389	—	—
Written options outstanding	—	(6,363)	—
<b>Totals by level</b>	<b>\$13,389</b>	<b>\$(60,872)</b>	<b>\$—</b>

\* Common stock classifications are presented at the sector level, which may differ from the fund's portfolio presentation.

# Statement of assets and liabilities

6/30/23 (Unaudited)

## Assets

Investment in securities, at value, including \$281,773 of securities on loan (Note 1):	
Unaffiliated issuers (identified cost \$51,251,195)	\$72,227,999
Affiliated issuers (identified cost \$2,084,290) (Note 5)	2,084,290
Dividends, interest and other receivables	60,432
Receivable for shares of the fund sold	80,340
Receivable for investments sold	21,857
Receivable for variation margin on futures contracts (Note 1)	13,125
Unrealized appreciation on forward currency contracts (Note 1)	8,497
<b>Total assets</b>	<b>74,496,540</b>

## Liabilities

Payable for investments purchased	50,821
Payable for shares of the fund repurchased	69,426
Payable for compensation of Manager (Note 2)	32,630
Payable for custodian fees (Note 2)	11,987
Payable for investor servicing fees (Note 2)	8,215
Payable for Trustee compensation and expenses (Note 2)	36,292
Payable for administrative services (Note 2)	260
Payable for distribution fees (Note 2)	10,194
Unrealized depreciation on forward currency contracts (Note 1)	63,006
Written options outstanding, at value (premiums \$7,184) (Note 1)	6,363
Collateral on securities loaned, at value (Note 1)	285,030
Other accrued expenses	32,650
<b>Total liabilities</b>	<b>606,874</b>

**Net assets** **\$73,889,666**

## Represented by

Paid-in capital (Unlimited shares authorized) (Notes 1 and 4)	\$54,134,276
Total distributable earnings (Note 1)	19,755,390
<b>Total — Representing net assets applicable to capital shares outstanding</b>	<b>\$73,889,666</b>

## Computation of net asset value Class IA

Net assets	\$22,983,070
Number of shares outstanding	721,102
Net asset value, offering price and redemption price per share (net assets divided by number of shares outstanding)	\$31.87

## Computation of net asset value Class IB

Net assets	\$50,906,596
Number of shares outstanding	1,605,399
Net asset value, offering price and redemption price per share (net assets divided by number of shares outstanding)	\$31.71

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

## Statement of operations

Six months ended 6/30/23 (Unaudited)

### Investment income

Dividends (net of foreign tax of \$4,958)	\$510,286
Interest (including interest income of \$40,406 from investments in affiliated issuers) (Note 5)	45,179
Securities lending (net of expenses) (Notes 1 and 5)	1,829
<b>Total investment income</b>	<b>557,294</b>

### Expenses

Compensation of Manager (Note 2)	185,930
Investor servicing fees (Note 2)	23,820
Custodian fees (Note 2)	11,894
Trustee compensation and expenses (Note 2)	1,480
Distribution fees (Note 2)	57,459
Administrative services (Note 2)	803
Auditing and tax fees	17,312
Other	11,523
<b>Total expenses</b>	<b>310,221</b>
Expense reduction (Note 2)	(49)
<b>Net expenses</b>	<b>310,172</b>
<b>Net investment income</b>	<b>247,122</b>

### Realized and unrealized gain (loss)

#### Net realized gain (loss) on:

Securities from unaffiliated issuers (Notes 1 and 3)	(202,509)
Foreign currency transactions (Note 1)	45
Forward currency contracts (Note 1)	(39,169)
Futures contracts (Note 1)	51,757
<b>Total net realized loss</b>	<b>(189,876)</b>

#### Change in net unrealized appreciation (depreciation) on:

Securities from unaffiliated issuers	11,131,858
Assets and liabilities in foreign currencies	32
Forward currency contracts	(31,273)
Futures contracts	71,233
Written options	821
<b>Total change in net unrealized appreciation</b>	<b>11,172,671</b>
<b>Net gain on investments</b>	<b>10,982,795</b>
<b>Net increase in net assets resulting from operations</b>	<b>\$11,229,917</b>

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

## Statement of changes in net assets

	Six months ended 6/30/23*	Year ended 12/31/22
<b>Increase (decrease) in net assets</b>		
<b>Operations:</b>		
Net investment income	\$247,122	\$370,042
Net realized loss on investments and foreign currency transactions	(189,876)	(745,994)
Change in net unrealized appreciation (depreciation) of investments and assets and liabilities in foreign currencies	11,172,671	(12,162,300)
<b>Net increase (decrease) in net assets resulting from operations</b>	<b>11,229,917</b>	<b>(12,538,252)</b>
Distributions to shareholders (Note 1):		
From ordinary income		
Net investment income		
Class IA	(223,851)	(197,093)
Class IB	(384,912)	(264,785)
Net realized short-term gain on investments		
Class IA	—	(508,926)
Class IB	—	(926,901)
From net realized long-term gain on investments		
Class IA	—	(1,043,245)
Class IB	—	(1,900,050)
Increase from capital share transactions (Note 4)	166,424	7,817,293
<b>Total increase (decrease) in net assets</b>	<b>10,787,578</b>	<b>(9,561,959)</b>
<b>Net assets:</b>		
Beginning of period	63,102,088	72,664,047
<b>End of period</b>	<b>\$73,889,666</b>	<b>\$63,102,088</b>

\* Unaudited.

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

## Financial highlights

(For a common share outstanding throughout the period)

Period ended	INVESTMENT OPERATIONS:				LESS DISTRIBUTIONS:			RATIOS AND SUPPLEMENTAL DATA:					
	Net asset value, beginning of period	Net investment income (loss) <sup>a</sup>	Net realized and unrealized gain (loss) on investments	Total from investment operations	From net investment income	From net realized gain on investments	Total distributions	Net asset value, end of period	Total return at net asset value (%) <sup>b,c</sup>	Net assets, end of period (in thousands)	Ratio of expenses to average net assets (%) <sup>b,d</sup>	Ratio of net investment income (loss) to average net assets (%)	Portfolio turnover (%)
<b>Class IA</b>													
6/30/23†	\$27.32	.13	4.73	4.86	(.31)	—	(.31)	\$31.87	17.91*	\$22,983	.37*	.45*	16*
12/31/22	35.41	.21	(5.93)	(5.72)	(.27)	(2.10)	(2.37)	27.32	(17.07)	20,807	.76 <sup>e</sup>	.74	40
12/31/21	30.80	.18	6.90	7.08	(.10)	(2.37)	(2.47)	35.41	24.44	26,877	.73	.55	45
12/31/20	29.95	.19	4.21	4.40	(.25)	(3.30)	(3.55)	30.80	20.23	23,098	.82 <sup>f</sup>	.72 <sup>f</sup>	74
12/31/19	25.60	.28	7.65	7.93	(.41)	(3.17)	(3.58)	29.95	33.59	21,027	.78	1.03	77
12/31/18	26.81	.24	(1.45)	(1.21)	—	—	—	25.60	(4.51)	18,198	.81	.88	76
<b>Class IB</b>													
6/30/23†	\$27.15	.09	4.71	4.80	(.24)	—	(.24)	\$31.71	17.79*	\$50,907	.50*	.32*	16*
12/31/22	35.22	.14	(5.91)	(5.77)	(.20)	(2.10)	(2.30)	27.15	(17.28)	42,295	1.01 <sup>e</sup>	.49	40
12/31/21	30.66	.10	6.86	6.96	(.03)	(2.37)	(2.40)	35.22	24.13	45,787	.98	.29	45
12/31/20	29.81	.13	4.19	4.32	(.17)	(3.30)	(3.47)	30.66	19.92	29,115	1.07 <sup>f</sup>	.47 <sup>f</sup>	74
12/31/19	25.49	.21	7.61	7.82	(.33)	(3.17)	(3.50)	29.81	33.24	26,622	1.03	.78	77
12/31/18	26.75	.17	(1.43)	(1.26)	—	—	—	25.49	(4.71)	23,104	1.06	.63	76

\* Not annualized.

† Unaudited.

<sup>a</sup> Per share net investment income (loss) has been determined on the basis of the weighted average number of shares outstanding during the period.

<sup>b</sup> The charges and expenses at the insurance company separate account level are not reflected.

<sup>c</sup> Total return assumes dividend reinvestment.

<sup>d</sup> Includes amounts paid through expense offset and/or brokerage/service arrangements, if any (Note 2). Also excludes acquired fund fees and expenses, if any.

<sup>e</sup> Includes one-time proxy cost which amounted to 0.01%.

<sup>f</sup> Reflects a voluntary waiver of certain fund expenses in effect during the period. As a result of such waiver, the expenses of each class reflect a reduction of 0.01% as a percentage of average net assets.

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

## Notes to financial statements 6/30/23 (Unaudited)

Unless otherwise noted, the “reporting period” represents the period from January 1, 2023 through June 30, 2023. The following table defines commonly used references within the Notes to financial statements:

References to	Represent
Putnam Management	Putnam Investment Management, LLC, the fund’s manager, an indirect wholly-owned subsidiary of Putnam Investments, LLC
State Street	State Street Bank and Trust Company
JPMorgan	JPMorgan Chase Bank, N.A.
the SEC	the Securities and Exchange Commission
OTC	over-the-counter
PAC	The Putnam Advisory Company, LLC, an affiliate of Putnam Management
PIL	Putnam Investments Limited, an affiliate of Putnam Management

Putnam VT Research Fund (the fund) is a diversified series of Putnam Variable Trust (the Trust), a Massachusetts business trust registered under the Investment Company Act of 1940, as amended, as an open-end management investment company. The goal of the fund is to seek capital appreciation. The fund invests mainly in common stocks (growth or value stocks or both) of large U.S. companies that Putnam Management believes have favorable investment potential. For example, the fund may purchase stocks of companies with stock prices that reflect a value lower than that which Putnam Management places on the company. Putnam Management may also consider other factors that Putnam Management believes will cause the stock price to rise and may consider, among other factors, a company’s valuation, financial strength, growth potential, competitive position in its industry, projected future earnings, cash flows and dividends when deciding whether to buy or sell investments.

The fund offers class IA and class IB shares of beneficial interest. Class IA shares are offered at net asset value and are not subject to a distribution fee. Class IB shares are offered at net asset value and pay an ongoing distribution fee, which is identified in Note 2.

In the normal course of business, the fund enters into contracts that may include agreements to indemnify another party under given circumstances. The fund’s maximum exposure under these arrangements is unknown as this would involve future claims that may be, but have not yet been, made against the fund. However, the fund’s management team expects the risk of material loss to be remote.

The fund has entered into contractual arrangements with an investment adviser, administrator, distributor, shareholder servicing agent and custodian, who each provide services to the fund. Unless expressly stated otherwise, shareholders are not parties to, or intended beneficiaries of these contractual arrangements, and these contractual arrangements are not intended to create any shareholder right to enforce them against the service providers or to seek any remedy under them against the service providers, either directly or on behalf of the fund.

Under the fund’s Amended and Restated Agreement and Declaration of Trust, any claims asserted against or on behalf of the Putnam Funds, including claims against Trustees and Officers, must be brought in state and federal courts located within the Commonwealth of Massachusetts.

### Note 1 — Significant accounting policies

The following is a summary of significant accounting policies consistently followed by the fund in the preparation of its financial statements. The preparation of financial statements is in conformity with accounting principles generally accepted in the United States of America and requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities in the financial statements and the reported amounts of increases and decreases in net assets from operations. Actual results could differ from those estimates. Subsequent events after the Statement of assets and liabilities date through the date that the financial statements were issued have been evaluated in the preparation of the financial statements.

Investment income, realized and unrealized gains and losses and expenses of the fund are borne pro-rata based on the relative net assets of each class to the total net assets of the fund, except that each class bears expenses unique to that class (including the distribution fees applicable to such classes). Each class votes as a class only with respect to its own distribution plan or other matters on which a class vote is required by law or determined by the Trustees. If the fund

were liquidated, shares of each class would receive their pro-rata share of the net assets of the fund. In addition, the Trustees declare separate dividends on each class of shares.

**Security valuation** Portfolio securities and other investments are valued using policies and procedures adopted by the Board of Trustees. The Trustees have formed a Pricing Committee to oversee the implementation of these procedures and have delegated responsibility for valuing the fund’s assets in accordance with these procedures to Putnam Management. Putnam Management has established an internal Valuation Committee that is responsible for making fair value determinations, evaluating the effectiveness of the pricing policies of the fund and reporting to the Pricing Committee.

Investments for which market quotations are readily available are valued at the last reported sales price on their principal exchange, or official closing price for certain markets, and are classified as Level 1 securities under Accounting Standards Codification 820 *Fair Value Measurements and Disclosures* (ASC 820). If no sales are reported, as in the case of some securities that are traded OTC, a security is valued at its last reported bid price and is generally categorized as a Level 2 security.

Investments in open-end investment companies (excluding exchange-traded funds), if any, which can be classified as Level 1 or Level 2 securities, are valued based on their net asset value. The net asset value of such investment companies equals the total value of their assets less their liabilities and divided by the number of their outstanding shares.

Market quotations are not considered to be readily available for certain debt obligations (including short-term investments with remaining maturities of 60 days or less) and other investments; such investments are valued on the basis of valuations furnished by an independent pricing service approved by the Trustees or dealers selected by Putnam Management. Such services or dealers determine valuations for normal institutional-size trading units of such securities using methods based on market transactions for comparable securities and various relationships, generally recognized by institutional traders, between securities (which consider such factors as security prices, yields, maturities and ratings). These securities will generally be categorized as Level 2.

Many securities markets and exchanges outside the U.S. close prior to the scheduled close of the New York Stock Exchange and therefore the closing prices for securities in such markets or on such exchanges may not fully reflect events that occur after such close but before the scheduled close of the New York Stock Exchange. Accordingly, on certain days, the fund will fair value certain foreign equity securities taking into account multiple factors including movements in the U.S. securities markets, currency valuations and comparisons to the valuation of American Depository Receipts, exchange-traded funds and futures contracts. The foreign equity securities, which would generally be classified as Level 1 securities, will be transferred to Level 2 of the fair value hierarchy when they are valued at fair value. The number of days on which fair value prices will be used will depend on market activity and it is possible that fair value prices will be used by the fund to a significant extent. At the close of the reporting period, fair value pricing was used for certain foreign securities in the portfolio. Securities quoted in foreign currencies, if any, are translated into U.S. dollars at the current exchange rate.

To the extent a pricing service or dealer is unable to value a security or provides a valuation that Putnam Management does not believe accurately reflects the security’s fair value, the security will be valued at fair value by Putnam Management, who has been designated as valuation designee pursuant to Rule 2a-5 under the Investment Company Act of 1940, in accordance with policies and procedures approved by the Trustees. Certain investments, including certain restricted and illiquid securities and derivatives, are also valued at fair value following procedures approved by the Trustees. These valuations consider such factors as significant market or specific security events such as interest rate or credit quality changes, various relationships with other securities, discount rates, U.S. Treasury, U.S. swap and credit yields, index levels, convexity exposures, recovery rates, sales and other multiples and resale restrictions. These securities are classified as Level 2 or as Level 3 depending on the priority of the significant inputs.

To assess the continuing appropriateness of fair valuations, the Valuation Committee reviews and affirms the reasonableness of such valuations on a regular basis after considering all relevant information that is reasonably available. Such valuations and procedures are reviewed periodically by the Trustees. The fair value of securities is generally determined as the amount that the fund could reasonably expect to realize from an orderly disposition of such securities over a reasonable period of time. By its nature, a fair value price is a good faith

estimate of the value of a security in a current sale and does not reflect an actual market price, which may be different by a material amount.

**Security transactions and related investment income** Security transactions are recorded on the trade date (the date the order to buy or sell is executed). Gains or losses on securities sold are determined on the identified cost basis.

Interest income, net of any applicable withholding taxes, if any, is recorded on the accrual basis. Amortization and accretion of premiums and discounts on debt securities, if any, is recorded on the accrual basis.

Dividend income, net of any applicable withholding taxes, is recognized on the ex-dividend date except that certain dividends from foreign securities, if any, are recognized as soon as the fund is informed of the ex-dividend date. Non-cash dividends, if any, are recorded at the fair value of the securities received. Dividends representing a return of capital or capital gains, if any, are reflected as a reduction of cost and/or as a realized gain.

**Foreign currency translation** The accounting records of the fund are maintained in U.S. dollars. The fair value of foreign securities, currency holdings, and other assets and liabilities is recorded in the books and records of the fund after translation to U.S. dollars based on the exchange rates on that day. The cost of each security is determined using historical exchange rates. Income and withholding taxes are translated at prevailing exchange rates when earned or incurred. The fund does not isolate that portion of realized or unrealized gains or losses resulting from changes in the foreign exchange rate on investments from fluctuations arising from changes in the market prices of the securities. Such gains and losses are included with the net realized and unrealized gain or loss on investments. Net realized gains and losses on foreign currency transactions represent net realized exchange gains or losses on disposition of foreign currencies, currency gains and losses realized between the trade and settlement dates on securities transactions and the difference between the amount of investment income and foreign withholding taxes recorded on the fund's books and the U.S. dollar equivalent amounts actually received or paid. Net unrealized appreciation and depreciation of assets and liabilities in foreign currencies arise from changes in the value of assets and liabilities other than investments at the period end, resulting from changes in the exchange rate.

**Options contracts** The fund uses options contracts to gain exposure to securities. The potential risk to the fund is that the change in value of options contracts may not correspond to the change in value of the hedged instruments. In addition, losses may arise from changes in the value of the underlying instruments if there is an illiquid secondary market for the contracts, if interest or exchange rates move unexpectedly or if the counterparty to the contract is unable to perform. Realized gains and losses on purchased options are included in realized gains and losses on investment securities. If a written call option is exercised, the premium originally received is recorded as an addition to sales proceeds. If a written put option is exercised, the premium originally received is recorded as a reduction to the cost of investments.

Exchange-traded options are valued at the last sale price or, if no sales are reported, the last bid price for purchased options and the last ask price for written options. OTC traded options are valued using prices supplied by dealers.

Options on swaps are similar to options on securities except that the premium paid or received is to buy or grant the right to enter into a previously agreed upon interest rate or credit default contract. Forward premium swap option contracts include premiums that have extended settlement dates. The delayed settlement of the premiums is factored into the daily valuation of the option contracts. In the case of interest rate cap and floor contracts, in return for a premium, ongoing payments between two parties are based on interest rates exceeding a specified rate, in the case of a cap contract, or falling below a specified rate in the case of a floor contract.

Written option contracts outstanding at period end, if any, are listed after the fund's portfolio.

**Futures contracts** The fund uses futures contracts to equitize cash.

The potential risk to the fund is that the change in value of futures contracts may not correspond to the change in value of the hedged instruments. In addition, losses may arise from changes in the value of the underlying instruments, if there is an illiquid secondary market for the contracts, if interest or exchange rates move unexpectedly or if the counterparty to the contract is unable to perform. With futures, there is minimal counterparty credit risk to the fund since futures are exchange traded and the exchange's clearinghouse, as counterparty to all exchange traded futures, guarantees the futures against default. Risks may exceed amounts recognized on the Statement of assets and liabilities. When the contract

is closed, the fund records a realized gain or loss equal to the difference between the value of the contract at the time it was opened and the value at the time it was closed.

Futures contracts are valued at the quoted daily settlement prices established by the exchange on which they trade. The fund and the broker agree to exchange an amount of cash equal to the daily fluctuation in the value of the futures contract. Such receipts or payments are known as "variation margin."

Futures contracts outstanding at period end, if any, are listed after the fund's portfolio.

**Forward currency contracts** The fund buys and sells forward currency contracts, which are agreements between two parties to buy and sell currencies at a set price on a future date. These contracts are used to hedge foreign exchange risk.

The U.S. dollar value of forward currency contracts is determined using current forward currency exchange rates supplied by a quotation service. The fair value of the contract will fluctuate with changes in currency exchange rates. The contract is marked to market daily and the change in fair value is recorded as an unrealized gain or loss. The fund records a realized gain or loss equal to the difference between the value of the contract at the time it was opened and the value at the time it was closed when the contract matures or by delivery of the currency. The fund could be exposed to risk if the value of the currency changes unfavorably, if the counterparties to the contracts are unable to meet the terms of their contracts or if the fund is unable to enter into a closing position. Risks may exceed amounts recognized on the Statement of assets and liabilities.

Forward currency contracts outstanding at period end, if any, are listed after the fund's portfolio.

**Master agreements** The fund is a party to ISDA (International Swaps and Derivatives Association, Inc.) Master Agreements (Master Agreements) with certain counterparties that govern OTC derivative and foreign exchange contracts entered into from time to time. The Master Agreements may contain provisions regarding, among other things, the parties' general obligations, representations, agreements, collateral requirements, events of default and early termination. With respect to certain counterparties, in accordance with the terms of the Master Agreements, collateral pledged to the fund is held in a segregated account by the fund's custodian and, with respect to those amounts which can be sold or repledged, is presented in the fund's portfolio.

Collateral pledged by the fund is segregated by the fund's custodian and identified in the fund's portfolio. Collateral can be in the form of cash or debt securities issued by the U.S. Government or related agencies or other securities as agreed to by the fund and the applicable counterparty. Collateral requirements are determined based on the fund's net position with each counterparty.

Termination events applicable to the fund may occur upon a decline in the fund's net assets below a specified threshold over a certain period of time. Termination events applicable to counterparties may occur upon a decline in the counterparty's long-term and short-term credit ratings below a specified level. In each case, upon occurrence, the other party may elect to terminate early and cause settlement of all derivative and foreign exchange contracts outstanding, including the payment of any losses and costs resulting from such early termination, as reasonably determined by the terminating party. Any decision by one or more of the fund's counterparties to elect early termination could impact the fund's future derivative activity.

At the close of the reporting period, the fund had a net liability position of \$53,054 on open derivative contracts subject to the Master Agreements. There was no collateral pledged by the fund at period end for these agreements.

**Securities lending** The fund may lend securities, through its agent, to qualified borrowers in order to earn additional income. The loans are collateralized by cash in an amount at least equal to the fair value of the securities loaned. The fair value of securities loaned is determined daily and any additional required collateral is allocated to the fund on the next business day. The remaining maturities of the securities lending transactions are considered overnight and continuous. The risk of borrower default will be borne by the fund's agent; the fund will bear the risk of loss with respect to the investment of the cash collateral. Income from securities lending, net of expenses, is included in investment income on the Statement of operations. Cash collateral is invested in Putnam Cash Collateral Pool, LLC, a limited liability company managed by an affiliate of Putnam Management. Investments in Putnam Cash Collateral Pool, LLC are valued at its closing net asset value each business day. There are no management fees charged to Putnam Cash Collateral Pool, LLC. At the close of the reporting period, the fund received cash collateral of \$285,030 and the value of securities loaned amounted to \$281,773.



**Interfund lending** The fund, along with other Putnam funds, may participate in an interfund lending program pursuant to an exemptive order issued by the SEC. This program allows the fund to borrow from or lend to other Putnam funds that permit such transactions. Interfund lending transactions are subject to each fund's investment policies and borrowing and lending limits. Interest earned or paid on the interfund lending transaction will be based on the average of certain current market rates. During the reporting period, the fund did not utilize the program.

**Lines of credit** The fund participates, along with other Putnam funds, in a \$320 million syndicated unsecured committed line of credit, provided by State Street (\$160 million) and JPMorgan (\$160 million), and a \$235.5 million unsecured uncommitted line of credit, provided by State Street. Prior to May 2, 2023, the fund participated, along with other Putnam funds, in a \$100 million unsecured committed line of credit and a \$235.5 million unsecured uncommitted line of credit, both provided by State Street. Borrowings may be made for temporary or emergency purposes, including the funding of shareholder redemption requests and trade settlements. Interest is charged to the fund based on the fund's borrowing at a rate equal to 1.25% plus the higher of (1) the Federal Funds rate and (2) the Overnight Bank Funding Rate for the committed line of credit and 1.30% plus the higher of (1) the Federal Funds rate and (2) the Overnight Bank Funding Rate for the uncommitted line of credit. A closing fee equal to 0.04% of the committed line of credit and 0.04% of the uncommitted line of credit has been paid by the participating funds and a \$75,000 fee has been paid by the participating funds to State Street as agent of the syndicated committed line of credit. In addition, a commitment fee of 0.21% per annum on any unutilized portion of the committed line of credit is allocated to the participating funds based on their relative net assets and paid quarterly. During the reporting period, the fund had no borrowings against these arrangements.

**Federal taxes** It is the policy of the fund to distribute all of its taxable income within the prescribed time period and otherwise comply with the provisions of the Internal Revenue Code of 1986, as amended (the Code), applicable to regulated investment companies.

The fund is subject to the provisions of Accounting Standards Codification 740 *Income Taxes* (ASC 740). ASC 740 sets forth a minimum threshold for financial statement recognition of the benefit of a tax position taken or expected to be taken in a tax return. The fund did not have a liability to record for any unrecognized tax benefits in the accompanying financial statements. No provision has been made for federal taxes on income, capital gains or unrealized appreciation on securities held nor for excise tax on income and capital gains. Each of the fund's federal tax returns for the prior three fiscal years remains subject to examination by the Internal Revenue Service.

The fund may also be subject to taxes imposed by governments of countries in which it invests. Such taxes are generally based on either income or gains earned or repatriated. The fund accrues and applies such taxes to net investment income, net realized gains and net unrealized gains as income and/or capital gains are earned. In some cases, the fund may be entitled to reclaim all or a portion of such taxes, and such reclaim amounts, if any, are reflected as an asset on the fund's books. In many cases, however, the fund may not receive such amounts for an extended period of time, depending on the country of investment.

Under the Regulated Investment Company Modernization Act of 2010, the fund will be permitted to carry forward capital losses incurred for an unlimited period and the carry forwards will retain their character as either short-term or long-term capital losses. At December 31, 2022, the fund had the following capital loss carryovers available, to the extent allowed by the Code, to offset future net capital gain, if any:

Loss carryover			
Short-term	Long-term		Total
\$454,915	\$—		\$454,915

Tax cost of investments includes adjustments to net unrealized appreciation (depreciation) which may not necessarily be final tax cost basis adjustments, but closely approximate the tax basis unrealized gains and losses that may be realized and distributed to shareholders. The aggregate identified cost on a tax basis is \$54,071,922, resulting in gross unrealized appreciation and depreciation of \$22,522,033 and \$2,329,149, respectively, or net unrealized appreciation of \$20,192,884.

**Distributions to shareholders** Distributions to shareholders from net investment income are recorded by the fund on the ex-dividend date. Distributions from capital gains, if any, are recorded on the ex-dividend date and paid at least annually. The amount and character of income and gains to be distributed are

determined in accordance with income tax regulations, which may differ from generally accepted accounting principles. Dividend sources are estimated at the time of declaration. Actual results may vary. Any non-taxable return of capital cannot be determined until final tax calculations are completed after the end of the fund's fiscal year. Reclassifications are made to the fund's capital accounts to reflect income and gains available for distribution (or available capital loss carryovers) under income tax regulations.

**Expenses of the Trust** Expenses directly charged or attributable to any fund will be paid from the assets of that fund. Generally, expenses of the Trust will be allocated among and charged to the assets of each fund on a basis that the Trustees deem fair and equitable, which may be based on the relative assets of each fund or the nature of the services performed and relative applicability to each fund.

**Beneficial interest** At the close of the reporting period, insurance companies or their separate accounts were record owners of all but a de minimis number of the shares of the fund. Approximately 26.6% of the fund is owned by accounts of one insurance company.

**Note 2 — Management fee, administrative services and other transactions**

The fund pays Putnam Management a management fee (based on the fund's average net assets and computed and paid monthly) at annual rates that may vary based on the average of the aggregate net assets of all open-end mutual funds sponsored by Putnam Management (excluding net assets of funds that are invested in, or that are invested in by, other Putnam funds to the extent necessary to avoid "double counting" of those assets). Such annual rates may vary as follows:

0.710%	of the first \$5 billion,
0.660%	of the next \$5 billion,
0.610%	of the next \$10 billion,
0.560%	of the next \$10 billion,
0.510%	of the next \$50 billion,
0.490%	of the next \$50 billion,
0.480%	of the next \$100 billion and
0.475%	of any excess thereafter.

For the reporting period, the management fee represented an effective rate (excluding the impact from any expense waivers in effect) of 0.273% of the fund's average net assets.

Putnam Management has contractually agreed, through April 30, 2025, to waive fees and/or reimburse the fund's expenses to the extent necessary to limit the cumulative expenses of the fund, exclusive of brokerage, interest, taxes, investment-related expenses, extraordinary expenses, acquired fund fees and expenses and payments under the fund's investor servicing contract, investment management contract and distribution plan, on a fiscal year-to-date basis to an annual rate of 0.20% of the fund's average net assets over such fiscal year-to-date period. During the reporting period, the fund's expenses were not reduced as a result of this limit.

PIL is authorized by the Trustees to manage a separate portion of the assets of the fund as determined by Putnam Management from time to time. PIL did not manage any portion of the assets of the fund during the reporting period. If Putnam Management were to engage the services of PIL, Putnam Management would pay a quarterly sub-management fee to PIL for its services at an annual rate of 0.25% of the average net assets of the portion of the fund managed by PIL.

PAC is authorized by the Trustees to manage a separate portion of the assets of the fund, as designated from time to time by Putnam Management or PIL. PAC did not manage any portion of the assets of the fund during the reporting period. If Putnam Management or PIL were to engage the services of PAC, Putnam Management or PIL, as applicable, would pay a quarterly sub-advisory fee to PAC for its services at the annual rate of 0.25% of the average net assets of the portion of the fund's assets for which PAC is engaged as sub-adviser.

The fund reimburses Putnam Management an allocated amount for the compensation and related expenses of certain officers of the fund and their staff who provide administrative services to the fund. The aggregate amount of all such reimbursements is determined annually by the Trustees.

Custodial functions for the fund's assets are provided by State Street. Custody fees are based on the fund's asset level, the number of its security holdings and transaction volumes.

Putnam Investor Services, Inc., an affiliate of Putnam Management, provides investor servicing agent functions to the fund. Putnam Investor Services, Inc. was paid a monthly fee for investor servicing at an annual rate of 0.07% of the fund's



average daily net assets. During the reporting period, the expenses for each class of shares related to investor servicing fees were as follows:

Class IA	\$7,595
Class IB	16,225
<b>Total</b>	<b>\$23,820</b>

The fund has entered into expense offset arrangements with Putnam Investor Services, Inc. and State Street whereby Putnam Investor Services, Inc.'s and State Street's fees are reduced by credits allowed on cash balances. For the reporting period, the fund's expenses were reduced by \$49 under the expense offset arrangements.

Each Independent Trustee of the fund receives an annual Trustee fee, of which \$60, as a quarterly retainer, has been allocated to the fund, and an additional fee for each Trustees meeting attended. Trustees also are reimbursed for expenses they incur relating to their services as Trustees.

The fund has adopted a Trustee Fee Deferral Plan (the Deferral Plan) which allows the Trustees to defer the receipt of all or a portion of Trustees fees payable on or after July 1, 1995. The deferred fees remain invested in certain Putnam funds until distribution in accordance with the Deferral Plan.

The fund has adopted an unfunded noncontributory defined benefit pension plan (the Pension Plan) covering all Trustees of the fund who have served as a Trustee for at least five years and were first elected prior to 2004. Benefits under the Pension Plan are equal to 50% of the Trustee's average annual attendance and retainer fees for the three years ended December 31, 2005. The retirement benefit is payable during a Trustee's lifetime, beginning the year following retirement, for the number of years of service through December 31, 2006. Pension expense for the fund is included in Trustee compensation and expenses in the Statement of operations. Accrued pension liability is included in Payable for Trustee compensation and expenses in the Statement of assets and liabilities. The Trustees have terminated the Pension Plan with respect to any Trustee first elected after 2003.

#### Note 4 — Capital shares

At the close of the reporting period, there were an unlimited number of shares of beneficial interest authorized. Subscriptions and redemptions are presented at the omnibus level. Transactions in capital shares were as follows:

	Class IA shares				Class IB shares			
	Six months ended 6/30/23		Year ended 12/31/22		Six months ended 6/30/23		Year ended 12/31/22	
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount
Shares sold	26,332	\$780,459	68,335	\$1,943,227	127,459	\$3,688,911	303,269	\$8,753,956
Shares issued in connection with reinvestment of distributions	7,830	223,851	55,356	1,749,264	13,525	384,912	98,275	3,091,736
	34,162	1,004,310	123,691	3,692,491	140,984	4,073,823	401,544	11,845,692
Shares repurchased	(74,747)	(2,186,931)	(120,957)	(3,533,794)	(93,446)	(2,724,778)	(143,584)	(4,187,096)
<b>Net increase (decrease)</b>	<b>(40,585)</b>	<b>\$(1,182,621)</b>	<b>2,734</b>	<b>\$158,697</b>	<b>47,538</b>	<b>\$1,349,045</b>	<b>257,960</b>	<b>\$7,658,596</b>

#### Note 5 — Affiliated transactions

Transactions during the reporting period with any company which is under common ownership or control were as follows:

Name of affiliate	Fair value as of 12/31/22	Purchase cost	Sale proceeds	Investment income	Shares outstanding and fair value as of 6/30/23
<b>Short-term investments</b>					
Putnam Cash Collateral Pool, LLC*	\$724,203	\$4,885,151	\$5,324,324	\$13,397	\$285,030
Putnam Short Term Investment Fund**	2,332,410	7,071,048	7,604,198	40,406	1,799,260
<b>Total Short-term investments</b>	<b>\$3,056,613</b>	<b>\$11,956,199</b>	<b>\$12,928,522</b>	<b>\$53,803</b>	<b>\$2,084,290</b>

\*No management fees are charged to Putnam Cash Collateral Pool, LLC (Note 1). Investment income shown is included in securities lending income on the Statement of operations. There were no realized or unrealized gains or losses during the period.

\*\*Management fees charged to Putnam Short Term Investment Fund have been waived by Putnam Management. There were no realized or unrealized gains or losses during the period.

#### Note 6 — Market, credit and other risks

In the normal course of business, the fund trades financial instruments and enters into financial transactions where risk of potential loss exists due to changes in the market (market risk) or failure of the contracting party to the transaction to perform (credit risk). The fund may be exposed to additional credit risk that an institution or other entity with which the fund has unsettled or open transactions will default. Investments in foreign securities involve certain risks, including those related to economic instability, unfavorable political developments, and currency fluctuations.

The fund has adopted a distribution plan (the Plan) with respect to its class IB shares pursuant to Rule 12b-1 under the Investment Company Act of 1940. The purpose of the Plan is to compensate Putnam Retail Management Limited Partnership, an indirect wholly-owned subsidiary of Putnam Investments, LLC, for services provided and expenses incurred in distributing shares of the fund. The Plan provides for payment by the fund to Putnam Retail Management Limited Partnership at an annual rate of up to 0.35% of the average net assets attributable to the fund's class IB shares. The Trustees have approved payment by the fund at an annual rate of 0.25% of the average net assets attributable to the fund's class IB shares. The expenses related to distribution fees during the reporting period are included in Distribution fees in the Statement of operations.

#### Note 3 — Purchases and sales of securities

During the reporting period, the cost of purchases and the proceeds from sales, excluding short-term investments, were as follows:

	Cost of purchases	Proceeds from sales
Investments in securities (Long-term)	\$12,096,398	\$10,756,009
U.S. government securities (Long-term)	—	—
<b>Total</b>	<b>\$12,096,398</b>	<b>\$10,756,009</b>

The fund may purchase or sell investments from or to other Putnam funds in the ordinary course of business, which can reduce the fund's transaction costs, at prices determined in accordance with SEC requirements and policies approved by the Trustees. During the reporting period, purchases or sales of long-term securities from or to other Putnam funds, if any, did not represent more than 5% of the fund's total cost of purchases and/or total proceeds from sales.

**Note 7 — Summary of derivative activity**

The volume of activity for the reporting period for any derivative type that was held during the period is listed below and was based on an average of the holdings at the end of each fiscal quarter:

Purchased equity option contracts (contract amount)	\$3,000
Written equity option contracts (contract amount)	\$3,000
Futures contracts (number of contracts)	4
Forward currency contracts (contract amount)	\$5,300,000

The following is a summary of the fair value of derivative instruments as of the close of the reporting period:

**Fair value of derivative instruments as of the close of the reporting period**

Derivatives not accounted for as hedging instruments under ASC 815	Asset derivatives		Liability derivatives	
	Statement of assets and liabilities location	Fair value	Statement of assets and liabilities location	Fair value
Foreign exchange contracts	Receivables	\$8,497	Payables	\$63,006
Equity contracts	Investments, Receivables, Net assets — Unrealized appreciation	27,096*	Payables	6,363
<b>Total</b>		<b>\$35,593</b>		<b>\$69,369</b>

\*Includes cumulative appreciation/depreciation of futures contracts as reported in the fund's portfolio. Only current day's variation margin is reported within the Statement of assets and liabilities.

The following is a summary of realized and change in unrealized gains or losses of derivative instruments in the Statement of operations for the reporting period (Note 1):

**Amount of realized gain or (loss) on derivatives recognized in net gain or (loss) on investments**

Derivatives not accounted for as hedging instruments under ASC 815	Futures	Forward currency contracts	Total
Foreign exchange contracts	\$—	\$(39,169)	\$(39,169)
Equity contracts	51,757	—	\$51,757
<b>Total</b>	<b>\$51,757</b>	<b>\$(39,169)</b>	<b>\$12,588</b>

**Change in unrealized appreciation or (depreciation) on derivatives recognized in net gain or (loss) on investments**

Derivatives not accounted for as hedging instruments under ASC 815	Options	Futures	Forward currency contracts	Total
Foreign exchange contracts	\$—	\$—	\$(31,273)	\$(31,273)
Equity contracts	734	71,233	—	\$71,967
<b>Total</b>	<b>\$734</b>	<b>\$71,233</b>	<b>\$(31,273)</b>	<b>\$40,694</b>

## Note 8 — Offsetting of financial and derivative assets and liabilities

The following table summarizes any derivatives, repurchase agreements and reverse repurchase agreements, at the end of the reporting period, that are subject to an enforceable master netting agreement or similar agreement. For securities lending transactions or borrowing transactions associated with securities sold short, if any, see Note 1. For financial reporting purposes, the fund does not offset financial assets and financial liabilities that are subject to the master netting agreements in the Statement of assets and liabilities.

	Bank of America N.A.	Barclays Bank PLC	BofA Securities, Inc.	Citibank, N.A.	Goldman Sachs International	JPMorgan Chase Bank N.A.	Morgan Stanley & Co. International PLC	NatWest Markets PLC	State Street Bank and Trust Co.	UBS AG	WestPac Banking Corp.	Total
<b>Assets:</b>												
Futures contracts <sup>§</sup>	\$—	\$—	\$13,125	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$13,125
Forward currency contracts <sup>#</sup>	—	—	—	481	—	2,593	195	358	135	364	4,371	8,497
Purchased options <sup>***</sup>	—	5,478	—	—	—	—	—	—	—	8,229	—	13,707
<b>Total Assets</b>	<b>\$—</b>	<b>\$5,478</b>	<b>\$13,125</b>	<b>\$481</b>	<b>\$—</b>	<b>\$2,593</b>	<b>\$195</b>	<b>\$358</b>	<b>\$135</b>	<b>\$8,593</b>	<b>\$4,371</b>	<b>\$35,329</b>
<b>Liabilities:</b>												
Futures contracts <sup>§</sup>	—	—	—	—	—	—	—	—	—	—	—	—
Forward currency contracts <sup>#</sup>	15,120	5,475	—	5,598	16,080	5,583	4,692	2,153	4,585	3,720	—	63,006
Written options <sup>#</sup>	—	3,008	—	—	—	—	—	—	—	3,355	—	6,363
<b>Total Liabilities</b>	<b>\$15,120</b>	<b>\$8,483</b>	<b>\$—</b>	<b>\$5,598</b>	<b>\$16,080</b>	<b>\$5,583</b>	<b>\$4,692</b>	<b>\$2,153</b>	<b>\$4,585</b>	<b>\$7,075</b>	<b>\$—</b>	<b>\$69,369</b>
<b>Total Financial and Derivative Net Assets</b>	<b>\$(15,120)</b>	<b>\$(3,005)</b>	<b>\$13,125</b>	<b>\$(5,117)</b>	<b>\$(16,080)</b>	<b>\$(2,990)</b>	<b>\$(4,497)</b>	<b>\$(1,795)</b>	<b>\$(4,450)</b>	<b>\$1,518</b>	<b>\$4,371</b>	<b>\$(34,040)</b>
Total collateral received (pledged) <sup>†##</sup>	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—
Net amount	\$(15,120)	\$(3,005)	\$13,125	\$(5,117)	\$(16,080)	\$(2,990)	\$(4,497)	\$(1,795)	\$(4,450)	\$1,518	\$4,371	
<i>Controlled collateral received (including TBA commitments)**</i>	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—
<i>Uncontrolled collateral received</i>	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—
<i>Collateral (pledged) (including TBA commitments)**</i>	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—

\*\* Included with Investments in securities on the Statement of assets and liabilities.

† Additional collateral may be required from certain brokers based on individual agreements.

# Covered by master netting agreement (Note 1).

## Any over-collateralization of total financial and derivative net assets is not shown. Collateral may include amounts related to unsettled agreements.

§ Includes current day's variation margin only as reported on the Statement of assets and liabilities, which is not collateralized. Cumulative appreciation/(depreciation) for futures contracts is represented in the tables listed after the fund's portfolio. Collateral pledged for initial margin on futures contracts, which is not included in the table above, amounted to \$59,762.

## Note 9 — Of special note

On May 31, 2023, Franklin Resources, Inc. ("Franklin Resources") and Great-West Lifeco Inc., the parent company of Putnam U.S. Holdings I, LLC ("Putnam Holdings"), announced that they have entered into a definitive agreement for a subsidiary of Franklin Resources to acquire Putnam Holdings in a stock and cash transaction.

As part of this transaction, Putnam Management, a wholly-owned subsidiary of Putnam Holdings and investment manager to the Putnam family of funds (the "Putnam Funds"), would become an indirect wholly-owned subsidiary of Franklin Resources.

The transaction is subject to customary closing conditions, including receipt of applicable regulatory approvals. Subject to such approvals and the satisfaction of these conditions, the transaction is currently expected to be consummated in the fourth quarter of 2023.

Under the Investment Company Act of 1940, as amended, consummation of the transaction will result in the automatic termination of the investment management contract between each Putnam Fund and Putnam Management and any related sub-management and sub-advisory contracts, where applicable. In anticipation of this automatic termination, on June 23, 2023, the Board of Trustees of the Putnam Funds approved a new investment management contract between each Putnam Fund and Putnam Management (and new sub-management and sub-advisory contracts, if applicable), which will be presented to the shareholders of each Putnam Fund for their approval at shareholder meetings currently expected to occur in October 2023. Proxy solicitation materials related to these meetings have been made available to shareholders that held shares of the fund at the close of business on July 24, 2023.

## Trustee approval of management contracts

### Consideration of your fund's new and interim management, sub-management and sub-advisory contracts

At their meeting on June 23, 2023, the Board of Trustees of your fund, including all of the Trustees who are not “interested persons” (as this term is defined in the Investment Company Act of 1940, as amended (the “1940 Act”)) of the Putnam mutual funds, closed-end funds and exchange-traded funds (collectively, the “funds”) (the “Independent Trustees”) approved, subject to approval by your fund's shareholders, a new management contract with Putnam Investment Management (“Putnam Management”), a new sub-management contract between Putnam Management and its affiliate, Putnam Investments Limited (“PIL”), and a new sub-advisory contract among Putnam Management, PIL and another affiliate, The Putnam Advisory Company (“PAC”) (collectively, the “New Management Contracts”). The Trustees considered the proposed New Management Contracts in connection with the planned acquisition of Putnam U.S. Holdings I, LLC (“Putnam Holdings”) by a subsidiary of Franklin Resources, Inc. (“Franklin Templeton”). The Trustees considered that, on May 31, 2023, Franklin Templeton and Great-West Lifeco Inc., the parent company of Putnam Holdings, announced that they had entered into a definitive agreement for a subsidiary of Franklin Templeton to acquire Putnam Holdings in a stock and cash transaction (the “Transaction”). The Trustees noted that Putnam Holdings was the parent company of Putnam Management, PIL and PAC. The Trustees were advised that the Transaction would result in a “change of control” of Putnam Management, PIL and PAC and would cause your fund's current Management Contract with Putnam Management, Sub-Management Contract with PIL and Sub-Advisory Contract with PAC (collectively, the “Current Management Contracts”) to terminate in accordance with the 1940 Act. The Trustees considered that the New Management Contracts would take effect upon the closing of the Transaction, which was expected to occur in the fourth quarter of 2023.

In addition to the New Management Contracts, the Trustees also approved interim management, sub-management and sub-advisory contracts with Putnam Management, PIL and PAC, respectively (the “Interim Management Contracts”), which would take effect in the event that for any reason shareholder approval of a New Management Contract was not received by the time of the Transaction closing. The Trustees considered that each Interim Management Contract that became effective would remain in effect until shareholders approved the proposed New Management Contract, or until 150 days elapse after the closing of the Transaction, whichever occurred first. The considerations and conclusions discussed in connection with the Trustees' consideration of the New Management Contracts and the continuance of your fund's Current Management Contracts also apply to the Trustees' consideration of the Interim Management Contracts, supplemented by consideration of the terms, nature and reason for any Interim Management Contract.

The Independent Trustees met with their independent legal counsel, as defined in Rule 0-1(a)(6) under the 1940 Act (their “independent legal counsel”), and representatives of Putnam Management and its parent company, Power Corporation of Canada, to discuss the potential Transaction, including the timing and structure of the Transaction and its implications for Putnam Management and the funds, during their regular meeting on November 18, 2022, and the full Board of Trustees further discussed these matters with representatives of Putnam Management at its regular meeting on December 15, 2022. At a special meeting on December 20, 2022, the full Board of Trustees met with representatives

of Putnam Management, Power Corporation of Canada and Franklin Templeton to further discuss the potential Transaction, including Franklin Templeton's strategic plans for Putnam Management's asset management business and the funds, potential sources of synergy between Franklin Templeton and Putnam Management, potential areas of partnership between Power Corporation of Canada and Franklin Templeton, Franklin Templeton's distribution capabilities, Franklin Templeton's existing service provider relationships and Franklin Templeton's recent acquisitions of other asset management firms.

In order to assist the Independent Trustees in their consideration of the New Management Contracts and other anticipated impacts of the Transaction on the funds and their shareholders, independent legal counsel for the Independent Trustees furnished an initial information request to Franklin Templeton (the “Initial Franklin Request”). At a special meeting of the full Board of Trustees held on January 25, 2023, representatives of Franklin Templeton addressed the firm's responses to the Initial Franklin Request. At the meeting, representatives of Franklin Templeton discussed, among other things, the business and financial condition of Franklin Templeton and its affiliates, Franklin Templeton's U.S. registered fund operations, its recent acquisition history, Franklin Templeton's intentions regarding the operation of Putnam Management and the funds following the completion of the potential Transaction and expected benefits to the funds and Putnam Management that might result from the Transaction.

The Board of Trustees actively monitored developments with respect to the potential Transaction throughout the period leading up to the public announcement of a final sale agreement on May 31, 2023. The Independent Trustees met to discuss these matters at their regular meetings on January 27, April 20 and May 19, 2023. The full Board of Trustees also discussed developments at their regular meeting on February 23, 2023. Following the public announcement of the Transaction on May 31, 2023, independent legal counsel for the Independent Trustees furnished a supplemental information request (the “Supplemental Franklin Request”) to Franklin Templeton. At the Board of Trustees' regular in-person meeting held on June 22-23, 2023, representatives of Putnam Management and Power Corporation of Canada provided further information regarding, among other matters, the final terms of the Transaction and efforts undertaken to retain Putnam employees. The Contract Committee of the Board of Trustees also met on June 22, 2023 to discuss Franklin Templeton's responses to the Supplemental Franklin Request. Mr. Reynolds, the only Trustee affiliated with Putnam Management, participated in portions of these meetings to provide the perspective of the Putnam organization, but did not otherwise participate in the deliberations of the Independent Trustees or the Contract Committee regarding the potential Transaction.

After the presentations and after reviewing the written materials provided, the Independent Trustees met at their in-person meeting on June 23, 2023 to consider the New Management Contracts for each fund, proposed to become effective upon the closing of the Transaction, and the filing of a preliminary proxy statement. At this meeting and throughout the process, the Independent Trustees also received advice from their independent legal counsel regarding their responsibilities in evaluating the potential Transaction and the New Management Contracts. The Independent Trustees reviewed the terms of the proposed New Management Contracts and the differences between the New Management Contracts and the Current Management Contracts. They

noted that the terms of the proposed New Management Contracts were substantially identical to the Current Management Contracts, except for certain changes designed largely to address differences among various of the existing contracts, which had been developed and implemented at different times in the past.

In considering the approval of the proposed New Management Contracts, the Board of Trustees took into account a number of factors, including:<sup>1</sup>

- (i) Franklin Templeton's and Putnam Management's belief that the Transaction would not adversely affect the funds or their shareholders and their belief that the Transaction was likely to result in certain benefits (described below) for the funds and their shareholders;
- (ii) That Franklin Templeton did not intend to make any material change in Putnam Management's senior investment professionals (other than certain changes related to reporting structure and organization of personnel discussed below), including the portfolio managers of the funds, or to the firm's operating locations as a result of the Transaction;
- (iii) That Franklin Templeton intended for Putnam Management's equity investment professionals to continue to operate largely independently from Franklin Templeton, reporting to Franklin Templeton's Head of Public Markets following the Transaction;
- (iv) That, while Putnam Management's organizational structure was not expected to change immediately following the Transaction, Franklin Templeton intended to revise Putnam Management's reporting structure in order to include Putnam Management's fixed income investment professionals in Franklin Templeton's fixed income group and to include Putnam Management's Global Asset Allocation ("GAA") investment professionals in Franklin Templeton's investment solutions group, with both Franklin Templeton groups reporting to Franklin Templeton's Head of Public Markets;
- (v) Franklin Templeton's expectation that there would not be any changes in the investment objectives, strategies or portfolio holdings of the funds as a result of the Transaction;
- (vi) That neither Franklin Templeton nor Putnam Management had any current plans to propose changes to the funds' existing management fees or expense limitations, or current plans to make changes to the funds' existing distribution arrangements;
- (vii) Franklin Templeton's and Putnam Management's representations that, following the Transaction, there was not expected to be any diminution in the nature, quality and extent of services provided to the funds and their shareholders by Putnam Management, PIL and PAC, including compliance and other non-advisory services;
- (viii) That Franklin Templeton did not currently plan to change the branding of the funds or to change the lineup of funds in connection with the Transaction but would continue to evaluate how best to position the funds in the market;
- (ix) The possible benefits accruing to the funds and their shareholders as a result of the Transaction, including:
  - a. That the scale of Franklin Templeton's investment operations platform would increase the investment and operational resources available to the funds;
  - b. That the Putnam open-end funds would benefit from Franklin Templeton's large retail and institutional global distribution

capabilities and significant network of intermediary relationships, which may provide additional opportunities for the funds to increase assets and reduce expenses by spreading expenses over a larger asset base; and

- c. Potential benefits to shareholders of the Putnam open-end funds that could result from the alignment of certain fund features and shareholder benefits with those of other funds sponsored by Franklin Templeton and its affiliates and access to a broader array of investment opportunities;
- (x) The financial strength, reputation, experience and resources of Franklin Templeton and its investment advisory subsidiaries;
- (xi) Franklin Templeton's expectation that the Transaction would not impact the capabilities or responsibilities of Putnam Management's Investment Division (other than any impact related to reporting structure changes for Putnam Management's equity, fixed income and GAA investment groups and to including Putnam Management's fixed income and GAA investment professionals in existing Franklin Templeton investment groups, as discussed above) and that any changes to the Investment Division over the longer term would be made in order to achieve perceived operational efficiencies or improvements to the portfolio management process;
- (xii) Franklin Templeton's commitment to maintaining competitive compensation arrangements to allow Putnam Management to continue to attract and retain highly qualified personnel and Putnam Management's and Franklin Templeton's efforts to retain personnel, including efforts implemented since the Transaction was announced;
- (xiii) That the current senior management teams at Putnam Management and Power Corporation of Canada had indicated their strong support of the Transaction and that Putnam Management had recommended that the Board of Trustees approve the New Management Contracts; and
- (xiv) Putnam Management's and Great-West Lifeco Inc.'s commitment to bear all expenses incurred by the funds in connection with the Transaction, including all costs associated with the proxy solicitation in connection with seeking shareholder approval of the New Management Contracts.

Finally, in considering the proposed New Management Contracts, the Board of Trustees also took into account their concurrent deliberations and conclusions, as described below, in connection with their annual review of the funds' Current Management Contracts and the approval of their continuance, effective July 1, 2023, and the extensive materials that they had reviewed in connection with that review process.

Based upon the foregoing considerations, on June 23, 2023, the Board of Trustees, including all of the Independent Trustees, unanimously approved the proposed New Management Contracts and determined to recommend their approval to the shareholders of the funds.

#### **General conclusions — Current Management Contracts**

The Board of Trustees oversees the management of each fund and, as required by law, determines annually whether to approve the continuance of your fund's management contract with Putnam Management, the sub-management contract with respect to your fund between Putnam Management and PIL and the sub-advisory contract among Putnam

<sup>1</sup>All subsequent references to Putnam Management describing the Board of Trustees' considerations should be deemed to include references to PIL and PAC as necessary or appropriate in the context.



Management, PIL and PAC. (Because PIL and PAC are affiliates of Putnam Management and Putnam Management remains fully responsible for all services provided by PIL and PAC, the Trustees have not attempted to evaluate PIL or PAC as separate entities.) The Board of Trustees, with the assistance of its Contract Committee, requests and evaluates all information it deems reasonably necessary under the circumstances in connection with its annual contract review. The Contract Committee consists solely of Independent Trustees.

At the outset of the review process, members of the Board of Trustees' independent staff and independent legal counsel considered any possible changes to the annual contract review materials furnished to the Contract Committee during the course of the previous year's review and, as applicable, identified those changes to Putnam Management. Following these discussions and in consultation with the Contract Committee, the Independent Trustees' independent legal counsel requested that Putnam Management and its affiliates furnish specified information, together with any additional information that Putnam Management considered relevant, to the Contract Committee. Over the course of several months ending in June 2023, the Contract Committee met on a number of occasions with representatives of Putnam Management, and separately in executive session, to consider the information that Putnam Management provided. Throughout this process, the Contract Committee was assisted by the members of the Board of Trustees' independent staff and by independent legal counsel for the funds and the Independent Trustees.

At the Board of Trustees' June 2023 meeting, the Contract Committee met in executive session to discuss and consider its recommendations with respect to the continuance of the contracts. At that meeting, the Contract Committee also met in executive session with the other Independent Trustees to review a summary of the key financial, performance and other data that the Contract Committee considered in the course of its review. The Contract Committee recommended, and the Independent Trustees approved, the continuance of your fund's Current Management Contracts, effective July 1, 2023, and the approval of your fund's New Management Contracts and Interim Management Contracts, as discussed above.

The Independent Trustees' approvals were based on the following conclusions:

- That the fee schedule in effect for your fund represented reasonable compensation in light of the nature and quality of the services being provided to the fund, the fees paid by competitive funds, the costs incurred by Putnam Management in providing services to the fund and the application of certain reductions and waivers noted below; and
- That the fee schedule in effect for your fund represented an appropriate sharing between fund shareholders and Putnam Management of any economies of scale as may exist in the management of the fund at current asset levels.

These conclusions were based on a comprehensive consideration of all information provided to the Trustees and were not the result of any single factor. Some of the factors that figured particularly in the Trustees' deliberations and how the Trustees considered these factors are described below, although individual Trustees may have evaluated the information presented differently, giving different weights to various factors. It is also important to recognize that the management arrangements for your fund and the other Putnam mutual funds and closed-end funds are the result of many years of review and discussion between the Independent

Trustees and Putnam Management, that some aspects of the arrangements may receive greater scrutiny in some years than others and that the Trustees' conclusions may be based, in part, on their consideration of fee arrangements in previous years. For example, with certain exceptions primarily involving newer funds (including the exchange-traded funds) or repositioned funds, the current fee arrangements under the vast majority of the funds' management contracts were first implemented at the beginning of 2010 following extensive review by the Contract Committee and discussions with representatives of Putnam Management, as well as approval by shareholders. The Trustees also took into account their concurrent deliberations and conclusions, and the materials that they had reviewed, in connection with their approval on June 23, 2023 of the Interim Management Contracts and the New Management Contracts, which had been proposed in light of the Transaction (which would cause the fund's Current Management Contracts to terminate in accordance with applicable law or the terms of each contract).

### **Management fee schedules and total expenses**

The Trustees reviewed the management fee schedules in effect for all funds, including fee levels and breakpoints. Under its management contract, your fund has the benefit of breakpoints in its management fee schedule that provide shareholders with reduced fee levels as assets under management in the Putnam family of funds increase. The Trustees also reviewed the total expenses of each Putnam fund, recognizing that in most cases management fees represented the major, but not the sole, determinant of total costs to fund shareholders. (Two mutual funds and each of the exchange-traded funds have implemented so-called "all-in" or unitary management fees covering substantially all routine fund operating costs.)

In reviewing fees and expenses, the Trustees generally focus their attention on material changes in circumstances — for example, changes in assets under management, changes in a fund's investment strategy, changes in Putnam Management's operating costs or profitability, or changes in competitive practices in the fund industry — that suggest that consideration of fee changes might be warranted. The Trustees concluded that the circumstances did not indicate that changes to the management fee schedule for your fund would be appropriate at this time.

As in the past, the Trustees also focused on the competitiveness of each fund's total expense ratio. The Trustees, Putnam Management and the funds' investor servicing agent, Putnam Investor Services, Inc. ("PSERV"), have implemented expense limitations that were in effect during your fund's fiscal year ending in 2022. These expense limitations were: (i) a contractual expense limitation applicable to specified mutual funds, including your fund, of 25 basis points on investor servicing fees and expenses and (ii) a contractual expense limitation applicable to specified mutual funds, including your fund, of 20 basis points on so-called "other expenses" (i.e., all expenses exclusive of management fees, distribution fees, investor servicing fees, investment-related expenses, interest, taxes, brokerage commissions, acquired fund fees and expenses and extraordinary expenses). These expense limitations attempt to maintain competitive expense levels for the funds. Most funds, including your fund, had sufficiently low expenses that these expense limitations were not operative during their fiscal years ending in 2022. Putnam Management and PSERV have agreed to maintain these expense limitations until at least April 30, 2025. Putnam Management and PSERV's commitment to these expense limitation arrangements, which were intended to support an effort to have the mutual fund expenses meet competitive standards, was an important factor in the Trustees' decision to approve your fund's

New Management Contracts and Interim Management Contracts and the continuance of your fund's Current Management Contracts.

The Trustees reviewed comparative fee and expense information for a custom group of competitive funds selected by Broadridge Financial Solutions, Inc. ("Broadridge"). This comparative information included your fund's percentile ranking for effective management fees and total expenses (excluding any applicable 12b-1 fees), which provides a general indication of your fund's relative standing. In the custom peer group, your fund ranked in the third quintile in effective management fees (determined for your fund and the other funds in the custom peer group based on fund asset size and the applicable contractual management fee schedule) and in the third quintile in total expenses (excluding any applicable 12b-1 fees) as of December 31, 2022. The first quintile represents the least expensive funds and the fifth quintile the most expensive funds. The fee and expense data reported by Broadridge as of December 31, 2022 reflected the most recent fiscal year-end data available in Broadridge's database at that time.

In connection with their review of fund management fees and total expenses, the Trustees also reviewed the costs of the services provided and the profits realized by Putnam Management and its affiliates from their contractual relationships with the funds. This information included trends in revenues, expenses and profitability of Putnam Management and its affiliates relating to the investment management, investor servicing and distribution services provided to the funds, as applicable. In this regard, the Trustees also reviewed an analysis of the revenues, expenses and profitability of Putnam Management and its affiliates, allocated on a fund-by-fund basis, with respect to (as applicable) the funds' management, distribution and investor servicing contracts. For each fund, the analysis presented information about revenues, expenses and profitability in 2022 for each of the applicable agreements separately and for the agreements taken together on a combined basis. The Trustees concluded that, at current asset levels, the fee schedules in place for each of the funds, including the fee schedule for your fund, represented reasonable compensation for the services being provided and represented an appropriate sharing between fund shareholders and Putnam Management of any economies of scale as may exist in the management of the funds at that time.

The information examined by the Trustees in connection with their annual contract review for the funds included information regarding services provided and fees charged by Putnam Management and its affiliates to other clients, including collective investment trusts offered in the defined contribution and defined benefit retirement plan markets, sub-advised mutual funds, private funds sponsored by affiliates of Putnam Management, model-only separately managed accounts and Putnam Management's manager-traded separately managed account programs. This information included, in cases where a product's investment strategy corresponds with a fund's strategy, comparisons of those fees with fees charged to the funds, as well as an assessment of the differences in the services provided to these clients as compared to the services provided to the funds. The Trustees observed that the differences in fee rates between these clients and the funds are by no means uniform when examined by individual asset sectors, suggesting that differences in the pricing of investment management services to these types of clients may reflect, among other things, historical competitive forces operating in separate marketplaces. The Trustees considered the fact that in many cases fee rates across different asset classes are higher on average for 1940 Act-registered funds than for other clients, and the Trustees also

considered the differences between the services that Putnam Management provides to the funds and those that it provides to its other clients. The Trustees did not rely on these comparisons to any significant extent in concluding that the management fees paid by your fund are reasonable.

### **Investment performance**

The quality of the investment process provided by Putnam Management represented a major factor in the Trustees' evaluation of the quality of services provided by Putnam Management under your fund's management contract. The Trustees were assisted in their review of Putnam Management's investment process and performance by the work of the investment oversight committees of the Trustees and the full Board of Trustees, which meet on a regular basis with individual portfolio managers and with senior management of Putnam Management's Investment Division throughout the year. The Trustees concluded that Putnam Management generally provides a high-quality investment process — based on the experience and skills of the individuals assigned to the management of fund portfolios, the resources made available to them and in general Putnam Management's ability to attract and retain high-quality personnel — but also recognized that this does not guarantee favorable investment results for every fund in every time period.

The Trustees considered that, in the aggregate, peer-relative and benchmark-relative Putnam fund performance was generally encouraging in 2022 against a backdrop of volatile equity and fixed income markets, driven by factors such as Russia's invasion of Ukraine, increased tensions with China, disruptions in energy markets and broader supply chains, rising inflation and the significant tightening of monetary policy by the Board of Governors of the Federal Reserve in an effort to combat inflation. The Trustees further noted that, in the face of these numerous economic headwinds, corporate earnings and employment data had been generally robust throughout 2022. For the one-year period ended December 31, 2022, the Trustees noted that the Putnam funds, on an asset-weighted basis, ranked in the 41st percentile of their peers as determined by Lipper Inc. ("Lipper") and, on an asset-weighted-basis, outperformed their benchmarks by 1.3% gross of fees over the one-year period. The Committee also noted that the funds' aggregate performance over longer-term periods continued to be strong, with the funds, on an asset-weighted basis, ranking in the 34th, 27th and 22nd percentiles of their Lipper peers over the three-year, five-year and ten-year periods ended December 31, 2022, respectively. The Trustees further noted that the funds, in the aggregate, outperformed their benchmarks on a gross basis for each of the three-year, five-year and ten-year periods. The Trustees also considered the Morningstar Inc. ratings assigned to the funds and that 40 funds were rated four or five stars at the end of 2022, which represented an increase of 15 funds year-over-year. The Trustees also considered that seven funds were five-star rated at the end of 2022, which was a year-over-year decrease of two funds, and that 83% of the funds' aggregate assets were in four- or five-star rated funds at year end.

In addition to the performance of the individual Putnam funds, the Trustees considered, as they had in prior years, the performance of The Putnam Fund complex versus competitor fund complexes, as reported in the Barron's/Lipper Fund Families survey (the "Survey"). The Trustees noted that the Survey ranks mutual fund companies based on their performance across a variety of asset types, and that The Putnam Fund complex had performed exceptionally well in 2022. In this regard, the Trustees considered that the funds had ranked 9th out of 49 fund companies, 3rd out of 49 fund companies and 2nd out of 47 fund companies for the one-year, five-year and ten-year periods, respectively. The Trustees

also noted that The Putnam Fund complex had been the only fund family to rank in the top ten in all three time periods. They also noted, however, the disappointing investment performance of some Putnam funds for periods ended December 31, 2022 and considered information provided by Putnam Management regarding the factors contributing to the under-performance and, where relevant, actions being taken to improve the performance of these particular funds. The Trustees indicated their intention to continue to monitor the performance of those funds.

For purposes of the Trustees’ evaluation of the Putnam funds’ investment performance, the Trustees generally focus on a competitive industry ranking of each fund’s total net return over a one-year, three-year and five-year period. For a number of Putnam funds with relatively unique investment mandates for which Putnam Management informed the Trustees that meaningful competitive performance rankings are not considered to be available, the Trustees evaluated performance based on their total gross and net returns and comparisons of those returns to the returns of selected investment benchmarks. In the case of your fund, the Trustees considered that its class IA share cumulative total return performance at net asset value was in the following quartiles of its Lipper peer group (Lipper VP (Underlying Funds) — Large-Cap Core Funds) for the one-year, three-year and five-year periods ended December 31, 2022 (the first quartile representing the best-performing funds and the fourth quartile the worst-performing funds):

One-year period	Three-year period	Five-year period
2nd	2nd	1st

Over the one-year, three-year and five-year periods ended December 31, 2022, there were 175, 144 and 135 funds, respectively, in your fund’s Lipper peer group. (When considering performance information, shareholders should be mindful that past performance is not a guarantee of future results.)

The Trustees also considered Putnam Management’s continued efforts to support fund performance through certain initiatives, including structuring compensation for portfolio managers to enhance accountability for fund performance, emphasizing accountability in the portfolio management process and affirming its commitment to a fundamental-driven approach to investing.

### **Brokerage and soft-dollar allocations; distribution and investor servicing**

The Trustees considered various potential benefits that Putnam Management may receive in connection with the services it provides under the management contract with your fund. These include benefits related to brokerage allocation and the use of soft dollars, whereby a portion of the commissions paid by a fund for brokerage may be used to acquire research services that are expected to be useful to Putnam Management in managing the assets of the fund and of other clients. Subject to policies established by the Trustees, soft dollars generated by these means are used predominantly to acquire brokerage and research services (including third-party research and market data) that enhance Putnam Management’s investment capabilities and supplement Putnam Management’s internal research efforts. The Trustees indicated their continued intent to monitor regulatory and industry developments in this area with the assistance of their Brokerage Committee. In addition, with the assistance of their Brokerage Committee, the Trustees indicated their continued intent to monitor the allocation of the funds’ brokerage in order to ensure that the principle of seeking best price and execution remains paramount in the portfolio trading process.

Putnam Management may also receive benefits from payments made to Putnam Management’s affiliates by the mutual funds for distribution services and investor services. In conjunction with the review of your fund’s management, sub-management and sub-advisory contracts, the Trustees reviewed your fund’s investor servicing agreement with PSERV and its distributor’s contract and distribution plans with Putnam Retail Management Limited Partnership (“PRM”), both of which are affiliates of Putnam Management. The Trustees concluded that the fees payable by the mutual funds to PSERV and PRM for such services were fair and reasonable in relation to the nature and quality of such services, the fees paid by competitive funds and the costs incurred by PSERV and PRM in providing such services. Furthermore, the Trustees were of the view that the investor services provided by PSERV were required for the operation of the mutual funds, and that they were of a quality at least equal to those provided by other providers.



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## Other important information

### Proxy voting

Putnam is committed to managing our mutual funds in the best interests of our shareholders. The Putnam funds' proxy voting guidelines and procedures, as well as information regarding how your fund voted proxies relating to portfolio securities during the 12-month period ended June 30, 2022, are available in the Individual Investors section of [putnam.com](http://putnam.com) and on the Securities and Exchange Commission's (SEC) website at [www.sec.gov](http://www.sec.gov). If you have questions about finding forms on the SEC's website, you may call the SEC at 1-800-SEC-0330. You may also obtain the Putnam funds' proxy voting guidelines and procedures at no charge by calling Putnam's Shareholder Services at 1-800-225-1581.

### Fund portfolio holdings

The fund will file a complete schedule of its portfolio holdings with the SEC for the first and third quarters of each fiscal year on Form N-PORT within 60 days of the end of such fiscal quarter. Shareholders may obtain the fund's Form N-PORT from the SEC's website at [www.sec.gov](http://www.sec.gov).

### Liquidity risk management program

Putnam, as the administrator of the fund's liquidity risk management program (appointed by the Board of Trustees), presented the most recent annual report on the program to the Trustees in May 2023. The report covered the structure of the program, including the program documents and related policies and procedures adopted to comply with Rule 22e-4 under the Investment Company Act of 1940, and reviewed the operation of the program from January 2022 through December 2022. The report included a description of the annual liquidity assessment of the fund that Putnam performed in November 2022. The report noted that there were no material compliance exceptions identified under Rule 22e-4 during the period. The report included a review of the governance of the program and the methodology for classification of the fund's investments. Putnam concluded that the program has been operating effectively and adequately to ensure compliance with Rule 22e-4.

## Fund information

### Investment Manager

Putnam Investment Management, LLC  
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Boston, MA 02110

### Investment Sub-Advisors

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The Putnam Advisory Company, LLC  
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Boston, MA 02110

### Marketing Services

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Limited Partnership  
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Boston, MA 02110

### Investor Servicing Agent

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1-800-225-1581

### Custodian

State Street Bank and Trust Company

### Legal Counsel

Ropes & Gray LLP

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Robert L. Reynolds  
Manoj P. Singh  
Mona K. Sutphen

The fund's Statement of Additional Information contains additional information about the fund's Trustees and is available without charge upon request by calling 1-800-225-1581.

