

Tennessee Valley Authority  
Retirement System

2018 Annual Report

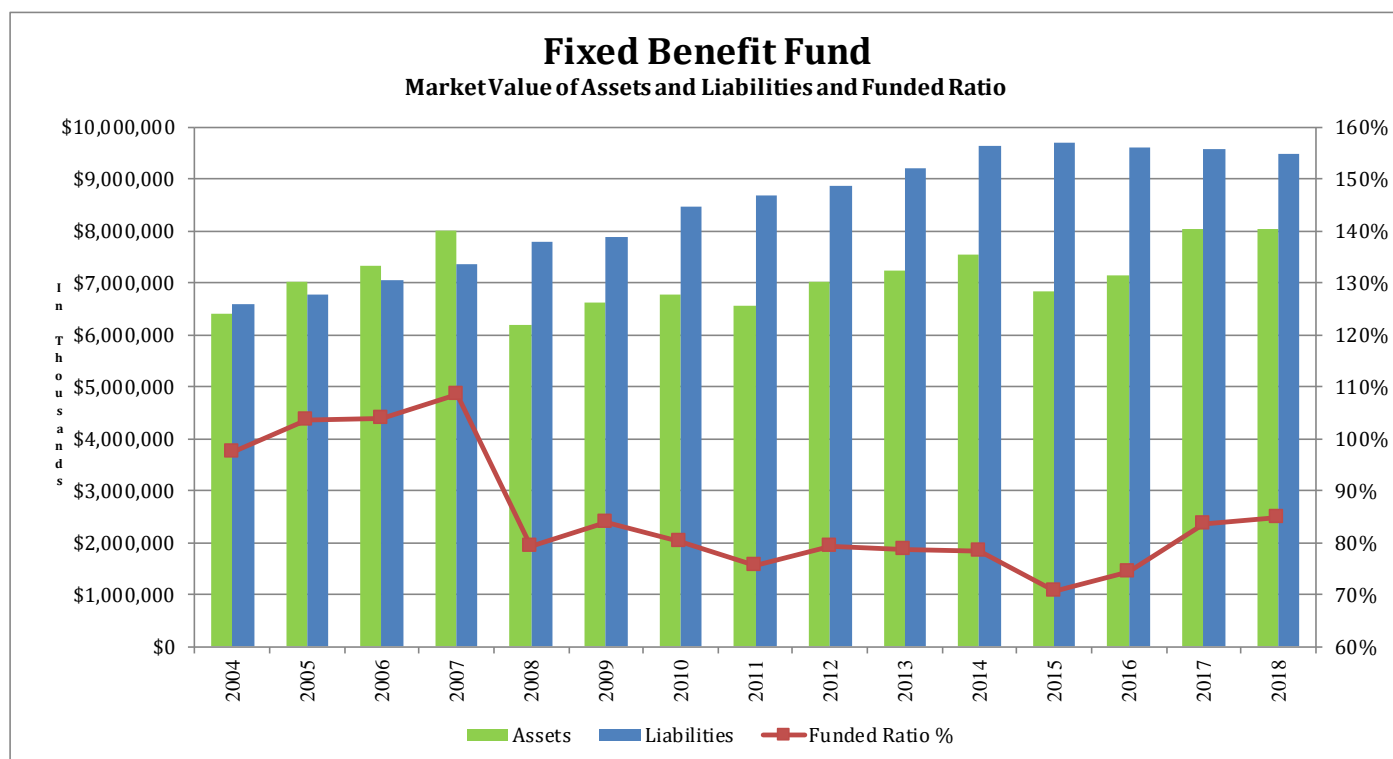
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# Financial Highlights and Statistics

<i>(Dollars in thousands)</i>	2018	2017	Change	% Change
<b>Net Assets Available for Benefits</b>				
TVA Retirement System (Fixed Benefit Fund and Variable Fund)	\$ 8,190,447	\$ 8,160,445	\$ 30,002	0.4%
TVA Savings & Deferral Retirement Plan [401(k) Plan]	2,625,243	2,354,150	271,093	11.5%
<b>Total</b>	<b>\$ 10,815,690</b>	<b>\$ 10,514,595</b>	<b>\$ 301,095</b>	<b>2.9%</b>
<b>Net Assets Available for Benefits (Fixed Benefit Fund)</b>				
<b>Actuarial Present Value of Accumulated Plan Benefits (Fixed Benefit Fund)</b>	<b>\$ 8,038,598</b>	<b>\$ 8,017,216</b>	<b>\$ 21,382</b>	<b>0.3%</b>
	<b>\$ 9,475,500</b>	<b>\$ 9,576,700</b>	<b>\$ (101,200)</b>	<b>-1.1%</b>
<b>Contributions</b>				
Employer (all funds)	\$ 379,894	\$ 878,558	\$ (498,664)	-56.8%
Employee (all funds)	\$ 109,599	\$ 106,259	\$ 3,340	3.1%
<b>Benefits Paid (all funds)</b>				
	\$ 866,427	\$ 870,369	\$ (3,942)	-0.5%
<b>Number of Active Members</b>				
	9,791	9,987	(196)	-2.0%
<b>Number of Retirees</b>				
	24,240	24,469	(229)	-0.9%

This summary is intended for informational purposes only.



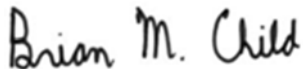
## To Retirement System Members and Retirees

The TVA Retirement System (System) Board of Directors is pleased to present the 2018 Annual Report for the fiscal year ended September 30, 2018. As of September 30, 2018, the net assets of the Fixed Benefit Fund totaled \$8.0 billion. During the fiscal year, the Fixed Benefit Fund paid \$714 million in benefits to approximately 24,000 retirees and beneficiaries and TVA contributed \$300 million. In addition, the net assets of the TVA Savings and Deferral Retirement Plan (401(k) Plan) rose to \$2.6 billion as of September 30, 2018. Employees contributed \$101 million to the 401(k) Plan during fiscal 2018, while matching and non-elective contributions from TVA totaled \$80 million.

The changes we have made over the past 3 years have helped to put the System on a more stable and sustainable long-term path. Since September 30, 2015, the System's pension obligation has declined from a peak of \$9.7 billion to \$9.5 billion as of September 30, 2018. During this same timeframe, the System's net assets increased from \$6.8 billion to \$8.0 billion. This included \$1.4 billion in contributions by TVA and \$1.6 billion in investment gains, while providing \$2.1 billion in retirement benefits to retirees and beneficiaries. As a result, from September 30, 2015 to September 30, 2018, the System's funded status has increased from 71% to almost 85%, the highest funded status since 2007.

September 6, 2019, will mark the 80<sup>th</sup> anniversary of the TVA board's establishment of TVARS and approval of the System's Rules and Regulations governing the System and its benefits. Over that time, the System's mission to provide retirement benefits for TVA employees and retirees has never changed.

We look forward to continuing our efforts to strengthen and protect these retirement benefits, with a focus on improving the funded status of the pension plan and engaging employees participating in the 401(k) Plan to help improve their retirement readiness and meet their retirement goals. The System's administration of the retirement plans continues to evolve as industry trends and new generations of TVA employees lead us into the future. We are honored to work on the behalf of TVA employees and retirees.



Brian M. Child  
Chair, Board of Directors  
TVA Retirement System

# TVA Retirement System Board of Directors

## Elected by Members



***James W. Hovious***

Elected November 1, 2013



***Leonard J. Muzyn***

Elected November 1, 2003



***Samuel J. Delay***

Elected November 1, 2017

## Appointed by TVA



***Brian M. Child***

Appointed September 23, 2013



***Christopher L. Hinton***

Appointed April 16, 2018



***Tammy W. Wilson***

Appointed May 10, 2010

## Selected by Other Directors



***Allen E. Stokes***

Selected March 8, 2011

In the recent election for a director vacancy on the TVA Retirement System Board, employees voted to elect Michael L. Belcher, Nuclear Reactor Unit Operator. His three-year term will run from November 1, 2018, to October 31, 2021. Belcher filled the director position previously held by Leonard Muzyn.



***Michael L. Belcher***

Elected November 1, 2018

## Standing Committees

### ***Audit***

Tammy W. Wilson, Chair  
Samuel J. DeLay  
Allen E. Stokes

### ***Election***

Samuel J. DeLay, Chair  
James W. Hovious  
Christopher L. Hinton

### ***Retirement***

Christopher L. Hinton, Chair  
Tammy W. Wilson  
Leonard J. Muzyn

### ***Investment***

Leonard J. Muzyn, Chair  
Christopher L. Hinton  
Brian M. Child  
Samuel J. DeLay  
James W. Hovious  
Allen E. Stokes  
Tammy W. Wilson

## Board Officers

*Brian M. Child*  
Chair

*Tammy W. Wilson*  
Vice Chair

*Patrick D. Brackett*  
Executive Secretary

*William B. Jenkins, Jr.*  
Assistant Secretary

*Sally R. Weber*  
Treasurer

*W. Colby Carter*  
Assistant Treasurer

*Courtney L. Hammontree*  
Assistant Treasurer

*T. Justin Vineyard*  
Assistant Treasurer

*Patrick B. Vananda*  
Assistant Treasurer

# Professional Advisers and Investment Managers

## Professional Advisers

### *Actuary*

Mercer Human Resource Consulting, Atlanta

### *Auditors*

Crowe LLP, South Bend

### *Board Advisers*

Michael Brakebill, Chief Investment Officer,  
Tennessee Consolidated Retirement System, Nashville  
Vincent V. Sands, Executive Vice President and Head of  
Strategic Initiatives, BNY Mellon Investment Services  
(retired), Pittsburgh

### *Investment Consultant - Pension Plan*

Wilshire Associates Incorporated, Pittsburgh

### *Investment Consultant – 401(k) Plan*

Aon Hewitt Investment Consulting, Inc., Atlanta

### *Legal Counsel*

W. Colby Carter, Senior Counsel, TVARS, Knoxville  
Bradley Arant Boult Cummings LLP, Nashville  
Groom Law Group, Chartered, Washington D.C

### *Master Trustee*

The Bank of New York Mellon, Pittsburgh

### *401(k) Plan Trustee*

Fidelity Management Trust Company, Boston

### *401(k) Plan Recordkeeper*

Fidelity Workplace Services LLC, Boston

### *Fixed and Variable Funds Recordkeeper*

Fidelity Investment Institutional Operations Company,  
Inc., Boston

### *Cash Balance Pension Plan Recordkeeper*

Aon Hewitt, Atlanta

### *Medical Board and Adviser*

Advanced Medical Reviews, Los Angeles

## Investment Managers

### *Fixed Benefit Fund*

Abbott Capital Management LP  
Acadian Asset Management, LLC  
Adams Street Partners, LLC  
AQR Capital Management, LLC  
Baillie Gifford Overseas Limited  
Bridgewater Associates, Inc.  
CoreCommodity Management, LLC  
Crestline Investors, Inc.  
Dimensional Fund Advisors LP  
Fisher Investments  
Franklin Templeton Institutional, LLC  
Fidelity Asset Management, LLC  
Hancock Natural Resource Group, Inc.  
HarbourVest Partners, LLC  
Harvest Fund Advisors, LLC  
J.P. Morgan Investment Management, Inc.  
Kennedy-Wilson Holdings, Inc.  
Landmark Realty Advisors, LLC  
Lazard Asset Management, LLC  
Los Angeles Capital Mgmt. & Equity Research, Inc.  
MacKay Shields, LLC  
Mellon Capital Management  
Neuberger Berman, LLC  
Oaktree Capital Management, LP  
Pacific Investment Management Company  
The Prudential Insurance Company of America  
Prudential Investment Management, Inc.  
Quantum Energy Partners  
Siguler Guff Advisors, LLC  
Standish Mellon Asset Management, LLC  
TCW Asset Management Company  
Tortoise Capital Advisors, LLC  
Vedanta Capital, LLC  
Wellington Management Company, LLP  
Western Asset Management Company  
Wilshire Associates Incorporated  
WRH Partners, LLC

### *Variable Fund*

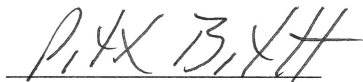
Fidelity Investments  
Mellon Capital Management

# Certification of Financial Statements

*I, Patrick D. Brackett individually certify that:*

1. I have reviewed the Financial Statements of the Tennessee Valley Authority Retirement System.
2. Based on my knowledge, the information in the Financial Statements does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the periods covered by the Financial Statements.
3. Based on my knowledge, the Financial Statements and other financial information included in the Annual Report fairly present in all material respects the financial condition and results of operations of the Tennessee Valley Authority Retirement System as of, and for, the periods presented in the Financial Statements.
4. I am responsible for establishing and maintaining disclosure controls and procedures for the Tennessee Valley Authority Retirement System and have:
  - a. designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the Tennessee Valley Authority Retirement System is made known to us by others, particularly during the period in which these Financial Statements are being prepared; and
  - b. evaluated the effectiveness of the Tennessee Valley Authority Retirement System's disclosure controls and procedures as of a date within 90 days prior to the date of the Financial Statements.
5. I have disclosed, based on my most recent evaluation of internal control over financial reporting, to the Tennessee Valley Authority Retirement System's auditors:
  - a. all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting that are reasonably likely to adversely affect the Tennessee Valley Authority Retirement System's ability to record, process, summarize and report financial information; and
  - b. any fraud, whether or not material, that involves management or other employees who have a significant role in the Tennessee Valley Authority Retirement System's internal control over financial reporting.

April 12, 2019



Patrick D. Brackett  
*Executive Secretary*



## INDEPENDENT AUDITOR'S REPORT

Members and Administrator of  
Tennessee Valley Authority Retirement System  
Knoxville, Tennessee

### Report on the Financial Statements

We have audited the accompanying financial statements of Tennessee Valley Authority Retirement System (Plan), which comprise the statements of net assets available for benefits as of September 30, 2018 and 2017, and the related statements of changes in net assets available for benefits for the years then ended, and the related notes to the financial statements.

### *Management's Responsibility for the Financial Statements*

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### *Auditor's Responsibility*

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Plan's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### *Opinion*

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial status of Tennessee Valley Authority Retirement System as of September 30, 2018 and 2017, and the changes in its financial status for the years then ended in accordance with accounting principles generally accepted in the United States of America.



Crowe LLP

South Bend, Indiana  
April 12, 2019

**Tennessee Valley Authority Retirement System**  
**Defined Benefit Pension Plan**  
**Statements of Net Assets Available for Benefits**

*September 30, 2018 and 2017*

*(Dollars in thousands)*

	2018	2017
<b>Assets</b>		
Investments at fair value	\$ 8,719,236	\$ 8,684,358
Receivables		
Due from broker	146,180	144,354
Interest and dividends	44,318	29,918
Foreign currency forward receivable	2,892	4,216
Other	425	1,336
Total receivables	193,815	179,824
Total assets	8,913,051	8,864,182
<b>Liabilities</b>		
Due to broker	273,982	311,236
Derivatives	7,124	4,900
Securities sold under agreements to repurchase	107,549	-
Investment fees payable	9,748	8,604
Other	2,678	2,888
Disbursements payable	1,080	1,805
Total payables	402,161	329,433
Foreign currency forward payable	2,612	5,842
Liabilities to brokers for securities lending (see Note 4 )	317,831	368,462
Total liabilities	722,604	703,737
<b>Net Assets Available for Benefits</b>	<b>\$ 8,190,447</b>	<b>\$ 8,160,445</b>

*The accompanying notes are an integral part of the financial statements.*

# Tennessee Valley Authority Retirement System

## Defined Benefit Pension Plan

### Statements of Changes in Net Assets Available for Benefits

*Fiscal Years Ended September 30, 2018 and 2017*

*(Dollars in thousands)*

	2018	2017
<b>Investment Income</b>		
Net appreciation in fair value of investments	\$ 314,431	\$ 677,201
Interest	141,195	120,222
Dividends	49,724	43,499
	<u>505,350</u>	<u>840,922</u>
<b>Less Investment Expenses</b>	<u>(42,928)</u>	<u>(39,366)</u>
Total investment income	<u>462,422</u>	<u>801,556</u>
 <b>Contributions</b>		
TVA	300,000	800,003
Members	8,450	9,822
Transfers from 401(k) Plan	4,727	4,465
Total contributions	<u>313,177</u>	<u>814,290</u>
Total increase	<u>775,599</u>	<u>1,615,846</u>
 <b>Benefits, Transfers, and Expenses</b>		
Retirement benefits - Fixed Benefit Fund	(714,495)	(707,731)
Retirement benefits - Variable Fund	(10,952)	(10,370)
Transfers to 401(k) Plan	(13,779)	(19,772)
Administrative expenses	(6,371)	(5,761)
Total benefits, transfers, and expenses	<u>(745,597)</u>	<u>(743,634)</u>
Net increase	30,002	872,212
 <b>Net Assets Available for Benefits</b>		
Beginning of year	8,160,445	7,288,233
End of year	<u>\$ 8,190,447</u>	<u>\$ 8,160,445</u>

*The accompanying notes are an integral part of the financial statements.*

# Notes to Financial Statements

## September 30, 2018 and 2017

### Note 1

#### PLAN DESCRIPTION

##### General

The Tennessee Valley Authority Retirement System (TVARS or System) was established by the Tennessee Valley Authority (TVA) in 1939 to provide retirement benefits for TVA employees. When TVA established the System, it also approved the Rules and Regulations of the TVA Retirement System (TVARS Rules), which constitute the legal charter under which the System operates and provide a defined benefit pension plan (Plan), which is administered by TVARS for TVA employees who are members of the System and eligible to participate in the Plan.

TVARS is a separate legal entity from TVA and is governed by an independent, seven-member Board of Directors (TVARS Board). Three of the directors are appointed by TVA, three are elected by and from the membership, and the seventh director, who is a TVA retiree, is selected by the other six. The System staff performs their work for the System under the supervision and direction of the TVARS Board and the System's Executive Secretary.

A brief description of the Plan is provided below for general information purposes only. Members and retirees may refer to the TVARS Rules for more information. *This description is intended to help TVARS members and stakeholders understand the System and the benefits under the Plan. The TVARS Rules, not this information, are used to determine the benefits to which a member is entitled.*

##### Plan Benefits

The Plan covers most full-time and part-time TVA annual employees first hired prior to July 1, 2014 (participants); however, TVA board members, and TVA employees with prior federal service who retain membership in the Civil Service or Federal Employees Retirement Systems, are excluded from participation in the Plan. As a retirement plan for employees of a federal agency, the Plan is a governmental plan under section 414(d) of the Internal Revenue Code and is not subject to the Employee Retirement Income Security Act (ERISA), which governs the retirement plans of private entities. Under the Plan, the benefits for which participants are eligible are subject to a vesting requirement of five years of service and depend on the participant's hire date and years of service as follows:

- Participants who were first hired prior to January 1, 1996, receive a traditional pension benefit calculated based on the participant's creditable service, the participant's average monthly salary for the highest three consecutive years of eligible compensation, and a pension factor based on the participant's age and years of service, less a Social Security offset.
- Participants who were first hired prior to January 1, 1996, and who elected to switch pension structures from the traditional to the cash balance, receive a cash balance pension benefit calculated based on pay-based credits and interest that accrue over time in the participant's account and the participant's age at the time of retirement. The monthly pay credits are equal to 6 percent of eligible compensation and monthly interest is credited at an annual interest rate equal to the change in the Consumer Price Index for All Urban Consumers (CPI-U) plus 3 percent (with a minimum of 6 percent and maximum of 10 percent).
- Participants who were first hired on or after January 1, 1996, and who had 10 or more years of service as of October 1, 2016, receive a cash balance pension benefit calculated based on pay-based credits and interest that accrue over time in the participant's account and the participant's age at the time of retirement. The monthly pay credits are equal to 3 percent of eligible compensation and monthly interest is credited at an annual interest rate equal to the change in the CPI-U plus 2 percent;

provided, however, that the annual interest rate will not be less than the Plan's assumed rate of investment return minus 2 percent nor greater than the Plan's assumed rate of investment return minus 0.5 percent. Prior to October 1, 2016, the monthly pay credits were equal to 6 percent of eligible compensation. Monthly interest was credited at an annual interest rate equal to the change in the CPI-U plus 3 percent with an established minimum annual interest rate of 6 percent and a maximum annual interest rate of 10 percent.

- Participants who were first hired on or after January 1, 1996, and who had less than 10 years of service as of October 1, 2016, receive a cash balance pension benefit calculated based on pay-based credits and interest that accrue over time in the participant's account and the participant's age at the time of retirement. As of October 1, 2016, the cash balance accounts of these participants receive no additional pay-based credits; however, the accounts continue to receive monthly interest credits at an annual interest rate equal to the change in the CPI-U plus 2 percent; provided, however, that the annual interest rate will not be less than the Plan's assumed rate of investment return minus 2 percent nor greater than the Plan's assumed rate of investment return minus 0.5 percent. Prior to October 1, 2016, the monthly pay credits were equal to 6 percent of eligible compensation. Monthly interest was credited at an annual interest rate equal to the change in the CPI-U plus 3 percent with an established minimum annual interest rate of 6 percent and a maximum annual interest rate of 10 percent.
- Employees who are first hired on or after July 1, 2014 (or who are rehired and were either previously not vested in the Plan or cashed out their Plan benefit) are not eligible for retirement benefits under the Plan.

## **Benefit Distributions**

Upon retirement or termination of employment, in the event participants meet the vesting requirement of five years of service, the participants are eligible for an immediate benefit under the Plan in the form of a pension, a deferred pension, or for the cash balance benefit, a lump-sum distribution that may be rolled over to another qualified retirement account. At retirement or termination of employment, participants may elect to take the maximum monthly pension during the participant's lifetime, with nothing payable after death, or to take a reduced amount and provide an on-going pension benefit for a designated survivor beneficiary. Each of the various survivor options is the actuarial equivalent of the maximum monthly pension.

## **Other Benefits**

Except for those participants who were first hired on or after January 1, 1996, and who have less than 10 years of service as of October 1, 2016, participants are eligible for certain benefits as set forth under the TVARS Rules in the event of death or disability during employment.

Upon retirement or termination of employment, in the event the participant is age 55 with at least 10 years of service (or age 50 with at least 10 years of service if terminated due to involuntary reduction-in-force), and the participant will receive a monthly pension benefit, the participant will be eligible for a supplemental benefit that may be used to help with the cost of retiree medical insurance, although it is not required to be used to pay for medical insurance.

Eligible retirees and beneficiaries may receive cost-of-living adjustments (COLAs) on the pension and supplemental benefits as determined in accordance with the TVARS Rules. The calculation of the COLA is based on the increase in the 12-month average of the CPI-U when the CPI-U exceeds by as much as 1 percent the CPI-U average for the prior year for which an adjustment was made minus 0.25 percent, with a 6.00 percent cap in any one year. Based on the above calculation, the COLA was 1.84 percent in calendar year 2018. The COLA was 0.99 percent in calendar year 2017.

## **Note 2**

### **SIGNIFICANT ACCOUNTING POLICIES**

#### **Basis of Accounting**

The financial statements are prepared on the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America.

#### **Impact of New Accounting Standard**

In August 2018, the Financial Accounting Standards Board issued guidance which eliminates and modifies certain fair value measurement disclosures. The requirement to disclose changes in unrealized appreciation (depreciation) relating to Level 3 investments is eliminated as well as the requirement to disclose the valuation processes for Level 3 fair value measurements and the policy for timing of transfers between levels of the fair value hierarchy. Additionally, the guidance modifies the disclosure related to the Level 3 investment rollforward by only requiring purchases, issuances, and transfers into and out of Level 3 to be shown. The standard is effective for TVARS for fiscal year 2020; however, the Plan elected to early adopt the guidance for fiscal year 2018. The adoption of this standard was applied retrospectively to all periods presented and had no material impact on the Statement of Net Assets and the Statement of Changes in Net Assets.

#### **Custody Relationships**

The Bank of New York Mellon (BNY Mellon) serves as the Master Trustee (Trustee) and Custodian (Custodian) of the Plan and accounts for the entire portfolio. The Plan has certain commingled fund investments where the investment adviser has contracted the custodial services to a financial institution other than BNY Mellon.

The holdings for private credit and equity funds are investments in limited partnerships and are not held at a custody bank. The private credit investments comprise 0.1 percent of Net Assets Available for Benefits in 2018 and none were held in 2017. The private equity funds comprise 7.9 percent of the Net Assets Available for Benefits in 2018 and 6.2 percent in 2017. The holdings for the private real estate investments are investments in commercial real estate and also are not held at a custody bank. The private real estate investments comprise 7.0 percent of the Net Assets Available for Benefits in 2018 and 6.7 percent in 2017.

#### **Investment Valuation and Income Recognition**

The Plan's investments and derivative instruments are reported at fair value. Purchases and sales of securities are recorded on a trade date basis. Interest income is recorded on the accrual basis. Dividends are recorded on the ex-dividend date. Net appreciation (depreciation) includes the Plan's gains and losses on investments bought and sold as well as held during the year.

Fair value is viewed as the price that would be received by the Plan for an asset or paid by the Plan to transfer a liability (an exit price) in an orderly transaction between market participants on the measurement date in the Plan's principal or most advantageous market for the asset or the liability. There is a fair value hierarchy that maximizes the use of observable inputs and minimizes the use of unobservable inputs when measuring fair value. The hierarchy places the highest priority on unadjusted quoted market prices in active markets for identical assets or liabilities (Level 1 measurements) and gives the lowest priority to unobservable inputs (Level 3 measurements). The three levels of inputs within the fair value hierarchy are defined as follows:

Level 1 Inputs: Quoted prices (unadjusted) for identical assets in active markets that the Plan has the ability to access at the measurement date.

Level 2 Inputs: Significant observable inputs other than Level 1 such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data such as matrix pricing, yield curves, and indices.

Level 3 Inputs: Significant unobservable inputs that reflect the Plan's own assumptions about the assumptions that market participants would use in pricing an asset or liability.

In many cases, a valuation technique used to measure fair value includes inputs from multiple levels of fair value hierarchy. The lowest level of significant input determines the placement of the entire fair value measurement in the hierarchy.

The following descriptions of the valuation methods and assumptions used by the Plan to estimate the fair value of investments apply to investments held directly by the Plan. Third-party pricing vendors provide valuations for investments held by the Plan in most instances, except for commingled, private credit, private equity, and private real estate funds which are priced at net asset values established by the investment managers. In instances where pricing is determined to be based on unobservable inputs a Level 3 classification has been assigned.

**Common stock, Registered investment companies, Master limited partnerships, and Preferred securities:** Investments, including common stock, registered investment companies, master limited partnerships, and preferred securities listed on either a national or foreign securities exchange or traded in the over-the-counter National Market System, are generally valued each business day at the official closing price (typically the last reported sale price) on the exchange on which the security is primarily traded and are classified as Level 1. Preferred securities classified as Level 2 may have been priced by dealer quote or using assumptions based on observable market data.

**Corporate debt securities:** Corporate bonds are valued based upon recent bid prices or the average of recent bid and asked prices when available (Level 2 inputs) and, if not available, they are valued through matrix pricing models developed by sources considered by management to be reliable. Matrix pricing, which is a mathematical technique commonly used to price debt securities that are not actively traded, values debt securities without relying exclusively on quoted prices for the specific securities but rather by relying on the security's relationship to other benchmark quoted securities (Level 2 inputs).

**Mortgage and asset-backed securities:** Residential mortgage-backed securities consist of collateralized mortgage obligations (CMOs) and U.S. pass-through security pools related to government-sponsored enterprises (GSEs). CMO pricing is typically based on either a volatility-driven, multidimensional, single-cash-flow stream model or an option-adjusted spread model. These models incorporate available market data such as trade information, dealer quotes, market color, spreads, bids, and offers. Pricing for GSE securities, including the Federal Home Loan Mortgage Corporation, the Federal National Mortgage Association, and the Government National Mortgage Association, is typically based on quotes from the To Be Announced (TBA) market, which is highly liquid with multiple electronic platforms that facilitate the execution of trading between investors and broker/dealers. Prices from the TBA market are then compared against other live data feeds as well as input obtained directly from the dealer community. Most residential mortgage-backed securities are considered to be priced using Level 2 inputs because of the nature of their market-data-based pricing models.

Commercial mortgage-backed and asset-backed securities are typically priced based on single-cash-flow stream models, which incorporate available market data such as trade information, dealer quotes, market color, spreads, bids, and offers. Because of the market-data-based nature of such pricing models, commercial mortgage-backed and asset-backed securities are classified as Level 2.

**Government debt securities:** For U.S. Treasury securities, fair values reflect the closing price reported in the active market in which the security is traded (Level 1 inputs). Agency securities are typically priced using evaluated pricing applications and models incorporating U.S. Treasury yield curves. Agency securities are classified as Level 2 because of the nature of their market-data-based pricing models.

Debt securities issued by state and local governments are typically priced using market-data-based pricing models, and are therefore classified as Level 2. These pricing models incorporate market data such as quotes, trading levels, spread relationships, and yield curves, as applicable.

Foreign government bonds and foreign government inflation-linked securities are typically priced based on proprietary discounted cash flow models, incorporating option-adjusted spread features as appropriate. Debt securities issued by foreign governments are classified as Level 2 because of the nature of their market-data-based pricing models.

**Commingled funds:** The Plan invests in commingled funds, which are classified by general type as common-collective trusts, limited liability companies, and a limited partnership. The Plan's ownership consists of a pro rata share and not a direct ownership of an underlying investment. These funds are valued at their closing net asset values (or unit value) per share as reported by the managers of the funds and as supported by the unit prices of actual purchases and sale transactions occurring as of or close to the financial statement date. The investment strategies of these funds are summarized as follows.

The Plan is invested in equity common-collective trusts, which can be categorized as either passively managed index funds or actively managed funds. The Plan is invested in an actively managed equity limited partnership. The equity index funds seek to track the performance of a particular index by replicating its capitalization and characteristics. Passive fund benchmark indices include the Russell 1000 index, the S&P 500 index, the Morgan Stanley Capital International All Country World Index ex-U.S., and the Dow Jones U.S. Select REIT index. The actively managed equity funds seek to outperform certain equity benchmarks through a combination of fundamental and technical analysis. Active funds select portfolio positions based upon their research.

The Plan is invested in debt limited liability companies and debt common-collective trusts, which can be categorized as either passively managed index funds or actively managed funds. A debt index fund seeks to track the performance of a particular index by replicating its capitalization and characteristics. The passive fund benchmark is the Bloomberg Barclays Capital U.S. Treasury Inflation-Protected Securities index. The actively managed debt funds seek to outperform certain fixed-income benchmarks through fundamental research and analysis. The funds invest in a diversified portfolio of fixed income securities and derivatives of varying maturities. Varying by strategy, fund objectives include achieving a positive relative total return through active credit selection and providing risk management through desired strategic exposures.

The Plan is invested in a commodity common-collective trust and a commodity limited liability company, which can be categorized as actively managed funds. The funds seek to outperform certain commodity benchmarks through fundamental research and analysis. The funds invest in a diversified portfolio of commodity securities and derivatives of varying maturities. The objective is to achieve a positive relative return through active security selection.

The Plan is invested in a common-collective trust which invests across multiple asset classes that can be categorized as blended. This fund seeks to outperform a passive benchmark through active security selection. The funds invest in securities across equity, fixed income, currency, and commodities. The portfolio employs fundamental, quantitative, and technical analysis.

The Plan's investments in equity, debt, blended, and commodity funds can generally be redeemed upon notification of the investment managers, with required notice periods varying from same-day to monthly. These investments do not have unfunded commitments.

**Cash equivalents and other short-term investments and Certificates of deposit:** Cash equivalents and other short-term investments are highly liquid securities with a maturity of less than three months and 12 months, respectively. These consist primarily of discount securities such as commercial paper, repurchase agreements, U.S. Treasury bills, and certain agency securities. These securities, as well as certificates of deposit, may be priced at cost, which approximates fair value due to the short-term nature of the instruments. Model based pricing which incorporates observable inputs may also be utilized. These securities are classified as Level 2. Active market pricing may be utilized for U.S. Treasury bills, which are classified as Level 1.



**Private credit fund:** Private credit limited partnerships are reported at net asset values provided by the fund managers.

The private credit limited partnerships generally focus on direct lending investments of senior secured first-lien loans to lower-middle market companies and seek to obtain financial returns through high income potential and occasional equity upside. The limited partnerships generally have a term life of five to eight years and are diversified by sector and industry.

The private credit fund has no investment withdrawal provisions prior to the termination of the partnership. The restricted investments of the private credit fund amounted to \$9 million as of September 30, 2018, and none were held as of September 30, 2017. The partnership continues seven years after the inception of the fund. The partnership is also subject to an extension period at the discretion of the General Partner. The contractual maturity of private credit fund held in 2018 is August 2025 before the extension is applied.

**Private equity funds:** Private equity limited partnerships are reported at net asset values provided by the fund managers.

The private equity limited partnerships typically make longer-term investments in private companies and seek to obtain financial returns through long-term appreciation based on corporate stewardship, improved operating processes, and financial restructuring, which may involve a merger or acquisition. Significant investment strategies include venture capital; buyout; mezzanine, or subordinated debt; restructuring, or distressed debt; energy infrastructure; and special situations. Venture capital partnerships consist of two main groupings. Early-stage venture capital partnerships invest in businesses still in the conceptual stage where products may not be fully developed and where revenues and/or profits may be several years away. Later-stage venture capital partnerships invest in more mature companies in need of growth or expansion capital. Buyout partnerships provide the equity capital for acquisition transactions either from a private seller or the public, which may represent the purchase of the entire company or a refinancing or recapitalization transaction where equity is invested. Mezzanine or subordinated debt partnerships provide the intermediate capital between equity and senior debt in a buyout or refinancing transaction and typically own a security in the company that carries current interest payments as well as a potential equity interest in the company. Restructuring or distressed debt partnerships purchase opportunities generated by overleveraged or poorly managed companies. Energy infrastructure partnerships acquire essential, long-lived real assets in three main groupings. Upstream assets include oil and gas exploration, drilling, and acquisition. Midstream assets include storage, pipelines, gathering, processing, and transportation of energy commodities. Downstream assets include generation, distribution, and transmission facilities. Special situation partnerships include organizations with a specific industry focus not covered by the other private equity subclasses or unique opportunities that fall outside the regular subclasses.

The private equity funds have no investment withdrawal provisions prior to the termination of the partnership. The restricted investments of the private equity funds amounted to \$649 million as of September 30, 2018, and \$508 million as of September 30, 2017. Partnerships generally continue 10 to 12 years after the inception of the fund. The partnerships are also generally subject to various extension periods at the discretion of the General Partner. The contractual maturities of private equity funds held in 2018 range from October 2018 to May 2028 before the extensions are applied. Partnerships can generally be dissolved by an 80 percent vote in interest by all limited partners, with some funds requiring the occurrence of a specific event.

**Private real estate investments:** The Plan's ownership in private real estate investments consists of a pro rata share and not a direct ownership of the underlying investments. The fair values of the Plan's private real estate investments are estimated utilizing net asset values provided by the investment managers. The methodologies utilized by the investment managers to calculate their net asset values are summarized as follows.

The Plan is invested in limited partnerships that invest in real estate securities, real estate partnerships, and in direct real estate properties. This includes investments in office, multifamily, industrial, and retail

investment properties in the U.S. and international markets. The investment strategy focuses on distressed, opportunistic, and value-added opportunities. Partnership investments also include mortgage and/or real estate-related fixed-income instruments and related securities. Investments are diversified by property type and geographic location.

The Plan is invested in a commingled fund that develops, renovates, and re-leases real estate properties to create value. Investments are predominantly in top tier real estate markets that offer deep liquidity. Property types include residential, office, industrial, hotel, retail, and land. Properties are diversified by geographic region within the U.S. domestic market. The Plan is invested in a second commingled fund that invests primarily in core, well-leased, operating real estate properties with a focus on income generation. Investments are diversified by property type with a focus on office, industrial, apartment, and retail. Properties are diversified within the U.S. with an overweight to major market and coastal regions.

Fair value estimates of the underlying investments in these limited partnerships and commingled fund investments are primarily based upon property appraisal reports prepared by independent real estate appraisers within a reasonable amount of time following acquisition of the real estate and no less frequently than annually thereafter. The appraisals are based on one or a combination of three methodologies: cost of reproduction analysis, discounted cash flow analysis, and sales comparison analysis. Pricing for certain investments in mortgage-backed and asset-backed securities is typically based on models that incorporate observable inputs.

The Plan is invested in a private real estate investment trust formed to make direct or indirect investments in commercial timberland properties. Pricing for these types of investments is based on comprehensive appraisals that are conducted shortly after initial purchase of properties and at three-year intervals thereafter. All appraisals are conducted by third-party timberland appraisal firms. Appraisals are based on either a sales comparison analysis or a discounted cash flow analysis.

The redemption provisions vary by fund and are detailed below:

#### Private Real Estate Investment Restrictions

<i>(Dollars in thousands)</i>	2018		2017	
	Fair Market Value		Fair Market Value	
Withdrawals available quarterly	\$	444,931	\$	411,079
Restricted - No withdrawals until partnership termination	\$	100,799	\$	104,641
Sale of shares permitted under prescribed guidelines	\$	29,423	\$	29,255

The contractual maturities of private real estate investments held in 2018 range from May 2019 to March 2028 are applied.

**Securities lending collateral:** Collateral held under securities lending arrangements is held in a separately managed account which invests in various short-term investments, such as repurchase agreements. Repurchase agreements and other short-term investments are often priced at cost, which approximates fair value due to the short-term nature of the instruments.

**Derivatives:** The Plan invests in a variety of derivative instruments. The valuation methodologies for these instruments are as follows:

**Futures:** The Plan enters into futures. The futures contracts are listed on either a national or foreign securities exchange and generally valued each business day at the official closing price (typically the last reported sales price) on the exchange on which the security is primarily traded. The pricing is performed by third-party vendors. Since futures are priced by an exchange in an active market, they are classified as Level 1.

**Options:** The Plan enters into purchased and written options. Options that are listed on either a national or foreign securities exchange are generally valued each business day at the official closing price (typically the last reported sales price) on the exchange on which the security is primarily traded. These options are classified as Level 1. Options traded over the counter and not on exchanges are priced by third-party vendors and are classified as Level 2.

**Swaps:** The Plan enters into various types of swaps. Credit default swaps are priced at market using models that consider cash flows, credit curves, recovery rates, and other factors. The pricing is performed by third-party vendors. Interest rate swap contracts are priced at market using forward rates derived from the swap curve, and the pricing is also performed by third-party vendors. Other swaps such as total return swaps and inflation swaps are priced by third-party vendors using market inputs such as spot rates, yield curves, and volatility. The Plan's swaps are generally classified as Level 2 based on the observable nature of their pricing inputs.

**Foreign currency forwards:** The Plan enters into foreign currency forwards. All commitments are marked to market daily at the applicable translation rates, and any resulting unrealized gains or losses are recorded. Foreign currency forwards are priced by third-party vendors and are classified as Level 2.

See Note 3 for additional information regarding derivative financial instruments.

**Securities sold under agreements to repurchase:** The Plan enters into contracts to sell securities to a counterparty at a specified price with an agreement to purchase the same or substantially the same security from the same counterparty at a fixed or determinable price at a future date. Securities sold under agreements to repurchase are presented at their contract price which approximates fair value due to their short-term nature. These securities are classified as Level 2. In connection with sales of securities under agreements to repurchase, the counterparties require the Plan to maintain collateral securities with a fair value that approximates or exceeds the contract amount of the repurchase agreement. These securities are held in government inflation-linked bonds and classified as government debt securities.

The valuation methods described above may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. Furthermore, while TVARS believes its valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

Investments and derivative instruments measured at fair value on a recurring basis are summarized on the following tables.

## Assets and Liabilities at Fair Value

Investments and derivative instruments measured at fair value on a recurring basis at September 30, 2018, are summarized below:

Fair Value Measurements at September 30, 2018, Using

<i>(dollars in thousands)</i>	Total	Quoted Prices in Active Markets for Identical Assets Level 1	Significant Other Observable Inputs Level 2	Significant Unobservable Inputs Level 3
<b>Investments</b>				
Common stock	\$ 1,650,825	\$ 1,649,578	\$ -	\$ 1,247
Registered investment companies	164,063	164,063	-	-
Master limited partnerships	136,778	136,778	-	-
Preferred securities	9,239	3,521	5,718	-
Corporate debt securities	1,301,753	-	1,301,247	506
Mortgage and asset-backed securities	605,317	-	599,605	5,712
Government debt securities	1,047,490	709,637	336,435	1,418
Commingled funds measured at net asset value <sup>(a)</sup>				
Common-collective trusts	1,594,943	-	-	-
Limited liability companies	256,881	-	-	-
Limited partnership	75,823	-	-	-
Cash equivalents and other short-term investments	304,487	41,663	262,822	2
Certificates of deposit	2,741	-	2,741	-
Private credit fund measured at net asset value <sup>(a)</sup>	8,598	-	-	-
Private equity funds measured at net asset value <sup>(a)</sup>	649,303	-	-	-
Private real estate investments measured at net asset value <sup>(a)</sup>	575,153	-	-	-
Securities lending collateral	317,831	-	317,831	-
<b>Derivatives</b>				
Futures	7,493	7,493	-	-
Options	1,764	407	153	1,204
Swaps	8,754	-	8,327	427
<b>Investments at fair value</b>	<b>\$ 8,719,236</b>	<b>\$ 2,713,140</b>	<b>\$ 2,834,879</b>	<b>\$ 10,516</b>
Foreign currency forward receivable	2,892	-	2,892	-
<b>Total Investments and Foreign Currency Forward Receivable at Fair Value</b>	<b>\$ 8,722,128</b>	<b>\$ 2,713,140</b>	<b>\$ 2,837,771</b>	<b>\$ 10,516</b>
<b>Liabilities</b>				
<b>Derivatives</b>				
Futures	\$ 4,409	\$ 4,409	\$ -	\$ -
Options	2,095	437	3	1,655
Swaps	620	-	360	260
Foreign currency forward payable	2,612	-	2,612	-
Securities sold under agreements to repurchase	107,549	-	107,549	-
<b>Total Liabilities at Fair Value</b>	<b>\$ 117,285</b>	<b>\$ 4,846</b>	<b>\$ 110,524</b>	<b>\$ 1,915</b>

<sup>(a)</sup> Certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the amounts presented in the statement of net assets available for benefits.

## Assets and Liabilities at Fair Value

Investments and derivative instruments measured at fair value on a recurring basis at September 30, 2017, are summarized below:

Fair Value Measurements at September 30, 2017, Using

<i>(dollars in thousands)</i>	Total	Quoted Prices in Active Markets for Identical Assets Level 1	Significant Other Observable Inputs Level 2	Significant Unobservable Inputs Level 3
<b>Investments</b>				
Common stock	\$ 1,629,550	\$ 1,628,699		\$ 851
Registered investment companies	206,454	206,454	-	-
Master limited partnerships	141,027	141,027	-	-
Preferred securities	14,439	3,439	11,000	-
Corporate debt securities	1,159,155	-	1,156,319	2,836
Mortgage and asset-backed securities	578,656	-	561,185	17,471
Government debt securities	653,374	300,807	352,124	443
Commingled funds measured at net asset value <sup>(a)</sup>				
Common-collective trusts	1,489,124	-	-	-
Limited liability companies	585,315	-	-	-
Limited partnership	79,787	-	-	-
Cash equivalents and other short-term investments	698,016	48	697,919	49
Certificates of deposit	8,981		8,981	
Private equity funds measured at net asset value <sup>(a)</sup>	507,758	-	-	-
Private real estate investments measured at net asset value <sup>(a)</sup>	544,975	-	-	-
Securities lending collateral	368,462	-	368,462	-
<b>Derivatives</b>				
Futures	17,463	17,463	-	-
Options	219	41	178	-
Swaps	1,603	-	1,586	17
<b>Investments at fair value</b>	<b>\$ 8,684,358</b>	<b>\$ 2,297,978</b>	<b>\$ 3,157,754</b>	<b>\$ 21,667</b>
Foreign currency forward receivable	4,216	-	4,216	-
<b>Total Investments and Foreign Currency Forward Receivable at Fair Value</b>	<b>\$ 8,688,574</b>	<b>\$ 2,297,978</b>	<b>\$ 3,161,970</b>	<b>\$ 21,667</b>
<b>Liabilities</b>				
<b>Derivatives</b>				
Futures	\$ 3,042	\$ 1,571	\$ -	\$ 1,471
Options	260	39	175	46
Swaps	1,598	-	1,468	130
Foreign currency forward payable	5,842	-	5,842	-
<b>Total Derivative Liabilities at Fair Value</b>	<b>\$ 10,742</b>	<b>\$ 1,610</b>	<b>\$ 7,485</b>	<b>\$ 1,647</b>

<sup>(a)</sup> Certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the amounts presented in the statement of net assets available for benefits.

The table below presents a summary of transactions for Plan investments measured at fair value on a recurring basis using significant unobservable inputs (Level 3) for the years ended September 30, 2018 and 2017.

### Summary of Fair Value Measurements Using Significant Unobservable Inputs (Level 3) Transactions

The table below presents transfers in and out and purchases of System investments measured at fair value on a recurring basis using significant unobservable inputs (Level 3) for the years ended September 30, 2018 and 2017.

	2018		2017	
	Transfers in and/or out of		Transfers in and/or out of	
(Dollars in thousands)	Level 3	Purchases	Level 3	Purchases
Mortgage and asset-backed securities	\$ (2,116)	\$ 7,123	\$ (3,488)	\$ 16,977
Corporate debt securities	(407)	2,667	(2,098)	268
Government debt securities	-	1,551	-	482
Common stock	-	273	-	242
Swaps - assets	-	378	-	17
Swaps - liabilities	-	-	-	(130)
Options - assets	-	1,277	-	-
Options - liabilities	-	(1,682)	-	(45)
	\$ (2,523)	\$ 11,587	\$ (5,586)	\$ 17,811

### Asset Allocation

Over the long-term, asset allocation is expected to be the single greatest contributor of risk and return to the Plan's investments. The asset allocation policy embodies the TVARS Board's decisions about what proportions of the Plan's assets will be invested in various asset classes. The policy is based on an asset-liability analysis conducted periodically by the investment consultant and the Plan's actuaries, and the return objectives, risk tolerance, and liquidity needs of the Plan.

The recommended long-term asset allocation policy is identified by strategic target weights to each of the major asset classes. In addition, minimum and maximum allocations are provided to serve as guidelines for the range of the asset classes. The asset classes may fluctuate within the bands established by the minimum and maximum allocation ranges before the System's investment staff considers reallocating from one asset class to another.

Target allocations are as follows:

Asset Category	Target Allocation
Public equity	35%
Private equity	8%
Safety oriented fixed income	17%
Opportunistic fixed income	15%
Public real assets	15%
Private real assets	10%
Total	100%

### Risks and Uncertainties

The Plan invests in securities and derivative instruments which are exposed to various risks such as interest rate, market, liquidity, and credit risks. Due to the level of risk associated with certain investments and the sensitivity of certain fair value estimates to changes in valuation, it is at least reasonably possible that

changes in the values of investments will occur in the near term and that such changes could materially affect the amounts reported in the Statements of Net Assets Available for Benefits and members' individual account balances.

Plan contributions are made and the actuarial present value of accumulated plan benefits is reported based on certain assumptions pertaining to interest rates, inflation rates, and employee demographics, all of which are subject to change. Due to uncertainties inherent in the estimation and assumption processes, it is at least reasonably possible that changes in these estimates and assumptions in the near term could materially affect the amounts reported and disclosed in the financial statements.

### **Tax Status**

The Internal Revenue Service (IRS) determined and informed TVARS in August 2014 that the TVARS Rules are designed in accordance with the applicable sections of the Internal Revenue Code (IRC). The TVARS Rules have been amended subsequent to the receipt of the latest IRS determination letter. However, TVARS management and its tax counsel believe that the Plan and the TVARS Rules are currently designed and being operated in compliance with the applicable requirements of the IRC. Therefore, no provision for income taxes has been included in these financial statements.

Accounting principles generally accepted in the United States of America require TVARS management to evaluate tax positions taken by the Plan. A tax position is recognized as a benefit only if it is "more likely than not" that the tax position would be sustained in a tax examination, with a tax examination presumed to occur. The amount recognized is the largest amount of tax benefit that is greater than 50% likely of being realized upon examination. For tax positions not meeting the "more likely than not" test, no tax benefit is recorded.

TVARS management has analyzed the tax positions it has taken, and has concluded that as of September 30, 2018 and 2017, there are no uncertain positions taken or expected to be taken that would require recognition of a liability (or asset) or disclosure in the financial statements. The Plan is subject to audit by the Internal Revenue Service, Tax Exempt and Government Entities Division; however, there are currently no audits for any tax periods in progress. TVARS management believes the Plan is no longer subject to plan qualification examinations for years prior to 2012.

### **Management Estimates**

The preparation of financial statements in conformity with generally accepted accounting principles in the United States requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date(s) of the financial statements and the reported amounts of revenues and expenses during the reporting period(s). Management also uses estimates and assumptions in determining the actuarial present value of accumulated plan benefits and the changes in actuarial present value of accumulated plan benefits. Actual results could differ materially from those estimates.

## **Note 3**

### **DERIVATIVE FINANCIAL INSTRUMENTS**

The Plan is party to derivative financial instruments in its normal course of business. Interest rate futures, options, and swaps, forward volatility options, and inflation rate floor options may be utilized for managing duration and yield curve risk. Credit default swaps and options may be utilized to obtain credit default protection or as a substitute for the bond, but not to employ leverage. Foreign currency forwards, options, and futures may be utilized to hedge risks associated with short-term exchange rate fluctuations or implement active management decisions via the currency markets. Equity futures and options, total return swaps, and variance swaps may be used in the implementation of various active management strategies. Derivatives are not to be used to effectively leverage the portfolio. Net exposures resulting from derivatives transactions must be covered by holdings within the portfolio. Under the investment management agreements, investment managers may not use derivative financial instruments to fundamentally change the

risk/return profile of their portfolios relative to their benchmarks. Additionally, these managers cannot invest in asset classes that are inconsistent with the benchmarks of their strategies. The derivative strategies employed by the managers in their individual portfolios can expose the Plan to market and credit risk.

The Plan has counterparty exposure in the derivative instruments of certain currency forwards, options, and swaps. Such contracts and agreements have been executed with creditworthy counterparties. Thus, TVARS considers the risk of nonperformance to be remote. The credit risks associated with these instruments are controlled through the evaluation and continual monitoring of the creditworthiness of the counterparties. TVARS also reviews the credit ratings of counterparties on a regular basis. In the event that a counterparty fails to meet the terms of a contract or agreement, the Plan's exposure should be limited to the currency rate differential or contract differential.

The right of set-off generally exists in the event of default for Plan derivatives, which would be applied based on contract terms. Typically set-off would be permitted by counterparty to each investment manager. The total market value exposure will normally also be set-off against collateral exchanged to date, which would result in a net receivable/(payable) that would be due from/to the counterparty.

A summary of derivatives is presented on the following page.



	Fair Values of Derivative Instruments on Statements of Net Assets Available for Benefits				Effect of Derivative Instruments on the Statement of Changes in Net Assets for the year ended September 30, 2018	Effect of Derivative Instruments on the Statement of Changes in Net Assets for the year ended September 30, 2017
	as of September 30, 2018		as of September 30, 2017			
	Notional Amount *	Fair Value	Notional Amount *	Fair Value	Net Appreciation (Depreciation)	Net Appreciation (Depreciation)
<i>(Dollars in thousands)</i>						
<b>Futures contracts</b>						
<b>Assets</b>						
Equity futures	\$ 359,710	\$ 3,259	\$ 592,150	\$ 15,532		
Foreign currency futures	(350,672)	1,923	(183,813)	186		
Interest rate futures	(171,565)	2,311	(204,826)	1,745		
Total futures contract assets	\$ (162,527)	\$ 7,493	\$ 203,511	\$ 17,463		
<b>Liabilities</b>						
Equity futures	\$ 262	\$ (504)	\$ (80,698)	\$ (1,656)		
Foreign currency futures	430,136	(1,408)	71,999	(177)		
Interest rate futures	263,580	(2,497)	203,429	(1,209)		
Total futures contract liabilities	\$ 693,978	\$ (4,409)	\$ 194,730	\$ (3,042)		
Total Futures	\$ 531,451	\$ 3,084	\$ 398,241	\$ 14,421	\$ 59,433	\$ 88,123
<b>Option contracts</b>						
<b>Assets</b>						
Interest rate options	475,492	\$ 1,734	8,500	\$ 192		
Foreign currency options	3,020	30	1,971	27		
Total purchased option assets	478,512	\$ 1,764	10,471	\$ 219		
<b>Liabilities</b>						
Interest rate options	(351,501)	\$ (2,093)	(36,500)	\$ (205)		
Foreign currency options	(1,100)	(2)	(101)	(9)		
Inflation rate floor options	(12,000)	-	(12,000)	-		
Mortgage-backed security options	-	-	(24,800)	(46)		
Total written option liabilities	(364,601)	\$ (2,095)	(73,401)	\$ (260)		
Total Options	113,911	\$ (331)	(62,930)	\$ (41)	\$ 190	\$ 338
<b>Swaps</b>						
<b>Assets</b>						
Interest rate swap contracts	\$ 472,413	\$ 8,132	\$ 53,464	\$ 1,126		
Total return swap contracts	13,458	429	9,999	239		
Credit default swap contracts	16,731	193	21,849	238		
Total swap contract assets	\$ 502,602	\$ 8,754	\$ 85,312	\$ 1,603		
<b>Liabilities</b>						
Interest rate swap contracts	\$ 80,724	\$ (360)	\$ 44,710	\$ (290)		
Total return swap contracts	16,761	(260)	20,732	(417)		
Credit default swap contracts	-	-	26,126	(891)		
Total swap contract liabilities	\$ 97,485	\$ (620)	\$ 91,568	\$ (1,598)		
Total Swaps	\$ 600,087	\$ 8,134	\$ 176,880	\$ 5	\$ 17,688	\$ 8,654
<b>Forwards</b>						
Forward foreign currency contracts - receivable		\$ 2,892		\$ 4,216		
Forward foreign currency contracts - payable		(2,612)		(5,842)		
Total Forwards		\$ 280		\$ (1,626)	\$ (11,627)	\$ 5,177

\* Reflects number of contracts for options (in thousands)

\* Number of forward foreign currency contracts outstanding as of September 30, 2018 and September 30, 2017 were 619 and 685, respectively.

## **Note 4**

### **SECURITIES LENDING**

The Plan participates in a security lending program through a lending agent, its Trustee and Custodian, BNY Mellon. The securities lending program was restarted in December 2016, after it was discontinued in 2009 as collateral securities matured. Under this program, the Plan's investment securities are loaned to approved borrowers and, in return, the Plan receives payment of a fee from the borrowers. The Plan's rights to the loaned securities are unencumbered. The Plan maintains effective control of the loaned securities through the Trustee during the term of the program arrangement, since the securities on loan may be recalled by the Plan at any time. Under the terms of the program arrangement, the borrower must return the same or substantially the same investments that were borrowed. Securities lent are secured by collateral equal to at least 102 percent of the market value of securities loaned. The Plan generally receives cash as collateral for securities lending but it may also receive investment grade securities or baskets of equity securities. The Plan receives a portion of the income earned on the collateral. The Plan does not have the right to sell or re-pledge securities received as collateral. The cash collateral received is recorded both as an asset and a liability in the Statement of Net Assets Available for Benefits. Cash received is invested in a separately managed investment account of various short-term securities where the maximum maturity of the fund is 195 days. Each investment must meet standards defined in the investment guidelines including but not limited to investment eligibility, credit quality, and maturity and diversification requirements. The lending agent provides the Plan indemnification against losses due to borrower default. The lending agent also provides the Plan indemnification against the risk of loss in the investment repurchase transactions made with the cash collateral.

As of September 30, 2018, securities on loan are fully collateralized and the portion of the collateral that was cash was co-invested in a separately managed investment account for the Plan held by the Trustee (see Note 2) or other non-cash securities noted below. At September 30, 2018, and 2017, securities of the Plan with a fair value of approximately \$644.3 million and \$502.8 million, respectively, were on loan under the Trustee's securities lending program. At September 30, 2018, and 2017, the fair value of the cash collateral held was approximately \$317.8 million and \$368.5 million, respectively. At September 30, 2018, and 2017, the non-cash collateral held by the Plan consisted of \$364.8 million and \$156.8, respectively of securities held in an account in the Trustee's name. The cash collateral held by the Plan and the obligation to return the cash collateral is reflected in the accompanying Statements of Net Assets Available for Benefits. Net income from the program was \$1.8 million and \$868 thousand for the years ended September 30, 2018, and 2017, respectively.

## SECURITIES LENDING

The following tables summarize the securities loaned and the related collateral:

<i>(Dollars in thousands) September 30, 2018</i>	Fair Value of Securities on Loan	Total Collateral	Collateral Percent*	Fair Value of Collateral - Cash	Fair Value of Collateral - Non-Cash
Common stocks - domestic	\$ 246,585	\$ 264,669	107.3%	\$ 123,260	\$ 141,410
Corporate bonds	159,314	163,123	102.4%	163,123	-
US Government	176,088	186,130	105.7%	4,986	181,144
Common stocks - international	46,350	52,210	112.6%	9,953	42,257
Sovereign fixed income	15,959	16,509	103.5%	16,509	-
	<b>\$ 644,296</b>	<b>\$ 682,641</b>	<b>106.0%</b>	<b>\$ 317,831</b>	<b>\$ 364,811</b>

<i>(Dollars in thousands) September 30, 2017</i>	Fair Value of Securities on Loan	Total Collateral	Collateral Percent*	Fair Value of Collateral - Cash	Fair Value of Collateral - Non-
Common stocks - domestic	\$ 211,146	\$ 220,835	104.6%	\$ 155,885	\$ 64,950
Corporate bonds	182,139	186,629	102.5%	186,629	-
US Government	64,066	66,713	104.1%	11,468	55,245
Common stocks - international	36,464	41,623	114.1%	5,019	36,604
Sovereign fixed income	9,034	9,461	104.7%	9,461	-
	<b>\$ 502,849</b>	<b>\$ 525,261</b>	<b>104.5%</b>	<b>\$ 368,462</b>	<b>\$ 156,799</b>

\* Calculated on unrounded amounts

## Note 5

### COMMITMENTS AND CONTINGENCIES

The Plan has made commitments to various limited partnerships and private real estate investments. A summary is provided below.

The following summarizes the Plan's commitments and contingencies with respect to the Private Credit, Private Equity and Private Real Estate funds held by the Plan at September 30, 2018 and 2017.

	2018			2017		
<i>(Dollars in thousands)</i>	Number of Funds	Fair Market Value	Unfunded Commitments	Number of Funds	Fair Market Value	Unfunded Commitments
Private Credit Fund	1	\$ 8,598	\$ 26,707	0	\$ -	\$ -
Private Equity Funds	26	\$ 649,303	\$ 609,679	24	\$ 507,758	\$ 462,943
Private Real Estate Funds	13	\$ 575,153	\$ 54,534	13	\$ 544,975	\$ 73,684

## Note 6

### PARTICIPANT CONTRIBUTIONS

Participants who were hired prior to January 1, 1996, may voluntarily make after-tax contributions to the Plan and elect to invest the funds in either the Fixed Fund, the Variable Fund, or both. Contributions to the Fixed Fund and/or the Variable Fund are limited by the TVARS Rules to the lesser of \$10,000 per calendar year or 100 percent of calendar year-to-date compensation. Participants who were hired on or after January 1, 1996, were previously eligible to make contributions to the Plan. Effective as of October 1, 2016,

these participants may no longer make any new contributions; however, their balances may remain in the Fixed and Variable Funds if they choose until retirement or termination of employment.

Participant contributions invested in the Fixed Fund earn monthly interest at an annual interest rate equal to the change in the CPI-U plus 2 percent; provided, however, that the annual interest rate will not be less than the Plan's assumed rate of investment return minus 2 percent nor greater than the Plan's assumed rate of investment return minus 0.5 percent. The interest rate during calendar year 2018 and 2017 was 4.75 percent and 5 percent, respectively. Participant contributions to the Variable Fund are invested in an S&P 500 Index Fund. As a part of the Plan, federal income tax is deferred on interest and investment earnings in the Fixed and Variable Funds until the participant's funds are distributed upon retirement or termination of employment.

Under the TVARS Rules, participants are permitted to make transfers between the Fixed Fund and the Variable Fund once per calendar month and may, at any time during employment, transfer their entire balance to the Tennessee Valley Authority Savings and Deferral Retirement Plan (401(k) Plan). Participants who were hired prior to January 1, 1996, and who transfer their balance to the 401(k) Plan on or after May 1, 2005, are no longer eligible to make additional contributions to the Plan. Upon retirement or termination of employment, participants who were hired prior to January 1, 1996, may elect either (i) a lump-sum distribution or rollover of their balances in the Fixed and Variable Funds, or (ii) a monthly fixed or variable annuity payment from the Fixed Fund, the Variable Fund, or both. In addition, these participants may elect to transfer all or any portion of their after-tax account in the 401(k) Plan to the Fixed Fund and/or Variable Fund to receive monthly annuity payments. Participants who were hired on or after January 1, 1996, and who have balances in the Fixed and Variable Funds, may only elect a lump-sum distribution or rollover of their balances in the Fixed and Variable Funds at the time of retirement or termination of employment.

## **Note 7**

### **TVA CONTRIBUTIONS**

The Plan's assets are used to pay Plan benefits to retirees and beneficiaries and are maintained separately from TVA in a pension trust. Under the TVARS Rules, TVA is required to make an annual minimum required contribution to the Plan equal to the greater of (i) a formula set forth in the TVARS Rules consisting of a normal contribution and accrued liability contribution, which is calculated by the Plan's actuary, or (ii) \$300 million. The \$300 million floor applicable to the annual minimum required contribution is in effect for a period of 20 years (from fiscal year 2017 through fiscal year 2036) or, if earlier, through the fiscal year in the which the Plan reaches and remains at a 100 percent funded status. In addition to the minimum required contribution, TVA has the option in its discretion to make additional contributions to the Plan.

In 2018, TVA contributed \$300 million to the Plan. In 2017, TVA contributed \$800 million to the Plan, consisting of the \$300 million minimum contribution and an additional discretionary contribution of \$500 million. In August 2018, the TVA Board of Directors approved a \$300 million contribution to the Plan for 2019.

## **Note 8**

### **AMENDMENTS TO THE TVARS RULES AND REGULATIONS**

On June 15, 2018, the TVARS Board approved an amendment to the TVARS Rules that establishes a term limit for any individual to serve as a director of the TVARS Board (whether elected, appointed, or selected) of no more than three full 3-year terms. Under this amendment, any partial terms do not count toward the term limit of three full 3-year terms and any current sitting director who has already served three full 3-year terms will be eligible to continue as a director for the remainder of the director's current 3-year term.

On May 23, 2018, the TVARS Board approved amendments to the Plan and 401(k) Plan that provided the following election options: (i) TVA employees who are continuing to accrue cash balance benefits in the Plan

to voluntarily elect to switch future participation to the 401(k) Plan only, and (ii) TVA employees with cash balance accounts in the Plan who have a 401(k) only benefit, the additional option to waive their rights to benefits under the Plan and transfer their cash balance accounts (and Fixed and Variable Fund accounts, if any) to the 401(k) Plan. These voluntary election options were offered to eligible TVA employees during a two-month window from July 1, 2018 to August 31, 2018, with changes and transfers becoming effective October 1, 2018. As a result, there were approximately \$23 million one-time transfers to the 401(k) Plan based upon employee elections.

On October 30, 2017, the TVARS Board approved an amendment to the TVARS Rules, which provides that in the event the TVARS Board is unable to select a new seventh director by the end of the sitting seventh director's term, then the current sitting seventh director will continue as a director for up to an additional one year or until such time as the TVARS Board selects a seventh director, if earlier. Under this amendment, during any such continuation period, the seventh member will not be eligible to vote on amendments to the TVARS Rules or the 401(k) Plan, except for amendments related to the IRS tax-qualified status of the plans.

## **Note 9**

### **ACTUARIAL ASSUMPTIONS**

Accumulated benefits are those future periodic payments, including single-sum payments that are attributable under the Plan to participants' service and contributions. Accumulated benefits include benefits expected to be paid to (1) retired or terminated participants or to their beneficiaries, (2) beneficiaries of participants who have died, and (3) current participants or their beneficiaries.

Pension benefits for participants who were first hired prior to January 1, 1996, are based on years of creditable service (to the nearest month), highest average compensation during any three consecutive years of creditable service, and a pension factor, less a Social Security offset.

Pension benefits for participants who were first hired prior to January 1, 1996, and who elected to switch pension structures from traditional to cash balance, are based on pay credits and interest credits that accumulate over the participant's cash balance service. Pay credits accumulate at a rate equal to 6 percent of eligible compensation, and interest is credited each month at the rate established by the TVARS Board each January 1. The interest rate is determined by calculating the percentage change of the 12-month average of the CPI-U for the period ending the previous October 31 over the preceding 12-month period, plus 3 percent (with a minimum of 6 percent and maximum of 10 percent). The interest rate was 6 percent during calendar years 2018 and 2017.

Pension benefits for participants who were first hired on or after January 1, 1996, and who have 10 or more years of service as of October 1, 2016, are based on pay credits and interest credits that accumulate over the participant's cash balance service. Pay credits accumulate at a rate equal to 3 percent of eligible compensation, and interest is credited each month at the rate established by the TVARS Board each January 1. The interest rate is determined by calculating the percentage change of the 12-month average of the CPI-U for the period ending the previous October 31 over the preceding 12-month period, plus 2 percent (with a minimum of 4.75 percent and maximum of 6.25 percent). The interest rate was 4.75 percent during calendar year 2018 and 5 percent during calendar year 2017.

Pension benefits for participants who were first hired on or after January 1, 1996, and who have less than 10 years of service as of October 1, 2016, are based on pay and interest credits accrued through October 1, 2016, and interest credits that accumulate over the participant's cash balance service after October 1, 2016. Interest is credited each month at the rate established by the TVARS Board each January 1. The interest rate is determined by calculating the percentage change of the 12-month average of the CPI-U for the period ending the previous October 31 over the preceding 12-month period, plus 2 percent (with a minimum of 4.75 percent and maximum of 6.25 percent). The interest rate was 4.75 percent during calendar year 2018 and 5 percent during calendar year 2017.

The actuarial present value of accumulated benefits is determined by the Plan's actuary, Mercer Human Resource Consulting, and is the amount that results from applying actuarial assumptions to adjust the accumulated benefits to reflect the time value of money (through discounts for interest) and the probability of payment (by means of decrements such as for death, disability, withdrawals or retirement) between the valuation date and the expected date of payment. Calculations of the accumulated pension benefits for participants as described above are based on benefits payable under all circumstances – retirement, death, disability, and termination of employment – are included to the extent they are deemed attributable to participants' compensation earned and service rendered to the valuation date. The significant actuarial assumptions used in the valuations as of September 30, 2018 and 2017, were:

- A. Life expectancy of participants – the RP-2014 Mortality table with a 5/10 percent male/female load and MSS-2018 Mercer improvement scale for 2018 and the RP-2014 Mortality table with a 5 percent load and MSS-2017 Mercer improvement scale for 2017.
- B. Interest rate – 6.75 percent for 2018 and 2017.
- C. Retiree cost-of-living adjustment increases – The actual COLAs were 0.99 percent, 1.84 percent, and 2.21 percent annually for 2017, 2018, and 2019, respectively. The assumed COLA is 2.00 percent annually thereafter.
- D. Annual rates of retirements – the assumptions for 2018 were:

Original Benefit Structure		Cash Balance Benefit Structure	
Attained Age	Annual Rates of Retirement	Attained Age	Annual Rates of Retirement
45-50	2.0%	45-54	2.0%
51-54	4.5%	55-58	6.5%
55-57	15.0%	59-61	9.0%
58-59	21.0%	62-63	18.5%
60-61	24.5%	64	13.0%
62-65	34.0%	65-69	27.0%
66-69	37.0%	70	100.0%
70	100.0%		

- E. Annual rates of retirements – the assumptions for 2017 were:

#### Original and Cash Balance Benefit Structures

Attained Age	Annual Rates of Retirement
45-49	2.0%
50-54	6.0%
55	15.0%
56-59	12.5%
60-61	20.0%
62	30.0%
63-64	25.0%
65	30.0%
66-69	25.0%
70	100.0%

The foregoing actuarial assumptions are based on the presumption that the Plan will continue. If the Plan were terminated, different actuarial assumptions and other factors might be applicable in determining the actuarial present value of accumulated benefits.

## Accumulated Benefits

*The estimated actuarial present value of accumulated benefits for the TVA Retirement System Defined Benefit Pension Plan is as follows:*

<i>(Dollars in thousands)</i>	<i>September 30</i>	
	<b>2018</b>	2017
Vested benefits		
Participants currently receiving benefits	\$ 7,862,100	\$ 7,889,800
Active participants	1,522,900	1,582,200
Deferred benefit participants	<u>83,300</u>	<u>84,600</u>
Total	<b>9,468,300</b>	9,556,600
Nonvested benefits	<u>7,200</u>	<u>20,100</u>
Total estimated actuarial present value of accumulated benefits payable from the Fixed Benefit Fund	<u><b>\$ 9,475,500</b></u>	<u>\$ 9,576,700</u>

*The changes in the estimated actuarial present value of accumulated benefits of the TVA Retirement System Defined Benefit Pension Plan are as follows:*

<i>(Dollars in thousands)</i>	<i>September 30</i>	
	<b>2018</b>	2017
Actuarial present value of accumulated benefits payable from the Fixed Benefit Fund at beginning of year	\$ 9,576,700	\$ 9,615,700
Increase during the year attributable to:		
Additional benefits accumulated and actuarial gains and losses	65,000	99,500
Interest due to decrease in the discount period	622,100	624,700
Benefits paid to participants	(722,400)	(721,500)
Change in assumptions	<u>(65,900)</u>	<u>(41,700)</u>
Actuarial present value of accumulated benefits payable from the Fixed Benefit Fund at end of year	<u><b>\$ 9,475,500</b></u>	<u>\$ 9,576,700</u>

## **Note 10**

### **ADMINISTRATIVE EXPENSES AND RELATED PARTY TRANSACTIONS**

The Plan's assets are used to pay for all eligible Plan administrative expenses.

In administering the Plan, the TVARS Board has the authority to arrange for administrative, clerical, legal, and medical adviser services, and it has historically requested many of such services from TVA. The TVARS Board appoints an Executive Secretary who serves as the executive director of TVARS and is responsible for all day-to-day functions of administering the Plan and investing the Plan's assets. The TVARS staff performs their work under the supervision and direction of the TVARS Board and Executive Secretary. The Executive Secretary and the TVARS staff are TVA employees who are loaned to TVARS pursuant to a loaned employee agreement. As loaned employees, TVARS reimburses TVA for their compensation, which is paid from the Plan's assets. For its use of requested services and the reimbursement of loaned employee compensation and benefits, as described above, TVARS paid TVA \$3.7 million in 2018 and \$3.6 million in 2017.

## **Note 11**

### **TERMINATION**

Under the TVARS Rules, TVA has the right at any time in its discretion to terminate the Plan. The termination of the Plan would not affect the obligations of TVA with regard to participants' nonforfeitable rights to accrued benefits under the Plan as set out in the TVARS Rules. In the event the Plan were terminated, the net assets of the Plan would be allocated generally to provide Plan benefits in the following order: (1) Fixed and Variable Fund benefits based on participants' contributions, and (2) nonforfeitable benefits based upon TVA's contributions, including COLA benefits. The Plan benefits are not guaranteed by the Pension Benefit Guaranty Corporation; however, under the TVARS Rules, TVA is responsible in a termination situation for funding any shortfall in assets necessary to pay nonforfeitable benefits and could fund such shortfall in a single lump-sum or in installments over a reasonable period of time.

## **Note 12**

### **VARIABLE FUND**

A general description of the Variable Fund is found under Note 6 – Participant Contributions.

Key financial data of the Variable Fund at September 30, 2018, and 2017 are as follows:



<i>(Dollars in thousands)</i>	2018	2017
<b>Assets</b>		
Commingled funds	\$ 96,742	\$ 91,448
S&P 500 Stock Index Fund	55,106	51,960
Total investments at fair value	151,848	143,408
Net receivable from the Fixed Benefit Fund	-	29
Other receivable	1	-
<b>Liabilities</b>		
Net payable to the Fixed Benefit Fund	-	5
Due to broker	-	203
<b>Net Assets</b>	<b>\$ 151,849</b>	<b>\$ 143,229</b>
<b>Investment Income</b>		
Net appreciation		
in fair value of investments	\$ 23,315	\$ 22,255
Dividends	1,056	1,257
Total investment income	24,371	23,512
<b>Members' Contributions</b>	<b>1,007</b>	<b>1,038</b>
<b>Net Transfers for:</b>		
Retirement benefits, withdrawals, and death benefits	(10,952)	(10,370)
Net transfers to Fixed Benefit Fund	(4,614)	(1,721)
Net transfers to 401(k) Plan	(1,192)	(1,507)
Net transfers	(16,758)	(13,598)
<b>Net increase</b>	<b>\$ 8,620</b>	<b>\$ 10,952</b>

## Note 13

### PENDING LITIGATION

In March 2010, a group of eight current and retired members and beneficiaries of the System filed a complaint asserting a purported class-action lawsuit against the six then-current members of the TVARS Board concerning the amendments to the TVARS Rules that became effective January 1, 2010. In September 2010, the United States District Court for the Middle District of Tennessee (the Court) dismissed the complaint, after which the plaintiffs filed an amended complaint against TVARS and TVA challenging the amendments. These amendments (1) suspended the TVA contribution requirements for fiscal years 2010 through 2013, (2) reduced the calculation for COLAs for calendar years 2010 through 2013, (3) reduced the interest crediting rate for the Fixed Fund accounts, and (4) increased the eligibility age to receive COLAs from age 55 to 60. In August 2015, the Court granted TVA's motion for summary judgment and dismissed the case with prejudice. The plaintiffs appealed that decision to the United States Court of Appeals for the Sixth Circuit (the Sixth Circuit). In August 2016, the Sixth Circuit held that the plaintiffs' rights were not violated because COLAs are not vested benefits, and remanded a few other issues to the Court for further proceedings. On March 2, 2017, the Court entered judgment in favor of TVARS and TVA on all remanded issues and dismissed the case with prejudice. Plaintiffs filed a notice of appeal to the Sixth Circuit on March 31, 2017.

On June 29, 2017, the plaintiffs filed an appellant's brief with the Sixth Circuit on the remaining issues. On July 31, 2017, TVA and TVARS each filed an appellee's brief with the Sixth Circuit on the remaining claims, to which the plaintiffs filed a reply brief on August 28, 2017. On January 31, 2018, oral arguments were

presented before the Sixth Circuit. On Friday, March 16, 2018, the Sixth Circuit (in a 2-1 decision) issued a favorable opinion dismissing the plaintiffs' remaining claims. The case is now concluded.

TVARS retained Bradley Arant Boult Cummings LLP to represent it in the lawsuit. TVARS incurred legal fees concerning the litigation of \$125 thousand in 2018 and \$110 thousand in 2017. Loss contingencies, including claims and legal actions, are recorded as liabilities when the likelihood of loss is probable and an amount or range of probable loss can be reasonably estimated. TVARS management has not concluded that any loss is probable as of September 30, 2018.

## **Note 14**

### **SUBSEQUENT EVENTS**

On May 23, 2018, the TVARS Board approved amendments to the Plan and 401(k) Plan. The amendments allow certain TVA employees the option to switch participation and/or transfer balances from their cash balance accounts in the pension plan to the 401(k) Plan with changes and transfers becoming effective October 1, 2018. As a result, there were approximately \$23 million one-time transfers to the 401(k) Plan based upon employee elections. See Note 8, Amendments to the TVARS Rules and Regulations, for additional information.

TVARS management has evaluated subsequent events for recognition and disclosure through April 12, 2019, which is the date the financial statements were available to be issued.

## INDEPENDENT AUDITOR'S REPORT

Members and Administrator of  
Tennessee Valley Authority Savings and Deferral Retirement Plan  
Knoxville, Tennessee

### Report on the Financial Statements

We have audited the accompanying financial statements of Tennessee Valley Authority Savings and Deferral Retirement Plan (Plan), which comprise the statements of net assets available for benefits as of September 30, 2018 and 2017, and the related statements of changes in net assets available for benefits for the years then ended, and the related notes to the financial statements.

### *Management's Responsibility for the Financial Statements*

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### *Auditor's Responsibility*

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Plan's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### *Opinion*

In our opinion, the financial statements referred to above present fairly, in all material respects, the net assets available for benefits of Tennessee Valley Authority Savings and Deferral Retirement Plan as of September 30, 2018 and 2017, and the changes in net assets available for benefits for the years then ended in accordance with accounting principles generally accepted in the United States of America.

  
Crowe LLP

South Bend, Indiana  
April 12, 2019

**Tennessee Valley Authority**  
**Savings and Deferral Retirement Plan**  
**Statements of Net Assets Available for Benefits**

*September 30, 2018 and 2017*

*(Dollars in thousands)*

	<b>2018</b>	<b>2017</b>
<b>Assets</b>		
Investments at fair value	\$ 2,585,237	\$ 2,311,594
Other receivables	14	8
Notes receivable		
Participant loans	40,168	42,719
Total Assets	<u>\$ 2,625,419</u>	<u>\$ 2,354,321</u>
<b>Liabilities</b>		
Accounts payable	<u>176</u>	<u>171</u>
<b>Net Assets Available for Benefits</b>	<u><u>\$ 2,625,243</u></u>	<u><u>\$ 2,354,150</u></u>

*The accompanying notes are an integral part of the financial statements.*

**Tennessee Valley Authority**  
**Savings and Deferral Retirement Plan**  
**Statements of Changes in Net Assets Available for Benefits**

*Fiscal Years Ended September 30, 2018 and 2017*

*(Dollars in thousands)*

	2018	2017
<b>Investment Income</b>		
Net appreciation	\$ 213,521	\$ 231,107
Dividends and interest	8,636	7,017
Total investment income	222,157	238,124
<b>Contributions</b>		
Members	101,149	96,437
TVA	79,894	78,555
Transfers from annuity funds	13,779	19,772
Total contributions	194,822	194,764
<b>Other Income</b>		
Revenue credit	50	19
<b>Benefits, Withdrawals, and Transfers</b>		
Benefits and withdrawals	(140,980)	(152,268)
Transfers to annuity funds	(4,727)	(4,465)
Administrative expenses-consultant and audit fees	(229)	(204)
Total benefits, withdrawals, and transfers	(145,936)	(156,937)
Net increase	271,093	275,970
<b>Net Assets Available for Benefits</b>		
Beginning of year	2,354,150	2,078,180
End of year	\$ 2,625,243	\$ 2,354,150

*The accompanying notes are an integral part of the financial statements.*

# Notes to Financial Statements

## September 30, 2018 and 2017

### Note 1

#### PLAN DESCRIPTION

##### General

The Tennessee Valley Authority Retirement System (TVARS or System) was established by the Tennessee Valley Authority (TVA) in 1939 to provide retirement benefits for TVA employees. When TVA established the System, it also approved the Rules and Regulations of the TVA Retirement System (TVARS Rules), which constitute the legal charter under which the System operates. TVARS is a separate legal entity from TVA and is governed by an independent, seven-member Board of Directors (TVARS Board). Three of the directors are appointed by TVA, three are elected by and from the membership, and the seventh director, who is a TVA retiree, is selected by the other six. The System staff performs their work for the System under the supervision and direction of the TVARS Board and the System's Executive Secretary.

The Tennessee Valley Authority Savings and Deferral Retirement Plan (401(k) Plan) is a defined contribution plan sponsored by TVA and administered by the TVARS Board. The 401(k) Plan is governed by the Provisions of the Tennessee Valley Authority Savings and Deferral Retirement Plan (401(k) Plan Provisions). As a retirement plan for employees of a federal agency, the 401(k) Plan is a governmental plan under section 414(d) of the Internal Revenue Code and is not subject to the Employee Retirement Income Security Act (ERISA), which governs the retirement plans of private entities. Fidelity Management Trust Company, which serves as the 401(k) Plan trustee, and Fidelity Workplace Services LLC, which serves as the provider of recordkeeping services, are collectively known as "Fidelity."

A brief description of the 401(k) Plan is provided below for general information purposes only. Participants may refer to the 401(k) Plan Provisions for more information. *This description is intended to help participants and stakeholders understand the administration of and the benefits under the 401(k) Plan. The 401(k) Plan Provisions, not this information, are used to determine the benefits to which a participant is entitled.*

##### Participant Contributions

Most full-time and part-time annual TVA employees are eligible to participate in the 401(k) Plan (participants); however, TVA board members, and TVA employees with prior federal service who retain membership in the Civil Service or Federal Employees Retirement Systems, are excluded from participation in the 401(k) Plan. Participants may elect to contribute to the 401(k) Plan in the form of pre-tax deferrals, designated Roth contributions, and/or after-tax contributions. In addition, participants who are age 50 or older during the plan year are eligible to make additional "catch up" contributions (either pre-tax or Roth designated).

Salary deferrals (pre-tax and/or Roth designated) are made through bi-weekly payroll deductions only into the 401(k) Plan. Eligible employees who do not elect to opt out are automatically enrolled as participants in the 401(k) Plan upon employment with pre-tax salary deferrals of six percent of eligible compensation. After-tax contributions may be made by payroll deductions or cash payment into the 401(k) Plan. A participant may increase, decrease, or stop any of these contributions at any time.

##### TVA Contributions

Under the 401(k) Plan, the non-elective and matching contributions TVA makes to participant accounts are based on the participant's employment hire date and years of service as follows:

- Participants who were first hired prior to January 1, 1996, receive matching contributions from TVA of 25 cents on every dollar contributed by the participant to the 401(k) Plan up to a maximum of 1.5 percent of eligible compensation.
- Employees who were first hired prior to January 1, 1996, and who elected to switch pension structures from the traditional to the cash balance, receive matching contributions from TVA of 75 cents on every dollar contributed by the participant to the 401(k) Plan up to a maximum of 4.5 percent of eligible compensation.
- Employees who were first hired on or after January 1, 1996, and who have 10 or more years of service as of October 1, 2016, receive (1) an automatic, non-elective contribution from TVA equal to 3 percent of eligible compensation, and (2) matching contributions from TVA of 75 cents on every dollar contributed by the participant to the 401(k) Plan up to a maximum of 4.5 percent of eligible compensation.
- Employees who were first hired on or after January 1, 1996, and who have less than 10 years of service as of October 1, 2016, receive (1) an automatic, non-elective contribution from TVA equal to 6 percent of eligible compensation, and (2) matching contributions from TVA on participant contributions to the 401(k) Plan dollar-for-dollar up to a maximum of 6 percent of eligible compensation.
- Employees who are first hired on or after July 1, 2014 (or who are rehired and were either previously not vested in the pension or cashed out their pension benefit) receive (1) an automatic, non-elective contribution from TVA equal to 4.5 percent of eligible compensation, and (2) matching contributions from TVA of 75 cents on every dollar contributed by the participant to the 401(k) Plan up to a maximum of 4.5 percent of eligible compensation.

### **Contribution Limits**

All contributions to the 401(k) Plan are subject to certain annual limits published by the Internal Revenue Service (IRS). For calendar years 2018 and 2017, contributions to the 401(k) Plan, including participant contributions and TVA matching and non-elective contributions, along with participant contributions to the System's Fixed and Variable Funds, could not exceed the lesser of \$55,000 (2018), \$54,000 (2017) or 100 percent of calendar year-to-date compensation. Additionally, salary deferral contributions (pre-tax and/or designated Roth) to the 401(k) Plan could not exceed \$18,500 and \$18,000 for calendar years 2018 and 2017, respectively. For calendar years 2018 and 2017, participants who are age 50 or older were eligible to make additional "catch-up contributions" (on a pre-tax and/or designated Roth basis) up to \$6,000 over and above pre-tax/designated Roth contribution limit, which could not begin until the annual pre-tax/designated Roth contribution limit was reached. These IRS limits may increase annually according to the IRS cost-of-living adjustment rules.

### **Vesting, Distributions, and Rollovers**

Participants who contribute to the 401(k) Plan are immediately vested in their own contributions and vest in TVA matching and non-elective contributions upon completion of three years of TVA service.

Notwithstanding, participants vest in TVA matching and non-elective contributions during employment upon death, disability, or attainment of age 65.

At the time of an IRS-qualified distribution event, such as termination of employment, retirement, death, or disability, participants (or the participant's beneficiary if the participant is deceased) may elect the distribution of all or a portion of the balance of the participant's 401(k) account balance in various lump-sum or periodic payment options in accordance with the 401(k) Plan Provisions. The 401(k) Plan also provides for several different types of in-service distribution options, such as hardship withdrawals, post age 59 ½ distributions, and distributions of rollover and after-tax balances, all subject to certain rules and restrictions as set forth under the 401(k) Plan Provisions and applicable IRS rules.

During employment, participants are permitted to rollover funds from other qualified retirement plans and individual retirement accounts (IRAs) into the 401(k) Plan. Also, participants are permitted to transfer their funds from the System's Fixed and Variable Funds to the 401(k) Plan.

### **Accounts and Investments**

Individual accounts are maintained for each participant. Each participant's account is adjusted to reflect the participant's contributions, TVA's contributions, any investment earnings or losses, and a flat quarterly fee for Fidelity's trustee, recordkeeping, and other services. Participants may invest their accounts in any of the investment funds offered in the 401(k) Plan within the following four-tier structure: Tier 1 – Target Date Funds; Tier 2 – Passively Managed Funds; Tier 3 – Actively Managed Funds; and Tier 4 – Self-Directed Brokerage Account.

The Target Date Funds, called Target Retirement Portfolios, are managed by BlackRock and serve as the qualified default investment alternative for participants. The Target Retirement Portfolios provide a simple and efficient way for participants to create a diversified asset allocation with prudent risk and return characteristics based on their target retirement date and managed to gradually become more conservative over time. The current Target Retirement Portfolios managed by BlackRock are as follows: Target Retirement Income Portfolio, 2020 Target Retirement Portfolio, 2025 Target Retirement Portfolio, 2030 Target Retirement Portfolio, 2035 Target Retirement Portfolio, 2040 Target Retirement Portfolio, 2045 Target Retirement Portfolio, 2050 Target Retirement Portfolio, 2055 Target Retirement Portfolio, and 2060 Target Retirement Portfolio.

The Passively Managed Funds include the following 4 broad market index funds: BlackRock U.S. Debt Index Fund M (fixed income); BlackRock Equity Index Fund M (U.S. large cap equity); BlackRock Russell® 2500 Index Fund M (U.S. small/mid cap equity); and BlackRock MSCI ACWI ex-U.S. IMI Index Fund M (international equity).

The Actively Managed Funds include the following nine funds: Vanguard Prime Money Market Fund Admiral Shares (money market); Fidelity Managed Income Portfolio II CI3 (stable value fund); Loomis Sayles Core Plus Fixed Income Fund (fixed income); BlackRock Strategic Completion Non-Lendable Fund M (real assets composed of REITs, TIPS and commodities); T. Rowe Price Institutional Large Cap Value Fund (U.S. large cap value equity); Fidelity Growth Company CIT (U.S. large cap growth equity); DFA U.S. Targeted Value Portfolio Institutional Class (U.S. small/mid cap value equity); William Blair Small-Mid Cap Growth Collective Investment Fund (U.S. small/mid cap growth equity); and Harding Loevner International Equity Collective Investment Fund (international equity).

### **Forfeitures**

If a participant ceases to be an employee for any reason other than death or disability prior to completing three years of TVA service, the entire amount of that participant's matching and non-elective contributions account is forfeited as of the termination date. Forfeitures are used to reduce TVA's matching contributions to the 401(k) Plan and for 401(k) Plan administrative expenses. The amount of forfeitures used to reduce TVA's matching contributions totaled \$129 thousand in 2018 and \$372 thousand in 2017. The amount of forfeitures used for administrative expenses totaled \$223 thousand in 2018 and \$204 thousand in 2017.

### **Termination**

Under the 401(k) Plan Provisions, TVA has the right at any time in its discretion to terminate the 401(k) Plan. In the event the 401(k) Plan is terminated: (1) any unvested matching contributions in participant accounts will become vested, (2) the net assets will be distributed to participants in proportion to their respective accounts in the 401(k) Plan, and (3) payment of vested benefits based on contributions and gains and losses thereon to participants' accounts will be assured.



## Note 2

### SIGNIFICANT ACCOUNTING POLICIES

#### Basis of Accounting

The financial statements are prepared on the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America. Benefits are recognized at the time of payment.

#### Investment Valuation and Income Recognition

The 401(k) Plan's investments are reported at fair value. Purchases and sales of securities are recorded on a trade date basis. Interest income is recorded on the accrual basis. Dividends are recorded on the ex-dividend date. Net appreciation (depreciation) includes the 401(k) Plan's gains and losses on investments bought and sold as well as held during the year.

Fair value is viewed as the price that would be received by the 401(k) Plan for an asset or paid by the 401(k) Plan to transfer a liability (an exit price) in an orderly transaction between market participants on the measurement date in the 401(k) Plan's principal or most advantageous market for the asset or the liability. There is a fair value hierarchy which maximizes the use of observable inputs and minimizes the use of unobservable inputs when measuring fair value. The hierarchy places the highest priority on unadjusted quoted market prices in active markets for identical assets or liabilities (Level 1 inputs) and gives the lowest priority to unobservable inputs (Level 3 inputs). The three levels of inputs within the fair value hierarchy are defined as follows:

Level 1 Inputs: Quoted prices (unadjusted) for identical assets in active markets that the 401(k) Plan has the ability to access at the measurement date.

Level 2 Inputs: Significant observable inputs other than Level 1, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data such as matrix pricing, yield curves, and indices.

Level 3 Inputs: Significant unobservable inputs that reflect the 401(k) Plan's own assumptions about the assumptions that market participants would use in pricing an asset or liability.

In many cases, a valuation technique used to measure fair value includes inputs from multiple levels of fair value hierarchy. The lowest level of significant input determines the placement of the entire fair value measurement in the hierarchy.

The following descriptions of the valuation methods and assumptions used by the 401(k) Plan to estimate the fair value of investments apply to investments held directly by the 401(k) Plan.

**Mutual funds:** A mutual fund is an investment company that pools the capital of many investors and invests it in stocks, bonds, short-term money market instruments, and other securities. The 401(k) Plan's investments in any mutual funds are valued at quoted market prices based on their closing net asset values (or unit value) per share. Since mutual fund holdings are priced by an exchange in an active market, they are classified as Level 1.

**Collective trusts:** The fair values of participation units held in the collective trusts are based on the net asset values per unit as reported by the fund managers. The collective trusts provide for daily redemptions by the Plan at reported net asset values per share, with no advance notice requirement.

**Separate accounts:** The fair values of each of the separate accounts are based on the net asset values per unit as reported by the fund manager. The separate accounts provide for daily redemptions by the Plan at reported net asset values per share, with no advance notice requirement.

**Self-directed brokerage link (BrokerageLink):** BrokerageLink allows participants who open a brokerage account with Fidelity to purchase mutual funds, exchange-traded funds, or other investment securities

offered on the BrokerageLink platform. Each participant selects the specific holdings for their account. The fair value hierarchy classification is determined by the category pricing methodologies.

Mutual funds, including money market mutual funds, are priced by an exchange in an active market and are therefore classified as Level 1. Stocks are priced based on quoted bid prices in active markets for identical assets and are therefore classified as Level 1.

Bonds in BrokerageLink consist primarily of corporate bonds and U.S. Treasury securities. Corporate bonds are valued based on recent bid prices or the average of recent bid and asked prices, when available (Level 2 inputs). If not available, the bonds are valued through matrix pricing, a mathematical technique commonly used to price debt securities that are not actively traded. This method values debt securities without relying exclusively on quoted prices for a specific security but rather by relying on the security's relationship to other benchmark-quoted securities (Level 2 inputs). The fair value of U.S. Treasury securities reflects the closing price reported in the active market in which the security is traded (Level 1 inputs).

Other investments in BrokerageLink consist primarily of certificates of deposit and exchange traded options. Certificates of deposit are typically priced using evaluated pricing applications and models that incorporate observable market data such as current interest rates and relative maturities (Level 2 inputs). Exchange-traded options are generally valued each business day at the official closing price (typically the last reported sales price) on the exchange on which the security is primarily traded. These options are classified as Level 1.

Investments measured at fair value on a recurring basis are summarized as follows.

#### Investments at Fair Value

Investments measured at fair value on a recurring basis at September 30, 2018 and 2017, are summarized below:

(Dollars in thousands)	Fair Value Measurements at September 30, 2018, Using			Fair Value Measurements at September 30, 2017, Using		
	Total	Quoted Prices in Active Markets for Identical Assets Level 1		Total	Quoted Prices in Active Markets for Identical Assets Level 1	
		Significant Other Observable Inputs Level 2			Significant Other Observable Inputs Level 2	
Mutual funds	\$ 98,332	\$ 98,332	\$ -	\$ 85,959	\$ 85,959	\$ -
Collective trusts <sup>(a)</sup>	819,127	-	-	657,451	-	-
Separate accounts <sup>(a)</sup>	1,215,945	-	-	1,154,796	-	-
BrokerageLink	451,833	449,427	2,406	413,388	411,581	1,807
<b>Total Investments at fair value</b>	<b>\$ 2,585,237</b>	<b>\$ 547,759</b>	<b>\$ 2,406</b>	<b>\$ 2,311,594</b>	<b>\$ 497,540</b>	<b>\$ 1,807</b>

<sup>(a)</sup> Certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the amounts presented in the statement of net assets available for benefits.

#### Risks and Uncertainties

The 401(k) Plan holds various investments. Investments are exposed to various risks such as interest rate, market, liquidity, and credit risks. Due to the level of risk associated with certain investments and the sensitivity of certain fair value estimates to changes in valuation, it is at least reasonably possible that changes in the values of investments will occur in the near term and that such changes could materially affect the amounts reported in the Statements of Net Assets Available for Benefits and participants' individual account balances.

#### Tax Status

The IRS determined and informed TVARS in August 2014 that the 401(k) Plan is designed in accordance with the applicable sections of the Internal Revenue Code (IRC). The 401(k) Plan has been amended subsequent

to the receipt of the latest IRS determination letter. However, TVARS management and its tax counsel believe that the 401(k) Plan is currently designed and being operated in compliance with the applicable requirements of the IRC. Therefore, no provision for income taxes has been included in these financial statements.

Accounting principles generally accepted in the United States of America require TVARS management to evaluate tax positions taken by the 401(k) Plan. A tax position is recognized as a benefit only if it is “more likely than not” that the tax position would be sustained in a tax examination, with a tax examination presumed to occur. The amount recognized is the largest amount of tax benefit that is greater than 50 percent likely of being realized upon examination. For tax positions not meeting the “more likely than not” test, no tax benefit is recorded.

TVARS management has analyzed the tax positions it has taken, and has concluded that as of September 30, 2018 and 2017, there are no uncertain positions taken or expected to be taken that would require recognition of a liability (or asset) or disclosure in the financial statements. The 401(k) Plan is subject to routine audits by the Internal Revenue Service, Tax Exempt and Government Entities Division; however, there are currently no audits for any tax periods in progress. TVARS management believes the 401(k) Plan is no longer subject to plan qualification examinations for years prior to 2012.

### **Management Estimates**

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date(s) of the financial statements and the reported amounts of revenues and expenses during the reporting period(s). Actual results could differ from those estimates.

## **Note 3**

### **AMENDMENTS TO 401(k) PLAN PROVISIONS**

On May 23, 2018, the TVARS Board approved amendments to the Plan and 401(k) Plan Provisions that provided the following election options: (i) TVA employees who are continuing to accrue cash balance benefits in the Plan to voluntarily elect to switch future participation to the 401(k) Plan only (in order to receive higher contributions to the 401(k) Plan of 6 percent non-elective and 6 percent dollar-for-dollar match), and (ii) TVA employees with cash balance accounts in the Plan who have a 401(k) only benefit, the additional option to waive their rights to benefits under the Plan and transfer their cash balance accounts (and Fixed and Variable Fund accounts, if any) to the 401(k) Plan. These voluntary election options were offered to eligible TVA employees during a two-month window from July 1, 2018 to August 31, 2018, with changes and transfers becoming effective October 1, 2018. As a result, there were approximately \$23 million one-time transfers to the 401(k) Plan based upon employee elections on October 1, 2018.

On June 15, 2017, the TVARS Board amended its 401(k) loan program policies administered by Fidelity to implement a 60-day waiting period between loans by participants effective October 1, 2017.

## **Note 4**

### **COMMITMENTS AND CONTINGENCIES**

The 401(k) Plan had no existing material commitments or contingencies at September 30, 2018 and 2017.

## **Note 5**

### **REVENUE CREDITS**

Only one fund in the 401(k) Plan investment lineup utilizes revenue sharing fees – the Fidelity Government Money Market Fund – which is the temporary default fund where money is invested when participants sell any securities in BrokerageLink and then move the proceeds out of BrokerageLink to invest in the core lineup of investment funds. Under the 401(k) Plan trust agreement with Fidelity, any revenue sharing fees tied to participant funds in the Fidelity Government Money Market Fund (and any other funds with revenue sharing fees that may be added to the investment lineup in the future) are credited back to the participants on a dollar-for-dollar basis. The amount credited to participants' accounts was \$9 thousand in 2018 and \$8 thousand in 2017. Additionally, the 401(k) Plan receives a small amount of revenue credits pertaining to net float earnings on omnibus accounts used for transactions in transit. These float credits are applied at the 401(k) Plan level. The amount of float credits was \$41 thousand in 2018 and \$11 thousand in 2017.

## **Note 6**

### **ADMINISTRATIVE EXPENSES AND PARTICIPANT COSTS**

The cost of recordkeeping and certain other financial and trust services of the 401(k) Plan, which includes the cost of two dedicated Fidelity financial consultants for participants, are paid by the 401(k) Plan participants. Participants are charged a flat, quarterly fee, which is deducted from participants' accounts. Participants also pay certain costs associated with services they elect to use such as managed accounts and loans, which are deducted from participants' accounts. Such participant costs are included within benefits and withdrawals in the 401(k) Plan's Statement of Changes in Net Assets Available for Benefits. Investment management fees for the funds in the 401(k) Plan investment lineup are charged as a reduction of investment return and included in the investment income (loss) reported by the 401(k) Plan.

Certain administrative expenses of the 401(k) Plan, such as consulting and audit fees, are paid by TVA. The 401(k) Plan incurred \$229 thousand in administrative expenses in 2018 and \$204 thousand in 2017.

## **Note 7**

### **NOTES RECEIVABLE FROM PARTICIPANTS**

With certain limits, the 401(k) Plan permits loans to participants from their own accounts. Participants may borrow a percentage of their vested account balance (maximum \$50,000) for up to five years, or 10 years if the loan is to be used to purchase a primary residence. The loan interest rate is the prime rate as of the beginning of the quarter during which the loan was taken plus 1 percent, which was 6.00 percent at September 30, 2018, and 5.25 percent at September 30, 2017. Such interest is credited directly to the account of the participant.

Notes receivable from participants are reported at their unpaid principal balance, with no allowance for credit losses, as repayments of principal and interest are received through payroll deductions and the notes are collateralized by the participants' account balances.

## **Note 8**

### **SUBSEQUENT EVENTS**

On May 23, 2018, the TVARS Board approved amendments to the Plan and 401(k) Plan. The amendments allow certain TVA employees the option to switch participation and/or transfer balances from their cash balance accounts in the pension plan to the 401(k) Plan with changes and transfers becoming effective October 1, 2018. As a result, there were approximately \$23 million one-time transfers to the 401(k) Plan on

October 1, 2018, based upon employee elections. See Note 3, Amendments to 401(k) Plan Provisions, for additional information.

On December 3, 2018, the TVARS Board approved an amendment to the 401(k) Plan Provisions that will allow participants to elect in-plan Roth rollovers effective on or after April 1, 2019. With an in-plan Roth rollover, participants may choose contributions and earnings in their pre-tax, matching, non-elective, and after-tax contribution accounts and elect to roll (or convert) those amounts to their designated Roth account within the 401(k) Plan.

TVARS management has evaluated subsequent events for recognition and disclosure through April 12, 2019, which is the date the financial statements were available to be issued.

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