



APFC

ALASKA PERMANENT  
FUND CORPORATION

# Overview: Alaska Permanent Fund

House Finance Committee – January 22, 2018

# The Alaska Constitution

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Over four decades ago, in 1976, Alaskans in an historic vote amended the Constitution of the State of Alaska by a margin of 75,588 to 38,518 and created the Alaska Permanent Fund.

## *Alaska Constitution Article IX, Section 15*

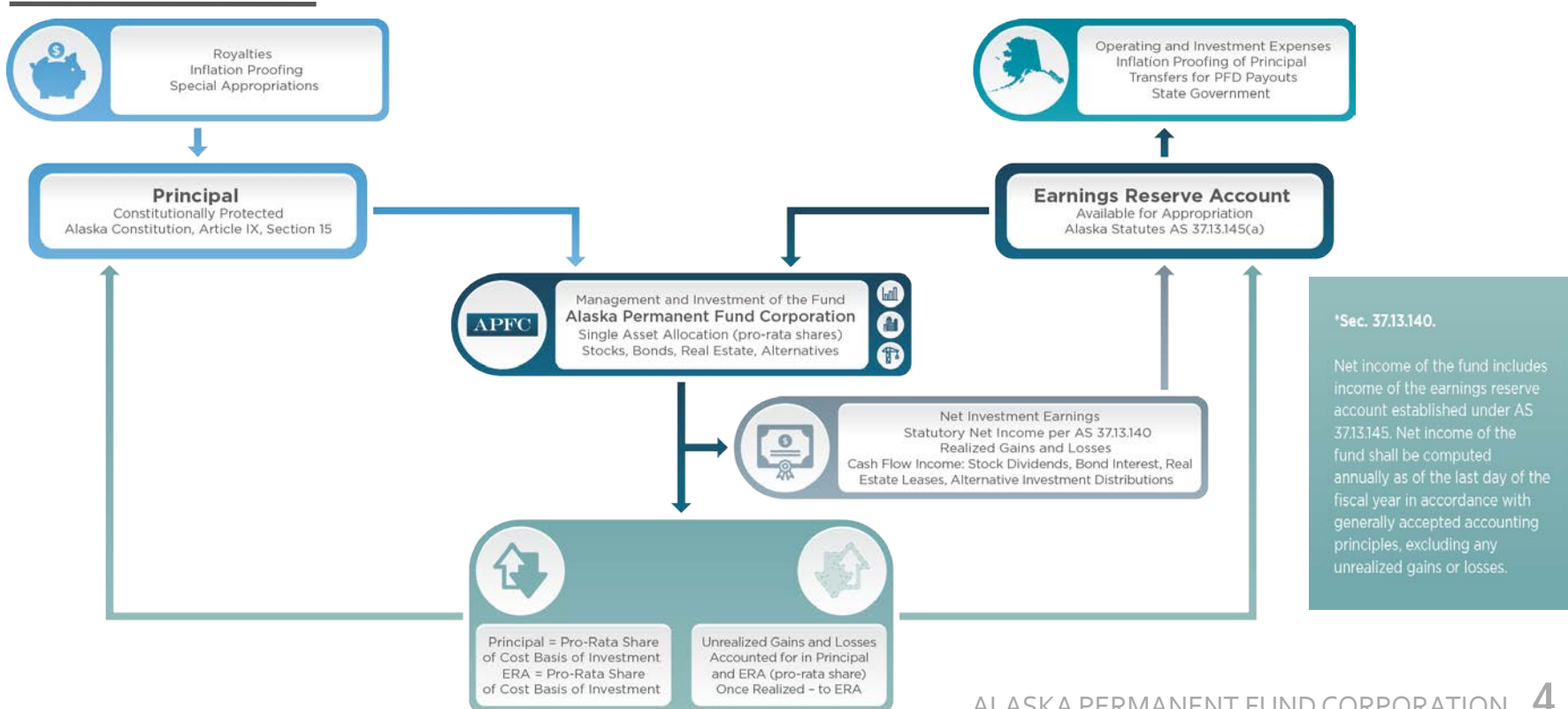
### *Section 15. Alaska Permanent Fund*

*At least twenty-five percent of all mineral lease rentals, royalties, royalty sale proceeds, federal mineral revenue sharing payments and bonuses received by the state shall be placed in a permanent fund, the principal of which shall be used only for those income-producing investments specifically designated by law as eligible for permanent fund investments. All income from the permanent fund shall be deposited in the general fund unless otherwise provided by law.*

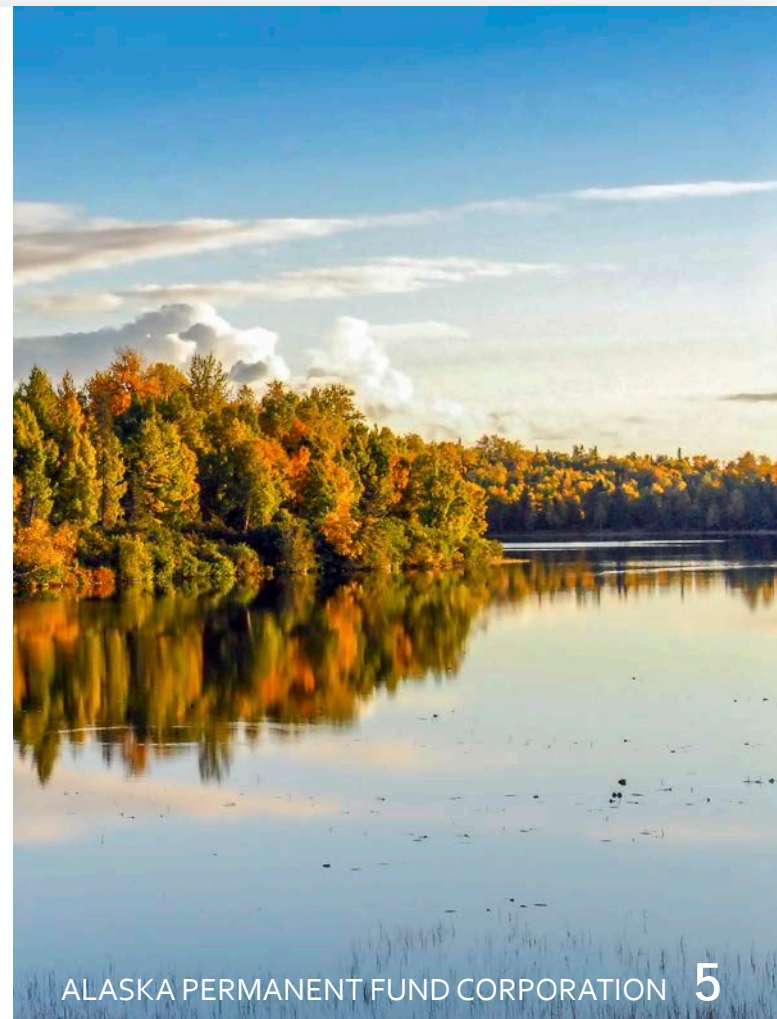
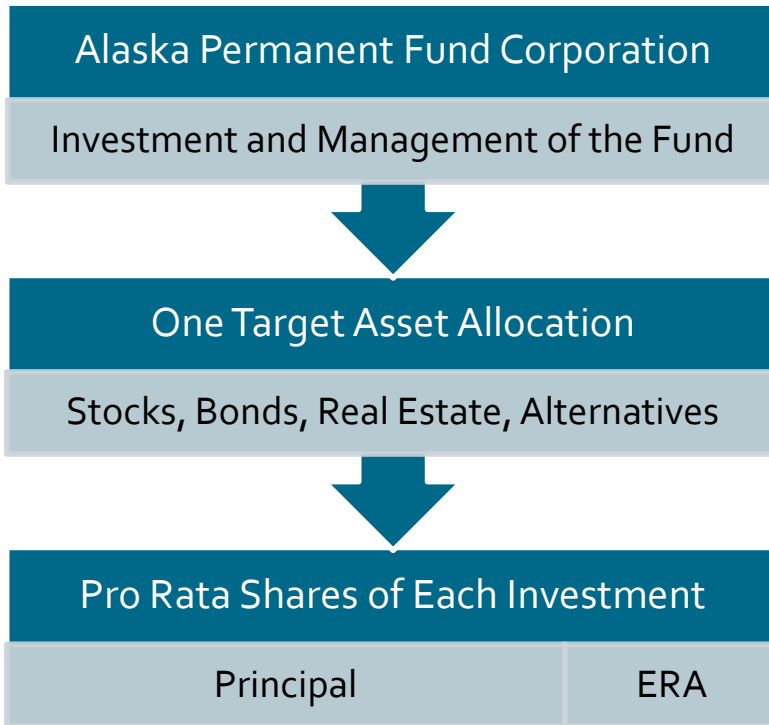
The background of the slide is a solid teal color. Overlaid on this background is a close-up photograph of a pine branch with several pine cones. The image is semi-transparent, allowing the teal background to show through. The pine needles are sharp and pointed, while the cones are clustered together.

# How the Fund Works

# How the Fund Works



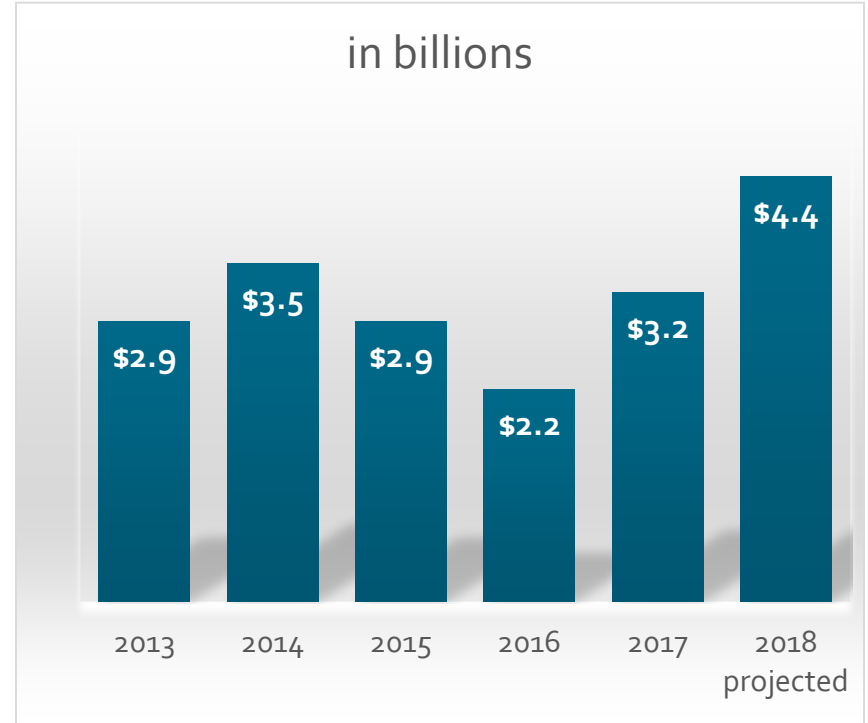
# Invested as One Fund



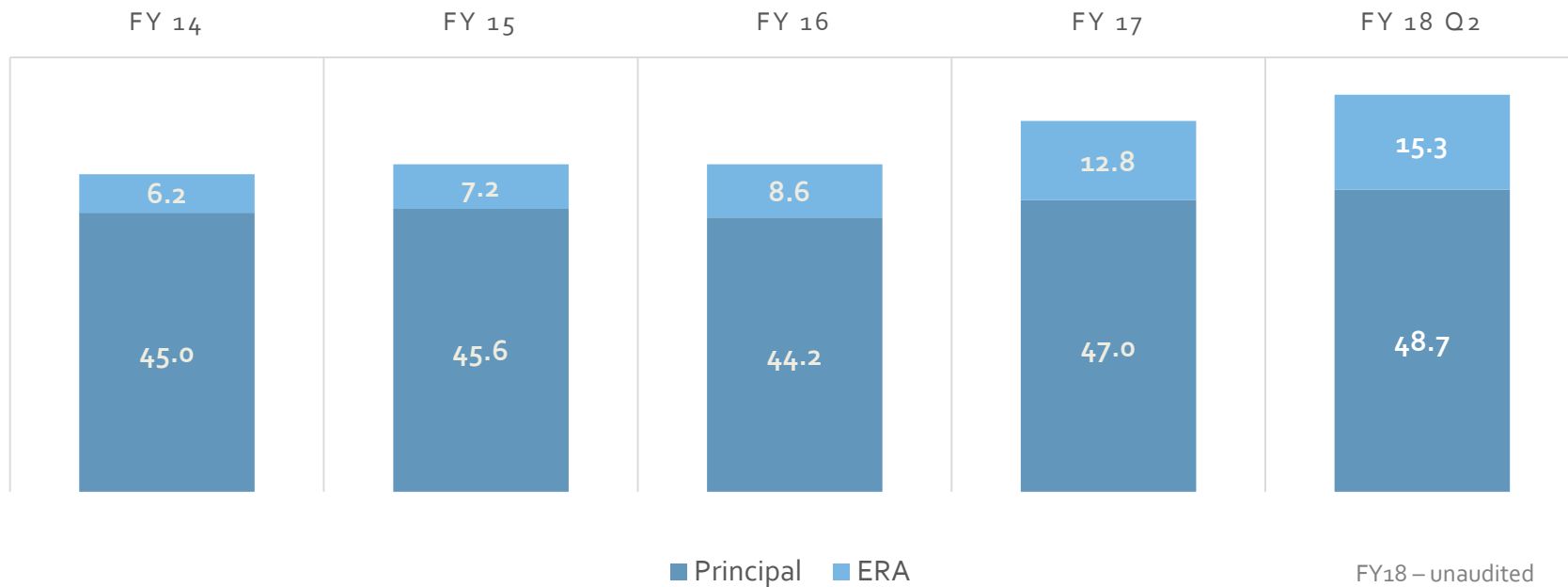
# Statutory Net Income AS 37.13.140

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- Pursuant to state law (AS 37.13.140), at the end of each fiscal year APFC calculates and reports on the net realized gains accounted for during the fiscal year.
- These net realized gains and investment income are the funds in the ERA that are subject to appropriation by a simple majority of the Alaska Legislature.
- Net realized gains = realized gains accumulated during the fiscal year (-) minus realized losses accounted for during the year.
- Unrealized gains earned by Principal are part of Principal, only until realized at which time they are transferred to the ERA.



# Assets Under Management in billions



FY18 – unaudited

# Principal

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The Principal is built through:  
royalty deposits; inflation proofing; and other  
special appropriations.

Contributions Since Inception	In billions
Constitutional deposits from mineral revenues	\$ 16.5
Transfers from the ERA for Inflation Proofing	\$ 16.2
Special Appropriations from ERA and GF	\$ 7.1



# Inflation Proofing

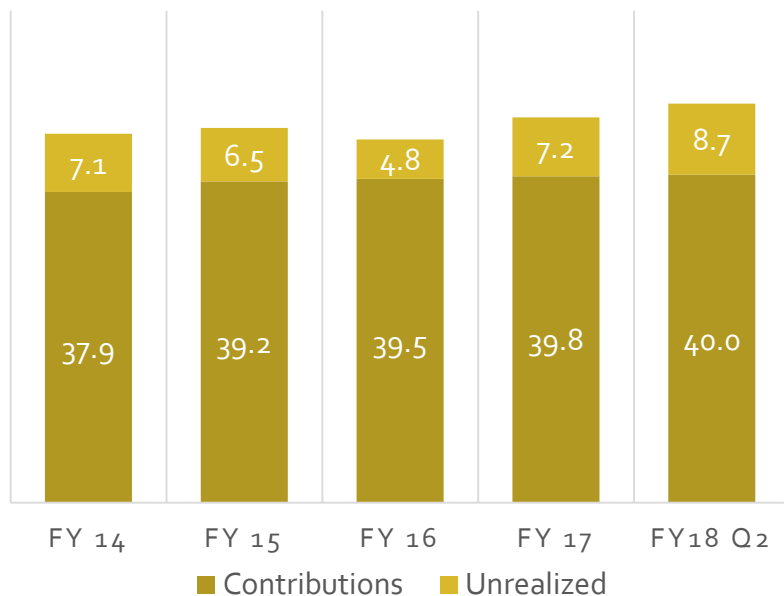
- The Board of Trustees emphasized the importance of inflation proofing by unanimously adopting Resolution 17-01 during their September 2017 Annual Meeting.
  - *Directing APFC to identify and pursue legislative support for inflation proofing the Principal of the Alaska Permanent Fund to preserve the purchasing power for all generations as stated in AS 37.13.020.*
- AS 37.13.145 (c) provides the inflation proofing mechanism which is calculated at the end of the fiscal year. Historically, the Legislature has included an estimated amount in the language of the operating budget to fulfill this statutory obligation.
- The following amounts remain unappropriated at this time, and have been included in the Governor's proposed FY19 operating budget:
  - FY16      \$ 47 million
  - FY17      \$ 501 million
  - FY18      \$ 903 million (estimated)
  - FY19      \$ 943 million (estimated)

	In millions	
Fiscal Year	Inflation Transfer	Royalty Deposits
2009	\$1,144	\$651
2010	\$0	\$679
2011	\$533	\$887
2012	\$1,073	\$915
2013	\$743	\$840
2014	\$546	\$779
2015	\$624	\$600
2016	\$0	\$285
2017	\$0	\$365
2018	\$0	\$291*
2019	\$943*	\$352*

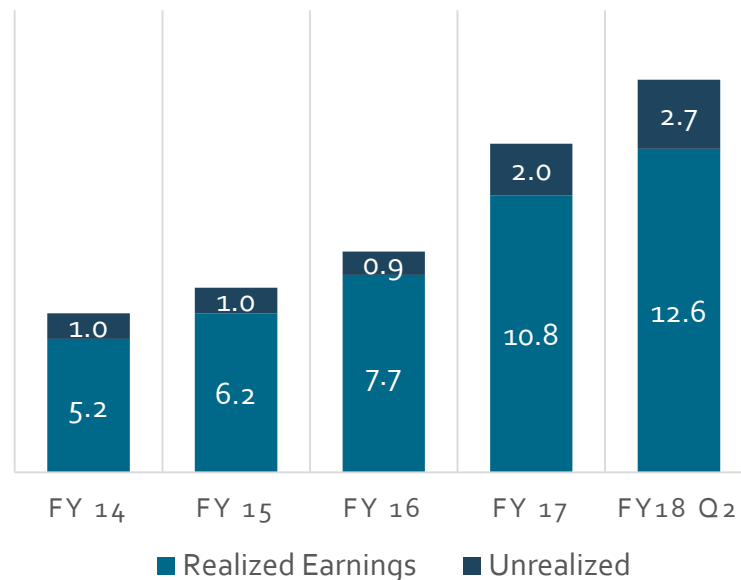
\* Estimated based on projections

# Unrealized Gains in billions

## Principal



## Earnings Reserve Account



# Fund Balance FY 18 Q2 and FYE 17

## ALASKA PERMANENT FUND

### Balance Sheets

Unaudited (millions of dollars)	December 31, 2017	June 30, 2017
<b>Assets</b>		
Cash and temporary investments	\$ 2,152.6	2,653.5
Receivables, prepaid expenses and other assets	316.0	544.8
Investments:		
Marketable debt securities	11,224.5	10,114.6
Preferred and common stock	27,380.1	25,354.4
Real estate	7,086.8	6,886.8
Absolute return	4,929.8	4,567.0
Public-private credit	1,248.7	1,111.8
Private equity	7,392.3	6,818.1
Infrastructure	2,750.4	2,458.3
Total investments	62,012.6	57,311.0
<b>TOTAL ASSETS</b>	<b>\$ 64,481.2</b>	<b>60,509.3</b>
<b>Liabilities</b>		
Accounts payable	\$ 473.9	699.1
Income distributable to the State of Alaska	0.0	25.1
<b>TOTAL LIABILITIES</b>	<b>473.9</b>	<b>724.2</b>
<b>Fund Balances</b>		
Nonspendable:		
Permanent Fund corpus - contributions and appropriations	40,000.7	39,814.3
Not in spendable form - unrealized appreciation on invested assets	8,707.9	7,155.3
Total nonspendable	48,708.6	46,969.6
Committed:		
Current FY dividend	0.0	0.0
Current FY inflation proofing	832.0	0.0
Current FY AK Capital Income Fund	16.6	0.0
Total committed	848.6	0.0
Assigned for future appropriations:		
Realized earnings	11,715.1	10,863.2
Unrealized appreciation on invested assets	2,735.0	1,952.3
Total assigned	14,450.1	12,815.5
<b>TOTAL FUND BALANCES</b>	<b>64,007.3</b>	<b>59,785.1</b>
<b>TOTAL LIABILITIES AND FUND BALANCES</b>	<b>\$ 64,481.2</b>	<b>60,509.3</b>

### Fund Balances

#### Nonspendable:

Permanent Fund corpus - contributions and appropriations	40,000.7	39,814.3
Not in spendable form - unrealized appreciation on invested assets	8,707.9	7,155.3
<b>Total nonspendable</b>	<b>48,708.6</b>	<b>46,969.6</b>

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### TOTAL FUND BALANCES

### TOTAL LIABILITIES AND FUND BALANCES

	December 31, 2017	June 30, 2017
<b>TOTAL FUND BALANCES</b>	<b>64,007.3</b>	<b>59,785.1</b>
<b>TOTAL LIABILITIES AND FUND BALANCES</b>	<b>\$ 64,481.2</b>	<b>60,509.3</b>

# Changes to Fund Balance

## ALASKA PERMANENT FUND

### Statements of Revenues, Expenditures and Changes in Fund Balances

Unaudited (millions of dollars)	Month ended December 31, 2017	Six months ended December 31, 2017	Fiscal year-end audited June 30, 2017
<b>Revenues</b>			
Interest	\$ 72.1	224.8	310.8
Dividends	112.0	310.3	563.0
Real estate and other income	44.3	176.0	380.3
Total interest, dividends, real estate and other income	228.4	711.1	1,254.1
Net increase (decrease) in the fair value of investments:			
Marketable debt securities	48.7	77.7	(62.5)
Preferred and common stock	384.9	2,688.3	4,125.6
Real estate	16.6	187.9	102.6
Absolute return	21.0	208.2	351.8
Public-private credit	0.5	26.9	85.3
Private equity	(45.9)	734.3	1,056.6
Infrastructure	6.8	213.3	259.2
Derivative Instruments	9.6	2.0	69.1
Currency	(26.2)	(21.8)	(436.4)
Total net increase (decrease) in investments	416.0	4,116.8	5,551.3
<b>TOTAL REVENUES</b>	<b>644.4</b>	<b>4,827.9</b>	<b>6,805.4</b>

### Expenditures

Operating expenditures	(8.8)	(60.2)	(121.2)
Other legislative appropriations	0.0	(5.9)	(8.6)
<b>TOTAL EXPENDITURES</b>	<b>(8.8)</b>	<b>(66.1)</b>	<b>(129.8)</b>

### Excess (deficiency) of revenue over expenditures

\$	635.6	4,761.8	6,675.6
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### Other Financing Sources (Uses)

Transfers in	43.5	186.4	364.9
Transfers out	0.0	(726.0)	(25.1)

### NET CHANGE IN FUND BALANCES

	679.1	4,222.2	7,015.4
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### Fund Balances

Beginning of period	63,328.2	59,785.1	52,769.7
End of period	\$ 64,007.3	64,007.3	59,785.1

### Statutory Income Calculation

Excess (deficiency) of revenues over (under) expenditures	635.6	4,761.8	6,675.6
Adjustments to bring net income to statutory net income:			
Unrealized (gains) losses	235.3	(2,335.4)	(3,436.3)
Alaska Capital Income Fund realized income	(5.9)	(16.6)	(25.1)
<b>STATUTORY NET INCOME</b>	<b>\$ 865.0</b>	<b>2,409.8</b>	<b>3,214.2</b>

The background image is a landscape photograph of a body of water, possibly a lake or fjord, with steep, rocky mountains in the distance. The water is calm, reflecting the sky. In the foreground, there are some rocks and a small patch of shoreline. A bright sunburst effect is visible in the upper right portion of the sky. The entire image is covered with a semi-transparent teal or blue-green color overlay, which makes the colors appear monochromatic and gives it a modern, corporate feel.

# How We Invest

# Board of Trustees

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As the fiduciaries, the Trustees have a duty to Alaskans in assuring that the Fund is managed and invested in a manner consistent with legislative findings: AS 37.13.020

- The Permanent Fund should provide a means of conserving revenue from mineral resources ***to benefit all generations of Alaskans.***
- The Permanent Fund's goal should be to ***maintain safety of principal while maximizing total return.***
- The Fund should be used as ***a savings device managed to allow the maximum use of disposable income*** from the Fund for the purposes designated by law.



# Investment Oversight

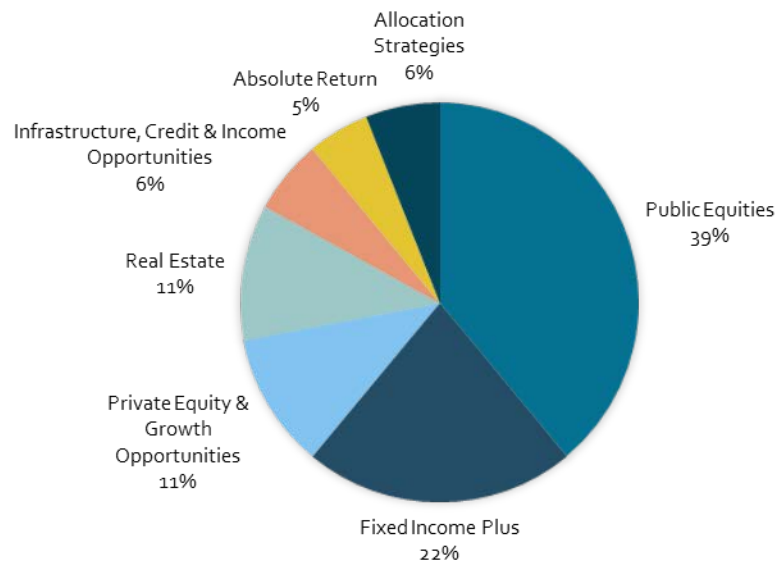
## AS 37.13 .120 Investment Responsibilities – Mandates Use of the Prudent Investment Rule



# The Portfolio \$64.0 Billion as of FY18 Q2

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## TARGET ALLOCATION (FY 2018)





# Public Equities \$26.1 B

audited value as of 6/30/17

## Director of Public Equities

- Oversees Internal Team (2) and External Managers (28)
- Holds quarterly meetings with each manager
- Confirms strategies and performance
- Gauges and adjusts mandates

## Management

- Internally Managed Tactical Portfolio
- Director and Team provide active oversight of External Portfolio Managers
- Ex. Adding global managers with specific tactical tilts and removing non-performing global managers

## Stocks Holdings

- Liquid - Growth
- International Equities
- Global Equities
- Domestic Equities

APFC Operating  
\$2.9 m

External Fees  
\$60.7 m + \$3.7 m (net)

# Fixed Income Plus \$11.7 B

audited value as of 6/30/17

## Director of Fixed Income Plus

- Oversees Internal Team (4)
- Leads the daily trading activity and determines allocation between various fixed income products.
- Looks at how much to hold in corporate bonds vs treasuries or listed infrastructure.

## Management

- Internally Managed - \$7.7 B
- Externally Managed - \$4.0 B

## Bonds, REITs, Listed Infrastructure

- Liquid – Income
- Investment Grade Bonds
- High Yield Bonds
- Emerging Market Debt
- Real Estate Investment Trusts (REITS)
- Listed Infrastructure

APFC Operating  
\$4.8 m

External Fees  
\$10.2 m

# Private Equity and Special Growth \$7.0 B

audited value as of 6/30/17

## Director of Private Equity

- Oversees Internal Team (2) and Portfolio Investments
- Evaluates investment opportunities
- Concentrates on exceptional themes and talented Managers

## Management

- Fund Managers - External
- Co-Investments - Internal
- Direct Investments – Internal
- Board approved Direct and Co-Investing in 2013

## Private Holdings

- Illiquid - Growth
- Venture Capital
- Buyouts

APFC Operating  
\$2.9 m

External Fees  
\$11.5 m + \$182.9 m (net)

# Infrastructure, Private Credit and Income Opportunities \$3.2 B

audited value as of 6/30/17

## Director of Private Income

- Oversees Internal Team (1) and Portfolio Investments
- Aims to provide a high level of income and limited volatility
- Manages a broad range of assets providing current income

## Management

- Fund Managers - External
- Co-Investments - Internal
- Direct Investments – Internal
- Board approved Direct and Co-Investing in 2013

## Public and Private Holdings

- Illiquid - Income
- Infrastructure: Energy, Transportation, Water, Timber
- Private Credit: Mezzanine Lending, Distressed Credit
- Income Opportunities: High End Rentals

APFC Operating  
\$1.4 m

External Fees  
\$0.4 m + \$34.3 m net

# Absolute Return \$2.2 B

audited value as of 6/30/17

## Director of Private Income

- Oversees Internal Team (1) and Hedge Fund Managers
- Selectively chooses funds
- Ensures diversification based on geographies, securities, and strategies

## Management

- Fund of Funds - External
- Co-Investments - Internal
- Direct Investments – Internal
- Moving towards fully direct approach - based on the Board's approval of Staff's recommendation in May 2016

## Hedge Fund Portfolios

- Illiquid - Growth
- Strategies: Global, Macro, Commodities, Event Driven

APFC Operating  
\$1.4 m

External Fees  
\$16.3 m net

# Real Estate \$5.6 B

audited value as of 6/30/17

## Director of Real Estate

- Oversees Internal Team (3) and External Advisors
- Targets a mix of investment styles, ownership structures, property life cycles and property types.
- Focus on steady cash flow and preservation of capital

## Management

- Portfolio is managed by APFC's Team and 5 External Advisors.
- Advisors provide property management services

## Real Estate Holdings

- Illiquid - Income
- 56 properties – US and Europe
- Residential, Retail, Industrial, Office Buildings
- Build to Core

APFC Operating  
\$3.8 m

External Fees  
\$0.7 m + 33.6 m net

# Asset Allocation and Risk \$4.5 B

audited value as of 6/30/17

## Director of Risk and Asset Allocation

- Oversees Internal Team (1) and External Managers
- Manages Cash and Over Arching Mandate
- Monitors Risk Factors: Markets, Liquidity, Concentration, Inflation

## Management

- External CIO Program
- Currency Overlay
- Liquidity Management

## Strategies

- Partnering with Best In Class Firms
- Amount of cash held is determined by investment goal, time horizon and risk tolerance.

APFC Operating  
\$1.9 m

External Fees  
\$19.5 m



# Outcomes



# Fiscal Year 2017 Performance as of 6/30/2017

## Realized and Unrealized Gains

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	FY17	3 Years	5 Years	Since Inception
Total Fund	12.89%	6.21%	8.85%	8.79%
Passive Index Benchmark <small>(60 Stocks   20 Bonds   10 RE   10 TIPs)</small>	10.26%	3.37%	7.10%	<i>Not Available</i>
Performance Benchmark	11.19%	4.77%	8.15%	9.00%
Total Fund Return Objective   CPI+ 5%	6.63%	5.92%	6.32%	7.67%

# Asset Class Performance (Realized and Unrealized Gains)

Returns as of September 30, 2017	Fiscal Year 2018 Q1	3 Year	5 Year
<b>Public Equities</b>			
International Equities	6.89%	5.97%	7.17%
Global Equities	5.37%	7.75%	11.21%
Domestic Equities	5.13%	10.92%	14.62%
<b>Fixed Income Plus</b>			
US Investment Grade Corporate	1.54%	4.82%	4.09%
Non US Fixed Income	0.49%	3.23%	3.35%
Global High Yield	2.05%	5.36%	5.85%
Emerging Market Debt	3.71%	3.54%	2.49%
TIPS	0.79%	1.45%	0.03%
REITS	1.56%	8.61%	8.07%
<b>Private Equity</b>	7.50%	17.43%	18.33%
<b>Real Estate</b>	-0.50%	9.02%	10.03%
<b>Infrastructure</b>	6.83%	17.02%	15.12%
<b>Public/Private Credit</b>	3.64%	5.99%	8.06%
<b>Absolute Return</b>	2.01%	2.40%	3.84%
<b>Asset Allocation</b>			
Cash	0.28%	0.29%	0.18%
Multi-Asset Class	3.35%	5.42%	5.21%

# Callan's Capital Markets Forecast

as of September 2017

10 year horizon	Previous	New
Total Return	6.95%	6.50%
Statutory Return	6.24%	6.53%
Inflation	2.25%	2.25%

Asset Category	Projected 10-Year Geometric Return	Annualized Standard Deviation
Global Equities	7.00%	18.55%
Cash Equivalents	2.27%	0.90%
US TIPS	3.00%	5.25%
US Fixed Income	3.00%	3.75%
Investment Grade Credit	3.55%	5.05%
Non US Fixed Income	1.40%	9.20%
Emerging Markets Debt	4.50%	9.60%
High Yield Fixed Income	4.75%	10.35%
Global REITS	6.40%	20.30%
Global Listed Infrastructure	5.80%	15.90%
Private Equity	8.50%	22.00%
Real Estate	5.95%	13.50%
Private Infrastructure	5.75%	14.50%
Absolute Return	5.05%	9.15%



# APFC Stress Tests

# What are the stress tests?

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- At the request of the Board Chair, Bridgewater, one of our partners with expertise in portfolio management, developed and presented stress scenario analyses to the Board of Trustees.
- These analyses demonstrate the effects of stressful economic conditions on the Fund under assumed draws:
  - 5.25% years 1-2, and 5% years 3-10
  - 5.25% years 1-2, and 4.5% years 3-10.
- The stress analyses estimate the returns required to achieve assumed draw outcomes, and compare these return hurdles to the range of returns implied by forward-looking Bridgewater assumptions, Callan estimates, and historical returns (adjusted for today's cash rates).

# Bridgewater's Observations

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- Total returns for savers are likely to be historically low over the next decade.
- Forecasting future returns is inherently imprecise; however, there is confidence that low cash rates will be a drag on all assets for the medium term.
- This development presents a significant challenge to investors whose spending plans are based on higher expected returns than are now likely.

# Methodology

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For each draw assumption two stress tests were conducted - distinguished by whether the current stock of unrealized gains are used as an additional lever to support the balance in the Earnings Reserve.

## Stress Test 1

Make payments according to distribution plan (5.25% to 5% or 5.25% to 4.5%) until Earnings Reserve is exhausted (~13B starting buffer)

- This stress test is conservative with respect to potential distributions (i.e., should represent a lower-bound for expected payments from the fund).

## Stress Test 2

Make payments until overall plan surplus (Earnings Reserve + Current Unrealized Gains) is exhausted (~20B starting buffer)

- This stress test is less conservative with respect to distributions (i.e., the worst case distribution outcomes will be less severe, though the worst case ending fund size will be more severe).

# Assumptions

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## Draws

- Scenario 1:  
Distributions are Calculated as 5.25% of the 5-Year Average of the Total Fund Size in years 1-2, and 5.00% in years 3-10.
- Scenario 2:  
Distributions are Calculated as 5.25% of the 5-Year Average of the Total Fund Size in years 1-2, and 4.50% in years 3-10.

## Distributions

- Limited by either the size of the ERA (Stress Test 1) or the ERA plus current unrealized gains (Stress Test 2).
- Prioritized over inflation proofing payments – partial payments allowed.
- ERA can be drawn to zero, but never have a negative balance.

## Inflation Proofing

- Assessed on the Principal Fund Balance, excluding any unrealized gains.
- 2.25% Annual Inflation (unless otherwise noted).

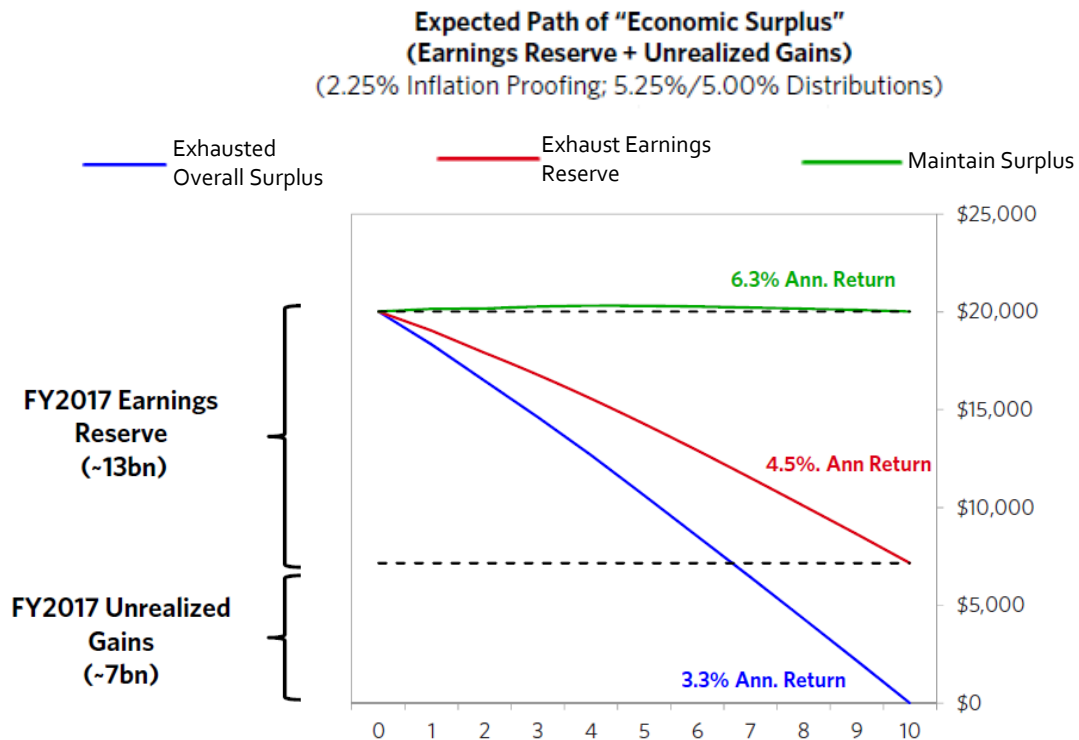




# Scenario 1

5.25% years 1-2 and 5.00% years 3-10

# Required Return (5.25% to 5.00% Scenario)



Assuming 2.25% Annual Inflation Proofing:		
	Required Return	Odds of Falling Short
Exhaust Overall Surplus	3.3%	20%
Exhaust Earnings Reserve	4.5%	30%
Maintain Surplus	6.3%	48%

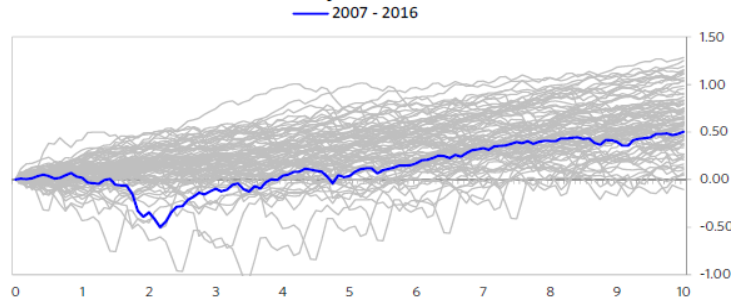
Note: Probabilities based on Callan Return Estimates

Note: the probabilities shown above assume all distributions are made in full. To the extent payments are reduced after depleting the earnings reserve, the odds of exhausting the "Overall Surplus" would be lower.

(Bridgewater)

# Stress Test Example: 2007-2016 (5.25% to 5.00% Scenario)

**Stress Test of Returns**  
(Sim. Historical Returns Adjusted To Current 1.3% Cash Rate)



**Financial Crisis & Recovery ('07-'16)**

Projection Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Returns Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Rolling 5yr Fund Size (BOY)	\$52.3	\$55.0	\$52.5	\$51.8	\$52.6	\$51.6	\$51.9	\$57.8	\$62.1	\$64.2
Target Distribution (%)	5.25%	5.25%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Target Distribution (\$)	\$2.7	\$2.9	\$2.6	\$2.6	\$2.6	\$2.6	\$2.6	\$2.9	\$3.1	\$3.2
Asset Portfolio Return	2.0%	-30.1%	27.9%	14.4%	-0.5%	14.5%	16.9%	7.7%	-0.7%	10.9%
Actual Distribution (\$)	\$2.7	\$2.9	\$0.0	\$0.0	\$2.6	\$2.6	\$2.6	\$2.9	\$3.1	\$3.2
% of Desired	100%	100%	0%	0%	100%	100%	100%	100%	100%	100%
Total Fund Size (EOY)	\$58.6	\$38.4	\$49.5	\$57.0	\$54.4	\$60.1	\$68.0	\$70.8	\$67.6	\$72.2
Earnings Reserve (EOY)	\$10.4	\$0.0	\$0.0	\$6.8	\$2.9	\$7.9	\$14.4	\$15.6	\$10.9	\$13.8
Economic Surplus (EOY)	\$17.6	-\$3.9	\$6.9	\$14.0	\$10.1	\$15.0	\$21.5	\$22.8	\$18.0	\$21.0
Cumulative Distributions	\$2.7	\$5.6	\$5.6	\$5.6	\$8.3	\$10.8	\$13.4	\$16.3	\$19.4	\$22.6
Cum. Expected @ 6.5% Return	\$2.7	\$5.7	\$8.6	\$11.6	\$14.7	\$17.9	\$21.2	\$24.6	\$28.0	\$31.5
% of Expected (@ 6.5% Return)	100%	99%	66%	49%	56%	61%	63%	66%	69%	72%
Cumulative Missed Inf. Payments	\$0.0	\$0.0	-\$1.0	-\$1.9	-\$1.9	-\$2.6	-\$2.6	-\$2.6	-\$2.6	-\$2.6
Real Value of Principal Balance	\$40.1	\$40.4	\$39.9	\$39.3	\$39.7	\$39.4	\$39.8	\$40.2	\$40.6	\$41.0

In the analysis above, simulated excess return of the APFC portfolio are added to Bridgewater forward looking cash rate of 1.3%. Each gray line represents a distinct 10-year period, beginning in January 1925. Estimates of the distributions and future capacity measures are based on the cash flows provided by APFC and Bridgewater analysis. Assumes 5.25% distributions in years 1 & 2, and 5.00% distributions thereafter, calculated based on the rolling 5-year total fund balance, and annual 2.25% inflation proofing payments. HYPOTHETICAL OR SIMULATED PERFORMANCE RESULTS HAVE CERTAIN INHERENT LIMITATIONS. UNLIKE AN ACTUAL PERFORMANCE RECORD, SIMULATED RESULTS DO NOT REPRESENT ACTUAL TRADING OR THE COSTS OF MANAGING THE PORTFOLIO. ALSO, SINCE THE TRADES HAVE NOT ACTUALLY BEEN EXECUTED, THE RESULTS MAY HAVE UNDER OR OVER COMPENSATED FOR THE IMPACT, IF ANY, OF CERTAIN MARKET FACTORS, SUCH AS LACK OF LIQUIDITY. SIMULATED TRADING PROGRAMS IN GENERAL ARE ALSO SUBJECT TO THE FACT THAT THEY ARE DESIGNED WITH THE BENEFIT OF HINDSIGHT. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. Past performance is not indicative of future results.

(Bridgewater)

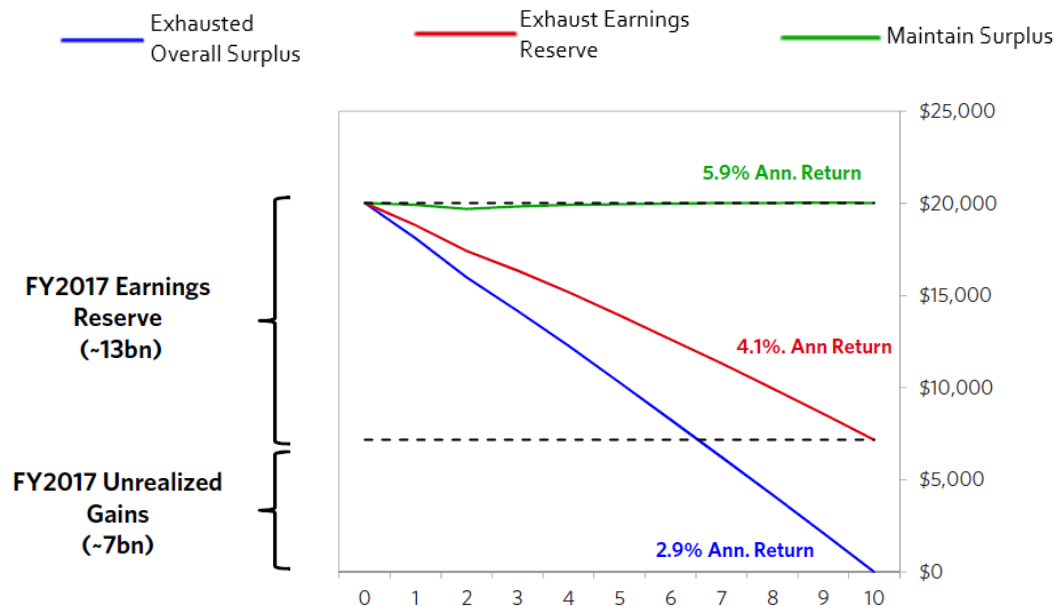


## Scenario 2

5.25% years 1-2 and 4.50% years 3-10

# Required Return (5.25% to 4.50% Scenario)

**Expected Path of "Economic Surplus"**  
**(Earnings Reserve + Unrealized Gains)**  
 (2.25% Inflation Proofing; 5.25%/4.5% Distributions)



Assuming 2.25% Annual Inflation Proofing:		
	Required Return	Odds of Falling Short
Exhaust Overall Surplus	2.9%	17%
Exhaust Earnings Reserve	4.1%	26%
Maintain Surplus	5.9%	44%

Note: Probabilities based on Callan Return Estimates

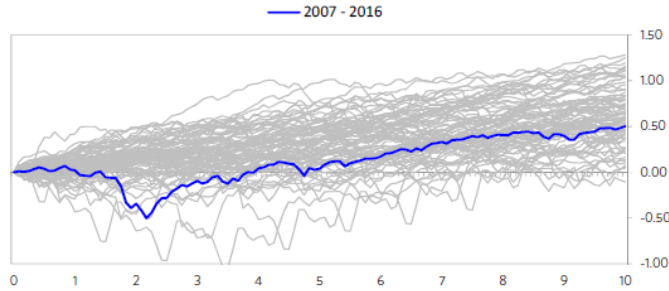
Note: the probabilities shown above assume all distributions are made in full. To the extent payments are reduced after depleting the earnings reserve, the odds of exhausting the "Overall Surplus" would be lower.

(Bridgewater)



# Stress Test Example: 2007-2016 (5.25% to 4.50% Scenario)

**Stress Test of Returns**  
(Sim. Historical Returns Adjusted To Current 1.3% Cash Rate)



**Financial Crisis & Recovery ('07-'16)**

Projection Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Returns Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Rolling 5yr Fund Size (BOY)	\$52.3	\$55.0	\$52.5	\$51.8	\$52.6	\$51.6	\$52.0	\$58.1	\$62.7	\$65.1
Target Distribution (%)	5.25%	5.25%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%
Target Distribution (\$)	\$2.7	\$2.9	\$2.4	\$2.3	\$2.4	\$2.3	\$2.3	\$2.6	\$2.8	\$2.9
Asset Portfolio Return	2.0%	-30.1%	27.9%	14.4%	-0.5%	14.5%	16.9%	7.7%	-0.7%	10.9%
Actual Distribution (\$)	\$2.7	\$2.9	\$0.0	\$0.0	\$2.4	\$2.3	\$2.3	\$2.6	\$2.8	\$2.9
% of Desired	100%	100%	0%	0%	100%	100%	100%	100%	100%	100%
Total Fund Size (EOY)	\$58.6	\$38.4	\$49.5	\$57.0	\$54.7	\$60.7	\$68.9	\$72.0	\$69.1	\$74.2
Earnings Reserve (EOY)	\$10.4	\$0.0	\$0.0	\$6.8	\$3.2	\$7.9	\$14.7	\$16.3	\$11.9	\$15.3
Economic Surplus (EOY)	\$17.6	-\$3.9	\$6.9	\$14.0	\$10.3	\$15.1	\$21.9	\$23.5	\$19.0	\$22.4
Cumulative Distributions	\$2.7	\$5.6	\$5.6	\$5.6	\$8.0	\$10.3	\$12.7	\$15.3	\$18.1	\$21.0
Cum. Expected @ 6.5% Return	\$2.7	\$5.7	\$8.6	\$11.6	\$14.7	\$17.9	\$21.2	\$24.6	\$28.0	\$31.5
% of Expected (@6.5% Return)	100%	99%	66%	49%	54%	58%	60%	62%	65%	67%
Cumulative Missed Inf. Payments	\$0.0	\$0.0	-\$1.0	-\$1.9	-\$1.9	-\$2.1	-\$2.1	-\$2.1	-\$2.1	-\$2.1
Real Value of Principal Balance	\$40.1	\$40.4	\$39.9	\$39.3	\$39.7	\$39.9	\$40.2	\$40.6	\$41.0	\$41.4

In the analysis above, simulated excess return of the APFC portfolio are added to Bridgewater forward looking cash rate of 1.3%. Each gray line represents a distinct 10-year period, beginning in January 1925. Estimates of the distributions and future capacity measures are based on the cash flows provided by APFC and Bridgewater analysis. Assumes 5.25% distributions in years 1 & 2, and 5.00% distributions thereafter, calculated based on the rolling 5-year total fund balance, and annual 2.25% inflation proofing payments. HYPOTHETICAL OR SIMULATED PERFORMANCE RESULTS HAVE CERTAIN INHERENT LIMITATIONS. UNLIKE AN ACTUAL PERFORMANCE RECORD, SIMULATED RESULTS DO NOT REPRESENT ACTUAL TRADING OR THE COSTS OF MANAGING THE PORTFOLIO. ALSO, SINCE THE TRADES HAVE NOT ACTUALLY BEEN EXECUTED, THE RESULTS MAY HAVE UNDER OR OVER COMPENSATED FOR THE IMPACT, IF ANY, OF CERTAIN MARKET FACTORS, SUCH AS LACK OF LIQUIDITY. SIMULATED TRADING PROGRAMS IN GENERAL ARE ALSO SUBJECT TO THE FACT THAT THEY ARE DESIGNED WITH THE BENEFIT OF HINDSIGHT. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. Past performance is not indicative of future results.

(Bridgewater)

# Summary Comparison

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Probabilities and Expected Outcomes are Based on Callan 6.5% Return Assumption

	Base Case (5.25%/5.0%)	Reduced Distributions (5.25%/4.5%)
<b>Required Return (and Probability of Falling Short)</b>		
To meet all planned distributions while:		
Maintaining overall surplus:	6.3% (48%)	5.9% (44%)
Exhausting the earnings reserve:	4.5% (30%)	4.1% (26%)
Exhausting the economic surplus:	3.3% (20%)	2.9% (17%)
<b>Expected 10y Outcomes (Callan Estimates)</b>		
Cumulative Distributions:	\$31,521	\$29,172
Total Fund Size:	\$75,331	\$78,298
Ending Earnings Reserve:	\$14,316	\$17,282
Ending Economic Surplus:	\$21,471	\$24,437
Cumulative Missed Inflation Proofing:	\$0	\$0

(Bridgewater)



Questions ?