



TD Asset Management

Retirement Conundrum

June 2019

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Vice President & Director



Why Focus on the Retirement Segment...



72%

Of financial wealth will be controlled by households over the age of 55 by 2026



The largest CAGR to occur in the 65+ age group segment

\$1 Trillion

Over the next decade it is anticipated that \$1.1 trillion will be transferred between generations

Opportunity to grow assets and help clients meet their retirement investment goals

Source: Investor Economics, 2017 Household Balance Sheet Report, pages 75, 157. As of June 30, 2017. CAGR – The Compound Annual Growth Rate (CAGR) is the mean annual growth rate of an investment over a specified period of time longer than one year

Retirement Goal : Maximize income & longevity

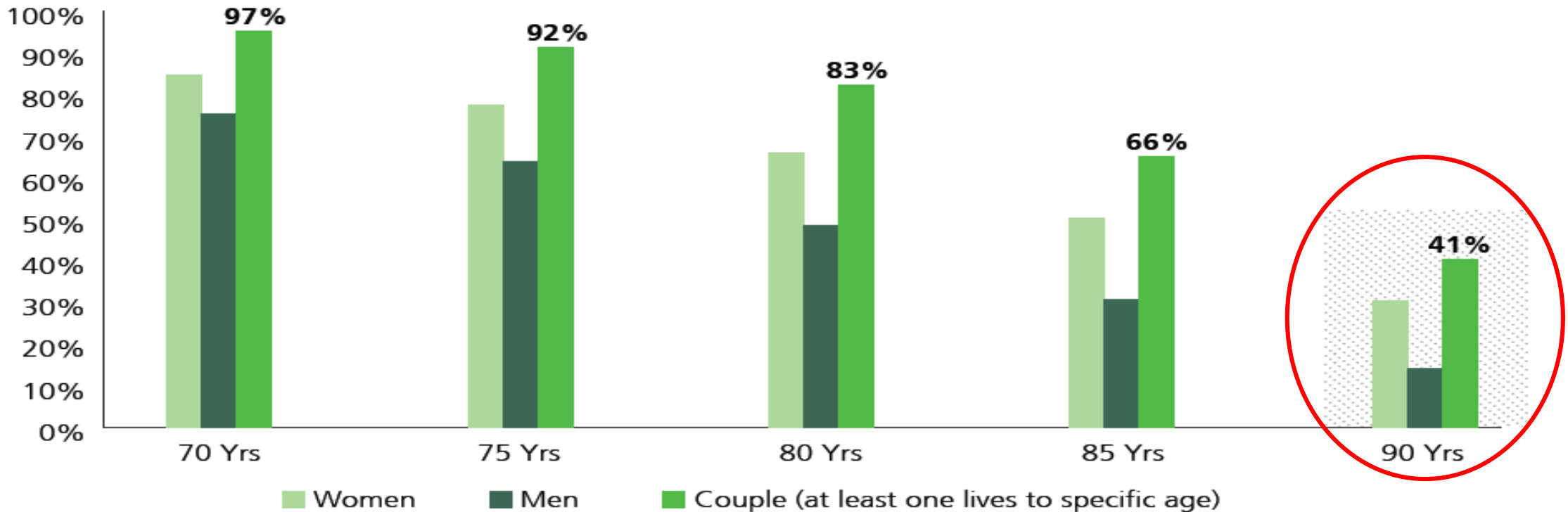
1. **Withdrawal Rate:** The gravity of any retirement income strategy, longevity is closely anchored to a tight withdrawal range
2. **Investment Return:** Higher annual rate of return helps improves asset longevity and income by overcoming the significant hurdles of inflation and fees
3. **Portfolio Volatility:** Unlike accumulation, for most retirees the journey matters more.

How should you invest today to help meet your retirement investment goals

Retirement Conundrum: Longevity after retirement



The probability of living to a specific age or beyond, if you are 65 years old today



Retired clients still have a long time horizon

Source: TDAM calculation, Statistics Canada, CANSIM Table 109-5202. As at December 31, 2017.

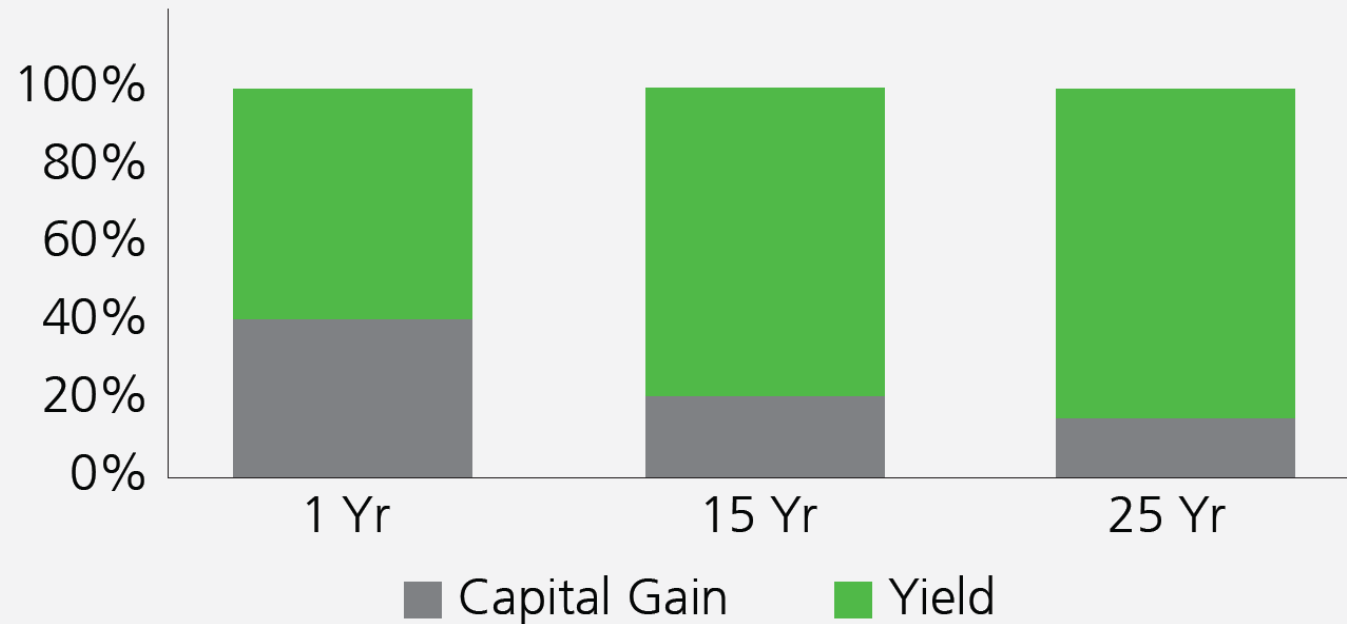
Note: For illustrative purposes only.

Retirement Conundrum:

Drivers of fixed income returns – yield and capital gains



Average Composition of Fixed Income Returns



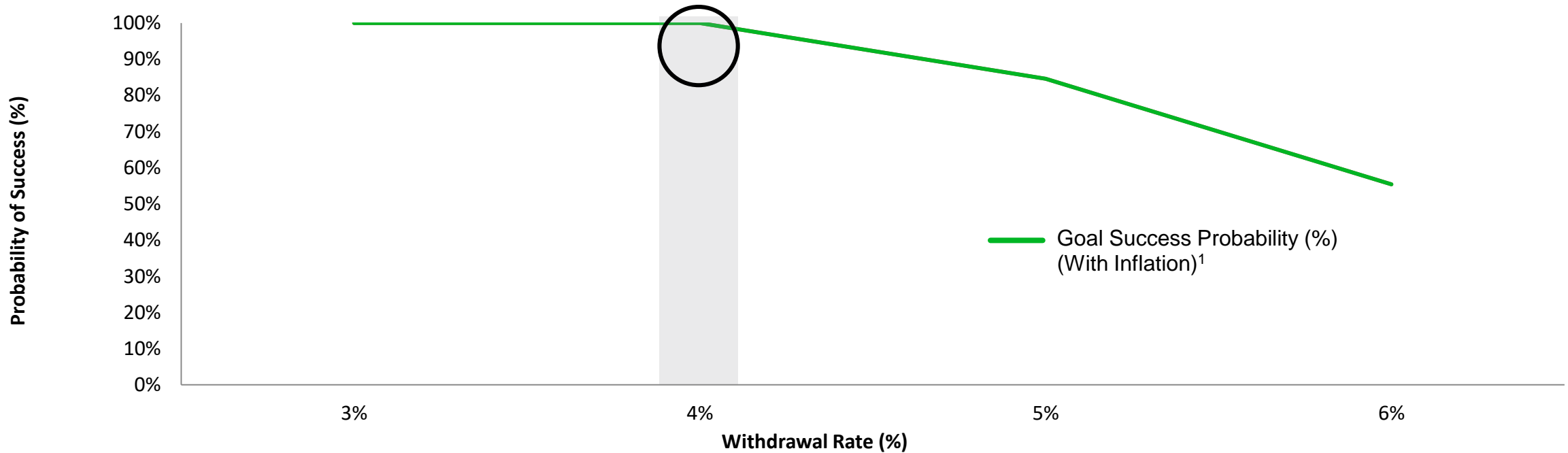
Current YTM = 2.5%¹

¹ Current Yield to Maturity (YTM) based on U.S 10 Years Bond as at April 24, 2019
Source: TDAM calculation, Bloomberg Finance L.P. As at December 31, 2017. Note: For illustrative purposes only.

Implication for Retirees: The Past has worked



Historical Probability of Success of a 20% Equity, 80% Fixed Income Portfolio



Retirement focused conservative allocation worked in the past!

¹ Based on assumptions.

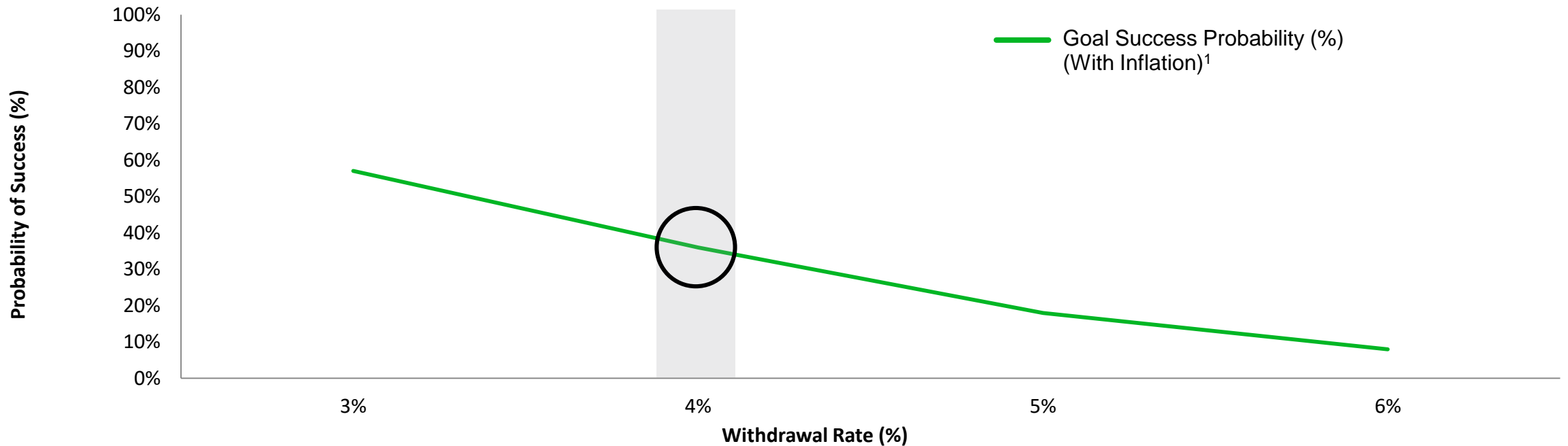
Source: TDAM calculation, Bloomberg Finance L.P. As at December 31, 2018.

Note: Historical probability of success assumptions - Equity and Fixed Income returns used in the calculations reflect historical 30-year rolling monthly returns, adjusted for 2% inflation and 2% management fees, for the S&P500 Index and 10-Year US Treasuries between January 1953 and December 2016. Future probability of success assumptions - Calculations used historic S&P500 Index and 10-Year US Treasuries 30-year rolling returns adjusted for 2% inflation and 2% management fees, and adjusted to reflect lower future expected returns. For illustrative purposes only.

Implication for Retirees: Impact for changes to future expected return



Future Probability of Success of a 20% Equity, 80% Fixed Income Portfolio



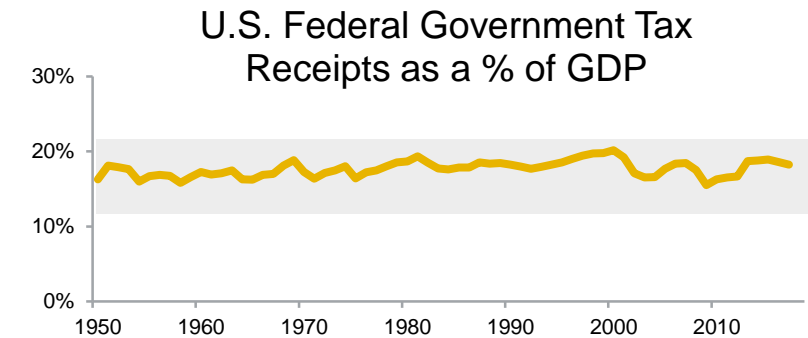
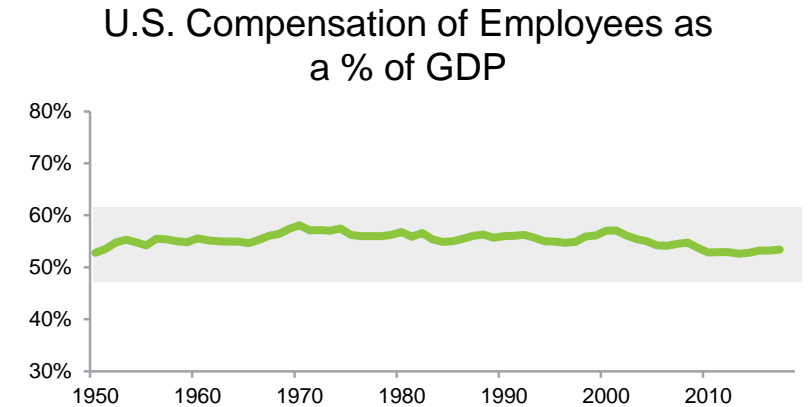
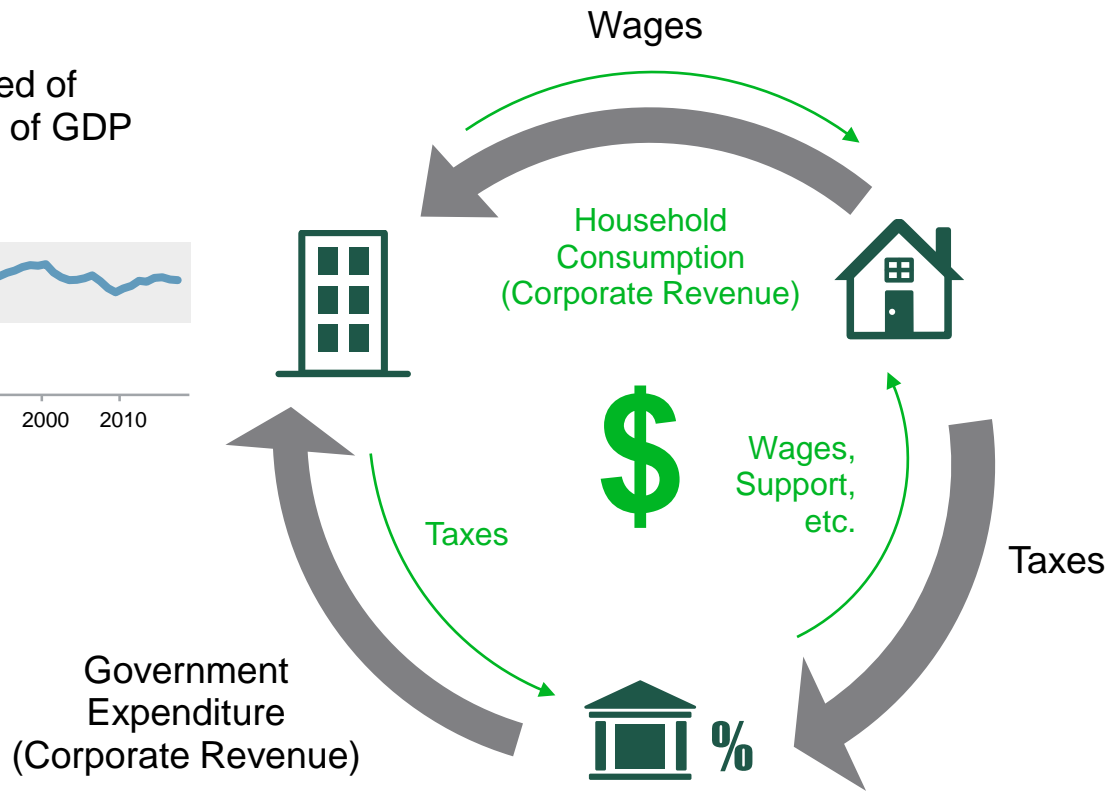
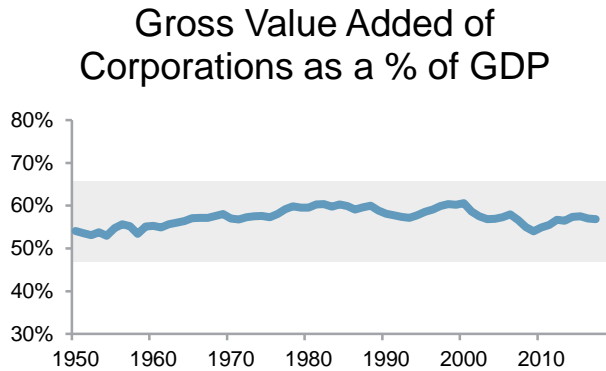
What worked in the past, may not work in the future

¹ Based on assumptions.

Source: TDAM calculation, Bloomberg Finance L.P. As at December 31, 2018.

Note: Historical probability of success assumptions - Equity and Fixed Income returns used in the calculations reflect historical 30-year rolling monthly returns, adjusted for 2% inflation and 2% management fees, for the S&P500 Index and 10-Year US Treasuries between January 1953 and December 2016. Future probability of success assumptions - Calculations used historic S&P500 Index and 10-Year US Treasuries 30-year rolling returns adjusted for 2% inflation and 2% management fees, and adjusted to reflect lower future expected returns. For illustrative purposes only.

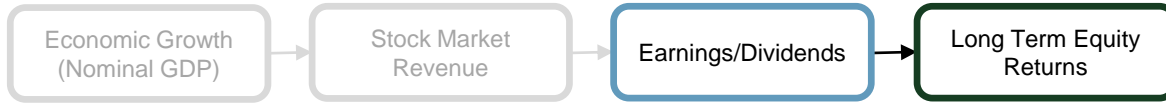
How Corporate Revenues and the Economy are Connected



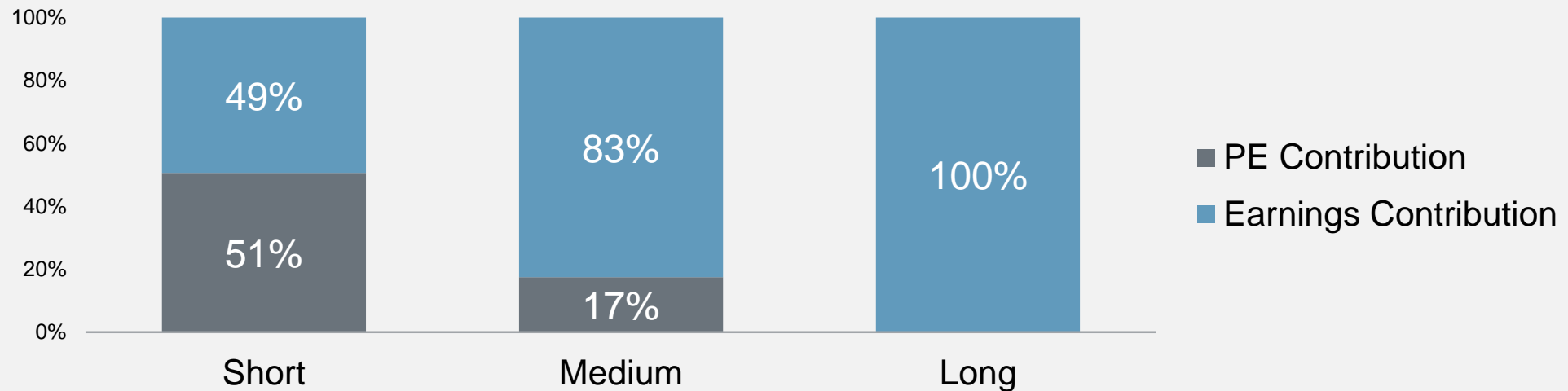
Economy (GDP) is interconnected with Markets (Corporate Sales)

Source: Thomson Reuters Datastream. As of December 31, 2018

Drivers of Equity Returns



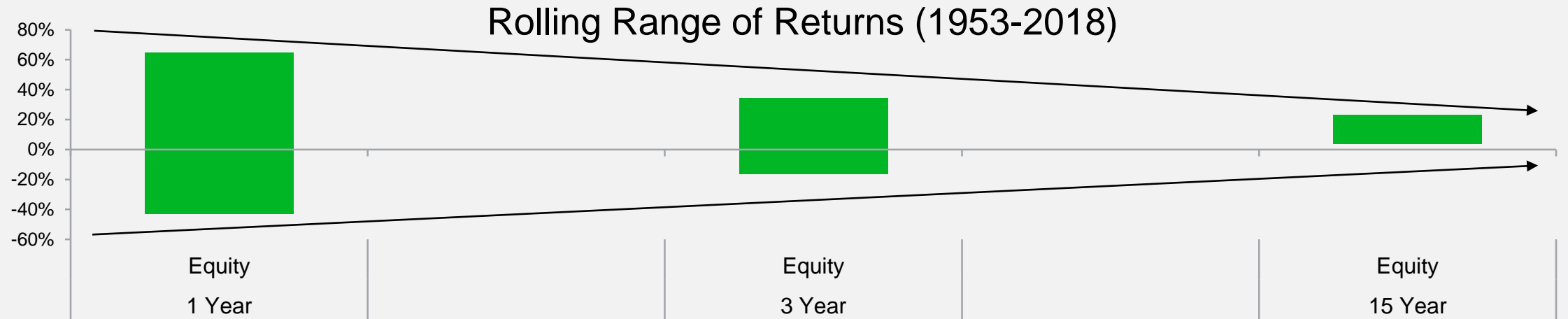
Average U.S. Equity Returns Contribution



Equity returns are largely driven by earnings which are further driven by economic growth

Source: TDAM calculation, Bloomberg Finance L.P. TDAM. As of December 31, 2018. Equity returns are average S&P 500 returns.
Note: For illustrative purposes only. Short = 1 year, Medium = 5 year, Long = 15 year.

Long term: Are equity returns predictable? (Example)



	Short	Medium	Long	Short	Medium	Long
	Equity			Fixed Income		
Volatility	17.8%	7.8%	4.1%	11.9%	4.8%	3.1%
Maximum Gain	64.5%	34.2%	19.3%	12.4%	11.3%	9.7%
Minimum Return	-43.1%	-16.4%	4.0%	-3.3%	0.8%	3.7%

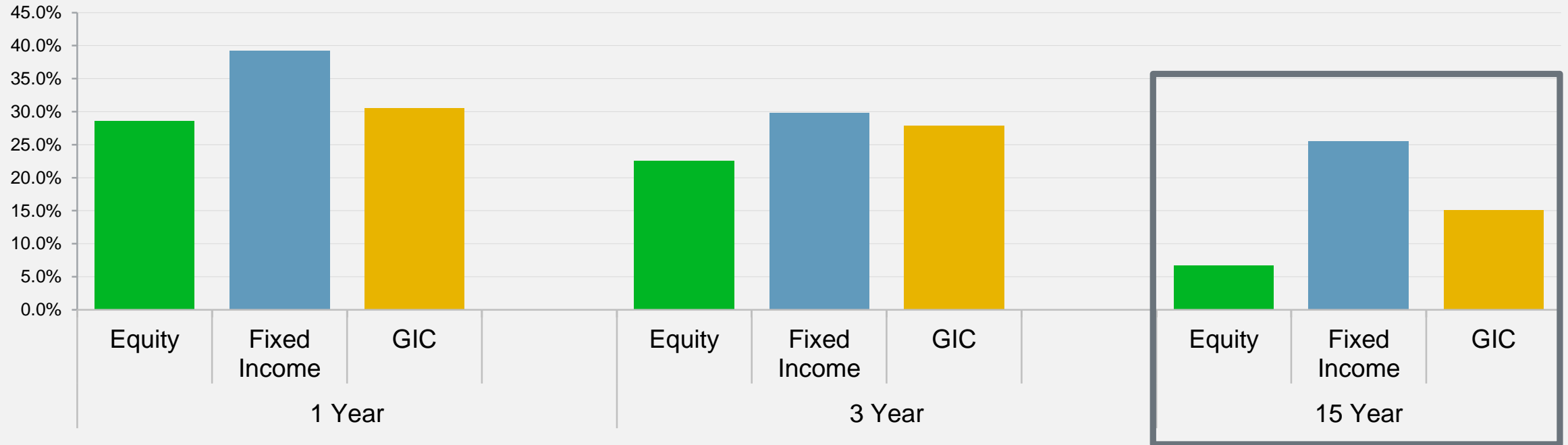
Source: Bloomberg Finance L.P. TDAM. For illustrative purposes only.

Note: Equity Return is based on S&P 500 Index. Fixed Income Return is based on FTSE Canada Universe Bond Index. As of December 31, 2018.

Long Term: Understanding true risk? (Example)



% of Rolling Periods with Negative Real Returns



Long-term GICs / Fixed Income have more often resulted in negative real returns.

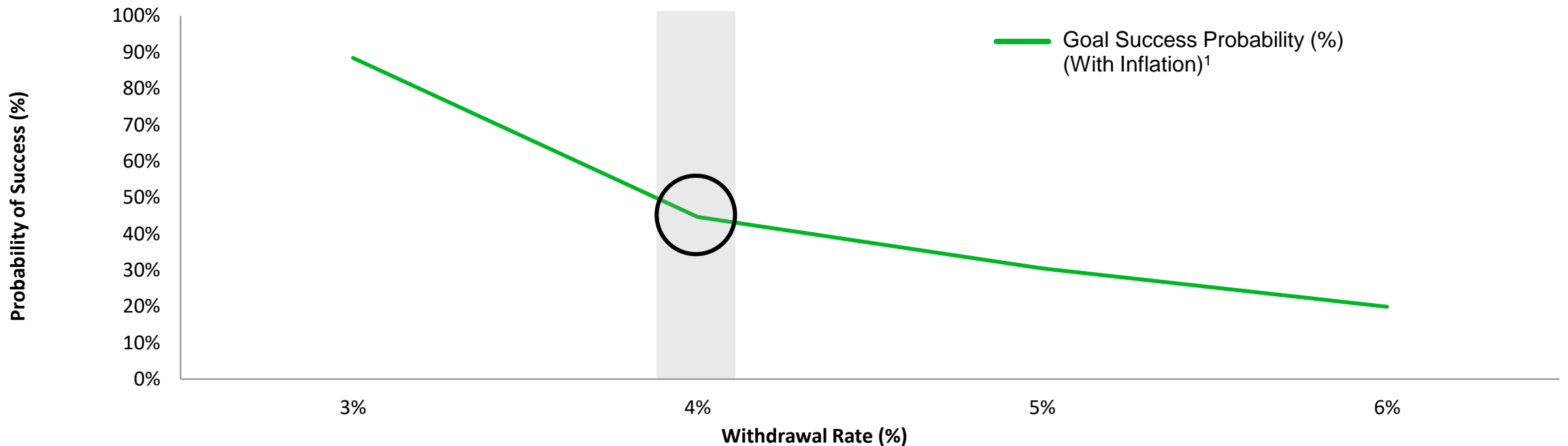
Source: Bloomberg Finance L.P. TDAM. For illustrative purposes only.

Note: Equity Return is based on S&P 500 Index. Fixed Income Return is based on FTSE Canada Universe Bond Index. As of December 31, 2018.

Implication for Retirees: Higher equities allocation



Future Probability of Success of a 60% Equity, 40% Fixed Income Portfolio



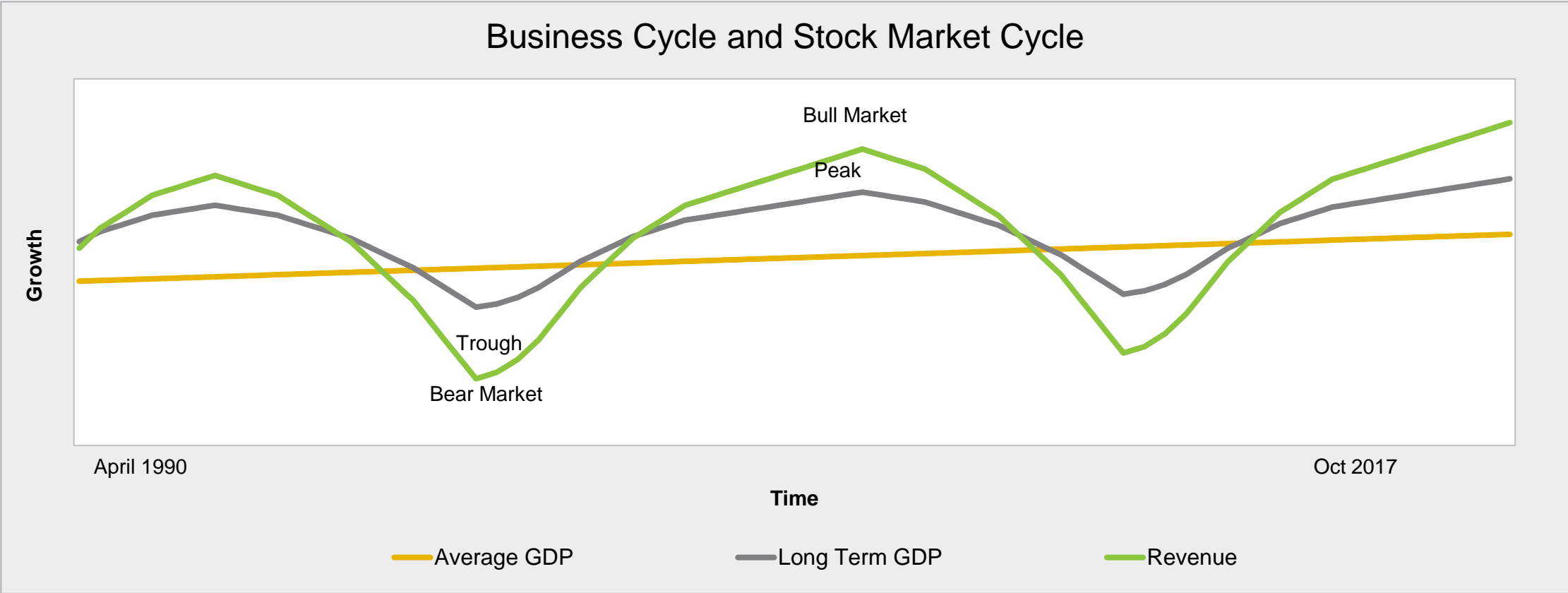
If growth assets are still risky, how can we achieve longevity success?

¹ Based on assumptions.

Source: TDAM calculation, Bloomberg Finance L.P. As at December 31, 2018.

Note: Historical probability of success assumptions - Equity and Fixed Income returns used in the calculations reflect historical 30-year rolling monthly returns, adjusted for 2% inflation and 2% management fees, for the S&P500 Index and 10-Year US Treasuries between January 1953 and December 2016. Future probability of success assumptions - Calculations used historic S&P500 Index and 10-Year US Treasuries 30-year rolling returns adjusted for 2% inflation and 2% management fees, and adjusted to reflect lower future expected returns. For illustrative purposes only.

Economic Growth Can Translate Into Equity Growth



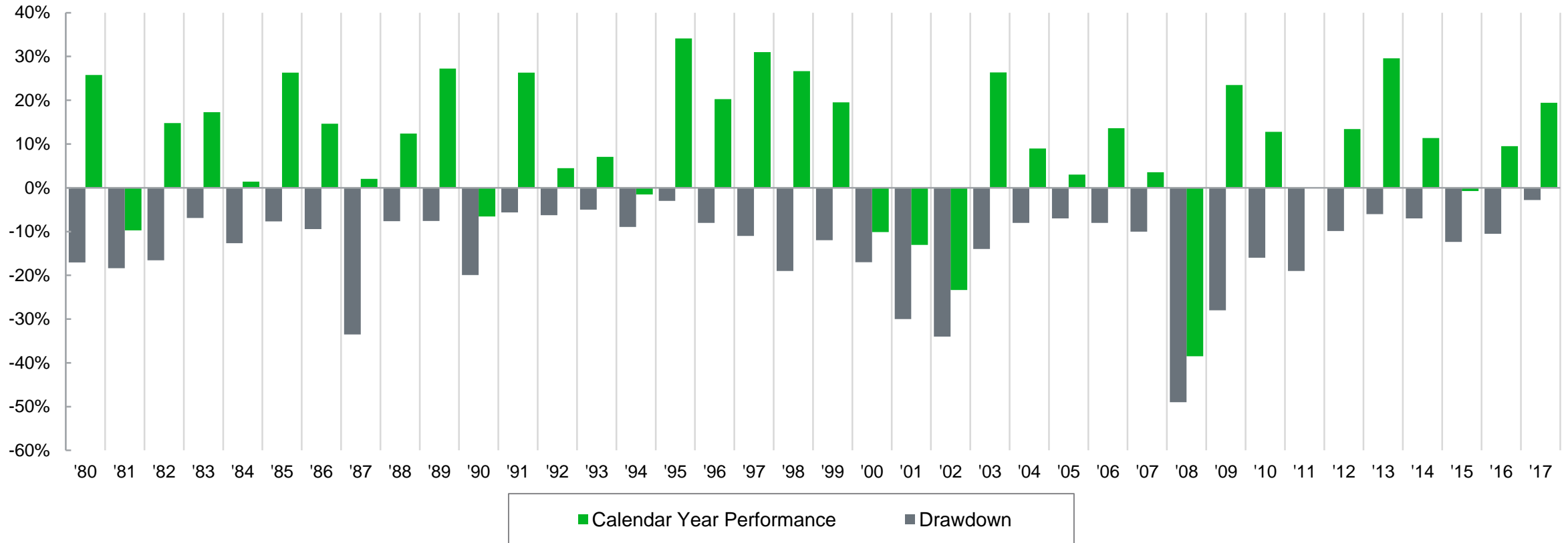
Markets go through cycles but follow a positive long term trend

For illustrative purpose only.
Source: TDAM. As at October 31, 2017.

Volatility is a Constant – Even in Positive Markets



S&P 500 Index Calendar Year Returns and Drawdowns



For illustrative purpose only.

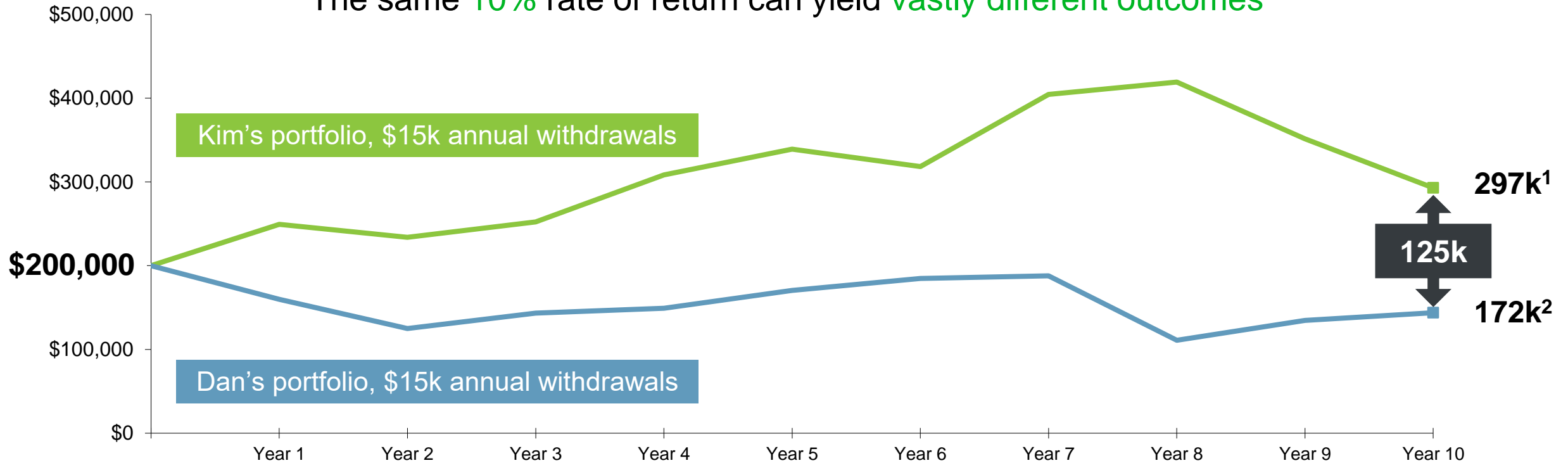
Source: Bloomberg Finance L.P., TDAM.

Note: Declines or drawdown refer to the largest price decline from a peak to trough during the calendar year. Data as of December 31, 2017.

Sequence of returns: Does it matter?



The same 10% rate of return can yield vastly different outcomes



Avoiding negative returns early in retirement is critical

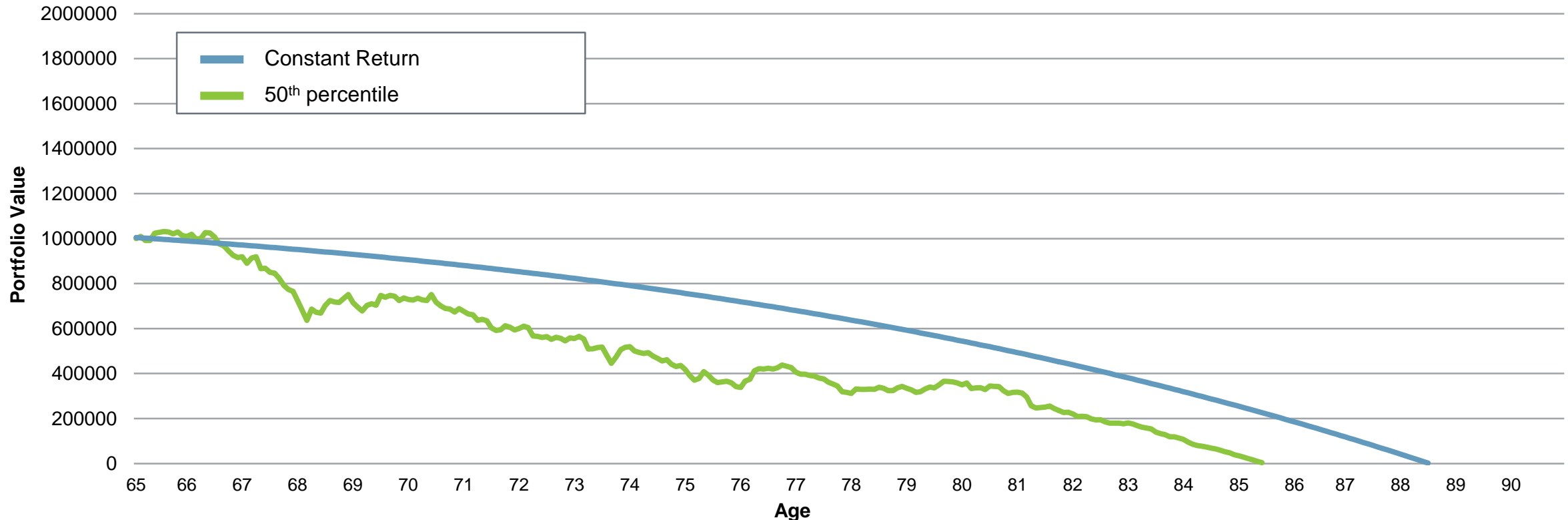
Assumption: Kim and Dan have an annual withdrawal of \$15,000 per year. ¹Kim's returns reflect the S&P/TSX annual return between 1993 and 2002

²Dan's returns reflect the S&P/TSX annual return between 2001 and 2010. For illustrative purposes only.

Volatility is the Enemy of Longevity



Impact of Portfolio Volatility



Managing volatility can be the difference between success and failure

Source: TDAM calculation, Bloomberg Finance L.P. As at December 31, 2017.

Assumptions: Simulated return data for a balanced portfolio with an annual return of 5.5% and a constant withdrawal. For illustrative purposes only.

Observations:

1. **It's not about Beta:** Using beta focused or passive solution may not be enough.
2. Simply focusing on **Performance vs. Benchmark may not be the right solution either.**
3. **Absolute returns may not be the right solution either,** as a better upside/downside capture ratio portfolio may underperform the overall market.

Retirement Investing is driven by managing the return and the downside risk

Note: Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole.

Moving the Odds in Your Favour (Simulated)



Probability of meeting your investment goals

Withdrawal Rate	Upside/Downside capture ratios relative to the S&P 500 Index		
	Full Participation	70/40	50/50
4.00%	41.8%	100.0%	0.0%
5.00%	28.8%	96.0%	0.0%
6.00%	9.6%	55.9%	0.0%

Managing downside but preserving upside is key

Source: TDAM calculation, Bloomberg Finance L.P. As at December 31, 2018.

Note: Calculations used historic S&P500 Index and 10-Year US Treasuries 30-year rolling returns adjusted for 2% inflation and 2% management fees, and adjusted to reflect lower future expected returns. For illustrative purposes only.

Managing the Journey: Optimize based on Risk Factors



Risk Factor: Distinct exposures that can drive portfolio returns

Why optimize?

- Use better portfolio construction techniques to help deliver better client outcomes with lower to equal risk
- Better diversification as a result of maximizing the effective number of bets in the portfolio

Key Tradeoff:

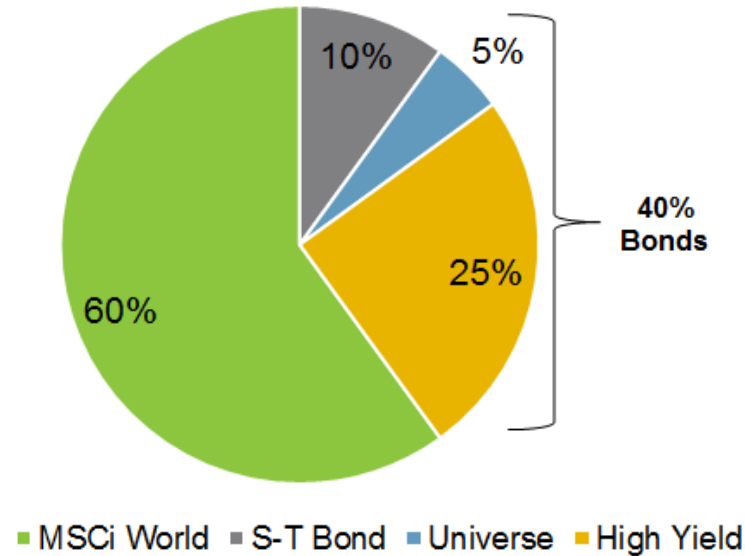
- Focuses on overall risk and return objective vs industry standard benchmark centric portfolios

Risk Factor Optimization ➡ **Better Diversification** ➡ **Improved Client Experience**

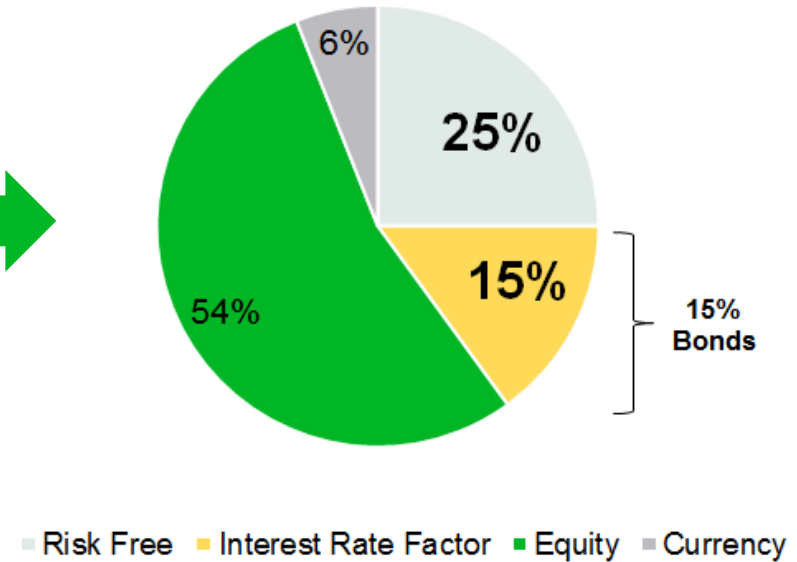
Increasing Diversification: Weight ≠ Exposure



Standard Portfolio Weight Allocation



Standard Portfolio Exposure Contribution



Are we effectively diversifying the portfolio?

For illustrative purposes only.

Impact on a Portfolio with Less Diversification and More Equity Exposure



It's not about Beta: Using beta focused or passive solution may not be enough

Source: TDAM, Phoenix and Bloomberg Finance L.P. Data as of December 31, 2018

Note: Diversified Equity 1 = S&P 500, Diversified Equity 2 is 55% S&P 500 and 45% Nasdaq. Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole.

Incremental VaR

Measures the effect individual position changes have on the portfolio's overall VaR

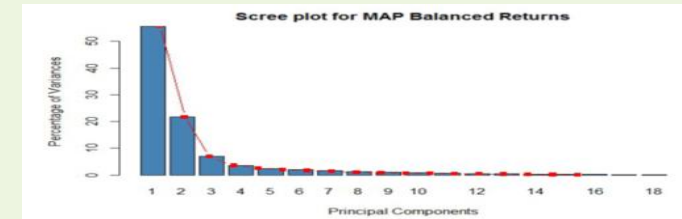
$$iVaR_i = \frac{\partial(VaR)}{\partial w_i} w_i = \underbrace{\frac{\partial(VaR)}{\partial w_i}}_{\text{pure } i\text{-th related component}} + \underbrace{\sum_{j \neq i} 2\rho_{ij}\sigma_j w_j}_{\text{spurious component}}$$

Minimum Linear Torsion (MLT)

- Unlike Principal Component Analysis (PCA), MLT clearly determines the identity of each factor and allows for a clearer attribution of factor risk
- MLT however does not deal with diversification and the error term
- MLT is complex to program and aims to convert correlated factors to uncorrelated factors which as closely as possible relates to the original factor

PCA

Breaks down the portfolio variability into descending "Principal Components" (linearly uncorrelated variables)



For illustrative purposes only.

X-Sigma-Rho Framework

- A flexible methodology for attributing portfolio risk to the same decision variables used to attribute portfolio return
- For the following analysis we chose the following as factors:
 - FI: Canada 10 year Bond, Corporate Bond, High Yield Bond
 - Equity: S&P500, MSCI EAFE, S&P TSX
 - Currency : USD, EUR,JPY
 - Absolute premium : Above risk free rate
 - Illiquidity premium : Above risk-free rate

Optimizing risk and return with stronger diversification

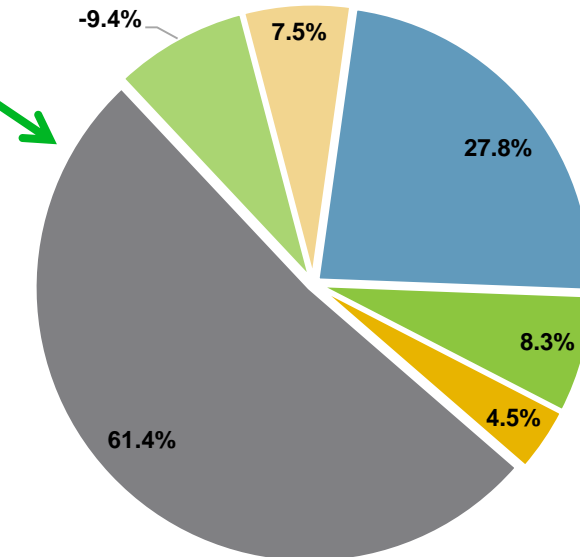
Optimized Portfolio with Our Approach (Hypothetical)



Portfolio Weights

FIXED INCOME	25.0%
EQUITY	75.0%
TD Canadian Corporate Bond Fund	5.0%
TD Global Unconstrained Bond Fund	5.0%
Ishares 20+ Year Treasury	10.0%
Real Estate Investments	5.0%
Infrastructure Investments	5.0%
Private Debt	5.0%
TD Canadian Blue Chip Fund	5.0%
TD Canadian Dividend Fund	15.0%
TD Global Low Volatility Fund	15.0%
TD Canadian Low Volatility Fund	5.0%
TD U.S. Risk Managed Equity Fund	10.0%
TD U.S. Blue Chip Equity Fund	15.0%

Portfolio Exposure



Risk Factors

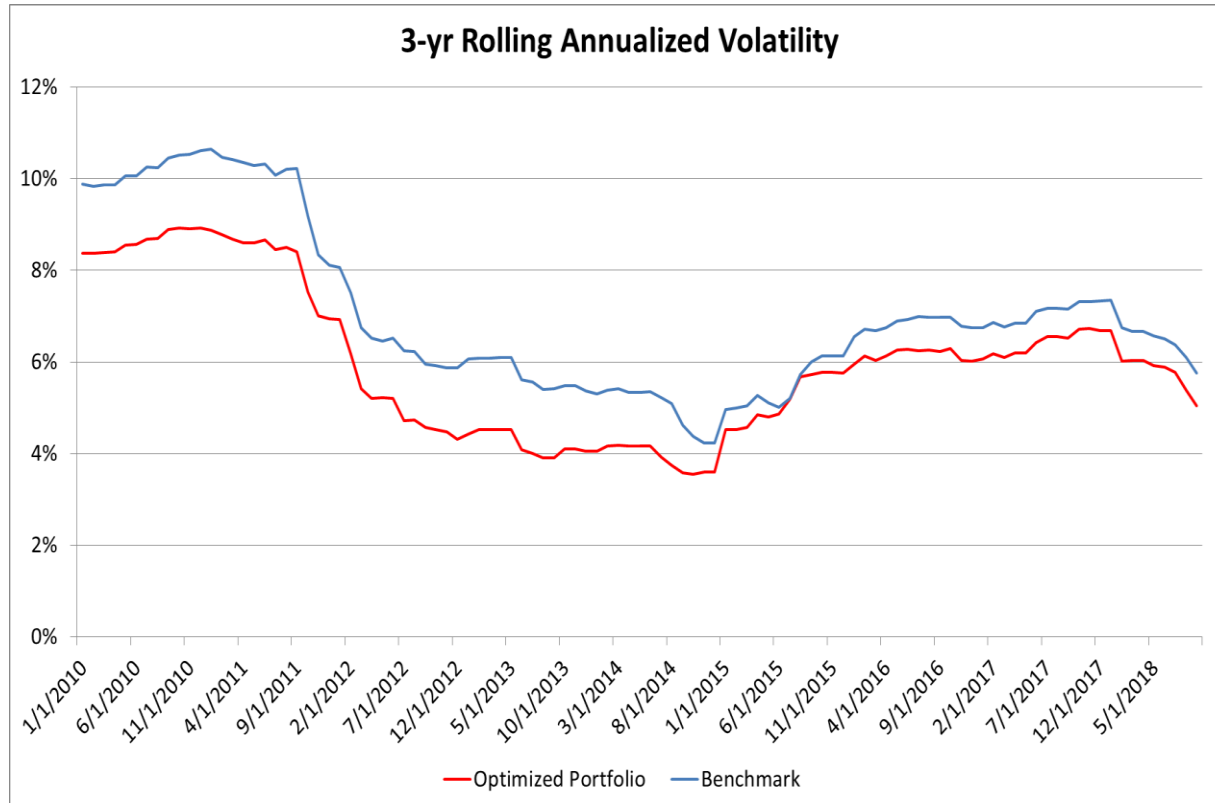
- Fixed Income
- Currency
- Absolute Premium
- Equity
- Risk Free
- Illiquidity Premium

Disclaimer: Portfolio Exposures are calculated using X-Sigma-Rho methodology. All Returns used to calculate exposure are either benchmark returns of underlying funds or simulated returns by TDAM (Jan 2007-Dec 2018)

Higher equity weight, but lower risk exposure

For illustrative purposes only.

Traditional vs. Risk Optimized Volatility (Hypothetical)



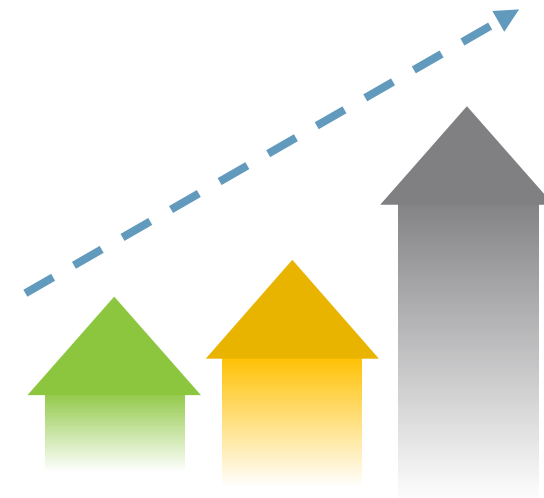
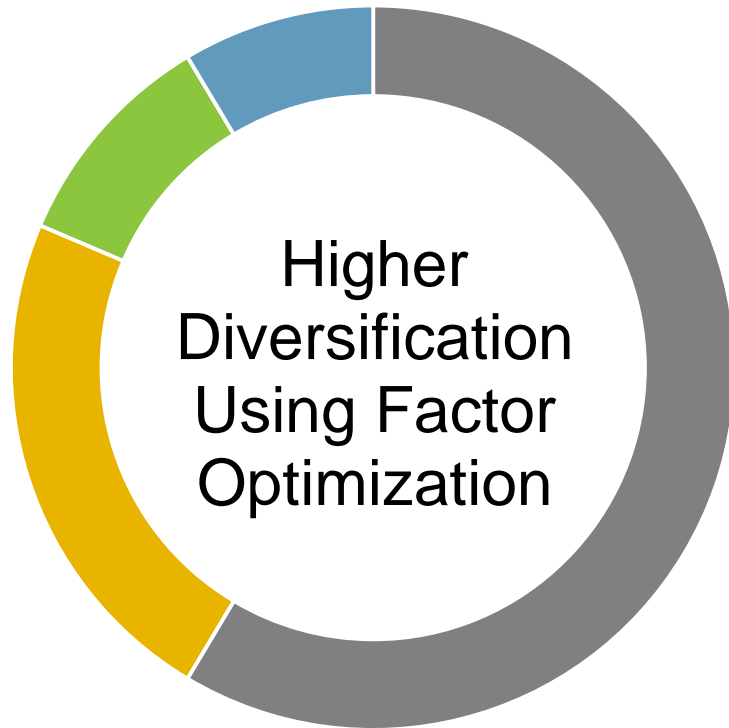
Comparative Portfolio Risk Analytics

Risk Factor	Optimized	Standard 60/40 Balanced
Volatility		
	6.20%	7.03%
Max Drawdown		
	-21.33%	-28.22%
Recovery Period (Months)		
	37	60
Average Actual Return		
	7.90%	5.88%

Disclaimer: Using TDAM simulated returns or using benchmark data of the underlying funds from Jan 2007- Dec 2018.

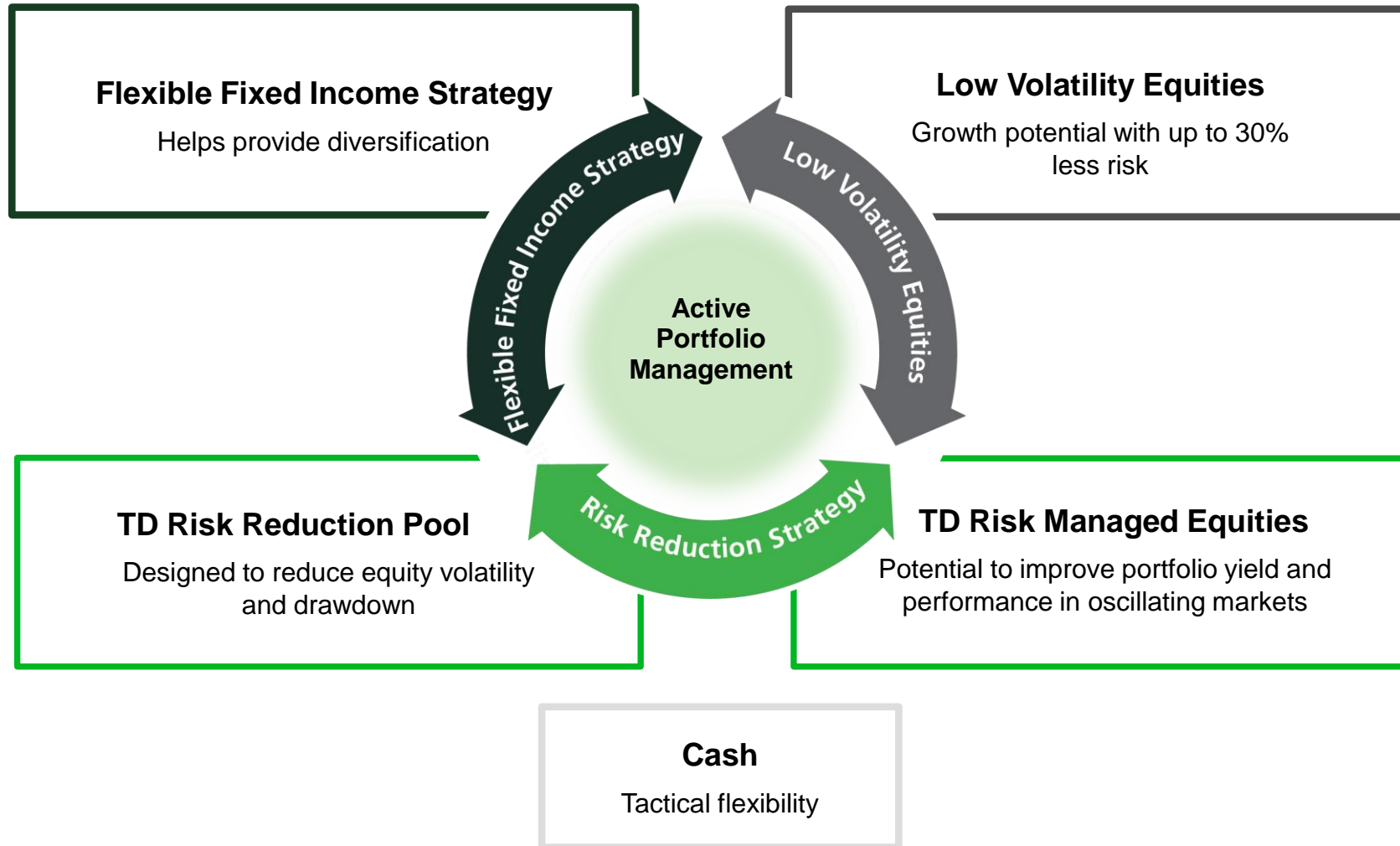
The risk factor optimized solution outperforms its benchmark with consistently lower volatility

Standard Portfolio – 10% Merrill High Yield Index, 5% FTSE Canada Short Bond Index, 25% FTSE Canada Universe Bond Index, 60% MSCI World Index.



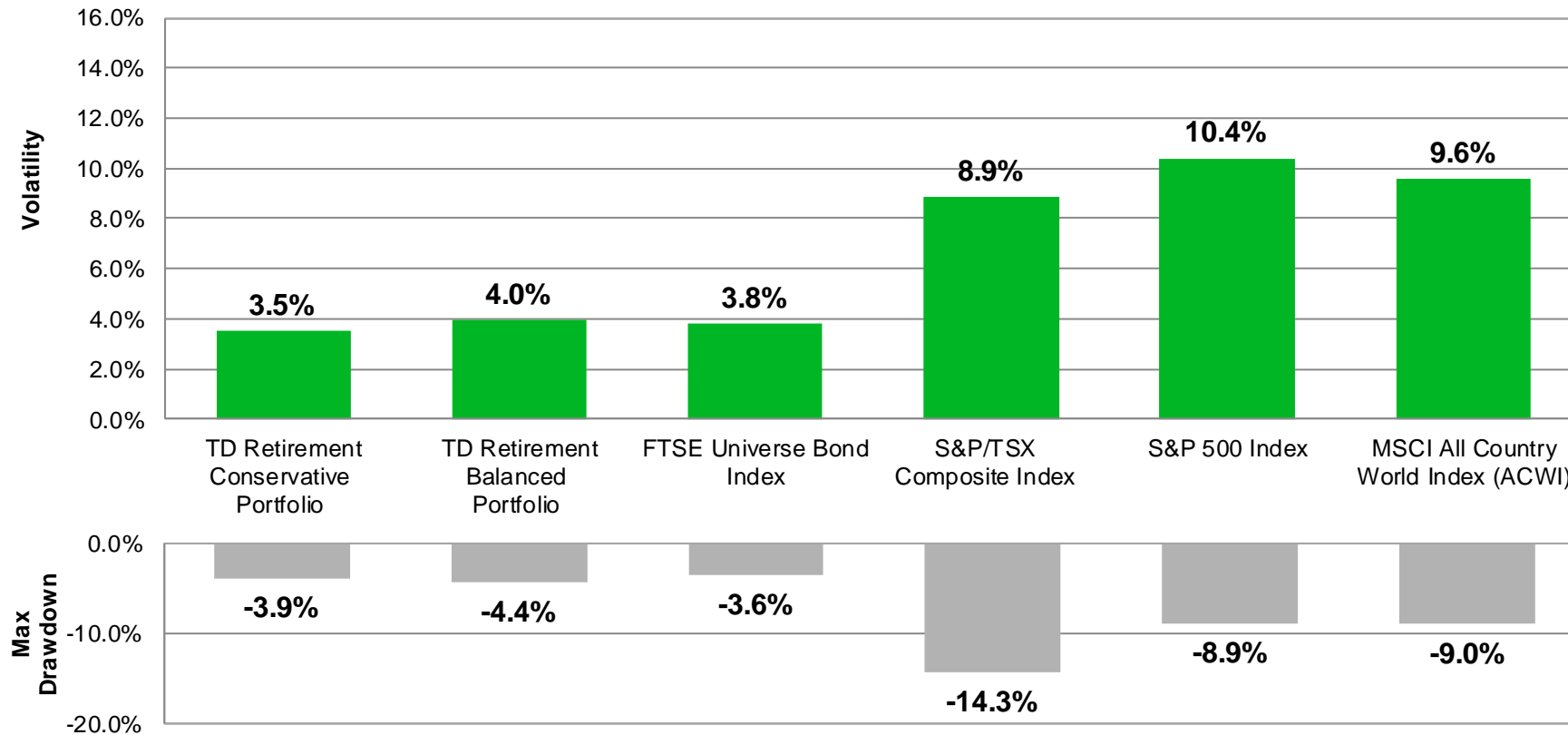
Higher Equity and
Economic Growth
Driven Return

TD Retirement Portfolios: a Purpose-Built Solution



TD Retirement Portfolios

Managing Risk for Retirees



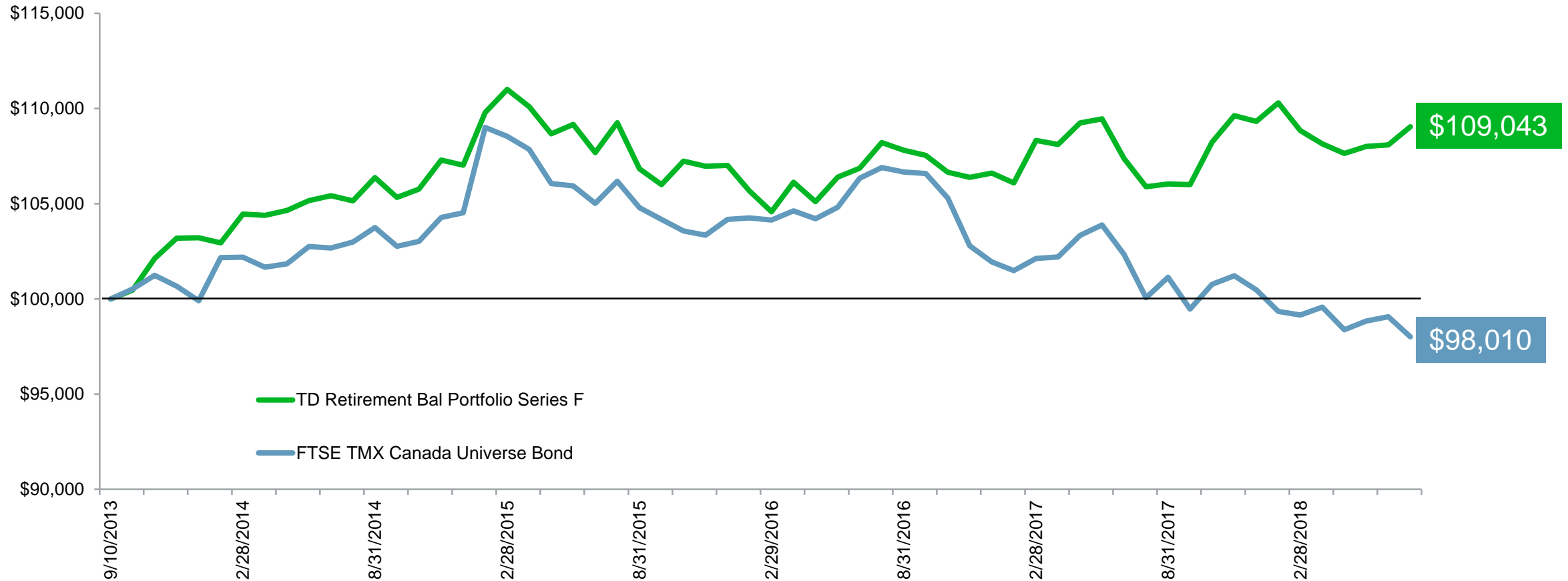
Seeking to provide low volatility and downside protection

Source: TD Asset Management, FTSE TMX Global Debt Capital Markets Inc., TSX Group Inc., Standard & Poor's, MSCI Inc. Data as of March 31, 2019.

Note: F Series net monthly returns used for the TD Retirement Portfolios. Net dividend, Canadian dollar returns used for MSCI All Country World Index (MSCI ACWI). For illustrative purposes only.

Retirement Portfolios: Retiree Experience

Drawing Down 4% Income in Retirement



Note: Based on \$4000 annual withdrawal made in \$333.33 monthly increments
Source: TD Asset Management. As at July 31, 2018. Note: F Series net returns used for the TD Retirement Portfolios.

Fund Performance

F- Series



Data as of March 31, 2019

Returns ¹ as at March 31, 2019	3 months	1 year	2 year	3 Year	5 Year	Since inception ²
TD Retirement Conservative Portfolio – F Series	4.5%	3.1%	3.5%	3.9%	3.6%	4.1%
TD Retirement Balanced Portfolio – F Series	4.8%	4.0%	3.9%	4.5%	4.6%	5.3%
TD US\$ Retirement Portfolio – F Series	6.3%	4.0%	4.6%	4.8%	N/A	4.8%

¹Inception date for TD Retirement Balanced Portfolio – F Series: 9/10/2013. Inception date for TD Retirement Conservative Portfolio – F Series: 9/10/2013. Inception date for TD US\$ Retirement Portfolio – F Series: 9/15/2015. Note: Returns for periods one year and over are annualized. Net returns provided. Source: TD Asset Management Inc.

TD Asset Management

Thank you!

Questions?





Amol Sodhi, CFA, CIM, Vice President & Director

10 years experience

Amol Sodhi joined TD Asset Management Inc. (TDAM) in 2010 and is a Senior Portfolio Manager on TDAM's Asset Allocation and Fund of Funds team. Amol co-manages the TD Comfort Portfolios, TD Retirement Portfolios, TD Strategically Managed Portfolios, and provides guidance with the management of all other Fund of Funds strategies. He is also involved in providing ongoing risk management, strategic portfolio design, tactical asset allocation, top-down macro & quantitative research, and developing innovative solutions. Amol has previous experience at a leading asset management firm providing investment research in equities and fixed income securities for both mutual funds and institutional mandates. He also has experience as a project lead at a multinational software consulting firm. Amol holds an MBA in Finance and a Computer Engineering degree from University of Toronto. Amol is a certified Canadian Investment Manager and a CFA charterholder.

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