No Portfolio is an Island

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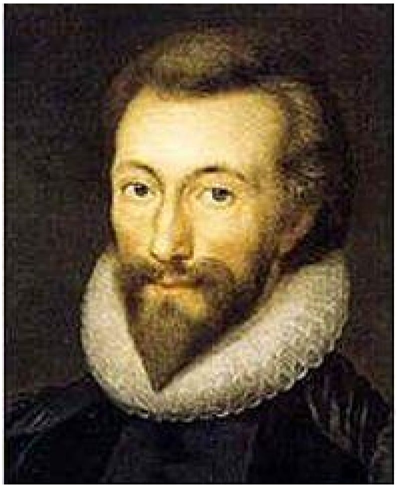
This Presentation Will Cover…

- Different types of risks to consider when building portfolios that are more efficient for clients when viewed from a total wealth perspective
- Understand why there is no one efficient portfolio for all investors
- Frameworks for incorporating different risks and preferences into the portfolio optimization process

No man is an island,
Entire of itself,
Every man is a piece of the continent,
A part of the main

John Donne, 1624

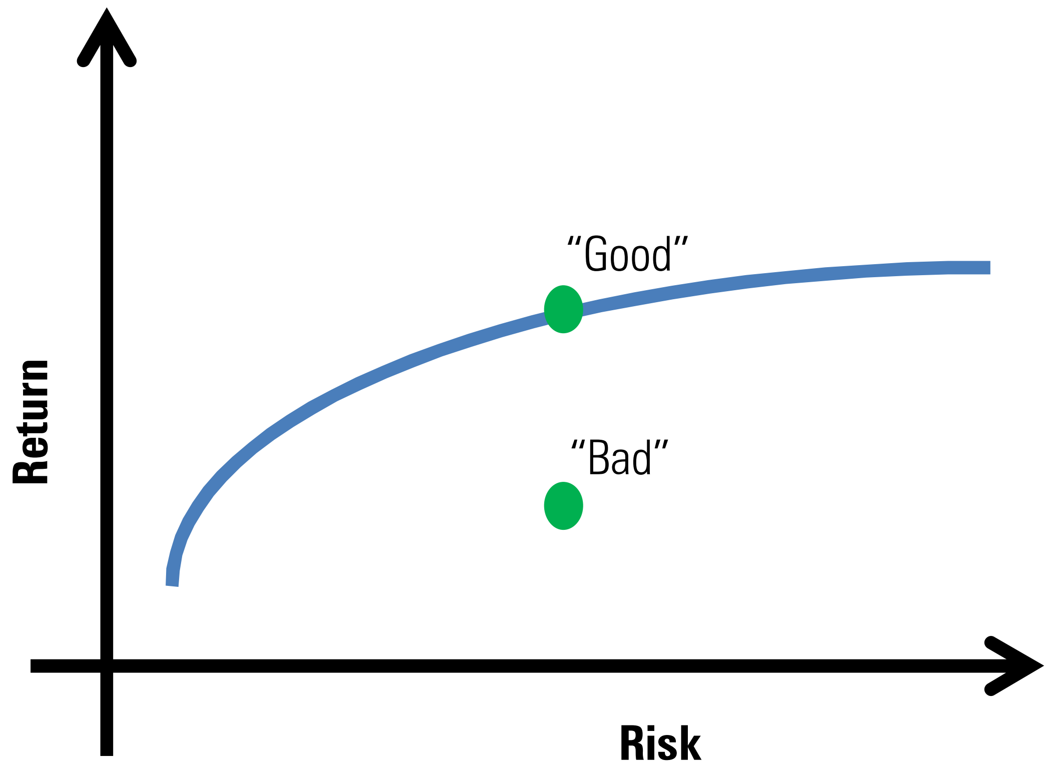


Agenda

The Impact of ______ on Efficient Portfolios

- Total Wealth
- The Goal
- an Income Focus
- Taxes
- Time

How Efficient is Your Portfolio?



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Diversification… The Only Free Lunch

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2003–17
Highest Return (%)	53.3	25.9	35.0	36.1	39.4	14.1	83.8	28.4	9.4	19.7	37.9	13.6	1.8	20.3	36.0	13.1
	47.7	21.6	25.5	26.6	31.8	−3.2	58.2	23.6	5.2	17.5	31.8	6.9	1.7	17.1	25.5	12.0
	42.4	20.4	15.9	17.0	12.7	−22.2	37.7	21.8	5.0	16.5	22.0	4.9	1.3	12.9	22.7	9.7
	29.0	17.6	7.0	15.9	10.3	−26.2	36.1	15.1	2.6	16.0	14.3	4.5	−1.4	11.3	15.0	9.4
	27.0	11.5	5.8	13.0	8.6	−33.8	24.8	13.4	0.6	15.8	7.4	3.9	−1.8	11.2	14.7	9.0
	24.7	11.1	4.9	11.8	6.7	−36.1	21.8	12.3	−2.6	12.0	0.6	2.5	−4.5	8.6	7.5	8.0
	22.5	9.5	2.7	4.9	6.0	−36.2	20.9	11.4	−5.3	11.2	−1.8	−0.8	−4.9	4.6	4.5	5.3
	7.9	4.9	1.1	3.6	1.9	−43.0	19.5	8.5	−11.9	3.7	−2.7	−3.9	−13.3	3.4	2.3	3.8
Lowest Return (%)	2.7	3.0	0.7	−0.2	−0.7	−53.8	−1.4	7.1	−18.6	2.5	−3.7	−24.4	−26.3	1.2	1.5	2.5

- Small stocks
- Large stocks
- International-developed stocks
- Emerging-markets stocks
- Inter-term government bonds
- Inter-term corporate bonds
- High-yield bonds
- Commodities
- Moderate portfolio

Source: Morningstar

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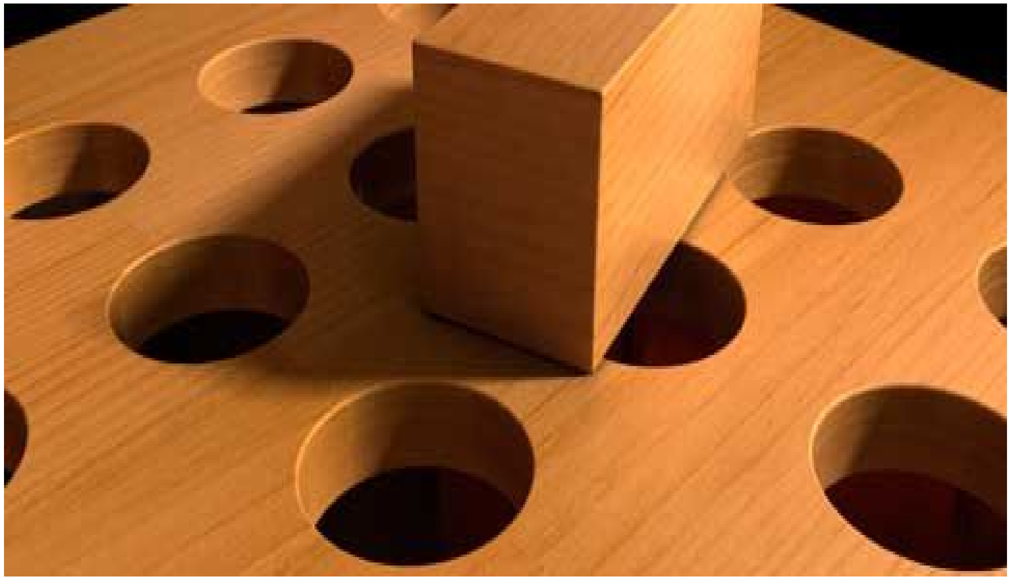
One Size Does Not Fit All



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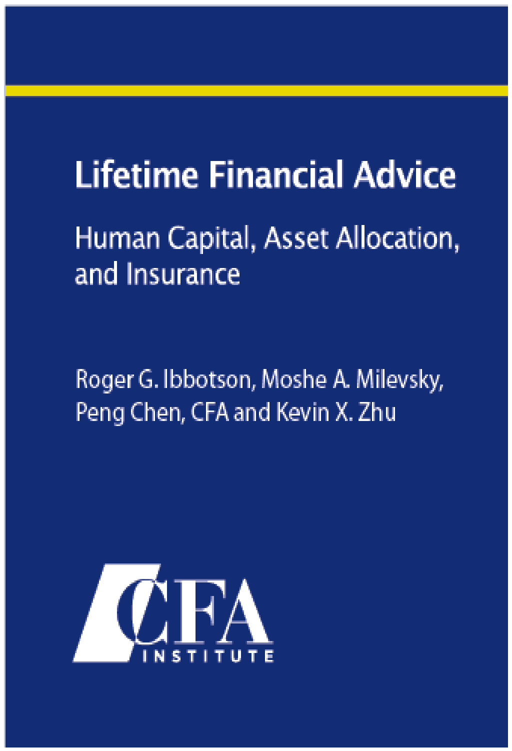
A Total Wealth Perspective (Households)

Total Wealth Research



Financial Analysts Journal
Volume 71 • Number 3
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FAJ

No Portfolio Is an Island

David M. Blanchett, CFA, and Philip U. Straehl

The authors incorporated nonfinancial assets—industry-specific human capital, region-specific housing wealth, and pensions—into a traditional portfolio optimization and found that the optimal portfolio varies materially for different compositions of total wealth. In particular, they found that the optimal equity allocation decreases with age, riskier employment, and riskier home ownership, whereas it increases with guaranteed pension income. These results suggest that every portfolio needs to be considered in the context of an investor's total wealth.

In the famous poem "For Whom the Bell Tolls," English poet John Donne (1572–1631) warns readers against thinking that the funeral bells we hear are not for us, the living: because of the interconnectedness of humankind, each of us is diminished by the loss of another. The poem begins, "No man is an island/entire of itself." This poem has a lesson for investors, because no portfolio is an island either.

When building portfolios, most investors tend to focus entirely on the risk and return characteristics of investments, such as cash, bonds, and stocks, ignoring the interconnectedness of their portfolios with other assets that they effectively own, such as human capital, real estate, and pensions. In many instances, these overlooked assets' value exceeds the value of the financial (i.e., liquid) wealth. For example, Becker (1993) estimated that the value of human capital is at least four times larger than the value of stocks, bonds, housing, and all other assets combined. Heaton and Lucas (2000) estimated that human capital is 48% of household wealth whereas financial assets represent only 6.8%.

A growing body of research incorporates the unique risks associated with human capital into the asset allocation decision, but a relatively limited body of research accounts for multiple dimensions of wealth and explores how the characteristics of outside wealth affect optimal portfolio choice. Although the majority of research on the subject has relied on complex utility-based consumption models, we used a familiar single-period portfolio optimization routine in our study.

Editor's note: The authors may have a commercial interest in the topics discussed in this article.

David M. Blanchett, CFA, is head of retirement research and Philip U. Straehl is a senior research consultant and portfolio manager at Morningstar Investment Management, Chicago.

■ *Discussion of findings.* In our study, we explored the impact of incorporating human capital, housing wealth, and pensions into the optimal portfolio choice. We found significant evidence that the optimal allocation for an investor's financial assets varies materially for different compositions of total wealth. In particular, we found that the optimal equity allocation decreases from 61% at age 25 to 26% at age 65 as an individual's human capital erodes and housing wealth and financial wealth rise. We also found that the optimal portfolio varies significantly for different types of industry-specific human capital. For instance, the optimal equity allocation is higher for a worker in an industry with a lower equity market beta, and vice versa. Similarly, we found that human capital is correlated with the value factor and that region-specific housing wealth also affects the optimal equity weight. Overall, we found that across 1,000 total wealth compositions considered, incorporating outside wealth results in an average increase in risk-adjusted return of 30 bps.

The total wealth approach introduced in this article can help (1) private wealth managers build more-efficient portfolios for their clients and (2) defined contribution plan sponsors implement a more customized target-date solution for their participants.

Dimensions of Wealth

Financial assets and nonfinancial assets (e.g., human capital) share common systematic risks, which may vary significantly for different people. In our study, we developed a straightforward total wealth framework to help investors build portfolios in the context of the risks associated with different dimensions of wealth. The notion of a total wealth portfolio discussed in this article is related to the idea of the extended portfolio introduced by Jennings and Reichenstein (2008). Expanding the total wealth concept beyond assets, Black, Ciccotello, and Skipper (2002) included such

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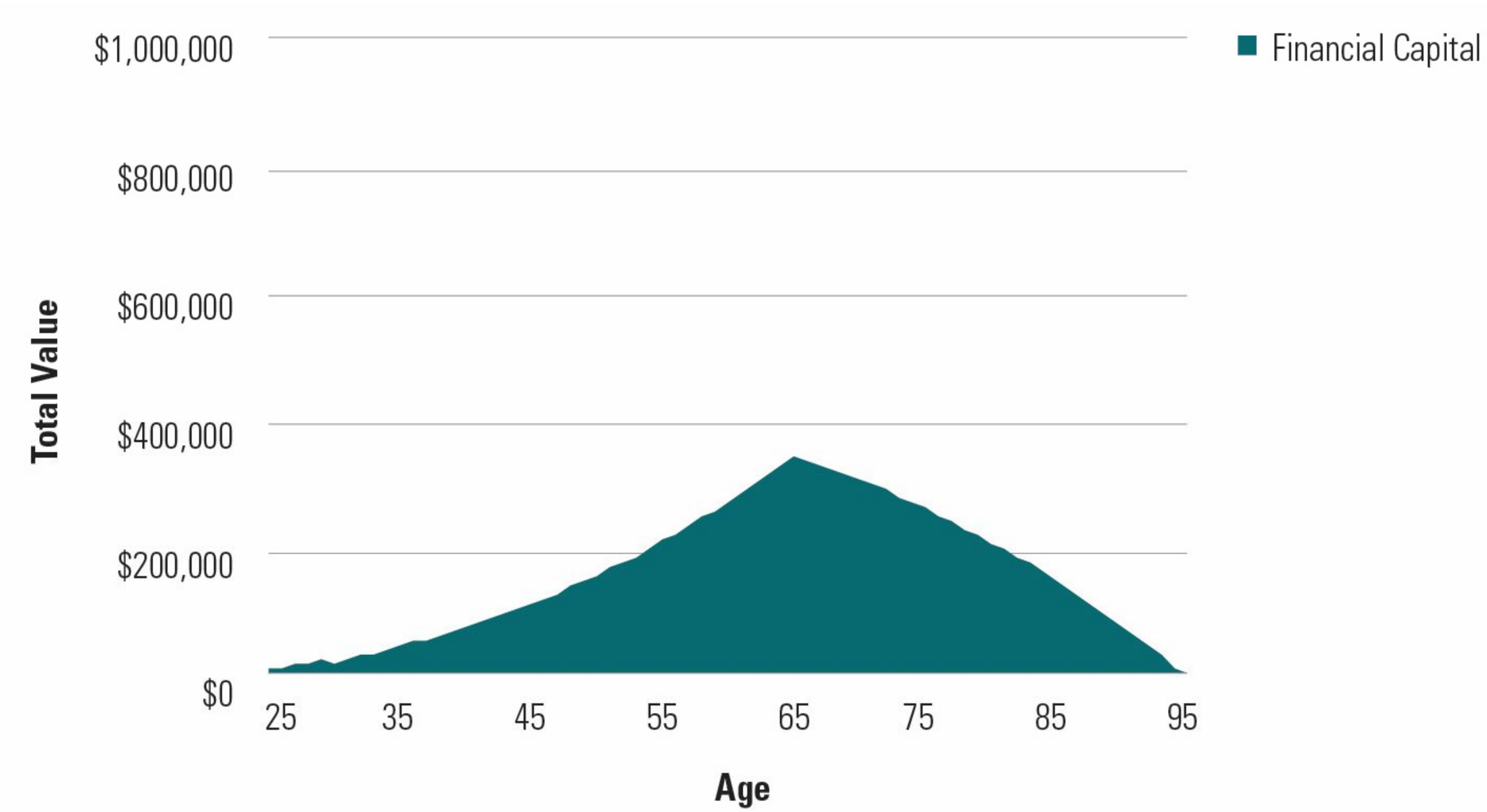
Typical "Wealth" Perspective



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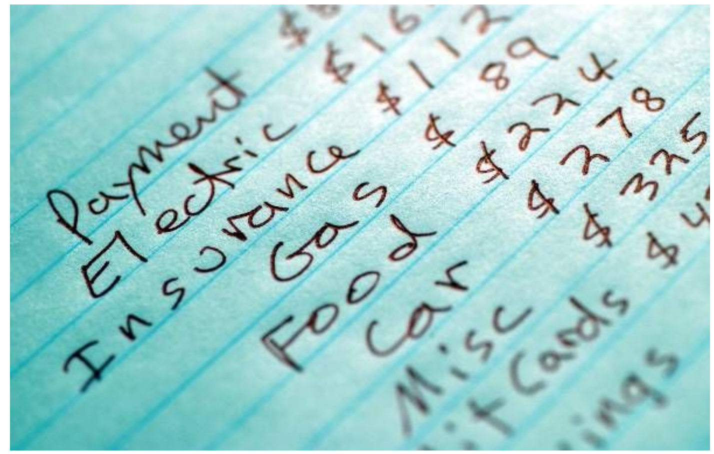
Two Sides to the Equation

Assets



Liabilities

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No Portfolio is an Island

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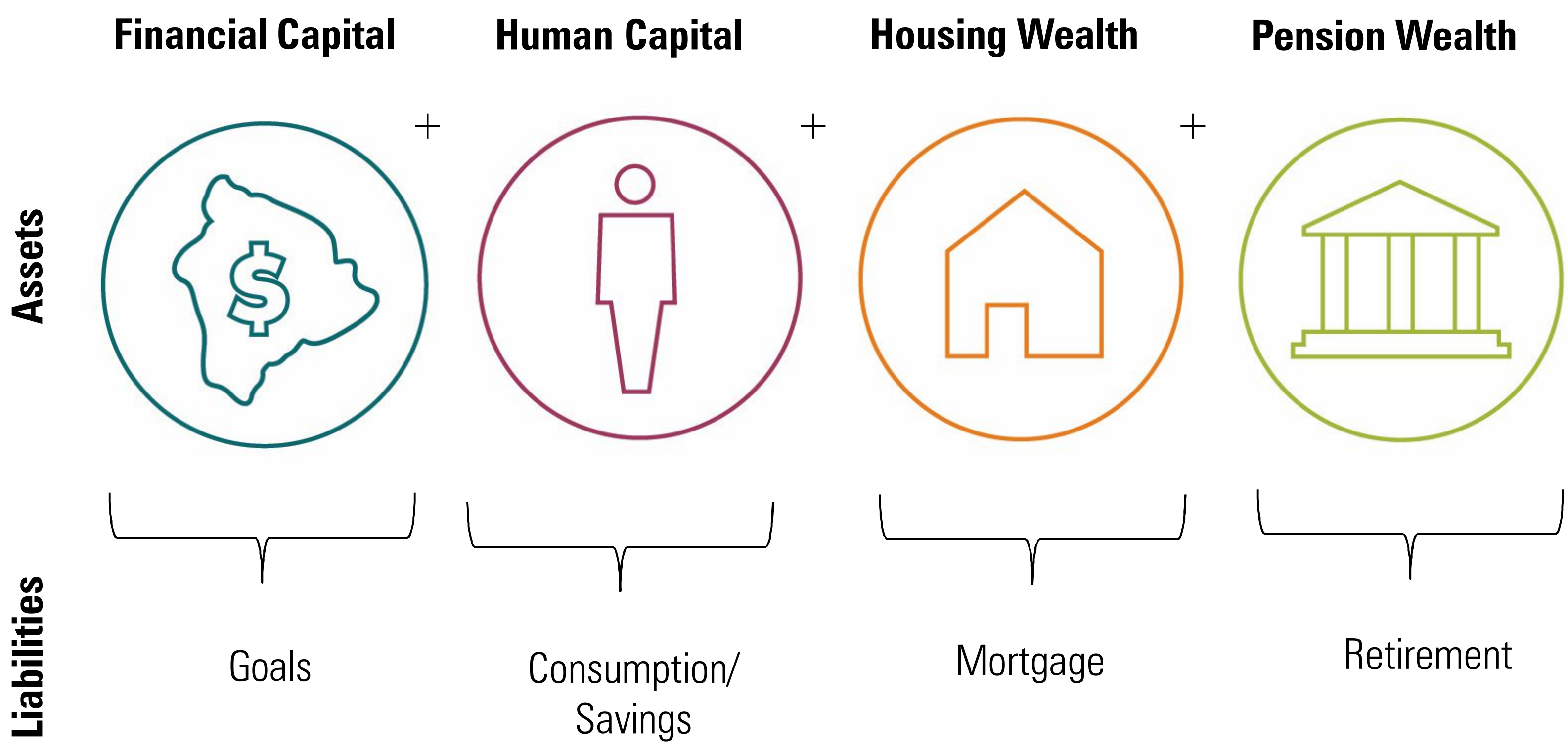
Total Wealth Components (for a Household)



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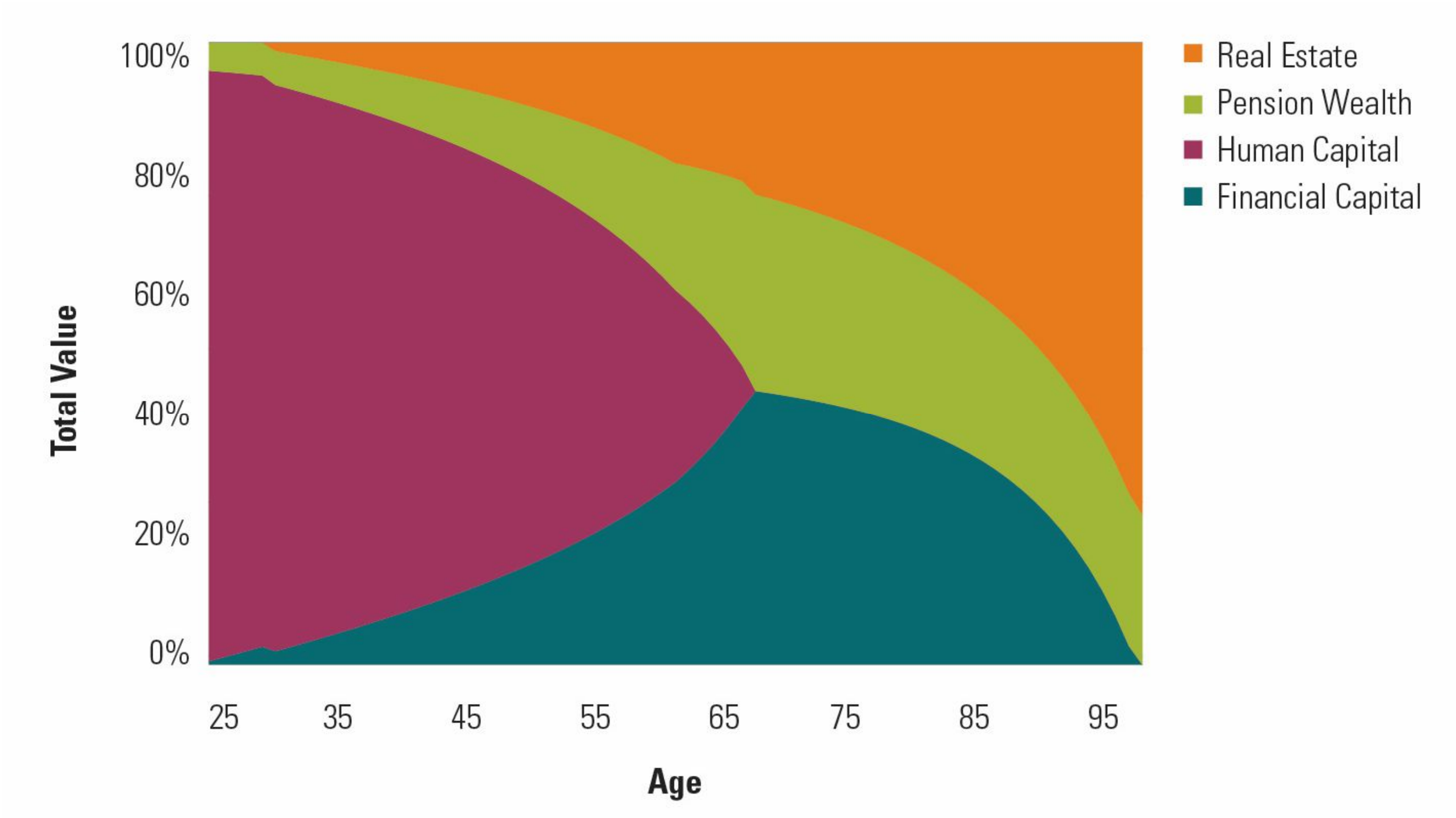
Total Economic Worth (Relative Weights)



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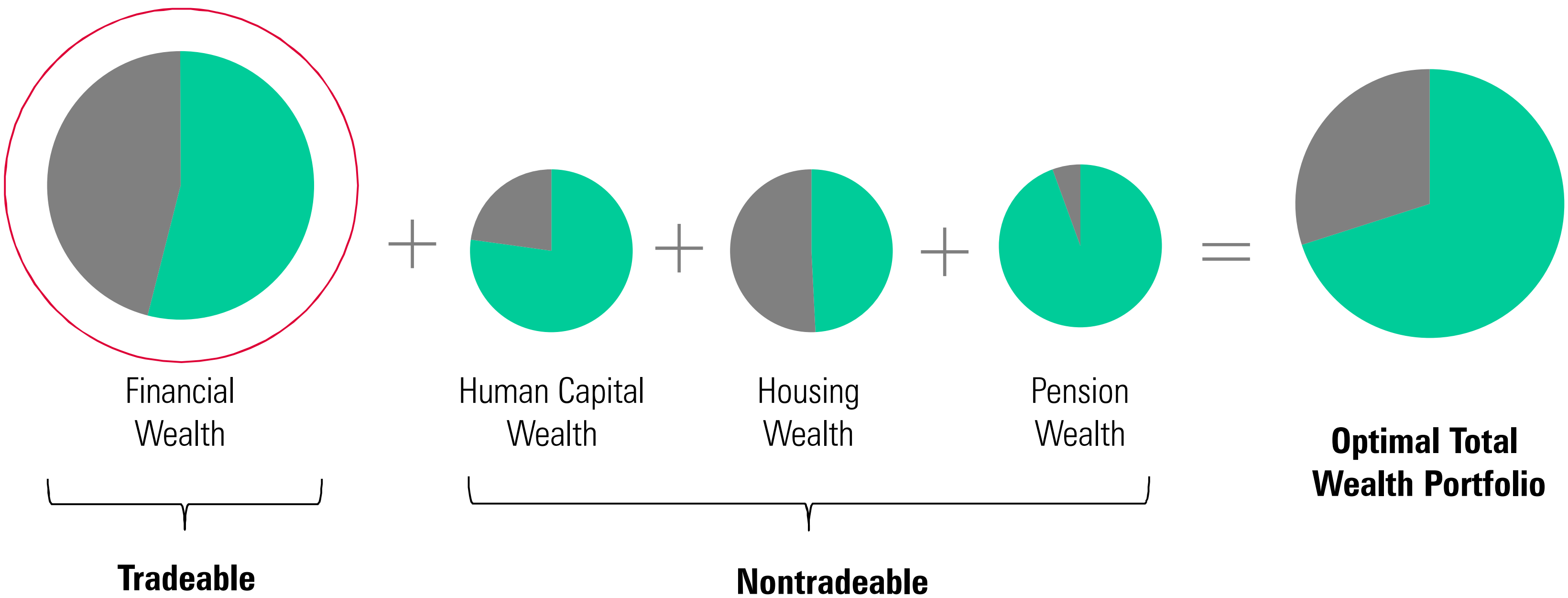
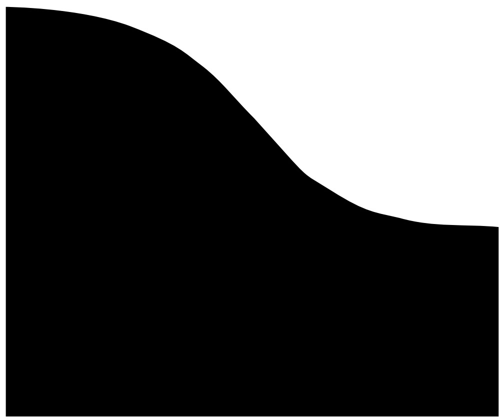
Using Financial Wealth as a Completion Portfolio



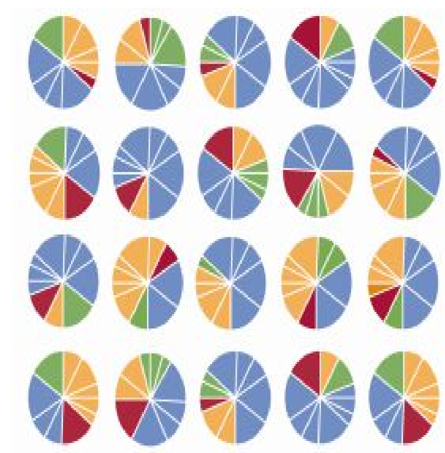
Source: "No Portfolio is an Island." by David Blanchett and Philip Straehl in the *Financial Analysts Journal*

Dual Impact

Equity Target



Asset Allocation



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Human Capital

Human Capital Matters

- *Human capital theory supports a significant commitment to equities for young individuals, declining to a more modest allocation as one approaches retirement and eventually leaves the workforce.*

  – Vanguard's Approach to Target-Date Funds

- *We consider participants' ability to earn income and save—their human capital—to be a critical component of their total portfolio.*

  – SSgA Custom Target Date Funds

- *For a vast majority of households, human capital and its role in an investor's wealth are critically important.*

  – Merrill Lynch Target Date Asset Allocation Methodology

Human Capital: What Can Possibly Go Wrong?

ENRON®

Endless possibilities.™

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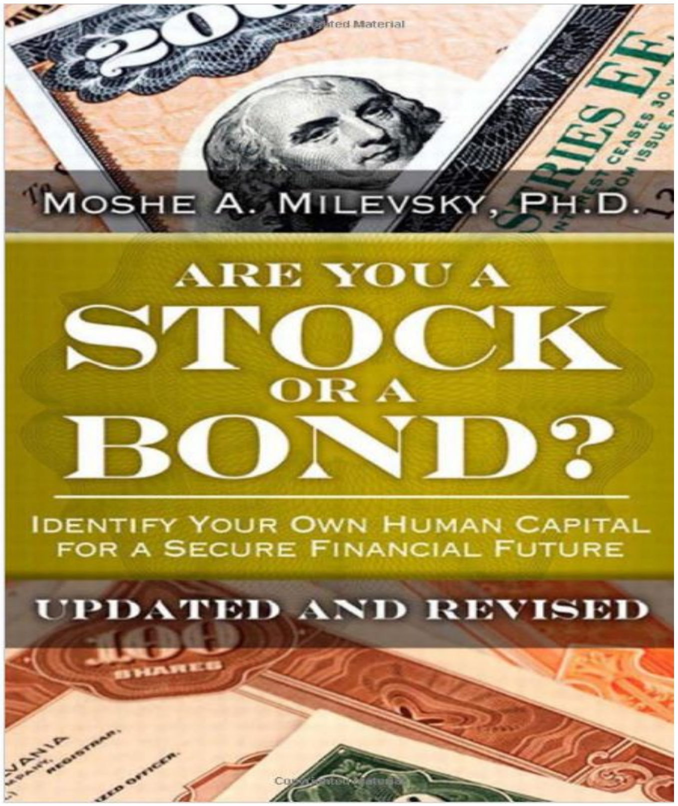
How Risky is Human Capital?



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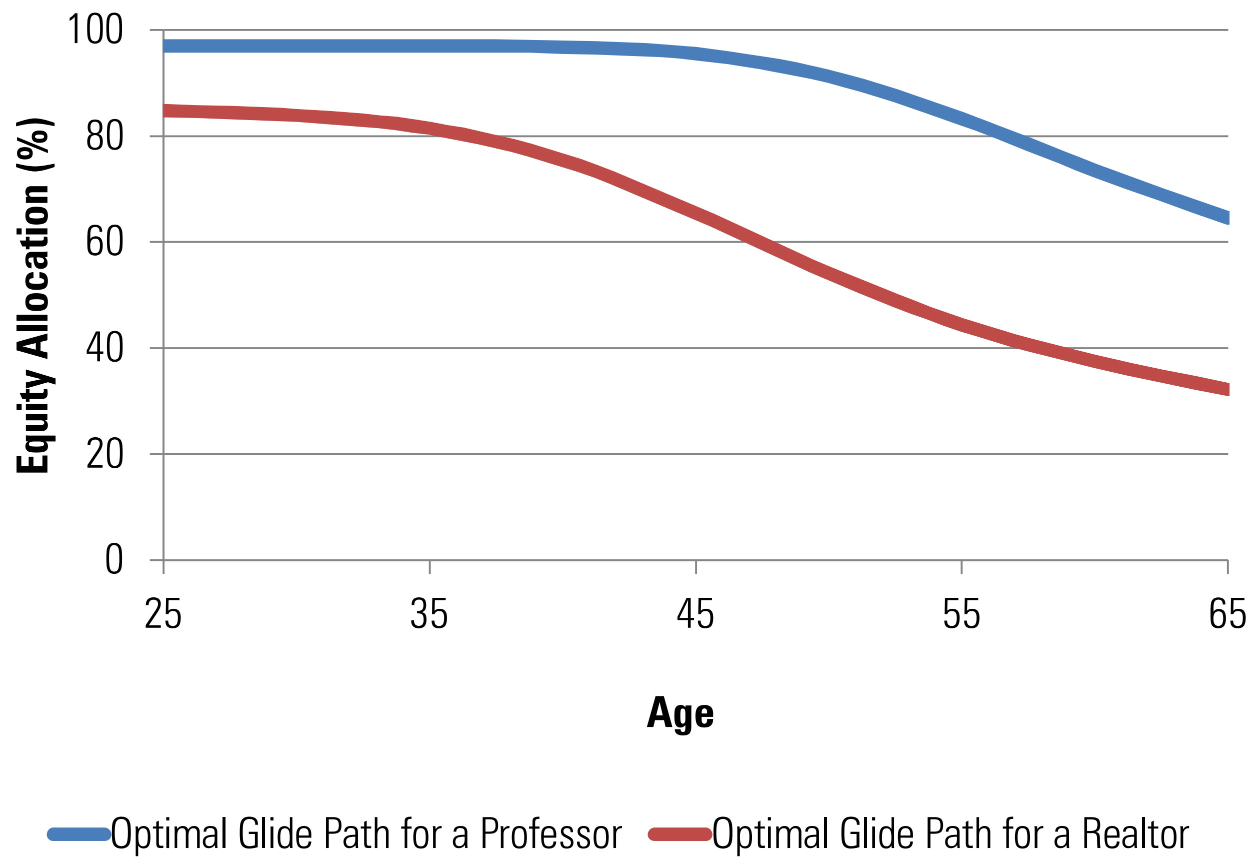
Examples of Optimal Glide Paths for Different Jobs



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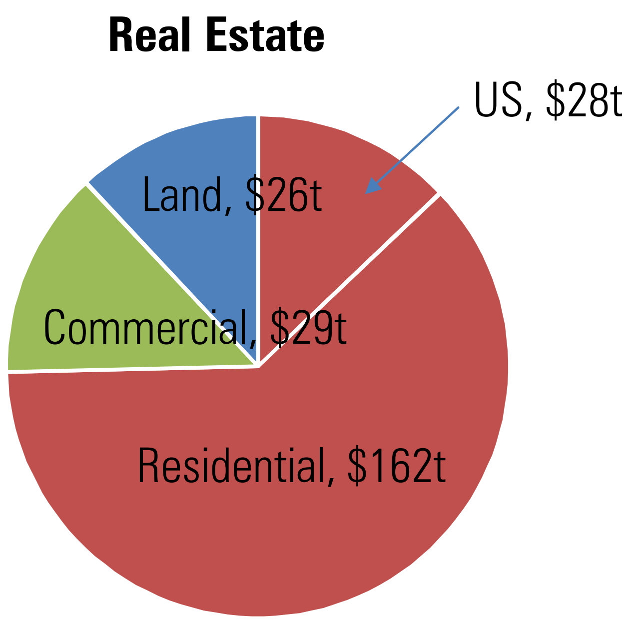
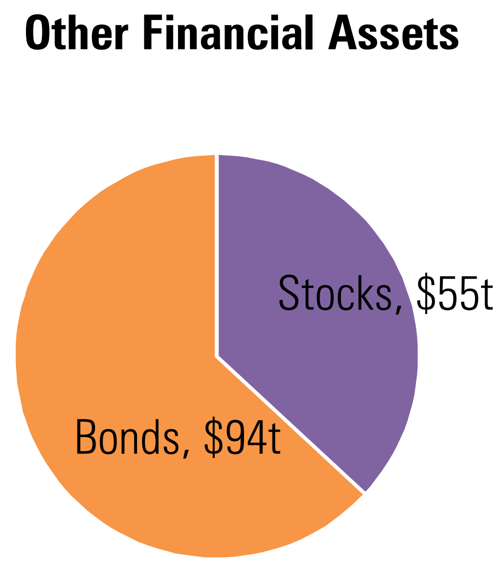
Residential Real Estate (Homes)

The Relative Value of Real Estate



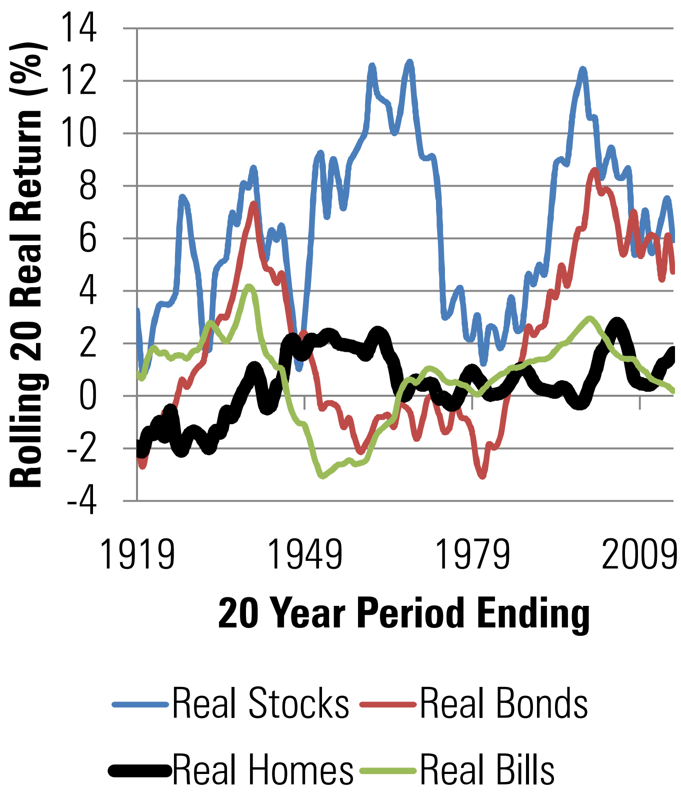
Total Value = $217 trillion

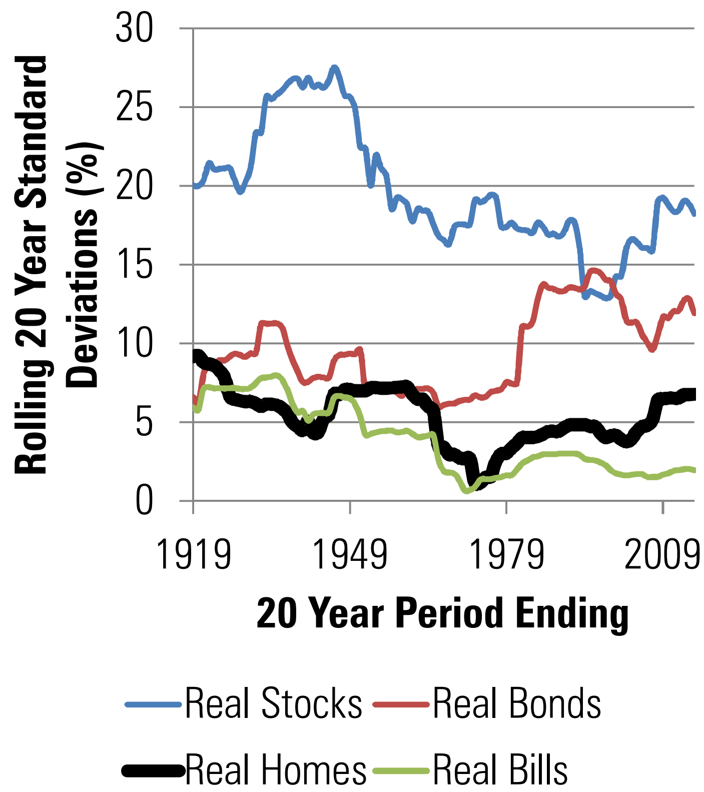


Total Value = $149 trillion

Source: "Your Home as an Investment." by David Blanchett. Morningstar White Paper.

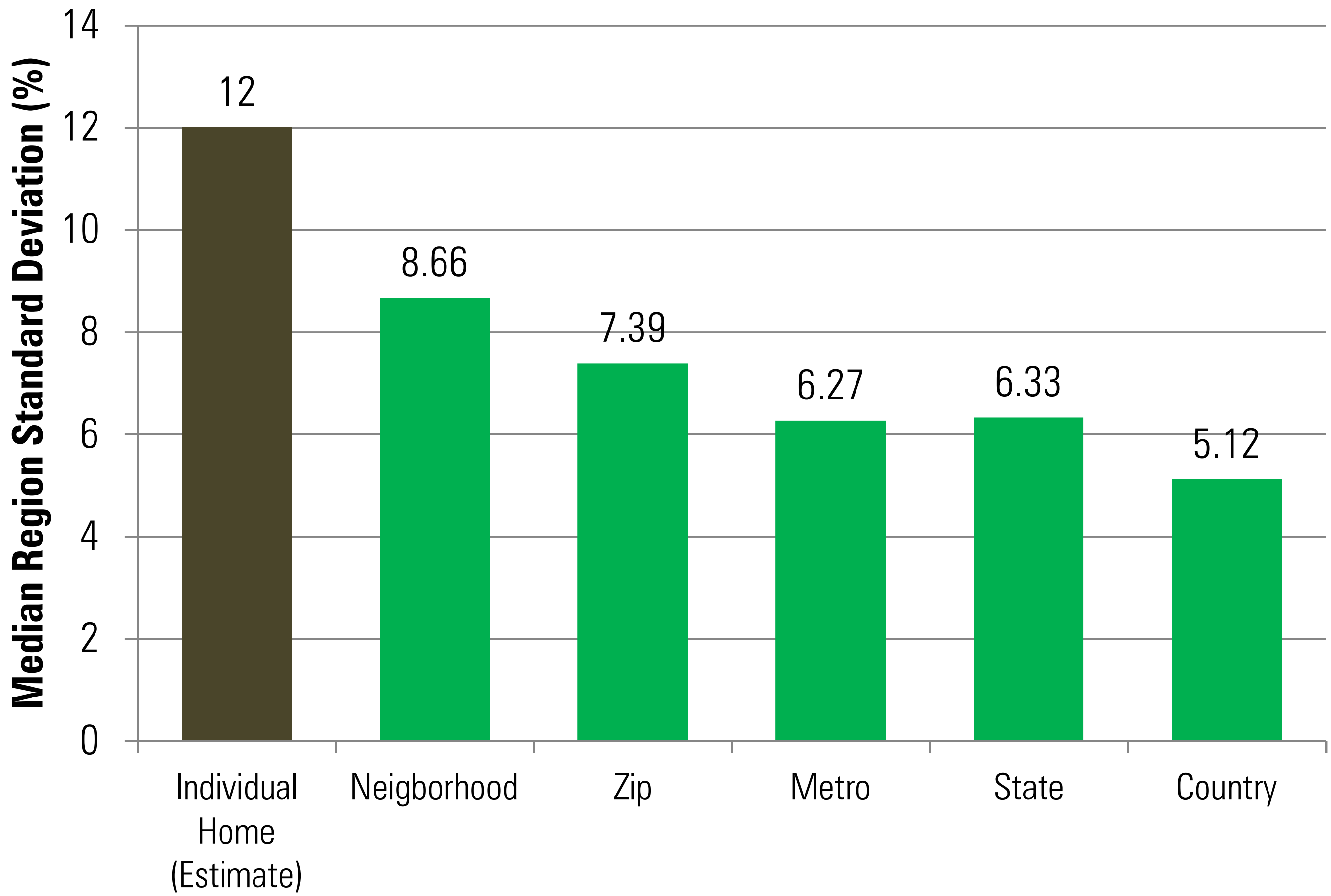
Historical Real Returns and Risk





Source: "Your Home as an Investment." by David Blanchett. Morningstar White Paper.

Differences in Annual Home Price Volatility by Region-Size



Source: "Your Home as an Investment." by David Blanchett. Morningstar White Paper.

Pensions

The Largest Asset of Most Retirees

- Where is it on your/their balance sheet?

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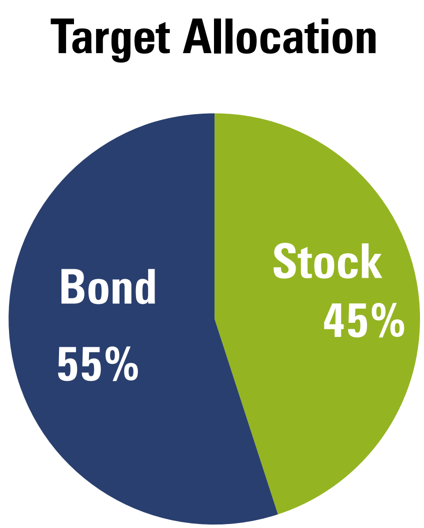
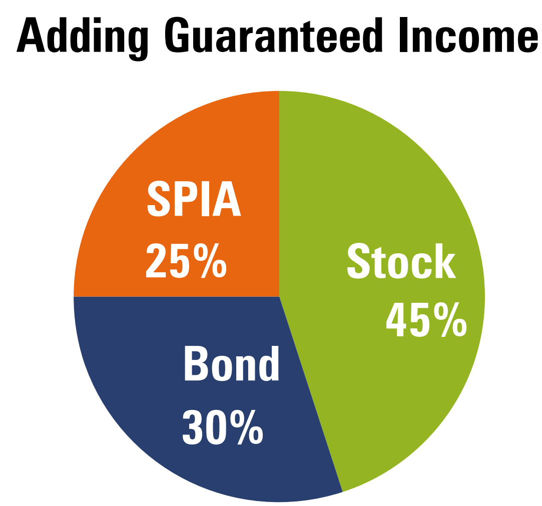
Thinking About Guaranteed Income





- The remaining non-annuity portfolio now has a 60% equity allocation; however, the total wealth allocation from an income perspective, after considering the Single Premium Immediate Annuity (SPIA), is still 45% equities.

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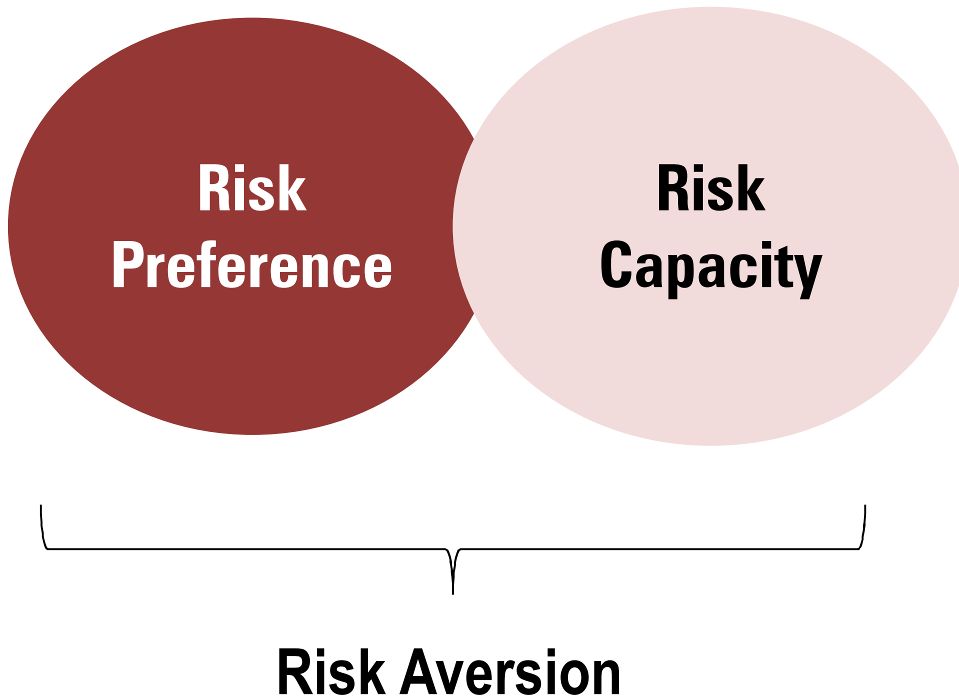
Optimal Retiree Equity Allocation by Guaranteed Income Level

		SS % of Wealth				
		5	25	50	75	95
Initial w%	2%	40	60	80	100	100
	3%	25	40	65	100	100
	4%	30	35	50	95	100
	5%	40	45	55	90	100
	6%	50	55	70	90	100

Source: "The Impact of Guaranteed Income on Retiree Portfolios" by David Blanchett and Michael Finke. Working Paper

Risk Capacity vs Risk Preference



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The Importance of Holistic Planning

Collect Inputs

Human Capital

Financial Capital
and Current Savings

INS

Life Insurance and Annuities

Determine Asset Allocations

Traditional Funds, ETFs

Life Insurance/Annuities

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Liability-Relative Investing (for Individuals)

What is the Goal?

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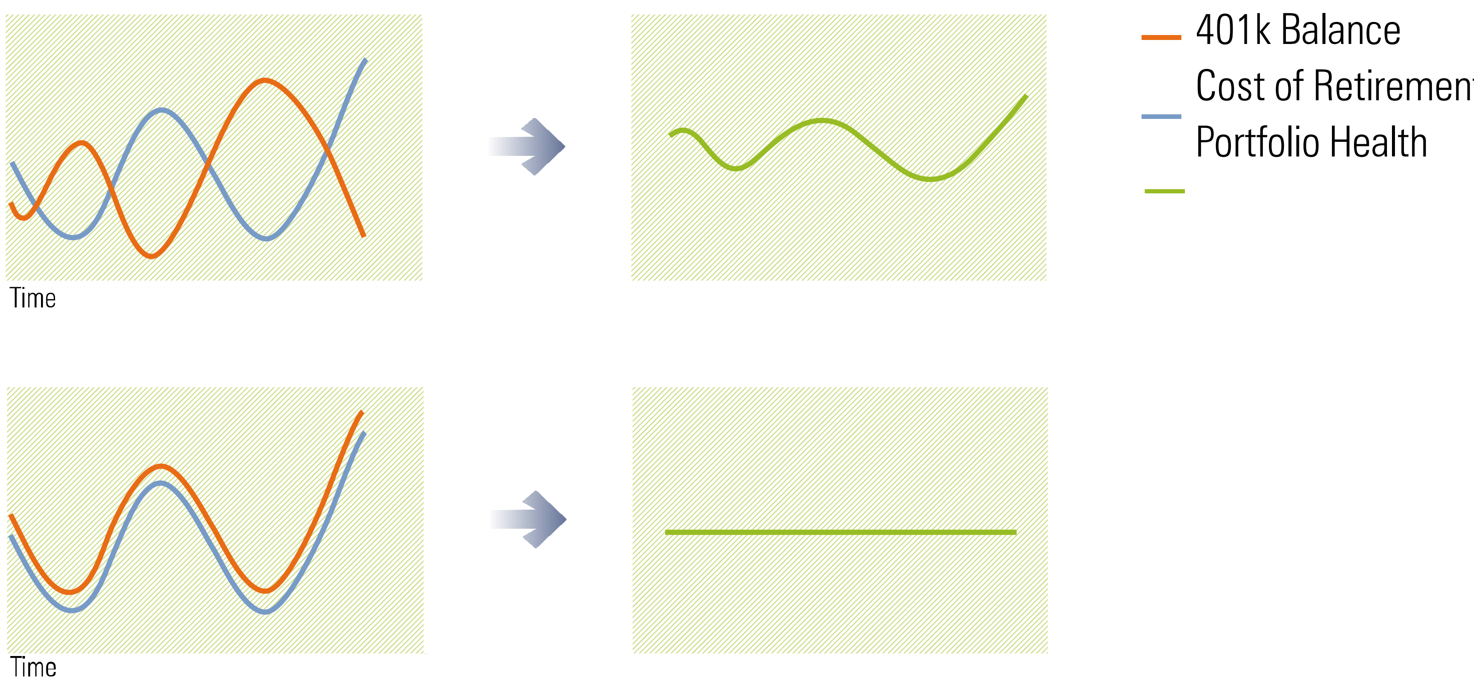
Improving Portfolio Health

Value of Liabilities vs. Value of Assets

Portfolio Health/Funding Costs

Asset-only Approach

Liability-relative Approach



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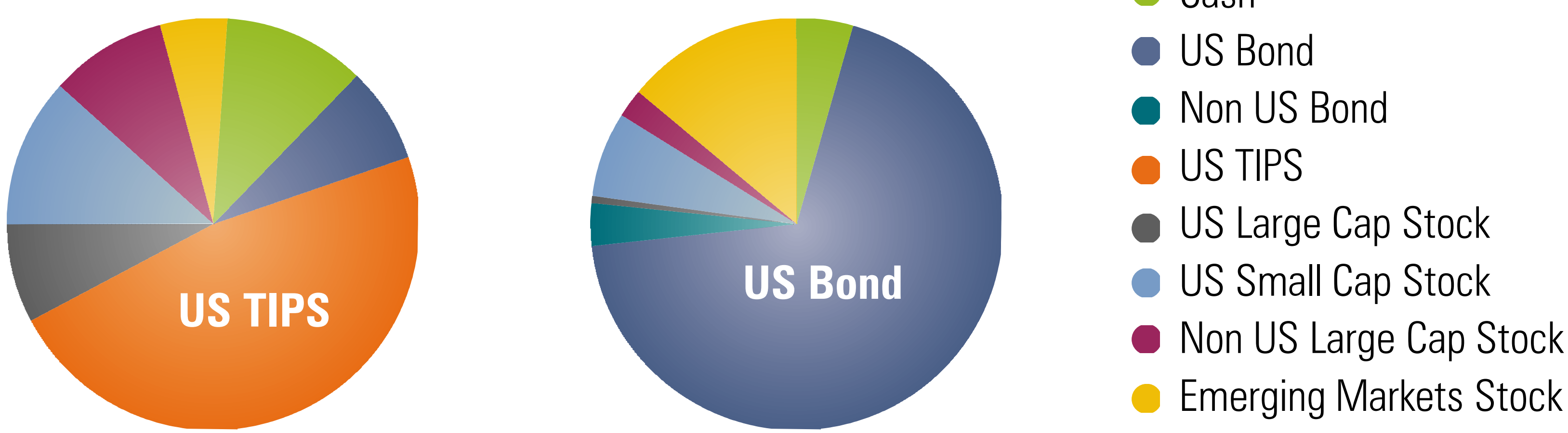
Different Efficient Portfolios

Retirement Focused **Accumulation Focused**



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Efficient Income Investing

An Income Perspective

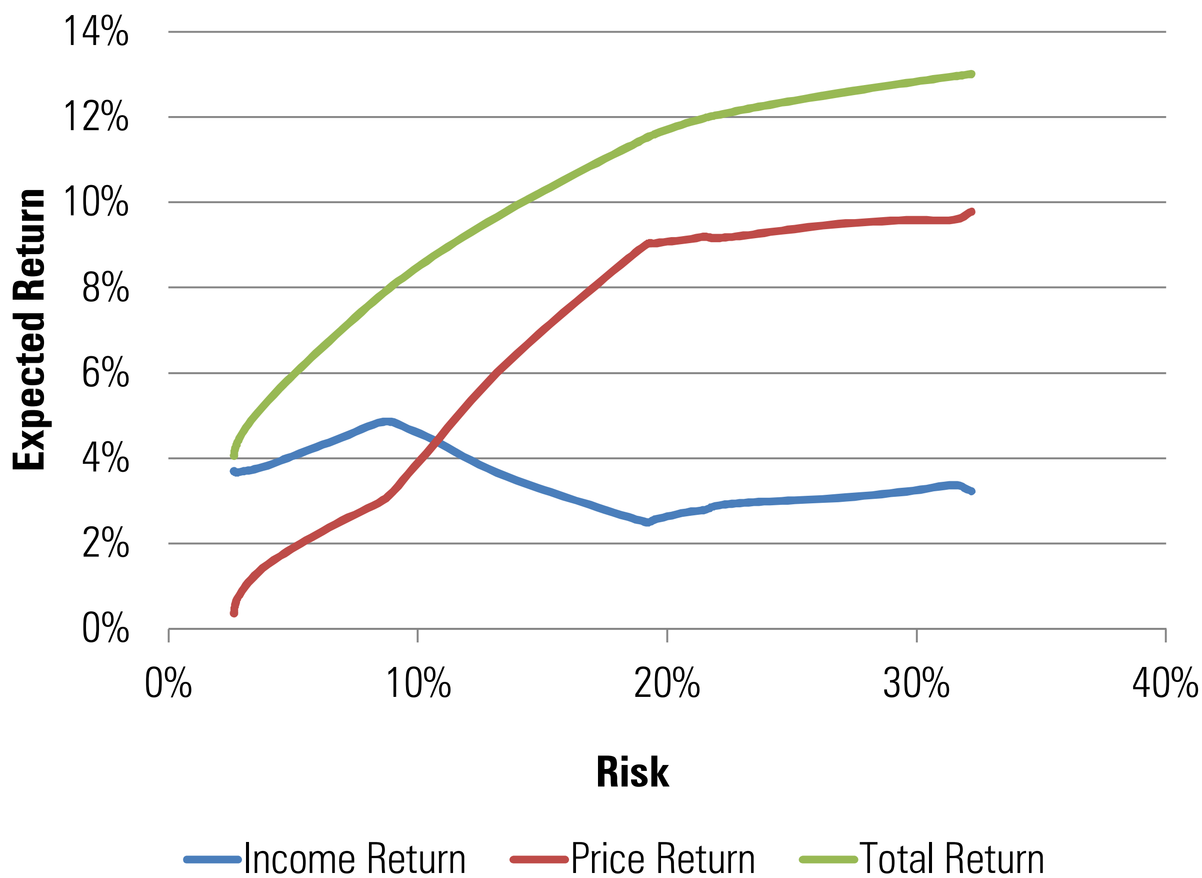
- Limited guidance on how to build an efficient income portfolio
- Traditional portfolio optimization research focuses on Total Return (which combines Price Return and Income Return), which is an incomplete perspective for a retiree who wants to generate income and not liquidate principal
    - Example: Long-Term bonds held to maturity

Income Return, Price Return, and Total Return

Asset Class	Income Return		Price Return		Total Return	
	Return	Std Dev	Return	Std Dev	Return	Std Dev
Short-term Bond	3.80%	1.36%	0.00%	2.13%	3.80%	2.73%
Intermediate Govt	3.83%	1.41%	0.00%	3.81%	3.83%	4.19%
Long Govt	4.05%	0.97%	0.00%	11.24%	4.05%	11.80%
High Yield	6.84%	0.69%	0.00%	14.73%	6.84%	16.12%
International Bond	6.01%	1.62%	0.65%	8.78%	6.66%	9.17%
Emerging Markets Bond	7.03%	2.90%	0.76%	13.52%	7.79%	14.65%
Large Growth	1.50%	0.44%	8.53%	22.40%	10.03%	22.73%
Large Value	2.65%	0.49%	6.92%	17.02%	9.56%	17.53%
Small Growth	0.62%	0.13%	11.07%	22.59%	11.69%	22.74%
Small Value	2.11%	0.28%	7.94%	17.88%	10.05%	18.22%
Preferred Stock	7.50%	0.78%	0.00%	12.74%	7.50%	13.99%
Non-US Large Growth	2.59%	0.56%	9.25%	21.83%	11.84%	22.34%
Non-US Large Value	4.07%	0.92%	7.87%	21.93%	11.93%	22.57%
Emerging Markets Equity	2.60%	0.50%	10.62%	35.65%	13.22%	36.53%
Non-US Real Estate	4.20%	0.47%	8.46%	28.60%	12.66%	29.83%
US Real Estate	3.00%	1.38%	7.67%	19.57%	10.67%	21.19%

Source: "Efficient Income Investing" by David Blanchett and Hal Ratner in the *Journal of Portfolio Management*

Decomposing the Efficient Frontier



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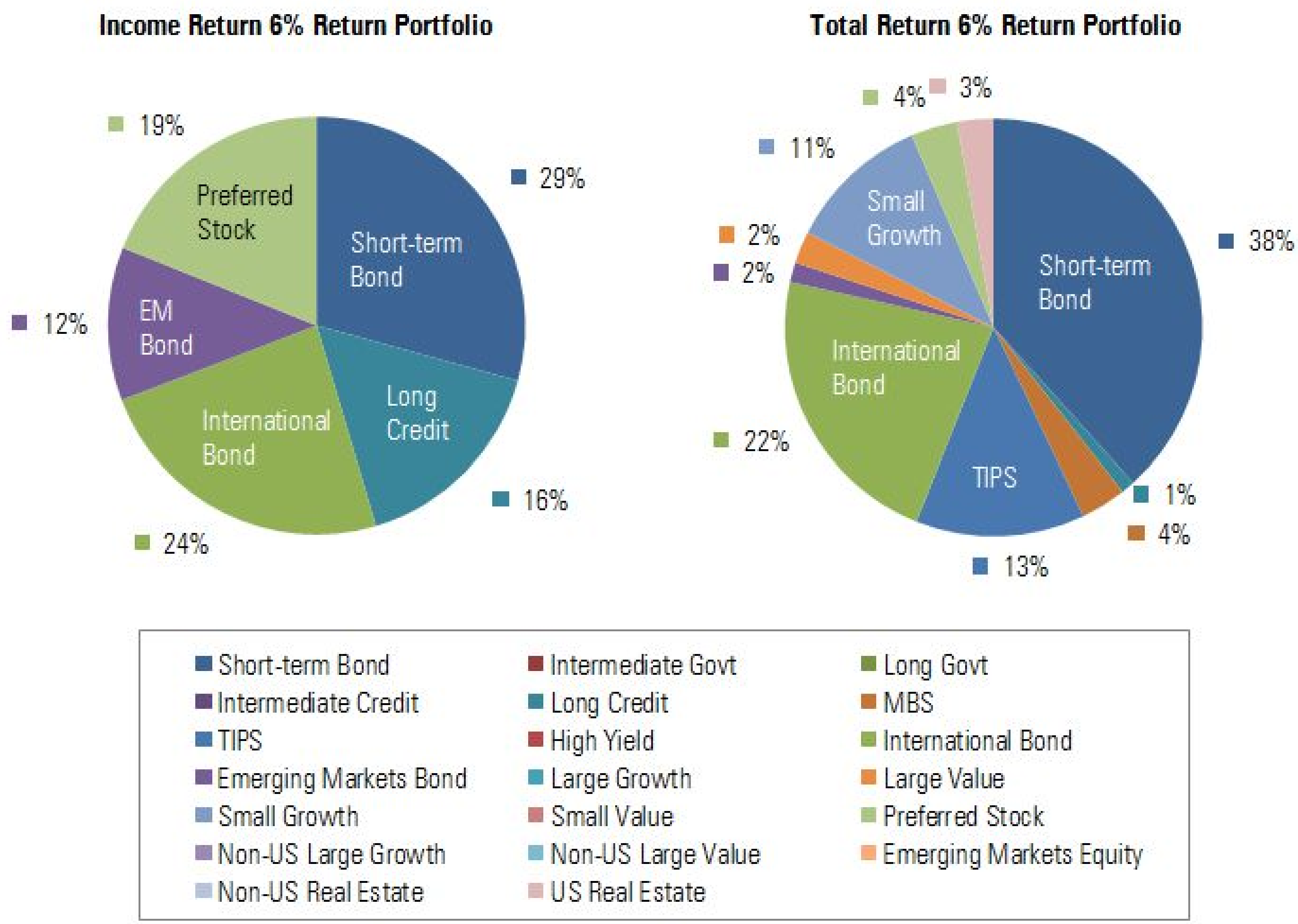
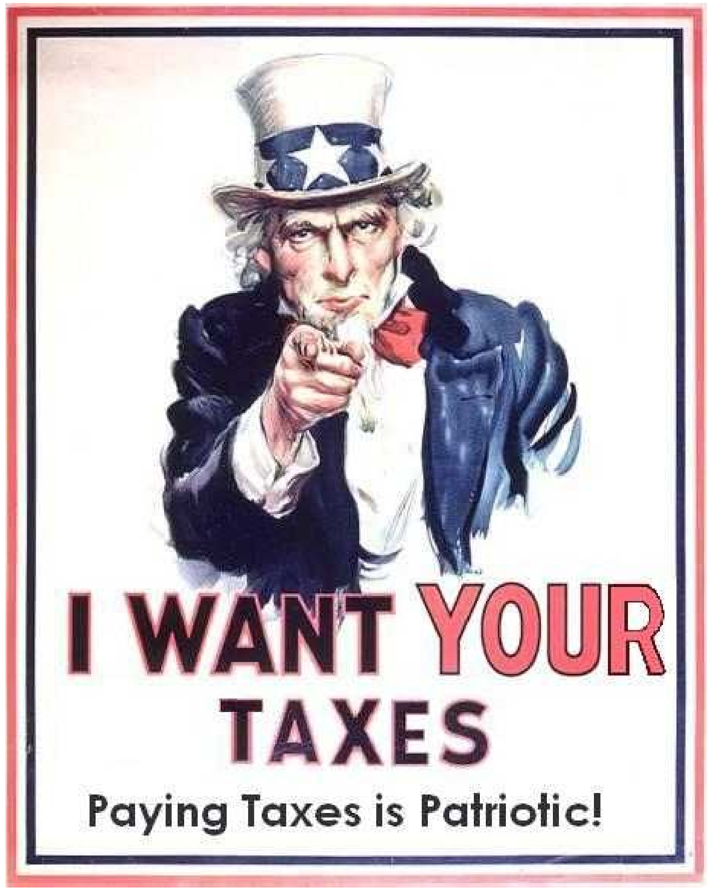
Different Efficient Portfolios



Source: "Efficient Income Investing" by David Blanchett and Hal Ratner in the *Journal of Portfolio Management*

Taxes

Who Likes Paying Taxes?



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Taxes Aren't Always a Bad Thing…

15%	35%
Today	**Tomorrow**

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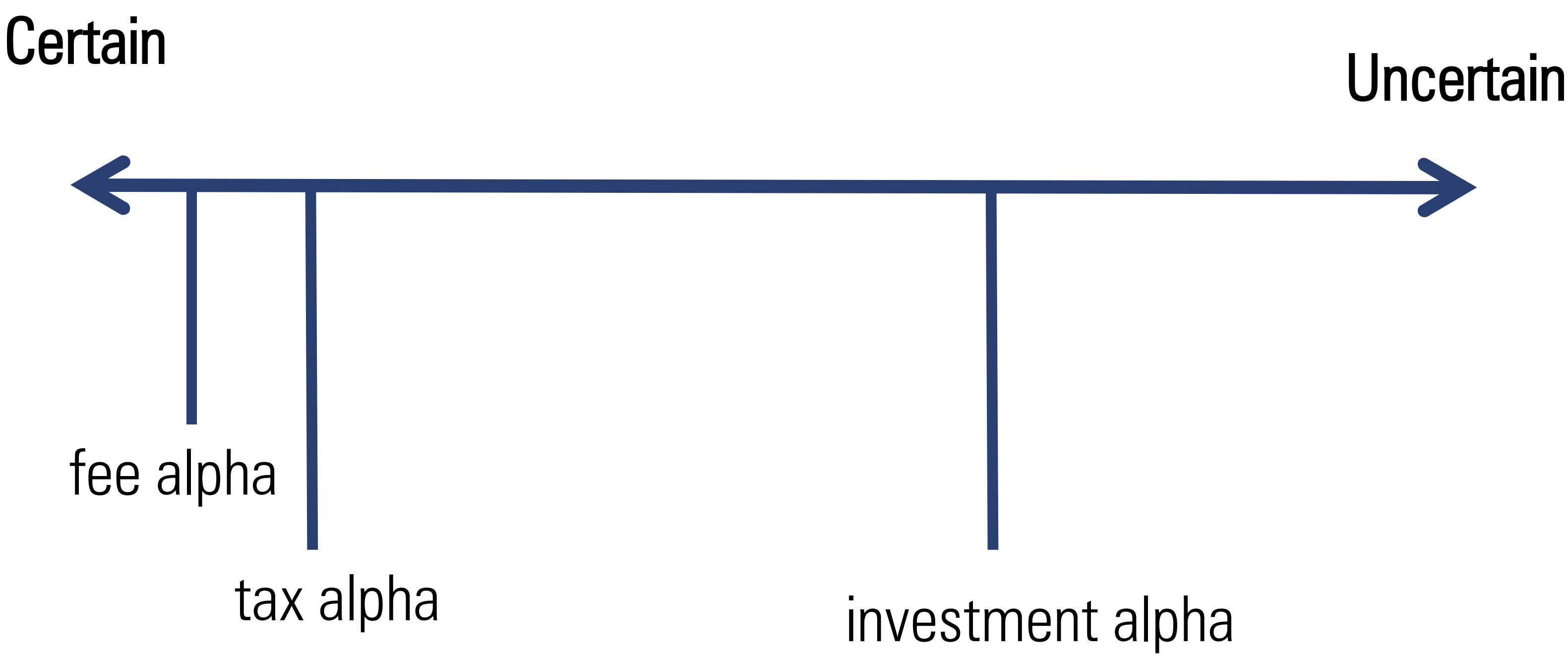
The "Cost" of Taxes (Finding Tax Alpha)

- Future earnings on taxes paid
- Paying a higher potential tax rate

Generating Alpha



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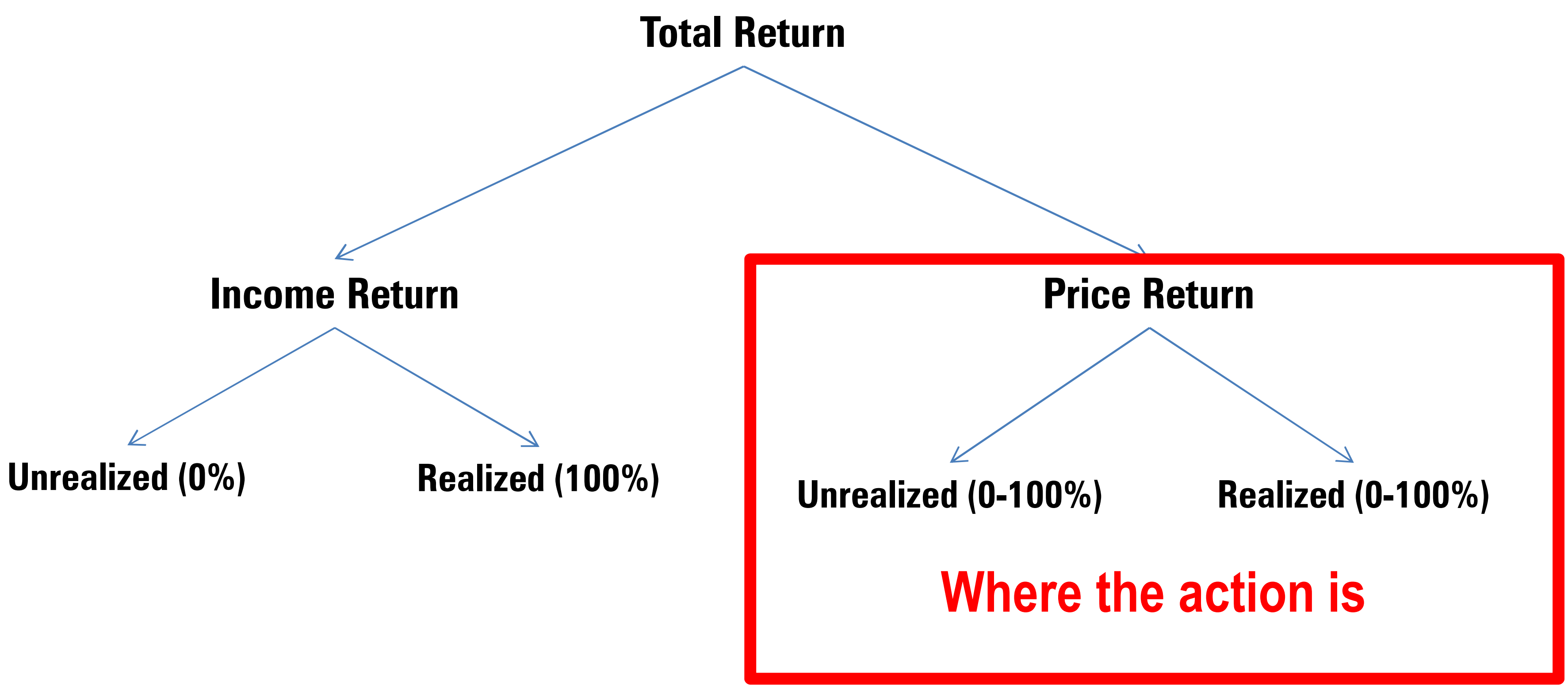
Decomposing Returns



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Impact of Taxes on Relative Fund Performance

- Index funds generate 25 bps of tax alpha, on average, versus all active funds
- Tax alpha for an index can easily exceed 100 bps for an “active” actively managed fund
    - This creates a relatively high hurdle for an active manager to overcome in the taxable space

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Sample Optimization Inputs

	Before Tax		After Tax		Change	
Asset Class	**Return**	**Std Dev**	**Return**	**Std Dev**	**Return**	**Std Dev**
Large Cap Equity	7.8%	18.8%	6.2%	16.4%	80%	87%
Mid Cap Equity	8.7%	20.3%	7.1%	17.7%	81%	87%
Small Cap Equity	8.6%	24.2%	7.0%	21.0%	81%	87%
International Equity	9.1%	20.7%	7.4%	18.2%	81%	88%
Emerging Markets Equity	12.3%	29.2%	10.4%	26.3%	84%	90%
US REITs	8.1%	23.5%	5.9%	23.4%	73%	100%
HY Bonds	5.2%	11.2%	3.0%	14.5%	58%	129%
Aggregate Bonds	3.4%	7.0%	2.2%	6.3%	65%	90%
Cash	2.0%	1.9%	1.3%	1.9%	65%	99%
TIPS	3.6%	7.0%	2.4%	6.3%	66%	90%

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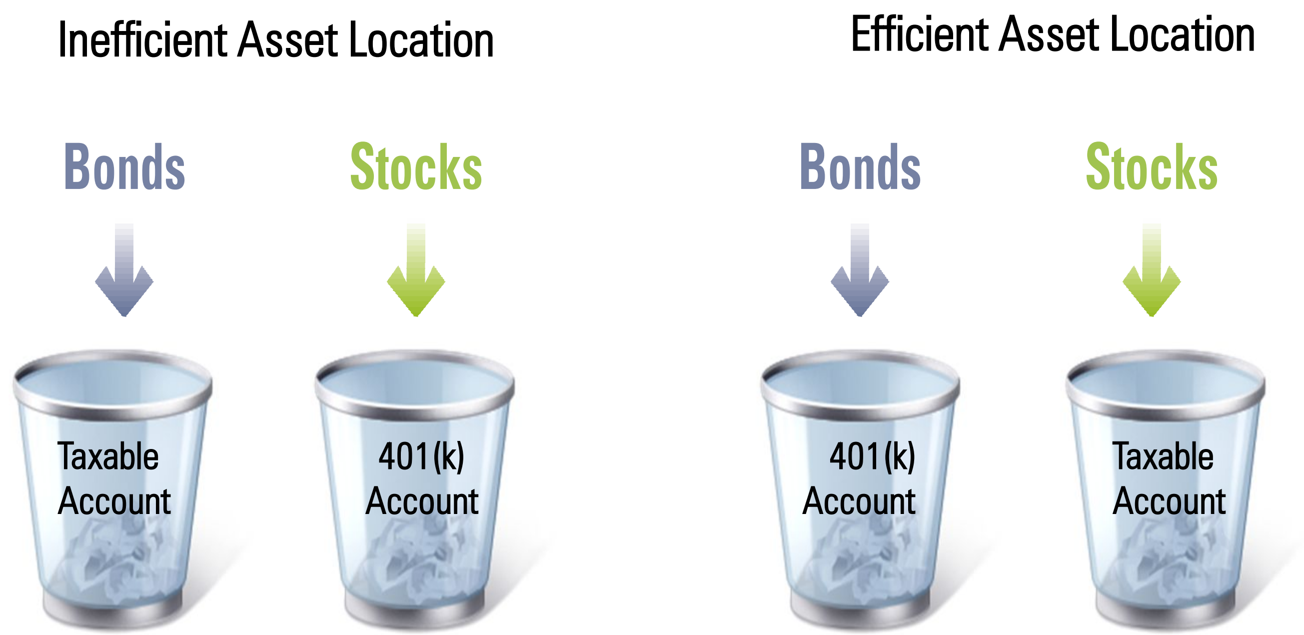
Impact of Taxes on Optimal Equity Allocations

Total Return		Pre-Tax	Post-Tax	Δ
	4.50%	8.1%	9.2%	1.1%
	5.00%	11.9%	13.7%	1.9%
	5.50%	16.1%	19.2%	3.1%
	6.00%	20.0%	27.1%	7.1%
	6.50%	23.5%	32.6%	9.1%
	7.00%	27.1%	38.1%	11.0%

Source: "Efficient Income Investing" by David Blanchett and Hal Ratner in the *Journal of Portfolio Management*

Asset Location



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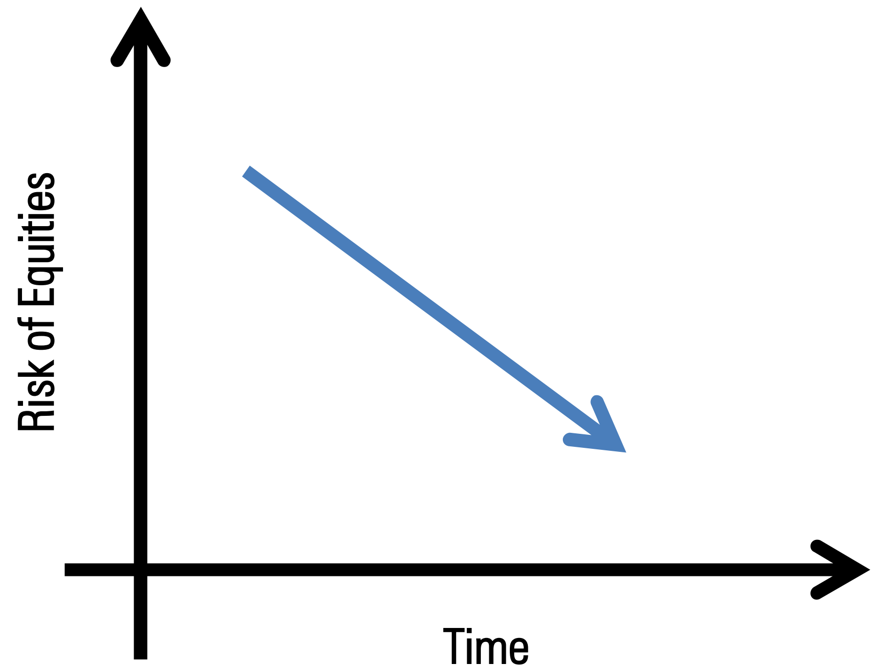
Optimal Portfolios for the Long Run

What is Time Diversification?



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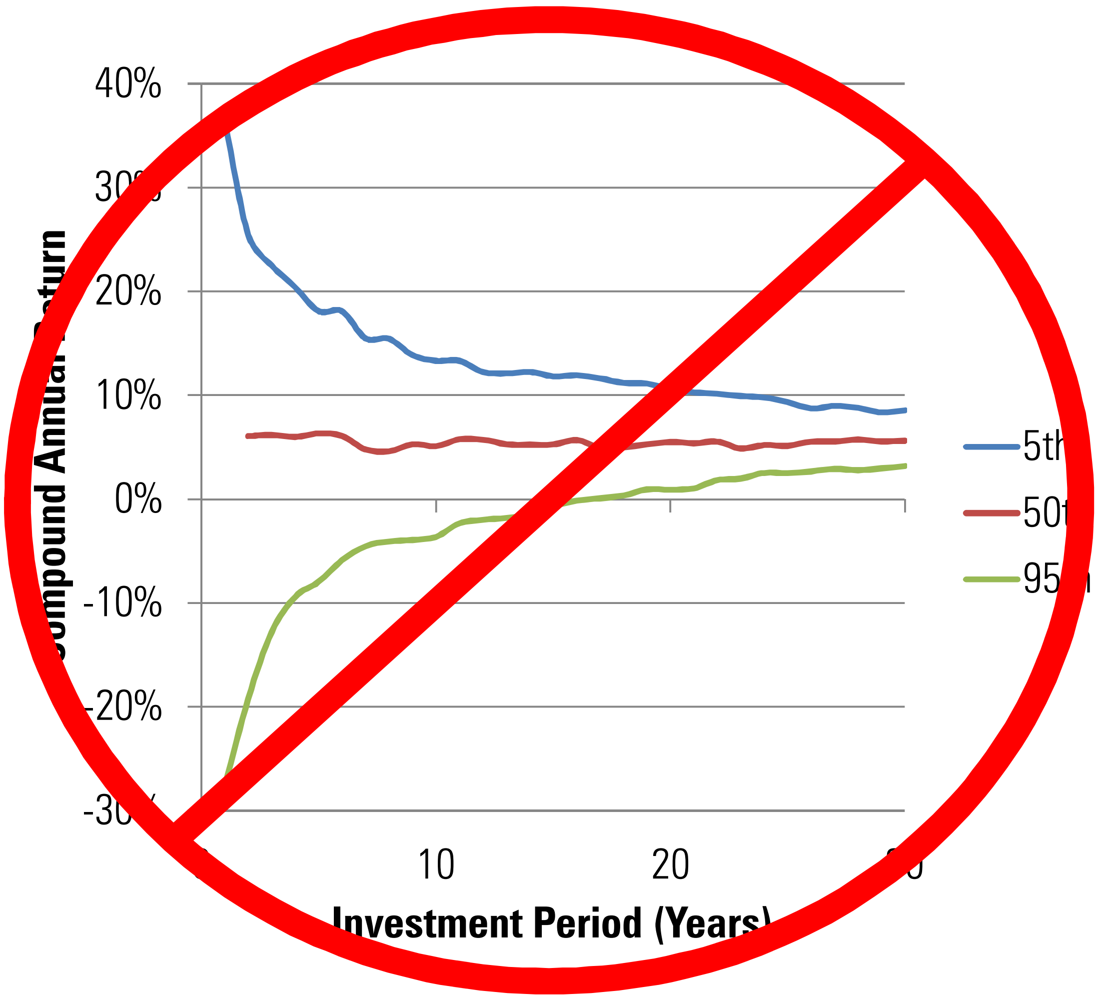
Compound Annual Return of Equities by Investment Period



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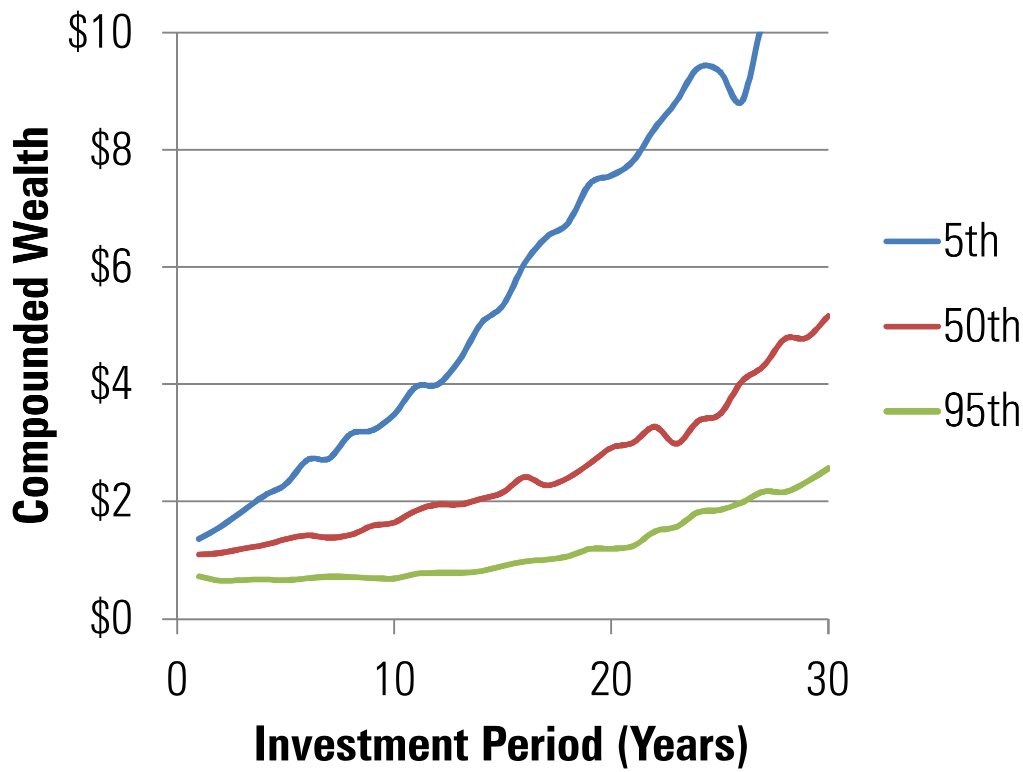
Cumulative Wealth by Investment Period



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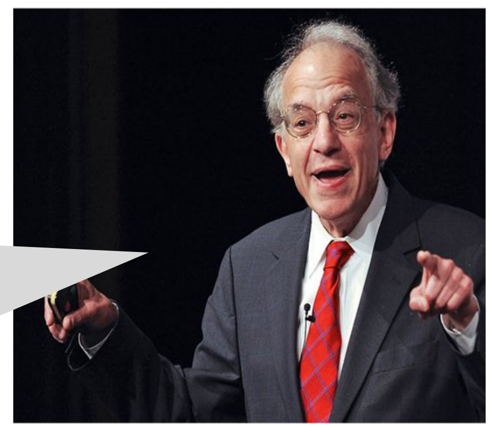
Time Diversification Debate

"Having a long time horizon and being risk averse are two completely different things. The popular literature has basically said if you have a long time horizon you're tolerant towards risk. That's the fundamental fallacy."
Source: NAPFA 2004 Conference

Zvi Bodie, Ph.D.
Boston University



"Stocks are relatively safer in the long run than random walk theory would predict. Doesn't mean they're safe. The whole point is that they are relatively safer... Does the fact that equity returns display long run mean reversion change your equity strategy? The answer is definitely yes. Change your allocation strategy? The answer is definitely yes."
Source: NAPFA 2004 Conference

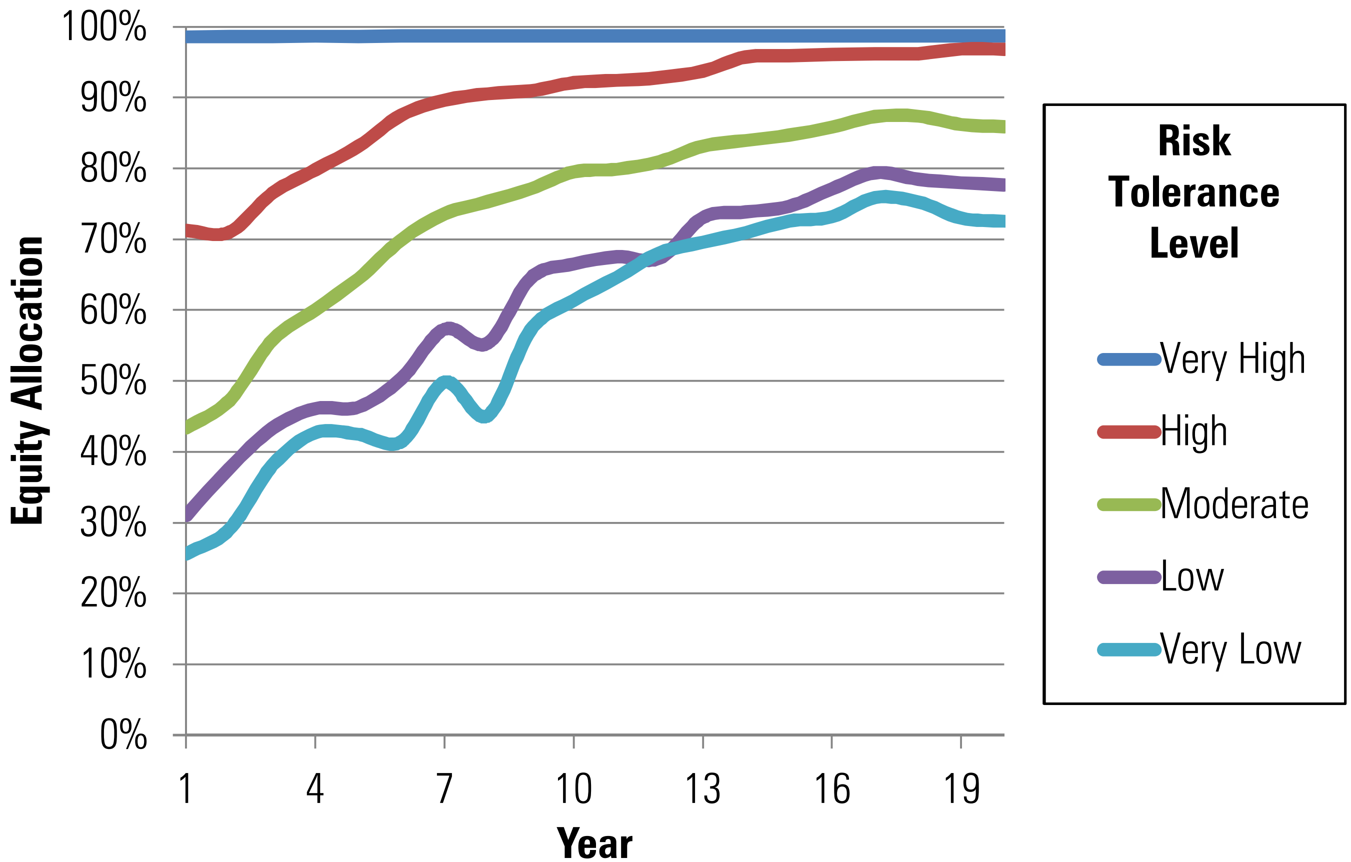
Jeremy Siegel, Ph.D.
Wharton School

Analysis

- Rolling return data from 20 countries between 1900 and 2012 (DMS data)
- Create rolling and distinct periods from 1 to 20 years
- Estimate growth in portfolios over each rolling period
- Estimate how much utility we'd get from consuming portfolio at end of period
- Optimize asset allocation that maximizes utility for each set of rolling periods
- Calculate optimal allocations for varying levels of risk aversion

Source: "Optimal Portfolios for the Long Run" by David Blanchett, Michael Finke, and Wade Pfau. White Paper.

Optimal Equity Allocation by Holding Period and Risk Tolerance Level



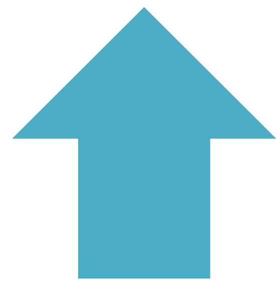
Source: "Optimal Portfolios for the Long Run" by David Blanchett, Michael Finke, and Wade Pfau. White Paper.

Is Time Diversification Going Away? (No)

Optimal Equity Allocation for Short-term Investors

The optimal equity allocation for a moderately risk averse investor with a single period time horizon has decreased from ~50% to ~20%

Benefit of Time Diversification



The optimal change (increase) in equity allocation by investment time horizon has increased from ~1% to ~2.5%

Source: “Optimal Portfolios for the Long Run” by David Blanchett, Michael Finke, and Wade Pfau. White Paper.

Framing Retirement Using Buckets

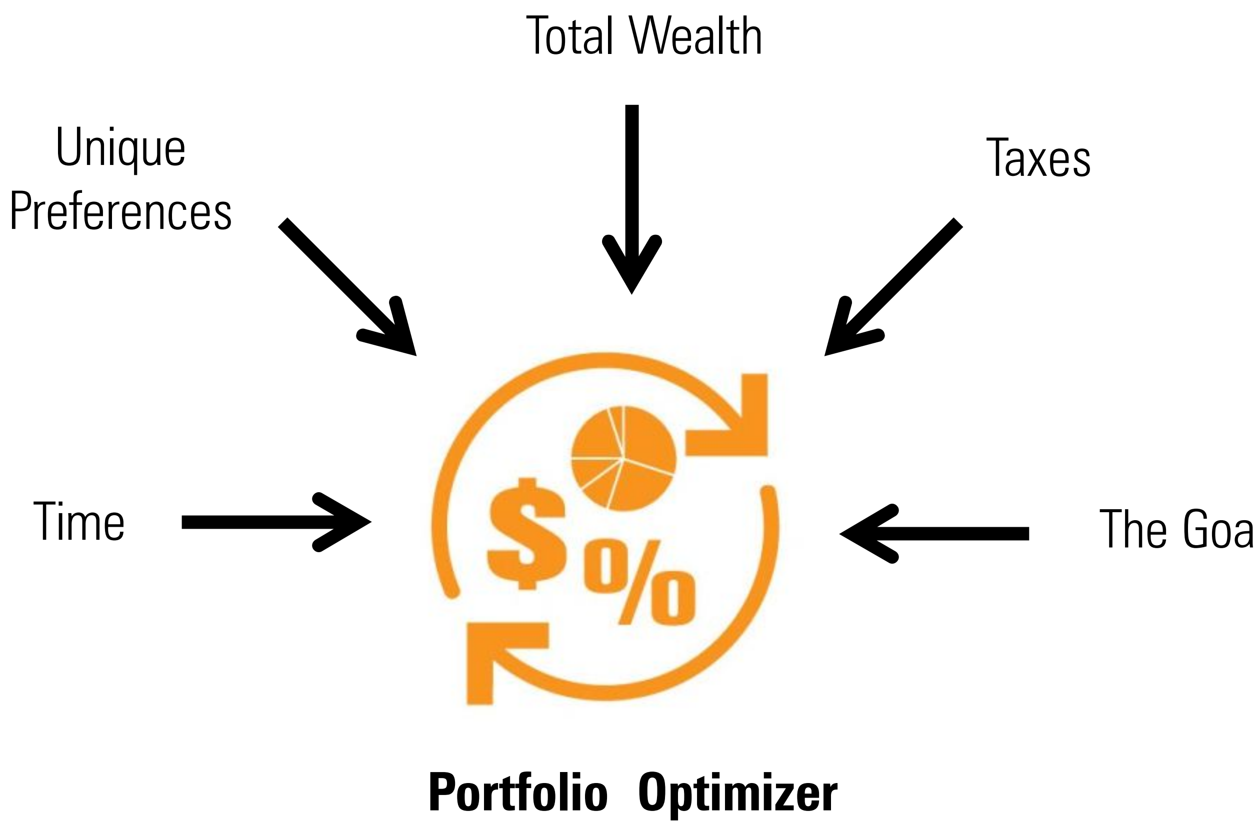
- Segment assets into accounts based on how long until the money is going to be needed

Cash **Portfolio** **Annuity**

For illustration only.

Conclusions

More Optimal "Optimized" Portfolios



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True Alpha = Outcomes

α

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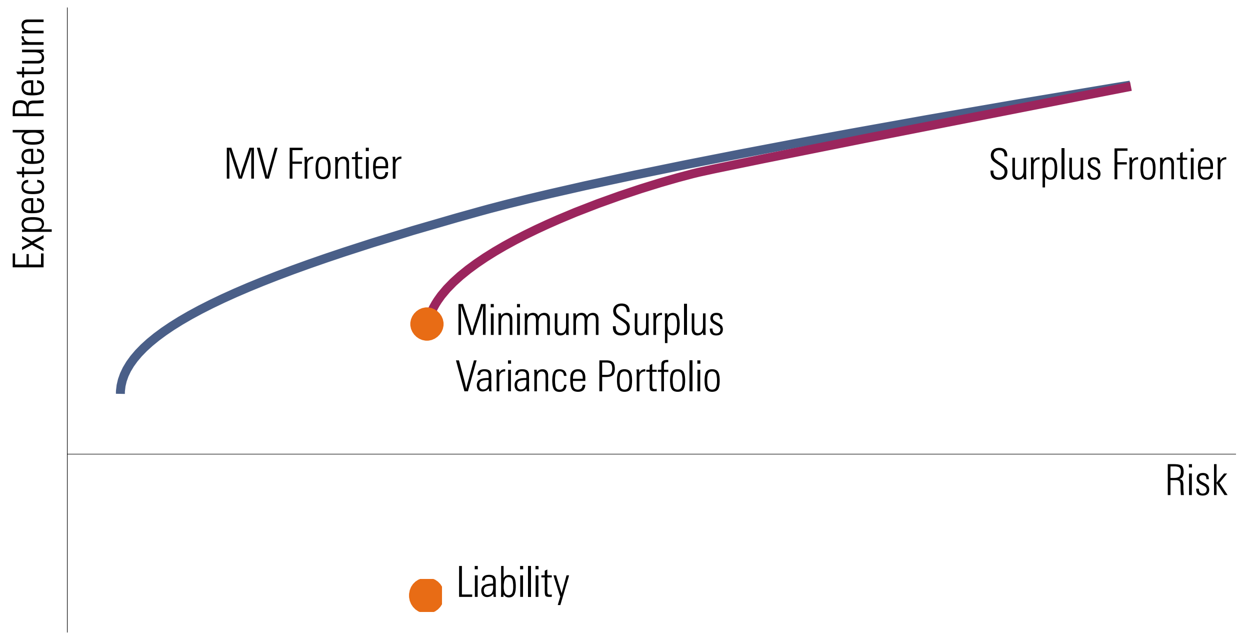
Different Efficient Portfolios



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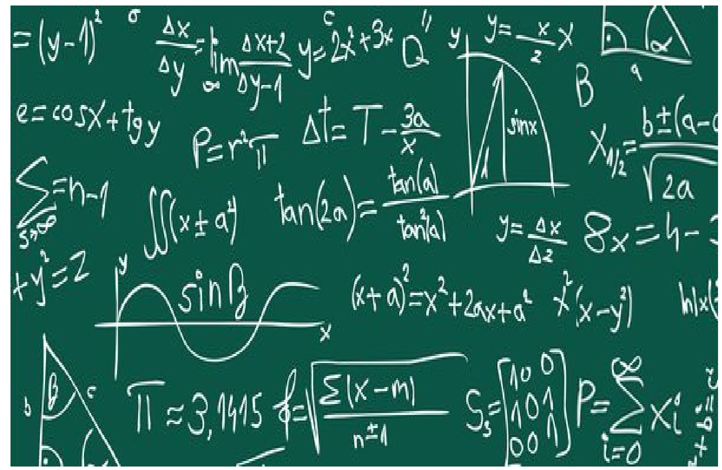
The Art and Science of Building Optimal Portfolios



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Monte Carlo is an analytical method used to simulate random returns of uncertain variables to obtain a range of possible outcomes. Such probabilistic simulation does not analyze specific security holdings, but instead analyzes the identified asset classes. The simulation generated is not a guarantee or projection of future results, but rather, a tool to identify a range of potential outcomes that could potentially be realized. The Monte Carlo simulation is hypothetical in nature and for illustrative purposes only. Results noted may vary with each use and over time. The results from the simulations described within are hypothetical in nature and not actual investment results or guarantees of future results. This should not be considered tax or financial planning advice. Please consult a tax and/or financial professional for advice specific to your individual circumstances.

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