



## **A Comprehensive Approach to Private Wealth Management**

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# Private Wealth Management vs. Institutional Investment Management

## PRIVATE WEALTH MANAGEMENT

## INSTITUTIONAL INVESTMENT MANAGEMENT

### SCOPE

- ▶ Comprehensive mandate
- ▶ Implied assets
- ▶ Implied liabilities

- ▶ Focused mandate
- ▶ Financial assets
- ▶ Asset management in isolation

### MANAGEMENT APPROACH

- ▶ Customization
- ▶ After-tax wealth accumulation
- ▶ Absolute returns

- ▶ Standardization
- ▶ Periodic pretax return
- ▶ Relative returns



# Private Wealth Management vs. Institutional Investment Management

## PRIVATE WEALTH MANAGEMENT

### CLIENT PROFILE

- ▶ Complexity of individual client
- ▶ Diverse client goals
- ▶ Limited investment sophistication
- ▶ Psychological profile

### TAXES

- ▶ Important tax considerations
- ▶ Progressive tax rates
- ▶ Complex tax interactions

## INSTITUTIONAL INVESTMENT MANAGEMENT

- ▶ Fewer investment constraints
- ▶ Homogeneous
- ▶ High investment sophistication
- ▶ Psychology neutral

- ▶ Often tax neutral
- ▶ Uniform marginal tax rates
- ▶ Few tax considerations



## Private Wealth Management vs. Institutional Investment Management

### PRIVATE WEALTH MANAGEMENT

#### TIME HORIZON

- ▶ Finite and/or multi-stage
- ▶ Varies by client
- ▶ Varies over time

### INSTITUTIONAL INVESTMENT MANAGEMENT

- ▶ Infinite
- ▶ Homogeneous
- ▶ Static over time



## Agenda

**What is Wrong with Mean-Variance Optimization (MVO)**

**The Discretionary Wealth Framework as an Alternative**

**Incorporating Taxes into the Framework**

## Traditional Markowitz Mean-Variance Optimization (MVO)

$$\text{Max } U = \bar{r}_p - \frac{1}{2} A \sigma_p^2$$

$$E(r_p) = w_1 \bar{r}_1 + w_2 \bar{r}_2$$

$$\sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 \rho_{12} \sigma_1 \sigma_2$$

**Assumes quadratic utility**

**Elusive risk tolerance parameter**

**Assumes efficient markets**

**Single period framework**

**Ignores low probability catastrophes (shortfall risk)**

**Ignores taxes**

**Ignores higher moments**

**Not applicable to private clients**



## An Alternative: The Discretionary Wealth Hypothesis

### Discretionary Wealth Framework

- ▶ Wilcox (2000, 2003 *Journal of Portfolio Management*)
- ▶ Wilcox, Horvitz, and DiBartolomeo (2006, *Research Foundation of CFA Institute*)

### Comprehensive Accounting

#### Implied Assets

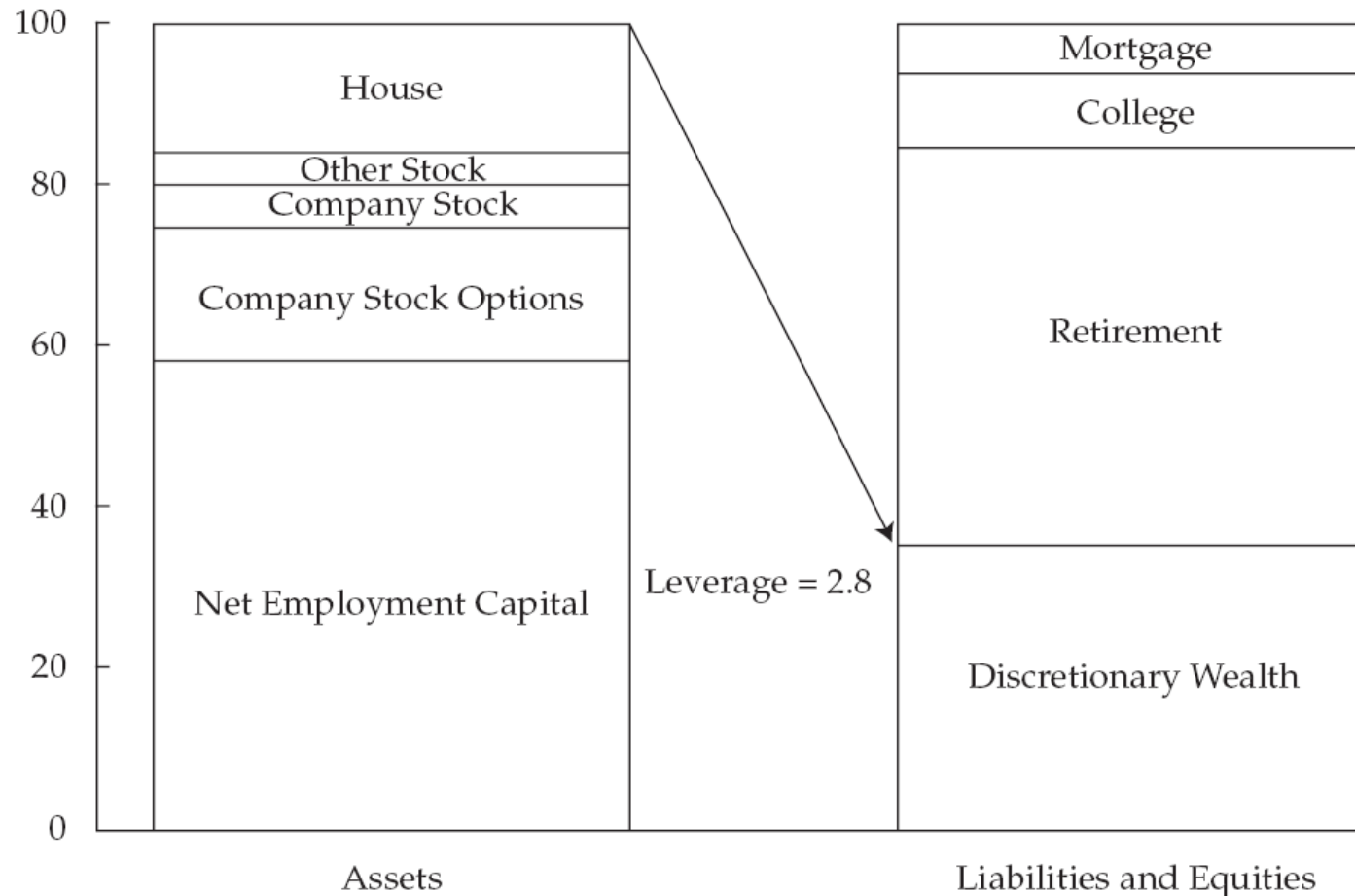
- ▶ Tangible personal assets (e.g., real estate)
- ▶ Human capital
- ▶ Private business/stock options
- ▶ Expected social security benefits
- ▶ Expected pension benefits
- ▶ Expected inheritances

#### Implied Liabilities

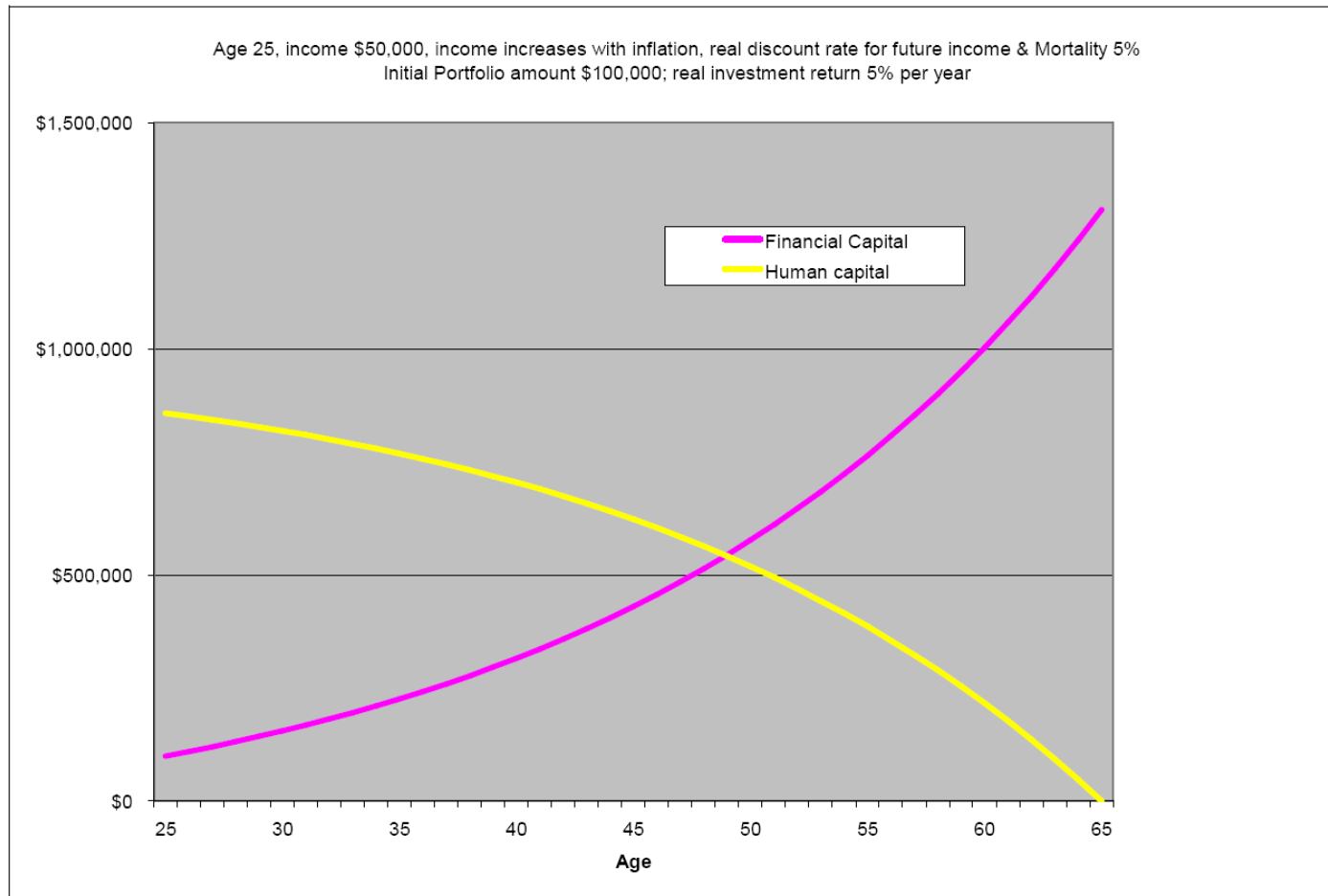
- ▶ Home mortgage
- ▶ Education funding goals
- ▶ Retirement funding goals
- ▶ High-priority goals

# Hypothetical Example of Life Balance Sheet

Portion (%)



## Financial and Human Capital Trends



### 1. Personal

- ▶ Meet current and unexpected needs (e.g., retirement goals)
- ▶ Maintain future flexibility

### 2. Dynastic Goals

- ▶ Transferring wealth to children, grandchildren, etc.

### 3. Philanthropic

- ▶ Active or passive philanthropy
- ▶ Philanthropy as a family value

### For Each Goal

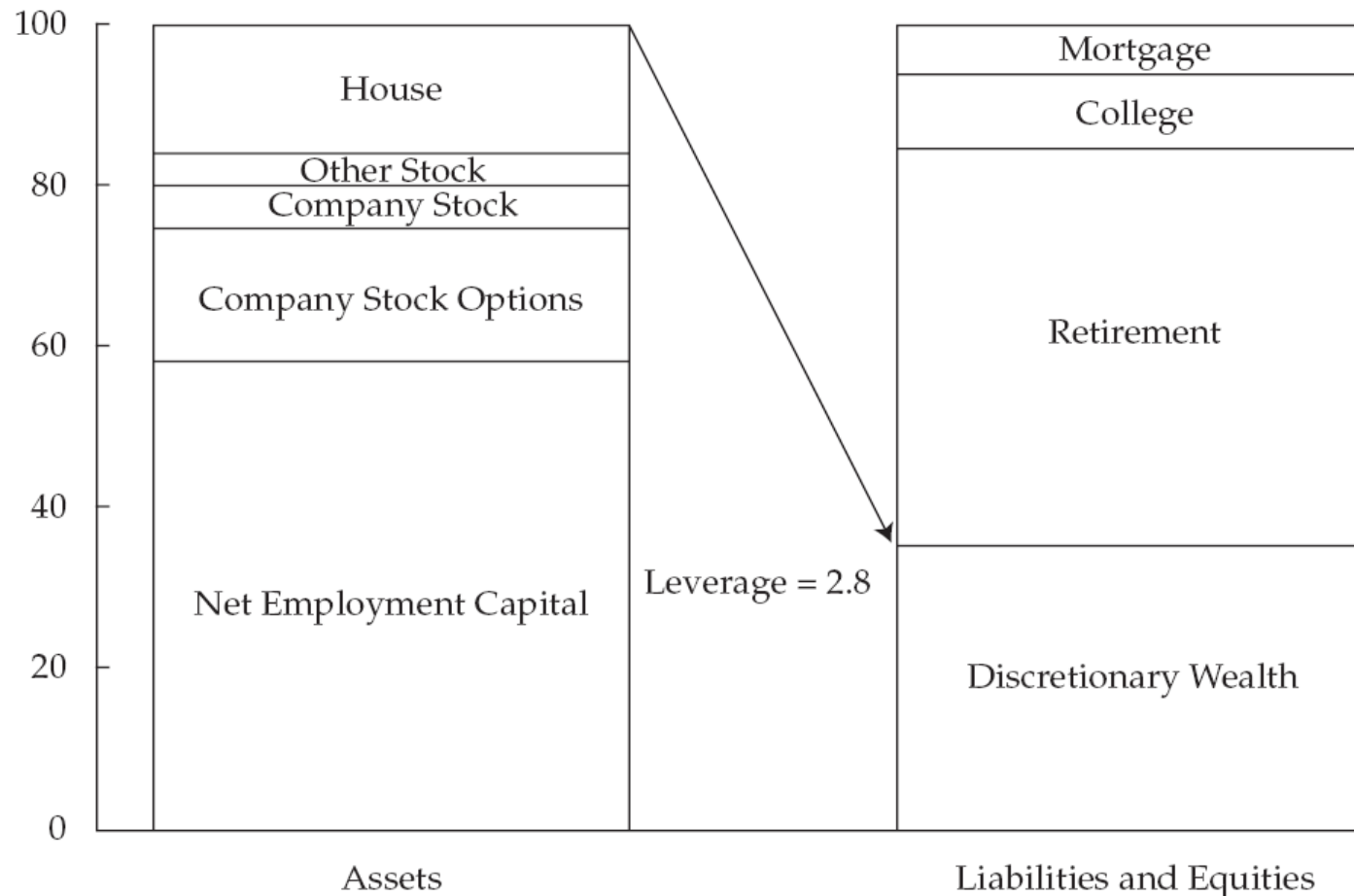
- ▶ Value
- ▶ Prioritize
- ▶ Place on Life Balance Sheet
  - High priority goals – liabilities on the Life Balance Sheet
  - Low priority goals – residual claimants on Life Balance Sheet

### Allocating Risk Across Goals

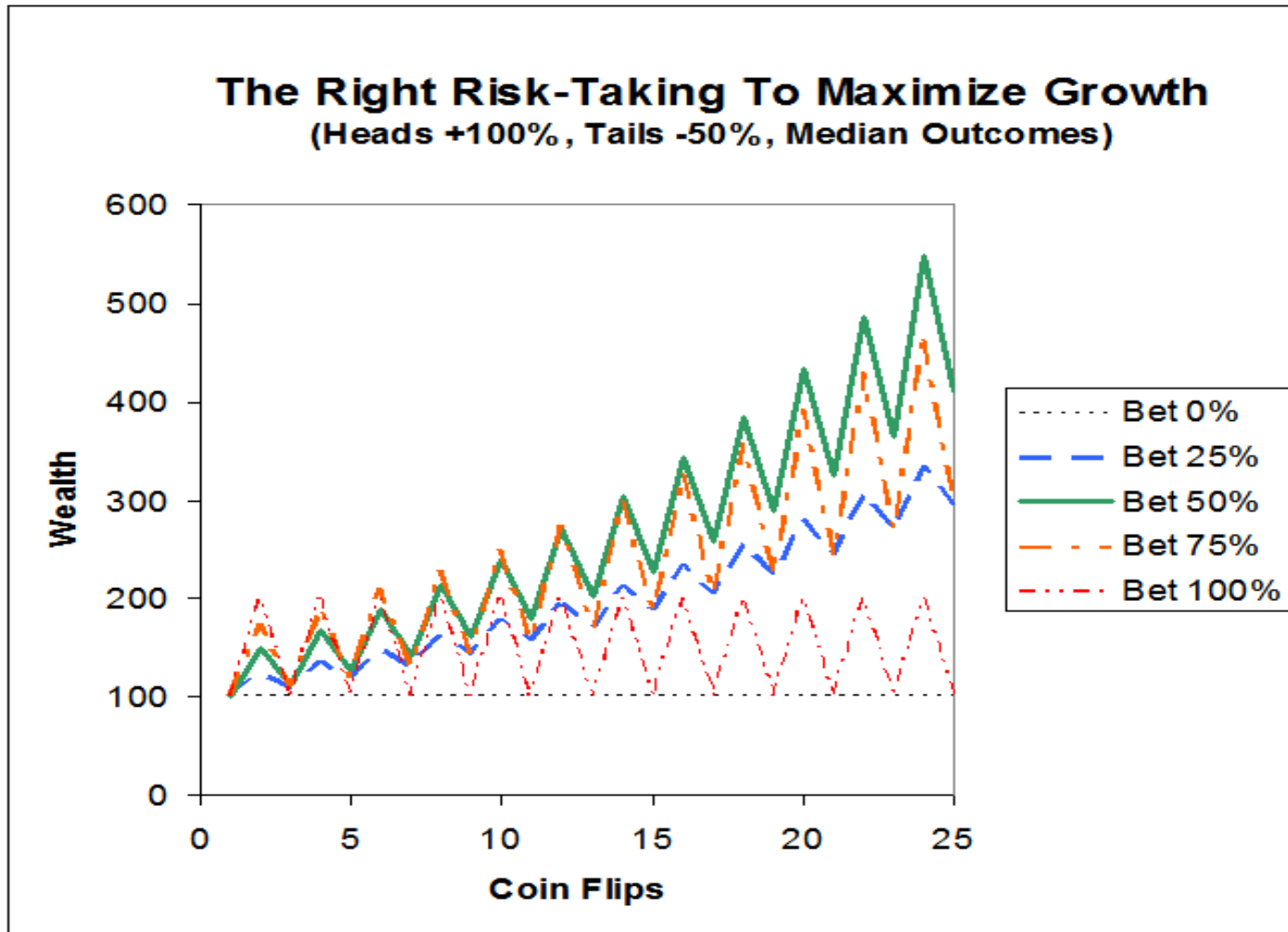
- ▶ High Priority → low risk profile
- ▶ Loss Aversion
- ▶ Asset Segregation
- ▶ Interaction of Volatility and Withdrawals

# Hypothetical Example of Life Balance Sheet

Portion (%)



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Source: Presentation by Jarrod Wilcox at CFA Institute Wealth Management Workshop, 2007

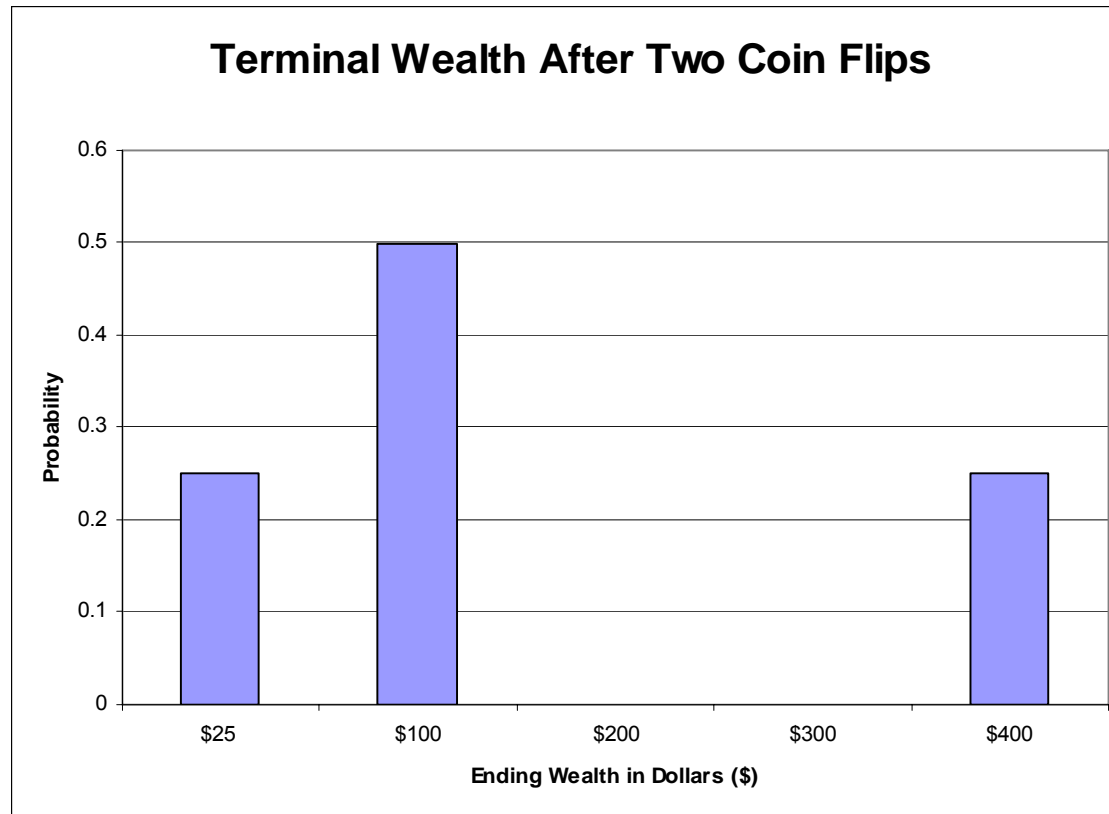
## Compound Return

- ▶ Geometric return

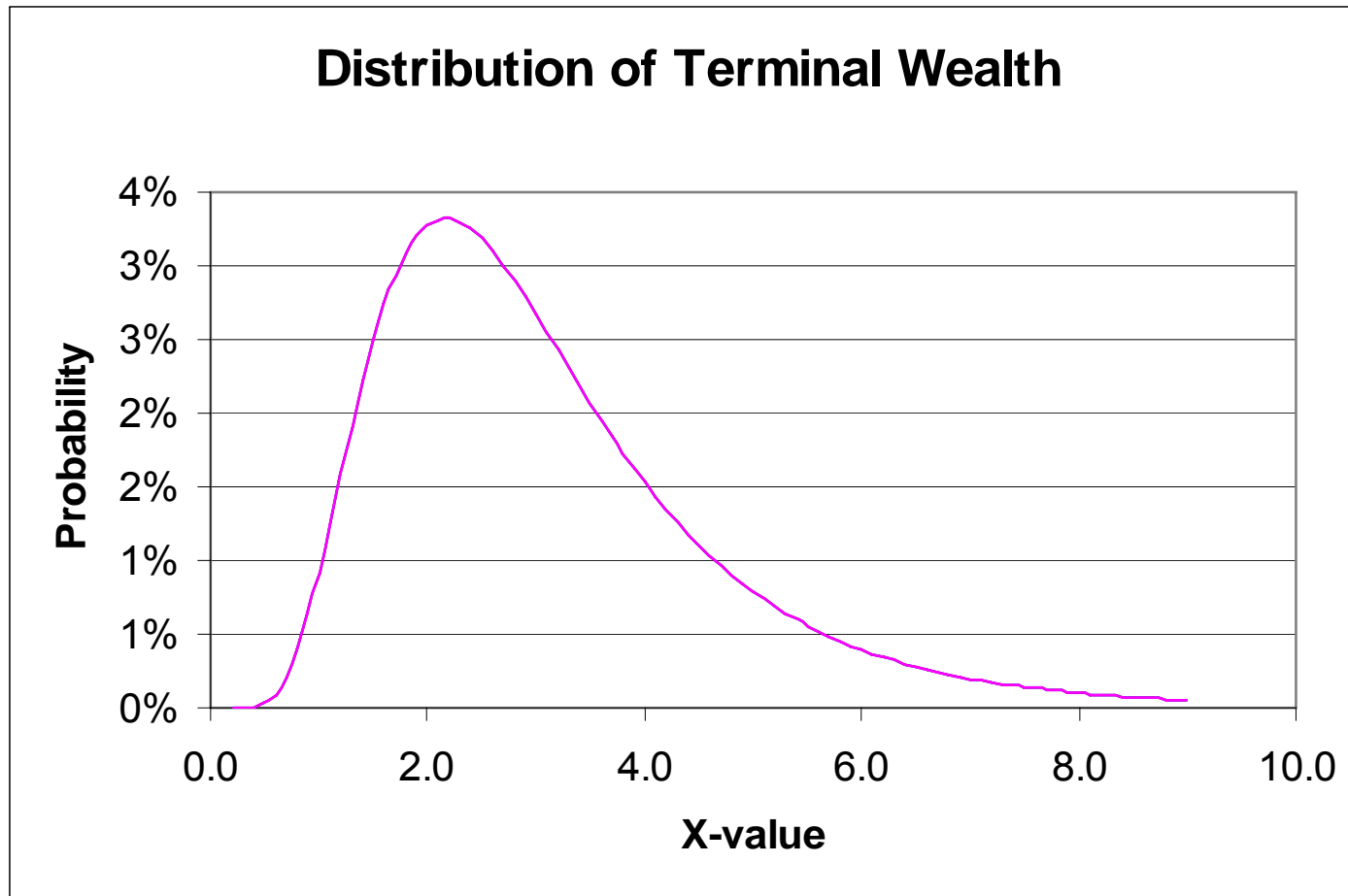
$$R_C \cong \bar{r} - \frac{1}{2}\sigma^2$$

## Coin Flipping Exercise

- ▶  $E(r) = (1/2)(-50\%) + (1/2)(100\%) = 25\%$ 
  - Does this impressive return grow terminal wealth? No.
  - It does not compound over successive flips
- ▶  $R_C = 0\%$ 
  - Half the outcomes will exceed initial wealth, half below initial wealth



Average = \$156  
Median = \$100



### Log Return Multiple

- ▶ Continuously-compounded return
- ▶ Drives median terminal wealth

$$\text{Max } E[\ln(1+r)] \cong \ln(1+\bar{r}) - \frac{1}{2} \cdot \frac{\sigma^2}{(1+\bar{r})^2} + \frac{1}{3} \cdot \frac{S\sigma^3}{(1+\bar{r})^3} - \frac{1}{4} \cdot \frac{K\sigma^4}{(1+\bar{r})^4} + \dots$$

▶ where

- $r$  = single-period return
- $\sigma$  = standard deviation of returns
- $S$  = skewness of returns
- $K$  = kurtosis of returns

$$\text{Max } E[\ln(1+r)] \cong \ln(1+\bar{r}) - \frac{1}{2} \cdot \frac{\sigma^2}{(1+\bar{r})^2}$$

## Maximizing Log Return

$$\text{Max } \bar{r}_p - \frac{1}{2}\sigma_p^2$$

$$\text{Max } L\bar{r}_p - \frac{1}{2}L^2\sigma_p^2$$

$$\text{Max } \bar{r}_p - \frac{1}{2}L\sigma_p^2$$

**We are back to a Markowitz-like Framework**

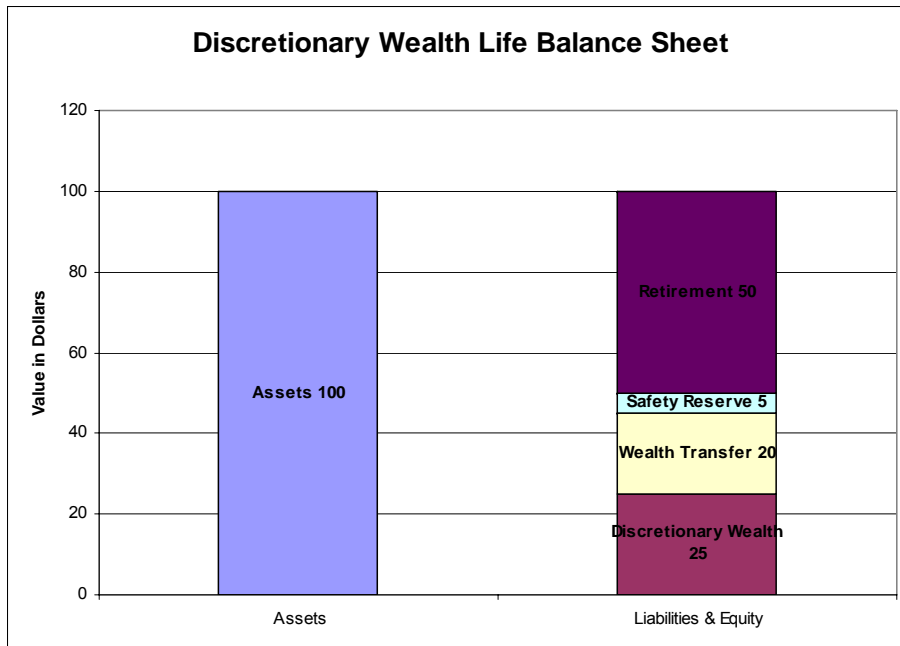
▶ But we started from a very different place

**L = Assets/Discretionary Wealth**  
**= 100/25 = 4**

$$Max \bar{r}_p - \frac{1}{2} 4\sigma_p^2$$

	<u>Equity</u>	<u>Cash</u>
<b>Return</b>	8%	3%
<b>Std. Dev.</b>	20%	0%
<b>Weight</b>	<b>31%</b>	<b>69%</b>

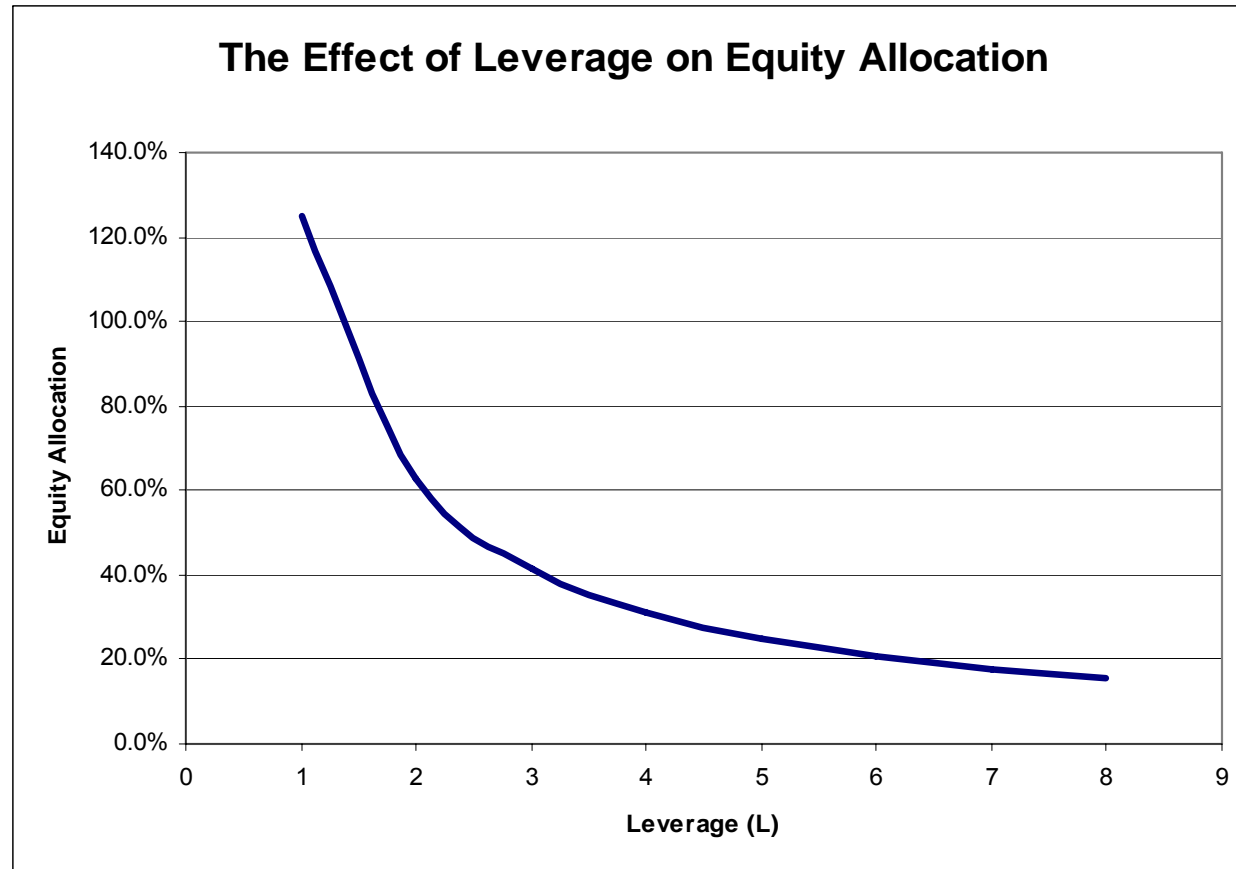
<b>L</b>	4
<b>Portfolio Return</b>	4.6%
<b>Portfolio Std. Dev.</b>	6%
<b>Log Return</b>	3.8%





## Asset Allocation Across Type of Goals

	Five-Year Safety Portfolio	High Priority Goals	Low Priority Goals	Total
<b>Cash</b>	\$200,000	\$400,000	\$90,000	\$690,000
<b>Stock</b>	-	60,000	250,000	310,000
	\$200,000	\$460,000	\$340,000	\$1,000,000
<b>Cash</b>	100%	87%	26%	<b>69%</b>
<b>Stock</b>	0%	13%	74%	<b>31%</b>



### Transparency of the Risk Aversion Parameter

### Incorporating Higher Moments

$$\text{Max } E[\ln(1 + Lr)] \cong \ln(1 + L\bar{r}) - \frac{1}{2} \cdot \frac{L^2 \sigma^2}{(1 + L\bar{r})^2} + \frac{1}{3} \cdot \frac{SL^3 \sigma^3}{(1 + L\bar{r})^3} - \frac{1}{4} \cdot \frac{KL^4 \sigma^4}{(1 + L\bar{r})^4} + \dots$$

- ▶ High Leverage
- ▶ Alternative asset classes with non-normal returns (e.g., hedge funds)
- ▶ Options and option-like payoffs
- ▶ Long return intervals

### **Reduce the Probability of Interim Low Performance Shortfall**

- ▶ Markowitz can place too little weight on low probability disasters
- ▶ Expected log return neither underweights nor overweights disasters

### **Dynamic Framework**

### **Incorporate Behavioral Finance Principles**

- ▶ No need for new asset pricing theory
- ▶ Leaves the analysis unaffected



## How Does This Work in a Taxable Environment?

**Taxes Affect Return**

**Taxes Affect Risk**

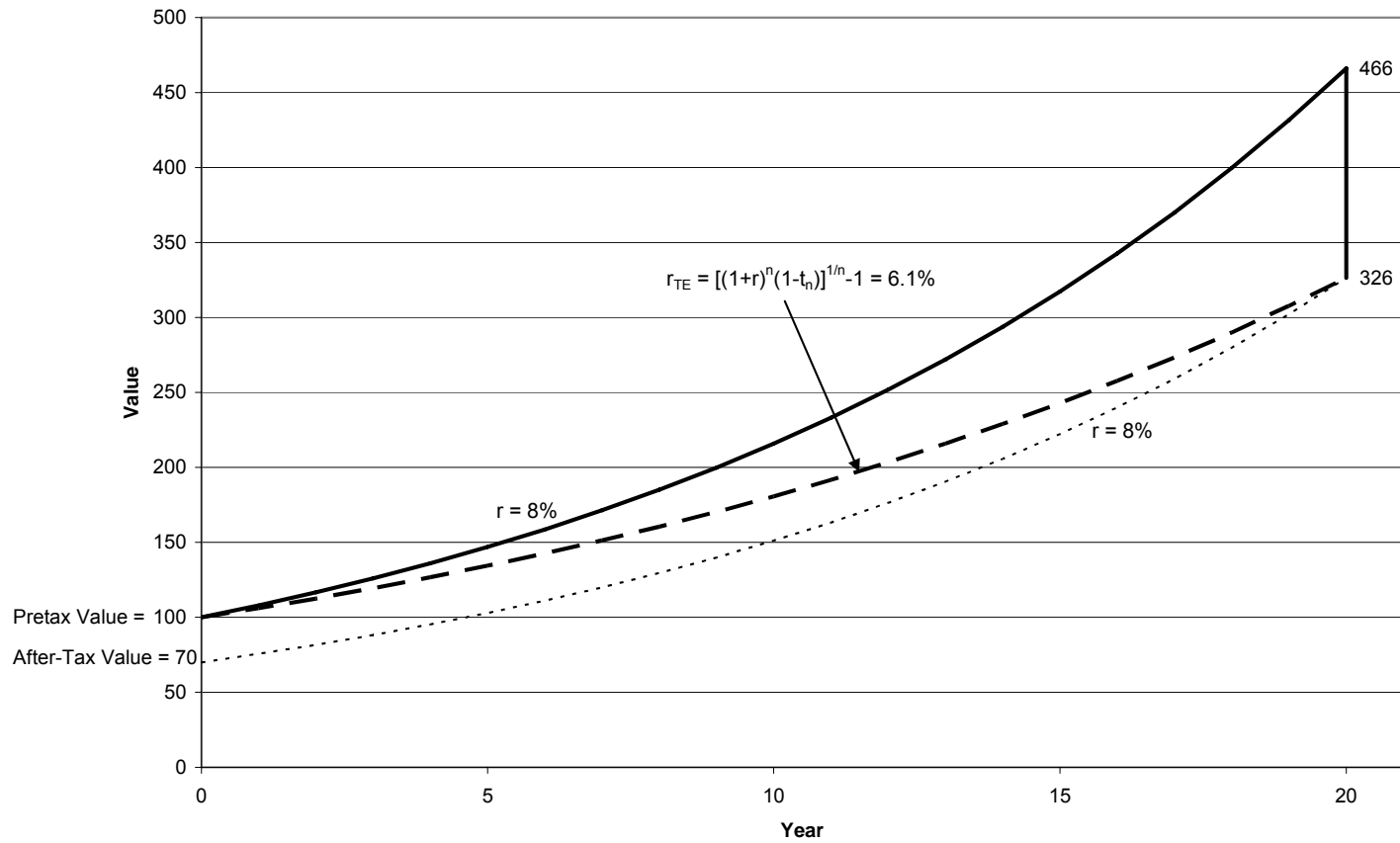
**Taxes Affect Asset Allocation**

**Tax Structures/Locations**

- ▶ Each possible account-asset combination is a unique after-tax asset

# What is Your Tax Rate?

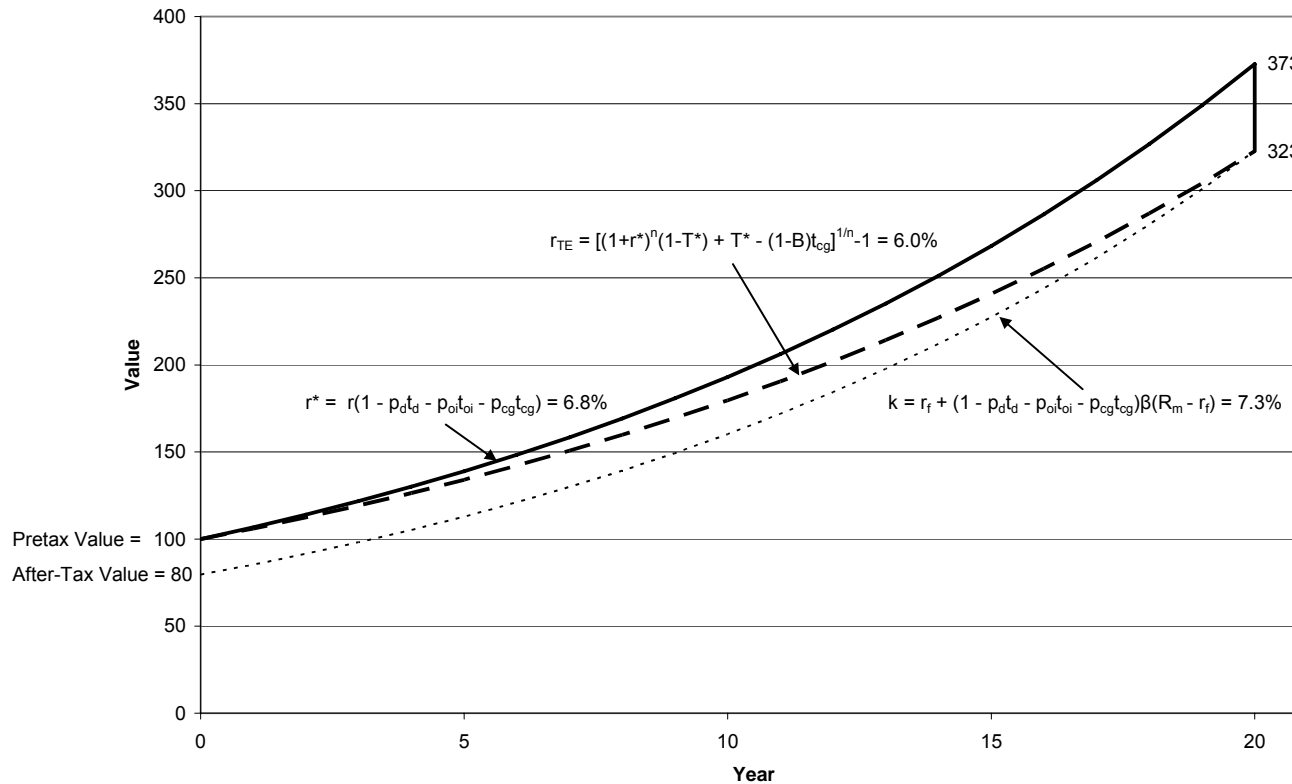
Value of a TDA Over Time



Value of a tax-deferred account over time assuming an 8% pretax return and a 30% terminal tax rate.

# What is Your Tax Rate?

Value of a Taxable Account Over Time



Value of a taxable account over time assuming an 8% return. The pretax return is 8%. The proportion of return taxed each year as ordinary income, dividends, and capital gains is 25%, 25%, and 0%, respectively. The tax rates on each of these forms of return are assumed to be 30%, 30%, and 25%, respectively. The original cost basis is assumed to be 60% of the initial pretax market value. The risk-free rate is 3%, the beta is one, and the market risk premium is 5%.

Consider a \$100,000 investment with the following potential outcomes

Outcome	Prob.	After-Tax Accumulation	Pretax Return
Good	1/3	\$125,000	25%
Average	1/3	110,000	10%
Bad	1/3	95,000	-5%
Exp. Value		\$110,000	10%
Std. Dev. ( $\sigma$ )			<b>15%</b>

Note: Investment returns are assumed to be taxed at a rate of 40 percent in the year they are earned.

## Simple Example of After-Tax Asset Allocation

Account Type	Asset Class	Pretax Market Value	Pretax Weights
TDA	Stock	\$1,500,000	<b>75%</b>
Tax-Exempt	Bonds	500,000	<b>25%</b>
Total Portfolio		\$2,000,000	100%

Note: Withdrawals at the end of the investment horizon are assumed to be taxed at a rate of 40 percent.

## After-Tax Returns

- ▶ Different assets
- ▶ Different accounts
  - Tax-deferred accounts (e.g., 401(k) plans)
  - Tax-exempt accounts (e.g., Roth IRAs)
  - Taxable accounts
- ▶ Each asset-account combination is a unique after-tax asset

## After-Tax Volatility

## After-Tax Covariance Matrix

## Portfolio Constraints

- ▶ Funds available in a particular account

## Simple Example

- ▶ Two uncorrelated asset classes
- ▶ Two types of accounts

		Taxable		TDA	
		Equity	Bonds	Equity	Bonds
Taxable	Equity	1	0.0	1	0.0
	Bonds	0.0	1	0.0	1
TDA	Equity	1	0.0	1	0.0
	Bonds	0.0	1	0.0	1



## Simplified After-Tax MVO Example

	Taxable		TDA	
	Equity	Bonds	Equity	Bonds
<b>Pretax Return</b>	8%	3%	8%	3%
<b>Effective Ann. Tax Rate</b>	20%	40%	15%	15%
<b>Effective After-Tax Return</b>	6.4%	1.8%	6.8%	2.6%
<b>Pretax Std. Dev.</b>	20.0%	0.0%	20.0%	0.0%
<b>After-tax Std. Dev.</b>	16.0%	0.0%	17.0%	0.0%
<b>Weight</b>	<b>40.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>60.0%</b>

<b>Account Constraints</b>	40.0%	60.0%
<b>L</b>	4	
<b>Portfolio Return</b>	4.1%	
<b>Correlation</b>	0.0	
<b>Portfolio Std. Dev.</b>	6.4%	
<b>Log Return</b>	3.3%	

**It is generally better to place highly-taxed assets (e.g., bonds) in tax-sheltered structures**

Suppose the investor wants only 40% bonds.

But what if that over-weights bonds?  
Then, borrow in the taxable account

Account Type	Asset Class	Existing Pretax Market Value	Existing Pretax Allocation %
TDA	Bond	\$100,000	80%
Taxable	Stock	\$25,000	20%
Total		\$125,000	100%

### Traditional mean-variance optimization has weaknesses

#### Discretionary Wealth Framework

- ▶ Focuses on median long-term wealth
- ▶ Addresses many weaknesses of Markowitz MVO
- ▶ But... brings us back to MVO, which can be modified to meet special needs
- ▶ Can incorporate behavioral influences
- ▶ Can be adapted for a taxable environment
- ▶ Simultaneously locates assets in proper places

- ▶ Wilcox, Jarrod, Jeffrey Horvitz, Dan DiBartelomeo, 2006, *Investment Management for Taxable Private Investors*, Research Foundation of CFA Institute, Charlottesville, VA.
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- ▶ Hakansson, Niles, 1971, "Multi-period Mean-variance Analysis: Toward a General Theory of Portfolio Choice", *Journal of Finance*
- ▶ Kelly, J.L., 1956, "A New Interpretation of Information Rate", *Bell Systems Technical Journal*



## **Asset Allocation for Taxable Private Clients: Discretionary Wealth Framework**

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