

# **Investment Management for Private, Taxable Wealth**

**Sunday, March 26<sup>th</sup> – Monday, March 27<sup>th</sup>, 2006**

**Trapp Family Lodge**  
700 Trapp Hill Road  
Stowe, Vermont

## **Agenda**

### **A Conceptual Framework for Helping Private Investors**

*Jarrold Wilcox*

### **Private Wealth and Taxation**

*Jeffrey Horvitz*

### **Organizing the Management Firm for Private Clients**

*Dan diBartolomeo*

### **Individual Retirement Plans and Location**

*Dan diBartolomeo*

### **On Concentrated Risk**

*Jarrold Wilcox*

### **Assessment and Benchmarking for Private Wealth**

*Jeffrey Horvitz*

# **A Framework for Helping Private Investors**

**Jarrold Wilcox**

**Northfield Seminar  
Stowe, Vermont  
March 26, 2006**



**Wilcox Investment**

“The US client was astonished to see that the investment advisory firm had mistakenly rebalanced his family’s stock portfolio in the same way as those of its tax-exempt pension fund accounts.”

Chapter One, Investment  
Management for Taxable  
Private Investors



**Wilcox Investment**

# When We Don't Pay Attention to Private Client Needs...

- **Conventional institutional product-oriented specialization causes:**
  - A vacuum, soon filled, for specialization by client
  - Leaving value added on the table.
- **Difficulty in identifying future alpha**
  - Leads to competition on the basis of mere appearances
  - And low barriers to entry.
- **Combined with inherent unreliability, leading to:**
  - High and expensive manager turnover.
- **Private client loyalty requires something more.**



# Managing Institutional Funds...

- **Gets one used to**
  - Standardized approaches
  - Narrow product focus rather than a total financial picture.
- **Applying that experience to private investors doesn't prepare one for:**
  - Client-by-client customization
  - Complexity generated by tax rules
  - Need for pro-active fiduciary responsibility.



# Good Ethics Help Build Long-Term Relationships

- **Suitability**
  - After-tax, not pre-tax
  - Total risk contribution, not tracking error
  - Ability to tolerate small chance of a large loss.
- **Honest Advertising**
  - Not just “past performance is no guarantee of future results,” but...
  - Past performance has very little predictive value, and that only in the short run.



# Relevant Theoretical Models -- I

- **Quasi-efficient markets (yes)**
  - For client grasp of near unpredictability of returns.
  - Builds case for risk and tax management.
- **Expected utility (no)**
  - Single-period model.
  - Offers no added value for long-term return compounding avoiding intermediate shortfalls.
  - Offers no normative guidance.



# Relevant Theoretical Models -- II

- **Markowitz mean-variance optimization (with care)**
  - Potentially excellent tool for single-period diversification
  - Many pitfalls for the unwary when used for security selection
    - Input estimation errors
    - Multi-period linkages: trading costs and taxes
    - Downside risk not fully captured by variance
  - More safely used for broad asset-liability allocations
    - But offers no advice on where on efficient risk-return frontier to invest.
    - Consequently not useful for financing decisions.



# Relevant Theoretical Models -- III

- **Sharpe-Lintner Capital Asset Pricing Model (no)**
  - Excessively idealized in its assumptions.
  - Strong descriptive predictions, other than the usefulness of index funds, are not supported by evidence.
  - Has supported performance measures for testing forecasting skill rather than incremental investor welfare:
    - Alpha, Sharpe ratio, “information ratio”.



# Relevant Theoretical Models -- IV

- **Black-Scholes option model (yes)**
  - Not just for understanding derivatives and dynamic hedging
  - The choice as to when to realize a taxable event creates option value related to dispersion in price/cost basis.
- **Stochastic growth theory (yes)**
  - Helps set risk tolerance parameters for single periods in pursuit of long-term goals.
  - Can deal with financing decisions.
  - Shows why strategies that lead to negative return skew or fat tails (kurtosis) require extra return to compensate.

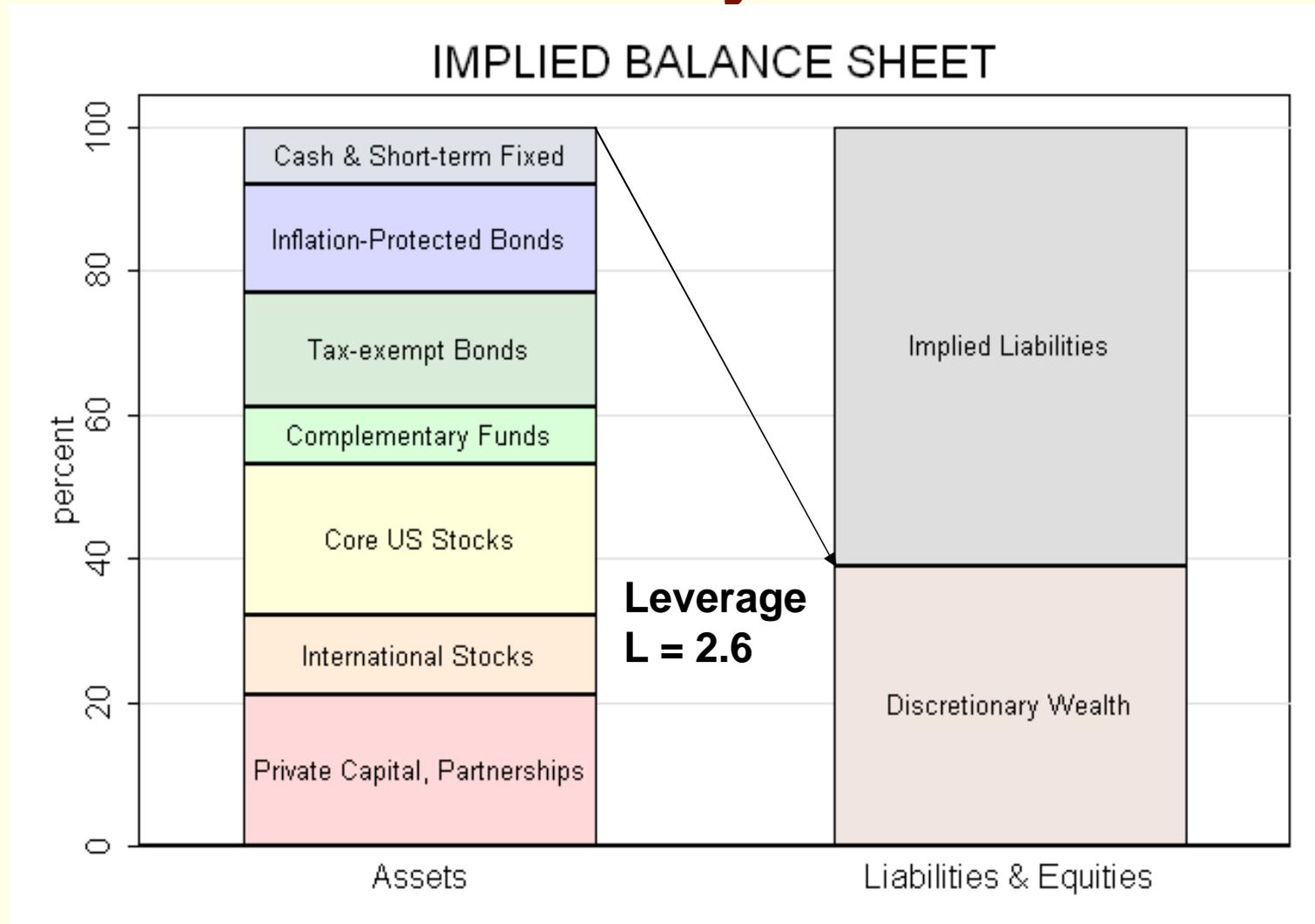


# An Approach to Life Cycle Investing

- **Implicit balance sheets.**
- **Applying the stochastic growth model to discretionary wealth.**
- **Contingent mean-variance optimization over a life-cycle.**
- **Brief Introduction to details (much more tomorrow).**



# Manage The Full Implied Asset-Liability Problem

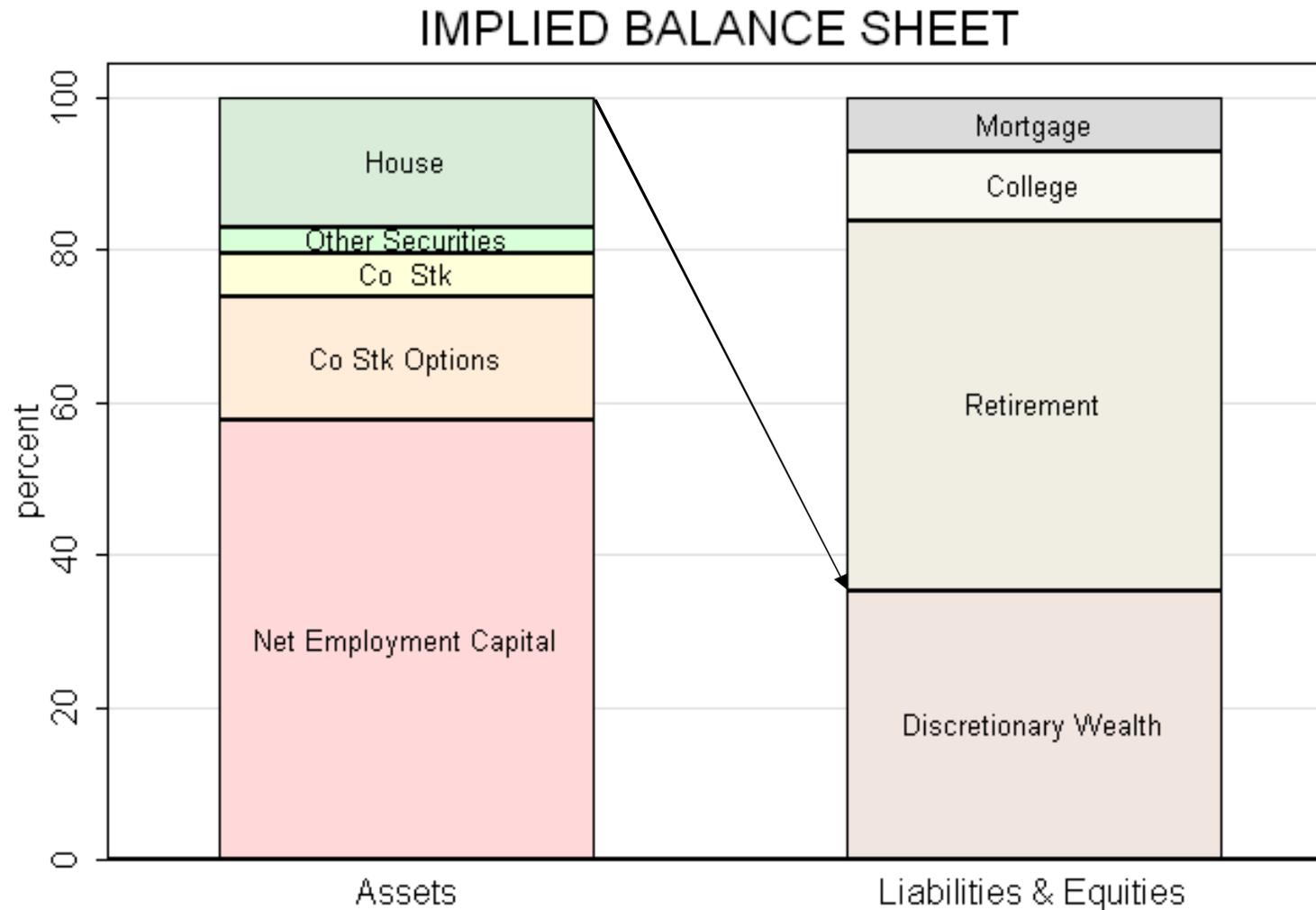


# Constructing Implied Balance Sheets

- **Streams of net withdrawal needs should be capitalized as liabilities.**
- **Expected streams of net outside contributions to the financial portfolio should be capitalized as assets.**
- **How would you treat:**
  - Stock options?
  - Life span?
  - Probability of capturing unvested benefits?
  - A divorce settlement?
  - Tax rates? Nominal or effective?
  - Inflation?
  - Flexibility to cut spending rates?
- **What time discounting rate would you use?**



# Include Both Implied Assets And Implied Liabilities



# Discretionary Wealth Approach to Managing Risk

- **In a risky world, seek better median, not average, compounded outcomes.**
  - Maximize single-period expected log return, truncated for finite lifetimes.
  - To prevent shortfalls, apply it to discretionary wealth, not to assets.



# Mathematics of Risky Growth -- I

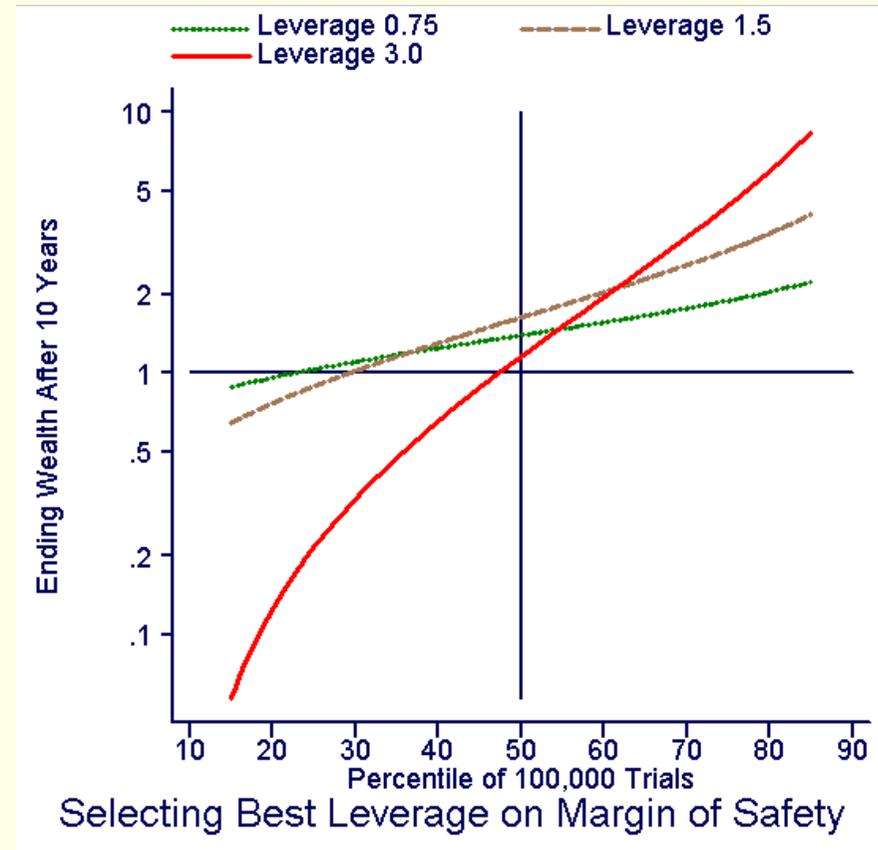
- **For diversified, unlevered portfolios, expected log return is about  $E - V/2$ .**
  - E: expected single-period return
  - V: single-period return variance.
- **For discretionary wealth, use  $LE - L^2V/2$ .**
  - L: leverage, the ratio of assets to discretionary wealth.



# Leveraging Discretionary Wealth (Introduction to Financing Decisions)

- **You can do Monte Carlo simulation:**
  - Log-normal returns
  - Mean excess stock return vs cash E: .06
  - Return variance V:  $.20^2$
  - Leverages L on Discretionary Wealth = 0.75, 1.5, 3.0
- ***Or, just choose L to maximize  $LE - L^2V/2$ :***

$$L = E/V = .06/.04 = 1.5$$



## Mathematics of Risky Growth -- II

- **Expected log return on discretionary wealth as a Taylor series:**
- **The first four terms are enough, given limited investor lifetimes:**
  - $\ln(1+LE) - L^2V/(2(1+LE)^2) \dots$   
 $+ L^3SV^{3/2}/(3(1+LE)^3) - L^4KV^2/(4(1+LE)^4) + \dots$
  - S is skewness and K is kurtosis, 3 for a normal distribution.
- **Useful approximation,  $s = V^{1/2}$  :**  
 $LE - (Ls)^2/2 + S(Ls)^3/3 - K(Ls)^4/4$



# Markowitz Mean-Variance Optimization Makes Most Sense When...

- The impact of return moments higher than variance is small.
- No change in leverage (financing change) is contemplated:
  - Then we can maximize  $LE - L^2V/2$
  - By maximizing  $E - LV/2$ .
- And then the appropriate Markowitz aversion to single-period risk is  $L/2$ .



# Contingent Asset Allocation

- **Allocations may vary as expected E and V change.**
- **But they also should vary with L.**
  - What happens to L when losses occur?
  - What should the investor do
    - If one's change in L is similar to that of the market as a whole.
    - If less?
    - If more?



# When Do Higher Moments Matter?

- **Not just when skewness or kurtosis is large...**
- **But when return variance is high, and when ...**
- **Leverage on discretionary wealth is high.**
  - *Includes both hedge funds and many pensioners.*
- **And when time periods between investment decisions are long:**
  - Since successive returns are nearly independent:
    - Mean and variance increase linearly with time.
    - The 3rd moment increases with variance to the 3/2 power.
    - The 4<sup>th</sup> moment increases with variance *squared*.



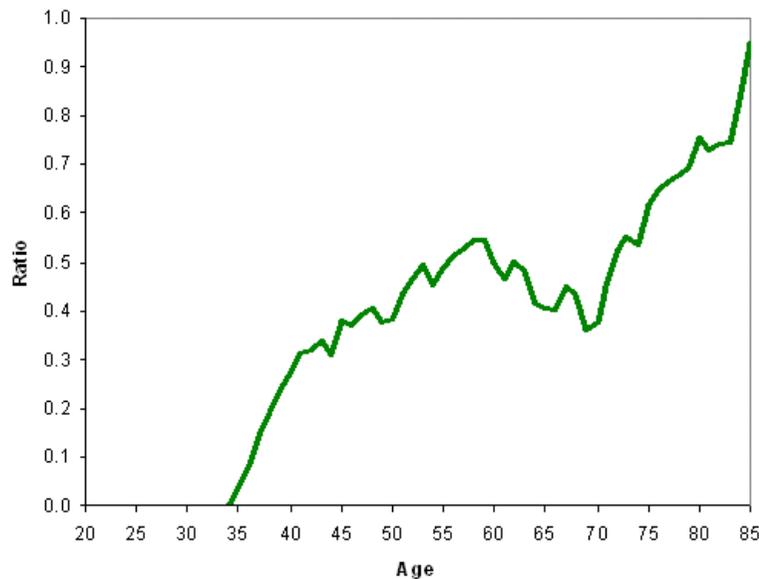
# A Hypothetical Case Study

- **Early conservative savings to provide for minimum future needs in retirement.**
- **Implied assets related to employment build up, permitting more risk-taking**
- **Retirement, maintain balanced fund to safeguard future.**
- **Old age – good results and shortening time horizon again permit risk taking.**



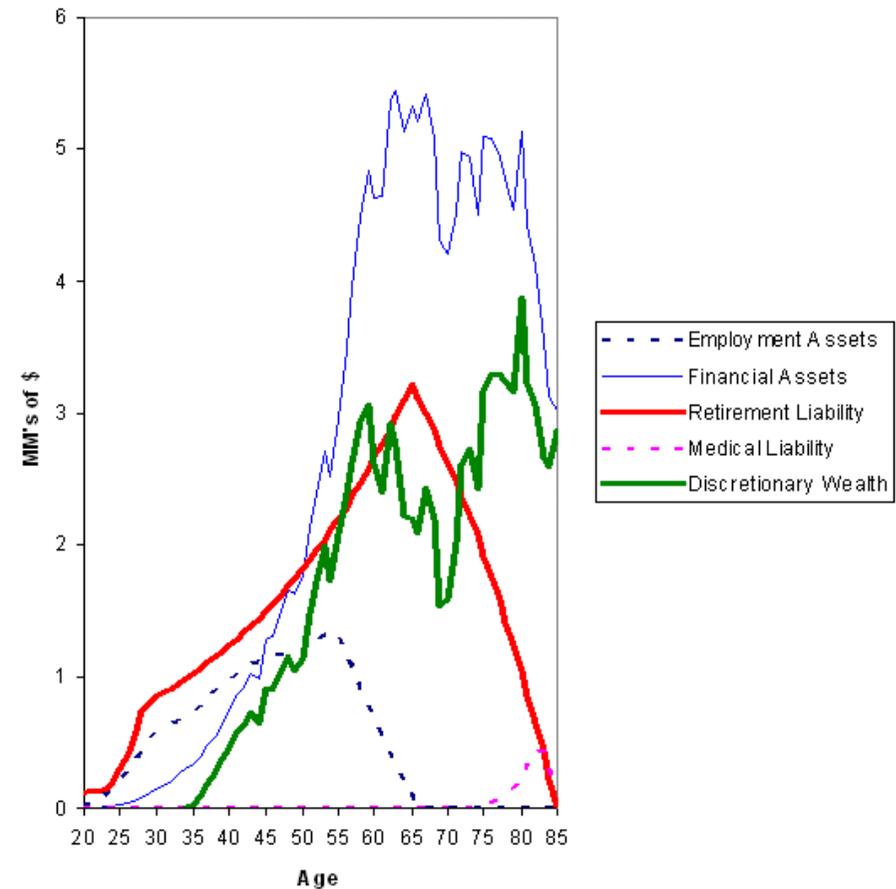
# Life-Cycle Customization

## Ratio of Discretionary Wealth to Total Assets



- Risk aversion should be customized to reflect leverage based on discretionary wealth after implied assets and implied liabilities.

## Assets & Liabilities



# Typical Patterns

## EXHIBIT 3-1. LIFE-CYCLES AND WEALTH

### TYPICAL BEST POLICY

	YOUNG	MIDDLE-AGED	OLD
VERY WEALTHY	AGGRESSIVE	AGGRESSIVE	AGGRESSIVE
HIGH NET WORTH	BALANCED	AGGRESSIVE	BALANCED/AGGRESSIVE
PROSPEROUS	CONSERVATIVE	BALANCED	CONSERVATIVE
THE REST OF US	CONSERVATIVE	CONSERVATIVE	VERY CONSERVATIVE

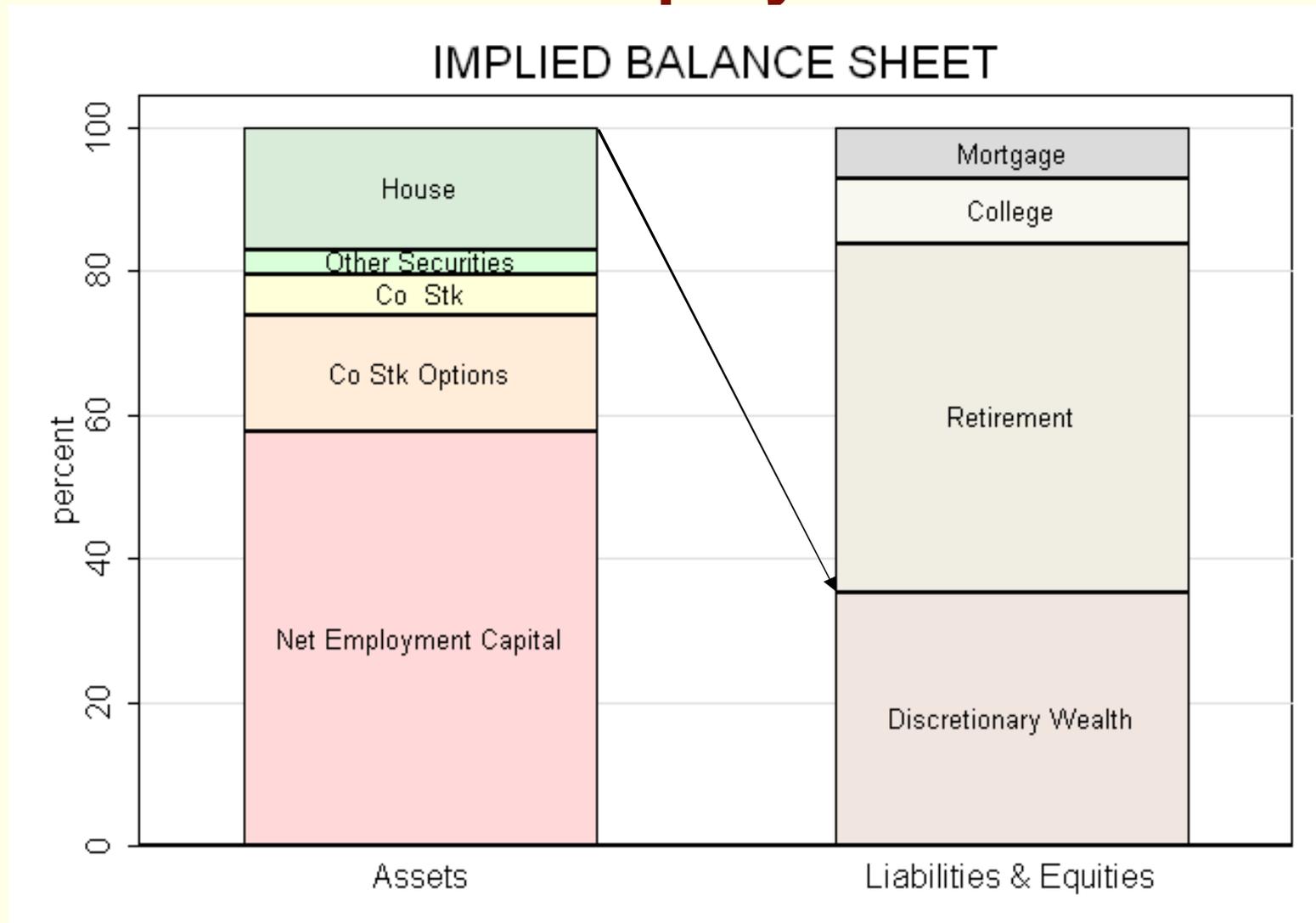


# Brief introduction to details: Directions for Further Customization

- **Complementary Funds**
  - Recognize what else is on the balance sheet
- **Tax-Sensitivity**
  - Asset allocation based on after-tax returns and after-tax risks
  - Full court press on tax alpha
  - Solving special problems of location and concentrated risk.
- **For extremes of client sensitivity, buy or sell higher moment risk protection.**



# Strong Need for Assets Complementary to Employer



# Taxable Risk Management

- **The effective tax rate can act as an offset to leverage in determining expected log return:**
  - $L(1-T^*)E$
  - $- L^2(1-T^*)^2V/2$
  - $+ L^3(1-T^*)^3SV^{3/2}/3$
  - $- L^4(1-T^*)^4KV^2/4$
  - $T^*$  is the effective tax rate.
- **Take enough risk.**
  - If taxable investors have offsetting gains available...
  - They can take more pre-tax variance risk and much more higher moment risk.



# Integrating Tax Considerations

## (Some automation required...)

- **Example: what is the effective annual tax rate for a property/casualty insurance company?**
  - On municipal bond interest 5.1%
  - On Treasury bonds 34%
  - On zero dividend stocks with pretax annual gains of 10% held for:
    - 1yr 34.0%
    - 2yr 32.9%
    - 5yr 29.9%
    - 10yr 25.5%
    - 20yr 18.6%
- **If there is an unrealized gain of 25% in a stock, should we sell for the tax benefit?**
- **Should we over-diversify stocks and tax lots to get more tax loss harvesting opportunities?**



# Better Client Matching for Existing Products

- **Go beyond the obvious:**
  - Municipal bonds for wealthy retirees, etc.
- **We have already discussed making conventional securities more suitable for taxable clients.**
- **Use the higher moment concepts from the discretionary wealth approach:**
  - Downside protection versus option-income funds
  - Momentum and growth styles versus value
  - Venture capital & hedge funds.



# Examples Using Higher Moments -- I

- **Product Attributes**

- Negative skew
  - Value strategies

- **Customer Attributes**

- Low leverage
  - Wealthy taxpayers

- 
- Option income,  
junk bonds

- Low leverage
  - 401(k) for wealthy individual
  - Well-funded insurance company



# Examples Using Higher Moments -- II

- **Product Attributes**

- Positive skew
  - Momentum strategies

- **Customer Attributes**

- High leverage
  - Middle class investors in 401(k) funds

- 
- Structured products with principal protection

- High leverage
  - Corporate treasurers



# Examples Using Higher Moments -- III

- **Product Attributes**

- High Kurtosis
  - High volatility concentrated stock strategy

- **Customer Attributes**

- Low leverage
  - Wealthy individuals

- 
- Venture capital

- Low leverage & able to tolerate long lock-in periods
  - Wealthy individuals



# Examples Using Higher Moments -- IV

- **Product Attributes**

- High Kurtosis
  - Single strategy hedge fund with long lock-in period

- 
- Low Kurtosis
    - Diversified hedge fund with monthly notice

- **Customer Attributes**

- Low leverage
  - Tax-protected vehicle for wealthy individuals

- 
- Low leverage
    - Untroubled insurance company portfolio



A question for discussion...

**Every private client is different. Because of family, business role, taxation or limited lifespan, his or her needs are complex. Each client needs help but doesn't initially know enough to ask for the right kinds. What do you do?**



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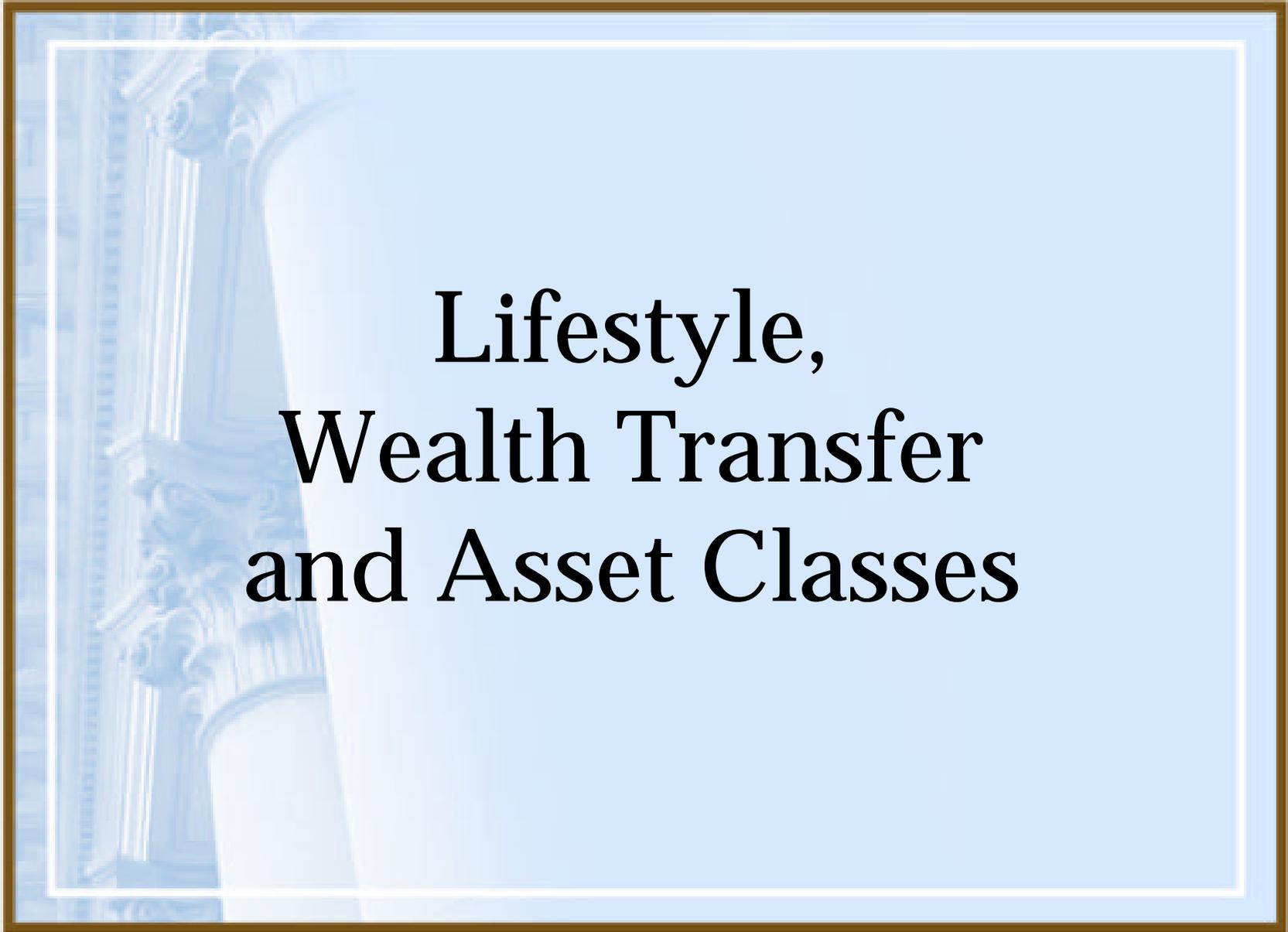


# Investment Management for Taxable Private Investors

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**Lifestyle,  
Wealth Transfer  
and Asset Classes**

# CATEGORIES OF SPENDING

1. BASIC NECESSITIES

*(food, basic housing, basic clothing, utilities, transportation, medical/insurance coverage)*

2. LIFESTYLE MAINTENANCE

*(education, entertainment, dining out, child care, family vacations)*

3. LUXURY CONSUMPTION

*(luxury travel, luxury clothes, domestic staff, luxury furnishings)*

4. NON-INVESTMENT ASSETS

*(primary home, second home, yacht, private airplane, art, antiques)*

5. SAVINGS AND INVESTMENTS

*(bank accounts, employee stock and options, pensions, whole life insurance, stocks, bonds, alternative investments)*

*A sixth category is the goal of making money as an end in itself, either for ego, prestige, or a sense of “winning.”*

# “Four Horsemen of the Investment Apocalypse”

## 1. Investment Expenses

(Management Fees, Transaction and Custody Costs),

## 2. Taxes

(Income and Estate Taxes),

## 3. Inflation,

## 4. Consumption.

Annualized Compound Returns, 1925–2004  
(net of taxes and inflation)

**U.S. Asset Class Returns**

Stocks 4.8%

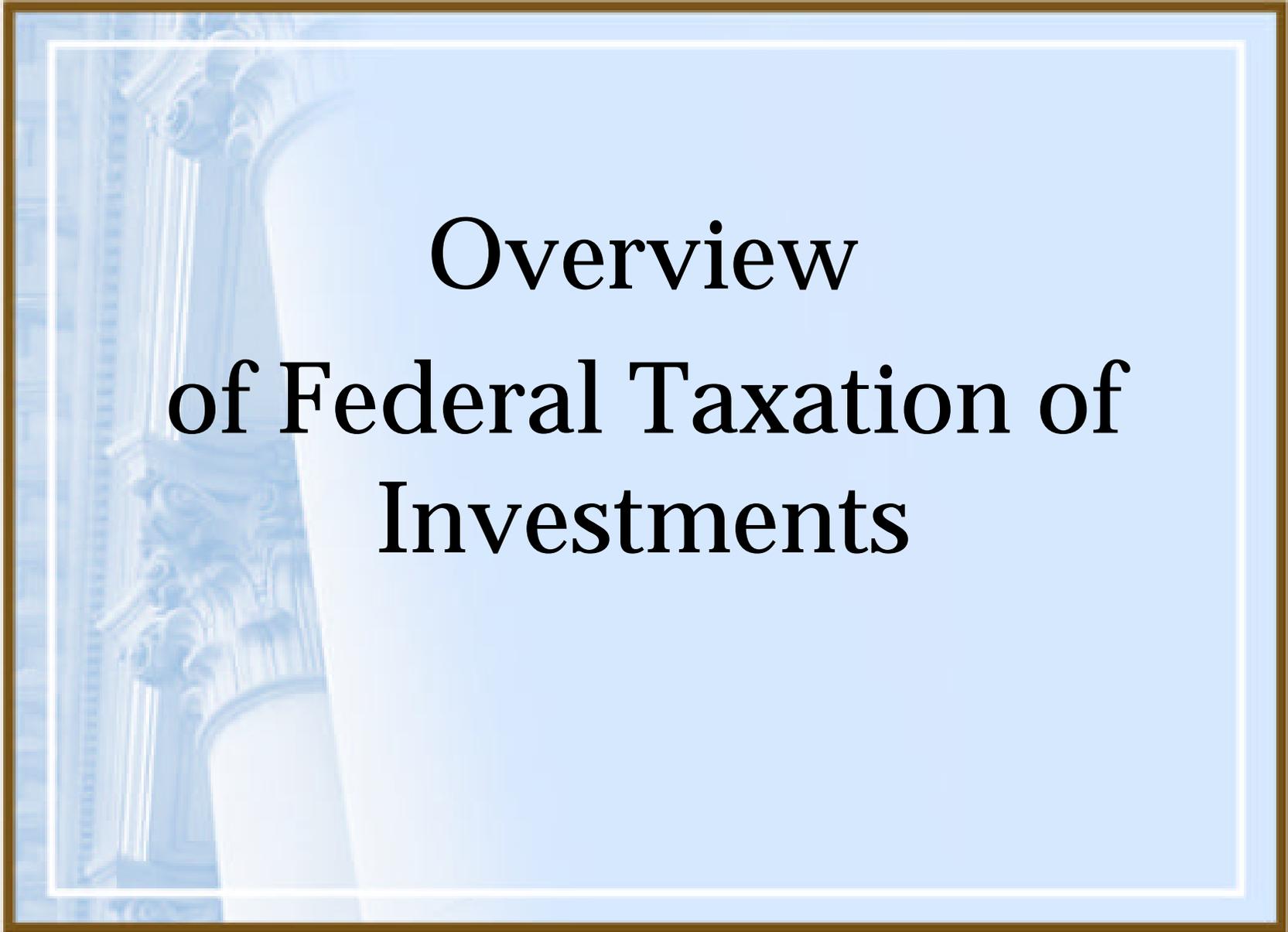
Municipal bonds 1.3%

Government bonds 0.8%

Treasury bills 0.9%

*Source: Ibbotson Associates (2005)*

*These results would be very different, and more attractive, if the analysis used today's tax rates, which are some of the lowest seen in the post-World War II era.*



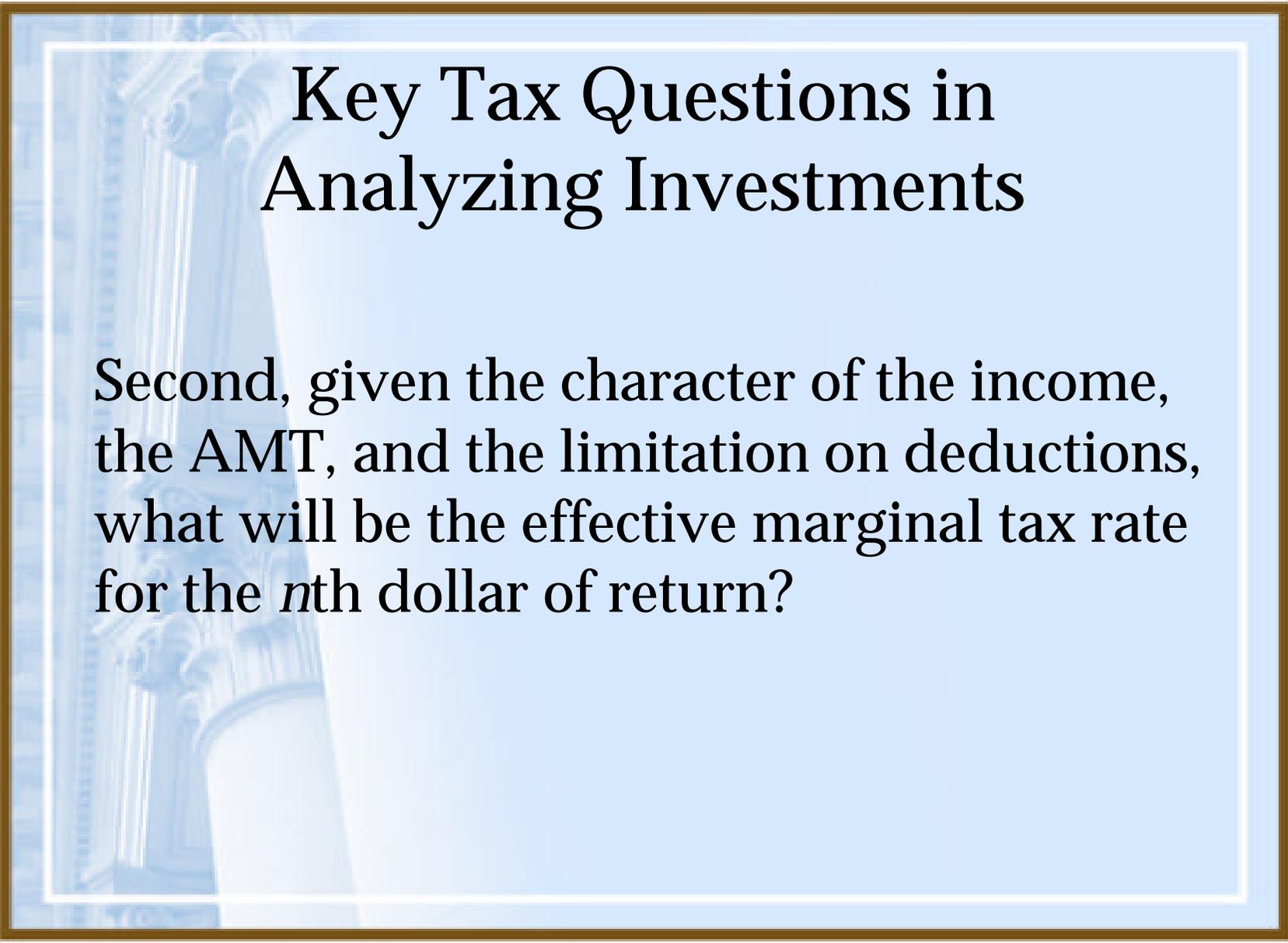
# Overview of Federal Taxation of Investments

## **Three Factors Determine the Amount of Tax**

- Tax “Rate”
- “Character” of Income
- Applicable “Netting” Rules

# Key Tax Questions in Analyzing Investments

First, what is the *character* of the components of expected return, e.g., ordinary income; dividends; long-term capital gains; short-term capital gains; asset class-specific tax rates; federal tax exemptions; state/local tax exemptions; foreign income subject to withholding.

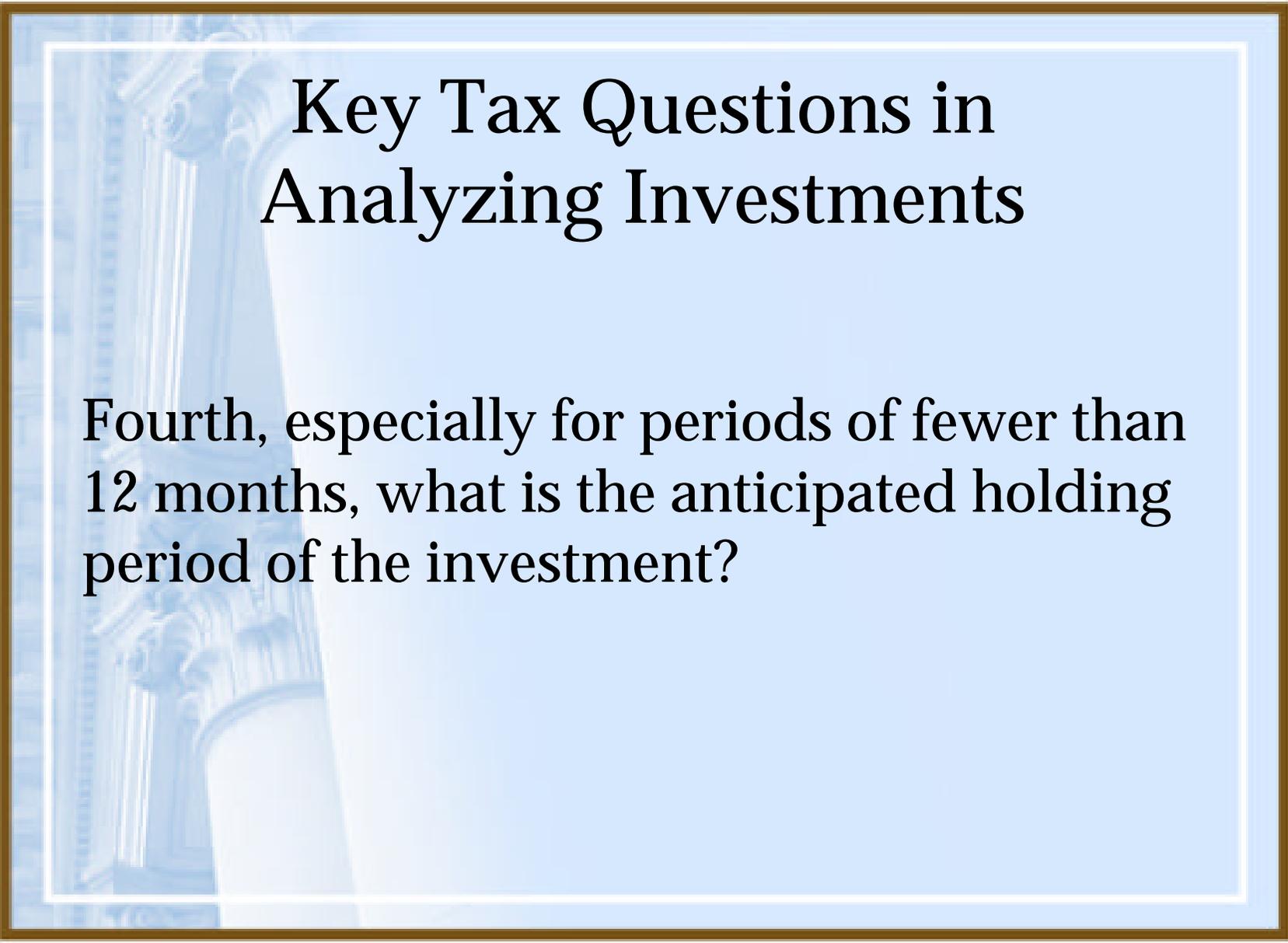


## Key Tax Questions in Analyzing Investments

Second, given the character of the income, the AMT, and the limitation on deductions, what will be the effective marginal tax rate for the  $n$ th dollar of return?

## Key Tax Questions in Analyzing Investments

Third, what deductions, expenses, or offsets are available to reduce the tax on the investment return? Does this investment make the most efficient use of those potential benefits? Will the taxpayer be subject to the AMT, and if so, how will being subject to the AMT affect the net treatment of taxable income?

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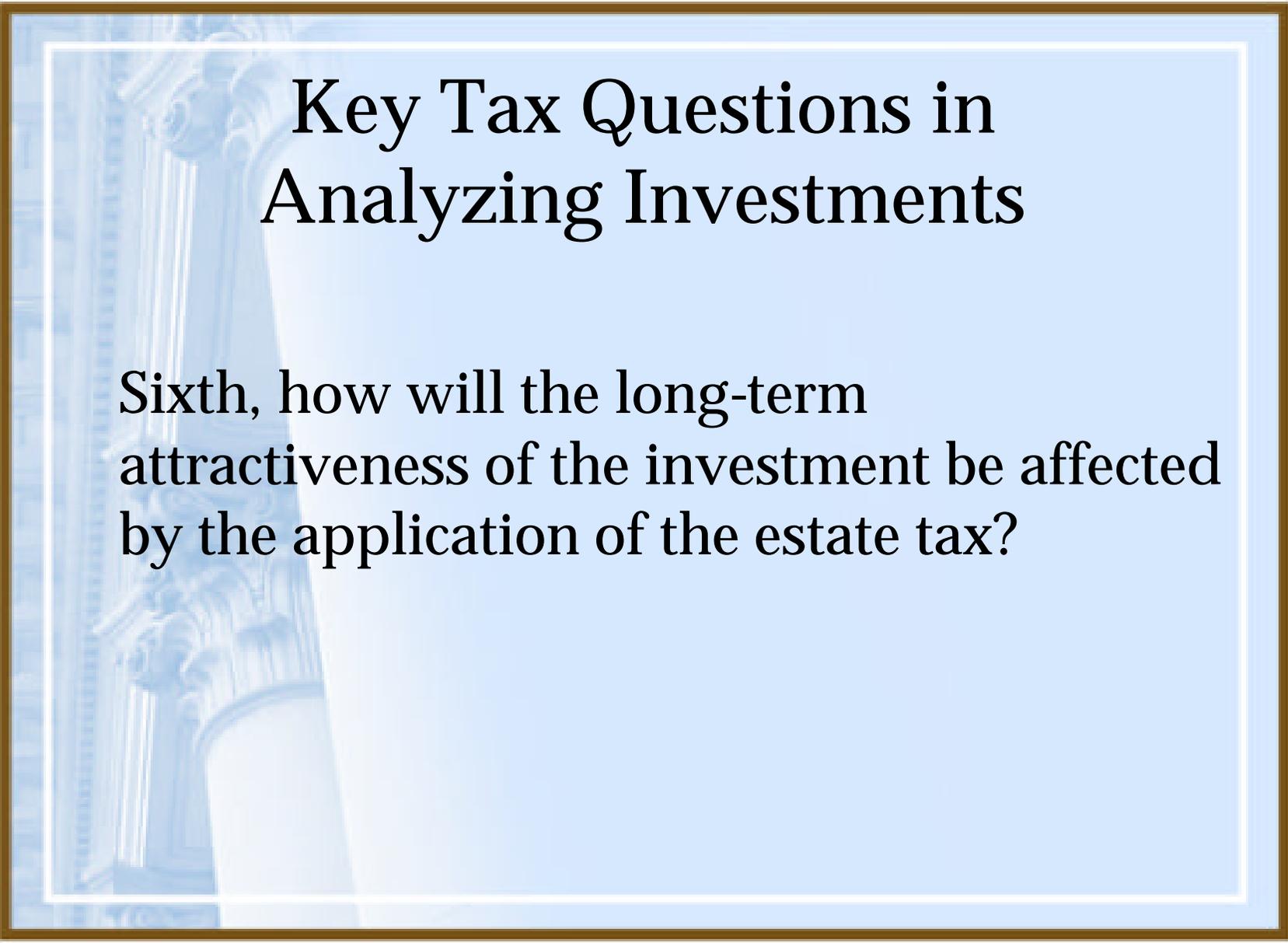
## Key Tax Questions in Analyzing Investments

Fourth, especially for periods of fewer than 12 months, what is the anticipated holding period of the investment?

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## Key Tax Questions in Analyzing Investments

Fifth, how will potential future changes in tax rates affect the after-tax risk and return attractiveness of the investment?

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## Key Tax Questions in Analyzing Investments

Sixth, how will the long-term attractiveness of the investment be affected by the application of the estate tax?



# Techniques for Improving After-Tax Investment Performance

## Wealth from \$10,000 Invested after Different Tax Rates Applied

	<b>5 Years</b>	<b>10 Years</b>	<b>20 Years</b>
<u>ROR=5%</u>			
15% LTCG tax	\$2,310	\$5,160	\$12,990
35% STCG tax	\$1,730	\$3,770	\$8,960
<u>ROR=10%</u>			
15% LTCG tax	\$5,040	\$12,610	\$41,120
35% STCG tax	\$3,700	\$8,770	\$25,240

Notes: LTCG = long-term capital gains; STCG = short-term capital gains

# Summary

*Investment tax strategies fall into a few broad categories:*

- Convert the character of taxable return from high-tax ordinary income or short-term capital gains into low-tax long-term capital gains.
- Delay the recognition of gain or income for long periods of time.
- Hold off the recognition of gain or income until death so that only the estate tax, if any, applies.
- Create voluntary losses to offset current gains.
- Use government-sanctioned tax-sheltering vehicles to defer or eliminate taxation of investment returns.

# Asset Management for High Net Worth Investors from the Investment Firm Perspective

Dan diBartolomeo

Northfield Seminar 2006

Stowe Vermont

# What I Want to Cover in This Session

- Crucial differences between managing institutional assets and high net worth clients
  - Changing preference functions through the life cycle
  - Lifestyle and wealth transfer considerations in asset class selection
  - Need to deal with concentrated legacy positions
- Portfolio management as a manufacturing exercise
- Two key tools:
  - Tax Sensitive Portfolio Optimization
  - Analytic Hierarchy Process

# The Challenge of Private Clients

- Private clients are heterogeneous. They require a high degree of customization
  - Most investments are taxable, and taxes are a vastly bigger issue than the transaction costs that all investors face
  - Private investors will have different pools of wealth set aside to fund specific consumption events
  - Investor preference functions evolve during a finite life span. The goals and objective will be constantly changing
  - The desire to liquidate investment assets for consumption is less predictable than institutions
  - Too much similarity among multiple private client accounts can be considered an illegal, unregistered mutual fund by the SEC

# Good practices for Private Clients

- Even very wealthy individuals rarely have a staff of investment experts and consultants to help them create sound investment policies
- It is incumbent upon the investment firm to act in a greater fiduciary capacity
  - Clients have to be educated about the economic ramifications of policy decisions in an *after-tax* context, particularly the pros and cons of active versus passive management of taxable assets
  - You can't assume that if an investor buys into your investment product that it's the right product for them
- For institutional portfolios, the intellectual capacity of the investment firm can be concentrated on the investment markets. For high net worth individuals equal attention must be focused on constant adaptation to client needs and preferences

# Checklist for institutional managers taking on a private client

- Private client objectives are not easily summarized in conventional benchmark indices
  - What is the economic meaning of “after-tax” tracking error?
  - “Suitability” means as much as optimality
- Taxes are a key driver
  - Use effective tax rates for asset allocation decisions
  - Run security portfolios with tax-efficiency in mind
  - Tax “alpha” is real, consistently available and large (30 to 100 bps)
- Asset managers have a fiduciary duty to advise clients sensibly
  - What’s your realistic expectation of your active management alpha after taxes? If it’s negative, passive management is the way to go
- The volatility of after tax returns is reduced proportionately to the effective tax rate

# More issues for institutional managers taking private clients

- Risk management policies matter even more for taxable investors.
  - It can be very expensive to revise asset allocations
- Private clients often have large concentrated positions as a result of inheritance or business ownerships
  - Any transition strategy must weigh taxes carefully against the improved compounding through lower risk
- Private clients care a lot about absolute return and risk
  - You need cash for spending
  - Taxes are levied on absolute profits, not index relative profits

# Portfolio management as a manufacturing exercise

- “Mass customization” is the key to managing large volumes of high net worth clients. Separate the investment process into three distinct roles
  - Client relationship to define client needs and wants
  - Investment research and “best ideas” investment models
  - Adaptation of “best idea models” to individual client needs. This is the usual bottleneck for large volumes, but it can now be effectively automated
- Most firms do a poor job with private client accounts
  - Taxes are often ignored, or treated as a last minute afterthought
  - Or they use taxes as an excuse to do “pseudo passive” management at active management fees

# Tax Aware Investing is a Challenge Worthy of Pursuit

- Active Strategies that produce excess returns pre-tax may still produce negative excess returns after-tax
  - “Is Your Alpha Big Enough to Cover its Taxes?” Robert Arnott & Robert Jeffrey, *Journal of Portfolio Management*, 1993
- Taxable Accounts are labor intensive
  - Each account is different
  - Accounts may be started with different positions
  - Even identical accounts started on different dates will have different cost basis and tax consequences

# Private Taxable Investors

- Individuals
  - Ultra High Net Worth / Family Office
  - High Net Worth / Bank Trust
- Separately Managed Account Programs
  - Large Volume of Accounts
  - But its where the market is headed. SMA assets expected to go from \$600B to \$2.6T in the next 5 years (Paul Fullerton, Cerulli Associates)

# Do Taxes Really Matter?

- Pre-Tax and After-Tax Returns on Mutual Funds are Almost Unrelated
  - Joel Dickson & John Shoven “Ranking Mutual Funds on an After-Tax Basis”, Working Paper 4393, *National Bureau of Economic Research*, 1993
  - Peterson, Pietranico, Riepe and Xu “Explaining After-Tax Mutual Fund Performance”, *FAJ*, January 2002
    - Persistence in after-tax performance
    - Net redemptions hurt, especially in large cap value
    - Investment style and risk level impact after tax returns
    - Turnover is not a determinant of after-tax returns
- Tax Managed Mutual Funds and the Taxable Investor, shows Huge Value of Tax Management
  - KPMG, Edited by Neil Wolfson

# What Do We Do About Taxes?

- We've been thinking about it a long time
  - Elliman of Stillman-Rockefeller showed with computer simulations that stocks must be severely overvalued to be worth selling in taxable accounts for our conference in 1989
- Rigorous Mathematical Analysis
  - Apelfeld, Granito and Psarris, "Active Management of Taxable Assets: A Dynamic Analysis of Manager Alpha", *Journal of Financial Engineering*, 1996
- Index Funds
  - James Garland "The Advantage of Tax-Managed Index Funds", *Journal of Investing*, 1997

# Not Much Other Research

- Academic Studies

- Eli Talmor “Personal Tax Considerations in Portfolio Construction: Tilting the Optimal Portfolio Selection”, *Quarterly Review of Economics and Business*, 1985
- M. Fedenia and T. Grammatikos “Portfolio Rebalancing and The Effective Taxation of Dividends and Capital Gains Following the Tax Reform Act of 1986” *Journal of Banking and Finance*, 1991
- Dann Fisher, David O’Bryan, Tom Schmidt and James Parker “Portfolio Optimization Subject to Tax Bracket Constraints: A Linear Programming Approach” *Journal of American Taxation Association*, 1992

# Simple Answer

- Don't Ever Sell Anything
  - This works for an index funds as long as there is net positive cash flow into the fund. Even for index funds, trade-offs are needed to deal with net negative cash flow
  - The pseudo-passive account became standard for private account managers
  - Doomed to underperformance with active fees for passive management. Clients aren't that dumb any more.

# HNW Current Approach Level 0

- Ignore taxes altogether
- Liquidate existing portfolios of new investors and start fresh
  - Potentially generates large tax liabilities
- Only benefit over a mutual fund is the ability to pass tax losses as well as tax gains through to the investor

# HNW Current Approach Level .5

- Apply some tax management approach to a model account
- Keep all separate accounts identical after that
- Still requires liquidation of pre-existing accounts
- Very sub-optimal as new accounts open at different dates, with different cost basis in positions and different tax circumstances. No individual investor has the “average” tax circumstances
- Only advantage over a “tax sensitive” mutual fund is ability to pass through losses

# HNW Current Approach Level 1

- Use a model account but do year-end tax “loss harvesting”
- Still requires liquidation of pre-existing accounts
- Since different clients started accounts on different dates with different cost basis, accounts will be heterogeneous with respect to losses.
- Use proceeds of sales to buy an index ETF. Hold ETF 31 days, sell and replace with whatever stocks are needed to return to conformity with the current state of the model account
- Disrupts investment strategies during the “wash sale” period
- Potential tax liability on sale of the ETF if the market has risen while you held ETF
- Missed all the opportunities for tax benefits due to temporary declines in stock prices during the year

# HNW Current Approach Level 2

- Use model account, with rule based methods to prevent “tax dumb” transactions
- Example: don’t sell stocks at a gain if the position has been held for more than ten months but less than twelve months
- You can apply rules to pre-existing holdings but as there are no explicit economic trade-offs (taxes, expectations of risk and return), its very hard to “migrate” pre-existing accounts in an automated way
- Rules must be customized to each manager’s style (value, growth, low turnover, high turnover, trading urgency, typical liquidity) or they can easily interfere with investment strategies
- Over time accounts will be come different without a traceable economic rationale for the differences

# HNW Current Approach Level 3

- Full blown “loss harvesting”. Logic comparable to “tax swaps” in municipal bond portfolios.
  - Arnott, Robert D. “Loss Harvesting: What Its Worth to the Taxable Investor?” *Journal of Wealth Management*, Spring 2001, 10-18.
- Sell a stock every time it drops a specific percentage below cost, “banking tax losses”
- May lead to unnecessary transaction costs (no need to harvest losses in a down market) and opportunity costs associated with the wash sale period
- Works best with long horizon value strategies for large cap US equities (insensitive to time of purchase, low trading costs)

# HNW Current Approach Level 4: Doing it Right Seems Complex

- Real tax-aware optimization to explicitly and consistently consider the investor goal to maximize the expectation of risk-adjusted return net of costs
  - $U = E [ R - S^2/T - (C * A) ]$
- We must simultaneously consider a lot of things
  - Return and Risk Characteristics of the Portfolio
  - Tax Lot by Tax Lot Tax Considerations
  - Minimize the Cost of the Tax Spread (Pre-Tax to After-Tax)
  - Provide for Minimal Inhibitions to the Active Investment Strategy (e.g. not limit turnover)
  - Be able to be Highly Automated to Allow Efficient Processing of Thousands of Accounts

# Our Involvement Begins in 1996

- In 1996 a client from a quant firm turned up at my Boston office
  - He asked if our technology could be easily adapted to taxable accounts
  - Stupidly, I said “YES”. Having known this person for many years, I should have known better
- We reviewed the academic literature and didn't find too much that was of practical use
  - We did find one promising technique and built a prototype within six weeks
- Since then we've learned a great deal about how to optimally manage taxable accounts

# The Breakthrough

- A Team from JP Morgan came up with the first practical answer
  - Apelfeld, Fowler and Gordon “Tax Aware Equity Investing” *Journal of Portfolio Management*, 1996
- Treat Capital Gains Taxes as Large Transaction Costs on Position Closing Trades (usually sales) only
  - Represent Different Tax Lots as Different Securities to Allow Different Transaction Costs (Taxes) for each Lot.
- This representation is not immediately compatible with commercially available “factor” risk models that assume asset specific risks are independent (IBM Lot 1 is obviously not independent from IBM Lot 2)
  - You can convert your risk model data to the mathematically equivalent full covariance matrix

# Key Concept: Automate Tax Awareness

- Do Not Try to Limit Turnover, Use It
  - Actively Offset Capital Gains and Capital Losses
  - Imagine a stock on which you have a “sell” rating but it has an unrealized capital gain. Find another with a “sell” or “neutral” rating and a capital loss
  - Sell Both. Now you have fresh cash to invest in new “buy” rated stocks and you’ve offset the taxable gain on one position with the losses from the other
- This is a simple example.
  - Imagine doing all possible combinations of 200 different tax lots of 50 different stocks. Definitely has to be computerized
- A Wide Range of Active Strategies can be Accommodated

# Some Practical Considerations

- Even fundamentally driven strategies can use tax aware optimization to index track the “best ideas” model portfolios for different clients
- Be Tax Aware
  - Adjust alphas to reflect expected after-tax dividend stream
  - Treat capital gain taxes as big transaction costs
  - Amortize taxes to reflect portfolio turnover, compounding value of tax deferral, and likelihood of stepped up cost basis
- Deal with client heterogeneity
  - Adjust risk aversion different risk absolute and index relative preferences across clients
  - Adapt number of stock names to different portfolio sizes
  - Build in compliance constraints such as social responsibility restrictions
- Stock universes with higher cross-sectional dispersion (e.g. small cap) increase the value of the tax deferral option

# The Technology is Proven

- Since 1997, Northfield and other firms have commercialized enhanced versions of the JP Morgan concept
  - Modeling capital gains taxes as linear piecewise transaction costs allows for multiple tax lots, but also allows for use of commercial “factor” style risk models
  - Build in algorithms to handle wash sales, wash sale opportunity costs and rounding to round lots
  - Provide for explicit tradeoffs between expected return attractiveness, portfolio risk and taxes
  - Also handles other types of heterogeneity (i.e. my grandmother was run over by a Pepsi-Cola truck)

# First Level Subtleties

- It's a multi-period problem
  - Returns accrue wealth over time
  - Portfolio volatility risk is experienced over time
  - Taxes and trade costs occur at moments in time
  - Incremental taxes for short-time gains as compared to long term gains
  - My market outlook may change tax preferences
- Wash sales
  - Potential loss of previously realized tax losses
  - Wash sale opportunity costs

# Basic Solution to the Timing Issues

- Amortize all costs over expected life
  - Long term capital gains taxes over expected time horizon (average holding period)
  - Incremental taxes on short term gains amortized over time before getting long term status on the position
  - If explicit returns forecasts are available, consider the opportunity cost of not owning a high-return stock in order to harvest a tax loss
  - Use appropriate geometric, not the linear amortization rate
- Adjust the amortization rate to reflect the probability of realizing improved returns or lower risks during the investment time horizon
  - I have a forthcoming paper on this issue

# Further Adjusting Amortization Rates

- Investors may wish to adjust amortization rates to reflect various circumstances
  - Possibility of escaping capital gains taxes through bequest
  - Deferral of tax payments is worth more when interest rates are high
  - Investors learn whether the market is up or down for the year. They can adjust tax preferences to reflect having net gains or losses as the year progresses
  - Market expectations. Investors' preferences for taxes may change if they have a bullish or bearish view of the market

# Style Biases

- Momentum strategies naturally provide a degree of tax deferral
  - Keeping what's going up (defer capital gains) and sell what's gone down (realize capital loss)
- Value Strategies magnify tax problems
  - Selling what's gone up (realizing capital gains) and keeping what's gone down (defer capital losses)
- Bottom up fundamental strategies are harder to tax-manage
  - There are an almost infinite number of combinations of stocks will give you a particular size, value/growth and earning tilt.
  - Tough to sell IBM even if you hate it if your cost basis is zero

# Performance Reporting

- Former CFA Institute Performance Presentation Standards simply require reporting period returns net of taxes accrued on net realized gains
- Revised standards as of 2003 recommend but not require measurement of contingent tax liabilities. No formulation has yet been accepted as to how to incorporate the contingent tax liabilities into reported performance figures
- Some industry participants are advocating “full liquidation” computation of after-tax return. Assume the portfolio is liquidated at every measurement date, and calculate the percentage change in net value from period to period, adjusted for cash flows.

# Benchmarks

- Standard benchmarks such as the S&P 500, FT and Russell indices don't work
  - After-tax returns on the index depend on the cost basis of the positions which is dependent on the date when the account was set up. The after-tax return for the S&P 500 index is different for an account set up in 1990 and another set up in 1995.
  - David Stein "Measuring and Evaluating Portfolio Performance After Taxes" *Journal of Portfolio Management*, 1998
  - Les Gulko "An After-Tax Equity Benchmark", General Re Working Paper, 1998

# Tax Alpha is A Big Deal

- Horvitz, Jeffrey and Jarrod Wilcox, "Know When To Hold 'Em and When to To Fold 'Em: The Value of Effective Taxable Investment Management", Journal of Wealth Management, Fall 2003
  - Used long-term Monte Carlos simulations on a single asset portfolio (e.g. buying and selling in and out of the same mutual fund). Real portfolios have much greater potential savings.
  - Sensible tax management practices reduced federal taxes about 100 basis points per annum under the old tax law, about 75 basis points under the latest revisions.
  - Shows that tax deferral is not a tax free loan from the government. Rather the government has a subordinated carried interest like a limited partnership. By deferring taxes, wealth grows more quickly which could lead to eventually larger taxes upon termination.

# "Manufacturing" the really custom solution

- You can "manufacture" some very sophisticated cases
  - Offsetting capital gains and losses across asset classes
  - Provide a "tax efficiency overlay" service for clients with external managers
  - Finding the *globally optimal solution* across the multiple portfolios of an entire family, each with its own tax circumstances and constraints
- Gradual transition of concentrated legacy portfolios
  - Exploring the tax/risk efficient frontier to maximize long term wealth accumulation for transition of legacy portfolios
  - A leveraged complementary fund is a more aggressive version

# Private Clients Have Complex Preferences

- Institutional investors have liabilities that are usually clearly defined both in magnitude and time. Not so for private individuals
- Private clients often have complex financial preferences that can cross many lives and even generations
- Many preferences are not easily expressed in a quantitative form that can be reduced to MVO parameters
- Enter the Analytic Hierarchy Process

# Our Other Tool The Analytic Hierarchy Process

- AHP is a methodology that arises from operations research literature. AHP is used as a non-parametric method for making complex, often qualitative decisions in a robust, consistent fashion.
- Thomas Saaty, a professor at the University of Pittsburgh, developed the AHP as a way to improve complex decision making and to identify and weight selection criteria.
- Often used for things like how to decide where to put a large industrial plant. Lots of things to worry about: labor, suppliers, transportation, taxes. And once you build it you can't move it

# Analytic Hierarchy Process: Mechanics

- For *each* evaluation criterion, usually expressed as a multiple choice question, the AHP creates a comparison matrix.
- The upper triangle holds the relative ratings (1-9, with 1 being best) of the alternatives: asset classes or fund managers.
- The diagonal of the matrix is ones – every fund compared with itself is a 1!
- The lower triangle is the reciprocal of the upper triangle:  $x(i, j) = 1 / x(j, i)$ 
  - If A is 9 times as good as B, then B is 1/9 as good as A

# Analytic Hierarchy Process: Mechanics

- When the comparison matrix has been filled, the matrix's first eigenvector will contain the weights to assign to each choice.
- For this application we use these weights as the asset class or manager allocation for that criterion.
- The portfolio weights for each criterion are then averaged using the weight for each criterion.
- It's a form of "importance weighted" average score.

# AHP Isn't New To Investments,

- Khaksari, Shahriar, Ravindra Kamath and Robin Grieves. "A New Approach To Determining Optimum Portfolio Mix," *Journal of Portfolio Management*, 1989, v15(3), 43-49.
- Bolster, Janjigian, and Trahan, "Determining Investor Suitability Using the Analytic Hierarchy Process," *Financial Analyst's Journal*, July/August 1995
- Saraoglu and Miranda Lam Detzler, "A Sensible Mutual Fund Selection Model," *Financial Analysts Journal*, May/June 2002
- We've had excellent success building AHP models for asset allocation for a variety of private client wealth levels

# Conclusions

- Asset management firms that serve an HNW clientele must put as much effort into portfolio adaptation as into investment research.
- Lots of good theory and “best practices” have been developed in recent years on how to manage taxable private clients
- Asset allocation and security portfolio strategies can reliably obtain economically substantial “tax alpha”
- The Portfolio Manufacturing paradigm allows best practices to be implemented cost effectively for large sets of heterogeneous clients
  - Tax aware optimization can be applied to manage for after-tax return at the security level
  - The Analytic Hierarchy Process can be used very effectively to broaden the context of asset allocation to address the complex needs and preferences of private investors

# Integrating Asset Location and Asset Allocation for High Net Worth Investors

Dan diBartolomeo

Northfield Seminar 2006

Stowe, Vermont

# The Asset Location and Allocation Decisions are Inextricably Linked

- The most common integration situation is asset allocation across the entire portfolio of an individual including both taxable and tax deferred accounts
- Another case is an individual entity with multiple managers
- A particularly complex integration situation is a family with multiple individuals, trust funds and tax deferred accounts
- Integration of the location problem can be addressed at both the asset allocation level and the individual security level

# Traditional Asset Allocation Adapted

- The key issue in formulating investment policies is how aggressive or conservative an investor should be to maximize their long term wealth subject to a shortfall constraint (a floor on wealth). One way to express this is

$$U = E\{ R * (1-T^*) - L S^2 (1-T^*)^2 / 2 \}$$

- L is the ratio of total assets/net worth
  - In Northfield terminology  $RAP = 2/L$
  - **$T^*$  is the effective tax rate which can vary by asset class**
- Total assets and liabilities on an investor's "life balance sheet" can be flexibly defined to include the present value of implied assets such as lifetime employment savings, expected expenses such as college tuition, insurance, estate taxes

# Basic Considerations for Taxable Clients

- Consider each asset class inside a retirement account as distinct from its taxable counterpart. The effective tax rates are vastly different
- Evaluate the taxable/tax exempt bond decision inclusive of Alternative Minimum Tax if applicable.
  - The tax on municipal bonds is not zero
  - Tax “loss harvesting” has always been a prevalent practice among tax exempt bond investors
- Asset classes with high degrees of cross-sectional return dispersion (e.g. small cap stocks) offer the greatest opportunities for tax deferral. This can reduce the effective tax rate.

# Integration of tax deferred (i.e. retirement plans) and taxed assets

- There are a whole myriad of “individual retirement plans” for US investors.
  - Either tax deductible contributions and tax deferral
  - Or non-deductible contributions and tax exempt investment earnings
  - For the very wealthy, IRPs are of lesser importance
- Asset allocation and asset location are one problem
  - Treat each asset class inside an IRP as distinct from the normal class with its own effective tax used in asset allocation
  - Funding for unexpected expenditures should be outside the IRP as there are penalties for early withdrawals
  - Most heavily taxed asset such as taxable bonds go inside IRPs
- Rebalancing asset allocations will usually mean moving money from stocks to bonds, so a balanced IRP account can minimize rebalancing tax costs
  - Tax inefficient equity funds can go inside IRPs

# How about an Easy Tax Aware MDA?

- Multiple Discipline Accounts are just multiple SMA managers sold to individuals as a package
- Assume each manager ignores taxes in forming a model portfolio for each client
- If the manager mandates are mutually exclusive, one approach is to just build a benchmark that is the weighted sum of the model portfolios
- Passively tax optimize the combined portfolio against the joint benchmark
  - Return proceeds of tax motivated transactions back to the source account for reinvestment

# A Smarter Tax Aware MDA?

- This works better than the simple approach and is necessary if the manager's have overlapping universes
  - At each rebalancing, take each manager's model portfolio and compute "implied returns" using your favorite model of risk
  - Transform tracking error into risk tolerance to allow for different aggressiveness levels across different managers
  - Form the weighted consensus alpha across all managers for each stock
  - Optimize the portfolio to the joint benchmark using the consensus alphas and tax awareness
- Details at:
  - diBartolomeo, Dan. "A Radical Proposal for the Operation of Multiple Manager Investment Funds", Northfield Working Paper, 1999, <http://www.northinfo.com/documents/61.pdf>
- Vanguard Australia is using this technique very successfully with large pension funds (which are taxable entities)

# Lets Consider A More General Case

- We want to find the globally optimal portfolio for a set of related sub-portfolios
  - Possibly ownership of different assets by different individuals or legal entities
  - Potential different tax rates and legacy positions
  - Legal considerations may require different risk levels of risk aversion in different accounts including position size constraints
- We would like
  - To be tax efficient across the entire portfolio
  - Capture as much pre-tax performance as possible
- We can't just optimize as one big portfolio because we can't move money between accounts

# Stupid Optimizer Tricks

- Transform the problem into a mathematically equivalent problem with uniform risk tolerance and tax rates across all accounts
- Create separate versions of each security for each account such as IBM\_Husband, IBM\_Wife, IBM\_IRA
- Some commercial optimizers can handle “composite assets” which is a single representation of a portfolio (such as ETF or index future)
- The market value of all “\_Husband” securities must always add up the starting value less transaction costs
  - Set position size limits on “versions” as needed
  - Factor constraints at the sub-account level

# Conclusions

- Wealth management for individuals and families will inevitably intertwine asset allocation and asset location
- Asset allocation should be undertaken using effective tax rates for each asset class, treating the same asset class separately for each applicable tax situation
- Procedures exist for handling the impact of asset location on portfolio management strategies across multiple accounts of one individual, or multiple accounts held by multiple entities

# More Stupid Optimizer Tricks

- We manipulate the cost basis of positions to create different tax rates in different accounts
  - To simulate an account with no capital gain tax, we can have any tax rate we want as long as the cost basis of any position is equal to its current market price
- We adjust for different risk aversions by making each version of a security contain a varying degree of leverage
  - IBM in an account that is twice as risk averse can be represented as a composite asset consisting of 200% IBM, -100% cash
- Tax optimize the whole thing against an appropriate joint benchmark

# **Taxable Concentrated Risk**

**Jarrold Wilcox**

**Northfield Seminar  
Stowe, Vermont  
March 27, 2006**



**Wilcox Investment**

# Concentrated Risk Problems

- **Create difficult decisions.**
  - Emotional and business ties.
  - Complex analysis required.
  - Some otherwise obvious remedies fall under tax authority “constructive sale” rules.



# Concentrated Risk Problems

- **May be dealt with by:**
  - Hedging, usually with a “collar” in some form to avoid a cash outlay.
  - Borrowing on margin and diversifying with the proceeds.
  - Pooling risks, as in an exchange fund.
- **Or...**



# Concentrated Risk Problems

- **May be dealt with more simply by:**
  - Diversifying concentrated risk better in the rest of the portfolio (complementary fund).
  - Selling much of the position and paying the taxes.
  - Doing nothing – the lifetime horizon is short and we need the money that would go to taxes.



# Collar Hedging

- **Finance the purchase of a put hedge through the sale of a call.**
  - Custom fees can be high and puts generally cost more than symmetric out-of-the-money calls.
  - Asymmetric tax law can trigger short-term gain treatment but any losses are long-term and unavailable until end of multi-year contract.
- **Prepaid Variable Forward Wrapper**
  - Can skirt margin limitations.
  - Can trigger constructive sale if too little risk



# Using Borrowed Funds

- **One method:**
  - Borrow on margin but offset much of the risk through a short-sale on a market index.
  - Buy portfolio suitable for tax loss harvesting
  - Sell off loss positions in new portfolio
    - To offset taxes on coordinated partial sales of concentrated position.
- **Considerations:**
  - Leverage has involved a financing decision.
  - Unfavorable tax treatment on short sales.



# Risk Pooling

- **Exchange Funds**

- Investors with similar problems pool funds.
- Cleanest way to get diversification.
- But government rules require an additional activity
  - borrowing to buy real estate is typical.

- **Charitable Remainder Trusts**

- Charity can diversify without tax
- But makes sense only if charity attractive otherwise.



# The Simple Alternatives

- **Complementary funds**
  - Constrained mean-variance optimization.
- **Sell partial position and pay tax**
  - Good solution with long lifetime and low tax rate.
  - But tax payment may be large enough relative to discretionary wealth to justify financing analysis.
- **Do nothing.**
  - Best if funds will be gifted or receive step-up in cost basis...
  - within a period too short to recover tax payment through reduced risk or added return.



# Concentrated Wealth Example

## BASIC PROBLEM INPUTS

Concentrated Stock	\$ 1,000,000
Residual Assets	\$ 1,000,000
Pres Value C Tax Liability	\$ 103,962
Other Liabilities	\$ 1,500,000
Initial Discretionary Wealth	\$ 396,038
Initial Disc With %	19.80%

Press to find best current plan for concentrated stock.

## EXPANDED PROBLEM INPUTS

Tax Liab. Discnt Rate	6.00%
Conc Stk Cost Basis	\$ 125,000
Unrealized Gain %	87.50%
Current Gains Tax	15.00%
Future Gains Tax	15.00%
Years to Liquidation	4
Future Tax Liability	\$ 131,250

	Concentrated Stock	Replacement Stocks	Replacement Bonds	Residual Assets
<b>Initial Weights</b>	50.0%	0.0%	0.0%	50.0%
<b>Ideal Weights</b>	1.4%	43.5%	5.1%	50.0%
<b>Difference</b>	-48.6%	43.5%	5.1%	0.0%
<b>Trading Cost</b>	0.80%	0.20%	0.10%	0.25%
<b>Mean Pre-Tax Return</b>	15.0%	10.0%	5.0%	8.0%
<b>Std Dev Pre-tax Rtn</b>	40.0%	15.0%	6.0%	12.0%
<b>Effective Tax-Rate</b>	14%	14%	35%	25%
<b>Return Correlations</b>				
Concentrated Stock	1.00	0.60	0.00	0.50
Replacement Stocks	0.60	1.00	0.00	0.60
Replacement Bonds	0.00	0.00	1.00	0.40
Residual Assets	0.50	0.60	0.40	1.00
Maximum Weight	50.00%	50.00%	50.00%	50.00%
Minimum Weight	0.00%	0.00%	0.00%	50.00%



# Concentrated Wealth Example -- II

## INTERMEDIATE CALCULATIONS

Concentrated Stock	\$	27,376	Total Weights	0	100.0%
Total Assets	\$	1,862,411			
Pres Value C Tax Liability	\$	2,650	Disc With %	19.32%	
Other Liabilities	\$	1,500,000	Leverage	5.18	
Discretionary Wealth	\$	359,761			
		<b>Concentrated</b>	<b>Replacement</b>	<b>Replacement</b>	<b>Residual</b>
		<b>Stock</b>	<b>Stocks</b>	<b>Bonds</b>	<b>Assets</b>
after-tax rate		86%	86%	65%	75%
after-tax mean		12.90%	8.60%	3.25%	6.00%
Mean Contributions		0.18%	3.74%	0.17%	3.00%
after-tax risk		34.40%	12.90%	3.90%	9.00%
after-tax risk matrix		0.3440	0.0000	0.0000	0.0000
		0.0000	0.1290	0.0000	0.0000
		0.0000	0.0000	0.0390	0.0000
		0.0000	0.0000	0.0000	0.0900
Covariance matrix		0.118336	0.0266256	0	0.01548
		0.0266256	0.016641	0	0.006966
		0	0	0.001521	0.001404
		0.01548	0.006966	0.001404	0.0081



# Concentrated Wealth Example -- III

## RESULTS

Portfolio Mean Return	0.0709	<b>Port Mean Return</b>	<b>7.09%</b>
Portfolio Variance	0.0088	<b>Portfolio Risk</b>	<b>9.40%</b>
Disc Wealth Mean	0.3668		
Disc Wealth Variance	0.2368		
<b>Expected Subsequent Growth Rate of Discretionary Wealth</b>			<b>24.84%</b>
<b>Current % Loss of Discretionary Wealth</b>			<b>9.16%</b>
<b>Growth Adjustment for Initial Loss</b>			<b>-2.40%</b>
<b>Expected Growth Rate of Discretionary Wealth</b>			<b>22.44%</b>



# Useful Tools for Analysis

- **Effective Tax Rates:**
  - Short-term gain treatment (highest)
  - Dividends
  - Effective long-term gain
  - Heirs step-up in basis and gift exclusions (lowest)
- **Mean-variance optimization, embedded within...**
- **Discretionary wealth financing paradigm.**
  - Financing objective:  $LE - L^2V/2$ .



A question for discussion...

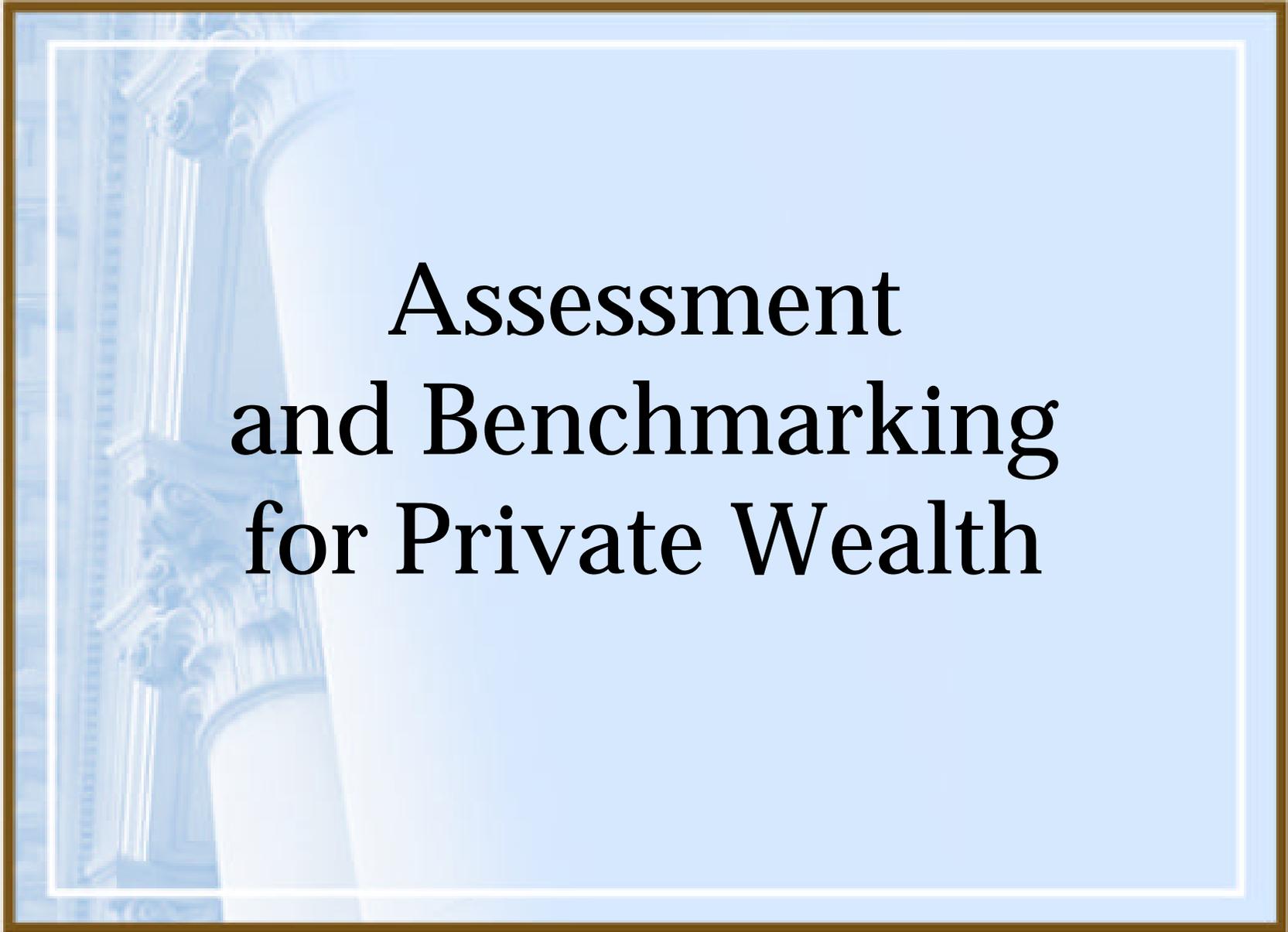
**A new client holds \$30 million dollars in low cost basis Microsoft stock, and \$5 million in other financial assets, plus a magnificent house overlooking the water.**

What do you ask them?

What do you tell them?



Wilcox Investment



# Assessment and Benchmarking for Private Wealth

**An appropriate assessment method for private wealth must meet, at a minimum, the following criteria:**

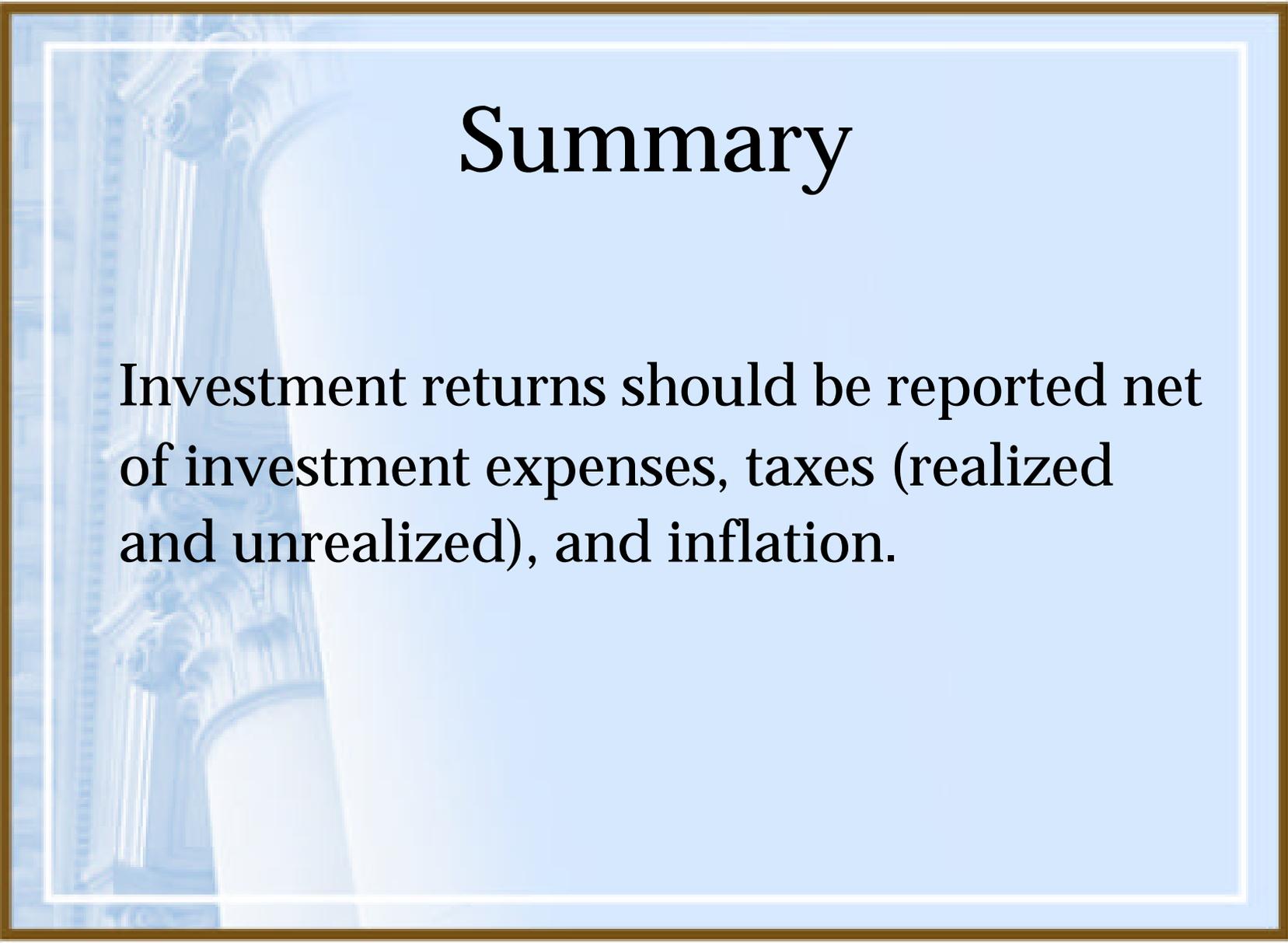
1. Risk and return measures must ultimately extend to the question of purchasing power.
2. The tax inputs in the calculations must be idiosyncratic to the specific investor; they cannot be general tax rates.
3. The advisor must have a clear, quantified understanding of at least the minimum wealth and spending levels that must be maintained at all times.
4. If the investor is responsible for other family members or charities, the analysis of the investment plan and its performance should take these people or organizations into account—their available assets, spending/saving, and taxation.

As a start, a performance report might be constructed as follows:

1. Gross return (net of transaction costs) of client portfolio,
2. Return net of management fees,
3. Return net of #2 and implied taxes, and
4. Return net of #2, #3, and inflation.

# Summary

Approaches to assessing the performance measurement and benchmarking needs of wealthy individuals need to be comprehensive and need to recognize the highly individualized nature of each investor's circumstances:



# Summary

Investment returns should be reported net of investment expenses, taxes (realized and unrealized), and inflation.

# Summary

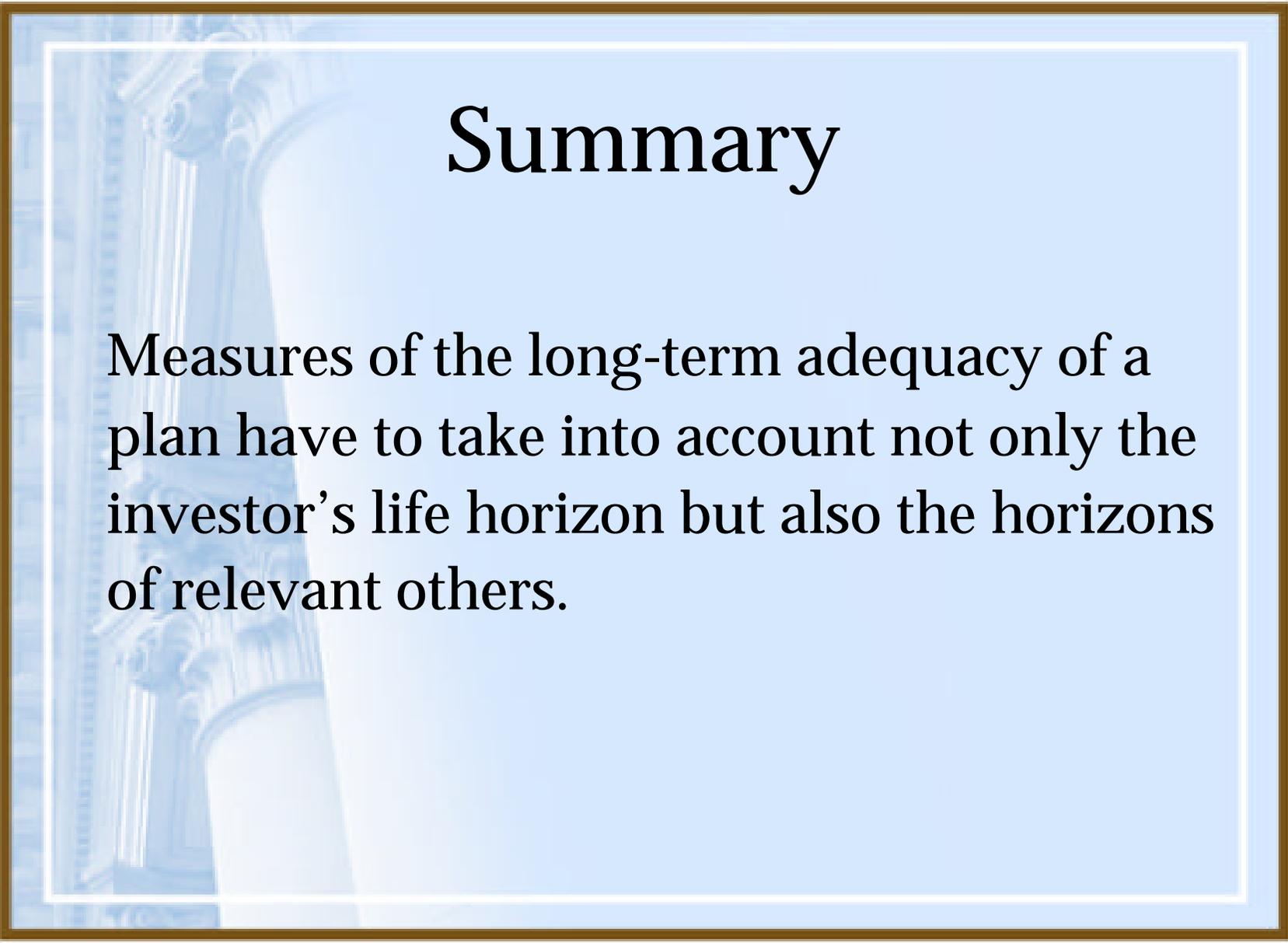
Taxes should be calculated on the basis of the actual circumstances in the tax year of the report and should take into account ex-portfolio tax factors.

# Summary

Measures of risk need to be adjusted for the actual tax circumstances of the investor and should be reported in the context of the specific shortfall constraints.

# Summary

To properly assess a portfolio's purchasing power, measures of wealth accumulation have to take into account inflation and consumption.



# Summary

Measures of the long-term adequacy of a plan have to take into account not only the investor's life horizon but also the horizons of relevant others.

# Summary

For accurately assessing whether the investor's goals are likely to be met by the plan, the advisor must use an integrated approach that considers *all* the entities holding the investor's monies.