

# Managing Legacy Portfolios with Concentrated Positions



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## The Problem

- Legacy Portfolios are often poorly diversified with low cost basis.
  - This makes it expensive to trade to a “better” portfolio that:
    - More properly suits the investor’s risk and return preferences.
    - Is more timely with regard to investment opportunities arising from active management.
- Paying long term capital gains taxes to diversify the portfolio may be in the investor’s best interest
  - But many investors are tax-phobic and place constraints on the maximum tax they are willing to pay.
- How do we manage the portfolio with respect to the realization of capital gains, both short term long term resulting from very low cost basis concentrated positions?

## Concentrated Portfolios

- Of the many reasons why investors have concentrated portfolios, two are typical:
  - A senior manager of a company accumulates a **large single stock** position in their employer through options or stock grants.
    - For various contractual and career reasons, managers must continue to hold that position during their employment.
  - A bank trust department manages a trust portfolio for decades.
    - This portfolio creates income for the beneficiary but transfers to the remainder-persons at a low cost basis.
    - Typically these portfolios have 50 or less dividend paying “blue-chip” mega-cap stocks.
    - The higher yield stocks allow for a high distribution to the beneficiary while still holding equities.
    - The managers tend to favor very low turnover and a very low cost basis
    - These portfolios have about 6-10% tracking error to S&P 500 or the Russell 1000.

## Literature Prior to 1994

- Talmor, Eli. “Personal Tax Considerations in Portfolio Construction: Tilting the Optimal Portfolio Selection,” *Quarterly Review of Economics and Business*, 1985
- Fedenia, M. 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
- Fisher, Dann, David O’Bryan, Tom Schmidt and James Parker. “Portfolio Optimization Subject to Tax Bracket Constraints: A Linear Programming Approach,” *Journal of the American Taxation Association*, 1992.
- Arnott, Robert and Robert Jeffrey. “Is Your Alpha Big Enough to Cover its Taxes,” *Journal of Portfolio Management*, Spring 1993.
- Dickson, Joel M. and John Shoven, “Ranking Mutual Funds on an After-Tax Basis,” Working Paper 4393, National Bureau of Economic Research, 1993
- Dickson, Joel M. and John Shoven, “A Stock Index Mutual Fund without Net Capital Gains Realizations,” Working Paper 4717, National Bureau of Economic Research, 1994

## Literature Between 1996 and 2000

- Apelfeld, Roberto, Gordon Fowler and James Gordon, “Tax Aware Equity Investing,” *Journal of Portfolio Management*, Winter 1996.
- Apelfeld, Roberto, Michael Granito and Akis Psarris. “Active Management of Taxable Assets: A Dynamic Analysis of Manager Alpha,” *Journal of Financial Engineering*, 1996
- Garland, James, “The Advantages of Tax-Managed Index Funds,” *Journal of Investing*, Spring 1997
- Gulko, Les. “An After-Tax Equity Benchmark,” General Re Working Paper, 1998
- Stein, David, “Measuring and Evaluating Portfolio Performance After Taxes,” *Journal of Portfolio Management*, 1998.
- Wolfson, Neil, “Tax Managed Mutual Fund and the Taxable Investor,” KPMG Working Paper, New York, 2000.
- Dickson, Joel M. and John Shoven, “Tax Externalities of Equity Mutual Funds,” Working Paper 7669, National Bureau of Economic Research, 2000

## Literature after 2000

- We now get entire books written about tax efficient investment management and concentrated wealth in particular.
  - Kochis, Tim, *Managing Concentrated Stock Wealth*, Bloomberg Press, 2005
  - Rogers, Douglas, *Tax Aware Investment Management*, Bloomberg Press, 2006
  - Wilcox, J., diBartolomeo, D. and Horvitz, J., *Asset Management for Private Investors*, CFA Institute, 2005
    - Wilcox, Jarrod. "Harry Markowitz and the Discretionary Wealth Hypothesis," *Journal of Portfolio Management*, 2003.
    - Horvitz, Jeffrey and Jarrod Wilcox. "Know When to Hold 'em and Know When to Fold 'em," *Journal of Wealth Management*, 2003.

## Long Term vs. Short Term Capital Gains

- Avoiding net short term gains should be the key goal of tax-management of assets that ***are matched to lifetime*** spending goals.
- We can calculate the expected value of compounding deferral of long-term capital gains for different horizons.
  - This allows the returns to compound at a higher rate than the discounted taxes, increasing the NPV of the tax deferral.
- The actual value of tax deferral is higher than the tax burden because it is the investor's option as to when to realize long term capital gains based on current future tax considerations and changing preferences between investment and consumption.

# The Optionality of Long Term Capital Gains

- With concentrated stock positions, you have the option of being able to avoid taxes on low cost basis assets by:
  - Selling them at a later time when you might be in a lower tax bracket. This is unlikely, but possible, for high net worth investors.
  - Putting them in an exchange fund and exchange liquidity for diversification.
  - Collaring them to reduce the chance of a major melt-down severely reducing terminal wealth.
    - Enron or any of the high-flying tech stocks like Sun Microsystems that crashed and have never come back.
    - You can estimate the collar's delta and use Northfield's composite asset feature to estimate portfolio risk reduction as the stock price evolves.
    - Having them step up in cost basis as part of your estate.
  - Putting them in a trust that will continue for several more generations.
  - Giving them to charity and avoiding taxes altogether.
  - Making gifts to children, grandchildren or great-grandchildren can lower tax rates or postpone estate taxes for a century or more.



## How Much Do You Intend to Spend?

- Jarrod Wilcox introduces the idea that one's risk preferences are a function of both capital market expectations and the ratio of total to discretionary assets.
  - Discretionary assets are those that you do not intend to match your planned lifetime spending (liabilities).
  - Leverage is the ratio of your total assets to your total liabilities
  - How do you estimate your liabilities?
    - Hire Jarrod and he will do it for you.
    - Tim Kochis (Managing Concentrated Stock Wealth) will, too.
    - Many financial planners estimate your lifetime spending needs.
    - Other financial advisors can provide you with an “optimal model portfolio” and you can use Wilcox's utility equation to estimate your implied liabilities relative to your financial assets.

## Wilcox's Equation for Utility

$$\text{Utility} = L \times E[r] - L^2 \times \sigma^2/2 + L^3 \times \text{Skew} \times \sigma^3/3 - L^4 \times \text{Kurtosis} \times \sigma^4/4$$

where:

**E[r]** = Expected returns, net of taxes

**L** = Leverage = Assets / (Discretionary Wealth)

Discretionary Wealth = Assets – Liabilities

**Liabilities** are the net present value of the expenses that *must be met* in order to meet the specified minimal acceptable living standard.

$\sigma$  = portfolio standard deviation of the after tax returns.

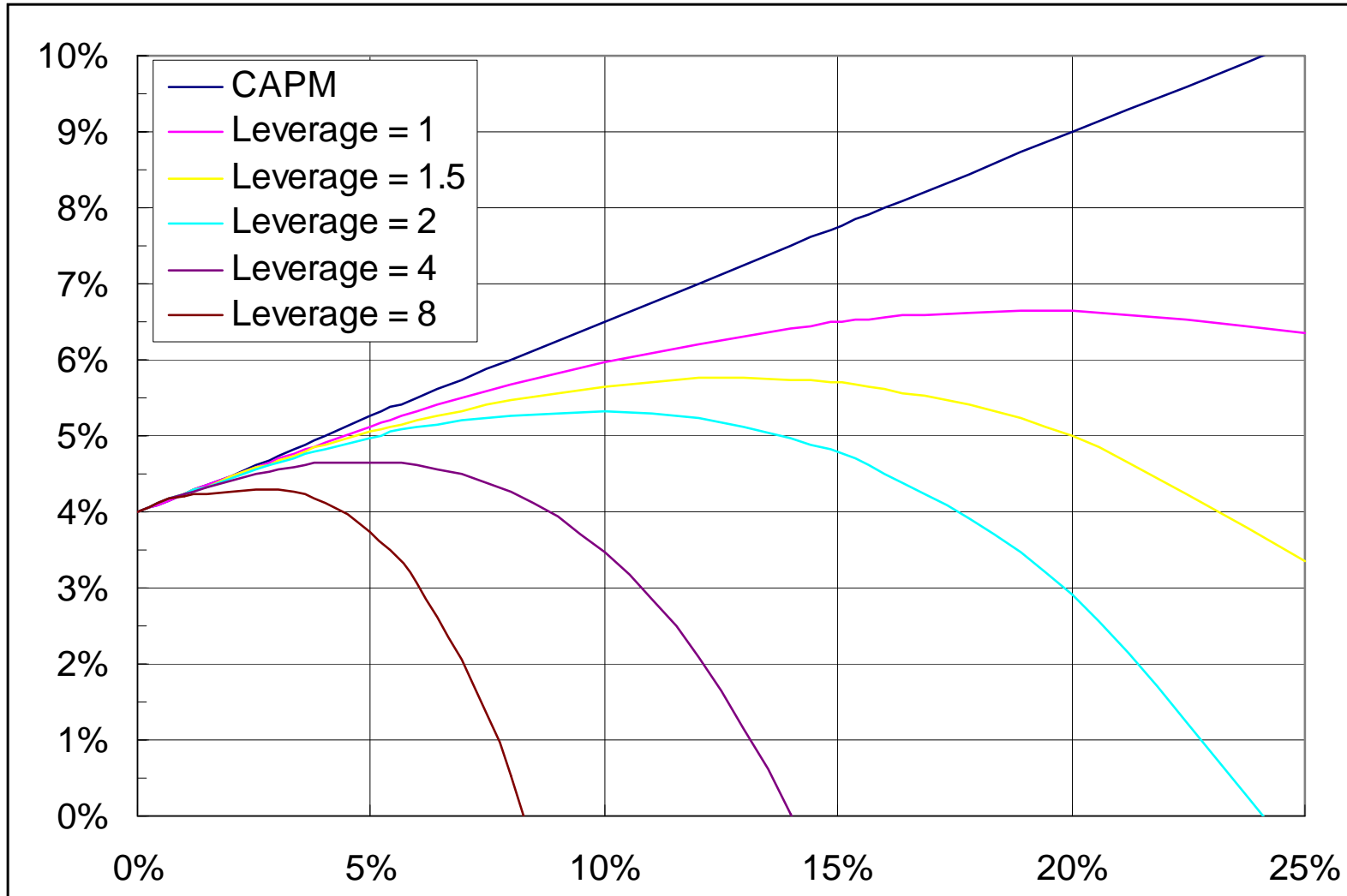
**Skew:** Negative skew implies that large negative returns are more likely than predicted by a normal distribution.

**Kurtosis:** The kurtosis of a normal distribution is equal to 3, not zero. A distribution with a kurtosis that exceeds three implies that large negative and positive returns are more likely than predicted by a normal distribution.

## Capital Market Assumptions

- Risk Free Rate = 4% -- this is irrelevant but makes the picture easier to understand.
- The after tax market price of risk (slope of the CAPM line) is 0.25. In other words, for every additional 4% risk, we pick up 15 return.
- Skew is -0.75
  - This is consistent with historical returns for the past twenty years and a globally diversified stock and bond portfolio ranging from 75/25 to 25/75.
  - This conservative estimate models many investors' inherent sensitivity to unfavorable outcomes.
- Kurtosis is 4.0
  - This is also consistent with historical returns used to estimate skew.

# Utility vs. Risk for Various Leverage Values



# Concentrated Positions and Consequent Risk

*There is no greater illustration of the power of diversification than the potential negative outcomes of holding a single security position.*

Consider a client with a position in a single security with no expectations that this security will do any better or worse than the market. Assume this security has average stock specific risk.

	Annualized		5 Year Horizon			
	Return	Risk	Return	Risk	5% VAR	10% VAR
<b>Diversified Portfolio</b>	10.0%	15%	61%	34%	5.9%	18.1%
<b>Concentrated Stock</b>	10.0%	35%	61%	78%	-67.7%	-39.2%
<b>Risk Equivalent Return</b>	18.6%	35%	135%	78%	5.9%	34.3%

Source: Placemark Investments

This notional client would need to expect that their single security would outperform the market by 860 bps annually for the next 5 years to have the same 5% level of VAR.

*But how much will taxes burden the portfolio if transitioned?*

## Approaches to Tax Management

- Never sell anything. This is typical of bank trust departments, even today.
- Use end-of-year loss harvesting. This requires a manager that has overcome the reluctance to realize losses.
- Use tax aware optimization to balance tax costs vs. tracking error and expected return.
  - Passive strategies use an index, such as the Russell 1000, to ensure that gains will not be realized if the security .
  - Active Strategies:
    - Use an overlay to a designated manager allocation. Optimization postpones or loss-matches client portfolios to avoid short term capital gains. Realized alpha requires effective manager selection.
    - Directly input stock or factor alphas into portfolio optimization. Realized alpha requires sufficient IC to offset trading costs.

# “Variety of Security Returns”

## Northfield High Net Worth Conference 2008

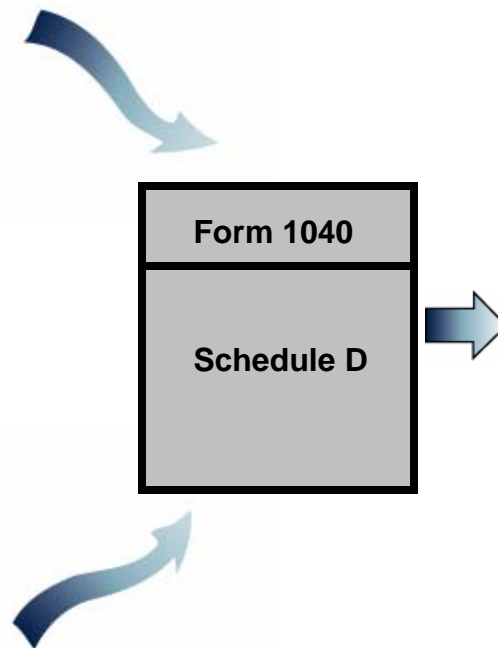
Dan diBartolomeo’s three assertions concerning the management of taxable portfolios:

- Experience suggests that asset managers are unable to parameterize portfolio construction problems so as to provide an optimal balance between capital growth, risk control and tax avoidance for taxable investors
- Dan asserts that the key to correctly balancing tax avoidance with risk adjusted returns is understanding the economic value of the option to realize capital gains at a time of the investor’s choosing
- The value of the “tax timing” option is directly related to the expected cross-sectional dispersion (“variety”) of asset returns within the investor’s portfolio

# A Sample Client's Tax Liability

<b>Manager A</b>	
<b>End of Year Value</b>	\$1,000,000
<b>Realized Gains and Losses</b>	
Short-term Gain	\$75,000
Short-term Loss	\$ -
Long-term Gain	\$ -
Long-term Loss	(\$75,000)
<b>Taxes Due</b>	<b>\$0</b>

<b>Manager B</b>	
<b>End of Year Value</b>	\$1,000,000
<b>Realized Gains and Losses</b>	
Short-term Gain	\$ -
Short-term Loss	\$ -
Long-term Gain	\$75,000
Long-term Loss	\$ -
<b>Taxes Due</b>	<b>\$11,250</b>



<b>Client</b>	
<b>End of Year Value</b>	\$2,000,000
<b>Realized Gains and Losses</b>	
Short-term Gain	\$75,000
Short-term Loss	\$ -
Long-term Gain	\$75,000
Long-term Loss	(\$75,000)
<b>Taxes Due</b>	<b>\$26,500</b>

*Tax Management Requires  
Integrated Realization of Gains  
and Losses*



## A Hypothetical Simulation

A portfolio in January 1998 contains about 40 stocks that combine:

- The remainder portion of a trust managed by a large New York bank's trust department.
- A retail account that was created by "building positions" by a major wire-house.
- A few very large positions with very low cost basis that resulted from employment in the computer industry.

<b>Stock</b>	<b>Portfolio Weight</b>	<b>Cost Basis / Price</b>
<b>Portfolio</b>	100.0%	14.4%
<b>IBM</b>	30.2%	1.7%
<b>Boeing</b>	16.2%	22.5%
<b>Sun Micro Systems</b>	10.9%	1.6%
<b>Coca-Cola</b>	9.2%	9.0%

## Compare Four Strategies

- Buy and Hold
- Active management but ignoring taxes by reducing tax rates to zero.
- Optimally rebalanced with taxation modeled as a transaction cost.
- We relax the long-only constraint to improve both:
  - The strategy's transfer coefficient (Clarke, de Silva and Thorley [2002])
  - The strategy's tax efficiency:
    - At 130/30, the initial rebalancing allows 30% fresh long positions with current cost basis. These positions are available for loss harvesting and replacing with "new ideas."
    - We can loss harvest most of the stocks on the short side of the portfolio in a rising market, and replace them with new short opportunities.

## A Few Ideas

- The benchmark is the Northfield Fundamental Model Estimation Universe.
  - This simulates a multi-manager portfolio with allocations to large cap, small/mid-cap and international ADR managers.
- This benchmark is essentially the union of:
  - The Russell 3000
  - The largest ADRs in the Northfield fundamental universe, with new additions added annually but most existing companies retained. This grows from about 200 to about 400 over the ten-year period.
- Alternatively (but not simulated) we could use a cash or reduced market exposure benchmark:
  - Max R. Arai, “Market Returns without Downside Risk: The Difference Between Beta and the Equity Premium,” *Northfield Conference at Key Largo*, 2007
  - Mike Knezevich, “The Beginner’s Guide to Taxable Portfolio Optimization,” *Northfield High Net Worth Seminar*, January 2008.
    - “You can express both by mixing cash into the benchmark. If the client is twice as worried about absolute risk and return, make the benchmark 2/3 cash and 1/3 your regular benchmark index”

## Ideas for Active Management

➤ Let's assume that we believe that we can manage a wide range of securities using active strategies:

- Internal research and rankings
- Stock rankings from Starmine, QSG, Ford, Columbine, etc.
- Factor alphas such as fundamental tilts that can be directly entered in the Northfield model file:\*

- Value

- Price/Earnings – 25%
- Price/Sales – 15%
- Price/ Book – 15%
- Dividends – 15%

We do not mean to imply that we have any faith that these tilts will succeed in the future.

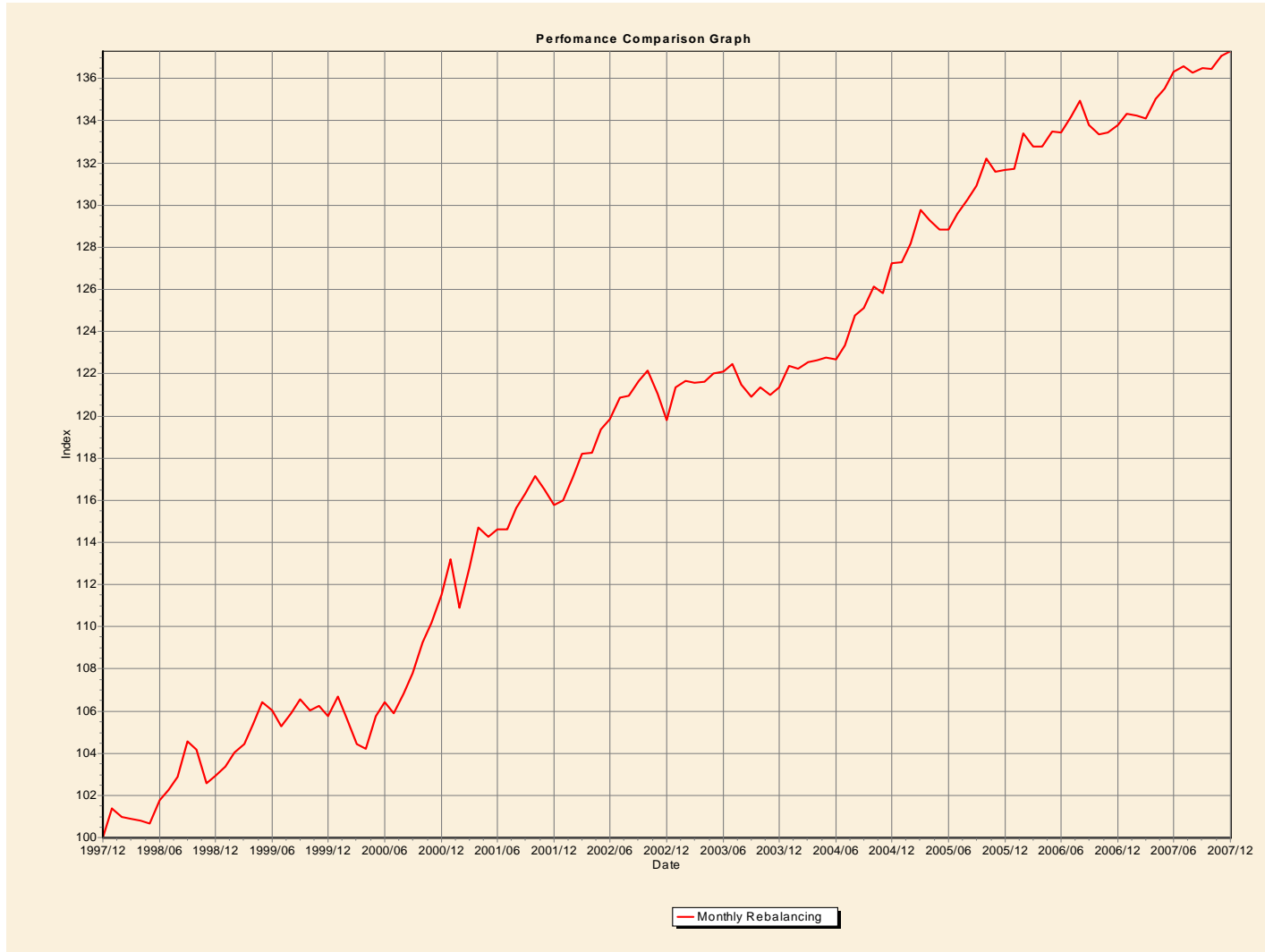
These tilts did work in the past and we use them to simulate active management with at a reasonably high level of skill.

- Growth

- EPS Share Growth – 15%
- Momentum – 15%

\* If you do this at home: Make Sure you **modify a copy** of the Model file and not the one sent by Northfield!

# The Performance of the “Factor Portfolio”



## Comparing the Style Coefficients: Northfield Factor Model Estimation Universe S&P Broad Market Global Index

**What's Missing in the NIS Universe:**

**Non US Value Stocks**  
**Non US Small Cap Stocks**

**What's Missing in the S&P GBMI:**

**½ Domestic Small Cap Stock Weight**

<b>Fund Name</b>	<b>S&amp;P Citi Global Broad Market</b>	<b>Error*</b>	<b>Northfield Fundamental Universe</b>	<b>Error*</b>
<b>Russell 1000 Value</b>	22.42	0.65	24.64	1.50
<b>Russell 1000 Growth</b>	23.93	0.58	36.43	1.33
<b>Russell 2000</b>	<b>5.35</b>	<b>0.53</b>	<b>12.27</b>	<b>1.23</b>
<b>S&amp;P/Citi Primary Growth World xU.S.</b>	17.72	1.26	22.82	2.91
<b>S&amp;P/Citi Primary Value World xU.S.</b>	<b>14.94</b>	1.44	<b>0.00</b>	3.34
<b>S&amp;P/Citi Emerging Markets</b>	3.71	0.39	3.84	0.91
<b>S&amp;P/Citi Extended Markets World xU.S.</b>	<b>11.94</b>	1.16	<b>0.00</b>	2.69
<b>Tracking Error:</b>	1.38		0.60	

# NIS Fundamental Universe vs. World Proxy

**What Weights Do You Need in Complementary Funds  
to best fit the S&P Broad Market Global Index?**

**Using S&P/Citi Indices**

<b>Fund Name</b>	<b>Style Wt. %</b>	<b>Error*</b>
<b>Northfield Fundamental Universe</b>	66.50	1.30
<b>S&amp;P/Citi Primary Value World xU.S.</b>	24.15	1.98
<b>S&amp;P/Citi Extended Market World xU.S.</b>	9.35	1.80
<b>Tracking Error:</b>	1.05	

**Using DFA Funds**

<b>Fund Name</b>	<b>Style Wt. %</b>	<b>Error*</b>
<b>Northfield Fundamental Universe</b>	74.74	1.40
<b>DFA Tax Managed International Value</b>	19.87	2.19
<b>DFA International Small Company</b>	5.38	1.82
<b>Tracking Error:</b>	1.30	

## Statistical Comparison of Management Strategies

<b>Statistic</b>	<b>Bench- mark</b>	<b>Buy &amp; Hold</b>	<b>Ignore Tax</b>	<b>Long Only</b>	<b>130 / 30</b>
<b>Gross Return</b>	8.78%	9.41%	14.87%	14.46%	17.34%
<b>Capital Gains Tax Drain: Trading</b>	0.00%	0.00%	2.26%	0.29%	0.50%
<b>Capital Gains Tax Drain: Corporate Events</b>	0.38%	0.38%	0.38%	0.38%	0.38%
<b>Dividend Tax Drain</b>	0.34%	0.18%	0.27%	0.28%	0.23%
<b>Transaction Cost</b>	0.00%	0.00%	0.50%	0.22%	0.55%
<b>Net Return</b>	8.07%	8.86%	11.47%	13.30%	15.68%
<b>Volatility, Standard Deviation of Returns</b>	15.70%	24.82%	19.02%	16.90%	17.13%
<b>Skew</b>	-0.76	-0.39	-0.65	-0.73	-0.60
<b>Kurtosis</b>	3.93	3.30	3.96	4.36	3.60
<b>Leverage</b>	1.50	1.50	1.50	1.50	1.50
<b>Wilcox's Utility</b>	4.76%	-1.33%	6.01%	9.16%	11.76%



## Comparison of Tax Efficient Strategies

	<b>Buy &amp; Hold</b>	<b>Ignore Tax</b>	<b>Long Only</b>	<b>130 / 30</b>
<b>Initial Optimization Tracking Error</b>	18.50	8.24	6.41	6.61
<b>Average Optimum Tracking Error</b>	18.50	8.18	6.21	6.37
<b>Realized Tracking Error</b>	12.82	6.96	5.92	6.13
<b>Factor / Total Variance</b>	0.37	0.58	0.36	0.32
<b>Average Pre-Optimization Ex-Ante Alpha</b>	-0.63	10.75	5.14	7.10
<b>Average Post Optimization Ex-Ante Alpha</b>	-0.63	11.43	5.55	7.75
<b>Realized Alpha</b>	2.64	6.12	5.64	8.52
<b>Factor / Total Alpha</b>	132%	120%	91%	59%
<b>Annual Tax Drain</b>	0.52%	2.26%	-0.29%	0.25%
<b>Effective IC</b>	-1.37%	2.81%	2.85%	3.28%
<b>Annual Turnover</b>	0.30	99.11	43.90	109.52

## Comparison of Sector Exposures: 1998-2007

Factor	Bench- mark	Buy & Hold	Ignore Tax	Long Only	130 / 30
Material	3.65	0.00	5.91	4.91	4.32
Industrial	18.99	15.39	19.52	19.21	7.77
Telecommunication	10.12	0.72	6.23	7.27	9.68
Consumer Discretionary	10.52	10.53	9.74	11.92	12.84
Consumer Staples	11.76	5.48	4.41	11.77	6.68
Energy	8.51	1.32	7.09	8.97	7.94
Financials	13.14	1.57	23.13	11.90	19.70
Health Care	4.74	3.77	5.70	5.55	11.20
Information Technology	12.44	61.20	12.01	13.66	15.99
Utilities	6.14	0.00	6.26	4.84	3.88

Sector Exposures in Red Are More than 5% Active Weight to the Benchmark

## Comparison of Fundamental Exposures: 1998-2007

Factor	Benchmark	Buy & Hold	Ignore Tax	Long Only	130 / 30
Price/Earnings	23.58	28.26	10.50	14.35	12.31
Price/Books	2.95	5.24	1.46	1.94	1.73
Dividend Yield	1.68	0.89	1.34	1.40	1.15
Trading Activity	0.09	0.13	0.13	0.11	0.11
Relative Strength	1.13	1.15	1.23	1.24	1.27
Market Cap	69,442	109,037	43,148	57,013	67,689
Earnings Variability	0.43	0.45	0.34	0.41	0.32
EPS Growth Rate	13.98	13.86	21.93	16.26	19.23
Price/Revenue	1.49	1.70	0.59	0.78	0.75
Debt/Equity	0.71	0.58	0.62	0.60	0.43
Price Volatility	0.23	0.25	0.27	0.26	0.26

Factor Exposures in Red Are More than One Sigma from Benchmark

## Conclusions

- Tax efficient investing minimizes net short term capital gains while allowing the investor the option as to whether to realize long term capital gains:
  - Based on information not available at previous rebalancing opportunities.
  - Maximizing utility as a function of benchmark tracking error, returns expectations and tax costs.
- Tax efficient investing can be effectively implemented using a uniform managed account.
  - Overlay management derives alpha ( $IR > 0$ ) from skill in manager selection.
- A broad investment universe improves both breadth and variety (cross sectional dispersion) which in turn improves the ability to time loss and gain realization.
  - This can be accomplished in an multi-manager overlay by including managers with a variety of style, market capitalization and geographic diversity.
- Use of 1X0/X0 allocations allow a higher breadth and greater opportunity for loss harvesting, particularly when combined with a highly concentrated initial portfolio with a low cost basis.

## Slide Summary for Review Purposes

- Slides 2-3: Background on who needs tax management
- Slides 4-6: Literature summary
- Slides 7-8: Long term vs. short term capital gains
- Slides 9-12: Wilcox's discretionary wealth hypothesis
- Slide 13: The risks of a concentrated stock position
- Slide 14-16: Approaches to tax-efficient management
- Slide 17-19: A Hypothetical simulation
- Slides 20-21: Benchmark, constraints, strategies, alphas
- Slides 22-23: Compare Benchmark to global portfolio using returns based style analysis
- Slides 24-25: Compare rebalancing strategies risk and return characteristics
- Slides 26-27: Compare rebalancing strategies fundamental and sector exposures
- Slide 28: Conclusions