THE ENDOWMENT INVESTMENT APPROACH: SHOULD WEALTHY TAXABLE INVESTORS REPLICATE THE STRATEGY?

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EXECUTIVE SUMMARY

The Yale Endowment is arguably the most successful investment institution with a 17.2% annualized return from 1986 – 2006. Should wealthy taxable investors replicate their endowment investment approach?

Edge believes that replication of the Yale investment methodology would be difficult for most investors with less than a $60 million liquid portfolio and may not be favorable even if they could. Why?

1. TAXES (AND IRR MYTHS)

- Yale does not pay taxes. We estimate that taxes would have eaten up 150 basis points of Yale's 17.2% annualized return from 1996 – 2006 due to turnover, capital gains, dividends, and interest from their underlying managers and investments.
- If we conduct the same analysis with Yale's active benchmark performance, the effect of taxes is more profound with a 250 basis point drag on performance (over 19% of the pre-tax return).
- We also remind you that there are lies, damn lies, and statistics[1]. While Yale's private equity portfolio has earned a 34.4% annualized IRR over the past 10 years, we estimate the "actual" (modified IRR) pre-tax return to an individual with cash waiting to be called is 21%.

2. ACCESS

- We estimate that an investor must have a liquid portfolio in excess of $60mm at a minimum without incurring additional fees for access. However, this minimum is likely far too low for true replication considering the unpredictable spending needs of the individual investor and high minimums by some investment managers.
- If a typical private equity fund generated a net return of 2.0x committed capital and a 20% IRR, an investor in an access vehicle such as a feeder fund would earn a net pre-tax return of 1.88x committed capital and a 17.2% IRR.
- If a typical hedge fund generated a net return of 12.9% (Yale's 10 year annualized return for "Absolute Return" managers), an investor in a fund of fund would earn a net pre-tax return of 11.0%. Moreover, the investor would earn 7.2% after-taxes.

3. TIME HORIZON

- Yale takes advantage of their high degree of certainty on spending requirements to give up liquidity in search of return. Yale has 44% of its portfolio allocated to illiquid assets. We argue that such a high allocation to illiquid investments is not suitable for individual investors because of their low degree of certainty on spending.

Combining these three factors together, we estimate that taxable investors with less than $60 million in liquid assets would have earned a net 13.8% annualized return from 1996 – 2006 compared to Yale's 17.2% return. This does not even include annual fixed costs for the infrastructure of Yale's illustrious investment office.

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[1] "There are three kinds of lies: lies, damn lies, and statistics." Attributed to Benjamin Disraeli by Mark Twain in "Chapters of My Autobiography", *North American Review*, No. DCXVIII, July 5, 1907
*All calculations above are based on assumptions found in the following pages.

INTRODUCTION

The Yale Endowment's annual report should be required reading for any sophisticated investor. We view David Swensen and the Yale Investment Committee as a champion of "modern" portfolio management who extends the academic foundation laid out by Harry Markowitz and James Tobin to include evolving alternative asset classes. Yale's 17.2% annualized returns from 1986 – 2006 resulted from their forward-thinking investment philosophy, the architecture of their portfolio structure, and, of course, healthy capital market returns.

As advisors to families of substantial wealth, we often ponder the question: How can Edge apply the lessons from the Yale Endowment franchise to the taxable, affluent investor? It is our opinion that replication of the Yale investment methodology would be difficult for most investors with less than a $60mm liquid portfolio and may not be favorable if they could. Why? Taxes, access, and time horizon. However, the process of defining asset classes by the market forces which drive risk and return and not by its legal structure is an invaluable lesson which can advance private investors out of the homogeneity of traditional asset allocation models.

Let us first explain why Yale has produced a superb long-term record (not surprisingly, Edge shares similar philosophies):

- ✓ Diversified and disciplined asset allocation policies
  - Yale's defense against large losses stems from the architecture of their portfolio structure
    - Academic theory and informed market judgment evaluates expected returns, risk, and correlation of investment assets
    - Broad diversification
    - Significant equity orientation toward inefficient, non-traditional asset classes
    - Long-term investment horizon
  - Discipline in adhering to the investment policy by maintaining target asset allocation through an annual review to rebalance
    - For example, shortly following the 1987 stock market crash when equity markets declined 20%, Yale purchased thousands of S&P 500 Index futures to rebalance the portfolio to investment policy targets
- ✓ Superior active management selection
  - Yale strongly favors long-term commitments to carefully chosen managers who are often at an early stage in their development
  - The primary criteria for those managers selected demonstrate:
    - Superior investment skills
    - Sound investment philosophies
    - A commitment to investment returns and not gathering assets
    - "Young and hungry" principles
    - A coherent organization and sustainable business strategy
    - Appropriate fees and incentives that keep managers motivated
    - High integrity
  - In other words, Yale seeks skillful, emerging managers who are managing relatively small pools of capital

Exhibit 1 is a summary of Yale's current investment policy target. On paper it would appear to be a very aggressive asset allocation compared to what most investment banks recommend their private clients target. Only 4% of the portfolio is allocated to Fixed Income. Alternative Investments (defined traditionally as any investment that is not a publicly traded stock or bond) comprise 69% of the policy target. Yale also takes advantage of their reasonably high degree of certainty on spending requirements to give up liquidity in search of return with only 31% of the portfolio in what they define as "liquid investments". While it is an aggressive investment policy, they are careful to target investment strategies whose return (and thus risk) is

driven by different factors (ie. low correlation). Despite high assumed risk (defined here as the variability of return) at the asset class level, the portfolio bears a relatively low volatility of 11.8% (approximately 72% of the S&P 500 volatility)[2]. In other words, the endowment has produced equity-like returns with meaningfully less risk.

EXHIBIT 1

INVESTMENT POLICY TARGET: 2006 ANNUAL REPORT

Asset Class	%	Definition	Benchmark	Expected Real Return*	Expected Nom Return	Expected Risk
Domestic Equity	12.0%	Long-biased, primarily value and small cap equities	Wilshire 5000 Index	6.0%	10.0%	20.0%
Fixed Income	4.0%	Treasuries, Corporates, Mortgages, High Yield, etc.	Lehman U.S. Treasury Index	2.0%	6.0%	10.0%
Absolute Return	25.0%	Event-driven and value-driven hedge funds	1YR Treasury + 6%	6.0%	10.0%	10.0%
Foreign Developed Equity	7.5%	Long-biased developed market equities	MSCI EAFE Index	6.0%	10.0%	20.0%
Foreign Emerging Equity	7.5%	Long-biased emerging market equities	MSCI Emerging Markets Index	8.0%	12.0%	25.0%
Private Equity	17.0%	LBO, Venture Capital, Mezzanine	Cambridge Associates	11.4%	15.4%	29.0%
Real Assets	27.0%	Timber, Oil & Gas, Real Estate	University inflation rate* + 6%	6.0%	10.0%	15.0%
Cash	0.0%					
	100.0%			6.2%	10.2%	11.8%

Cash/Fixed Income	4.0%
Public Equity	27.0%
Alternatives	69.0%

Liquid Assets	31.0%
Quasi-Liquid Assets	25.0%
Illiquid Assets	44.0%

*University inflation rate = CPI + 1% = 4%

This style of investment thinking did not occur overnight. Yale has made significant changes to its investment policy and portfolio structure in the last 20 years. For example, Yale's endowment in 1985 had 10% of its portfolio allocated to non-traditional assets whereas today it has over 69% of its portfolio targeted to non-traditional assets (see Exhibit 2).

EXHIBIT 2

INVESTMENT POLICY: 1985 vs. 2006

Asset Class	1985 %	2006 %	Definition
Domestic Equity	65.0%	12.0%	Traditional
Fixed Income	15.0%	4.0%	Traditional
Absolute Return	0.0%	25.0%	Non-Traditional
Foreign Equity	10.0%	15.0%	Traditional
Private Equity	0.0%	17.0%	Non-Traditional
Real Assets	10.0%	27.0%	Non-Traditional
Cash	0.0%	0.0%	Traditional
Traditional Assets	90.0%	31.0%	
Non-Traditional Assets	10.0%	69.0%	

The success of the Yale Endowment approach has motivated many others to adopt their style. However, has anyone evaluated if replication is appropriate for private individuals? Let's use the Yale Endowment as an example to measure the impact of taxes and cost of access, and qualify unpredictable factors that impact the time horizon for private individuals.

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[2] Annualized standard deviation of the S&P 500 over the 37 year period ending December 31, 2006 equals 16.6% (Source: CRSP); For our purposes, standard deviation, volatility, and risk are interchangeable terms referring to the variability of returns.

ILLUSTRATING THE IMPACT OF TAXES

To begin the tax analysis, we will look at two of the largest allocation buckets in Yale's policy target – private equity and absolute return strategies (in the form of hedge funds).

The term "hedge fund" has lost its descriptive power since its first modern use, credited to Carol Loomis, in an article describing the investing style of Alfred Winslow Jones[3] in 1966. The "Jones model" describes an investment style where an investor uses leverage to purchase long equities with market value above 100% of equity (but not substantially so) while at the same time shorting equities to create a hedge against the excess market risk. As a fee, he took 20% of profits earned. In this day and age, a hedge fund has evolved to include any number of strategies employing various degrees of leverage, investing in all parts of the capital structure, and in any part of the world. In our opinion, the term "hedge fund" only describes the legal structure allowing the manager to take the performance fee.

Swensen takes a similar view. Paraphrasing a passage from his book Unconventional Success, he believes that asset classes are differentiated by the market factors which drive risk and return, not the legal structure in which the manager is enclosed. For that reason, in the Yale annual reports you will notice an asset class called Absolute Return. Absolute Return is a style of hedge fund which seeks to achieve returns with no correlation (i.e. relationship) to publicly traded stock or bond markets. In other words, they try to earn positive returns no matter what is going on in the "traditional" asset classes (stocks and bonds).

The stereotype of this investing style is to be tax inefficient due to high turnover and use of fixed income securities. Although some funds may benefit from the use of futures and options on futures which receive "60/40" treatment under Section 1256 of the IRS code (60% long-term capital gains and 40% short-term gains even over periods less than a year although "marked-to-market" at year end), in our experience the assumption of 100% turnover at short-term capital gains rates is not a generally unrealistic expectation[4]. Based upon this assumption, if an investor was able to locate Absolute Return funds which generated the pre-tax level of returns enjoyed by the Yale Endowment (12.9%), an individual at the highest marginal, federal tax rate of 35% ended up with 8.4% after-taxes.

Now let's turn our attention to private equity. To further discuss, we must begin by understanding how private equity investing works. First, the allocation process in private equity is completely different than traditional asset classes. Investors commit money to a private equity manager just as they do to a bond or equity manager; however, only a small portion of an investor's commitment is called at the start. This differs meaningfully from the typical fixed income or equity manager who is fully invested at day one. The path of these cumulative capital calls and distributions in private equity investing is known as the "J-Curve".

[3] Source Loomis, Carol J. "The Jones Nobody Keeps Up With." Fortune April 1966: 237, 240, 242, 247.; There is no relation to co-author Henry Jones.

[4] It is important to note that there are some Absolute Return strategies which are more tax efficient, but do not represent the majority of current strategies.

EXHIBIT 3

PRE-TAX

Illustration of a $100 commitment called over 5 years, distributing 2.0x commitment (implies 20.0% IRR)											
	1	2	3	4	5	6	7	8	9	10	Total
Contribution	-27	-29	-28	-8	-8						-100
Distribution			12	18	36	40	38	31	20	5	200
Net Cashflow	-27	-29	-16	10	28	40	38	31	20	5	
Cumulative	-27	-56	-72	-62	-34	6	44	75	95	100	

Cumulative Cashflow of $100 Capital Commitment
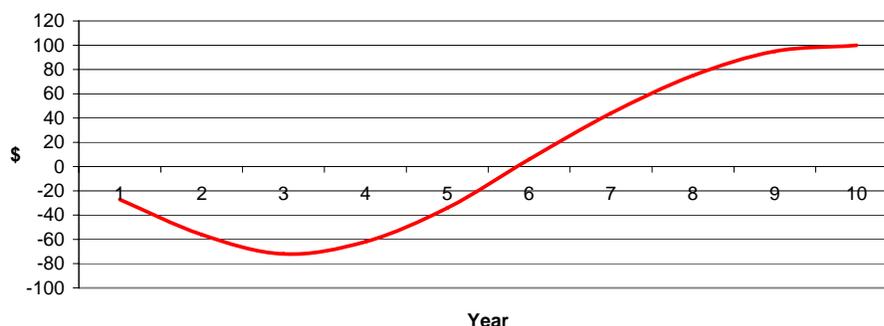
In Exhibit 3, we assume a 10 year duration for a private equity fund where the investor makes capital calls over a 5 year period. As the portfolio harvests, the investor ultimately realizes a 2.0x return on his or her original commitment. The private equity world measures performance on an internal rate of return (IRR) basis, which is the discount rate at which the sum of present values for all calls and distributions is equal to zero. In this instance the fund generated a 20.0% IRR. Internal rates of return are not as intuitive as they first appear. They reflect the return on <u>invested capital</u> which typically is far smaller than committed capital. An assumption built into the calculation is that the capital waiting to be called or that has been distributed is assumed to earn the same rate of return as the private equity portfolio that is currently invested (often not the case). The calculation is extremely sensitive to the timing and size of capital calls and distributions.

The best way to illustrate how an IRR for private equity is different than the annual return in a standard asset class (like equity) is to compare the amount of compounded capital at the end of the period. As shown in Exhibit 3, a 20% pre-tax IRR equates to a 2.0x return of capital commitment at the end of 10 years. If you had been able to invest your full commitment on day one which then earned an IRR of 20% over the full 10 years, you would have 6.19x your commitment by the end.

There are calculations which can be used to undo the assumption that uninvested cash is earning the same return as the invested private equity portfolio, most notably the modified internal rate of return (MIRR). In this calculation, capital calls are discounted back to the initial period using a "cost of capital" which in the portfolio's case is the opportunity cost of a foregone investment. Capital distributions are compounded forward to the period end using a reasonable re-investment rate.

To illustrate how the "actual" rate of return can be quite different, let's again use Yale's performance. Many private investors hold capital waiting to be called in fixed income, so we assume their 6.6% annualized return over the past 10 years as both the cost-of-capital and the re-investment rate. After using this calculation to remove the IRR's unrealistic assumption, we see the return on Yale's private equity portfolio fall from 34.4% to 21.0%. The rate of return falls by almost 39%! Not surprisingly, sophisticated investors are often frustrated with idle cash waiting to be invested in private equity because the opportunity cost can be so dilutive.

To minimize opportunity cost of cash sitting on the sidelines, investors make ongoing commitments to future private equity funds based on expected capital calls in an effort to keep a stable "net invested" amount in private equity. At Edge, the general rule of thumb to minimize this opportunity cost is to commit 1.5x the

amount one wants exposure to. In other words, investors should commit $1.50 for every $1.00 of desired exposure to private equity. This implies that an investor can expect to have approximately 70% of the capital commitment "net invested" at the bottom of the J-curve before distributions. However, this approach increases risk. Not only may one have their capital called sooner and more than expected, the return of capital may be later and less than expected. Venture capital investors in the 1999-2000 vintage years know this too well. In reality, investors must be dynamic to changing market conditions to manage liquidity and diversify across vintage years.

Due to the timing sensitivities of capital calls and distributions for the IRR calculation, the tax effect can appear dramatic. As seen in Exhibit 4, on an after-tax basis (assuming 15% federal tax rate), an investor in this same fund would have realized a 1.85x return on his investment and a 17.5% IRR. This calculation is subject to the specific timing of cashflows and the characterization of the distributions (particularly the early distributions); however, the thought process is similar.

EXHIBIT 4

Illustration of a $100 commitment called over 5 years, distributing 2.0x commitment (implies 20.0% IRR) After-Tax distribution of 1.85x commitment (implies 17.5% IRR)											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
Contribution	-27	-29	-28	-8	-8						-100
Gross Distribution			12	18	36	40	38	31	20	5	200
Taxes[1]			-1	-1	-3	-3	-3	-2	-2	0	
Net Distribution			11	17	33	37	35	29	19	5	185
Net Cashflow	-27	-29	-17	9	25	37	35	29	19	5	
Cumulative	-27	-56	-73	-64	-39	-2	33	62	80	85	

[1] The calculation for taxes assume that the gross distribution is 50% return of capital and 50% long term capital gain at a 15% tax rate.

Extending assumptions for all the asset classes in the Yale Endowment portfolio yields the results in Exhibit 5.

EXHIBIT 5

1996 - 2006: YALE'S ANNUALIZED RETURNS										
	1996 - 2006	**Return & Tax Assumptions**								
	Annualized	Principal		Capital Gain	Net Principal	Income	Income	Net Income	**Total Net**	Policy
Asset Class	**Return**	Return	Turnover	Taxes	Return	Return	Taxes	Return	**Return**	Allocation
Domestic Equity	**14.2%**	12.2%	35.0%	-1.0%	11.2%	2.0%	-0.3%	1.7%	**12.9%**	12.0%
Fixed Income	**6.6%**	0.6%	25.0%	-0.1%	0.5%	6.0%	-2.1%	3.9%	**4.4%**	4.0%
Absolute Return	**12.9%**	12.9%	100.0%	-4.5%	8.4%	0.0%	0.0%	0.0%	**8.4%**	25.0%
Foreign Equity	**14.5%**	12.5%	35.0%	-1.0%	11.5%	2.0%	-0.3%	1.7%	**13.2%**	15.0%
Private Equity[1]	**34.4%**	34.4%		-4.6%	29.8%	0.0%	0.0%	0.0%	**29.8%**	17.0%
Real Assets	**20.5%**	16.5%	50.0%	-1.2%	15.3%	4.0%	-1.4%	2.6%	**17.9%**	27.0%
Cash										0.0%
Total	**17.2%**								**15.7%**	**100.0%**

Tax Assumptions (Federal Only)

Equity Income Tax Rate	15.0%
Fixed Income and Real Asset Income Tax Rate	35.0%
Short Term Capital Gain Rate	35.0%
Long Term Capital Gain Rate	15.0%

Turnover Assumptions (ex Private Equity and Real Assets)

Short Term	40.0%
Long Term	60.0%
Private Equity and Real Assets assume 100% long term turnover	

[1] Yale's private equity portfolio is measured on an annualized 34.4% IRR, which assumes an annualized 29.8% IRR after-taxes.

From 1996-2006 (fiscal years[5]), Yale has produced a 17.2% annualized return. If one considers simple and realistic turnover assumptions and the policy asset allocation range, the after-tax return for taxable investors was 15.7%. In other words, 150 basis points or over 8% of the returns were eaten up by taxes. While a 15.7% annualized return is fantastic, one cannot deny the impact of taxes on returns.

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[5] Yale's fiscal year runs during the 12 months ending June 30th.

However, the effect of taxes as a percentage of return is sensitive to the total portfolio return. In review of their performance, Yale uses both a passive and an active benchmark. If we conduct the same analysis as above, but replace Yale's actual pre-tax returns with the active benchmark performance that is used for comparison, we see the effect of taxes more profoundly in Exhibit 6.

EXHIBIT 6

1996 - 2006: YALE'S ACTIVE BENCHMARK RETURNS

Asset Class	1996 - 2006 Annualized Return	Return & Tax Assumptions								Policy Allocation
		Principal Return	Turnover	Capital Gain Taxes	Net Principal Return	Income Return	Income Taxes	Net Income Return	Total Net Return	
Domestic Equity	**9.0%**	7.0%	35.0%	-0.6%	6.4%	2.0%	-0.3%	1.7%	**8.1%**	12.0%
Fixed Income	**6.4%**	0.4%	25.0%	0.0%	0.4%	6.0%	-2.1%	3.9%	**4.3%**	4.0%
Absolute Return	**11.7%**	11.7%	100.0%	-4.1%	7.6%	0.0%	0.0%	0.0%	**7.6%**	25.0%
Foreign Equity	**9.8%**	7.8%	35.0%	-0.6%	7.2%	2.0%	-0.3%	1.7%	**8.9%**	15.0%
Private Equity[1]	**20.3%**	20.3%		-2.9%	17.4%	0.0%	0.0%	0.0%	**17.4%**	17.0%
Real Assets	**14.0%**	10.0%	50.0%	-0.8%	9.3%	4.0%	-1.4%	2.6%	**11.9%**	27.0%
Cash										0.0%
Total	**13.0%**								**10.5%**	**100.0%**

Tax Assumptions (Federal Only)

Equity Income Tax Rate	15.0%
Fixed Income and Real Asset Income Tax Rate	35.0%
Short Term Capital Gain Rate	35.0%
Long Term Capital Gain Rate	15.0%

Turnover Assumptions (ex Private Equity and Real Assets)

Short Term	40.0%
Long Term	60.0%

Private Equity and Real Assets assume 100% long term turnover

[1]Yale's private equity portfolio is measured on an annualized 20.3% IRR, which assumes an annualized 17.4% IRR after-taxes.

All returns used above reflect the active benchmark returns used in the Yale Endowment 2006 report.

Taxes cause a 250bps drag on pre-tax performance in this example (over 19% of pre-tax return). What appears to be better "tax efficiency" in the actual returns of the Yale portfolio is driven by considerable outperformance of the active benchmark in private equity (traditionally a relatively tax efficient asset class).

THE COST OF ACCESS

Using the generic assumptions in Exhibit 7 on manager diversification and minimums, we estimate that an investor must have a portfolio in excess of $60 million at a minimum to consider replicating the Yale Endowment strategy without incurring additional fees for access. However, this minimum is likely too low for true replication considering the more sporadic cashflow needs (and hence need for liquidity) of the individual investor. In addition, the top quartile managers which are likely represented in the Yale Endowment portfolio will each tend to be at the top end of the investment minimum range presented, especially in an asset class like private equity. Most top quartile alternative investment managers and/or strategies (such as timber) have minimums as high as $20 million, so we estimate the portfolio size needs to be at least $500 million for true replication via direct access.

EXHIBIT 7

Illustration of Required Net Worth to Invest in Similar Managers as the Yale Endowment							
Yale Target Allocation		**Manager Minimum Range**			**Investor Commitment to Meet Manager Minimums**		
Asset Class	**%**	**Low***	**Realistic**	**High**	**Asset Class - Realistic**	**$**	**%**
Domestic Equity	12%	$1,000	$1,000,000	$10,000,000	Domestic Equity	$7,000,000	12%
					Manager A	*$2,500,000*	
					Manager B	*$2,500,000*	
					Manager C	*$2,000,000*	
Fixed Income	4%	$1,000	$3,000,000	$5,000,000	Fixed Income	$2,500,000	4%
					Manager D	*$2,500,000*	
Absolute Return	25%	$1,000,000	$2,000,000	$5,000,000	Absolute Return	$15,000,000	25%
					Manager E	*$3,000,000*	
					Manager F	*$3,000,000*	
					Manager G	*$3,000,000*	
					Manager H	*$3,000,000*	
					Manager I	*$3,000,000*	
Foreign Developed Equity	8%	$1,000	$1,000,000	$20,000,000	Foreign Developed Equity	$4,500,000	8%
					Manager J	*$2,250,000*	
					Manager K	*$2,250,000*	
Foreign Emerging Equity	8%	$1,000	$1,000,000	$20,000,000	Foreign Emerging Equity	$4,500,000	8%
					Manager L	*$2,250,000*	
					Manager M	*$2,250,000*	
Private Equity	17%	$1,000,000	$2,500,000	$20,000,000	Private Equity	$10,000,000	17%
					Manager N	*$2,000,000*	
					Manager O	*$2,000,000*	
					Manager P	*$2,000,000*	
					Manager R	*$2,000,000*	
					Manager S	*$2,000,000*	
Real Assets	27%	$1,000	$2,000,000	$20,000,000	Real Assets	$16,000,000	27%
					Manager T	*$4,000,000*	
					Manager U	*$3,000,000*	
					Manager V	*$3,000,000*	
					Manager X	*$3,000,000*	
					Manager Y	*$3,000,000*	
Cash	0%				Cash	$0	0%
	100%					$59,500,000	100%

*Low range of minimum is for ETF's and/or mutual funds

Yale has clearly done a superior job in selecting top quartile funds in private equity, but what is more impressive is that these returns are *net* of fees. Private equity managers charge high fees, including, but not limited to, placement fees, management fees, and carried interest. Carried interest is the share of profits that the fund manager is due once it has returned the cost of investment to investors (plus a hurdle rate in some cases).

We have seen management fees as high as 3% on committed or invested capital and carried interest as high as 30%. For simplicity, let's assume that the average fee structure is a 2.0% management fee on committed capital (and is terminated once the fund has fully distributed the investor's cost) and 20% carried interest. Using this assumption, let's try to back into the gross return of the Yale private equity portfolio in Exhibit 8. Although it is highly dependent on the timing and size of cashflows, the scenario below shows that the underlying fund returned 3.0x gross on committed capital for a 42.4% IRR whereas the investor earned 2.5x committed capital for a 34.4% IRR. The manager has earned the difference (or a blended fee of 0.49x committed capital). Putting it differently, a $1 billion private equity fund, for which there are now over 170[6], earned $490 million in fees. This does not include potential financing fees, transaction fees, or monitoring fees. In this instance, investors paid handsome fees for exceptional performance.

EXHIBIT 8
GROSS RETURNS

$100 Commitment: Gross return is 3.0x commitment, 42.4% IRR										
	1	2	3	4	5	6	7	8	9	10	Total
Contribution	-27.0	-29.0	-28.0	-8.0	-8.0						-100.0
Gross Distribution			30.0	50.0	60.0	60.0	40.0	30.0	20.0	12.0	302.0
Net Cashflow	-27.0	-29.0	2.0	42.0	52.0	60.0	40.0	30.0	20.0	12.0	
Cumulative	-27.0	-56.0	-54.0	-12.0	40.0	100.0	140.0	170.0	190.0	202.0	

NET RETURNS

$100 Commitment: Net return is 2.5x commitment, 34.4% IRR										
	1	2	3	4	5	6	7	8	9	10	Total
Contribution	-27.0	-29.0	-28.0	-8.0	-8.0						-100.0
Net Distribution		-4.0	28.0	48.0	52.0	48.0	32.0	24.0	16.0	9.6	253.6
Net Cashflow	-27.0	-33.0	0.0	40.0	44.0	48.0	32.0	24.0	16.0	9.6	
Cumulative	-27.0	-60.0	-60.0	-20.0	24.0	72.0	104.0	128.0	144.0	153.6	

$100 Commitment: Total Fees										
	1	2	3	4	5	6	7	8	9	10	Total
Total Fees	2.0	2.0	2.0	2.0	8.0	12.0	8.0	6.0	4.0	2.4	48.4

The average high net worth investor pays more in fees than institutional investors. Most individuals and families do not have the scale to meet minimums and/or build an appropriately diversified portfolio by investing directly in private equity funds. Many funds carry high minimums (typical minimums are $2 million and can be as high as $20 million) and, therefore, the average high net worth investor would have to commit at least $10 million to get a fairly concentrated portfolio of private equity funds.

As usual, Wall Street has developed two structures as solutions: feeder funds and fund-of-funds. A feeder fund structure is where an investment bank will commit to a high minimum private equity manager and subsequently charge a placement fee, management fee, and/or carried interest on top of the private equity fund's fee structure. For example, let's assume a feeder fund charges a 2% placement fee and a 1% management fee on committed capital (throughout the life of the investment) for providing access to a top quartile manager. The effect of the added fees is demonstrated in Exhibit 9.

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[6] Kessler, Andy. "Blackstone's World of Cash." Wall Street Journal 21 June 2007, sec. A: 17

EXHIBIT 9
UNDERLYING FUND

Illustration of a $100 commitment called over 5 years, distributing 2.0x commitment (implies 20.0% IRR)										
	1	2	3	4	5	6	7	8	9	10	Total
Contribution	-27.0	-29.0	-28.0	-8.0	-8.0						-100.0
Distribution			12.0	18.0	36.0	40.0	38.0	31.0	20.0	5.0	200.0
Net Cashflow	-27.0	-29.0	-16.0	10.0	28.0	40.0	38.0	31.0	20.0	5.0	
Cumulative	-27.0	-56.0	-72.0	-62.0	-34.0	6.0	44.0	75.0	95.0	100.0	

PRE-TAX

Pre-Tax Return: 1.9x commitment, 17.2% IRR										
	1	2	3	4	5	6	7	8	9	10	Total
Contribution	-27.0	-29.0	-28.0	-8.0	-8.0						-100.0
Distribution			12.0	18.0	36.0	40.0	38.0	31.0	20.0	5.0	200.0
Feeder Fees	-3.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-12.0
Net Cashflow	-30.0	-30.0	-17.0	9.0	27.0	39.0	37.0	30.0	19.0	4.0	
Cumulative	-30.0	-60.0	-77.0	-68.0	-41.0	-2.0	35.0	65.0	84.0	88.0	

AFTER-TAX

After-Tax Return: 1.6x commitment, 14.7% IRR										
	1	2	3	4	5	6	7	8	9	10	Total
Contribution	-27.0	-29.0	-28.0	-8.0	-8.0						-100.0
Distribution			12.0	18.0	36.0	40.0	38.0	31.0	20.0	5.0	200.0
Taxes			-0.9	-1.4	-2.7	-3.0	-2.9	-2.3	-1.5	-0.4	-15.0
Feeder Fees	-3.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-12.0
Net Cashflow	-30.0	-30.0	-17.9	7.7	24.3	36.0	34.2	27.7	17.5	3.6	
Cumulative	-30.0	-60.0	-77.9	-70.3	-46.0	-10.0	24.2	51.9	69.4	73.0	

$100 Commitment: Total Fees										
	1	2	3	4	5	6	7	8	9	10	Total
Total Fees	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	12.0

In this instance, the underlying fund generated a net return of 2.0x committed capital and a 20% IRR. But the investor in the feeder fund earned a net pre-tax return of 1.88x committed capital and a 17.2% IRR. Taking it a step further, the investor earned a net after-tax return of 1.73x committed capital and a 14.7% IRR. The added cost of access is striking.

A fund-of-funds structure is also commonly used to grant access at lower minimums and increase diversification. However, it can also be quite costly. Let's use hedge funds as our example in Exhibit 10. The typical fund-of-funds structure consists of an annual management fee with some degree of carry (or performance) fee. In our example, we will assume a 1.25% management fee and a 5% carry. If we also assume that the 13.1% return Yale reports as their Absolute Return performance is net of underlying manager fees, we can then calculate both the gross underlying hedge fund manager's performance and the net return an investor would receive if they accessed the same manager through a fund-of-funds vehicle.

EXHIBIT 10

FUND OF FUNDS NET RETURN	
Underlying Hedge Fund	
Gross Return	18.1%
Management Fee	2.0%
Carry	20.0%
Net Return (Pre-Tax)	12.9%
Fund of Funds Level	
Net Underlying HF Return	12.9%
Management Fee	1.25%
Carry	5.0%
Net Fund of Funds Return (Pre-Tax)	11.0%
After-Tax	
Net Fund of Funds Return (Pre-Tax)	11.0%
Taxes	3.9%
Net Fund of Funds Return (After-Tax)	7.2%

With the assumptions stated in Exhibit 10, the typical high net worth investor who accessed the same manager through a fund-of-funds would have experienced a meaningfully lower return after-tax (7.2% versus 12.9%).

While access to alternative investment strategies such as private equity and hedge funds presents a challenge to individual investors, the individual investor also does not have the scale to benefit from fee breakpoints in traditional strategies such as equities and fixed income. Let's use a sample equity manager from Exhibit 7 as an example. In this instance, we allocate $2.5 million to a long-only equity manager, Manager A, which consists of 4.2% of the portfolio. Yale would have to allocate $750 million to Manager A based on the same allocation. It is realistic to assume that Yale would receive a breakpoint from Manager A of at least 50% less than the individual investor.

TIME HORIZON

An investor's time horizon is a basic factor used by advisors to assess the suitability of an investment for a client. As you would expect, the more risky an asset class (i.e. wider range of potential outcomes) the longer an investor's time horizon must be for the opportunity to be appropriate. The investing time horizon varies by investor based not only on age, but also factors such as continued entrepreneurial aspiration, estate planning goals, spending rates, and charitable intentions. An individual might be investing based on their life expectancy, their children/grandchildren's life expectancy, or even with a view towards perpetuity in the case of some charitable goals. The classic example is the difference between stocks and bonds. It may seem intuitive why an equity investor must have a long time horizon, but the logic behind it is supported by the numbers (See Exhibit 11).

EXHIBIT 11

Historical Returns of the S&P 500 Over Various Rolling Periods							
Stated Period Rolled Monthly between January 1957 until December 2006							
	1 yr	**2yr**	**3yr**	**5yr**	**7yr**	**10yr**	**15yr**	**20yr**
Best (Max)	61.18%	37.46%	33.29%	29.63%	23.01%	19.48%	21.06%	18.26%
Mean	11.91%	11.32%	11.03%	10.84%	11.10%	11.32%	12.12%	11.52%
Median	12.60%	11.64%	11.24%	11.05%	11.57%	11.08%	11.90%	11.52%
Worst (Min)	-38.94%	-23.62%	-16.09%	-4.15%	-2.64%	0.49%	5.09%	6.45%
Range	100.12%	61.07%	49.39%	33.78%	25.65%	18.99%	15.97%	11.80%

While there are many people who prognosticate on what the equity markets will do 6 or 12 months out, you will notice in Exhibit 11 that the range of experience over any given 12 month period can be quite divergent. However, a long-term investor can become more comfortable with the range of expected returns the longer he or she holds the investment. Increased certainty means decreased risk.

"Hot" new asset classes are often discussed in the business news media with reference made to a well-respected, "smart money" investor and their past involvement in the space. It is not uncommon that many investors then attempt to imitate these opinion leaders using access vehicles available to them. Often, little thought is given to whether the time horizon of the asset class is appropriate for the situation. A prime example is timber. Timber is often hailed as a truly "uncorrelated" asset class because the primary driver of value over the long term is a tree's biological growth. A bigger, older tree is generally more valuable than a younger, smaller tree. For a tree to reach its "prime", it may take over twenty years from planting. In timber investing, it is prudent to diversify not only by region and tree species, but also by planting year. However, a twenty year planting cycle implies that an investor must have a very long time horizon in order to have exposure to more than one investment cycle. While this may be appropriate for some private individuals whose intent, and thus investment horizon, meaningfully exceeds their own natural life, it does not appear to be a "standard" asset class to be included for our investors.

PUTTING THE PIECES TOGETHER

On previous pages, we have separately reviewed the impact of taxes, access, and time horizon on the attractiveness of replicating Yale's portfolio for the typical high net worth investor. However, most investors face these factors together. As seen in Exhibit 12, we estimate that taxable investors with less than $60 million in liquid assets would have earned a net 13.8% annualized return from 1996 – 2006 compared to Yale's 17.2% return taking into consideration the factors in combination. Using Yale's active benchmark returns, the net return after taxes and access fees are even more profound. The net return is 8.7% compared to a 13.0% gross return, which equates to 44% of the gross return eaten up by taxes and access fees.

EXHIBIT 12

1996 - 2006: YALE ANNUALIZED RETURNS

Asset Class	Policy Allocation	Gross Return	After-Tax Return	Cost of Access	NET RETURN
Domestic Equity	12.0%	14.2%	12.9%	0.5%	12.4%
Fixed Income	4.0%	6.6%	4.4%	0.2%	4.2%
Absolute Return	25.0%	12.9%	8.4%	1.9%	6.5%
Foreign Equity	15.0%	14.5%	13.2%	0.5%	12.7%
Private Equity	17.0%	34.4%	29.8%	2.8%	27.0%
Real Assets	27.0%	20.5%	17.9%	2.8%	15.1%
Total	**100.0%**	**17.2%**	**15.7%**	**1.9%**	**13.8%**

1996 - 2006: YALE'S ACTIVE BENCHMARK RETURNS

Asset Class	Policy Allocation	Gross Return	After-Tax Return	Cost of Access	NET RETURN
Domestic Equity	12.0%	9.0%	8.1%	0.5%	7.6%
Fixed Income	4.0%	6.4%	4.3%	0.2%	4.1%
Absolute Return	25.0%	11.7%	7.6%	1.9%	5.7%
Foreign Equity	15.0%	9.8%	8.9%	0.5%	8.4%
Private Equity	17.0%	20.3%	17.4%	2.8%	14.6%
Real Assets	27.0%	14.0%	11.9%	2.8%	9.1%
Total	**100.0%**	**13.0%**	**10.5%**	**1.9%**	**8.7%**

Cost of Access Assumptions

	Yale	Individual Investor	Cost of Access
Domestic Equity	0.5%	1.0%	0.5%
Fixed Income	0.2%	0.4%	0.2%
Absolute Return*		1.9%	1.9%
Foreign Equity	0.5%	1.0%	0.5%
Private Equity*		2.8%	2.8%
Real Assets*		2.8%	2.8%

*Alternative investments assume access costs from Exhibit 9 (private equity and real assets) and Exhibit 10 (absolute return)

Finally, we must consider the potential annual costs for Yale's illustrious investment office. Yale's infrastructure is also not easy to replicate because we estimate that it has roughly $5 million in annual fixed costs as seen in Exhibit 13. The infrastructure costs alone would be a 1.00% drag for a family with $500 million in assets. For Yale, however, we estimate the infrastructure fee is just 0.03% thanks to its scale with over $18 billion in assets under management.

EXHIBIT 13

Estimated Infrastructure Cost - Yale Investments Office

Salary Expenses					Infrastructure Costs as % of AUM	
Title	Employees	Salary	Total		AUM (millions)	% Fee
Chief Investment Officer[1]	1	$1,290,000	$1,290,000		$100	5.00%
Senior Director	1	$500,000	$500,000		$200	2.50%
Director	3	$250,000	$750,000		$300	1.67%
Associate General Counsel	2	$125,000	$250,000		$400	1.25%
Associate Director	4	$100,000	$400,000		$500	1.00%
Senior Portfolio Manager	1	$125,000	$125,000		$600	0.83%
Senior Associates	2	$80,000	$160,000		$700	0.71%
Senior Financial Analyst	2	$60,000	$120,000		$800	0.63%
Financial Anlayst	4	$45,000	$180,000		$900	0.56%
Administration	5	$40,000	$200,000		$1,000	0.50%
TOTAL	**25**		**$3,975,000**		$2,000	0.25%
					$3,000	0.17%
Research & Reporting Expenses					$4,000	0.13%
Bloomberg			$40,000		$5,000	0.10%
Factset			$200,000		$6,000	0.08%
FirstCall			$50,000		$7,000	0.07%
Advent			$125,000		$8,000	0.06%
TOTAL			**$415,000**		$9,000	0.06%
					$10,000	0.05%
					$11,000	0.05%
Other General & Administrative Expenses					$12,000	0.04%
(rent, travel, technology, security, healthcare, etc.)			**$610,000**		$13,000	0.04%
					$14,000	0.04%
TOTAL EXPENSES			**$5,000,000**		$15,000	0.03%
					$16,000	0.03%
					$17,000	0.03%
					$18,000	0.03%
					$19,000	0.03%
					$20,000	0.03%

[1]The Chronicle of Philanthropy states that David Swenson's 2006 compensation was $1,290,000.

CONCLUSION

The investment successes of David Swensen at the Yale Endowment are remarkable. The approach employs evolving investment opportunities offered in the alternatives space within the framework of traditional modern portfolio theory by distilling down asset classes to their true sources of risk and return (and not be blinded by legal structure). Many lessons can be learned and applied to private investors, but we must be mindful that differences in circumstance discourage outright duplication. The three primary differences between an $18 billion, tax-exempt endowment and an individual investor are taxes, access (and the resulting added cost), and investment time horizon. Each of these three factors alone are enough to warrant concern of true replication; in concert we believe they make a solid case why it should not be considered a "turn key" solution to investment management for private individuals and families.

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SOURCES

Edge Capital Partners, LLC

Center for Research in Security Prices (CRSP)

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DISCLOSURE AND RISK SUMMARY