

Drivers of Returns for Alternative Investments vs. Traditional Asset Classes



Key Points

- ◆ What this topic is about
 - Alternative investments have overlaps with traditional assets
Alternative investments (e.g., hedge funds, private equity, real estate)
- ◆ Why it matters
 - It's not that alternative investments were “revealed” in this downturn
 - They were often not measured correctly (e.g., correlations)
 - Better measurement can improve portfolio efficiency
- ◆ Implications for portfolio construction, optimization, risk budgeting
 - Asset classes don't have stable correlations when you need them to
 - Asset allocation should be a function of liabilities management
 - Risk budgeting should account for liquidity, income, growth, and inflation

Not All Investments Fit into Asset Classes

- ◆ Capital Asset Pricing Model (CAPM) simplistically implies that an investment (y) is influenced by one asset class benchmark (x):
 - Single beta exposure: $y = \alpha + \beta x + \varepsilon$
- ◆ Arbitrage pricing theory (APT) implies that an investment (y) has multiple drivers of return and risk (x_1, x_2, \dots, x_n)
 - Multiple beta exposures: $y = \alpha + \beta_1 x_1 + \beta_2 x_2 \dots + \beta_n x_n + \varepsilon$

Sample Beta Exposures

+ / (-) portrays statistically significant beta exposures at the 80% confidence level

x = Independent Variables	y = Dependent Variables						
	Hedge Funds			Private Equity			Real Estate
	Arbitrage	Macro	Distressed	LBO	VC	Mezz	
Euro Stoxx 50		+	+	+	+	+	
REITs		+	+	+			+
Volatility Index	+						
Momentum	+	(-)	(-)		+		(-)
Inv-Grd Fxd Inc	+		(-)	(-)	(-)	(-)	(-)
Hi-Yld Fxd Inc		+	+	+		+	
Dollar		(-)	(-)	(-)			
Commodities							

Regression-Based Factor Analysis

Illuminates sensitivities (betas) of funds and portfolios to potential changes in the underlying factors

	Factor							
	S&P 500	SML	VMG	Momentum	Barclays Agg	Barclays High Yield	Commodities	Real GDP
Fund A	0.74	0.28	0.20	-0.56	0.61	1.09	-0.34	0.44
Fund B	0.69	0.18	0.24	-0.50	0.31	0.88	-0.26	0.46
Fund C	0.58	-0.26	-0.19	0.02	0.51	0.39	-0.12	-1.61
Fund D	-0.22	-0.41	-0.76	0.50	-0.55	-1.02	0.48	-0.72
Fund E	-0.27	-0.22	-0.24	0.20	0.18	-0.55	0.04	-0.57
Fund F	0.29	0.27	-1.29	0.54	2.59	1.49	-0.16	-2.12
Fund G	-0.62	-1.55	-0.95	0.62	0.73	-1.61	-0.07	-2.92
Fund H	-0.05	-0.79	-0.16	0.17	-0.34	-0.55	-0.15	-1.69
Fund I	1.43	0.11	0.50	-0.88	-1.05	1.40	-0.79	-0.30
Private Equity Portfolio	0.24	-0.08	-0.09	-0.03	0.17	0.15	-0.11	-0.63
Real Estate Portfolio	0.54	0.00	0.36	-0.43	0.07	0.75	-0.23	-0.68
Hedge Fund Portfolio	0.47	0.61	0.62	-0.35	-0.86	1.06	0.01	0.65
Total Portfolio	0.42	0.50	0.48	-0.28	-0.59	0.88	0.00	0.44

Not statistically significant at an 80% level or higher

Statistically significant at an 80% level

Statistically significant at a 90% level

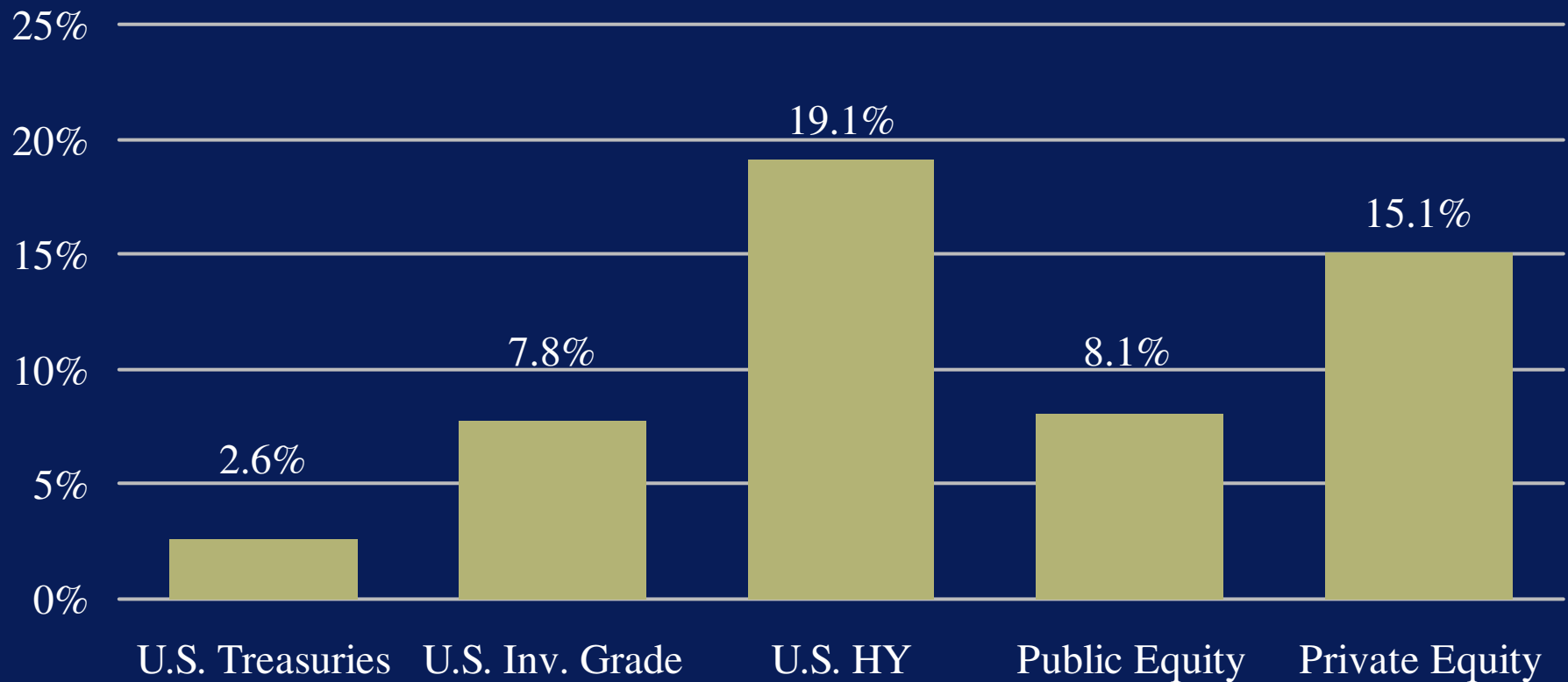
Statistically significant at a 95% level

Why this Matters

- ◆ Once you can appropriately measure the characteristics of alternative investments, you can better define which investment is attractive and when
- ◆ This allows you to develop an economic outlook for factors, then populate a portfolio with investments that have \pm betas to those factors
- ◆ This enables you to rebalance a portfolio according to the relative attraction of certain factors, rather than mechanically rebalancing according to an investment policy statement

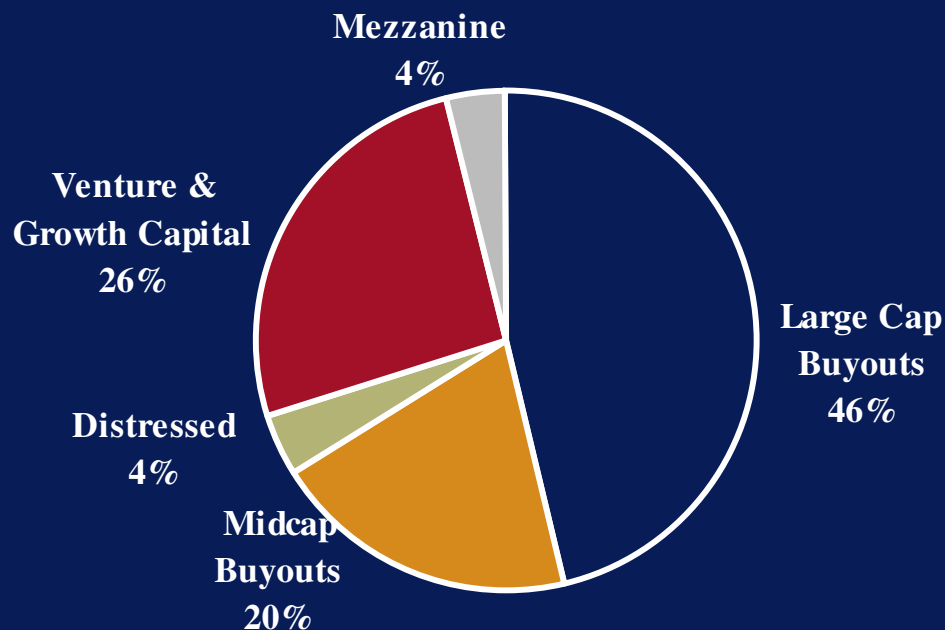
For Example, if You Have These Tactical Returns Expectations

Implied Short-Term Tactical Asset Class Returns



It Would Suggest a Tactical Private Equity Portfolio

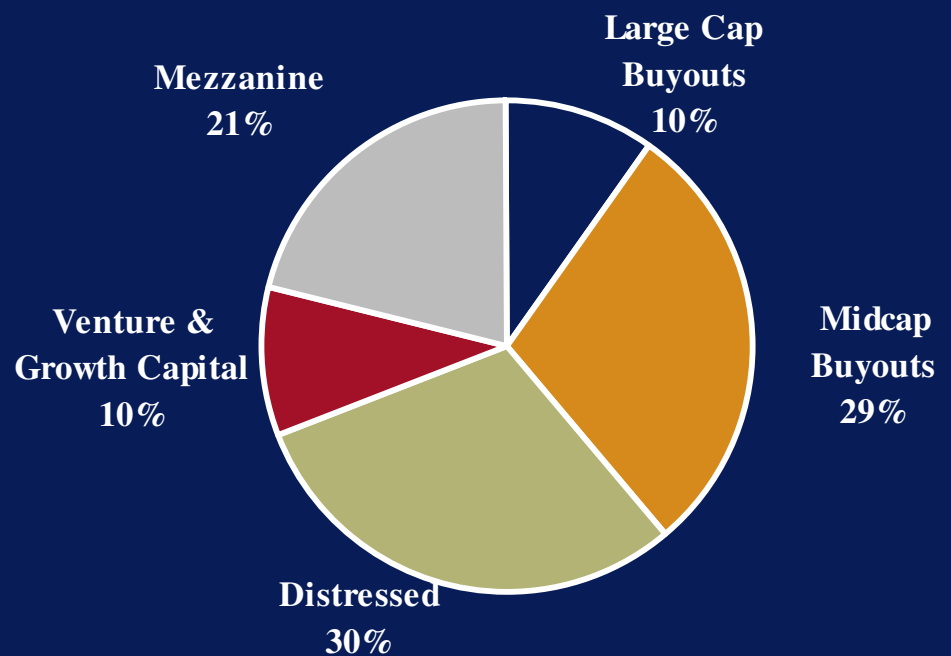
Market Weight Portfolio



- ◆ Not derived by MVO
- ◆ Similar to Black–Litterman
 - Market is strategic asset allocation
 - Tactical is adjusted for information and conviction

Vintage Year 2009 Tactical Portfolio

- ◆ Underweight: Large cap buyouts, venture, growth capital
- ◆ Overweights: Distressed, mezzanine, midcap buyouts



Advantages

- ◆ This enables the investor to make active decisions about tactical strategy allocation, rather than
 - Relying solely on strategic asset allocation for traditional asset classes
 - Using only a manager-selection-focus in deploying alternative investments
- ◆ In the current environment, it enables the investor to select investments (with a common measurement system across “asset classes”) that have sensitivity to potentially attractive areas:
 - Credit – Distressed debt, distressed real estate, distressed infrastructure
 - Currency trading
 - Providers of liquidity
 - Private equity and hedge fund secondaries
 - Raw land in real estate
 - Tactical asset allocation (TAA) in long-only asset classes
 - Is there skill in “style drift” or the use of cash?
 - Tracking error (at times) can be your friend

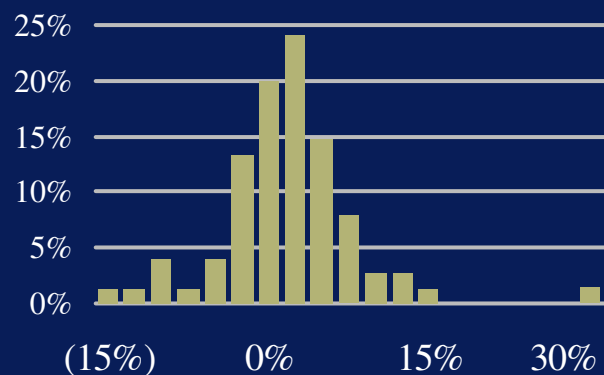
Implications for Portfolio Construction

- ◆ Traditional optimization techniques tend to fail for alternative investments
- ◆ Traditional investment optimization
 - Is based on homogeneous asset class definitions
 - Assumes normal returns distribution, tight manager dispersion
 - Uses mean–variance optimization and associated statistics (Sharpe)
- ◆ Alternative investments
 - Are prone to non-normal return distributions
 - Leverage, shorting, derivatives, directionality, illiquidity shocks
 - Have wide dispersion of manager returns
 - Have correlations that may not be constant
- ◆ These attributes are not captured by mean–variance optimization or Sharpe

Asset Class Return Distributions

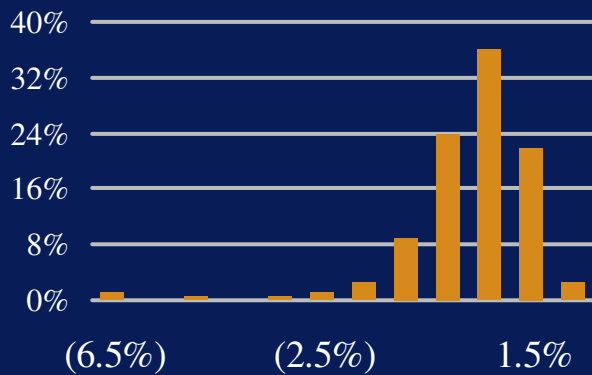
Private Equity

All Private Equity



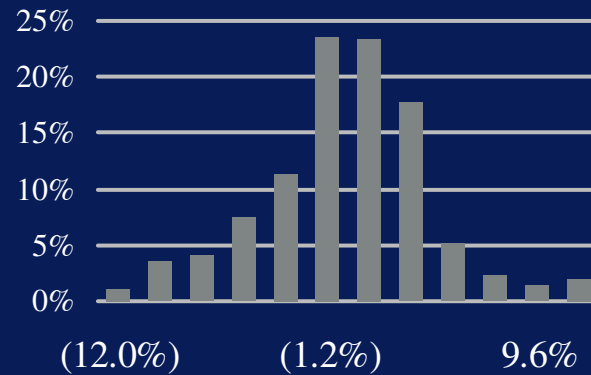
Hedge Funds

Merger Arb Hedge Funds

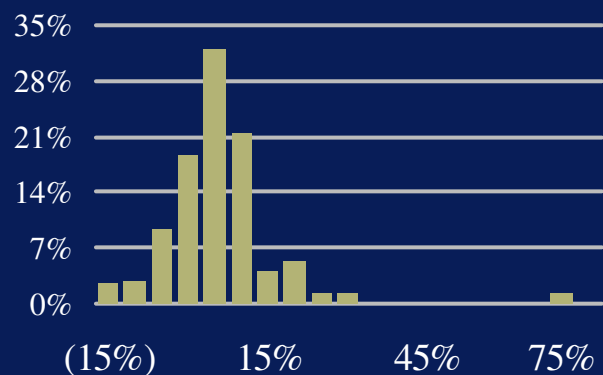


Traditional

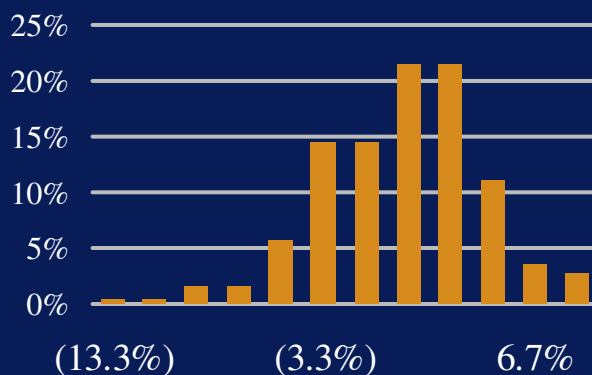
FTSE All-Share



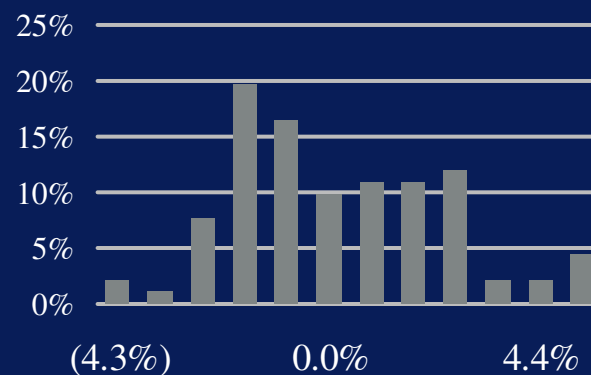
Venture Capital



Macro Hedge Funds



European Fixed Inc Agg

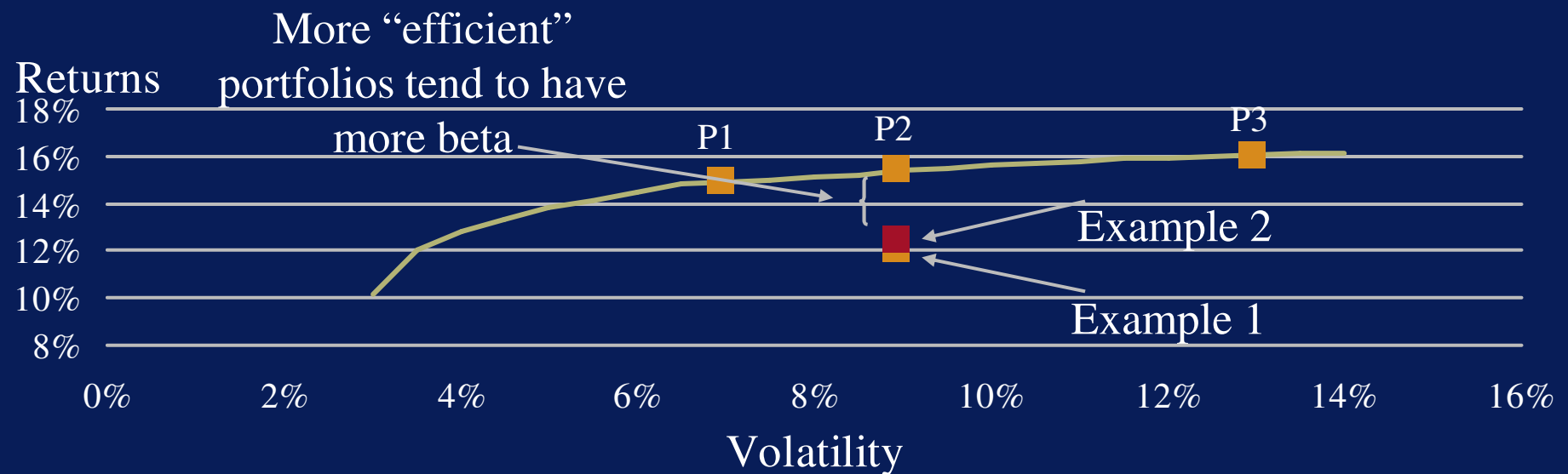


MVO Frontiers Are Limited in Their “Efficiency”

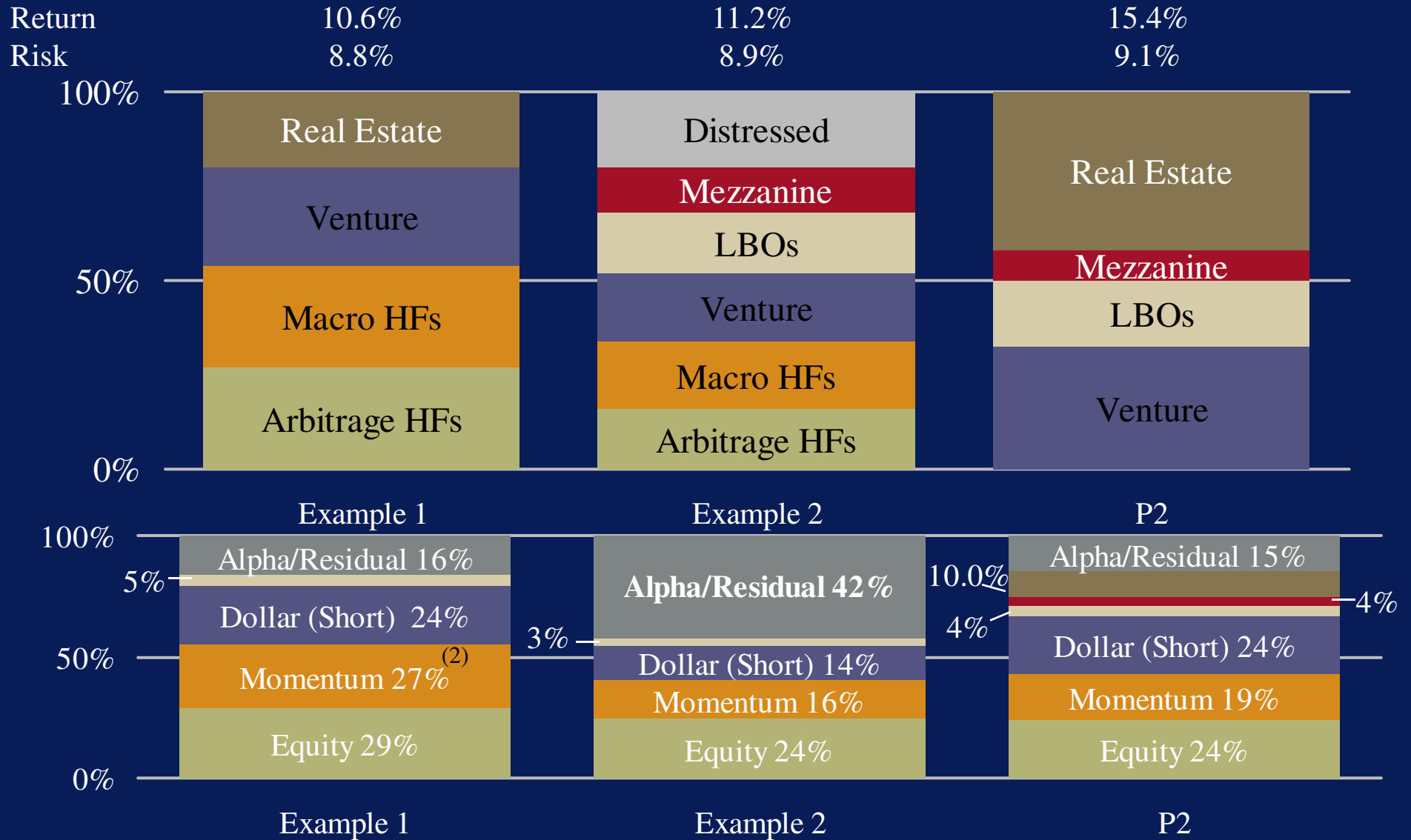
Annualized Return and Risk

- ◆ Frontier is set of optimal portfolios of private equity, hedge funds, and real estate
- ◆ The efficient portfolios P1, P2, and P3 lie along that frontier
- ◆ P2 at same risk level but higher expected return than example portfolios 1 and 2
- ◆ Example portfolios 1 and 2 have nearly same return and risk profiles as each other

Alternatives-Only Efficient Frontier



Investments (Top) vs. Sources of Return (Bottom)



Footnotes next page

■ Commods (Short) ■ LMS ■ GMV

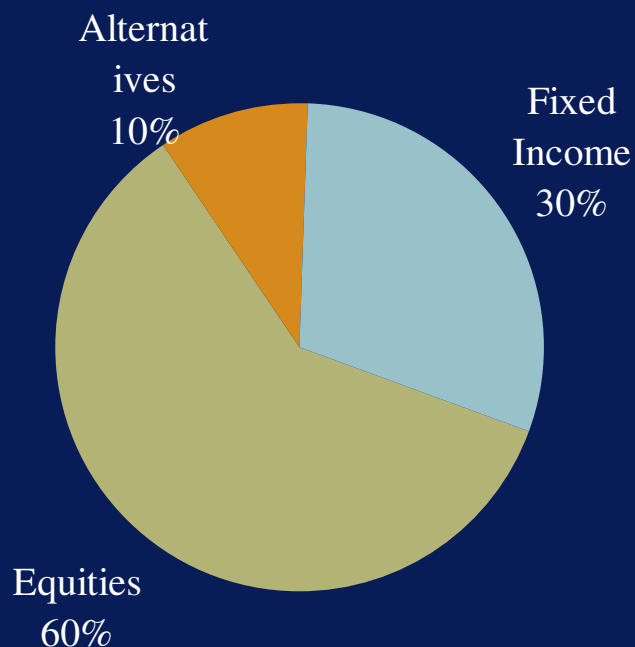
Beta Analysis Identifies Potentially Unintended Exposures

- ◆ An investor concerned only with risk and return would be relatively indifferent between example portfolios 1 and 2, but their factor attributions are very different
- ◆ Although P2 may seem superior to the example portfolios in terms of risk–reward alone, from a factor perspective it has greater betas to identifiable factors and less alpha / residual
- ◆ Scenario analysis can be run to look at the impact on the total portfolio from:
 - 1) Certain positive and negative returns from the factors
 - 2) Changes in factor beta magnitude and statistical significance
 - Then, changes to portfolio-wide factor exposures can altered through investments being added, subtracted, or neutralized

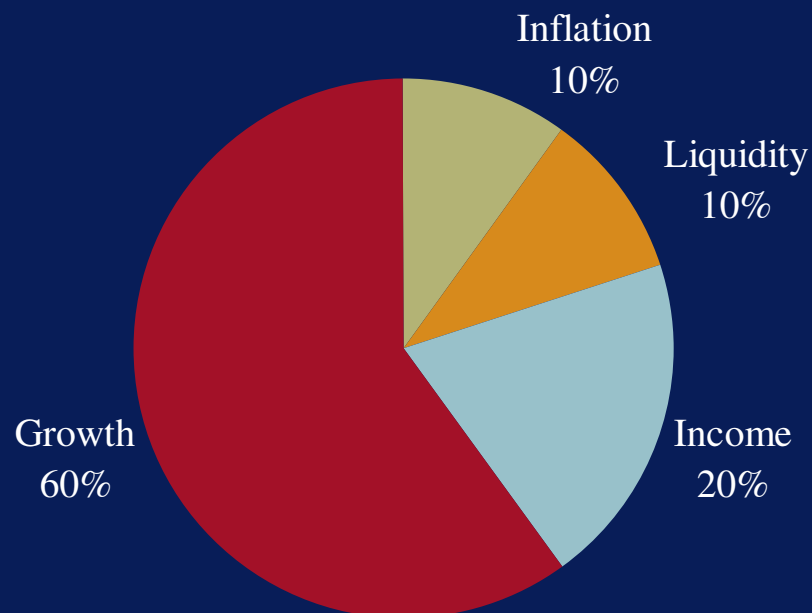
Observations on Risk Budgeting

- ◆ Once an investor knows how to aggregate the factor sensitivities across "asset classes," then risk may be budgeted by factors rather than by asset classes
- ◆ This also allows the measurement and use of investment managers who allocate more dynamically across styles, or use cash

Sample Old Paradigm



Sample New Paradigm



Observations on Risk Budgeting

- ◆ Enables risk to be budgeted by the needs of an investor's liabilities (liquidity duration, capital growth, inflation protection), rather than the mechanical use of a mean variance optimizer that creates efficient allocations to asset classes
- ◆ Creates new levers for rebalancing
 - Rather than only through $\uparrow \downarrow$ asset class allocation
 - But also through $\uparrow \downarrow$ factors across asset classes
 - Thus, if one investment is illiquid, another with similar exposures can be adjusted
 - Credit hedge fund High yield
 - Private equity Equity

Conclusions

- ◆ Alternative investments can be defined, at least partially, by traditional asset classes
- ◆ Factor analysis can enable
 - Identification of portfolio-wide factor exposures
 - Better diagnostics for risk management
 - Reduction of beta redundancy
 - Reduction of chances for high correlation of assets in stress events
 - Performance targeting
 - More accurate benchmarking and rebalancing
 - Selection of the best investments for equal factor exposures

Conclusions

- ◆ Implications for portfolio construction
 - Sharpe ratios and mean–variance optimization mask traditional asset class exposures of alternative investments
 - Two portfolios with the same risk–return profile may have different degrees of attractiveness from a factor perspective
 - An investor should pay for alpha, not traditional asset class beta
- ◆ Achieving the objective of true diversification from an alternative investment portfolio requires
 - An integrated but diversified portfolio of investments
 - Integrated oversight, factor measurement, and systematic rebalancing
 - Access to idiosyncratic, alpha-generating managers
 - Potential assistance from integrated portfolio providers

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