Asset Allocation in PenSam

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PenSam Quick Facts

- Danish labour market pension scheme
- Established 1986
- Members (organized in trade union FOA)
  - Active: 174.000
  - Retirees: 81.000
  - Deferred: 216.000
- Covers staff in public health care sector (low skilled, low paid workers)
- AUM approx. €16bn

Asset allocation as of 31.12.2015

Investment Grade Fixed Income	40%
Emerging Market Debt	9%
High Yield Bonds	6%
Listed Equities	23%
Real Estate	6%
Infrastructure	1%
Private Equity	5%
Credit	8%
Other	2%
Total	100%

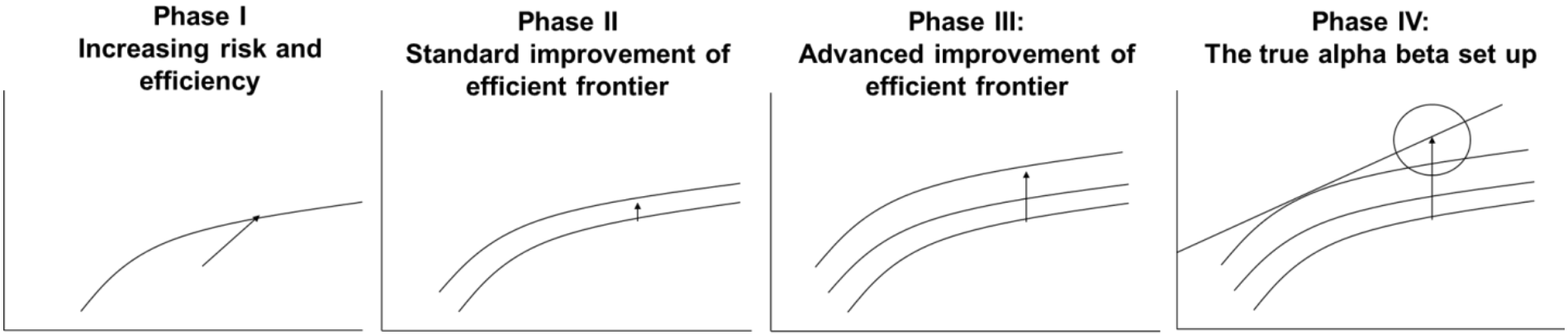
Recognized for active investment management

Investment proces

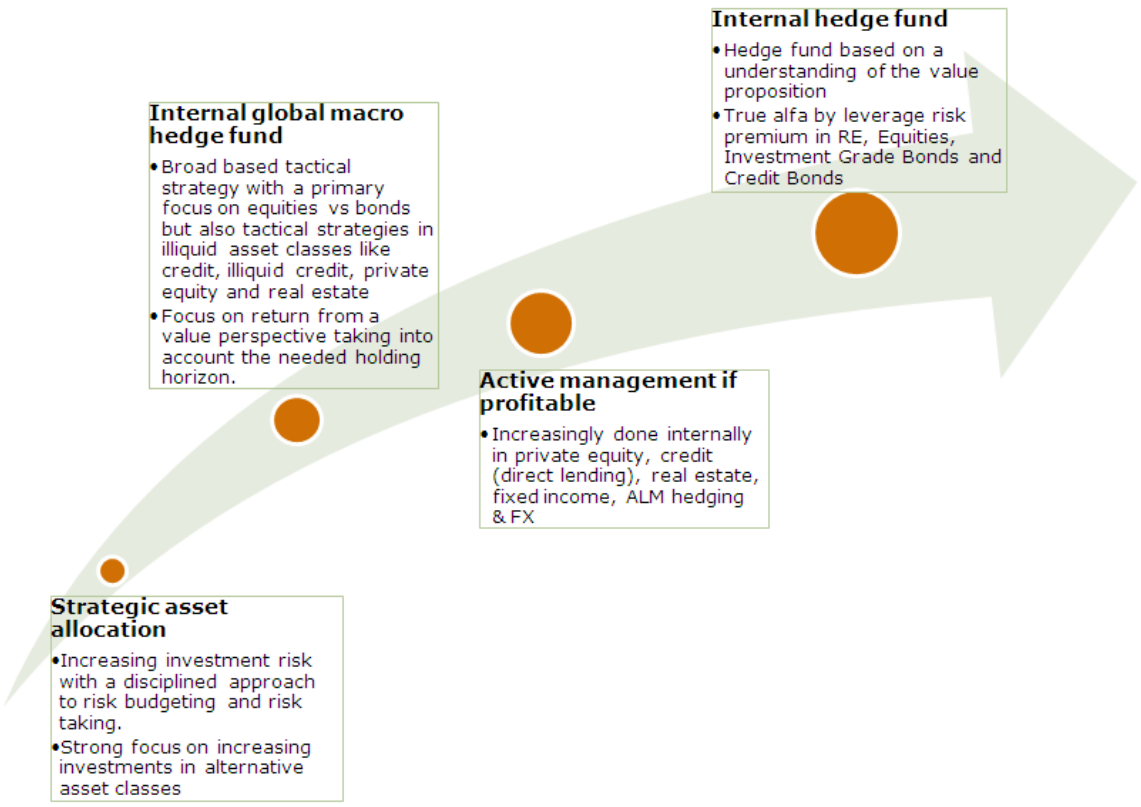
Journey started in 2009 with new strategy plan

	Phase 1	Phase 2	Phase 3	Phase 4
Active - Passive - Securities - Derivatives	Equities	Standard improvem. of efficient frontier	Advanced improvem. of efficient frontier	True Alfa-Beta
	Fixed Income			
Investment strategies - Identifying risk factors that create excess return	Alternatives	- Credit - Infrastructure - Forestry - Real Estate	- Tail risk - Volatility - Commodities - Short funds	- Leverage of risk premia on capital market line

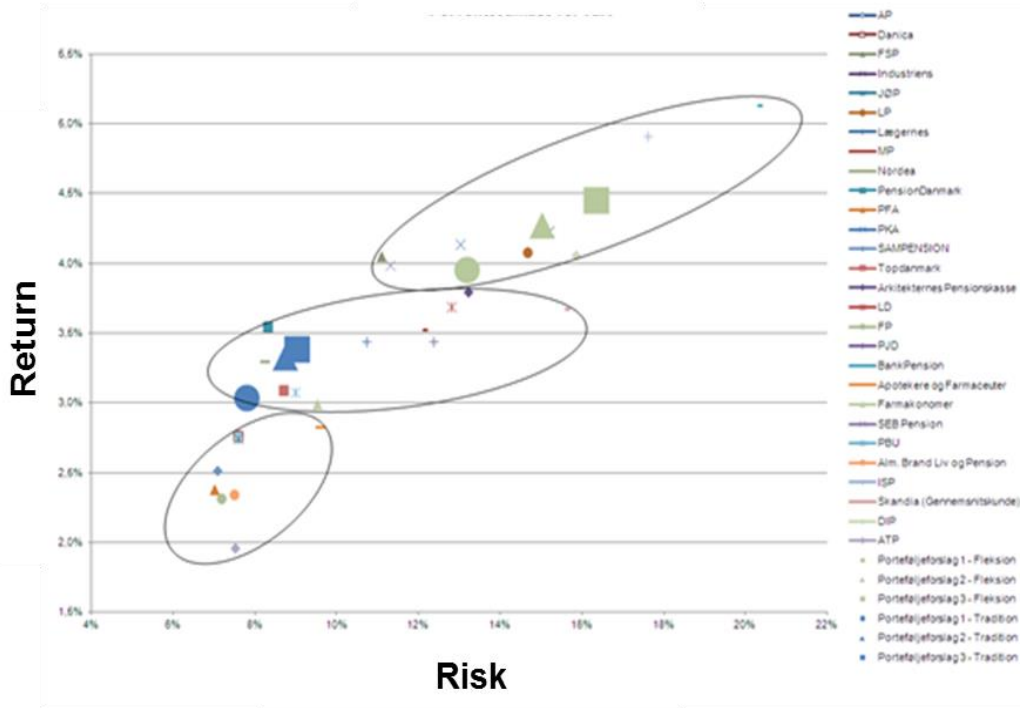
Strategy plan in modern portfolio theory context



Strategy change in 4 phases

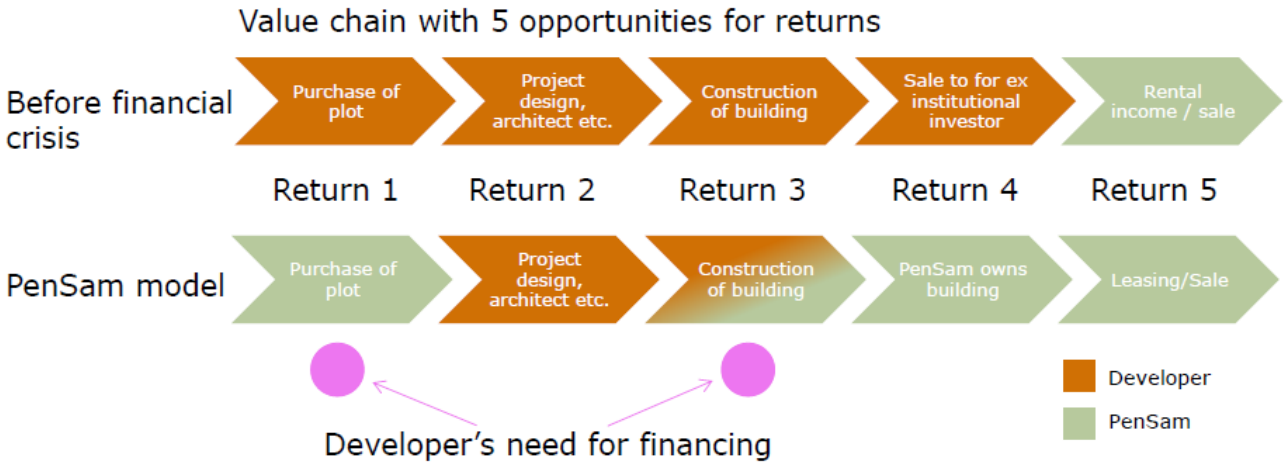


Significant performance improvement



Blue Ocean Strategy (Real Estate)

Attractive risk-reward relationship with combined debt and equity approach



	Developer	PenSam
Before financial crisis	Return 1+2+3+4	Return 5
PenSam model	Return 2+(3)	Return 1+3+4+5

TAA – Motivation

- Why TAA
  - Valuation (fair value) is driven by identifiable fundamental economic factors
  - Co-variation between the business cycle and asset price cycles is key in the TAA process: Asset prices cycles can be forecast based on forecast of the business cycle
    - Most performance is created in the run up to and during recessions (the 30% of the time equities are in a bear market)
  - Market factors behind short term deviations from fundamenmtally determined fair value; analysis of market factors thus an important part of the TAA process

- "Leverage": Global Macro strategies rest on many of the same inputs as the TAA process

TAA – Approach

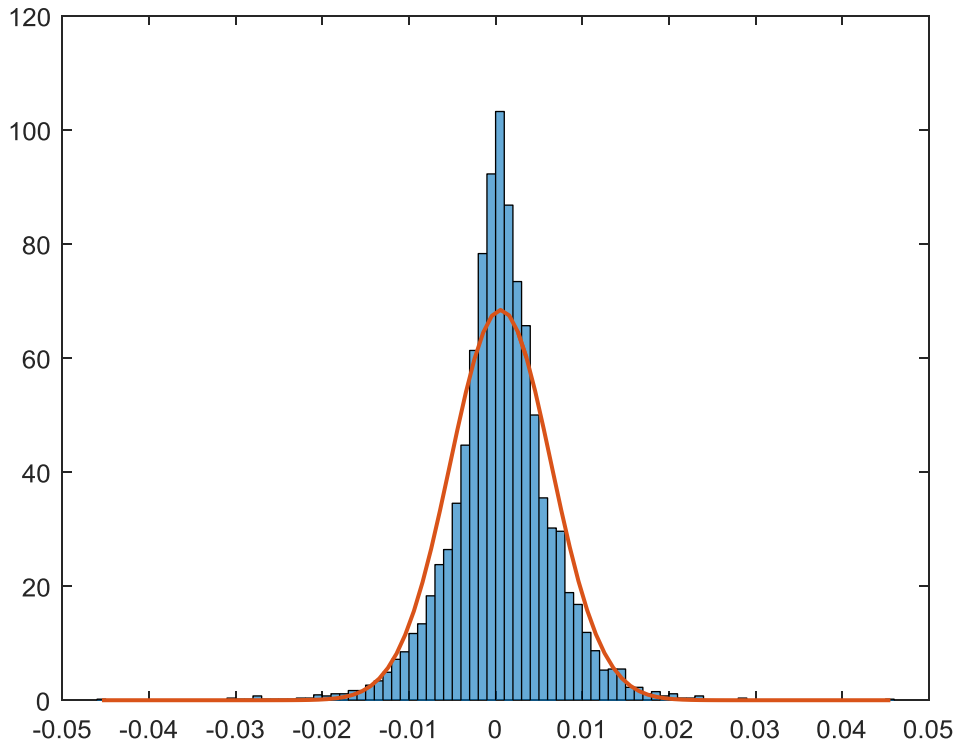
- Starting point: Risk on/off – choice between equities or bonds or cash
  - Strategy to be expanded to include F/X, credit and commodities
- Method: Mix of quantitative models and discretionary assessments which in particular focus on the part of the investment environment that is hard to quantify
- Quantitative models
  - Systematic strategies based on standard regression analysis
  - Regime modelling (Markov switching model)
  - Recessions probabilities (probit model)
- Discretionary overlay ((geo)politics, regulation, …)
- Effective implementation (derivatives – futures)
  - Timing
  - Costs
- Philosophy: *Simple, meaningfuld, robust*

TAA – Example

- Futures quant model: Short term market timing model with just two instruments

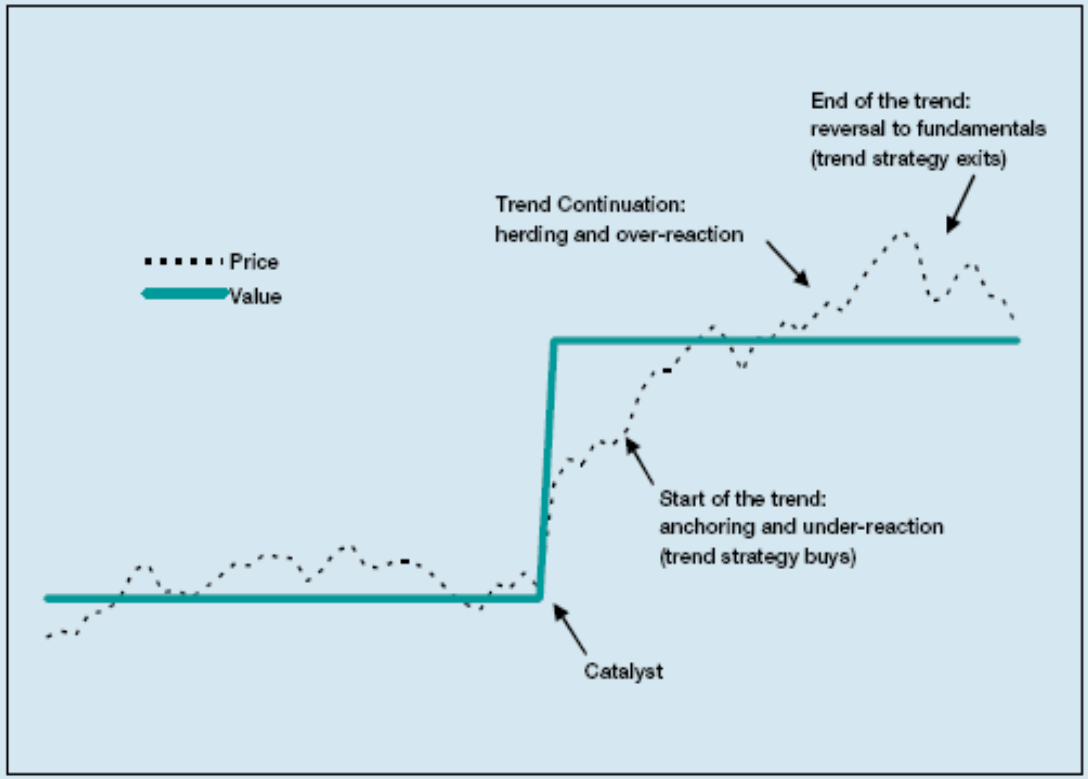
- Futures quant model

- Expected return 14,6%
- Volatility 9,2%
- SR 1,58
- Skewness -0,19
- Excess kurtosis 3,6



Modelling principle

- Build on the same behavioral errors and market frictions that trend and momentum models do - firm documentation in the academic research



Source: AQR. For illustrative purposes only.

- In an efficient market the adjustment is assumed to be instantaneuous.
- Underreaction to news makes a price reaction slow.
- Similarly, an overreaction leads to overshooting – sell instead of buy.
- Not trying to forecast (say) CPIX but rather riding on a **post-reaction drift**, if any, to a good/bad number.
- Timely data important – information disseminates quickly

Methodology cont.

- When investigating many variables or signals, the variables have to be profitable beyond what is expected by pure chance
- A signal could be a 12 month S&P futures return
- The signals are weighted together in a regression framework
- Variables have to make sense
- A good story of why they might be important is desired
- They have to be robust (e.g. to thresholds)
- Desirable to find variables that work across assets (e.g. momentum)
- Apply reasonable transformations only

S&P and US Treasury futures model (Jan 95 – Apr 15)

Sharpe ratios net of transaction costs – All: 1.6, Risk parity: 1.0, 40 SP/60 TY: 0.8