



Active Risk Allocation

Theory & Practical application

Independent | Transparent | Disciplined

Inconvenient facts

Investments 1.01

- Return forecast are always wrong
- Asset covariances are unstable
- Autocorrelation do exist
- Markets are not always efficient

Targeting Return vs. Risk Management

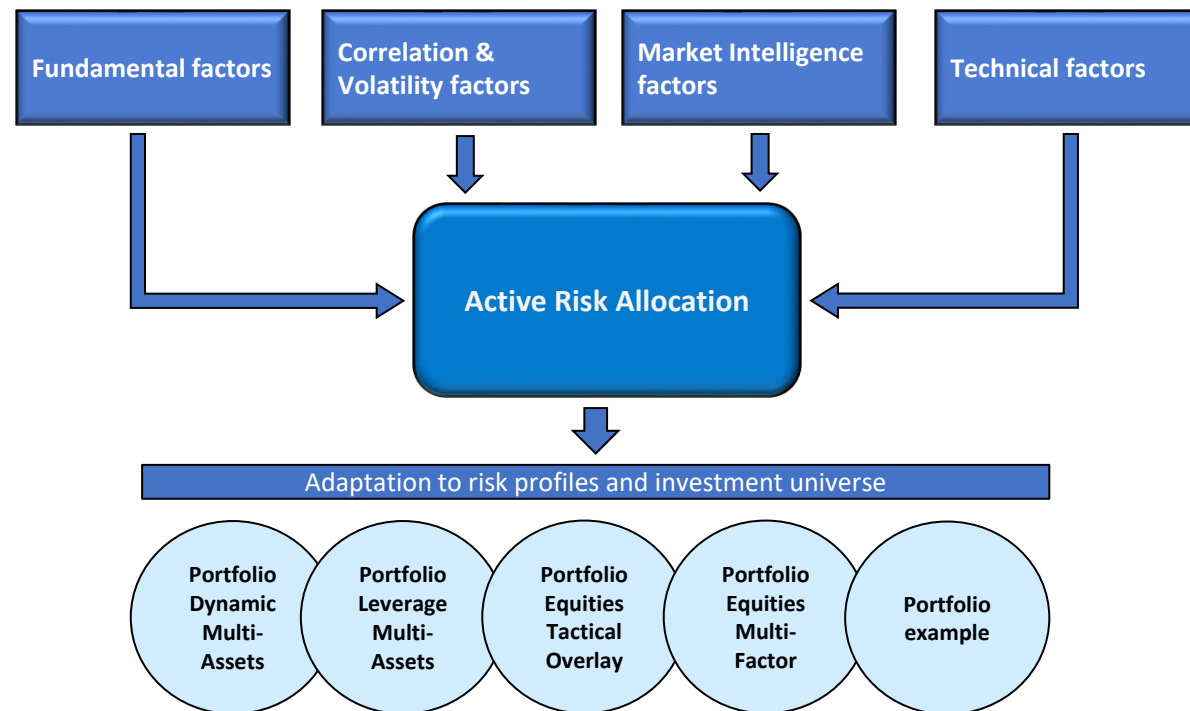
The traditional way: Return targeting

- Based on **expectations** of future returns
 - Expectations are most often wrong
 - Fixed intervals for portfolio rebalancing
- Changes in risk/volatility not taken into consideration
- Assumes that assets move in stable patterns relative to each other
- In times of trend changes, portfolio is only rebalanced as trend estimates are revised

The ARA way: Volatility targeting

- Based on **existing** volatilities
 - No guesswork as the volatilities are available
 - Adaptive intervals for rebalancing determined by target volatility
- Adjusting to changes in risk
- Takes into consideration that correlation patterns change
- In times of trend changes, volatility changes force a portfolio rebalancing

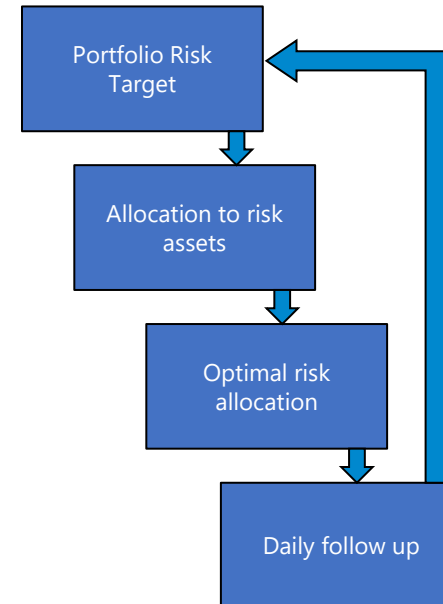
Disciplined investment process



Active Risk Allocation

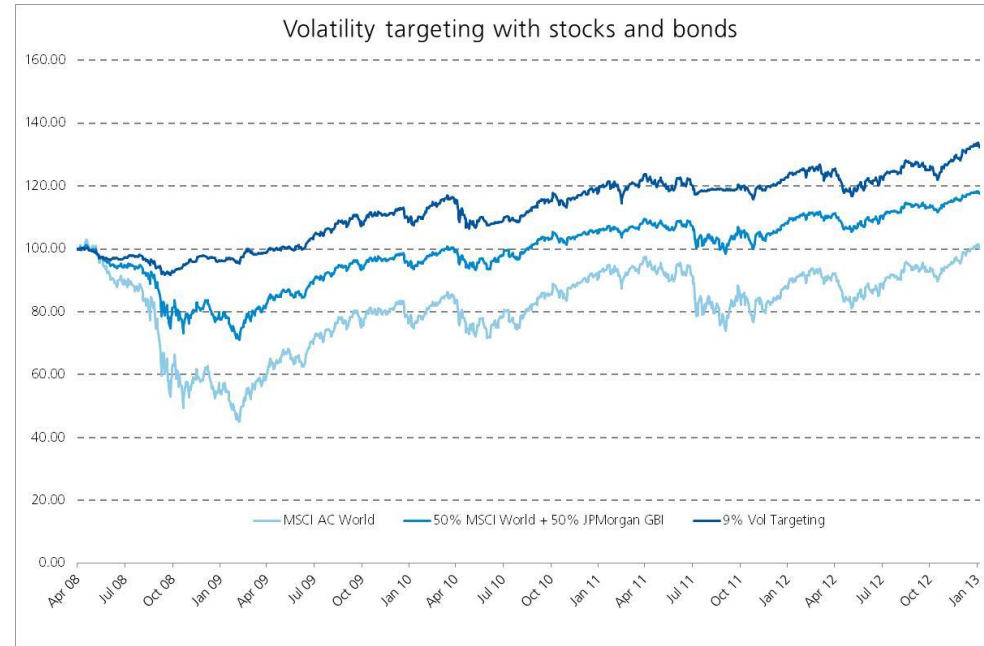
Summary of method

- Decide on desired portfolio volatility band
 - 3.5-5%, 6-8% or 9-11% target
 - Depending on model input
- Allocate between risk assets and non-risk assets
 - Between 0 and 100% of portfolio may be allocated to risk assets
 - Depending on model input
- Calculate portfolio allocation
 - Allocating assets in a way that no asset class gives a too large risk contribution (almost Risk Parity)
 - Respecting overall volatility target
 - Respecting overall allocation target
- Daily follow up
 - Daily calculation of expected portfolio volatility
 - Daily supervision of OMRI and portfolio risk allocation
 - Corrective action if necessary



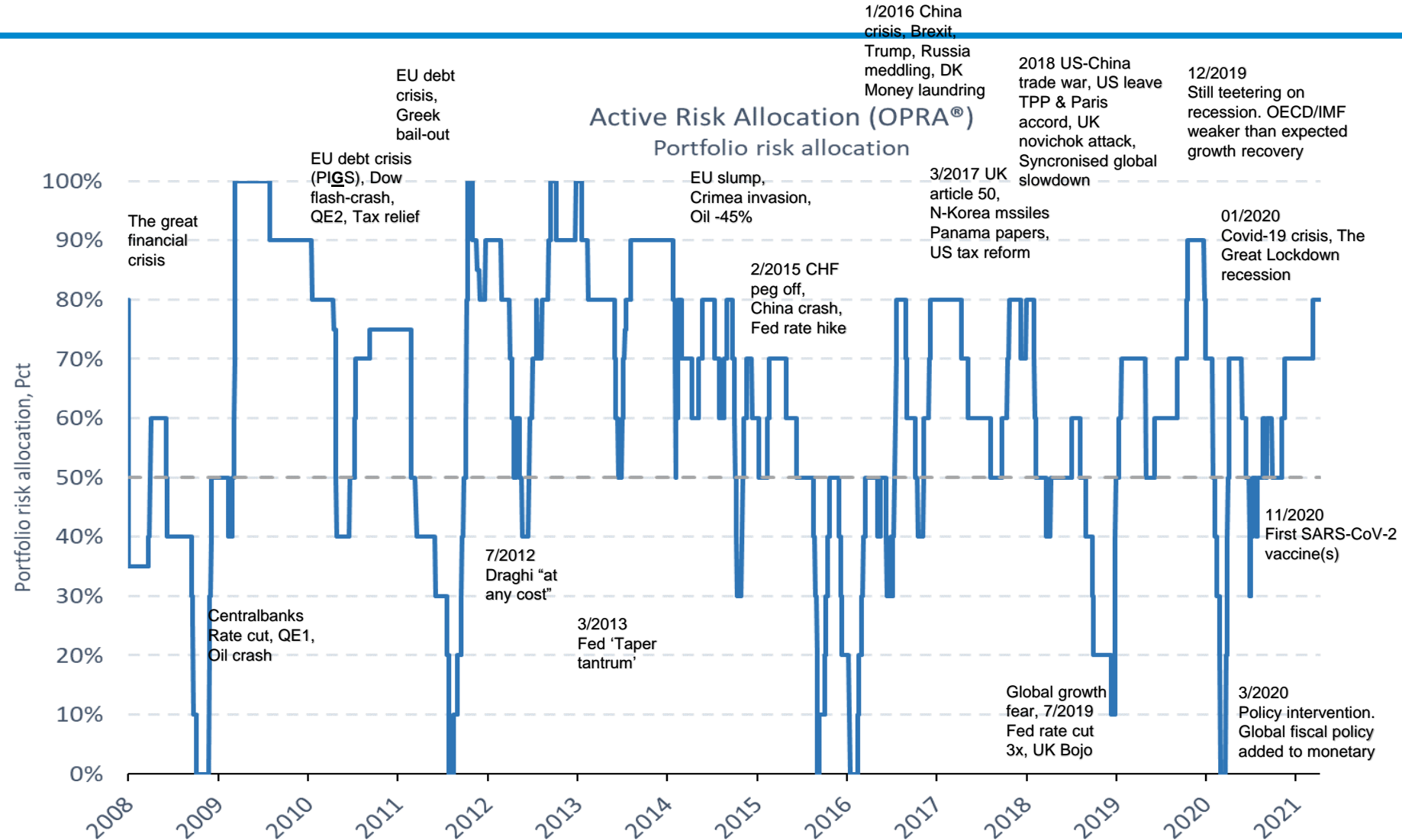
Try something else
Volatility targeting 9% — an example

- Finding best allocation, based only on volatility (risk) control
- Simplified example, with only two investments
 - MSCI World Stocks
 - JPMorgan GBI Bonds
- Strategy
 - Allocation is adjusted monthly
 - Target volatility 9%
- Results
 - Annualised return of 5.6% against 0.3%
 - Realised volatility 8.8% against MSCI Volatility of 19.74%
 - Max Drawdown of 9.0% against MSCI Drawdown of 52.1%
- A reactive strategy that reduces losses to outperform the market.



Holdings of stocks and bonds (available as ETF's) are adjusted monthly, targeting 9% portfolio volatility. In periods of increasing volatility, allocation is automatically directed towards the less volatile asset class.

OPRA[®], the backbone of our approach

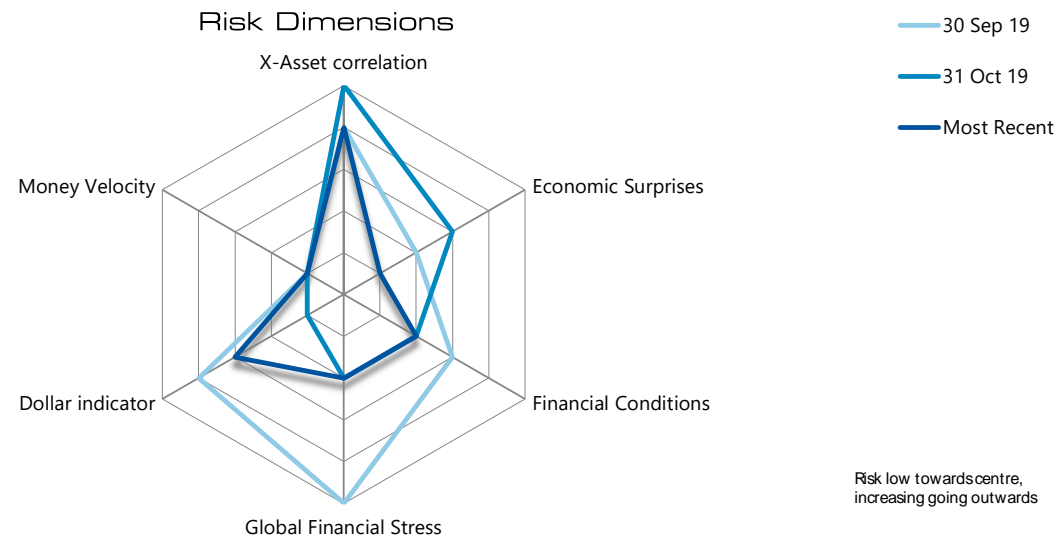
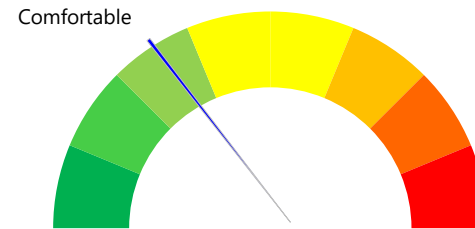


OMRI[®], Market Risk Indicator

State of the components: Risk-on, last inning

14 November 2019

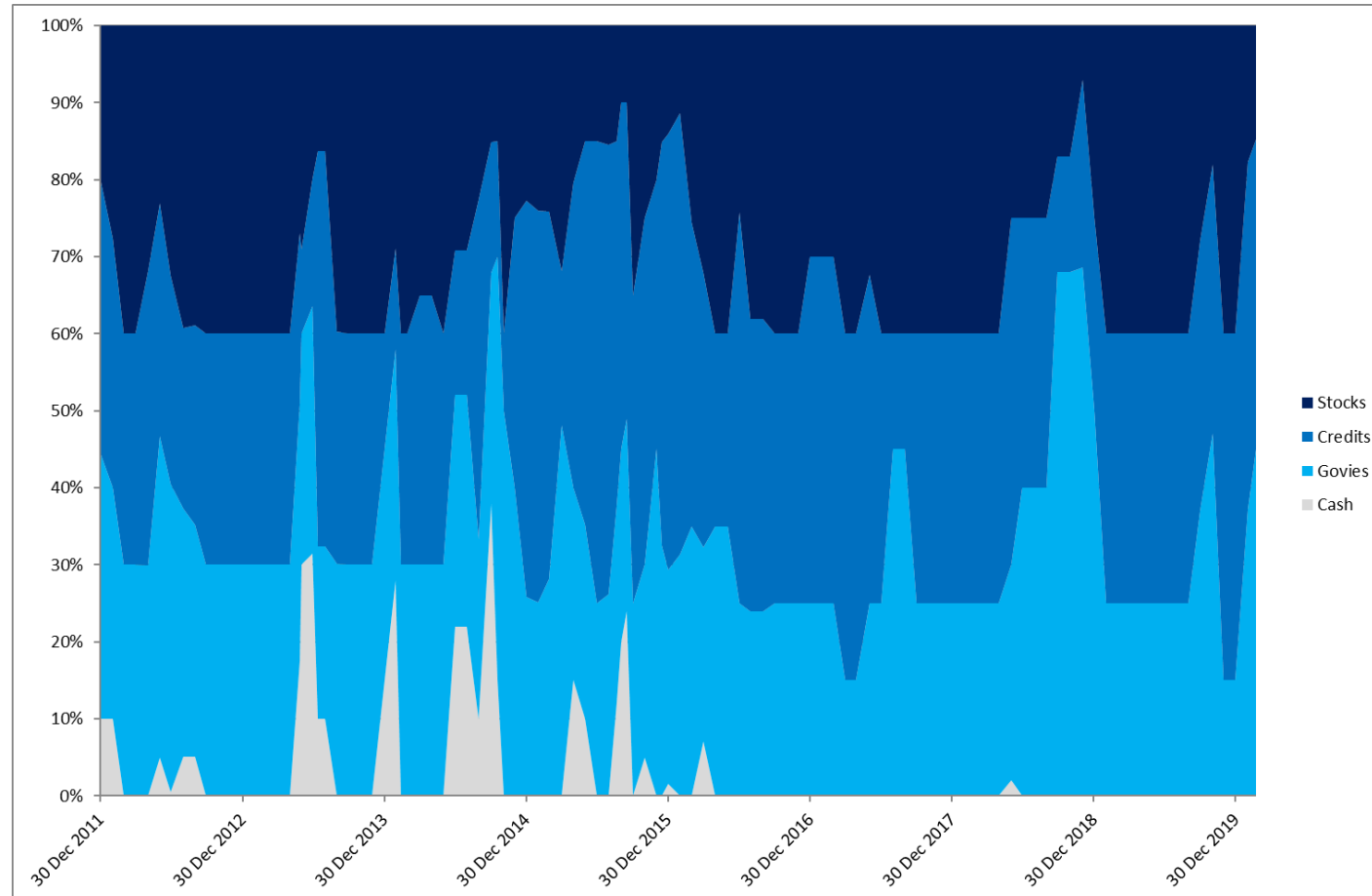
Indicator	Sentiment	Last update
X-Asset correlation	Tense	14 Nov 2019
Economic Surprises	Feels good	14 Nov 2019
Financial Conditions	Comfortable	14 Nov 2019
Global Financial Stress	Comfortable	13 Nov 2019
Dollar indicator	Neutral	14 Nov 2019
Money Velocity	Feels good	14 Nov 2019
Summary	Comfortable	



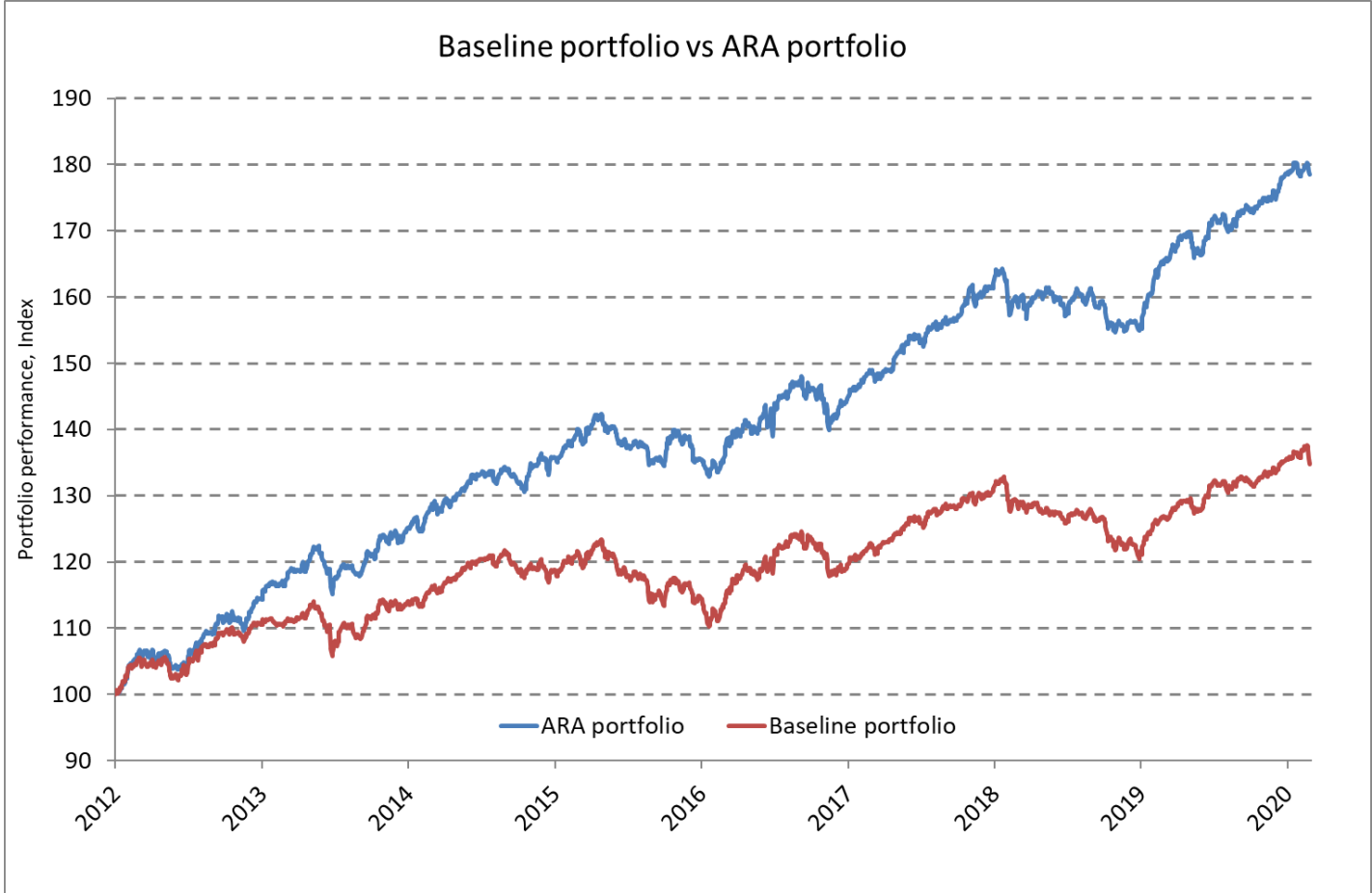
ARA optimisation — Investment universe

Asset Class	Low	High	Proxy for asset class
Short-term liquidity	0%	20%	JPMECUL:LX
Top AAA bonds	30%	65%	IEAG:IM / FRTDANB:LX
Asset backed mortgage bonds	10%	30%	FRODMBF:LX
High yield	0%	30%	HYLD:LN
Investment grade	0%	20%	BBINGRR:LX / LQD:US
Emerging market	0%	10%	EMB:US
Stocks	10%	35%	
Global stocks	5%	30%	IBCH:GR
Regional stocks	5%	15%	SPIOMXC:DC / CARWWDA:DC

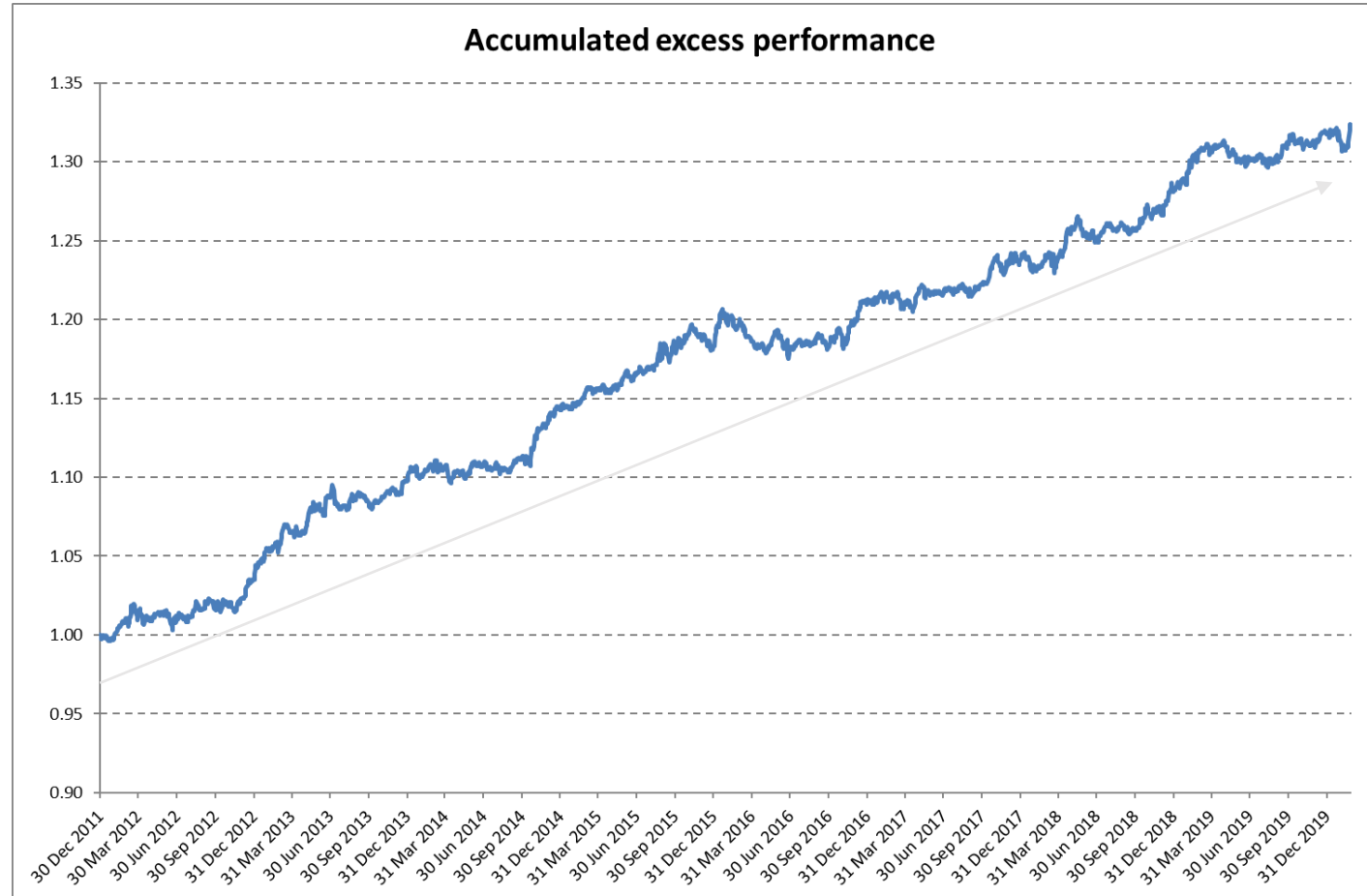
Portfolio — Historic asset allocation



Performance



Excess performance



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