Risk parity and risk factor Investing

19 February 2014

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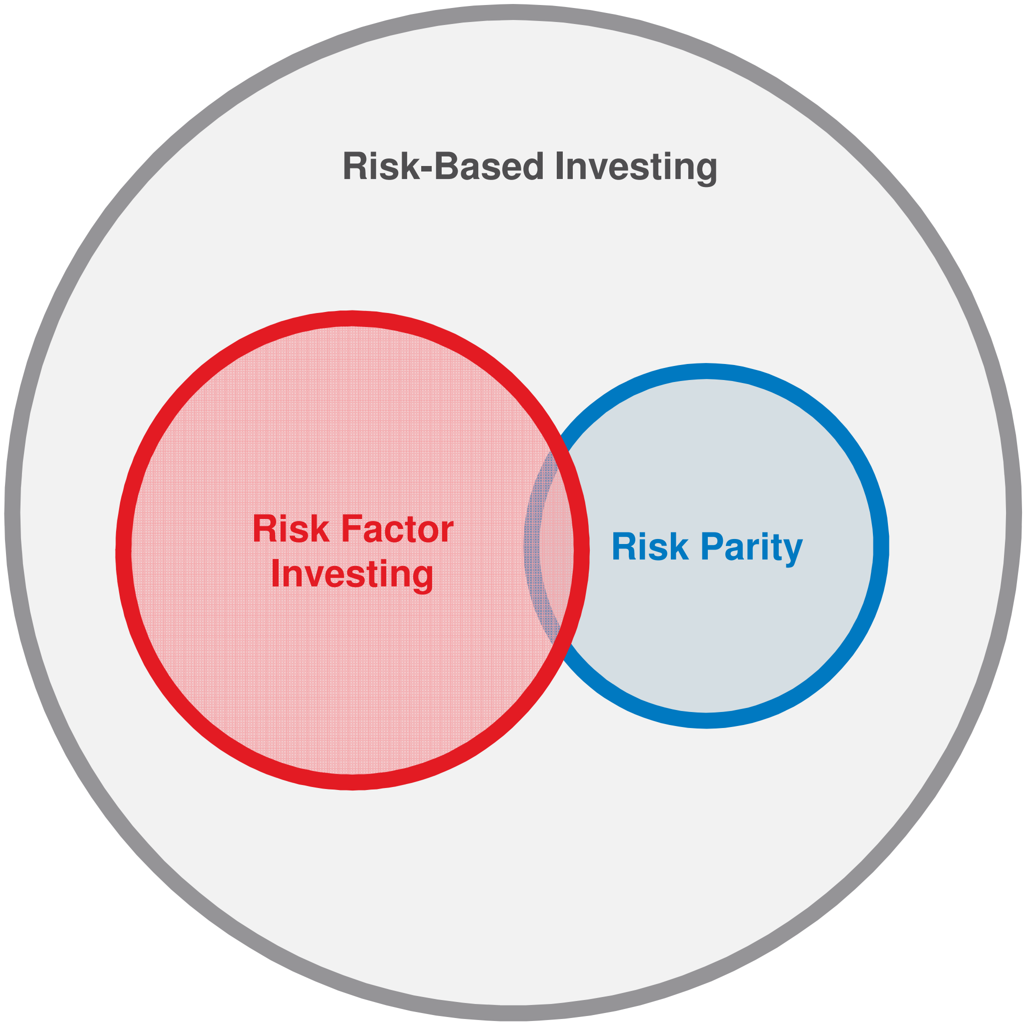
BLACKROCK®

What is Risk-Based Investing?



Risk-Based Investing

- Allocating risk instead of capital

Risk Parity

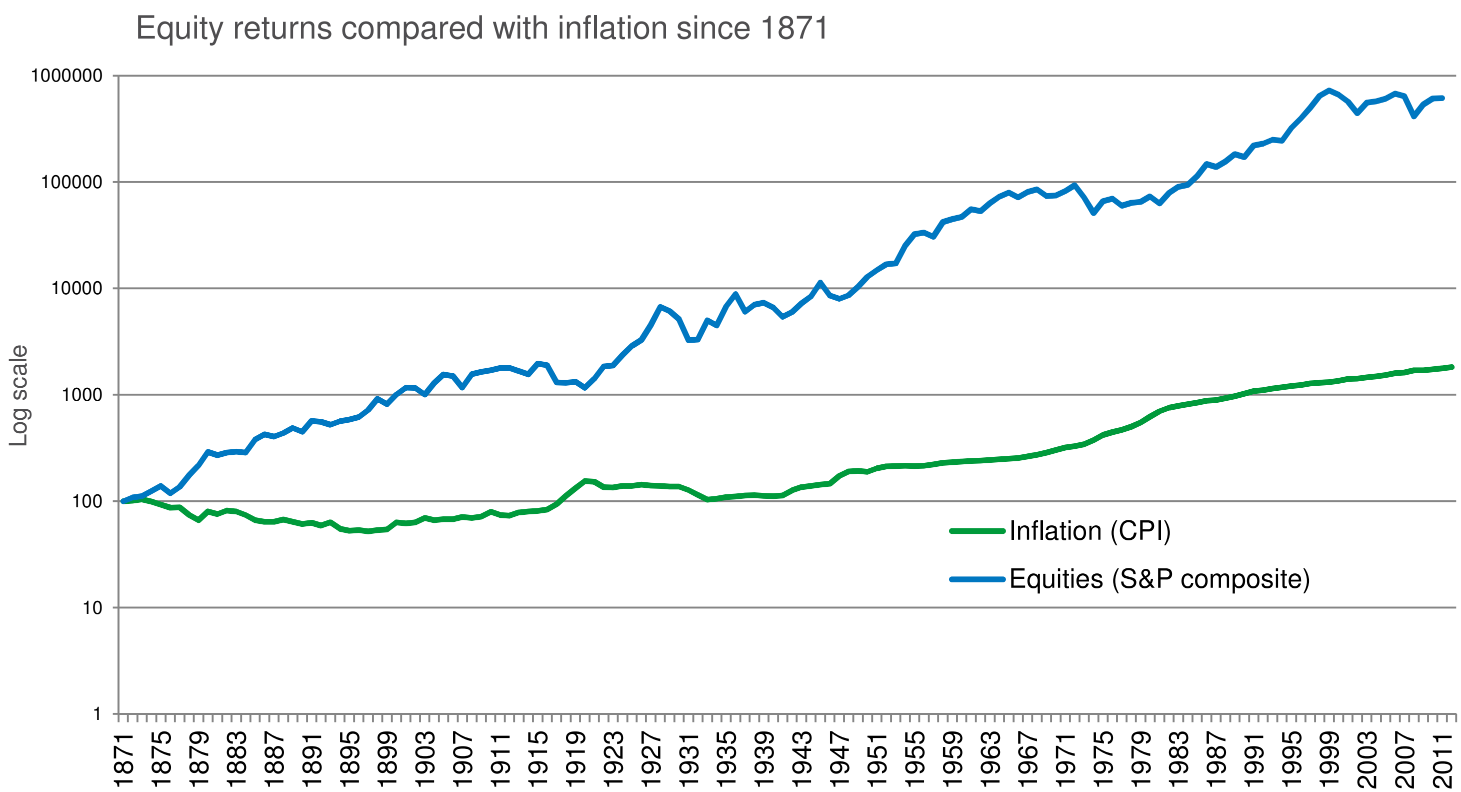
- The special case of risk-based investing where risk allocations are equal

Risk Factor Investing

- Allocating not to asset classes but to risk factors.
  Examples: The small cap premium, Liquidity premium

There is strong evidence of the existence of a investment risk premium

- From an empirical perspective
- From a theoretical perspective

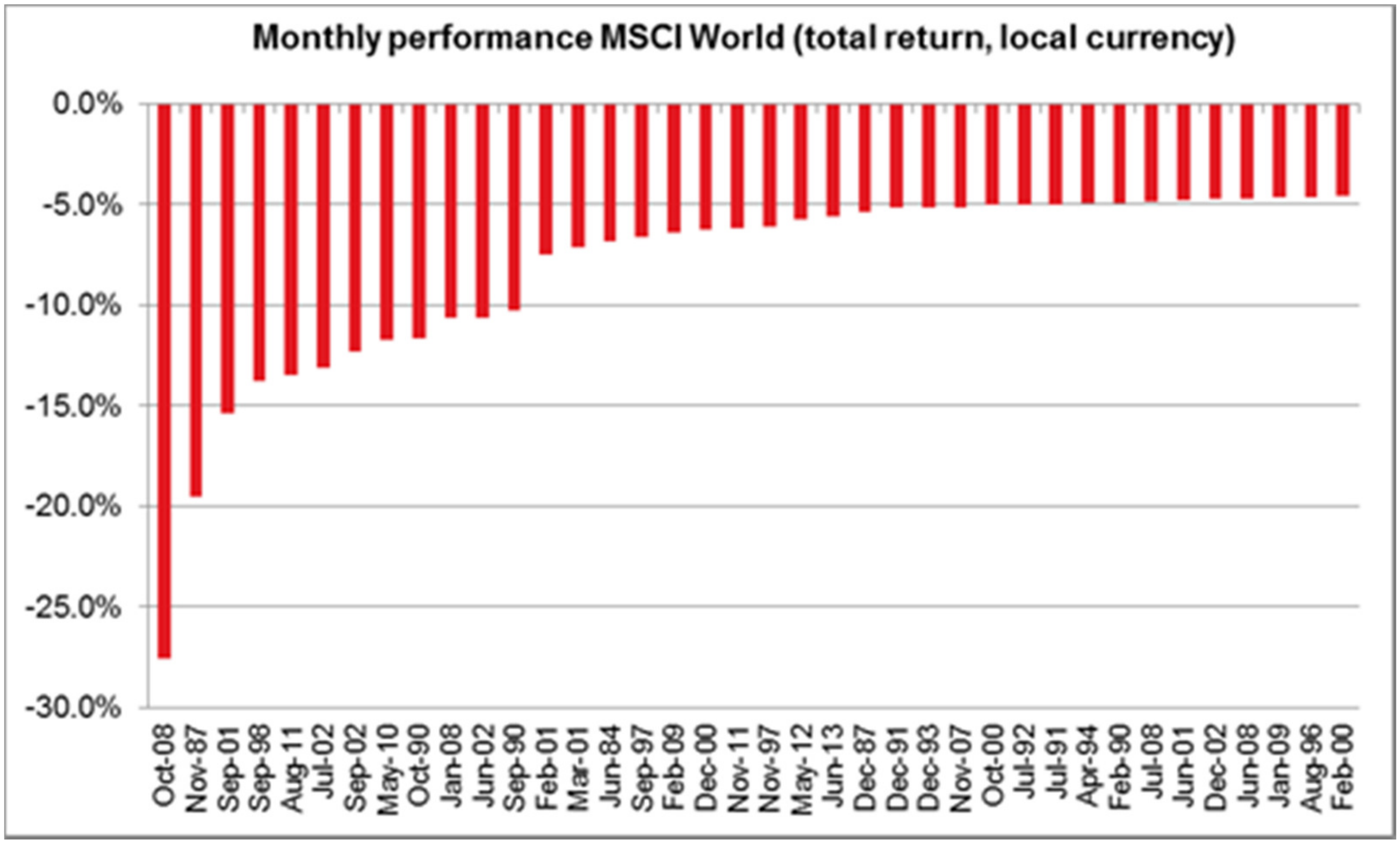


But risk matters

Source: Market Volatility, R. Shiller, MIT Press, 1989, and Irrational Exuberance, Princeton 2005

Lessons learnt from 30 years of investing in economic risk

MSCI World Index: most negative monthly returns of the past 30 years



Source: BlackRock, Datastream

A balanced portfolio

- An entrepreneur wants an increase in wealth over a 10-year period with reasonable certainty
- Decides to diversify by allocating an equal amount of dollars to two projects

Project A - $50m

Power plant

Chance of losing $50m over 10 years: ≈ 0%

Project B - $50m

Hyperloop

30% chance of losing $50m over 10 years

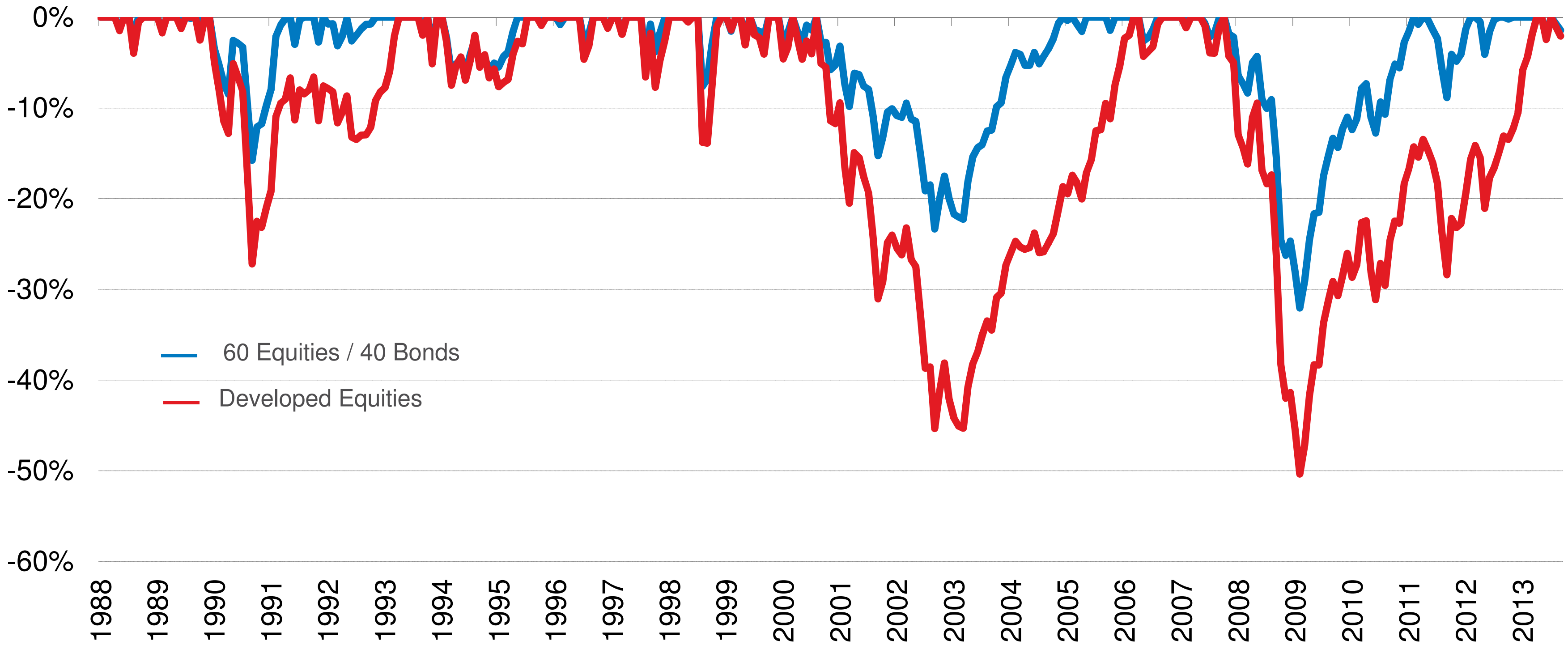
- This is not a balanced portfolio. 99% of the risk comes from project B
- Why bother with project A in the first place?

Source: Pixabay.com

Source: gas2.org

The experience of investing in equities and balanced portfolios

Drawdowns from previous high for an equities and 60/40 portfolio



- We have only just recovered from the losses started in 2007

Source: BlackRock

Using asset classes to achieve diversification is helpful

Identifying optimal portfolios requires only three pieces of information

1. Expected return
2. Risk
3. Correlations

Covariance matrix

	USD.Cash	IL.Debt	Dev.Sov.Debt	IG.Debt	EM.Sov.Debt	HY.Debt	Dev.Equity	Dev.Sml.Cap.Equity	EM.Equity	Listed.Private.Equity	Infrastructure	Property	Ex.Energy	Energy
USD.Cash	1.0	-0.5	-0.3	0.0	-0.1	0.5	0.8	0.6	0.3	0.4	0.3	0.5	-0.3	0.2
IL.Debt	-0.5	1.0	0.8	0.7	0.7	0.0	-0.6	-0.4	-0.1	0.0	0.3	0.2	0.2	0.0
Dev.Sov.Debt	-0.3	0.8	1.0	0.8	0.8	0.3	-0.5	-0.3	0.1	0.1	0.3	0.4	0.2	0.1
IG.Debt	0.0	0.7	0.8	1.0	0.7	0.3	-0.3	-0.2	0.0	0.1	0.4	0.5	0.0	0.0
EM.Sov.Debt	-0.1	0.7	0.8	0.7	1.0	0.5	-0.2	0.0	0.3	0.3	0.5	0.6	0.3	-0.1
HY.Debt	0.5	0.0	0.3	0.3	0.5	1.0	0.4	0.5	0.8	0.6	0.6	0.7	0.3	0.0
Dev.Equity	0.8	-0.6	-0.5	-0.3	-0.2	0.4	1.0	0.9	0.5	0.7	0.5	0.4	0.1	0.3
Dev.Sml.Cap.Equity	0.6	-0.4	-0.3	-0.2	0.0	0.5	0.9	1.0	0.7	0.9	0.7	0.5	0.4	0.4
EM.Equity	0.3	-0.1	0.1	0.0	0.3	0.8	0.5	0.7	1.0	0.8	0.7	0.5	0.5	0.3
Listed.Private.Equity	0.4	0.0	0.1	0.1	0.3	0.6	0.7	0.9	0.8	1.0	0.8	0.7	0.4	0.4
Infrastructure	0.3	0.3	0.3	0.4	0.5	0.6	0.5	0.7	0.7	0.8	1.0	0.7	0.4	0.5
Property	0.5	0.2	0.4	0.5	0.6	0.7	0.4	0.5	0.5	0.7	0.7	1.0	0.0	0.2
Ex.Energy	-0.3	0.2	0.2	0.0	0.3	0.3	0.1	0.4	0.5	0.4	0.4	0.0	1.0	0.2
Energy	0.2	0.0	0.1	0.0	-0.1	0.0	0.3	0.4	0.3	0.4	0.5	0.2	0.2	1.0

- In practice though, asset class returns overlap

Source:BlackRock

Asset class returns can be attributed to only six risk factors

Risk Factors						Asset Class
Real rates						Inflation-protected bonds
Real rates	Inflation					Nominal bonds
Real rates	Inflation	Credit				Corporate bonds
Real rates	Inflation	Credit	Liquidity			High yield bonds
Real rates	Inflation	Credit	Liquidity	Economic		Small cap equities
Real rates	Inflation	Credit	Liquidity	Economic	Emerging	Emerging equities

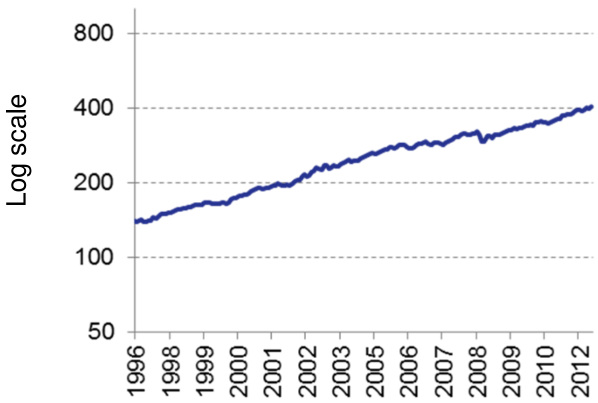
Source: BlackRock.

The fundamental sources of return

Source	Description	Example
Economic	Return premium associated with economic growth	Developed equities, commodities, and property
Credit	Return premium from lending money to corporations	Corporate bonds versus government bonds
Emerging markets	Return premium from investing in emerging market equities, bonds, and currencies	Emerging markets versus developed markets
Liquidity	Return premium associated with financial market and asset class liquidity risk	Small cap equity versus large cap equity
Real rates	Return premium from lending money for a period of time	Globally diversified inflation-linked government bond portfolio
Inflation	Return premium from bearing inflation exposure	Nominal bonds versus inflation-linked bonds

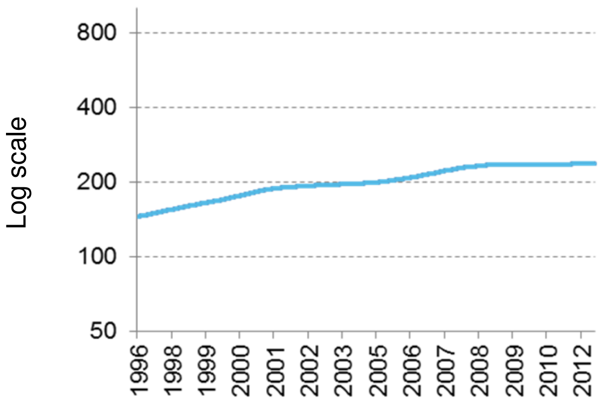
Asset classes deliver cash returns + a blend of risk premia. Example 1

Inflation-protected bonds returns

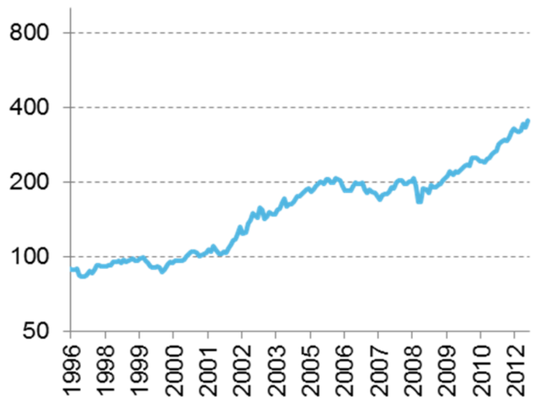


Barclays World Govt Inflation Linked Bond USD Hedged Index

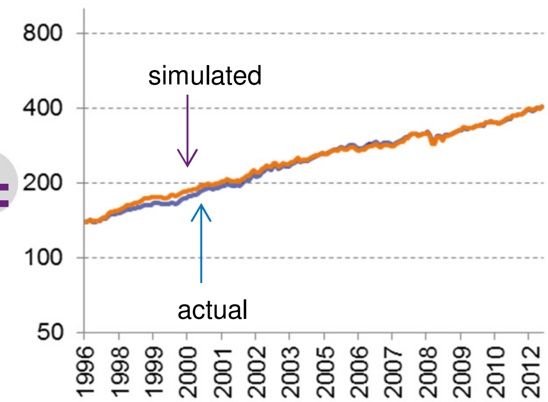
Cash



Returns from real rates risk premium



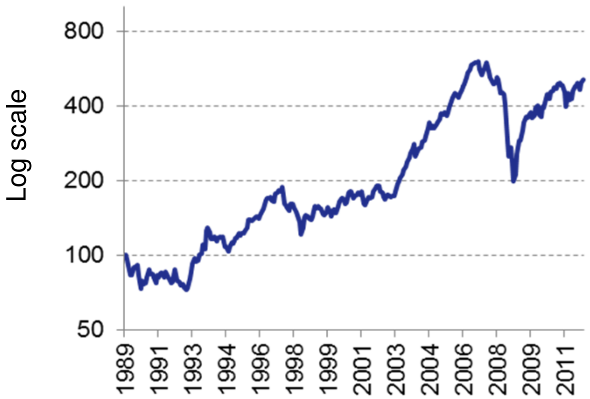
Inflation-protected bonds



Source: BlackRock

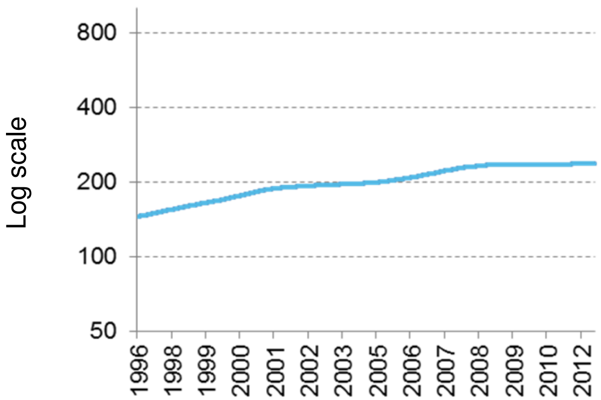
Asset classes deliver cash returns + a blend of risk premia. Example 2

Listed property returns (REITS)

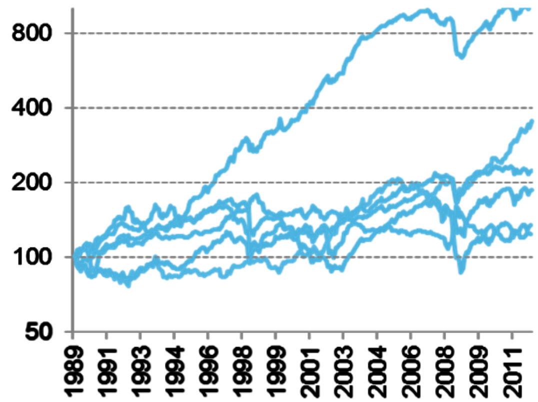


FTSE EPRA/NAREIT Global TR

Cash

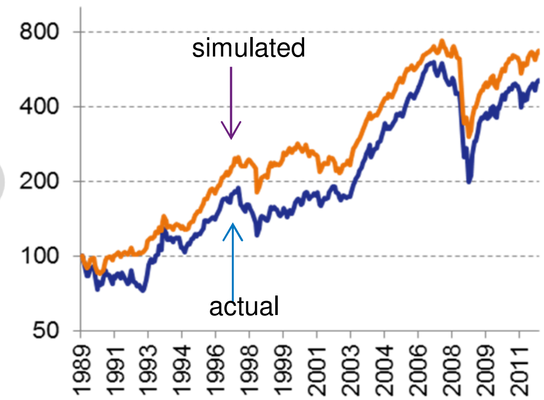


Real rates Inflation Credit Economic



Liquidity Emerging markets

Listed property

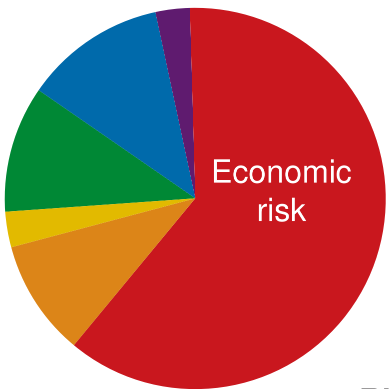


Source: BlackRock

The goal - achieving growth at reasonable risk…

Global pension assets

- Overexposed to economic risk
- Underexposed to other sources of return



Risk factor portfolio

- Balanced across fundamental sources of return

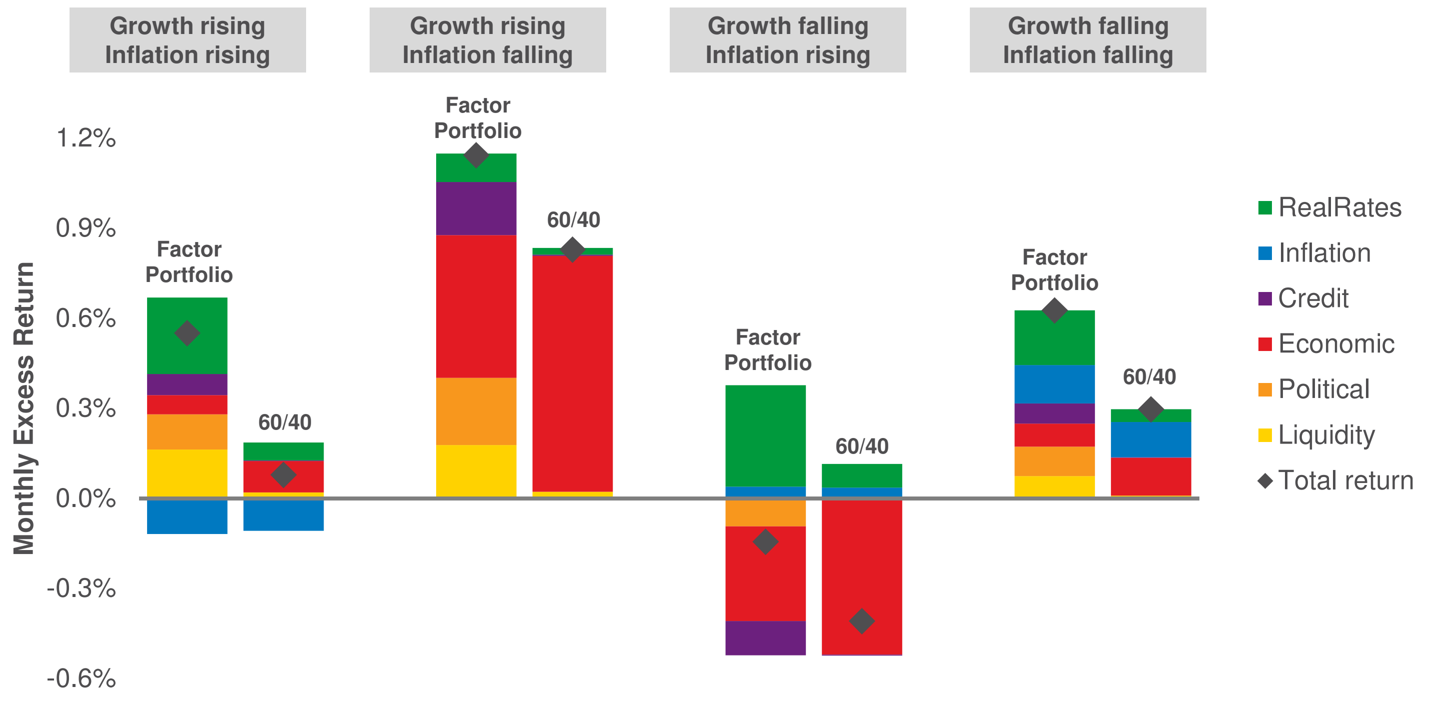
Risk factor portfolio versus average pension

- Redistribute sources of return and maintain return expectations

As of September 2013. SourceTowerswatson.com (Global Pension Assets Study 2013), Mercer.com (Asset Allocation Survey), FTSE (FTSE All-World index), BlackRock. The top level allocation is 47% equities 34% bonds 18% alternatives 1% cash. Global pension assets include defined contribution and defined benefit plans.

…and across market environments

The graph below shows the comparative average performance of a risk factor portfolio and 60% equities 40% bonds in four economic regimes defined by growth and inflation changes (1990-2013)



Factor portfolio relative allocations: Real Rates 27%, Inflation 10%, Credit 10%, Economic 28%, Political 17%, Liquidity 7%, rebalanced monthly.

Source: BlackRock. Growth rising/falling is defined by a 3-month increase/decrease in US ISM Manufacturing Index. Inflation rising/falling is defined by a 3-month increase/decrease in the 12-month % change of the US PCE Index. Excess returns for each risk factor are reported from January 1990 to January 2013
60/40 Blend: 60% MSCI World USD Hedged net return, 40% Barclays US Aggregate TR, rebalanced monthly.

For illustrative purposes.

Advantages and disadvantages of a risk factor approach

Pros	Cons
‣ Better understanding of return and risk. Asset class characterizations can be too broad (e.g. private equity) ‣ Portfolios more robust to market regimes ‣ Weighing the addition of new factors or asset classes to the portfolio and how large the allocation should be ‣ Better evaluation of benefits of active management	‣ No recognized list of factors ‣ Use of derivatives and short positions ‣ The need for frequent or active rebalancing of the risk factor building blocks ‣ By itself, using risk factors should not be a superior approach since both asset classes and risk factors are exactly identical

We need a better framework for understanding risk and return

Fat
Sugar
Salt
Proteins
Vitamins

High calorie content, but unbalanced

Balanced, but leaves you hungry

Fat
Sugar
Salt
Proteins
Vitamins

The solution?

Same amount of calories as a burger
As balanced as a salad

Fat
Sugar
Salt
Proteins
Vitamins

Summary

- Risk-based investing is expanding into multiple segments
- More crises to come: stay balanced
- Balance fundamental risks not asset classes