

Asset Allocation – From Past to Future

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swiss:finance:institute



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Outline

- 1 **Background**
- 2 The quest for factors
- 3 Changing environments
- 4 Final remarks

What is asset allocation?

From www.investopedia.com

An investment strategy that aims to balance **risk and reward** by apportioning a portfolio's assets according to an individual's goals, risk tolerance and investment horizon.

- Individual's goals (objective function), risk tolerance, investment horizon are important aspects, but not covered here.
- We all know what reward (return) means, but what about risk?
- And what does 'balance risk and reward' mean?

What is risk?

Risk means choice

“Risk” stems from the Latin verb “risicare”. “Risicare” means to dear. To dear is to act. It is a choice - not a fate!

Risk is manageable

Distinction between the concepts of risk and uncertainty: uncertainties are generally seen as inestimable, while risks are seen as calculable and can be managed.

Risk is an economic resource

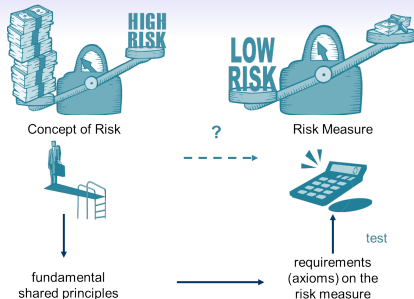
In the financial industry, risk should be considered as an economic resource.

No return without risk

Risk is an abstract concept – unlike return, which can easily be measured. Jointly, they define “performance”.

Risk and risk compensation?

- Everybody of us has an innate feeling of how financial risk should more or less behave like.
- Hence, **managing risk** might be a worthwhile exercise!
- But we cannot manage risk, if we do not know **how to measure** it!



Risk measurement questions

Financial

What do I measure ?

Statistical

How do I estimate it ?

Probabilistic

What hypotheses should I make ?

Computational

How can I carry out the computation?

Risk and return in finance

1st period: physics envy (starting 1947)

Samuelson and his PhD thesis, Markowitz diversifies, CAPM, market efficiency, Black-Scholes-Merton.

2nd period: cracks in the wall (starting 1978)

“Anomalies” pop up: Announcement effect, excess volatility, weekend and January effect, size effect, value premium, momentum.

3rd period: behavioral arguments (again) (starting 1972)

Slovic, Kahneman and Tversky, deBondt and Thaler, etc.

...the debate has become more puzzling

- 2000 Shiller publishes **Irrational Exuberance**.
 - 2001 Rubinstein concludes that markets are rational.
 - 2002 And the nobel prize goes to: **Kahneman and Smith**.
 - 2003 Malkiel concludes that stock markets are far more efficient and far less predictable than some recent academic papers would have us believe.
 - 2003 Schwert shows that when anomalies are published, **anomalies subsequently weaken or disappear**.
 - 2005 Malkiel shows that professional investment managers do not outperform their index benchmarks.
 - etc. ...
 - 2013 And the nobel prize goes to: **Fama, Hansen, Shiller**.
- ⇒ to be continued...

What to do with all this academic literature?

“I can calculate the movements of heavenly bodies, but not the madness of people.”

Sir Isaac Newton, 1720

“Can you imagine how hard physics would be, if electrons had feelings?”

Richard Feynman, 1965

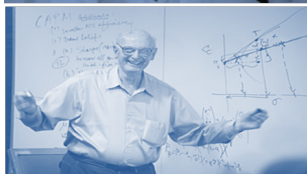
“I’m not blaming them for coming up with the idea, but I’m blaming the Nobel for giving them legitimacy. No one would have taken Markowitz seriously without the Nobel stamp [...] If no one else sues them, I will.”

Nassim Taleb, 2010

“The process of selecting a portfolio may be divided into two stages. **The first stage** starts with observation and experience and ends with beliefs about the future performances of available securities. **The second stage** starts with the relevant beliefs about future performances and ends with the choice of portfolio.

This paper is concerned with the second stage.”

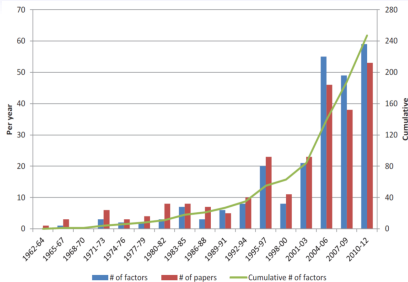
Harry Markowitz, 1952



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Anomalies, factors, statistical fluke?



- After discovery, anomaly (and factor) returns tend to wash out.
- On a side-note: In medical research, the recognition of multiple testing problems has led to the disturbing conclusion that “most claimed research findings are false” (Ioannidis (2005)).
- Also in finance, many factors may turn out to be statistical flukes.
- “Statistics is the **grammar of science.**” **Karl Pearson**
- “Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write.” **H.G. Wells**

- At least 316 factors have been tested to explain the cross-section of expected returns.
- Cochrane (2011) refers to this as “a **zoo of new factors**”.

A note on the smart beta trend

- The idea of smart beta goes back quite some time and probably starts with Ross' (1976) Arbitrage Pricing Theory (APT).
- The assumptions behind the APT are even more restrictive than those underlying Sharpe's CAPM.
- The literature on risk-premium bearing factors is immense.
- It is not clear what a 'true factor' should be. Is it justifiable from an economic viewpoint? Is it an anomaly? Or is it just a statistical fluke?

"Wenn wir müde sind, stürmen Gedanken auf uns ein, die wir längst erobert haben."

Friedrich Nietzsche

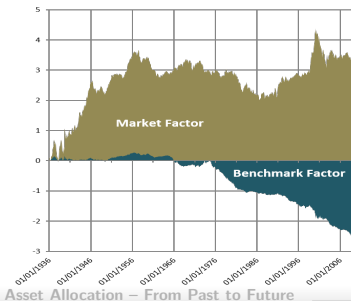
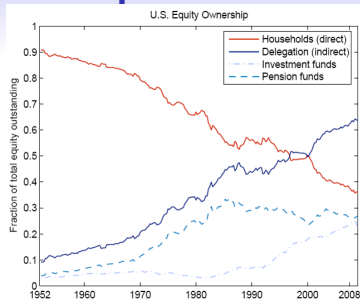
- Economic reasoning might help us in finding justification for risk-bearing factors...



Justifiable factors: an example

Leippold and Rohner, *Review of Finance*, 2012

- We observe a structural shift in investment discretion from private households to institutional investors.
- Delegation leads to a more informative price system and lower expected returns. Benchmark risk is a priced risk factor.
- In the empirical analysis, we find:
 - Stocks with high RIO exhibit significantly lower returns than do stocks with low RIO;
 - Large-cap stocks with a high residual beta exhibit significantly lower returns than do stocks with low residual betas.



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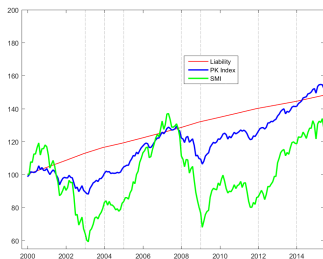
The bad think about luck

"I dreamed of the number 7 for seven straight nights, and 7 times 7 is 48."

Winner of the Spanish lottery revealing his theory of why he picked 48 as his last number.
Los Angeles Times, December 30, 1977.

The great enemy of truth is very often not the lie – deliberate, contrived and dishonest – but the myth – persistent, persuasive and unrealistic. Too often we hold fast to the cliches of our forebears. We subject all facts to a prefabricated set of interpretations. We enjoy the comfort of opinion without the discomfort of thought.

John F. Kennedy.



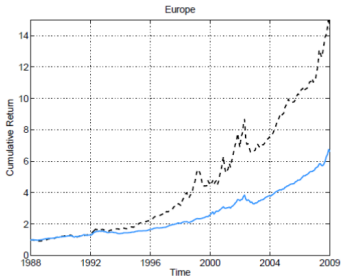
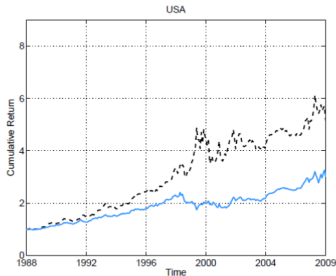
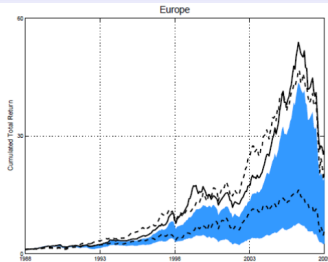
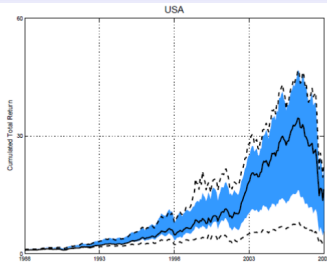
Even if you do the stats right...

- Price Momentum (Jegadeesh and Titman, 1993): Buy winners and sell losers.
- Earnings Momentum (Chan, Jegadeesh, Lakonishok, 1996): Buy positive and sell negative earnings revisions.

Findings Leippold and Lohre, *European Journal of Finance*, 2012

- ⇒ Accounting for multiple hypothesis testing, the international momentum puzzle prevails.
- PM is mostly EM in disguise, with some decoupling in the U.S. after the burst of the tech bubble.
- Evidence of momentum is due to investors' underreaction to fundamental news, not macroeconomic risk.
- Liquidity turns out to be a crucial driver.

Momentum (cont'd)

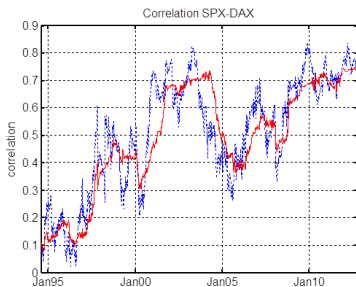


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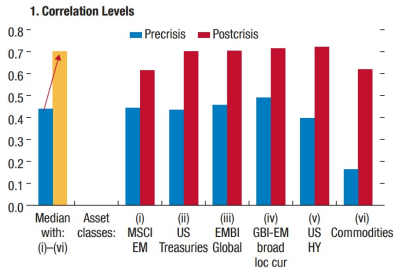
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Diversification still works?

- Since the financial crisis, correlations of international markets have increased.
- Also, correlations among stocks have increased over the recent years.



Correlations among major asset classes have risen markedly since 2010.

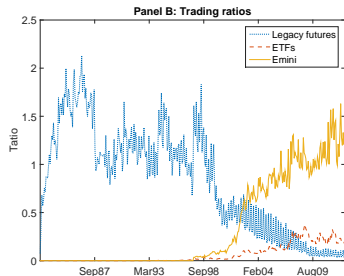
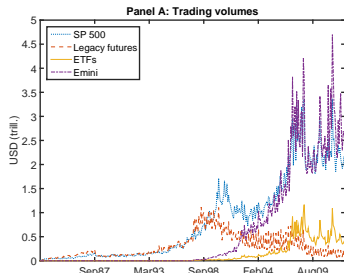


- Markets correlate even more during market downturns.
- Market correlation's increase may be a result of financial innovation.

Market correlation and ETF markets

Leippold, Su, and Ziegler, WP, 2014

- Research question: What impact do ETFs and futures have on the correlation of stock returns?
- Why do we care about correlation?
 - Diversification potential.
 - Correlation is priced.
- Why investigate ETFs and Futures?
 - S&P 500 ETFs have gained popularity in the past years.
 - Simple no-arbitrage relation between S&P 500 futures and ETFs and S&P 500 stocks.
 - Previous literature (Ben-David et al (2012), Da and Shrive (2013), Malamud (2015)).



Market correlation and ETF markets

Theoretical Predictions

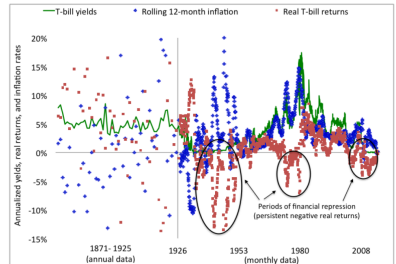
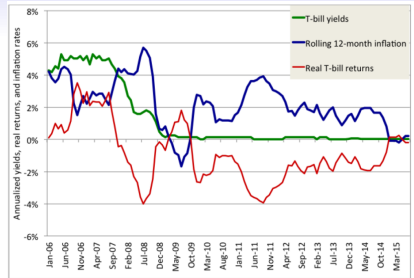
- H1: ETF and futures trading increase volatility for index and non-index stocks.
- H2: ETF and futures trading affects the correlations of index and non-index stocks. When correlations are high, ETF and futures trading lead to a further increase in correlation.
- H3: ETF trading has a stronger impact than futures trading.

Empirical results

- Index trading activity, a proxy for demand shocks, can explain a large part of the time variation in stock return correlations.
- Trading in index products not only increases the correlations of index stocks but also those of non-index stocks.
- Despite their lower dollar trading volume, ETFs have a higher impact on correlations than futures.

Financial repression?

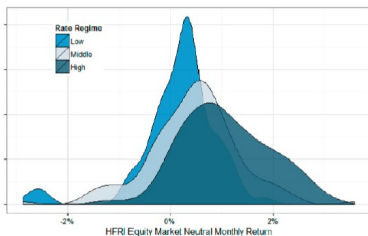
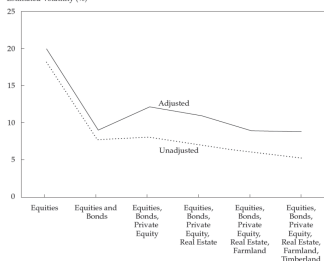
- In 1973, the economists Ronald McKinnon and Edward Shaw, looking back on the post-World War II period, described the policies of those times as financial repression.
- Negative real interest rates are a nefarious tax, punishing savers and depriving the economy of one of its primary sources of income.
- “Monetary policy is a lot less powerful than most people think it is. Bad monetary policy can screw things up.” (John Cochrane)



Going alternative?

- Lack of mark-to-market data lures investors into the misconception that alternative asset classes.
- Alternative investments are exposed to many of the same risk factors that drive stock and bond returns.

Estimated Volatility (%)



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Final remarks

- Over the years, discoveries in academia have had increasingly important influences on the asset management industry.

Dimensional Fund Advisors, as of June 30, 2014, manages \$378 billion. Academic research appears to have a deep influence on its operation, as its website states: "Working closely with leading financial academics, we identify new ideas that may benefit investors."

- Confronted with a 'zoo of factors', it is not straightforward to identify those that provide a true risk-return reward.
- Financial markets are an evolving system. New challenges are constantly emerging such as, e.g., "algorithmic high-frequency trading", "cheap money", and "big data".
- In such an environment, consistently measuring and effectively managing risk becomes pivotal in generating performance.

"The Committee recognizes that an extended period of low interest rates has the potential to induce investors to 'reach for yield' by taking on increased leverage, duration risk, or credit risk." – Jenet Yellen

- Do your homework right.