European Investment Roundtable

Rebalancing the portfolio

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Agenda

- Introduction
- Rebalancing mechanisms
  - Forecasting Based Approaches
  - Rule Based Approaches
- Summary

Introduction (1)

"Long term strategic asset allocation accounts for most of the time-series variation in portfolio returns, while market timing and asset selection appear to have been far less important."

Source: among others, Blake, Lehman, and Timmerman,1999

- **Due to market movements the actual portfolio will always deviate from the strategic asset allocation.**
- **The mechanism how to realign the portfolio with the strategy (rebalancing) has important implications on the risk and return profile.**

Introduction (2)

- Different rebalancing-approaches can be distinguished:
  1) **Forecasting Based Approaches** (“active tactical asset allocation”)
  2) **Rule Based Approaches** (“mechanical rebalancing”)

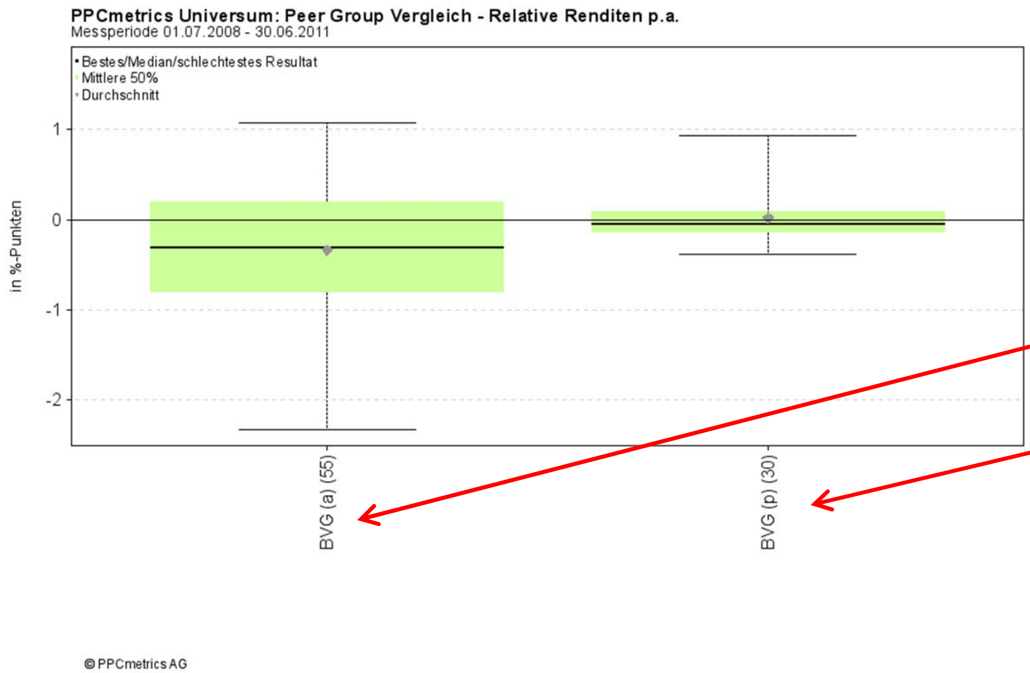
Forecasting based approaches (1)

- In forecasting based approaches (active tactical asset allocation) the weights of the different asset classes are steered based on the **forecast** regarding a variable (e.g., risk or return):
  - E.g., a model says that the **return** of stocks will be higher than average. Therefore, stocks should be overweighted.
  - E.g., the model says that the **risk** (volatility) of stocks will be higher than normal. Therefore, stocks should be underweighted.
- A "**model**" is needed to forecast the variables:
  - "Gut feeling"
  - Decision of an investment committee
  - Return forecasting based on factor models
  - GARCH-Models or implied volatility to forecast the future volatility
  - …

Forecasting based approaches (2)

- Forecasting based approaches:
  - **Empirical evidence** regarding the **market timing abilities** are rather mixed.
  - There is **not only an upside but also a downside potential** of active tactical management.
  - **The crucial question is how good the model is in forecasting the relevant variables (forecasting power).**

Forecasting based approaches (3)



- The graph shows the **relative returns** (differences to the respective benchmark) of real active and passive balanced portfolios:
  - Active portfolios with **active tactical asset** allocation (N=55)
  - Passive portfolios **without active tactical asset allocation** (N=30)
  - Time period: 3 years
  - Source: PPCmetrics investment controlling database

- According to our experience there are balanced portfolios with active tactical asset allocation where value was added. However, **on average** balanced portfolios with active tactical asset allocation did not perform better than indexed portfolios without active tactical asset allocation.
- This is in line with other empirical evidence.

Rule Based Approaches (1)

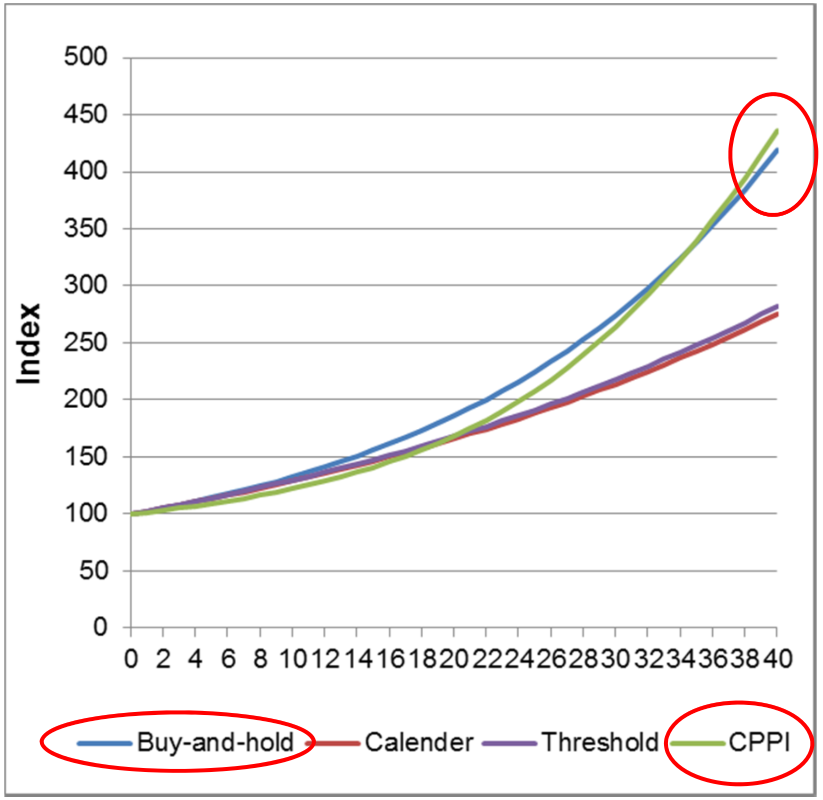
- Rule Based Approaches:
  - **Calendar rebalancing**
    - The portfolio is rebalanced at a pre-determined frequency (e.g., annually, quarterly, monthly).
  - **Threshold rebalancing**
    - The portfolio is rebalanced when the portfolio weight hits a pre-defined threshold. E.g., if a bandwidth is violated.
  - **Buy-and-hold** (“never rebalance”)
  - **CPPI** (constant proportion portfolio insurance)
    - Formula-based rebalancing approach that reduces (increases) the proportion in equities if portfolio value falls (rise).

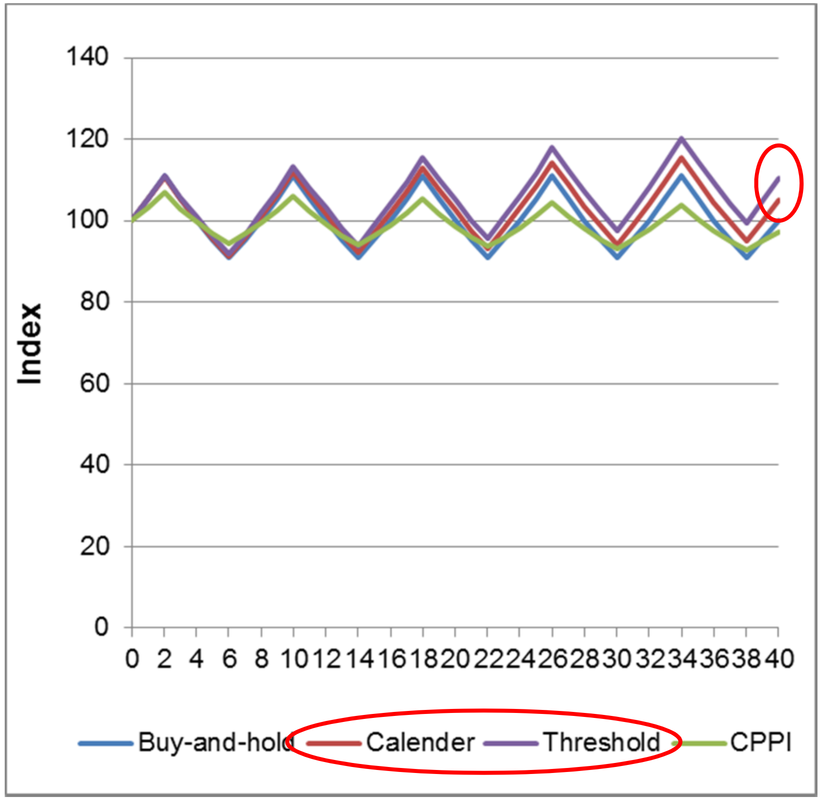
Anti-cyclical

Pro-cyclical

▸ **The rule based approaches behave different in different markets.**

Rule Based Approaches (2)





- CPPI and Buy-and-hold strategies are better in trending markets
  ➔ **Pro-cyclical**
- Threshold and calendar rebalancing are better in fluctuating markets
  ➔ **Anti-cyclical**

Rule Based Approaches (3)

- There are several rule based rebalancing mechanisms.
- All of them have some advantages and some drawbacks.
- Therefore, at least theoretically, it is not clear what strategy a pension fund should choose.
- **What about some empirical evidence?**

Ruled Based Approaches (4)

- An average Swiss pension fund with the following strategic asset allocation:

Asset class	Min	Strategy	Max
Swiss Bonds	39.0%	44.0%	49.0%
Global Bonds	5.0%	10.0%	15.0%
Swiss Stocks	6.0%	11.0%	16.0%
Global Stocks	16.0%	21.0%	26.0%
Real Estate	9.0%	14.0%	19.0%

- With those transaction costs:

Asset class	Costs
Swiss Bonds	0.6%
Global Bonds	0.6%
Swiss Stocks	0.4%
Global Stocks	0.4%
Real Estate	1.0%

Ruled Based Approaches (5)

- A historical perspective:
  What strategy was best since 1960?
- We look at return, volatility, sharpe ratio, tracking error and transaction costs and try to figure out the best strategy.

Ruled Based Approaches (6)
A Historical Analysis (1960 - 2011)

- Results

Feb 1960 - Jul 2011	Return p.a.	Volatility p.a.	Sharpe ratio p.a.	Transaction costs p.a.	
Strategy	5.49%	5.97%	0.61	n.a.	
Buy-and-Hold	5.38%	7.51%	0.47	n.a.	Pro-Cyclical
CPPI	5.45%	9.78%	0.37	0.02%	
Quarterly	5.61%	5.94%	0.64	0.05%	Anti-Cyclical
Monthly	5.51%	5.96%	0.62	0.07%	
Treshold	5.68%	6.02%	0.64	0.02%	

- **There seems to be a “premium” for anti-cyclical rebalancing mechanisms.**
- **Historically, threshold rebalancing offered good risk/return characteristics.**

Ruled Based Approaches (7)
Conclusions

- **The historical analysis shows that threshold rebalancing has good risk/return characteristics and low transaction costs.**
- **It is no coincidence that this approach is very often used by pension funds.**
- **Investors with a long term investment horizon can earn the "premium" of anti-cyclical rebalancing mechanisms.**

Summary (1)

- **Different types of rebalancing mechanisms can be distinguished:**
  1) **Forecasting Based Approaches:**
     - If you have forecasting powers, it makes sense to use them also when rebalancing the portfolio.
     - The crucial question is whether the different models really have a long term forecasting power.

Summary (2)

2) Rule Based Approaches:

- There seems to be a “premium” for anti-cyclical rebalancing mechanisms
- The different rule based approaches behave different under various markets conditions (e.g., trending versus fluctuating markets). Historically, a threshold approach offered good risk/return-characteristics.
- If you do not have a “crystal ball”, then **threshold rebalancing** (rebalancing if a bandwidth is violated) might be a good approach to follow.