“Using Dynamic Processes to Navigate your Pension Fund”

Advantages and Disadvantages of Dynamic Asset Allocation Strategies

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Agenda

- Definition
- Dynamic Asset Allocation Strategies
  - Forecasting Based Approaches
  - Liability Based Approaches
  - Rule Based Approaches
- Summary

Definition (1)

Long term strategic asset allocation accounts for most of the time-series variation in portfolio returns, while market timing and security selection appear to have been far less important.
(among others, Blake, Lehman, and Timmerman (1999))

Dynamic Asset Allocation
An active asset allocation strategy that **constantly adjusts the mix of assets as markets** rise and fall and the economy strengthens and weakens (i.e. "**market timing**").
For example, if the stock market is showing weakness, you sell stocks in anticipation of further decreases, and if the market is strong, you purchase stocks in anticipation of continued market gains.

Definition (2)

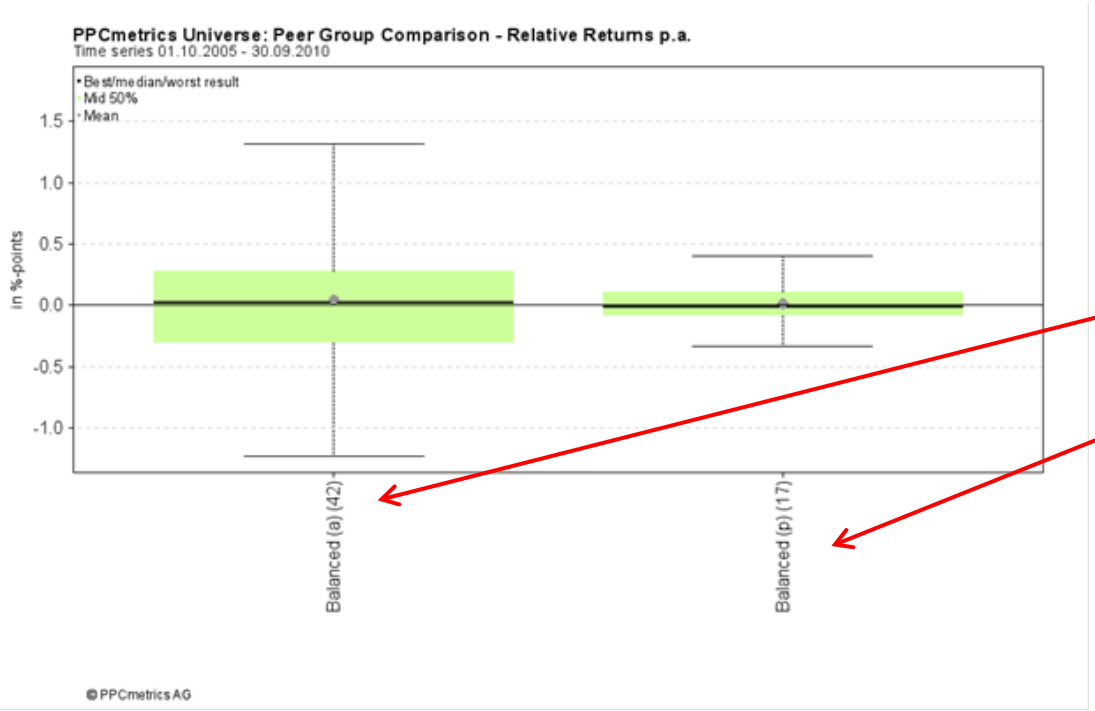
- **Strategic asset allocation** is the **long term** asset allocation which is **independent** from the current market environment.
- Making the asset allocation "**dynamic**" (dependent on **short term** market expectations) is in a way contrary to the original goal of having a long term strategic asset allocation. This can lead to confusion between strategic and dynamic asset allocation. Therefore, we try to distinguish different approaches of "**Dynamic Asset Allocation Strategies**":

    1) **Forecasting Based Approaches** ("crystal-ball-approach")
    2) **Liability Based Approaches** ("I-might-have-the-wrong-strategic-asset-allocation-approach")
    3) **Rule Based Approaches** ("What-shall-I-do-if-I-have-no-clue-what-the-markets-are-doing-in-the-future-approach")

Forecasting based approaches (1)

- The asset allocation is changed 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 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"
  - Return forecasting based on factor models
  - GARCH-Models or implied volatility to forecast the future volatility
  - …
- If someone has forecasting ability, it makes sense to use this knowledge to change the asset allocation in dynamic way.
- **The crucial question is whether the model really has long term forecasting powers or not.**

Forecasting based approaches (2)



- 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=42)
  - Passive portfolios **without active tactical asset allocation** (N=17)
  - Time period: 5 years
  - Source: PPCmetrics investment controlling database

- According to our experience there are balanced portfolios with active tactical asset allocation where value was added. But **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.

Forecasting based approaches (3)

- Forecasting based approaches:
  - **A little bit old wine** («active tactical asset allocation») **in a new bottle** («dynamic asset allocation»)
  - **Empirical and practical evidence** regarding the **market timing abilities** are 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**).

Liability Based Approaches

- The asset allocation is set to match the **liablities** of the pension fund.
- Changes in the liability structure can lead to changes in the asset allocation (e.g., changes in the age structure).
- It is a normal task for the pension board to make sure that the strategic asset allocation is in line with the liability side. This is normally checked every 1 - 5 years or when special circumstances occur.
- **The asset allocation of a pension fund is normally reviewed in a regular manner. For a pension fund, the asset allocation is already «dynamic» (with differences regarding e.g. periodicity and implementation).**

Ruled Based Approches (1)

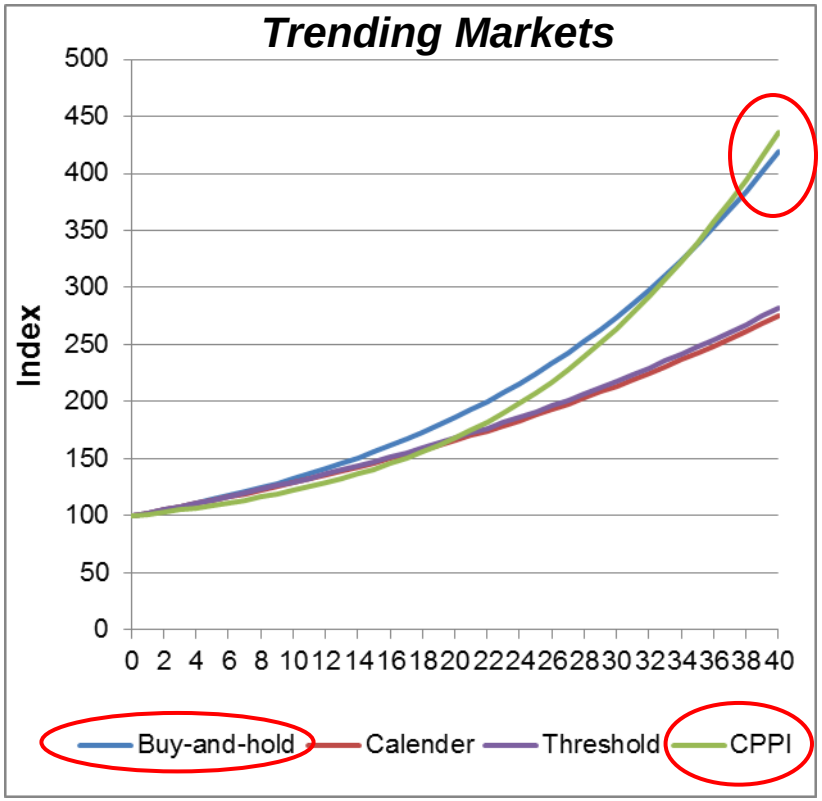
- Rule Based Approches:
  - **Calender rebalancing**
    - The portfolio is rebalanced at a pre-determinated frequency (e.g., annually, quarterly, monthly).
  - **Threshold rebalancing**
    - The portfolio is rebalanced when the porfolio weight hits a pre-defined threshold. E.g., if a bandwith is violated.
  - **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).

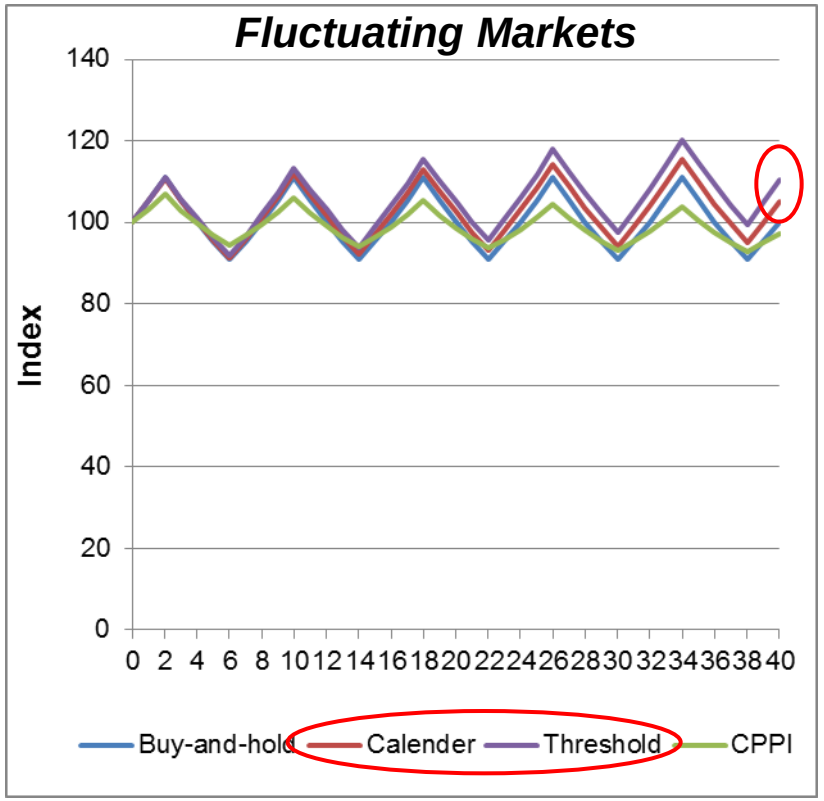
Anti-Cyclical

Pro-Cyclical

- **The rule based approaches behave different in different markets conditions.**

Ruled Based Approches (2)





- **CPPI** and **buy-and-hold** strategies are better in trending markets
  ➔ **Pro-Cyclical**
- **Threshold** and **calender rebalancing** are better in fluctuating markets
  ➔ **Anti-Cyclical**

Ruled Based Approches (3)

- There are several rules based dynamic asset allocation strategies.
- 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 Approches (4)

- An «average Dutch Pension Fund» with the following stategic asset allocation:

Asset class	Min	Strategy	Max
Dutch Bonds	0.0%	3.0%	6.0%
Global Bonds	57.0%	60.0%	63.0%
Dutch Equities	0.0%	3.0%	6.0%
Global Equities	21.0%	24.0%	27.0%
Real Estate	7.0%	10.0%	13.0%

Source for the asset allocation: Prof. A. Clare, The Investors Journal, March 2010

- Estimated transaction costs:

Asset class	Costs
Dutch Bonds	0.5%
Global Bonds	0.5%
Dutch Equities	0.4%
Global Equities	0.4%
Real Estate	1.0%

Ruled Based Approches (5)

- **A historical perspective**: What would have been the best strategy since 1986?
- Data are from Bloomberg and De Nederlandsche Bank (DNB)
  - Risk-free Rate (1 Month AIBOR)
  - Dutch Bonds (JPM GBI Netherlands)
  - Global Bonds (JPM GBI)
  - Dutch Equity (AEX Index)
  - Global Equity (MSCI World)
  - Real Estate (FTSE NAREIT US Real Estate)
- We calculate return, volatility, sharpe ratio, tracking error, and transaction costs.

Ruled Based Approches (6)
A historical analysis (1986 – 2010)

- **Results:**

Jan 1986 - Dec 2010	Return p.a.	Volatility p.a.	Sharpe ratio p.a.	Tracking Error p.a.	Transaction costs p.a.	
Strategy	6.58%	7.79%	0.69	n.a.	n.a.	
Buy-and-Hold	6.16%	8.48%	0.59	1.61%	n.a.	Pro-Cyclical
CPPI	5.92%	8.81%	0.54	8.81%	0.11%	
Quarterly	6.72%	7.78%	0.71	0.24%	0.08%	Anti-Cyclical
Monthly	6.58%	7.79%	0.69	0.00%	0.13%	
Threshold	6.73%	7.81%	0.71	0.28%	0.06%	

- **There is a «premium» for anti-cyclical rebalancing mechanisms.**
- **Historically threshold rebalancing offered good risk/return-characteristics.**

Ruled Based Approches (7)
Conclusions

- **The historical analysis shows that threshold rebalancing has good risk/return-characteristics and low transaction costs.**
- **It is not a 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 dynamic strategies exist:

1) Forecasting Based Approaches:

- If you have forecasting powers it makes sense to use them also on the asset allocation level.
- The crucial question is whether the different models really have a long term forecasting power.

2) Liability Based Approaches:

- Pension funds already steer the asset allocation in a “dynamic” way because they normally reassess the asset allocation if the liability structure changes (with differences regarding e.g. periodicity and implementation).

Summary (2)

Different types of dynamic strategies exist:

3) Rule Based Approaches:

- There is 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 the “crystal ball” than threshold rebalancing (rebalancing if a bandwidth is violated) might be a good approach to follow.