

CFA seminar June 24 2008:
Opportunities and Challenges
for Pension Funds

Guus Boender, gboender@ortec.nl
ORTEC & Free University Amsterdam

Pension fund management of Inflation

ORTEC
Postbus 4074
3006 AB Rotterdam
Max Euwelaan 78
Tel. +31 (0)10 498 6610
info@ortec.com
www.ortec.com

- What most experts agree upon (Greenberg, Van Duin,.....)
Structural inflation drivers:
 - Strongly **growing economies**, also getting richer:
 - Energy prices
 - Food prices
 - **Aging**: capital → consumption; “dependency ratio”

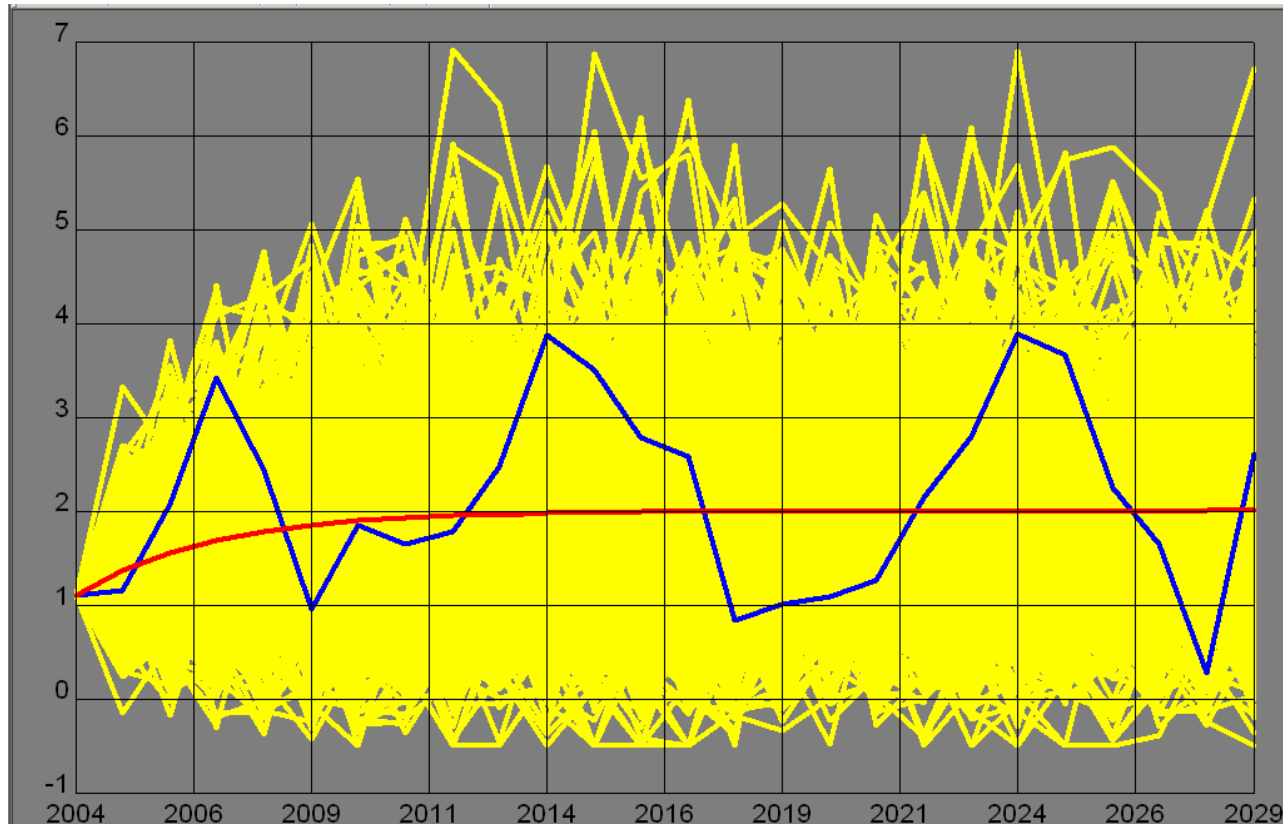
- What many experts do not agree upon:
Impact of:
 - current (peak oil) and new **energy sources**
 - **central bankers**: growth- or inflation objective, successfulness

*Thus, structural higher levels of inflation:
At least, it is a RISK*

- Two issues:
 - Scenarios
 - Products

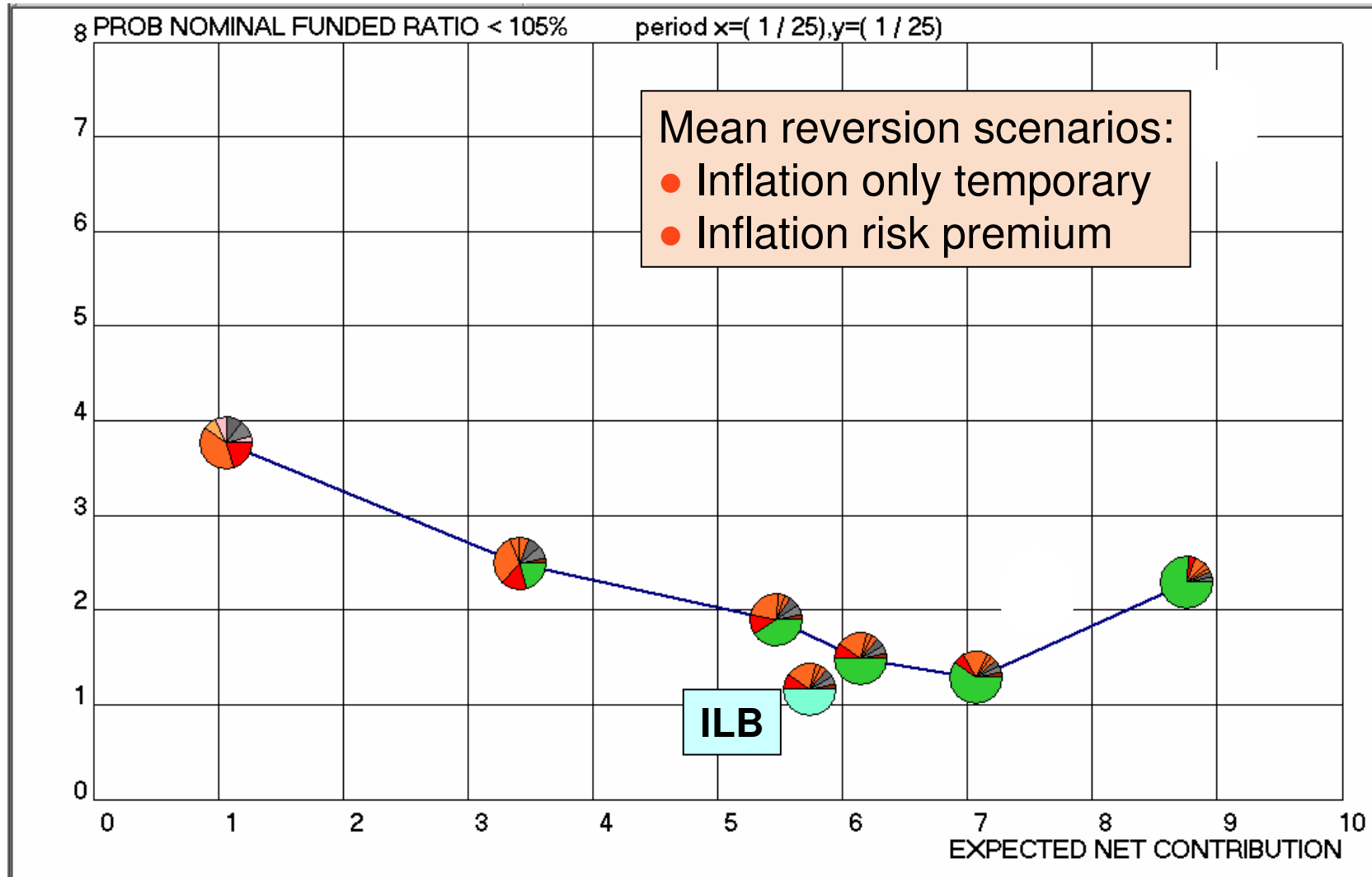
High inflation for pension funds: Scenarios

- Mean reversion scenarios of inflation

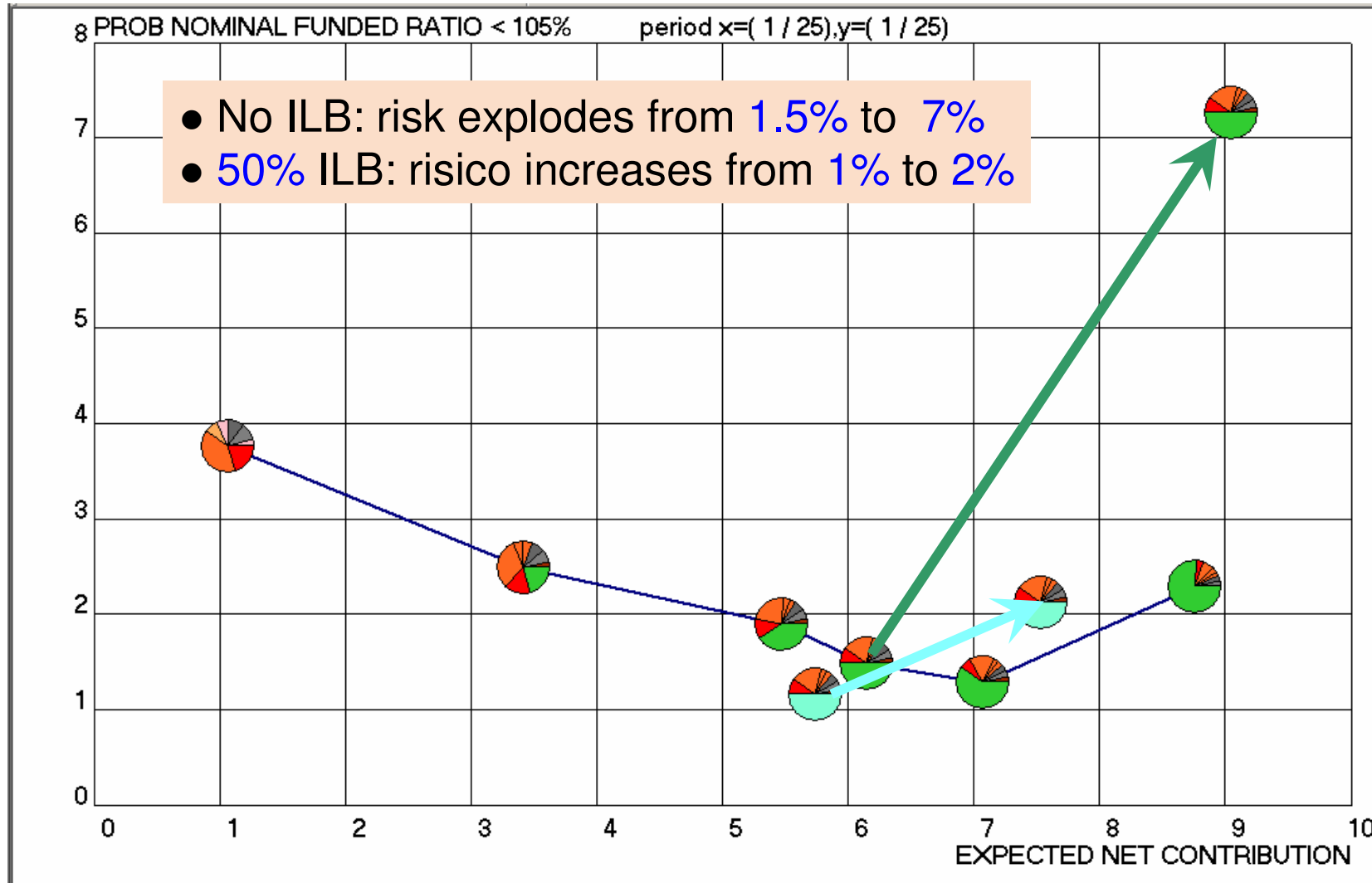


Mean reversion scenarios:

Index linked bonds & inflation swaps: small gain **ORTEC**



Expected inflation grows to 4%.... (Inflation seminar Aegon 2006)

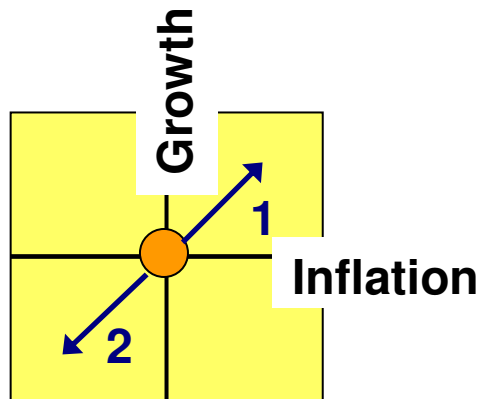


Sensitivity analysis inflation (Pension fund Medical specialists)

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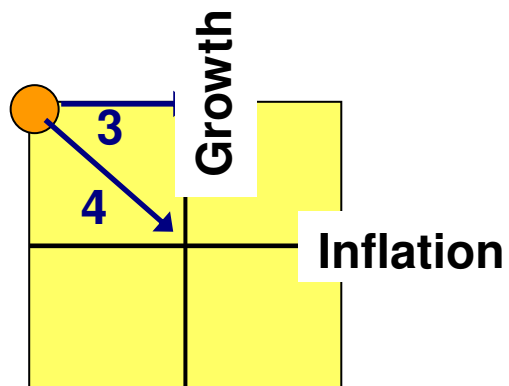
Basic assumptions	
10 year rate	4.5%
Inflation	2.0%
Real rate	2.25%

- Economy in **equilibrium**



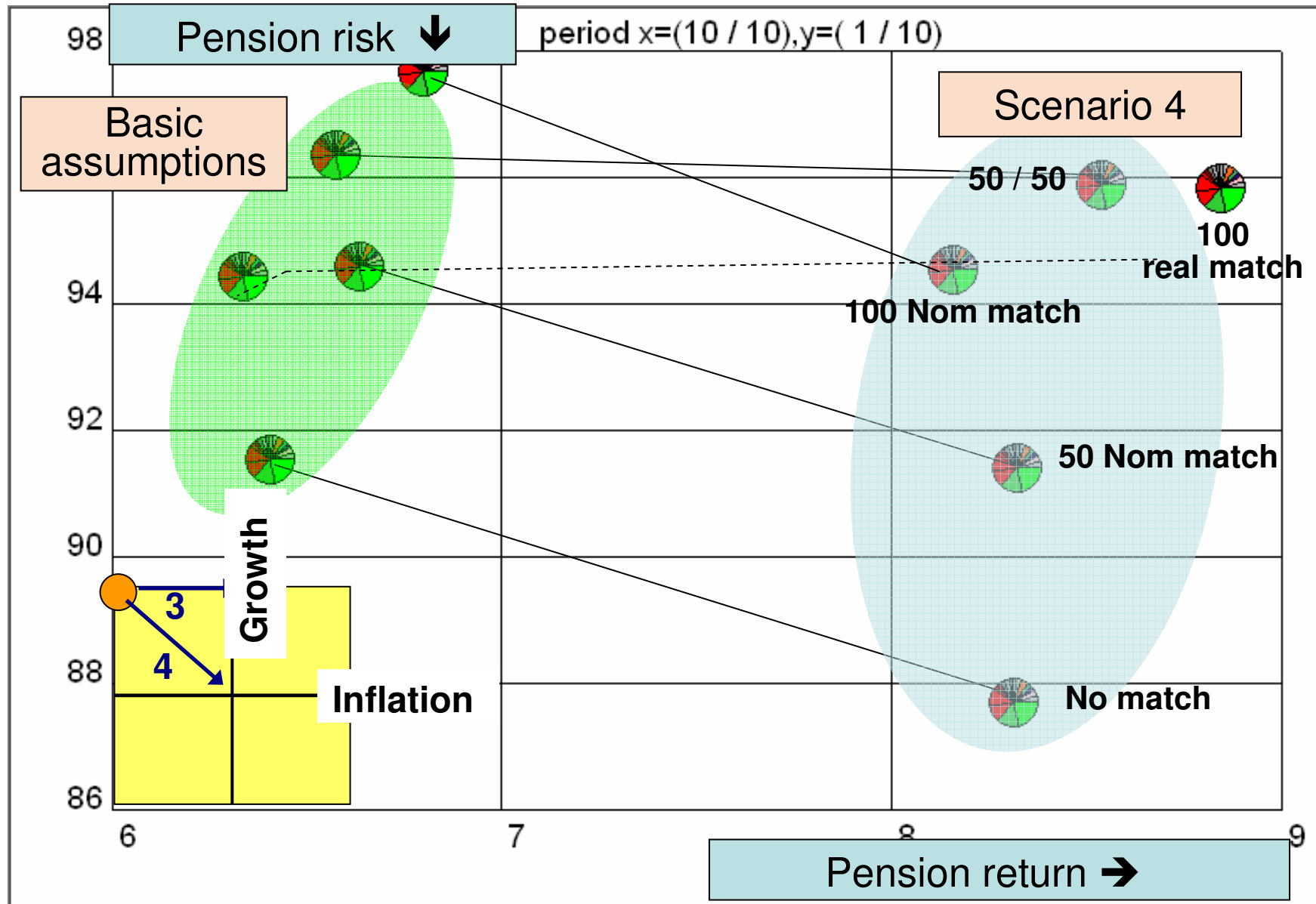
1. Rates 6.5%, inflation 3%, real 3.25%
2. Rates 2.5%, inflation 1%, real 1.25%

- End of **great moderation** with low rates and low energy prices



3. Rates 6.50%, inflation 4%, real 2.25%
4. Rates 5.75%, inflation 4%, real 1.50%

Sensitivity analysis inflation Medical specialists (work in progress)



Alternative scenarios PMT (in cooperation with Han de Jong)

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■ Continuation Goldilocks

- prices/wages: 2% / 3%;
- short/long interest rate: 4.5% / 5%;
- Equity unchanged arithmetic 7.8%

■ Fight against inflation

- prices/wages : 3.5% / 4.5%;
- short/long interest rate : 6% / 7%;
- Equity: 8.5%

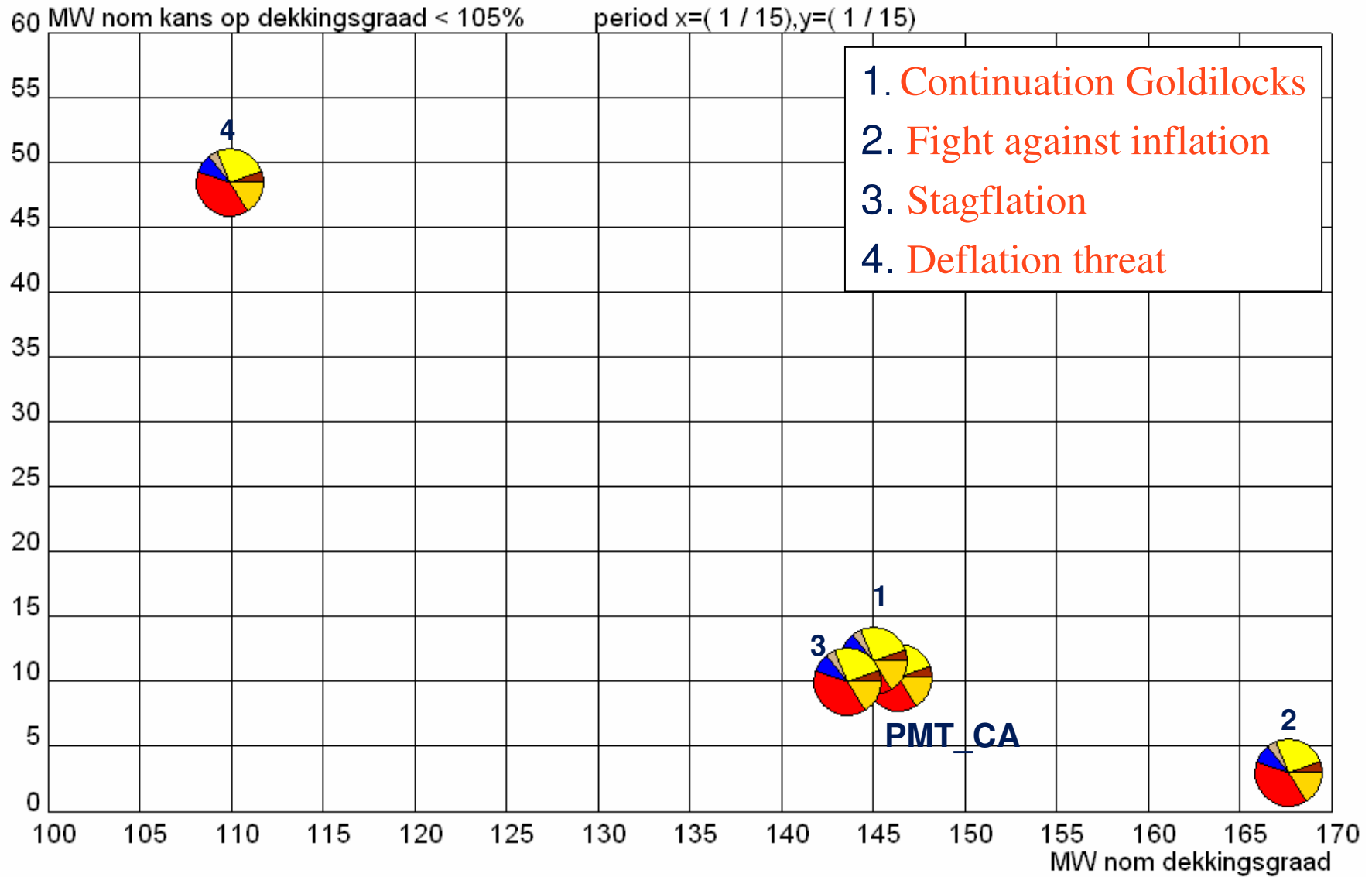
■ Stagflation

- prices/wages : 4% / 3.5%;
- short/long interest rate 4.5% / 5.5%;
- Equity unchanged 7.8%

■ Deflation threat:

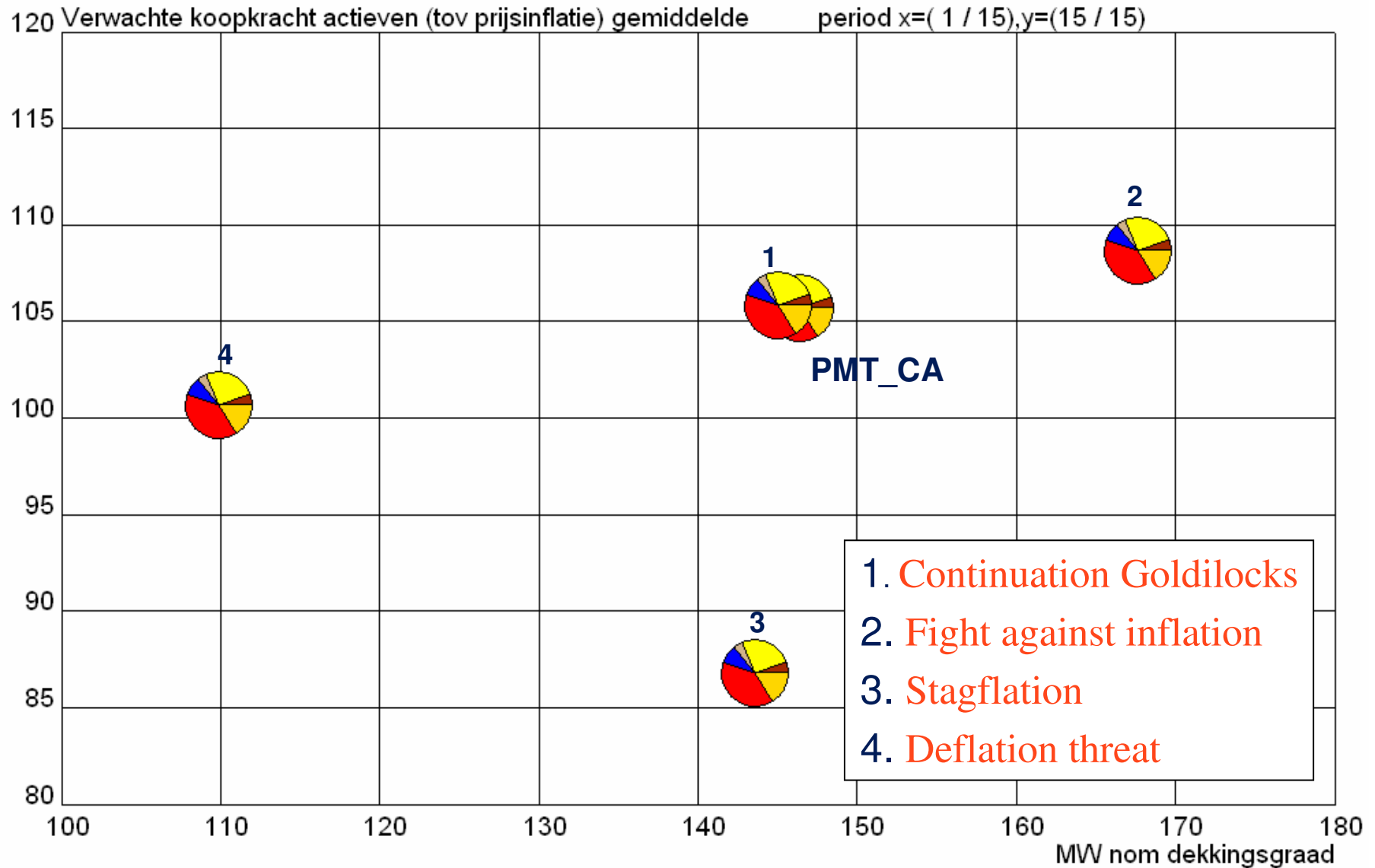
- prices/wages : 0% / 0%;
- short/long interest rate 2.5% / 2.5%;
- Equity: 3.0%

Sensitivity analysis inflation PMT (work in progress)



Deflation threat.....

Sensitivity analysis inflation PMT (work in progress)



Purchasing power especially sensitive for stagflation

- Outsourcing: Inflation swaps / swaptions

Inflation swaps:

- not dependent on unknown partial time-varying “correlations” (like real estate returns with inflation)
- inflation risk premium
- cost and availability
- correlation of non-dutch inflation with Dutch (wage) inflation

- In-house: Invest in products that intuitively & empirically hedge inflation

In addition to index linked bonds: Distinction between:

- **Short term** (1 year frequency) correlation with inflation

E.g. Correlation {commodities, price inflation}: +0.3

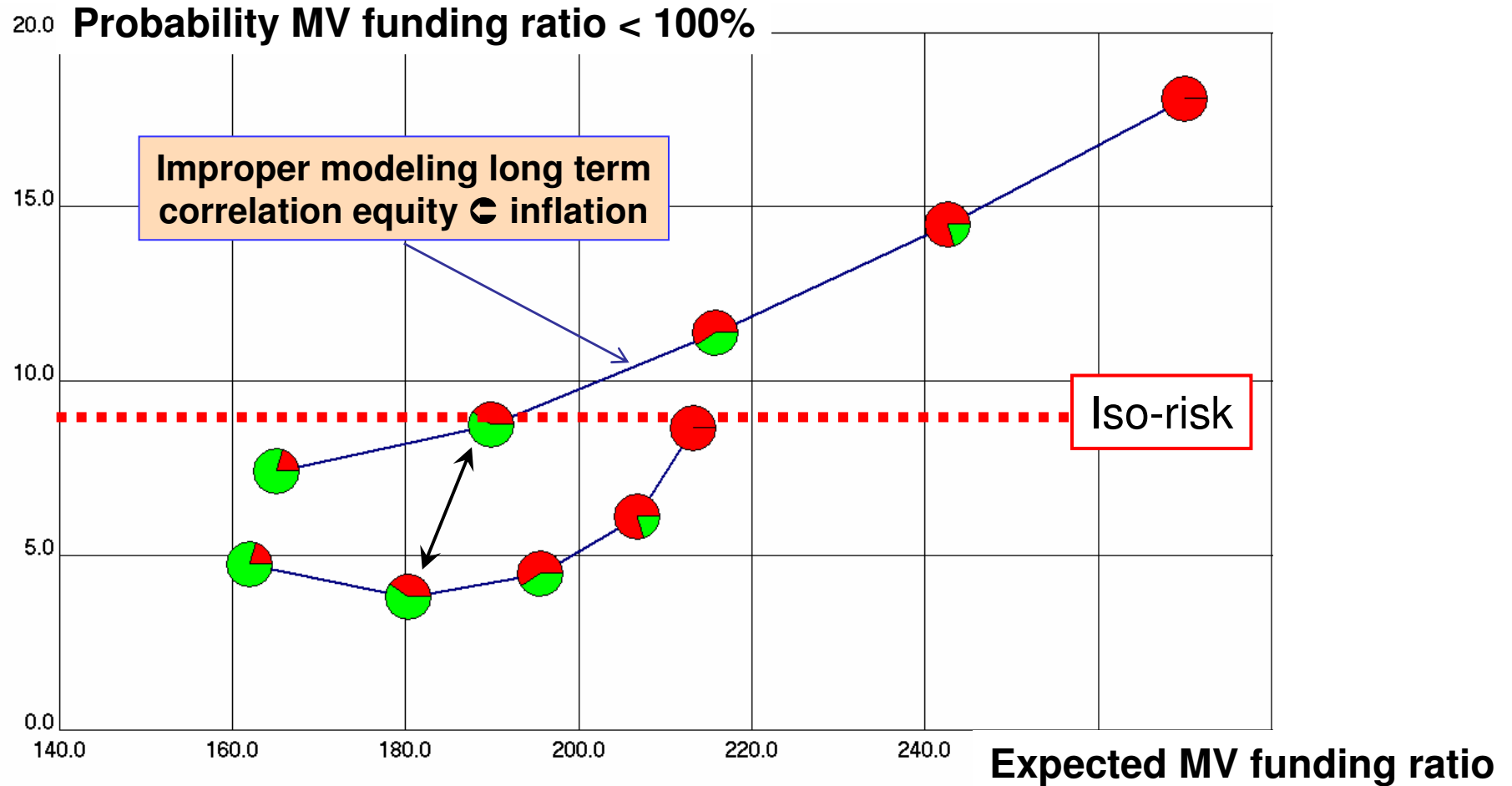
- **Long term** correlation with inflation

cf Ph.D Hens Steehouwer and Roy Hoevenaars

E.g. 1-year correlation {equity returns, inflation}: -0.3

long term correlation {equity returns, inflation}: +0.3

Short- and long term dynamics equity returns **ORTEC**



- Short- or long term dynamics:
Fundamental different SAA's at same solvency risk

- **Structural** (rather than temporary) inflation risk should be taken into account
- Develop structurally different **scenario sets**:
 - learn about the impact on optimal SAA and consequences
 - for each set:
 - determine SAA
 - assign relative weight
 - determine max solvency risk for SAA that is actually chosen
- **Inflation products**:
 - Outsourcing
 - Direct products:
 - Short term inflation protection
 - Long term inflation protection

Determine weight of short term solvency constraints (“warm water”), in relation to weight of long term ambition (“cold water”)
- And, most difficult of all is.....