FUTURE YIELD AFTER TAXES:
an advanced key figure for measuring performance?

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Topics

- Introduction
- Literature Review
- Body of the Presentation
- Theory
- Empirical Analysis
- Conclusions

Introduction

- **Why do we invest and „lend equity“ as a kind of „equity-credit“?**

- **Which rational restrictions for investing could be grave?**

1 „Credit“ has to get provided with physical securities?

2 Interests for abstention from consumption?

3 Interests for dispensation with alternative investments?

4 Invested capital has to get regained with profit in total?

Introduction

- **Which problems do exist with KPIs often used in practice?**

- **Why developing, advancing or in the end employing a new KPI?**

$$\text{Purchasing Yield:} \quad PY = \frac{\text{Revenues} - \text{non allocatable ancillary Rental Costs}}{\text{Purchasing Price} + \text{Additional Costs}}$$

$$\text{Growth Yield:} \quad GY_t = \frac{1}{t} \left(RoC_t - I_0\right)$$

$$\text{IRR:} \quad NPV_t = -I_0 + \sum_t \frac{CF_t}{(1 + i_{IRR})^t} = 0$$

Literature Review

Harris et. al. (2013)

Private Equity Performance: What Do We Know?

Better buyout performance than has previously documented.

Bergstresser, D./ Poterba, J. (2002)

Do after-tax returns affect mutual fund inflows?

The after-tax returns of mutual funds over the period 1993-1999 have more explanatory power than pretax returns in explaining inflows.

Ljungqvist, A./ Richardson, M. (2003)

The cash flow, return and risk characteristics of private equity

During the estimation period 1981-2001 the cash flow analysis for PE-Funds revealed a space of 8-10 years for earning fund profits.

Literature Review

Kaspereit, T. et al. (2013)

Are Initiators´ Forecasts of German Closed-end Funds Biased?

Estimation of 3.673 CEREF for the period 1972-2012 showing the gap between target figures and performance.

Kaserer, C./ Diller, C. (2004)

European Private Equity Funds – A Cash Flow Based Performance Analysis

Estimation of 200 PE-funds for the period 1980-2003 with a special IRR of 12.7% (fund cash flow, net ROC).

Fisher, J./ Goetzmann, W. (2005)

The Performance of Real Estate Portfolios: A Simulation Approach

Estimation of commercial real estates for the period 1977-2004 revealed IRR with 7.5% (NCREIF data).

Body of the Presentation

I. Advancing the known KPI ‚Equity Yield of Perfect Financial Planning‘ (EK-Rendite des Vollständigen Finanzplans)

II. Definition of the advanced KPI ‚Future Yield after Taxes (FYT)‘

III. Redundances and characteristics of the function FYT

IV. Empirical investigation of 510 CEREF/AIF for the period 1985-2015 issued by 78 German initiators (own produced database)

Theory

I. Method of Capital Accumulated Value (CAV)*

$$CAV_t = I_0 \cdot (1 + i_t)^t \Leftrightarrow i_t = \sqrt[t]{\frac{CAV_t}{I_0}} - 1 \quad s.t. \quad \frac{CAV_t}{I_0} > 0 \quad \forall \quad t \in \{t \mid \mathbb{Q} > 0\}$$

* No arbitrage in t = 0 and gaining profit in total

II. Definition ‚Future Yield after Taxes'

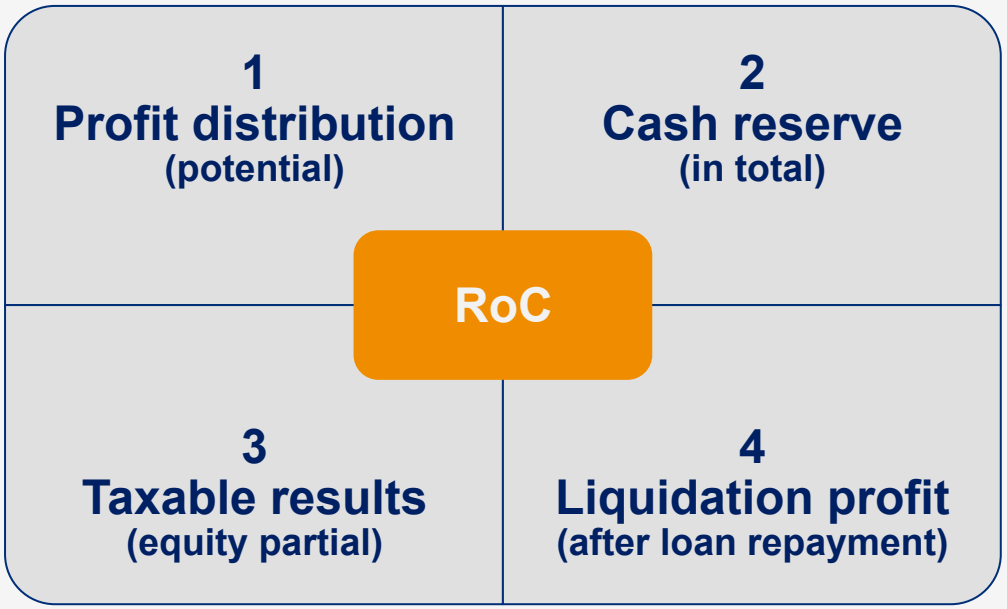
$$FYT_t := RoI_t \cdot \exp\left\{\frac{1}{t}\right\} - 1 \quad s.t. \quad RoI_t = \frac{RoC_t}{I_0} \quad \forall \quad t \in \{t \mid \mathbb{Q} > 0\}$$

$$\widehat{FYT}_t = FYT \cdot \left[1 - \sqrt[t]{\prod_1^t \text{Tax rate}'_t \cdot (1 + \text{Solidarity surcharge}_t)}\right]^{-1}$$

III. The Redundances of the FYT function arguments

Simplified notation:

$$FYT_t := \left(\frac{RoC_t}{I_0}\right)^{\frac{1}{t}} - 1 \quad \forall\ t \in \{t \mid \mathbb{Q} > 0\}$$



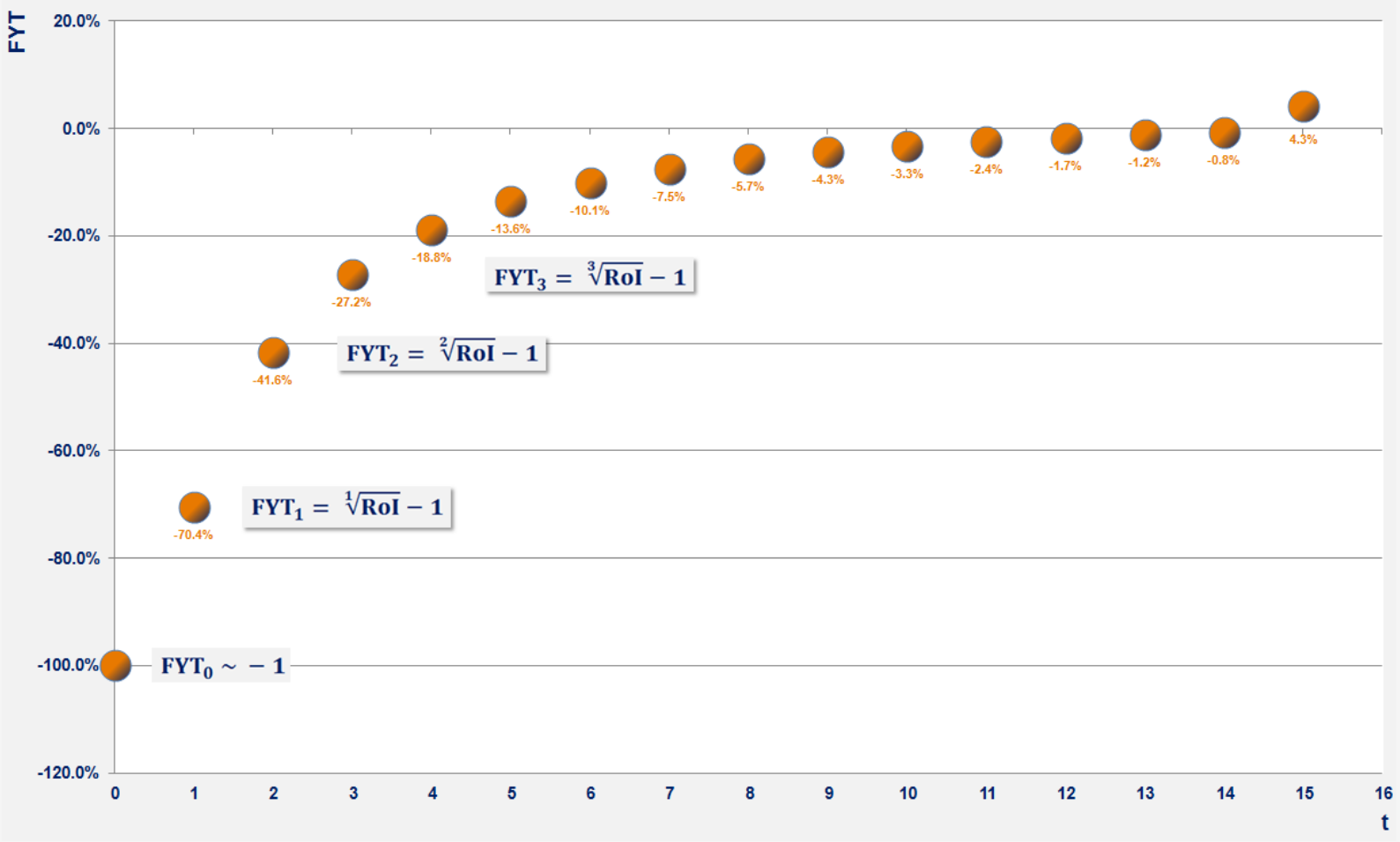
Theory

III. Characteristics of the function FYT (general)

$$FYT_t := RoI_t \cdot \exp\left\{\frac{1}{t}\right\} - 1 \quad s.t. \quad RoI_t = \frac{RoC_t}{I_0} \qquad \forall\ t \in \{t \mid \mathbb{Q} > 0\}$$

- Doesn´t work with direct/ implicit assumptions (Initiators´ view!)
- Independant RoC results despite dynamic effects of real estate management
- FYT do only determine yield instead of evaluating the investment
- Is comparable with every market interest rate (homogeneous scaling)
- Most of the data are available in forecasts of CEREF/AIF prospects

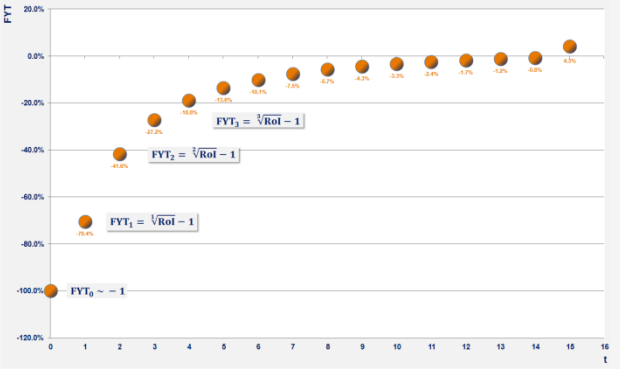
III. Characteristics of the function FYT (mathematical)



Theory

III. Mathematical characteristics

- **Asymptotical function flow**



Marginal function value at t = 0:

$$\lim_{t \to 0} FYT\,(t) = \lim_{t \to 0} \left[RoI^{\frac{1}{t}} - 1 \right] \sim -1$$

Marginal function value at t = ∞:

$$\lim_{t \to \infty} FYT\,(t) = \lim_{t \to \infty} \left[RoI^{\frac{1}{t}} - 1 \right] = 1 - 1 = 0$$

Function without break?

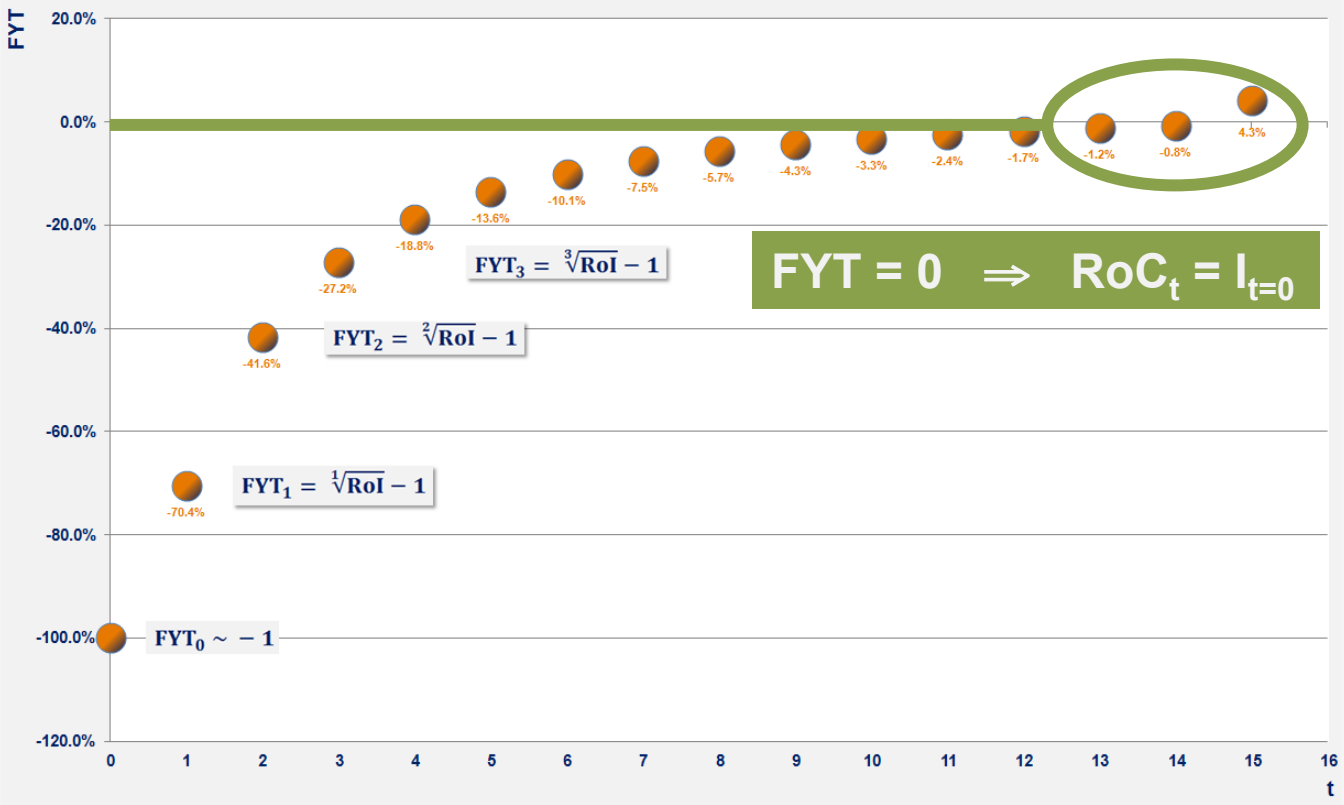
$$FYT\ (t-\varepsilon) = FYT\ (t+\varepsilon) \qquad \forall\ \varepsilon > 0$$

Function without buckling?

$$FYT'\,(t-\varepsilon) = FYT'\,(t+\varepsilon) \qquad \forall\ \varepsilon > 0$$

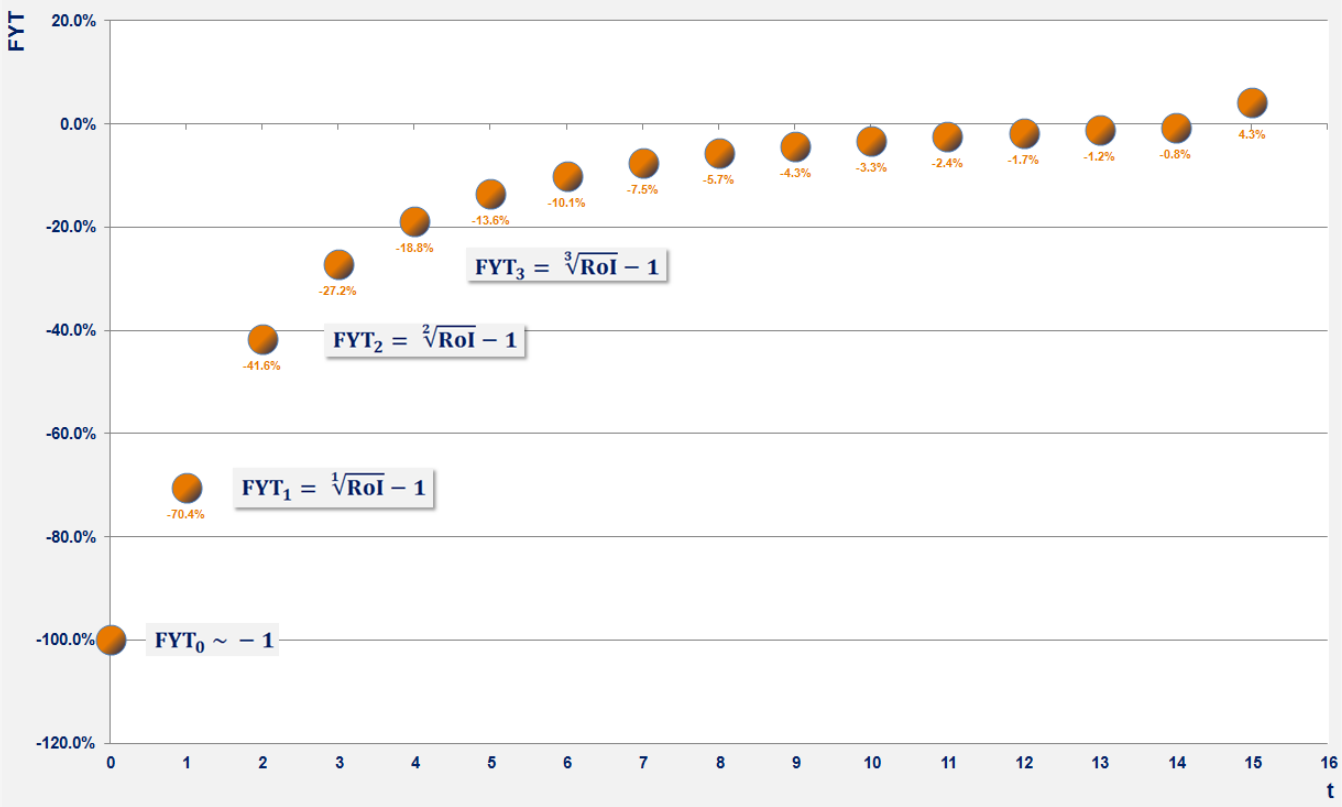
III. Mathematical characteristics

▪ Function zeroing



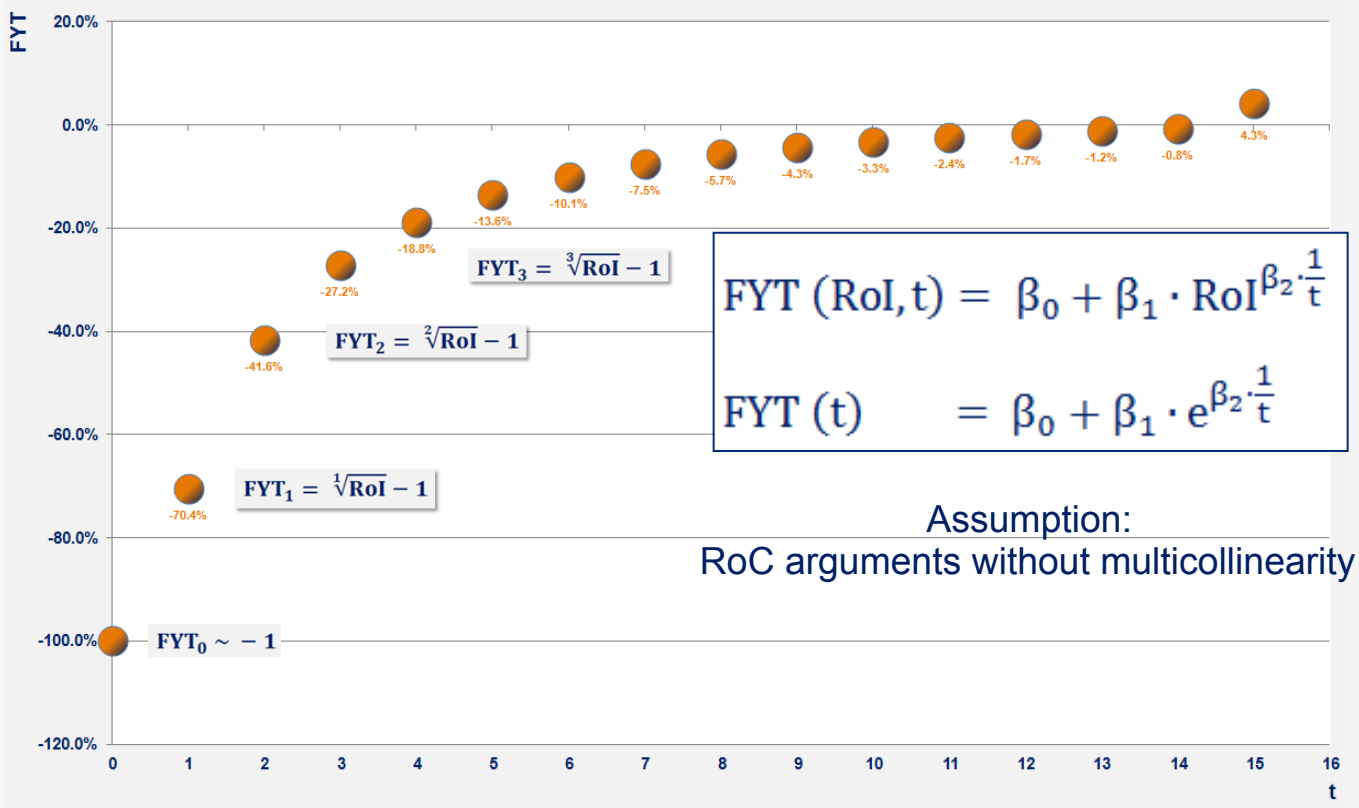
III. Mathematical characteristics

- **No function extremes (based on the asymptotical flow)**



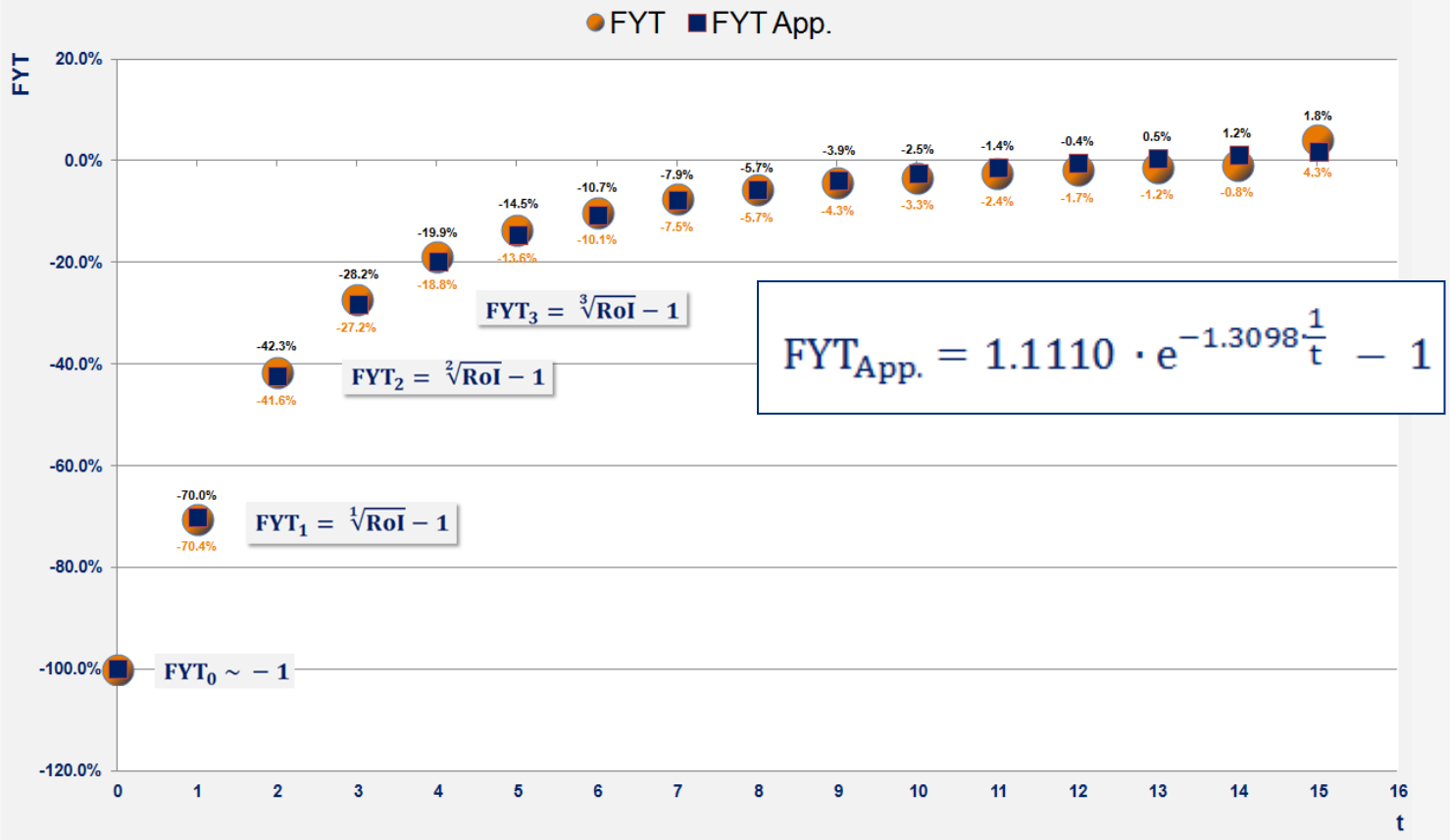
III. Mathematical characteristics

- **Regression function (FYT App.) by using least squares method**



III. Mathematical characteristics

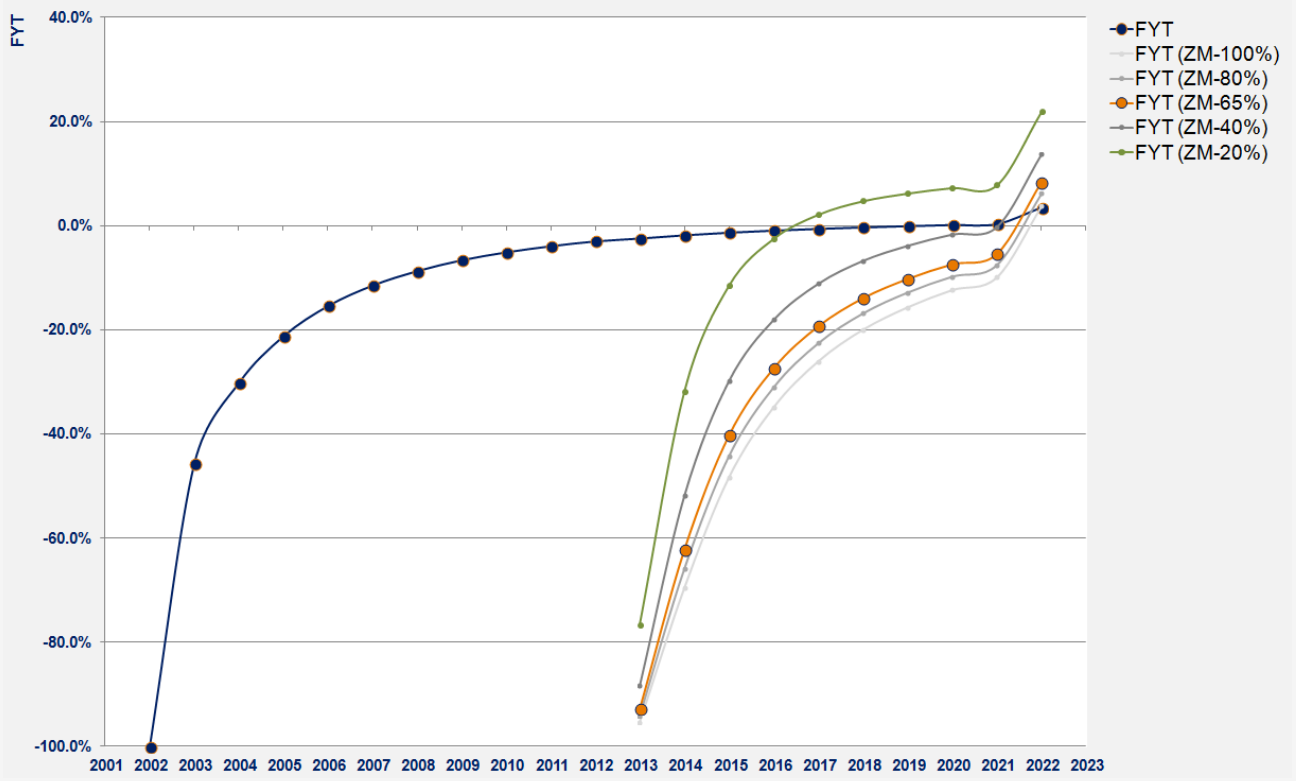
- **Konkrete CEREF financing a 3* Mercure Hotel in Mannheim**



Theory - Additional activities

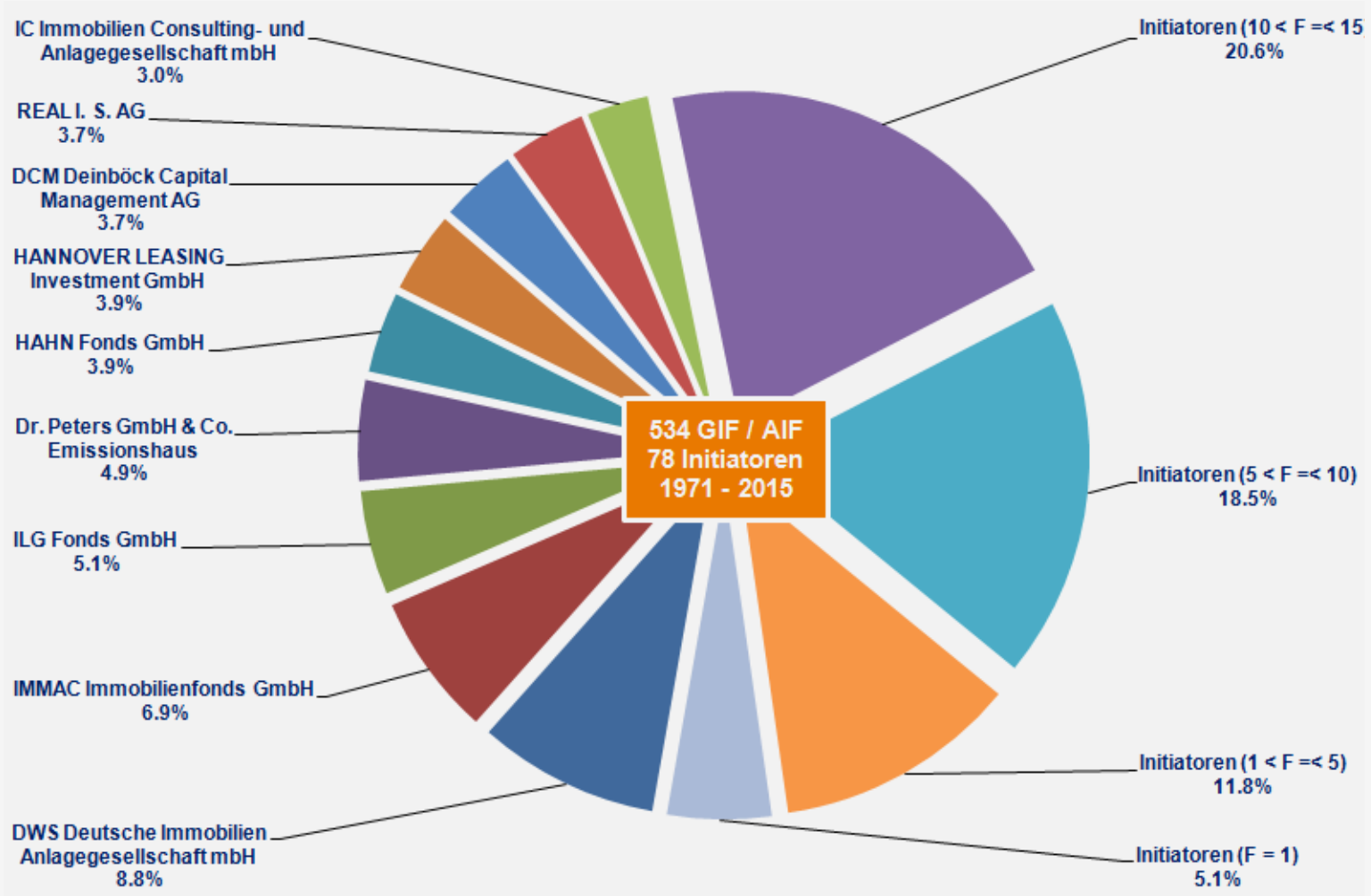
- **FYT-comparison with the function of Internal Rate of Return**

- **Investigation of buy out aspects due to the secondary market**

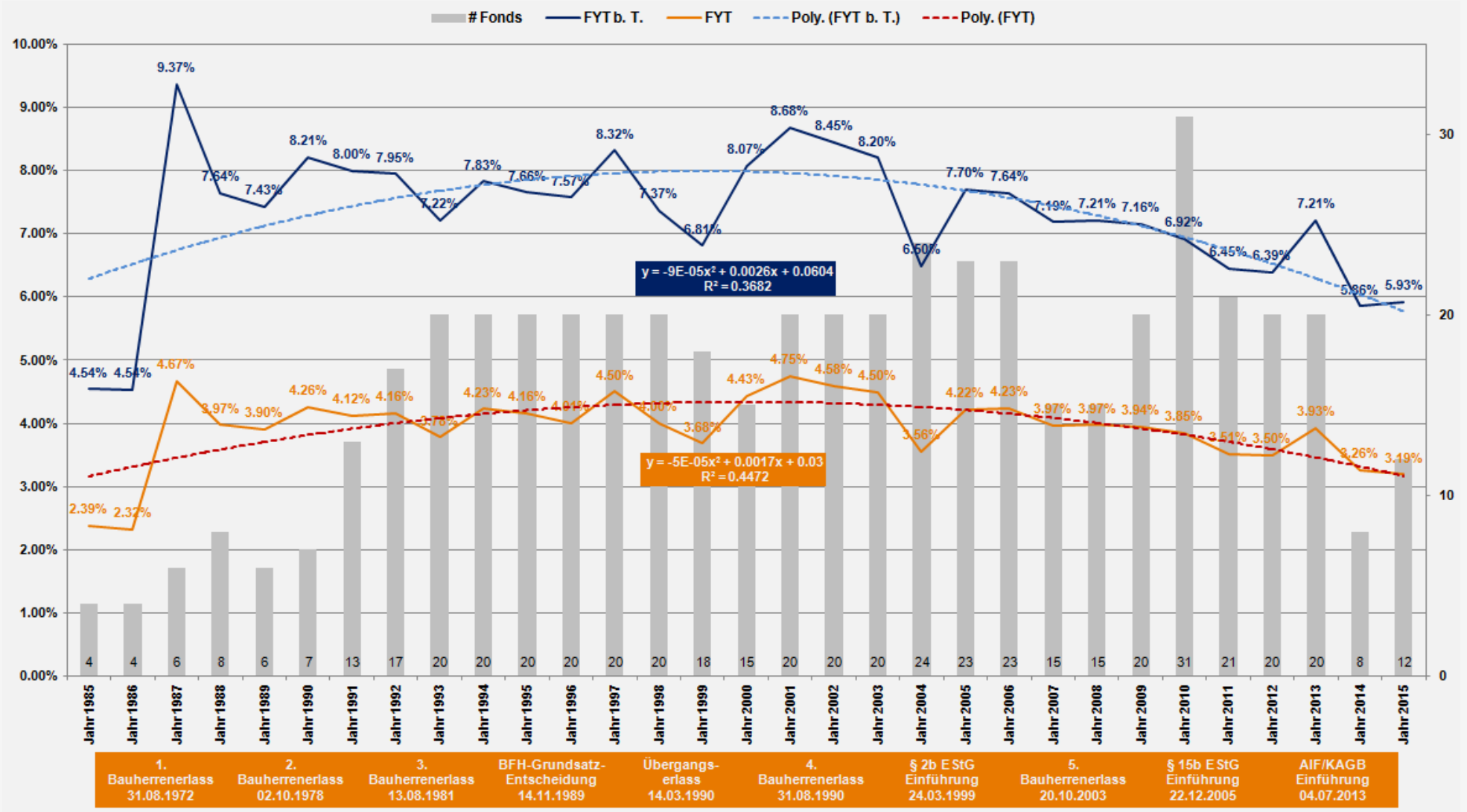


Empirical Analysis

- **Fund distribution and fund shape of each initiator**



Empirical Analysis



Empirical Analysis

- **Findings for period 1985-2015 (510 funds; 78 initiators; equity weighted)**

∅ Investment Period (offered):		18.59 Y
∅ Investment (I_0) plus Agio:		104.60 %
∅ Profit distributions:		108.10 %
∅ Taxable results:	. /.	15.22 %
∅ Proceeds of Liquidation:		131.88 %
∅ Return on Capital in total:		224.77 %

120.17 % (Capital Surplus)
: 18.59 (Years)
= 6.46 % (p. a. after Taxes)

Empirical Analysis

- **Findings for period 1985-2015 (510 funds; 78 initiators; equity weighted)**

∅ Purchasing Yield:	7.19 %
∅ Growth Yield:	6.20 % p. a. (vs. 6.46 % p. a.)
∅ Internal Rate of Return:	6.89 % p. a.
∅ Future Yield after Taxes:	3.92 % p. a. 7.29 % p. a. (before Taxes)

Conclusions

1 Why advancing a KPI called Future Yield after Taxes?

- Initiators´ side gets controlled permanently
- Investors´ side needs „enlightenment“ and manageable KPI-instruments
- FYT focusses profit (not revenue; main interest of the capital lender)
- Alternative KPIs work with relevant/ implicit assumptions

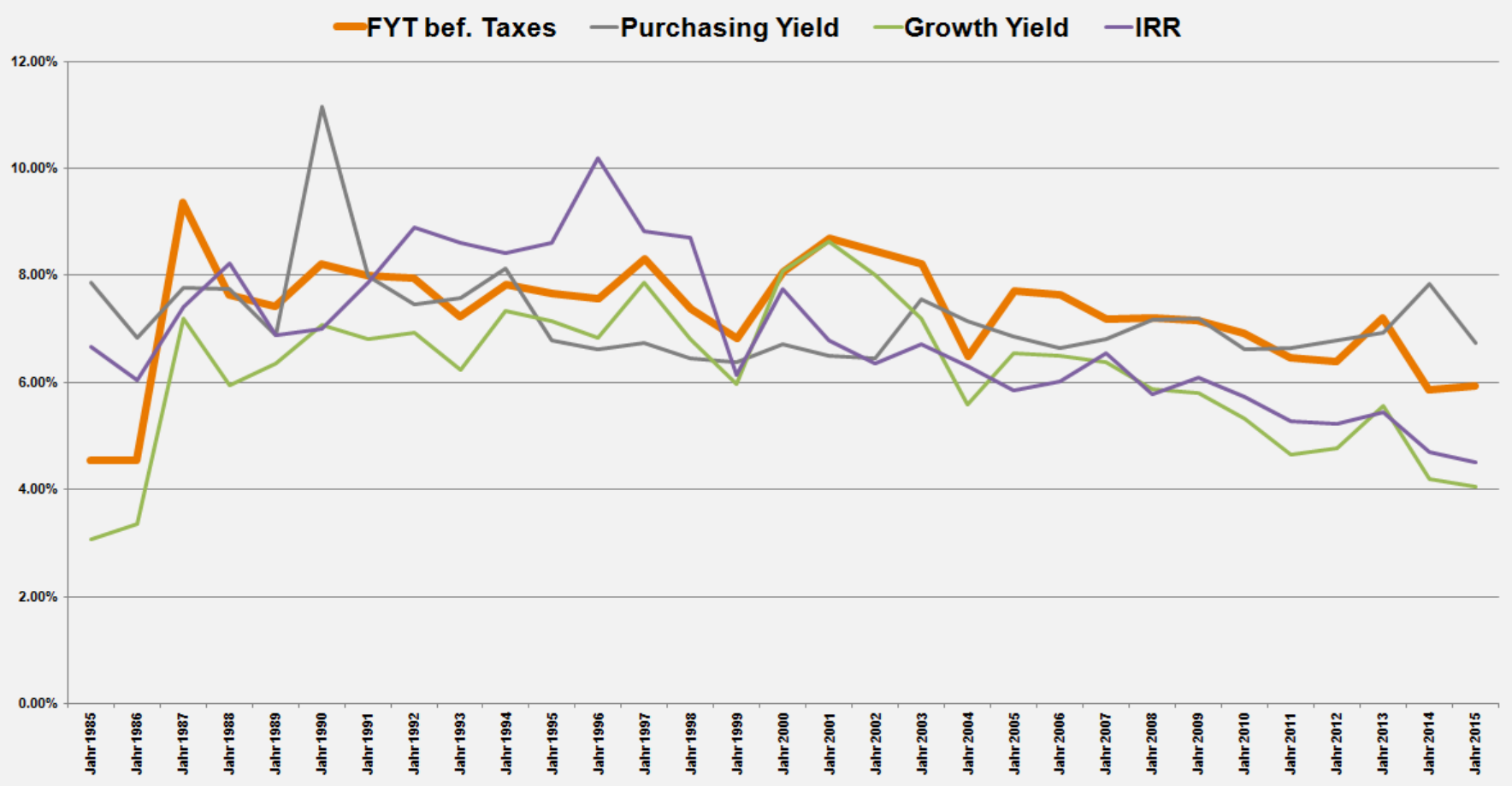
Conclusions

2 What are further advantages of these advanced KPI FYT?

- FYT uses direct components for Return of Capital
- FYT works independant due to dynamic effects of real estate management
- FYT is comparable with every market interests (homogeneous scaling)
- FYT is comparable with credit or minimum-garantee-insurance interest

Conclusions

3 What gives evidence that the FYT results are reflected as the better ones?



Conclusions

3 What gives evidence that the FYT results are reflected as the better ones?

- FYT function is established mathematically
- FYT function evolves like the function of fixed investors´ capital
- FYT works without relevant/ implicit assumptions
- FYT shows unique solutions

At the end FYT is usable to every type of capital investment!

THANK YOU FOR YOUR ATTENTION!

STAY !