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

Jan Paul Becker

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

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

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

Growth Yield: \[ GY_t = \frac{1}{t} (\text{RoC}_t - I_0) \]

IRR: \[ \text{NPV}_t = -I_0 + \sum_t \frac{\text{CF}_t}{(1 + i_{\text{IRR}})^t} = 0 \]
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.


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.
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.

European Private Equity Funds – A Cash Flow Based Performance Analysis

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).
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)
I. Method of Capital Accumulated Value (CAV)*

\[ CAV_t = I_0 \cdot (1 + i_t)^t \iff i_t = \frac{C A V_t}{I_0} - 1 \quad \text{s.t.} \quad \frac{C A V_t}{I_0} > 0 \quad \forall \quad t \in \{t \mid Q > 0\} \]

* No arbitrage in \( t = 0 \) and gaining profit in total

II. Definition 'Future Yield after Taxes'[

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

\[ \bar{FYT}_t = FYT \cdot \left[ 1 - \frac{1}{t} \prod_{1}^{t} \text{Tax rate}_t \cdot (1 + \text{Solidarity surcharge}_t) \right]^{-1} \]
III. The Redundances of the FYT function arguments

Simplified notation:

\[ FYT_t := \left( \frac{\text{RoC}_t}{I_0} \right)^{\frac{1}{t}} - 1 \quad \forall \ t \in \{ t \mid Q > 0 \} \]

1. Profit distribution (potential)
2. Cash reserve (in total)
3. Taxable results (equity partial)
4. Liquidation profit (after loan repayment)
III. Characteristics of the function FYT (general)

\[
FYT_t := \text{RoI}_t \cdot \exp\left\{ \frac{1}{t} \right\} - 1 \quad \text{s.t.} \quad \text{RoI}_t = \frac{\text{RoC}_t}{I_0} \quad \forall \ t \in \{t \mid Q > 0\}
\]

- 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)

\[
\text{FYT}_0 \sim -1
\]

\[
\text{FYT}_1 = \sqrt[3]{\text{RoI}} - 1
\]

\[
\text{FYT}_2 = \sqrt[4]{\text{RoI}} - 1
\]

\[
\text{FYT}_3 = \sqrt[5]{\text{RoI}} - 1
\]
III. Mathematical characteristics

- Asymptotical function flow

Marginal function value at $t = 0$:

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

Marginal function value at $t = \infty$:

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

Function without break?

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

Function without buckling?

$$FYT'(t - \varepsilon) = FYT'(t + \varepsilon) \quad \forall \varepsilon > 0$$
III. Mathematical characteristics

- Function zeroing

\[ \text{FYT} = 0 \implies \text{RoC}_t = 1_{t=0} \]
III. Mathematical characteristics

- No function extremes (based on the asymptotical flow)
III. Mathematical characteristics

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

\[ \text{FYT}_1 = \sqrt[2]{\text{RoI}} - 1 \]

\[ \text{FYT}_2 = \sqrt[3]{\text{RoI}} - 1 \]

\[ \text{FYT}_3 = \sqrt[4]{\text{RoI}} - 1 \]

\[ \text{FYT} (\text{RoI}, t) = \beta_0 + \beta_1 \cdot \text{RoI}^\beta_2 \cdot \frac{1}{t} \]

\[ \text{FYT} (t) = \beta_0 + \beta_1 \cdot e^{\beta_2 \cdot \frac{1}{t}} \]

Assumption:
RoC arguments without multicollinearity
III. Mathematical characteristics

- Konkrete CEREF financing a 3* Mercure Hotel in Mannheim

\[ \text{FYT} = \sqrt[3]{\text{RoI}} - 1 \]

\[ \text{FYT}_{\text{App.}} = 1.1110 \cdot e^{-1.3098 \frac{1}{t}} - 1 \]
- FYT-comparison with the function of Internal Rate of Return

- Investigation of buy out aspects due to the secondary market

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

![Chart showing fund distribution and fund shape of each initiator](chart.png)

- **IC Immobilien Consulting- und Anlagegesellschaft mbH** 3.0%
- **REALII. S. AG** 3.7%
- **DCM Deinböck Capital Management AG** 3.7%
- **HANNOVER LEASING InvestmentGmbH** 3.9%
- **HAHN Fonds GmbH** 3.9%
- **Dr. Peters GmbH & Co. Emissionshaus** 4.9%
- **ILG Fonds GmbH** 5.1%
- **IMMAC Immobilienfonds GmbH** 6.9%
- **DWS Deutsche Immobilien Anlagegesellschaft mbH** 8.8%
- **Initiatoren (10 < F <= 15)** 20.6%
- **Initiatoren (5 < F <= 10)** 18.5%
- **Initiatoren (1 < F <= 5)** 11.8%
- **Initiatoren (F = 1)** 5.1%

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INTRODUCTION

LITERATURE REVIEW

BODY OF THE PRESENTATION

THEORY

EMPIRICAL ANALYSIS

CONCLUSIONS

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28 June 2017

# 19
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 %

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FYT Future after Taxes: an advanced key figure for measuring performance?
- Findings for period 1985-2015 (510 funds; 78 initiators; equity weighted)

Ø Purchasing Yield: 7.19 %

Ø Growth Yield: 6.20 % p. a. (vs. 6.46 % p. a.)

Ø Internal Rate of Return: 6.89 % p. a.

Ø Future Yield after Taxes: 3.92 % p. a.

7.29 % p. a. (before Taxes)
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
What are further advantages of these advanced KPI FYT?

- FYT uses direct components for Return of Capital
- FYT works independently due to dynamic effects of real estate management
- FYT is comparable with every market interest (homogeneous scaling)
- FYT is comparable with credit or minimum-guarantee-insurance interest
3 What gives evidence that the FYT results are reflected as the better ones?
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 FYT!