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NOTE TO

"RATES OF RETURN ON OPEN-END DEBT INVESTMENT FUNDS AND BANK DEPOSITS IN POLAND IN THE YEARS 1995–2015 – A COMPARATIVE ANALYSIS"

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Abstract

The main goal of this paper is a discussion on the correct choice of annualized return rate. Selected return rate should be appropriate for the multiannual comparative analysis of bank deposits and investment funds. The whole discussion was based on theoretical considerations and a numerical experiment.

Keywords: spot rate, simple annualized return rate

JEL classification: G11

* This note presents the reviewer's polemic with the author.

I will use the financial terminology used in (Dittmann, 2016). In this interesting paper, bank deposits and investment funds are evaluated by their annualized returns rate. An analysis of the increase in the value of each of these financial assets is carried out for the multiannual holding period.

The process of growth in the value of bank deposit growth is in the process of bank accounts. For the case of a multiannual holding period, this process should be assessed using the *effective annualized rate of return.*[1]

The process of growth in the value of the unit investment fund is the process of capital appreciation. In the case of the multiannual holding period, this process should be assessed by means of the effective annualized rate of return or by the logarithmical annualized rate of return.[2]

It implies that returns on investment funds or on bank deposits can be compared only by means effective annualized rate of return.

The comparative analysis carried out in the paper (Dittmann, 2016) is based on the following estimates of return rates:

– for bank deposits

$$R_D = \frac{holding\ period\ return}{n} = \frac{\prod_{i=1}^{n}(1+r_i)-1}{n} \tag{1}$$

where:

R_D – *simple annualized net rate of return*[3] *on a deposit,*

r_i – net (after tax) interest rate on a one-year deposit in the *i*-th year,[4]

n – investment horizon in years;

– for investments funds

$$R_F = \frac{holding\ period\ return}{n} = \frac{\left(\frac{Q_S}{Q_B}\times(1-P)-1\right)\times(1-T)}{n} \tag{2}$$

where:

R_F – simple annualized net rate of return on a fund,

Q_S – quotation on the day of the sale of shares by an investor,

Q_B – quotation on the day of the buy of shares by an investor,

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[1] Defined as *spot rate.*

[2] Defined as *spot logarithmic rate.*

[3] Defined as *nominal net interest rate.*

[4] i.e. net forward rate in the *i*-th year.

P – distribution fee rate (%),

T – capital gains tax rate (%),

n – investment horizon in years.

Dittmann (2006) justifies the choice of simple annualized net return rate – as the basis tool for a comparative analysis – in this way that her "choice was dictated by the fact that in the case of funds, there is no capitalization of interest during the investment period". As is well known, in the case of funds, the process of interest capitalization is replaced by the process of capital appreciation. In addition, any simple annualized return rate may be applied only in the case of a holding period that is shorter than one year. Therefore, above Dittmann's justification is unconvincing.

Moreover, Dittmann (2016) states, that the formula (1) is suggested by Jajuga and Jajuga (2014). On the other hand, we can see that the holding period return is obtained by means of compound annual interest. In this case, Jajuga and Jajuga (2014, p. 93) state that any investment should be evaluated by means of effective (annualized) rate of return defined by formula (2.18) in the cited book. Analogous statements also are found, for example in (Janssen et al., 2009) or (Piasecki, Ronka-Chmielowiec, 2011).

For this reason, The comparative analysis carried out in the paper (Dittmann, 2016) should be based on the following estimates of return rates: for bank deposits:

$$\breve{R}_D = \sqrt[n]{holding\ period\ return} = \sqrt[n]{\prod_{i=1}^{n}\left(1+r_i\right)-1} \tag{1a}$$

where:

$\breve{R}_D$ – effective annualized net rate of return on a deposit,

r_i, n – defined below is formula (1);

– for investments funds

$$\breve{R}_F = \sqrt[n]{holding\ period\ return} = \sqrt[n]{\left(\frac{Q_S}{Q_B}\times\left(1-P\right)-1\right)\times\left(1-T\right)} \tag{2a}$$

where:

$\breve{R}_F$ – effective annualized net rate of return on a fund,

Qs, Q_B, P, T, n – defined below is formula (2).

I have stated thus far that Dittmann (2016) had applied the wrong theoretical basis for the carried out comparative analysis. It remains to be clarified whether this error has a significant impact on the calculation carried out. For this purpose let us look at the following example.
Example: We consider the holding period from 1995 to 2015. Then the investment horizon in years is equal to:

$$n = 2015 - 1995 = 20.$$

Let us assume that net (after tax) interest rate on a one-year deposit "Piggybank" is constant and it is equal to:

$$r_i = 0.05.$$

Then we can calculate:

– by means of (1) a simple annualized net rate of return on a deposit

$$R_D = 0.1653,$$

– by means of (1a) an effective annualized net rate of return on a deposit

$$\breve{R}_D = 0.05.$$

It is obvious, that the effective annualized net rate of return $\breve{R}_D$ describes "Piggybank" better than a simple annualized net rate R_D.

We can see additionally, that the relative error of the calculation is equal to:

$$\delta\breve{R}_D = \frac{R_D - \breve{R}_D}{\breve{R}_D} \times 100\% = 230\%. \qquad \square$$

This example is compelling proof that a formal error which has been found can have a significant impact on the comparative analysis carried out in (Dittmann, 2016).

All of this can ultimately decide that all of the results presented in the paper (Dittmann, 2016) are unreliable.

In this situation, I think it is necessary to repeat all of the calculations in such a way that:

– formula (1) is replaced by the formula (1a),

– formula (2) is replaced by the formula (2a).

This calculation then authenticates the obtained conclusions. I would not be surprised; as such calculations undermine the formulated conclusions thus far.

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