Construction Maeconomics Conference 2016

ROE under the influence of changing interest rate

Olga Heralová\*1

1VUT v Brně,Fakulta stavební, Ústav stavební ekonomiky a řízení, Veveří 331/95, Brno, 602 00, The Czech Rep., olga.heralova@gmail.com

Abstract

Intention of the article is to examine how ROE (Return on Equity) is influenced by changing interest rate. Size of influence is tested on Asset and Property Company (company´s business is focused on real estates, their maintenance and development). Financial management model of this company is based on two indicators, on ROE (Return on Equity) and WACC (Weighted Average Costs of Capital). Due to fact that company´s business is focused on real estates, what is business demanding on capital, these two indicators are suitable. Part of capital resources is external, what case that price of capital has significant impact on company´s profitability. Each owner (shareholder, investor) has some targeted ROE, for which investment is acceptable. It is the reason why knowledge of marginal costs of capital is important for verification whether investment in company is in line with investor´s intention.

Keywords

interest rate; return on equity (ROE); weighted average costs of capital (WACC)

1. Introduction details, hypothesis

Target of this article is to examine size of changing interest rate influence on return on equity (ROE). Examination is provided on company whose business is property and asset management in field of real estate.

Motivation to examine this influence is low money price on bank and interbank market during last 2 years. Current money price is close to technical zero. It is expected that duration of this situation will be changed soon. Property and Assets Company operating on real estate market (specifically company that owns real estate’s) are sensitive to price of money due to fact that real estate’s are demanding on capital resources.

*Hypothesis*: Increasing price of external capital influenced by money price of bank and interbank market can course ROE decrease under the limit acceptable for owners (investors).

Investors mostly do not accept ROE lower than price of external capital.

1. Methodology details

The object of the research are companies operating in maintenance and development of own real estates. Significant items in Balance Sheets of this company are categories on assets side like buildings, constructions and lands and on liabilities side external capital and equity to finance assets. From this is clear that this kind of business is demanding on capital. Capital is always combination of equity and external capital resources. Price of capital influence chance to reach expected ROE.

ROE is suitable indicator as part of financial management due to above specified kind of core business of the company.

Intention of companies operating in this business is to set capital structure (combination of equity and liabilities) with target to keep costs of capital at the lowest possible level to reach the highest possible ROE. Some companies uses for cost of capital monitoring and management indicator named WACC (weighted average cost of capital) and have settled internal maximum level for this indicator.

Methodology used for research:

* Financial analysis, indicators: ROE, WACC
* Table processor MS Excel, mainly table and graphic processing
* Data and Statutory reports from accounting database of selected company
* Officially available information related to money price on bank and interbank market (The Czech National bank, commercial banks operating in The Czech Republic)
	1. ROE and Du Pont equitation

Profitability indicators present information relevant to each activity of company, what is visible from so called Du Pont equation. Du Pont equation decomposed profitability indicator to partial indicators that measure asset management effectiveness (assets), capital usage (costs) and indebtedness.

Du Pont equation [1] is possible to write as below:

$ROE =\frac{EAT}{E}=\frac{EAT}{EBT}x\frac{EBT}{EBIT}x\frac{EBIT}{S}x\frac{S}{A}x\frac{A}{E}$ (1)

Where:

ROE return on equity

EAT earnings after tax

EBT earnings before tax

EBIT earnings before interest and tax

S sales

A assets

E equity

EBT/EBIT interest rate effect

A/E so called equity multiplication or financial leverage (increased liability ration on total capital , higher debts, of company has positive impact on ROE under conditions that company is capable to generate from every invested crown more than interest applied on external capital).

EBT/EBIT x A/E is profit effect of financial leverage

S/A asset turnover (high asset turnover indicates effective capital usage, so company is effective in asset and capital usage and management).

* 1. WACC – weighted average costs of capital

WACC indicates average price of capital used by company (capital reported in Balance Sheet).

Not every company define components for WACC computation identically, so it is highly important to define in each company the content of term equity and external capital. Each company (owner/shareholder) has specific demand on profitability of own invested capital.

Ministry of Trade uses specific definition of total capital in own rating model [2]. In their definition total debt is a debt for which company has to pay interest (so loans for free are excluded from external capital) and Re is considered on the same level as discount rate used for NPV calculation.

WACC could be easily used for benchmarking with other companies. Rating model of Ministry of Trade is also suitable to use for benchmark.

WACC could be defined as below:

$WACC =R\_{d}\left(1-t\right)\frac{D}{P}+R\_{e}\frac{E}{P}$ (2)

Where:

Rd demanded return on external capital (price of debt)

t income tax rate

D volume of debt (debt)

P total volume of used capital (equity + debt)

Re demanded return on equity

E volume of equity (equity)

* 1. Accounting data of specific company used for examination

2015 audited data of specific company were used for examination. Company was established in 2013 and all real estate assets were moved into company effectively as at 1.1. 2014.

Definition of transferred part was the object of Project Splitting by merger (in line with the Act no 125/2008 statue book about company transformation, as subsequently amended).

Transfer from the assets*:*

* Plants, Buildings, Equipment – net value

Transfer from the equity and liabilities:

* Retained earnings from the previous years
* Other long termed liabilities
* Deferred tax liabilities (related to transferred fixed assets)
* Deposits received (related to lease contracts)

The way how company was established and how assets were transferred into company is crucial for Equity definition. For ROE calculation Equity is defined as net booking value of assets as at 1.1.2014 increased by new asset purchases after this date.

Due to fact that the object of examination is influence of changing interest rate on company ROE, 2015 audited data and its variations (with different interest rates) were used.

1. Examination on case study

2015 audited results are presented in column in Table 1 below with interest rate 5% p.a.. Company has in bookkeeping evidence loans with interest rate 5% p.a., but also external capital for free, so average cost of debt is lower (3,5% p.a.).

Due to fact that current money price in interbank market is on so called technical zero, it is highly probable that currently company can get external capital for better conditions (interest rate lower than 5% p.a.). Five interest rates from interval from zero to 10% were selected. Zero was chosen as the lowest (despite of fact that in some EU countries negative interest rate is currently available) and 10% as the highest. The range of interest rates was selected for Czech market. Based on relevant information (declaration of The Czech national bank) negative interest rate is not considered.

Table 1: Calculated ROE for changing interest rate (source: author)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Interest rate (loan)* |  | *0* | *2,50%* | *5%* | *7,50%* | *10%* |
| External capital – average rate  |  | 0 | 1,74% | 3,50% | 5,20% | 7,00% |
| Interest costs in (000 CZK) |  | 0 | 844 | 2 109 | 3 164 | 4 218 |
| PAT in 000 CZK |  | 7 016 | 6 680 | 5 308 | 4 683 | 3 745 |
| Equity relevant for ROE in 000CZK |  | 122 759 | 122 759 | 122 759 | 122 759 | 122 759 |
| ROE |  | 5,72% | 5,44% | 4,32% | 3,81% | 3,05% |

Figure 1: ROE for changing interest rate (source: author)

2 marginal interest rates important for investors (owners of the company) are presented at Figure 1.

If investor (and management instructed by him) demands ROE at least equal to *average cost of debt (external capital),* this conditions is reached only for interest *rates lower than 6,1% p.a*..

If investor (and management instructed by him) demands ROE at least equal to *cost of debt (external capital),* this conditions is reached only for interest *rates lower than 4,67% p.a*., so in 2015 this condition was not fulfilled (interest rate of loan is equal to 5% p.a..

1. Conclusion and result

From the text and case study is visible that optimal situation for company is to receive external capital for the lowest price as possible (measured by indicator WACC) because it automatically cause increase in ROE. Usage of ROE and WACC for financial management of companies operating in property and assets management with real estates, that own, is suitable.

It is important to emphasise that interest rate is external factor for the company. Knowledge of interest rate influence on ROE is helpful, but in the same time it is necessary to work on inner effectiveness of the company. ROE decomposition with help of Du Pont equation can nicely indicate where the space for improvement is (whether in asset management effectiveness, capital usage or indebtedness).

Topic of this article was concentrated on external factor (macro factors) represented by interest rate.

*Hypothesis:*

Increasing price of external capital influenced by money price of bank and interbank market can course ROE decrease under the limit (price of external capital) acceptable by owners (investors, shareholders).

*Outcomes of company examinations:*

If investor demands ROE at least equal to *average cost of debt (external capital),* this conditions is reached only for interest *rates lower than 6,1% p.a*..

If investor demands ROE at least equal to *cost of debt (external capital),* this conditions is reached only for interest *rates lower than 4,67% p.a*., so in 2015 this condition was not fulfilled (interest rate of loan is equal to 5% p.a..

*Conclusion:* Hypothesis was proved, the knowledge of macro factors effects on the company is important. Macro factors were represented by changing interest rate in the case study (increasing interest rate cause decrease in ROE under the assumption that price of external capital is not fixed for long period and correction of interest related to situation on bank and interbank market is not excluded).

Examination was provided only on one company with usages of 2015 audited data (data were recalculated for different interest rates to receive more variants).

References

1. ŘEŽŇÁKOVÁ, M., *Efektivní financování rozvoje podnikání*, Praha, Grada, 2012, ISBN: 978-80-247-1835-4
2. *Benchmarkingový diagnostický systém finančních indikátorů INFA*, web stránky Ministerstva průmyslu a obchodu, dostupné na <http://www.mpo.cz/cz/infa.html>, ,