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FOR THE TRUST OF CAPM: THE EVIDENCE FROM ESTONIAN COMMERCIAL REAL ESTATE MARKET

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ABSTRACT

The main challenge for the real estate appraisers and investors is to acquire the adequate input data for their real estate investment and market valuations. One of those most challenging input data are those, which should be driven by the market players, especially the rates of returns.

According to the finance theory, direct and indirect methods can be used to calculate investor's required rate of return. In case of direct method, the required rate of return value will be given by investor(s), depending heavily on investor's levels of risk aversion. In case of indirect methods, the discount rate is calculated using current or historic data. The major difficulty here is that actual required rate of return cannot be observed from market data and that is why scholars can estimate different rates of return. One of the most well-known methods both in theory and in practice for estimating required rate of return of an investment is capital asset pricing model (CAPM), which on the other hand, has been challenged and criticized by some of the scholars. Therefore, within this paper, an applicability of the CAPM theory in practice is tested by confronting it with the Estonian commercial real estate investors' expert opinion.

Due to the above said, the current paper aims to explore, whether the implicit way of assessing rates of returns matches with the explicitly assessed rates of returns, based on the example of Estonian commercial real estate market. The research is based on the surveys conducted in years 2010, 2012, 2015 and 2018. The study findings show that the results of the market expert opinions acquired through the questionnaires verify the correctness of the results of required rate of return obtained by CAPM, calculated by 10-year based historical data. The overall results revealed that the average long-term required rate of return of a typical investor, considering a typical core investment in commercial real estate in Estonia, is around to 9% per annum.

Keywords: CAPM, required rate of return, expert opinion, real estate market, Estonia

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1. INTRODUCTION

It is substantial to assess the required rate of return as adequately as possible for both investment and market value of the commercial real estate[1] in order to make successful long-run real estate investment decisions – i.e., in a way that reckons all the direct and indirect costs occurring with the real estate investment and its´ risk level. Several studies have considered discount rate for the Estonian companies (e.g., Sander 2003; Jegorov 2010), but literature lacks of thorough theoretical considerations from the viewpoint of the Estonian commercial real estate market.

Current paper focuses on a typical real estate investor (both individual and institutional), making a direct investment and it´s further management decisions in a typical core real estate, considering a typical or conventional market situation (i.e., taking into account a normal long-run investment perspective). Typical real estate investment situation encompasses also standard financing scheme, which consists of *ca* 30% of debt capital and *ca* 70% of equity capital. Within this paper, under institutional investors, there is considered all national and international property funds, pension funds, and also various corporate users.

[1] Within the current paper, under the commercial real estate all core income-producing properties are considered; i.e., retail, office, warehouse and industrial real estate assets (see also e.g., Akinsomi *et al.* 2017).

The current paper aims to explore, whether the implicit way of assessing rates of returns matches with the explicitly assessed rates of returns, based on the example of Estonian commercial real estate market.

The main research question assigned here, is: *Whether it is possible to trust Capital Asset Pricing Model (CAPM) based rates of returns in Estonian commercial real estate market?*

Although widely used, CAPM has still got a quite heavy criticism by several scholars (e.g., Fernandez 2015; Roll 1977) and in its extreme cases, even being rejected the model´s empirical validity (see e.g., Fama *et al.* 1992, 1996). However, as it is stated by Glascock *et al.* (2018), then: "Numerous researches, …, attempt to improve empirical methodologies used in the validation of CAPM or focus on various theoretical frameworks to relax the assumptions in the unconditional CAPM world." Therefore, the authors of the paper have positioned themselves also for the trust of CAPM and intend to test the correctness of the CAPM-based estimation of long-term rates of return with the help of the results of real estate market experts' opinions in Estonia. Real estate market has chosen as the test-market sector because of its explicit framework and Estonia as a test-country has been chosen because of the secondary intention to prove the applicability of CAPM also on smaller markets.

The current paper is structured as follows. Firstly, theories and previous studies about the estimation of the opportunity cost of capital as the basis for the assessment of appropriate discount rate for real estate investment is handled. Secondly, a suitable method for estimating discount rate for real estate investment in Estonia, using capital asset pricing model (CAPM) is found. General considerations of CAPM are followed by specific analysis of all its components – risk free rate of return, market risk premium and systematic risk. Third part is finalized with the analysis of empirical findings obtained through the questionnaire, the results of which are compared to the results gained by CAPM method.

2. BACKGROUND

The history of Estonian freely tradable real estate market is quite short, dating back and starting only since the beginning of 1990s. At that time, the Estonian government started to return the property and land back to their previous private owners (the process was called privatization), which were expropriated from them at the beginning of the Soviet area in 1940s (see also Jürgenson 2016). Back then, the situation in the real estate market in Estonia was quite similar, as being described by Laurin *et al.* (2010) – i.e., although there were registered real estate transactions during the 1990s, the investment volumes really gained momentum in the early years of the 21st century. At that time, the market activities were shifting from a construction and property development toward the property investment market. By now, although quite small-scaled, but still rather considerable residential and commercial real estate market has developed out in larger urban areas in Estonia.

Since the regaining its independence at the 20th of August 1991, Estonian government has implemented an open and a very liberal market economy. Due to its smallness (with approximately 1,3 mln inhabitants), the whole country is very open and vulnerable to almost every global movement in the world economy. As an example, the result of the trends in global markets is clearly and recognizably seen on figure 1, depicting a highly cyclical movement in the overall real estate market price index in Estonia since the 2nd quarter of 2003 till the 2nd quarter of 2018.

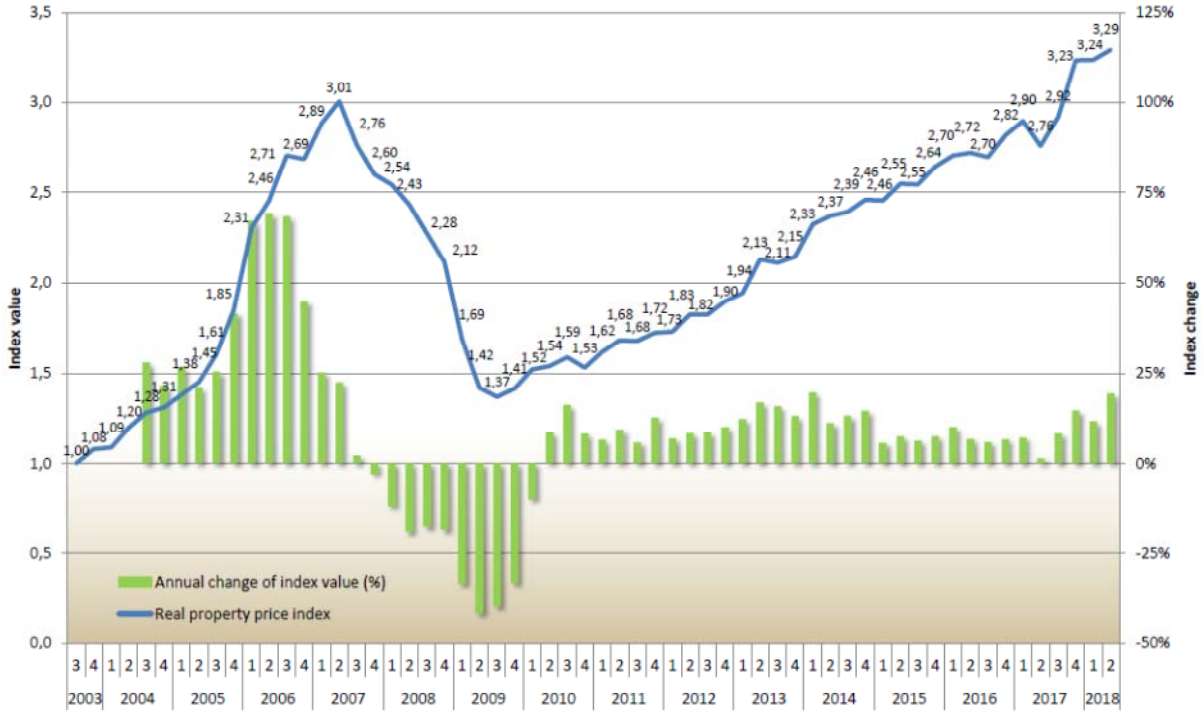

Figure 1. Estonian real property transactions price index – the whole market (2nd quarter 2003 = 100). (Source: Estonian Land Board, Transactions Database)

The description over the Estonian real estate market situation is given, in order to explain the main setting of the current paper – i.e., the implementation of the Capital Asset Pricing Model (CAPM) in practice. By the origin, CAPM was worked out to be used mainly on large-scale capital markets. However, the current research would like to somewhat test the use of the CAPM within the conditions of a small-scale open market economy.

3. LITERATURE REVIEW: ESTIMATING THE OPPORTUNITY COST OF CAPITAL

According to the finance theory, the applicable discount rate should include:

1) a risk free rate of return (which compensates the investor for postponing consumption and decrease in purchasing power),
2) a risk premium (which compensates risk level of cash flows, whereas most scholars agree that only that part of risk should be considered, which cannot be diversified) and
3) all the other relevant costs (e.g., the transaction costs that incur in the process of raising the capital on both demand and supply side).

Both, direct and indirect methods can be used to calculate investor's required rate of return (see figure 2).

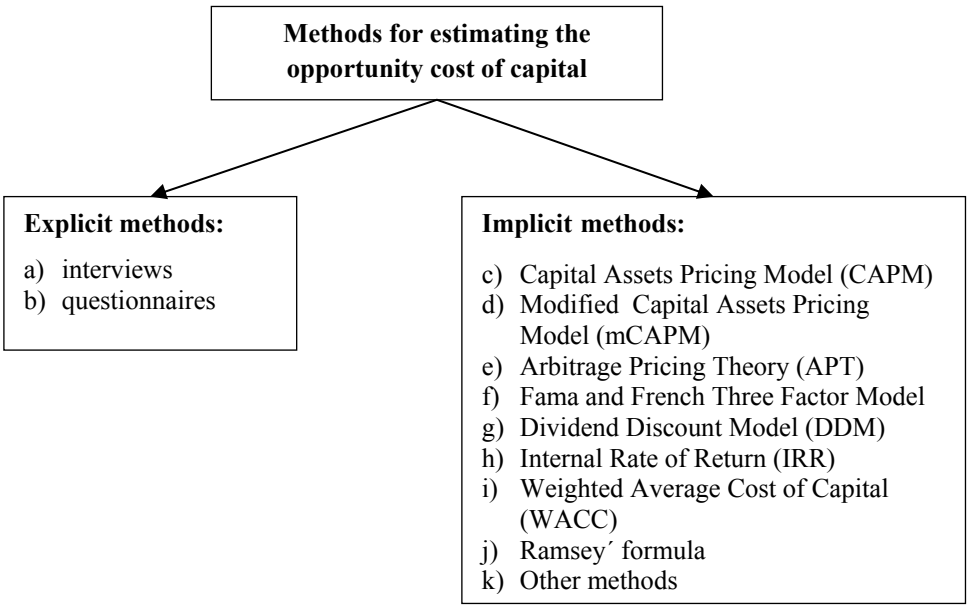

Figure 2. Explicit and implicit methods for estimating the size of the opportunity cost of capital. (Source: composed by authors, based on Kask 2014; Sander *et al.* 2011)

According to the direct or explicit method, the value to the required rate of return will be given directly by the investor(s). However, as different investors have different expectations on the levels of risk and return due to the differences in risk aversion, a problem with the assessment of explicit discount rate of return in practice occurs. For instance, on the example of the government as an investor, all the taxpayers in the country can be seen as (final) investors. The governmental officials being responsible for the investment decisions are only the representatives of all the taxpayers. In theory, in such cases the concept of marginal investor's required rate of return has been used (Damodaran 2010), but still it is not clear, who should be that hypothetical marginal investor.

In case of indirect methods, the discount rate is calculated using current or historic data. The major difficulty here is that actual required rate of return cannot be observed from market data and that is why scholars can calculate different rates of return. One of the most well-known methods for calculating required rate of return is capital asset pricing model (CAPM), formulated by Sharpe (1964), Treynor (1961)[2], Lintner (1965) and Mossin (1966). Traditional CAPM (developed by Sharpe-Lintner-Black) is a one-period static (unconditional) model (Glascock *et al.* 2018). It is an equilibrium model based on Markowitz's portfolio theory; Tobin's separation theorem and a number of restricting presumptions (see e.g., Sander 2003). Although many of those presumptions are not fulfilled in practice, CAPM has developed to be one of the most utilized methods in the world for the calculations of discount rates (Bruner *et al*. 1998; Pereiro 2002). Quite soon after the adoption of CAPM in 1964, some of the scholars (e.g., Miles *et al.* 1978; Wofford *et al.* 1978; Gau *et al.* 1978) suggested to apply it in real estate analysis (Draper *et al.* 1982).

The arbitrage pricing theory (APT) formulated in 1976 by Ross, has less restricting presumptions compared with CAPM. Still, the practical application of APT model is much more difficult, as it does not list the factors influencing required rate of return and scholars have to create the model based on the empirical data. In case of the Fama-French three-factor model, discount rate is beside systematic risk (used in CAPM) dependent on firm size and the ratio of firm book and market value (Fama *et al.* 1992).

Dividend discount model allows assessing discount rate reflected in the market price of the asset in case of the expected dividends (or other similar kind of cash flow) and their growth rate are known

[2] Treynor (1961) paper is an unpublished manuscript.

(see e.g., Vernimmen *et al.* 2005). There are also some other methods for calculating required rates of returns in practice, whereas some specific models have been created for real estate market (see e.g., D'Argensio *et al.* 2009).

As in general, it is rather time-consuming and costly to gather the data about commercial real estate rates of returns using the explicit methods, then the implicit approach is widely used in practice. Based on the literature, there are generally four traditional ways to estimate implicitly market discount rates for either real estate investment or valuation (Kask 2010):

- market comparisons method, calculating the internal rate of return (IRR) from comparative properties,
- comparative rates, using build-up method,
- weighted average cost of capital (WACC),
- capital asset pricing model (CAPM)[3].

In terms of commercial real estate, the scholars and practitioners have used either historical data based rates of returns or forward-looking internal rate of return (IRR) for either listed or unlisted real estate investment funds (REITs) to imply them as a proxy to the rate of return from the direct real estate investment (see e.g., Crosby *et al.* 2018). The derivation of IRR from comparative similar kind of properties to the subject property is the most preferred method for the discount rate estimation in case of real estate valuation, using income approach, but at the same time, it is also one of the hardest to implement for single private investor. On the other hand, it is convenient method for portfolio investor when the all relevant data about similar kind of real estate assets are known and available.

One of the mostly used alternatives for the IRR method in estimating the discount rate, is the build-up method, based on comparative rates of similar kind of properties (see e.g., Hutchison *et al.* 2017). The basic idea of the overall discount rate is to sum up the capitalization rate, being derived from the transaction prices of similar kind of properties and the estimated growth rate. This is also one of the main methods used in terms of deriving the rates of returns (or an implied capital return of real estate, as stated by Ishijima *et al.* 2014), based on the real estate market indices, e.g, either Investment Property Databank (IPD) index or NCREIF Property Index (NPI).

The weighted average cost of capital (WACC) method is applicable, while the cost of equity capital and the cost of debt capital and their weights within the overall capital structure are known. WACC is also a quite popular method among the real estate practitioners, in deriving implicitly the rates of returns from the property investments and valuations, by both private and public entities (see e.g., Commonwealth of Australia 1998). A tight relation between the WACC and the valuation of an asset has extensive theoretical underpinnings extending from the valuation of a company, developed by Modigliani *et al.* (1958) (Jud *et al.* 1995).

Finally, one of the alternative ways for estimating the discount rate implicitly is applying the Capital Asset Pricing Model (CAPM). Still, it can be concluded that CAPM has been most widely used by practitioners because of its simplicity (at least at the first glance). For example, CAPM is often used in practice in those cases, when the company is subject to price regulations, both in Estonia (see e.g., Konkurentsiamet 2016[4]; Sander 2009) as well as in the other countries (see e.g., Fernandez 2019; Jenkinson 2008). In addition, the required rate of return of equity capital for the Estonian 100% governmentally owned real estate company State Real Estate Ltd (RKAS), which is holding and managing the state government real estate portfolio, has also been calculated by using CAPM-based [5]

[3] CAPM method is used mainly for assessing the cost of equity capital, being part of the WACC formula. Nevertheless, it can be used to calculate also the overall cost of capital of an asset by using appropriate input data, asset beta included.
[4] Estonian Competition Authority instructions for weighed average cost of capital (WACC) calculation [http://www.konkurentsiamet.ee/file.php?17216]
[5] See for example, Estonian Ministry of Finance report about shares' administration, founder and member rights execution in 2009 [http://www.fin.ee/doc.php?106032]

methodology. The application of CAPM method for real estate investments in Estonia is elaborated more thoroughly in section 4, considering both theoretical and practical aspects.

4. EMPIRICAL ANALYSIS: CALCULATING DISCOUNT RATE FOR REAL ESTATE INVESTMENT IN ESTONIA

4.1. CAPM METHOD

The Capital Asset Pricing Model (CAPM) is a market equilibrium model and has a lots of assumptions that is not met in practice, but nevertheless it is one of the most applied models both in Estonia (see e.g., Kantšukov *et al.* 2012) as well as in the other countries (see e.g., Bruner 1998).

According to the CAPM, the required rate of return (R_i) depends on the risk free rate of return (R_F), on the asset beta coefficient, incorporating systematic risk (β_i) and on market risk premium (RP_m) (see formula 1):

(1) $$R_i = R_F + \beta_i \cdot RP_m$$

There has been developed several modifications to capital asset pricing model, taking into account for example risk premium for a small company, the overall risk level, etc. Comparing with the investment to the shares of the non-listed REITs, a direct investment to a commercial real estate asset comprises significantly greater level of liquidity risk. The investors value liquidity (especially in hard times) and therefore they agree to pay higher price for more liquid assets than for illiquid assets; i.e., the investors´ required rate of return is lower for more liquid instruments (or assets). The latter determines the need to use additional risk premium (RP_{liq}) for compensating the liquidity risk in assessing the appropriate level of real estate investment discount rate (see formula 2):

(2) $$R_i = R_F + \beta_i \cdot RP_m + RP_{liq}.$$

Estimating the liquidity risk, the important factors are time and costs in exiting the investment and also the length of the typical investment period. Concerning the liquidity risk, there are also some other important factors to consider – for example, the length of the time period for closing the deal or potential discount the seller has to account with in selling the asset faster than normally in the market. More precise methodology for accounting with all those previously mentioned factors in estimating the liquidity risk premium, is planned to elaborate by the authors during the further research in the future.

The liquidity risk premium (RP_{liq}) can be calculated, based on the illiquidity discount of an asset (ILD). In case of a perpetuity, it is possible to use the following formula 3:

(3) $$RP_{liq} = \frac{r}{1 - ILD} - r,$$

where r – discount rate.

The size of the illiquidity discount (ILD) in formula 3, depends on the roundtrip transaction costs (RTC) and on the typical length of holding period (t) and can be estimated in case of a perpetuity as follows[6] (see formula 4):

(4) $$ILD = RTC + \frac{RTC}{(1+r)^t} + \frac{RTC}{(1+r)^{2 \cdot t}} + \frac{RTC}{(1+r)^{3 \cdot t}} + \ldots + \frac{RTC}{(1+r)^{\infty \cdot t}}.$$

[6] The logic of the approach is based on the paper of Amihud (1993), „Liquidity and Cost of Capital: Implication for Corporate Management".

The table 1 describes input data and their sources used in the following CAPM calculations.

Table 1. The content and the expected components of CAPM in terms of Estonia.

CAPM component	Data source	Data description
Risk-free rate of return	www.ecb.eu	YTM of 10-Year German Bund
Market risk Premium	www.damodaran.com	Market risk Premium for Estonia
Unleveraged beta	www.damodaran.com	Unlevered beta of US REIT sector
Liquidity Premium	Appendix 1	Calculations based on average holding period and round trip costs in Estonia

Source: composed by authors.

As there is no freely tradable and liquid governmental bond market in Estonia, then in order to estimate the risk free rate, the authors have chosen to use the YTM of 10-Year German Bund as a proxy, due to its AAA-rating and a very high liquidity within the Eurozone[7]. The following figure 3 shows the behaviour of the YTM of 10-Year German Bund as a risk free rate during 1999-2017.

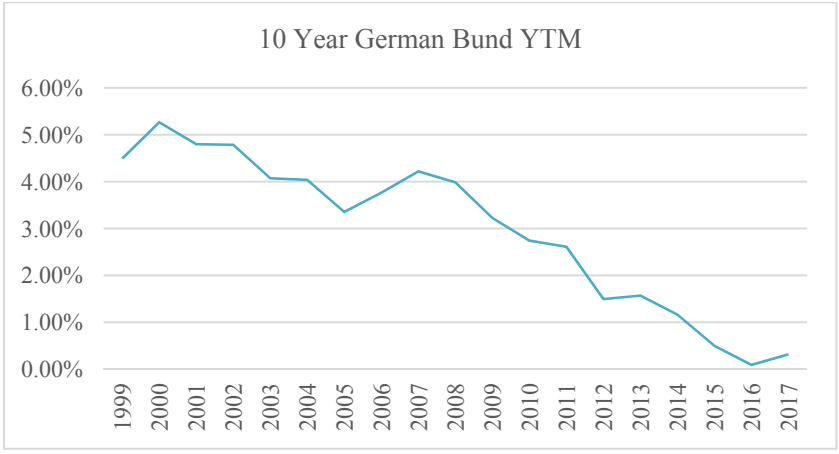

Figure 3. Historical behaviour for risk free rate. (Source: www.ecb.eu)

In order to estimate the systematic risk for diversified real estate portfolio, the authors have used the average betas of listed Real Estate Investment Trusts (REIT) in the United States, set as a proxy[8]. While the betas of the European REITs are available only for the last four years, the need for a longer time series forced to choose the data from the US market. As it is witnessed from figure 4, the asset betas of US REITs have been quite volatile, ranging between 0.12-1.09 during the last 18 years. Therefore, two estimates for discount rates have been provided: (1) based on the current level of inputs (R), which is more volatile and (2) based on the 10-year arithmetic average of inputs ($\overline{R}$), which is more stable over the time.

[7] Estonia joined the Eurozone since 2011.
[8] However, Breidenbach *et al.* (2006) argues that betas being published and calculated based on the equity REITs return-series, may not be a reasonable proxy for private real estate.

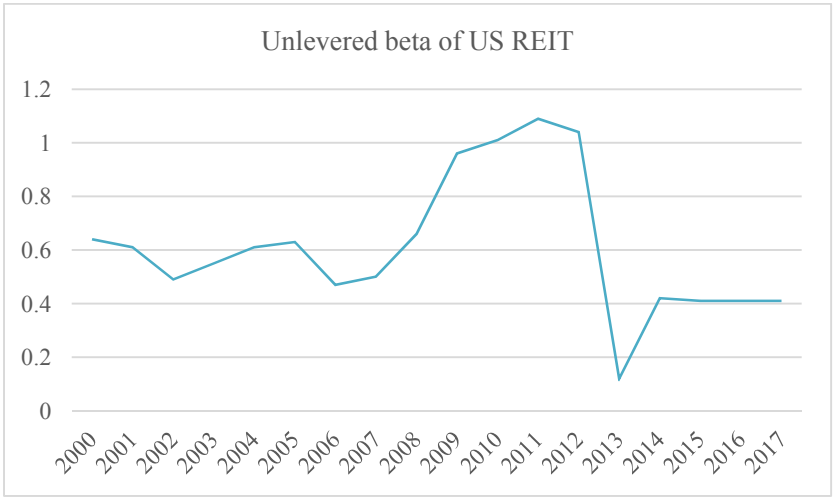

Figure 4. Historical behaviour for US REIT sector unleveraged beta. (Source: www.damodaran.com)

Commonly, market risk premium (RP_m) is calculated by using historical data (typically the spread of stock market rate return and risk-free bond yield). In our calculations, we use the market risk premiums for Estonia estimated by A. Damodaran[9]. The market risk premium for Estonian market consists of market risk premium for countries with AAA risk rating and country risk premium, which was estimated by Damodaran as 1.5 times countries´ default risk premium (Damodaran 2015).

The overall sum of the real estate roundtrip costs (RTC) in Estonia is approximately 2.57%-5.45% (Global Property Guide 2010), which is quite favourable result comparing with the international levels. As the overall holding period of real estate is quite long, the authors believe that it is appropriate to use 0.8% as liquidity risk premium.

The cost of capital (K_A) is usually higher than the required rate of return (R_i) due to the additional costs associated with the raising of the capital. In case of a perpetual capital, the cost of capital can be calculated, as it is seen in the following formula 5:

$$(5) \qquad K_A = \frac{R_i}{1-c},$$

where c – additional cost of raising capital (%).

In the calculations of the current study, there is assumed that the additional cost of raising capital is around 4%. The cost of capital in formula 5 can be considered also as an unleveraged cost of equity capital (k_U) in case of a typical real estate investment.

The following table 2 presents the CAPM-based required rates of returns for all the conducted surveys.

Table 2. The results of the assessed CAPM-based long-term cost of capital for commercial real estate in Estonia.

Year	CAPM-based cost of capital	
	based on current year data	based on 10-year historical average data
2010	10,04%	9,10%
2012	11,82%	9,17%
2015	5,02%	8,36%
2018	3,68%	7,19%

Source: elaborated by the authors.

[9] See from Damodaran homepage: http://people.stern.nyu.edu/adamodar/

In conclusion, the authors presume that although there would be hard to prove the validity of CAPM as the equilibrium market model (as it was originally created), the model includes on its modified form those important components from what the investors´ required rate of return should consist of.

In case the real estate investment is financed by both equity and debt capital, then the sharing of risks between the owner and creditor occur, but the overall risk level of the project will remain the same. According to the Estonian tax law, the usage of debt capital does not bring along any tax advantage[10], therefore there is no need to assume that obtaining debt financing in a conservative level with a fair price, could essentially change the level of discount rate of the project as a whole. But, the high level of the leverage brings along also the rise in costs of financial distress and the rise of the level of discount rate used in assessing the investment project´s value.

4.2. APPLICATION OF THE SURVEY METHOD

The authors have set up a task to control and compare the empirical results with the theory findings due to an abundant critique about the practical usage of theoretical models estimating the cost of capital in Estonia. The task was solved by involving market experts to assess empirically the cost of capital of various types of commercial real estate assets in Estonia. The data was gathered by questionnaire sent to a number of market participants and experts – i.e., investors, creditors and consultants, including real estate valuers. Detailed description of the survey analysis and findings is given under the following subsections, based again mainly on the description of the conducted survey in year 2010 as an example.

4.2.1. PURPOSE

The purpose of the questionnaire was to ascertain the expert opinion about the expected rates of returns of from the typical investor point of view within the main segments of commercial real estate, considering different time perspectives and also different regional locations in Estonia.

The task was to gather the estimation of expected rates of returns according to:

- time perspectives
  - current market situation,
  - short-run perspective (up to 1-2 years),
  - medium future (3-5 years),
  - long-run perspective (longer than 5 years);

- the following regional diversification of Estonia:
  - Tallinn,
  - Tartu and Pärnu,
  - other regions.

The targetted objects of the research were chosen as a typical commercial real estate asset classes from the investors point of view, i.e.:

- class A office buildings;
- class A retail buildings;
- class A warehouse and manufacturing buildings.

[10] Since the year 2000, there was adopted an unconventional income tax system for Estonian companies, where instead of taxing the profit, the companies in Estonia are taxed only on the level of cash-dividend payouts, and in case of 100% retained earnings, the corporate income tax rate is considered as 0%. It means that, "under the Estonian system of corporate taxation, companies need not pay income tax on undistributed earnings, allowing them to postpone income tax liability indeterminately" (Kantšukov *et al.* 2018). Therefore, in calculating the cost of debt capital within the weighted average cost of capital, it is possible to cancel out the corporate tax part of the formula.

4.2.2. Sample

The questionnaire was conducted via e-mailing system, asking the potential respondents to manually fill in the sent questionnaire. For example, in year 2010, the questionnaire was sent to 30 market experts, where 13 of them were investors, 10 creditors and 7 valuers and consultants. Finally, the overall number of responses to the sent out questionnaire was given by 15 market experts, resulting with the average response rate of 50%. But, as the answers of two of the responders were too declarative (the forms of the questionnaire were not properly filled in) and two respondents did not understood the aim of the questionnaire correctly, then the analysis was done, taking into consideration the answers from 4 investors, 3 creditors and 4 valuers and consultants (i.e., one third from the original sample). Although the accepted number of responses was relatively small during all four sets of the questionnaires, it was however, compensated with a very good quality of the answers, provided by the best real estate market experts in Estonia.

The summary of the sample sizes during the different surveys is summarized in table 3.

Table 3. The summary of sample size and number of respondents of the conducted surveys.

No	Time of the survey	Target group	Sample size	Accepted number of respondents	Response rate
1.	Oct-Nov 2010	institutional investors, valuers and consultants, creditors	30	11	37%
2.	Oct-Nov 2012	institutional investors, valuers and consultants, creditors	57	18	32%
3.	June 2015	institutional investors, valuers and consultants, creditors	29	14	48%
4.	May 2018	institutional investors, valuers and consultants, creditors	15	11	73%

Source: compiled by the authors.

4.2.3. Limitations

Due to the small size of Estonia as a country, there is also a rather small overall number of the real estate market experts in Estonia, which puts a clear limit to the sample size. Besides that, the sent out questionnaire was limited only to a certain target group, i.e.:

- managers of direct real estate investing companies (targeting the existing investment experience in real estate) – named as investors;
- representatives of bigger credit institutions (targeting the existing good overview of the local real estate market and the experience with forecasts) – named as creditors;
- real estate valuers of bigger companies with longer experience (targeting the existing good over-view of the local real estate market) – named as valuers and consultants.

4.3. SUMMARY OF THE RESULTS

As in long-run, over all the geographical regions in Estonia and types of real estate assets, the average overall rate of return of the median and arithmetic average is 8.9%, then the previously found CAPM-based estimation of overall rate of return – 9.18% – is very close to the findings got through the questionnaire. Therefore, it is possible to say that the results from the questionnaire support and verify the results obtained by the CAPM-based rate of return estimation and based on both numerical value it is possible to say that the suitable discount rate for the typical real estate investment within a typical market situation can be round to 9%.

Table 4 summarizes both the CAPM and market expert opinion based results over the all conducted surveys.

Table 4. The summary of results of overall rates of returns both CAPM-based and market expert based surveys in 2010, 2012, 2015 and 2018.

Assessment method	Year			
	2010	**2012**	**2015**	**2018**
CAPM	9,1	9,17	8,36	7,19
Market experts				
▪ median average	9,00*	9,00	9,00	8,00
▪ arithmetical average	9,46*	9,47	9,21	7,94
▪ std deviation	1,47	2,22	1,98	1,88

* Excl. retail real estate assets

Source: compiled by the authors.

As it is seen from table 4, a remarkable results were gained during the first two surveys, where both the results of CAPM-based and market expert opinion based overall long-term rates of returns were almost identical, ending up around 9%. It has to be mentioned that both surveys in years 2010 and 2012, stayed in the range of the market recovery, after the severe recession during 2007-2009, as it is seen from the figure 1. But thereafter, since the survey conducted in 2015, two kinds of effects are detected: (1) there is a sharp drop on the level of CAPM-based overall rates of returns and (2) a bigger gap between CAPM and expert opinion based results occurred. While in year 2015, the difference between the two assessments was approximately 0,65 basis points, then in 2018, the gap has been increased to almost 0,8 basis point. What is more – the median average result of 9% for market experts opinion over overall rates of returns holds steadily during the surveys in 2010, 2012 and 2015 and drops only in 2018 by 1 basis point, i.e., with a much longer time-lag than comparing to the CAPM-based results.

One of the possible explanations to that kind of discrepancy during the last two surveys may be that, although the market situation has changed a lot in meanwhile (i.e., the market values have increased and the market yields have decreased), then the market players still expect higher rates of returns, as they anchor to the higher historical results of the actual rates of returns occurred in the past. Another possible explanation may also be that, although the risk level of the overall market has become lower, the memory about the latest very sharp market recession is still in mind of many market players, then they implicitly account with the higher market risk as it actually is.

In addition to the assessments of the overall cost of capital, there were collected some other data and indicators during the surveys in 2015 and 2018, being summarized in the following table 5.

Table 5. Summary of the other indicators collected during the surveys of 2015 and 2018.

Indicator	2015	2018
Cost of equity capital		
Median average	18,00	15,00
Arithmetical average	17,23	15,25
Std deviation	4,45	3,67
Variance	19,78	13,44
Capitalization rate		
Median average	8,00	7,50
Arithmetical average	8,12	7,49
Std deviation	1,49	1,43
Variance	2,21	2,06

Vacancy rate		
Median average	5,00	5,00
Arithmetical average	6,74	6,50
Std deviation	4,31	4,20
Variance	18,60	17,62

Source: compiled by the authors.

Some additional comments to the findings:

- expectedly, it turned out that the estimations among the respondents differed mostly in cost of equity capital, where some of the respondents were not able to give any assessment at all to the size of the cost of equity or it was given only partially, to only some types of the commercial real estate assets;
- a general understanding over the overall cost of capital was quite harmonic and did not differ much among the respondents;
- many of the respondents were not able to give the estimation for rates of returns to smaller regions in Estonia, which is explained by the fact that most of the investments are made within three larger cities (or urban areas) in Estonia.

5. CONCLUSION

The average overall cost of capital shows on what level of rate of return the investment project should generate, in order to be aligned with and satisfy the requirements of those investors required rates of returns, who has placed their capital to the venture. In the situation, where using the debt capital does not bring along neither any tax benefits nor cause high expected bankruptcy costs (as it is in the case of Estonia), the size of the average overall cost of capital and unleveraged cost of equity are the same. The financing structure of the project influences only the proportion of the cash flows and risks are delivered to the various stakeholders of the investment (owners, debt holders), but it does not affect the overall risk level of the investment. The latter, on the other hand, is actually affecting the size of the discount rate applied to the cash flows generated by the project.

Based both on the results obtained by the CAPM and also on the conducted surveys among the real estate market experts in Estonia, it is possible to conclude that for a typical real estate asset (or for the whole real estate portfolio), it is appropriate to use a long-run discount rate rounded to 9% in terms of Estonian real estate market situation. That overall rate of return (i.e., 9%) is suitable to use in cases when the contractual risks correspond to the typical contract and risk level of the real estate market. In that case, the discount rate used in making real estate investment decision should be equivalent to the level typically required by the investors´ on the real estate market. For unconventional real estate objects and type of investments, the appropriate discount rate can differ and may not be suitable for investment decision-making calculations (mainly because of the different kind of risk level).

Finally, it is possible to conclude that the conducted research proved the applicability of the CAPM-based rates of returns also in smaller open market economies, like Estonia, but only in case the CAPM is used correctly and consistently, taking account all the relevant risks and costs related to the asset.

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APPENDIX 1. Value of risk premium compensating liquidity risk dependent of roundtrip costs and investment period length.

Share of roundtrip costs in transaction (%)

Length of investment period (years)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.2%	3.0%	5.4%	9.4%	16.6%	34.1%	137.5%	n.a.	n.a.	n.a.
3	0.4%	0.9%	1.4%	1.9%	2.6%	3.3%	4.1%	5.1%	6.2%	7.5%
5	0.3%	0.5%	0.8%	1.1%	1.5%	1.9%	2.2%	2.7%	3.1%	3.6%
7	0.2%	0.4%	0.6%	0.8%	1.1%	1.3%	1.6%	1.9%	2.2%	2.5%
9	0.2%	0.3%	0.5%	0.7%	0.9%	1.1%	1.3%	1.5%	1.8%	2.0%
10	0.2%	0.3%	0.5%	0.6%	0.8%	1.0%	1.2%	1.4%	1.6%	1.8%
12	0.1%	0.3%	0.4%	0.6%	0.7%	0.9%	1.1%	1.2%	1.4%	1.6%
14	0.1%	0.3%	0.4%	0.5%	0.7%	0.8%	0.9%	1.1%	1.3%	1.4%
15	0.1%	0.2%	0.4%	0.5%	0.6%	0.8%	0.9%	1.1%	1.2%	1.4%
16	0.1%	0.2%	0.4%	0.5%	0.6%	0.7%	0.9%	1.0%	1.2%	1.3%
18	0.1%	0.2%	0.3%	0.5%	0.6%	0.7%	0.8%	1.0%	1.1%	1.2%
20	0.1%	0.2%	0.3%	0.4%	0.5%	0.7%	0.8%	0.9%	1.0%	1.2%
22	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.8%	0.9%	1.0%	1.1%
24	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.7%	0.8%	1.0%	1.1%
25	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.7%	0.8%	0.9%	1.1%

Source: composed by the authors, using formulas (10) and (11) and assuming that the required rate for liquid investment is 8%.