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DIPLOMOVÁ PRÁCE



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Formulation and Analysis of Multiple Development Strategies for Project Horova

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Abstract

The thesis deals with a feasibility study of twenty years old development project which has been delayed due to various reasons over the time. The first part of the thesis consists of basic characteristics of project and development. Afterward, different methods of project analysis and appraisal are researched and described. Following chapters deal with the project introduction and project environment analysis. Based on the environment analysis and inputs derived from it the feasibility study of the project is undertaken in form of a cash flow model. The model is further assessed through sensitivity analysis and alternative strategies are formulated and briefly assessed. Consequently, the best alternative strategy is selected and further analysis is undertaken. Finally, the recommendation how to further proceed with the project is formulated.

Keywords

Feasibility analysis, discounted cash flow, development project, Hradec Králové, market analysis.

Abstrakt

Práce se zabývá zpracováním studie proveditelnosti dvacet let starého projektu v Hradci Králové jehož realiace byla mnohokrát odložena z různých důvodů. V úvodu práce jsou popsány základní charakteristiky projektu a developmentu. Poté jsou zkoumány a vysvětleny různé metody oceňování a analyzování developerských projektů. Následující kapitoly se zabývají představením projektu samotného a analýzou prostředí projektu včetně realitního trhu. Na základě analýzy současných podmínek a vstupů z ní získaných je zpracována studie proveditelnosti podobou cash flow modelu projektu. Model je dále zkoumán prostřednictvím citlivostní analýzy a jsou formulovány alternativní strategie projektu, které jsou krátce zhodnoceny. Následně je vybrána a dále analyzována nejlepší z navržených alternativních strategií. V závěru práce jsou strategie porovnány a je formulováno doporučení ohledně dalšího postupu.

Klíčová slova

Studie proveditelnosti, diskontované cash flow, developerský projekt, Hradec Králové, analýza trhu.

Contents

Introduction	6
1 Introduction to Real Estate Investments and Development	7
1.1 Glossary of Terms	7
1.2 Development projects and financing	8
1.2.1 Development Project	8
1.2.2 Project Types.....	9
1.2.3 Project Phases.....	9
1.3 Project Environment Research and Analysis	10
1.3.1 Real Estate Market.....	11
1.3.2 Project Stakeholders.....	11
1.3.3 Project Risks.....	12
2 Project Feasibility Analysis and Appraisal	16
2.1 Yields, rates and returns	17
2.1.1 Income Yield	17
2.1.2 Reversionary Yield	18
2.1.3 All Risks Yield	18
2.1.4 Exit Yield.....	19
2.1.5 Capital Return.....	19
2.1.6 Income Return.....	19
2.1.7 Total Return	20
2.1.8 Yield vs return.....	20
2.2 Project Appraisal Methods Overview	21
2.2.1 Residual Method	21
2.2.2 Discounted Cash Flow Method	24
2.2.3 Capitalisation Method	28
2.3 Discount Rate	29
2.3.1 Discount Rate Calculation	30
2.3.2 Different investors.....	31
2.4 Project Feasibility Analysis Summary	32
3 Project Environment Analysis.....	34
3.1 Macro environment – Czech Republic	34
3.1.1 General and Social	34

3.1.2	Financial and Legal.....	38
3.1.3	Czech Real Estate Market.....	41
3.2	Micro environment – Region Hradec Králové	46
3.2.1	General.....	47
3.2.2	Commercial Development	49
3.2.3	Residential Development	50
3.3	Analysis Summary.....	55
4	Possible Strategies and Feasibility Studies	56
4.1	Overview of the Original Project	56
4.1.1	Short Introduction of Investor	56
4.1.2	Technical description	58
4.1.3	Original assumptions	59
4.2	Analysis of Original Project	60
4.2.1	Initial Investment Costs	61
4.2.2	Net Operational Income Calculation.....	61
4.2.3	Debt Financing	66
4.2.4	Project Cash Flow	69
4.2.5	Sensitivity Analysis.....	74
4.2.6	Evaluation	77
4.2.7	Risk Identification.....	80
4.2.8	Summary	81
4.3	Possible alternative strategies	82
4.3.1	Student Accommodation.....	82
4.3.2	Apartments.....	85
4.3.3	Negotiate to sell the project to developer	86
4.3.4	Invite third party developer to co-finance the project.....	86
4.3.5	Summary	87
4.4	Feasibility Study – Residential Development	87
4.4.1	Additional Assumptions	87
4.4.2	Cash Flow Analysis.....	89
4.4.3	Evaluation	90
4.5	Analysis Summary.....	91
5	Conclusion.....	93
	Bibliography	95

List of Figures.....	99
List of Tables.....	100
Attachment 1 – Final Cash Flow Model – Office & Retail.....	102
Attachment 2 – Simulation Results	103

List of Abbreviations

Abbreviation	Description
ARY	All Risk Yield
CAPEX	Capital Expenditures
CAPM	Capital Asset Pricing Model
CF	Cash Flow
CNB	Czech National Bank
COD	Commercial Operation Date
D/E	Debt-equity
DCF	Discounted Cash Flow
DSCR	Debt-Service Coverage Ratio
ERV	Estimated Rent Value
FV	Future Value
GDP	Gross Domestic Product
GOI	Gross Operational Income
GPI	Gross Potential Income
IRR	Internal Rate of Return
ISO	International Organization for Standardization
LTC	Loan-to-Cost
LTV	Loan-to-Value
MS Excel	Microsoft Excel
NAREIT	National Association of Real Estate Investments Trusts
NOI	Net Operational Income
NPV	Net Present Value
PMBOK	Project Management: Body of Knowledge
PV	Present Value
RE	Real Estate
REIT	Real Estate Investment Trust
RoE	Return on Equity
rRoR	Required Rate of Return
RTS	RTS,a.s.
SPV	Special Purpose Vehicle
sqm	Square Meters

TEGoVA	The European Group of Valuers' Associations
VAT	Value Added Tax
WACC	Weighted Average Cost of Capital
y-o-y	Year on year

Introduction

Real estate market conditions change constantly and sometimes very rapidly. Projects which looked like a gold mine some years ago might now seem barely feasible. Every participant of real estate market be it an investor, developer, general contractor or even final customer acknowledge this and have to work around it. Each of them is in a different role and every individual has a different attitude to risk. However, all of them undertake some kind of financial analysis before entering any new projects in order to minimize risks and maximize profit.

Financial analysis is also the main topic of this thesis which objective is to evaluate feasibility of twenty years old development project in Hradec Králové. The project has been greatly delayed due to the prolonged permitting which took more than ten years and afterwards it was postponed again due to beginning economic crisis. Today, the investor considers to engage the project once again but is not convinced the project is still feasible if realized as it was planned twenty years ago. Therefore, the financial analysis of the original project needs to be undertaken.

In order to be able to successfully develop such analysis, basic concept and characteristics of development and projects, in general, have been researched. Furthermore, various tools, methods and theories commonly used for financial analysis of real estate projects have been introduced and explained. Theoretical research showed, that no financial analysis can be done without extensive environment research. Therefore, project environment has been analysed from macro a micro point of view. The macro analysis focuses on overall economic and legal conditions, general financing availability, the current condition of real estate market and its trends in the Czech Republic. Micro analysis looks closely at the location of the project in question – Hradec Králové.

Based on the environment research financial analysis is developed and evaluated. Furthermore, alternative strategies are proposed and briefly assessed. Afterward, the top performing alternative strategy is analysed in detail and compared with the original strategy to arrive at the goal of the thesis – the recommendation concerning the optimal strategy for project Horova.

1 Introduction to Real Estate Investments and Development

1.1 Glossary of Terms

Project

The project is a temporary endeavour undertaken to create a unique product, service or result. The project is of a temporary nature and has a definite beginning and end. The end is marked by reaching the project's objectives or by project termination. Temporary does not necessarily mean short in duration (Project Management Institute, 2013).

Special Purpose Vehicle

Special purpose vehicle (SPV) is a legally and economically independent project company financed with no or limited recourse debt for the purpose of financing a single purpose (Yescombe, 2013). Typical characteristics of off-balance sheet SPV are following. They are thinly capitalized and have no independent management or employees. The administrative operation is secured by a trustee who follows specified rules with regard to the receipt and distribution of cash. Assets held by the SPV are managed through a servicing arrangement (Gorton, 2007).

Market Value

“Market value is the estimated amount for which a property should exchange on the date of valuation between a willing buyer and a willing seller in an arm’s length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without compulsion.” (TEGoVA, 2016). It is important to emphasize the difference between value and price. The price is an amount actually paid for the property in particular currency and at a particular time when the transaction is realized.

Stakeholder

According to PMBOK (2013), a stakeholder is someone who is actively involved in the project, has interests that may be positively or negatively affected by the performance or completion of the project or may exert influence over the project, its deliverables or its team members.

Headline rent

The rent paid before the annual equivalent of any incentives has been deducted (Wyatt, 2007).

Effective rent

The effective rent is the contract (headline rent) plus the annual equivalent of capital expenditure on qualifying, alterations or improvements by the tenant, less the annual equivalent

value of any rent-free period or other financial contributions to expenditure by the landlord (Wyatt, 2007).

Estimated Rental Value (ERV)

Estimated rental value is also known as the market rental value and represents the open market rent that a property can reasonably generate given its parameters, condition, location and local market conditions. ERV is one of the most important things when considering a real estate investment. It is also often used as a comparison when a lease is up for renewal (DeClaron, 2016).

1.2 Development projects and financing

In order to be able to create different project strategies and scenarios, basics of different types of development projects have to be understood. This chapter explains what is a development project, what kinds of development projects there are, what phases does development project have and how can it be financed. Concerning this thesis, whenever the term “project” is used it automatically refers to the development project as further described.

1.2.1 Development Project

Development projects are part of a broader group called project finance. There are several types of these projects which are described in the following chapter. Nevertheless, most of the projects are characteristic by following:

- developer is the investor of the project;
- developer is not the final user of the project;
- final user seeks to buy the property or buy the SPV which owns the property or lease the property (or its part when there is more than one final user);
- developer takes a risks connected with realization of the project;
- the building itself is built by different company – the contractor; and
- commonly large group of project stakeholders such as financing bank, architects, local municipality etc.

In the case of the project which will be described in the practical part of this thesis, several of the aforementioned characteristics are not relevant which is mainly due to the local and conservative nature of this particular investor.

1.2.2 Project Types

The development projects can be divided into two main groups – commercial and residential projects. Commercial projects develop commercial buildings with very different usage. Residential projects are focused on the development of new residential buildings of all kind such as various types of houses, villas, blocks of flats or even whole new districts. See Figure 1 for more detailed breakdown of different types of projects.

Commercial	Residential
<ul style="list-style-type: none">• Office• Retail• Logistics• Short term accomodation• Other	<ul style="list-style-type: none">• Houses• Villas• Block of apartments• New districts• Various Combinations

Figure 1 Types of projects based on their function (created by Author based on (Rödlová, 2014))

Projects are also very often classified as mixed-use meaning that they incorporate more than one of the above-described functions. Most common combinations are residential with retail and office with retail. The retail part is often used to complement the other function and enhance the value of the project. Also, retail areas are often the best use of ground floors of the buildings in the centre of towns.

1.2.3 Project Phases

The project itself is divided into multiple phases. In each phase, a different group of stakeholders is present and have different influence over the project. Most commonly three main phases can be identified but their scope is defined little bit differently by each author (Yescombe, 2013).

- Pre-Investment/Development Phase;
- Investment/Construction Phase;
- Operation Phase.

Individual phases are briefly described below.

Pre-Investment/Development Phase

The beginning of the first phase of the project is marked by the idea of investing in such a project itself. Throughout this phase the project is defined, possible scenarios are constructed

including ballpark estimation¹, evaluated and the optimal scenario is chosen. Basically, this phase should answer following questions: "What?", "Why?", "Where?", "When", "For how much?" (Čápková et al, 2013). All these questions should be answered in the feasibility study, which will be further discussed in Chapter 2. If the best variant fulfils investor's requirements, the project can proceed to the next phase.

As previously mentioned various authors can differ on the scope of each phase. According to Yescombe (2013), development phase should also include contracts negotiating and signing and equity and debt financing should be already placed and available for drawing.

Investment/Construction Phase

At this point investor decided to proceed with the project, negotiated major contracts and obtained financing or at least letter of intent from the bank. In this period, the project finance is drawn down and the project is built. The end of this phase is marked by final completion and property handover also known as „commercial operation date“ or „COD“ (Yescombe, 2013).

Operation

Usually longest phase, where the project is operational and should produce positive cash flow to generate profit and pay lenders their interest principal repayments. After some time, the project success can be evaluated.

1.3 Project Environment Research and Analysis

The analysis of the project environment is one of the most important steps of a quality feasibility study and it is a foundation stone for the reliability of the study. Such analysis provides much-needed information which will be used for selection of potentially feasible investment strategies, risk assessment, determination of discount rate and also allows us to get a bigger picture of the project. A thorough analysis should provide information about following areas:

- real estate market – current condition, trends, forecast;
- financial – GDP, debt availability, major factors, forecasts;
- location – description of macro and micro-location;
- political – current law, upcoming changes; and
- social – demography, purchasing power, trends.

¹ Ballpark estimate is made when only rough outline information exists or when there is no time to prepare a detailed estimate. A ballpark estimate might achieve an accuracy of +- 25 per cent, given generous amount of luck and judgment (Lock, 2014)

As can be seen, the list is very similar to the PEST analysis which is very suitable for development projects. Based on the listed information, it should be possible to further assess the project and create follow-up analysis.

1.3.1 Real Estate Market

Real estate market is closely connected to the overall economic situation of the region. Therefore, when analysing real estate market one should also look at the bigger picture including the availability of financing, the profitability of other types of investments, recent trends of major macro-economic factors such as GDP, unemployment, buying power and overall atmosphere on market. Only then can potential investor understand the changes on real estate market in relation to their causes and consequences. Such analysis will be undertaken in the practical part of the thesis together with the analysis of real estate market itself.

The condition of real estate market can be immensely different across different sectors. Therefore, it is needed to assess the state and trends of each relevant sector individually. Furthermore, it is important to assess not only the present state of the market but also its history – how did the market get to the present state, and the future – trends and forecasts which can either be opinions of relevant field experts or can be hinted by other factors.

1.3.2 Project Stakeholders

Every project is enveloped in a certain environment. The project and its environments affect each other and stakeholders are very important part of it. According to PMBOK (2013), a stakeholder is someone who is actively involved in the project, has interests that may be positively or negatively affected by the performance or completion of the project or may exert influence over the project, its deliverables or its team members.

Proper identification and management of such entities are of crucial importance for the success of the project. Therefore, thorough stakeholder analysis should be carried out which should inform us about each stakeholder's interest, power (influence over the project) and requirements connected to the project. Based on gathered data proper stakeholder management strategy is developed and practiced. An example of a graphical outcome of such analysis can be seen on Figure 2 (Project Management Institute, 2013) which shows power/interest grid of stakeholders and respective general strategies for each segment.

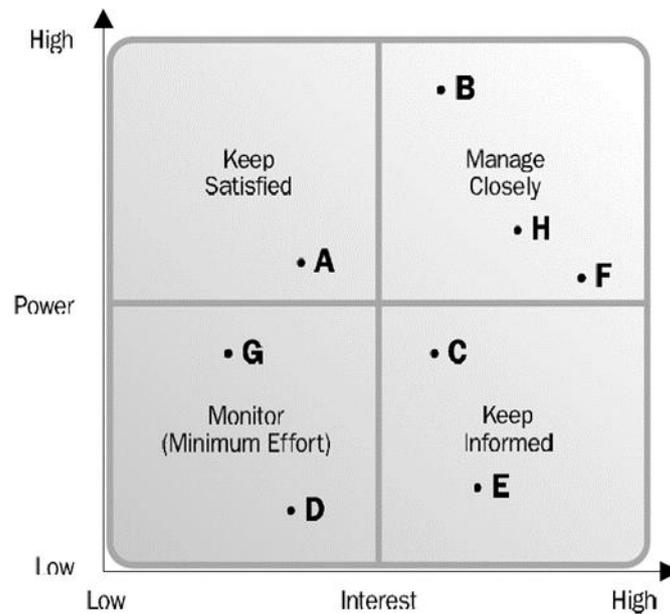


Figure 2 Example power/interest grid with A-H representing the placement of generic stakeholders (Project Management Institute, 2013)

Each group of stakeholders is then treated appropriately to their significance to the project and individual KPIs for each group are set up (Project Management Institute, 2013).

1.3.3 Project Risks

Analysis of the project environment also includes detail analysis of potential risks. In general, investment risk represents a certain level of uncertainty in connection with anticipated future income. The risk is defined as a likelihood of not reaching the anticipated income. Risks can be divided by multiple ways one of them being their nature (Valach, 2016):

- Systematic risks – risks which originate in connection to the global economic situation and individual macroeconomic factors. This includes the change of interest rates, market risk, inflation risk, etc. These risks cannot be diversified by broadening the investment portfolio when investing on enclosed market. These risks are also called Macroeconomic and political risks (Yescombe, 2013).
- Specific risks are as name hints risk specific to the project itself. They can be connected to the project location, local municipality, project type, micro market, lack of demand etc. These risks can be mitigated by diversification of the investment portfolio and are also called commercial risks (Yescombe, 2013).

The risk is a crucial factor in project development since if it has not been anticipated and properly hedged it can generate a cash shortfall or even default of whole project (Project Management Institute, 2013). Therefore, proper mitigation strategy has to be developed and

applied. First of all, the risk has to be identified, analysed and evaluated. Its identification consists of actually finding the risk and defining it. Various methods include Delphi technique, interview, checklists, Ishikawa diagram and many others. Individual methods will not be described in this thesis. Nevertheless, the outcome of all the methods is a list of identified risks. The identified risks have to be further analysed to find their possible impact on the project and the probability of their occurrence (ISO, 2009). Both of those factors are evaluated based on a unified criterion which can look similar to the example in Figure 3 and Figure 4.

	Consequence	Capital Cost	Project Buildability	Schedule Impact
1	Insignificant	<\$1k	Nil impact	Nil impact
2	Minor	>\$5k	Minor Impact	2 weeks delay
3	Moderate	>\$20k	Moderate impact	1 month delay
4	Major	>\$40k	Major impact	2 month delay
5	Catastrophic	>\$80k	Catastrophic impact	4 month delay

Figure 3 Risk impact criterion example (Author)

	Likelihood	Description	% of Project Life
A	Almost Certain	Is expected to occur in most circumstances	>90%
B	Likely	Is expected to occur occasionally	66-90%
C	Possible	Could occur at least once	33-66%
D	Unlikely	Not expected to occur	10-33%
E	Rare	May occur in exceptional circumstances	<10%

Figure 4 Risk likelihood criterion example (Author)

Afterward, overall significance of each risk is evaluated which is commonly presented in the form of risk matrix such as the example in Figure 5.

			Consequence			
			Minor	Moderate	Major	Catastrophic
			2	3	4	5
			Likelihood	A	Almost Certain	High (11)
B	Likely	Moderate (5)		High (12)	High (15)	Extreme (19)
C	Possible	Moderate (4)		Moderate (7)	High (14)	Extreme (17)
D	Unlikely	Low (2)		Moderate (6)	High (9)	High (16)
E	Rare	Low (1)		Low (3)	Moderate (8)	High (10)

Figure 5 Risk matrix example (Author)

When all the risks are evaluated and placed within the risk matrix proper treatment or mitigation strategy has to be selected. Mitigation strategy can have four basic forms – tolerate, treat, terminate or transfer. After proper strategy has been chosen project management team needs to continuously review and refine individual strategies and their efficiency. Whole risk assessment process as described above can be summarized in following diagram on Figure 6.

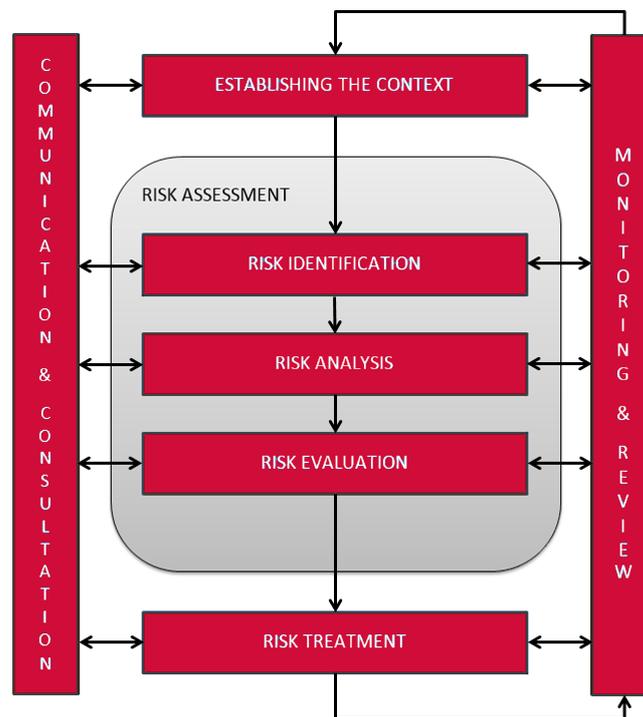


Figure 6 Risk assessment process (ISO, 2009)

The outcome of whole risk management should be a detailed risk management plan which is usually in the form of a list. Each risk is specified by its nature (cost, safety, time, etc.), risk description, risk owner, significance, mitigation strategy and a result of the mitigation strategy.

After the project starts the whole management plan has to be continuously updated and reviewed based on current progress and situation (ISO, 2009).

Nevertheless, such rigorous plan is only developed before the actual realization of the project. Since the investor is currently in the stage of assessing the feasibility of the project, risks will be analysed only from a strategic perspective. Meaning the risk analysis will be focused on critical risks which could jeopardize the whole project – those ranked as extreme in the risk matrix.

2 Project Feasibility Analysis and Appraisal

The project can be viewed from many angles and also the success of the project can be relative. Different projects can have very different goals and thus very different success indicators. Most of the time the success of the project is measured by the yield generated upon completion. But even the yield can be viewed differently for various projects. There are two main types of projects which have very different goals.

The first type are projects realized in a public sector where the investor is a public entity such as a local municipality, the ministry department or other publicly financed entities. Very similar projects are those which are financed through non-profit organisations and charities. The goal of such projects which are financed by those entities is primarily the benefit to people which is often represented through the enhancement of their quality of life.

The second type of projects is oriented at the profitability of the investment. In real estate business, the profit is commonly generated by one of these ways:

- lease – the yield (or profit) is generated by leasing the area of building to its final users;
- sale – the final product of the project – finished building is sold to another investor (which commonly plans to further lease it) or to the final user; or
- entrance and other fees – highways, entertainment parks, etc. (Čápková et al, 2013).

For the purpose of this thesis only the second type of the project will be further discussed. The profitability of the project is assessed with use of thorough feasibility studies. Such preliminary studies are of utmost importance to ensure highest and best use of the development project and its profitability. The importance of high standard planning, estimation and preparation is shown in Figure 7.

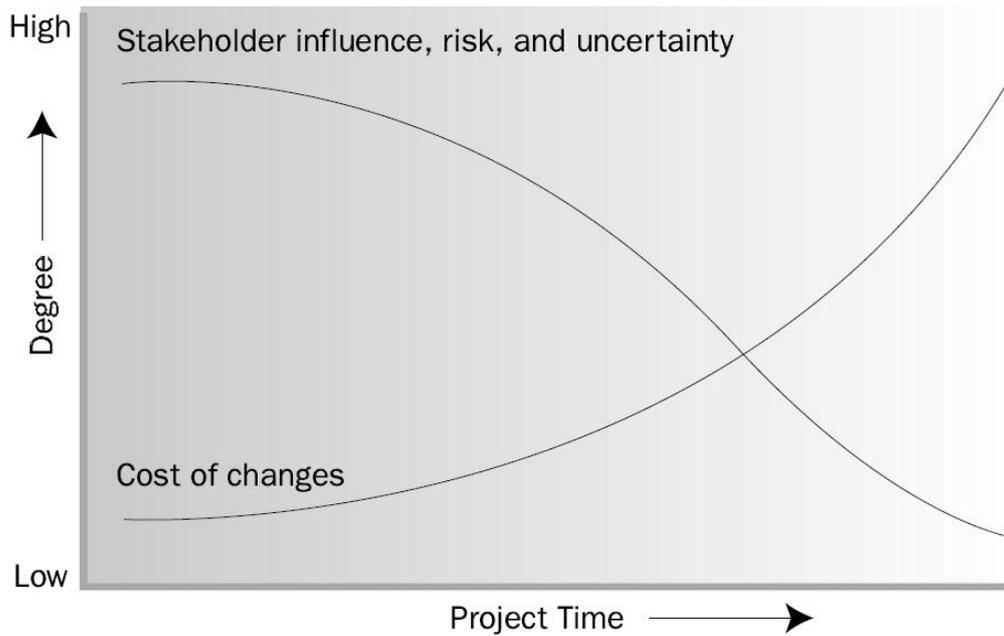


Figure 7 Impact of variable based on project time (Project Management Institute, 2013)

As can be seen, the stakeholder's influence over the project at early stages of the project is immense and basically, any changes can be incorporated into the project at minimal costs. When the project proceeds into next stages incorporating any changes becomes gradually more difficult and expensive. Therefore, a proper feasibility study has to be undertaken in order to mitigate additional and unplanned expanses. In development projects as in any other investment, the crucial indicator is the return on the investment. Following chapter explains how return on investment is viewed in the real estate business.

2.1 Yields, rates and returns

There are two fundamental factors in the process of investment analysis – return and risk. The second one has been already described and explained in Chapter 1.3.3. Both of these factors have to be estimated as precisely as possible because the valuation of considered assets is heavily dependent on them (Sayce et al., 2006) and so is the outcome of the investment analysis. Following are some examples how return can be viewed and assessed with a focus on the property market.

2.1.1 Income Yield

The income yield represents percentage ratio between a current income and current purchase price. It is one of the most basic return representation and is expressed in the Eq. (1).

$$Y_i = \frac{I}{P} \times 100 \quad (1)$$

where

- Y_i – Income Yield;
- I – Income; and
- P – Purchase Price.

The income yield is frequently called initial yield in the property market and is widely used in today practice (Sayce et al., 2006).

2.1.2 Reversionary Yield

Reversionary yield is calculated very similarly as an initial yield with a difference that instead of current income it calculates with the market values. Market rent in growing and healthy environment will usually be above the current income because of the inflation (Sayce et al., 2006).

Reversionary yield basically shows yields with considerations if all the lease agreement were revised to reflect the current market state. It is mostly used for property investments where current rent is below the market rent but will probably equalize with the market in the future. Therefore, when valuing the property through reversionary yield slightly higher required yields are used to reflect a bit uncertain additional incomes and to reflect perceived risk inherent in future (Wyatt, 2007).

2.1.3 All Risks Yield

All risk yield (ARY) is yet another mutation of initial yield. ARY is determined by analysis of recent and comparable investments and their initial yields. Additionally, valuers make adjustments to the initial yield of comparables to reflect the differences of individual properties such as location, age, condition of the property etc. (see Chapter 1.3.3 for more information about risks).

In similar locations and for similar property investment the yields use to be comparable because they tend to have similar income growth potential and overall included risk (Wyatt, 2007). All risk yield is mostly used in implicit methods of valuation and is very popular on the current real estate market. Nevertheless, valuation based solely on ARY has to have reliable comparables – the bigger the differences the bigger the amount of assumptions incorporated into the value of ARY.

2.1.4 Exit Yield

Exit yield's most common use is in discounted cash flow appraisals where reflects the capital value of the property at the end of the project duration (or at the end of the period of analysis). This value is therefore called exit value. The exit value reflects the net amount which the owner expects to obtain for an asset at the end of the period of analysis (Hungria-Garcia, 2004). The cost of disposal (agent fees, legal fees, etc.) is sometimes directly deducted from the exit value and sometimes is calculated separately.

2.1.5 Capital Return

Another form of return aside from income return that investors consider is the capital return. The capital return is derived from the change of capital value over the holding period. Capital value can increase reflecting in capital profit or decrease reflecting in a capital loss. The capital return, therefore, expresses the percentage ratio of any change in capital value to purchase price in the beginning of the measurement period. Capital return is directly dependant on changes of capital value which most of the times correlates with changes in the level of interest rates (Sayce et al., 2006). The relationship is expressed in the Eq. (2).

$$CR = \frac{CV_1 - CV_0}{CV_0} \times 100 \quad (2)$$

where

CR – Capital Return;

CV₀ – Capital Value at the beginning of the measurement period; and

CV₁ – Capital Value at the end of the measurement period.

2.1.6 Income Return

Income return is another percentage ratio of net income received over the measurement period to the purchase price or capital value at the beginning of the measurement period. The calculation of net income is described in Chapter 4.2.2. Nevertheless, net income is net of any costs and outgoings. Calculation principle is shown in Eq. (3) (Sayce et al., 2006).

$$IR = \frac{NI}{CV} \times 100 \quad (3)$$

where

- IR – Income return;
- NI – Net income received during the period; and
- CV – Capital Value at the beginning of the measurement period.

To reflect the time value of money future incomes are usually discounted at a certain discount rate to transform the future values into the present value. The discounting process will be explained in Chapter 2.2.2 and 2.3.

2.1.7 Total Return

Investors are often interested in a total return of an investment which is a combination of capital return and income return, for the calculation see Eq. (4).

$$TR = \frac{CV_1 - CV_0 + NI}{CV_0} \quad (4)$$

where

- TR – Total return;
- NI – Net income received during the period;
- CV₀ – Capital Value at the beginning of the measurement period; and
- CV₁ – Capital Value at the end of the measurement period.

2.1.8 Yield vs return

Both yield and return reflect the performance of an investment but it is important to understand the difference between both of them. The major difference is that yield is calculated based only on income, therefore, does not account for capital gains or loss. Return is usually calculated as a total return and incorporates capital gain and loss, therefore, provides a whole picture when assessing an investment (Baum, 2009).

Based on this difference a use of each value is different. Yield is commonly used to estimate the value of an investment while return can be used for comparison of different investment opportunities and strategies (Sayce et al., 2006). Again, when comparing multiple investment opportunities with different durations time value of money has to be taken into consideration.

2.2 Project Appraisal Methods Overview

Assessment of the development project is not that much different from a conventional valuation of already existing properties. In the Czech Republic, valuation practice has traditionally used 4 different methods (Schneiderová Heralová, 2008).

- the comparative method;
- the investment method;
- the cost approach; and
- “administrative” price.

In the market practice, most of the investors use the investment method to evaluate acquisition of investment property. Investment method is commonly used also as appraisal method for development projects. Investment method can be further divided based on available inputs and complexity of the property which is being assessed. For simple investment properties such as investment flats, a direct capitalisation of anticipated incomes is usually used. However, in more complex cases where incomes are not secured, there is financing in place or the investor thinks he can improve the performance of the building significantly discounted cash flow appraisal method (DCF) is used. Both methods will be explained in the following text. Last but not least is a residual method which is mainly used for valuation of land or (re)development projects. The use of each is greatly dependant on the purpose of the valuation and available data.

For the purpose of development project appraisal most commonly used methods are DCF, capitalisation and residual all of which incorporates important aspects of traditional methods. The big difference between traditional valuation and project appraisal is the amount of necessary assumptions and forecasting which both represent a higher amount of uncertainty and therefore risk. In the following chapters, major principles of mentioned methods will be explained.

2.2.1 Residual Method

Traditionally, the residual method is used for valuation of development sites or existing properties that can be redeveloped. The main reason for use of residual method is the difficulty of applying any other valuation methods. The first notion would be to use comparison valuation method. Nevertheless, this could prove as challenging even impossible task to perform. Main reason is the difficulty of obtaining comparable evidence for development land values. Specifications of each land vary greatly in terms of size, a condition of the site, potential use,

design, permissible density of development, restriction and more (Wyatt, 2007). All these differences would lead to misleading results.

Therefore, for valuation of properties with redevelopment potential, the residual method is used. Or in other words, for the properties which are not used to its highest and best use. Additionally, where the land cost is known residual method can be used to determine the developer's profit (Sayce et al., 2006). Common examples where the residual method would be used are an empty land (development) or land developed in a way which where it is economical to tear it down and build a new one (redevelopment). Therefore, the actual value of the land in question is not only assessed based on the current use of the land but also the potentially gained value through development – this value is often referred to as a development value.

The residual method involves estimation of a high number of inputs which can lead to wide variations in valuations. Estimate of inputs usual refers to other recent comparable projects. The residual method can serve as a preliminary method before undertaking more rigorous and complex techniques such as DCF. Therefore, it can be used a testing tool for alternative development strategies. (Wyatt, 2007).

In essence residual method consists of following steps:

- 1) **Estimate the value on completion.** The value on completion should not be discounted back to the valuation date. The inclusion of interest charges within the development cost makes the completion of development the date at which cost and value are to be compared. This estimate is also known as a Net Development Value (Wyatt, 2007).
- 2) **Estimate the costs relating to the construction of the buildings,** which should include preliminary survey and investigations, demolition, temporary protection and enabling works, hoardings, public utility works, diversion of services, works to adjoining sites, other interested parties' accommodation works etc. These costs can be estimated by various methods based on the level of detail available including ball-park estimate, detailed estimate with a list of quantities but usually, there are estimated by reference to recent comparable developments. In the Czech Republic, the cost indexes published by RTS are widely used for ball-park estimates. Indexes are updated every year and indicate total costs of a cubic meter of specific construction (RTS, a.s., 2016).
- 3) **Estimate any pre-construction costs** which are costs incurred in obtaining vacant possession of the site, acquiring necessary legal interests in the subject site or adjacent property, extinguishing easements or removing restrictive covenants (e.g. ecological burden, debt connected to the land).

- 4) **Introduce the contingencies.** Contingencies are usually based on the building costs and are calculated as a percentage of them.
- 5) **Derive the professional fees,** which are related to the appointment of professional consultants to secure procurement of the building. These fees are commonly calculated as a percentage of building costs plus contingencies. In particular, fees of architect, quantity surveyors, structural and mechanical engineers, project manager and more.
- 6) Incorporate any **other costs related to the investment,** which can be costs of securing planning permission and any fees for Building Regulation administration and inspections. The cost of model and of any public inquiry should also be considered.
- 7) Calculate **Interest** during construction and void period.
- 8) Estimate Post-construction costs in form of **agent fees** (lease agents, sale agents, legal, etc.) and **marketing.**
- 9) Set required **developer's profit.**
- 10) Calculate the value of land in question.

Above mentioned steps can be summarized by following Eq. (5) (Wyatt, 2007):

$$SV = NDV - C_d - P \quad (5)$$

where

- SV – Site Valuation;
- NDV – Net Development Value;
- C_d – Development costs; and
- P – Developer's profit.

In Eq. (5) Development Costs includes all cost connected to the development which are numbered 2) to 8) in the previous list. As can be seen, if the value of the land is known the Eq. (5) can be transformed into an equation for calculation of developer's profit. This transformation will be used in following feasibility studies since for the project in question the acquisition price (site valuation) of the land is known.

As already mentioned above, residual method is an effective tool for first evaluation of development proposal but has its flaws in form of inflexibility and undue sensitivity. As a result, a timing of costs and related interest is incurred in regular, equal installments which is often not the case. The summary of basic input variables can be found in Figure 8.

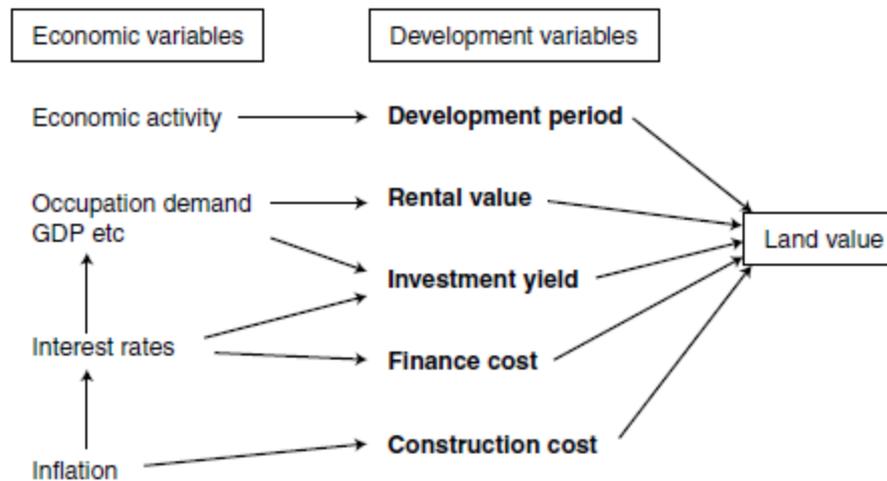


Figure 8 Key input variables in a development valuation (Wyatt, 2007)

Furthermore, many projects have multiple stages and thus can generate costs and revenues even before final completion of the whole project. It is important to note, that multiple stage project can be appraised with a use of residual method through sequential appraisal. The relative simplicity of the method results in undue sensitivity where small but compounded changes in inputs can result in a great difference of results (Wyatt, 2007). Therefore, sensitivity analysis should be undertaken and selected strategies should be further analyzed with more detailed methods such as DCF.

2.2.2 Discounted Cash Flow Method

Discounted Cash Flow method is an explicit approach to property/project appraisal and valuation due to a need of explicitly articulating all cash flow assumptions and attitudes to risk. This is in contrast to implicit methods where everything is wrapped into one input yield, more about these methods in chapter 2.2.3. In essence, DCF is used to tell the investor how much are the future receipts (cash inflow) and disbursements (cash outflow) connected to the project worth to investor on a day of assessment, i.e. to calculate present value (PV) of future cash flows (Canda, 2004).

Therefore, the foundation stone of DCF method is properly forecasted cash flow which involves estimating future revenues, growth, capital expenditures, operational costs and much more. When such estimates are done a large number of assumptions and factors have to be taken into account. Thus, estimated cash flow has to be based on relevant market data, historic data and extensive experience in business to provide meaningful and trustworthy outputs. Making such estimates grows even harder for longer periods of time. Therefore, most of the DCF models

will incorporate projected cash flows for finite period commonly 5, 10 or 15 years. The projected cash flow model should reflect matters such as (RICS, 2016):

- income chances resulting from anticipated variations in market rents;
- effects of obsolescence on rental growth and/or required capital outlays;
- income voids;
- void costs (property outgoings and taxes);
- re-letting costs (marketing, agents and legal fees);
- refurbishments and upgrades; and
- an exit value at the end of the cash flow period to reflect the condition of the market and of the investment at the end of the cash flow/holding period.

The conversion of future cash flows is done through discounting rate. PV of any future value of inflow or outflow can be calculated based on the following Eq. (6).

$$PV = \frac{FV}{(1 + r)^n} \quad (6)$$

where

- PV – Present Value;
- FV – Future Value;
- r – Discount rate; and
- n – Number of time periods.

The series of future cash inflows and outflows together forms future cash flow which when each value is properly transformed (using the Eq.(6)) into present value is called discounted cash flow. Also, the final year's net income stream is also capitalised at an all-yield-cap rate known as the exit yield. This value is called an exit value and is also discounted and added to the cash flow model (Canda, 2004).

One of the most used indicators when assessing the DCF is the Net Present Value (NPV). NPV is equal to a difference between present costs and the present value of future cash flow. Mathematically this can be expressed by Eq. (7).

$$NPV = -C_0 + \sum_{n=1}^T \frac{C_n}{(1+r)^n} \quad (7)$$

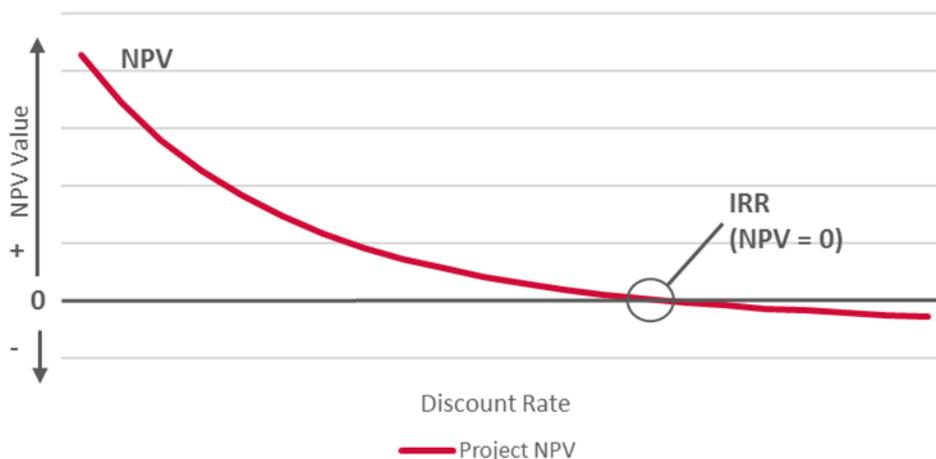
where

- NPV – Net Present Value;
- C_0 – Initial Investment;
- n – Number of time periods;
- C_i – Cash flow at nth period; and
- r – Discount rate.

From the above definition of NPV following suggestions can be made. If the NPV is equal to or greater than zero, project performs on or above required level set by required discount rate which indicates the investor should go on with the project. However, if the NPV is below zero, project does not meet the requirements and should either be changed or terminated.

Another widely used indicator is Internal Rate of Return (IRR) which is closely connected to the previously described NPV. IRR tells the investor at which rate of return would NPV be equal zero. That is to say, if the initial investment is known, the IRR is the rate of return at which all discounted future cash flows are equal to the initial investment (Sayce et al., 2006). The decision of the investor is therefore made based on the value of IRR which should be equal or greater to the minimal required rate of return. In a case of lower IRR investor should consider changes to the project or its termination. The relationship between IRR and NPV is shown in Table 1.

Table 1 Relationship between project NPV and IRR (created by Author)



The IRR is most often calculated by an appropriate software. For the purpose of this thesis, the IRR has been calculated in MS Excel with IRR function. The excel formula looks like "=IRR (cash flow cell range including initial investment and the exit value; target rate)". The input target rate is just an estimate to quicken the computation for extensive cash flows models which can be omitted. Without the use of software, IRR can be found through trial-and-error and various numerical methods. One of the more common processes uses interpolation between two different discount rates that yield positive and negative values of NPV (Canda, 2004). Therefore, at least two NPVs have to be calculated based on two trial discount rates. The formula for interpolation between calculated NPVs (one positive, one negative) is shown in Eq. (8).

$$IRR = r_l + \left[(r_h - r_l) \times \frac{NPV_l}{NPV_l - NPV_h} \right] \quad (8)$$

where

- r_l – lower trial discount rate;
- r_h – higher trial discount rate;
- NPV_l – NPV at the lower discount rate; and
- NPV_h – NPV at the higher discount rate.

As can be seen, discount rate plays an enormous role in the outcome of DCF method. Therefore, appropriate focus has to be kept when calculating the discount rate which is to be used in the model. The calculation and selection of right discount rate are discussed in Chapter 2.3.

Another important input is the value of forecasted yearly cash flow of running project used in Eq. (7) named C_n . Calculation of yearly cash flow is the bread and butter of DCF method and has to be done with high meticulousness. The values used in this calculation are usually acquired through comparison method – values will be derived from recent transactions comparable running projects and/or historic data for projects which are already in operation. Comprehensive DCF analysis should, therefore, consider following (Sayce et al., 2006):

- components of all anticipated cash flows;
- have cash flows based on comparables and reasoned forecasts;
- reflect investor's market perceptions;
- reflect debt finance;
- reflect taxes; and
- reflect risk to future net incomes and capital flows.

DCF method as described above is widely used not just as a valuation technique in real estate business but also in the valuation of companies, stocks and more. Therefore, the detailed description of the particular use of DCF method in real estate will be presented in practical part of this thesis in connection with real world data.

2.2.3 Capitalisation Method

As mentioned in the beginning of the previous chapter, capitalisation method is an implicit method. This is due to a fact, that most of the risks and otherwise necessary cash flow assumptions are incorporated into a single number – capitalisation rate. The value of the property is calculated based on anticipated annual income. The fundamental principle of this method is assumed relationship between the value of the property and its ability to generate income which should be reflected in the respective sector of the real estate market. Therefore, it is possible to calculate the value of the property as a multiple of the annual income as shown by Eq. (12) (Schneiderová Heralová, 2008).

$$IV = \frac{I}{i_c} \quad (9)$$

where

- IV – Investment value;
- I – representative annual income generated by the property; and
- i_c – capitalisation rate.

The value of capitalisation rate has to reflect the sustainability of current incomes, technical conditions of the property, connected future CAPEXs, legal, technical and other changes which would otherwise be incorporated into the model.

The second major factor in this method is the income generated by the property. There are several types of income such as (Schneiderová Heralová, 2008):

- gross potential income (GPI);
- gross operational income (GOI);
- net operational income (NOI); and
- net operational income after principal repayments.

Additional items have to be assessed in order to calculate above listed income, the major ones are these:

- vacancy, credit or service charge loss;
- operational costs; and

- principal repayments and interest payments.

Detailed description and its calculation will be described in the practical part of the thesis. However, the basic process of the calculation can be seen in Figure 9.

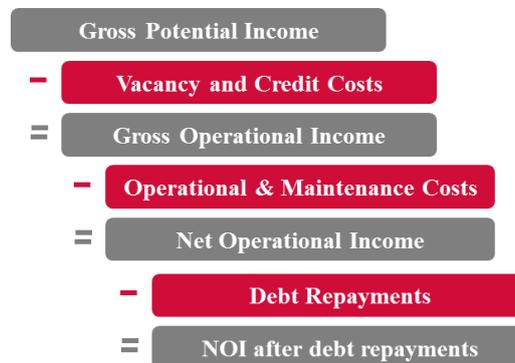


Figure 9 Calculation of income generated by property (created by Author based on (Schneiderová Heralová, 2008))

Overall, the method of direct capitalisation is very suitable for the calculation of the exit value at the end of the analysis period. As mentioned above, for more complex project more detailed assessment is essential for proper evaluation of the investment (Mc.Mahan, 2007). However, it is commonly used to get a general idea in what range the price should be. The capitalisation rates for specific kind of properties (residential, office, etc.) are tracked and regularly published by real estate agencies such as CBRE, Colliers, John Lang-LaSalle or Knight Frank.

2.3 Discount Rate

The discount rate is one of the most important inputs whenever assessing the NPV of any project. Alternatively, if the IRR is calculated the problem remains in form of selecting correct hurdle rate of return. A slight change in discount rate can reflect in an immense difference in the analysis outcome. Through discount rate time and risk are incorporated into the analysis and, therefore, into the valuation of the project (Rödllová, 2014).

Furthermore, the importance of discount rate is increasing with longer project time periods. The longer the project period the more important the discount rate is. The major project costs are commonly located at the beginning of the project – construction phase (acquisition) where a small difference in discount rate does not play a major role. However, the incomes and capital gains are more distant at the time and, therefore, are more influenced by the discount rate (Mc.Mahan, 2007).

The value of discount rate can vary greatly even when considering only the real estate investments. The value will depend on the type of investor, location, type of the property, legal,

taxations and other risks. Therefore, the basics of discount rate calculation and typical property investors are explained in the following chapters.

2.3.1 Discount Rate Calculation

The detailed assessment of current approaches for the calculation of discounted rate is beyond the topic of this thesis. Therefore, only most commonly used methods and their calculation principles will be shortly introduced.

CAPM Model

The CAPM model expresses the required rate of return as the risk-free rate and risk premium. The formula can be seen on Eq. (10) (Canda, 2004).

$$E[r_e] = r_f + \beta(E[r_m] - r_f) \quad (10)$$

where

- r_e – expected average rate of return;
- r_f – risk free rate;
- r_m – expected long-term market return; and
- β – market risk.

The problem with this model is in its application on real estate market which is only enhanced on Czech market due to the lack of historic and current data. The $E[r_e]$ and coefficient Beta can be derived based on international (mainly the USA) data of REIT and NAREIT. Nevertheless, since the values would be derived from foreign environment its comparability to local conditions of Czech market is very limited. Therefore, only systematic risks can be assessed through this model and specific risk would have to be further analysed (Rödlová, 2014).

Weighted Average Cost of Capital (WACC)

WACC represents the weighted average cost of components of any financing package. WACC plus minimal mark-up is often used as a hurdle rate for evaluating the investment. The most common variation is the weighted average cost of capital secured through equity and debt, the formula for its calculation can be seen on Eq. (11).

$$WACC = \frac{R_e * E}{D + E} + (1 - t) \frac{R_d * D}{D + E} \quad (11)$$

where

- R_e – cost of equity (required return on equity);
- E – amount of equity capital;

- D – amount of debt capital; and
- t – corporate income tax rate; and
- R_d – cost of debt (interest).

As can be seen, when calculating WACC the required rate of return on equity – cost of equity is still needed which brings us back to CAPM. Nevertheless, if the investor has his internal hurdle rate for equity the WACC can be used and often is (Canda, 2004).

There are more methods to calculate the discount rate more or less complex than the ones introduced such as Gordon model, derivation from capitalisation rate and more. Nevertheless, none of them is very suitable for assessment of development project. Therefore, many companies determine a general rate of return for their projects and only accept those which are above this rate.

2.3.2 Different investors

There are several methods for determining the value of discount rate or alternatively required rate of return. The method and approach used are heavily dependent on the type of the investor. Following is the short overview of different investors and their approach to risk and discount rate assessment.

Institutions

Institutions such as insurance companies or pension funds are one of the biggest players on real estate market. They seek suitable alternative investments such as properties and evaluate their risk/return profile in the context of their current portfolio. The basis of their evaluation is the return on government bonds for a comparable holding period. Afterward, the risk premium specific to the risk profile of evaluated property is added. Common risks present in property investment can be the property location, tenant default risk, taxation and legislation risks and more. On the other, the properties are widely perceived as a hedge against unexpected inflation – which is a distinctive advantage against bonds. Historically, the risk premium (after deducting the hedge benefit) is somewhere between 2 – 4 % for prime property investments (Sayce et al., 2006).

Core Plus Investors

These investors aim at higher returns (10 – 14 %) through a use of high leverage and added value. The added value is mostly achieved through active property management strategy, repositioning the property and more (Sayce et al., 2006). Core plus investors are usually

prepared to deal with reletting risk, refurbishment and a higher level of gearing in order to obtain the required rate of return.

Property Companies

The main objective of these companies is to maximise shareholder wealth. Therefore, as any other company, the rate of return has to be higher than their weighted average cost of capital. The difference between such companies and for example institutional investors is that the property investments is their only activity which enables them to consider a much wider range of investment approaches. The evaluation of the required rate of return can differ. The calculation can be based on the cost of debt, weighted average cost of capital or even on the decision of the Board of Directors which would set a hurdle rate which is achievable in their eyes. In practice, property companies often do not set certain hurdle rates they rather assess each investment individually and often look primarily into the property's ability to service their debt payments and the main profit is seen in the ownership of unmortgaged property in the future (Sayce et al., 2006).

Developer

The position of the developer is very different when assessing the investment in the development project when comparison against the traditional property investment. The developer takes on a great amount of risks such as construction risks, occupancy risks, sale risks etc. Some of those risks can be transferred to other stakeholders during the development and some of them can be mitigated through a pre-lease contract for example. Nevertheless, the development project will contain significantly more risks than an acquisition. In consequence, the discount rate has to reflect the increased amount of risks, therefore, the rates are commonly higher than 20 % (Kirsch, 2014).

2.4 Project Feasibility Analysis Summary

In this chapter, necessary theoretical foundations were described. Various yield types can be useful for different project strategies or for different analysis approaches. Some of the described yields are not commonly used in development projects and are more suitable for assessing the investment into an already running project with historical data of cash flow. Yields which will probably be used in the subsequent analysis are exit yield and all risk yield. When it comes to appraisal methods it is clear that the method of discounted cash flows is the most appropriate method for detailed and dependable investment analysis. However, the method of discounted cash flows does require a substantial amount of inputs and is much more extensive. Therefore,

DCF will be used only for limited amount of selected strategies. Other potential strategies will be assessed through comparison with market analysis or with the use of the residual method or where applicable capitalisation method.

The IRR has been identified as the main criteria for the investment decision and therefore minimal required IRR will be defined for each investment strategy. Simultaneously, the NPV of the project will be calculated based on the minimal required IRR of the investment. Further analysis of strategies which will pass the hurdle IRR will be undertaken. Further analysis will include sensitivity analysis of the model on various inputs. Following diagram summarizes the whole process of the assessment of potential investment strategy, see Figure 10.

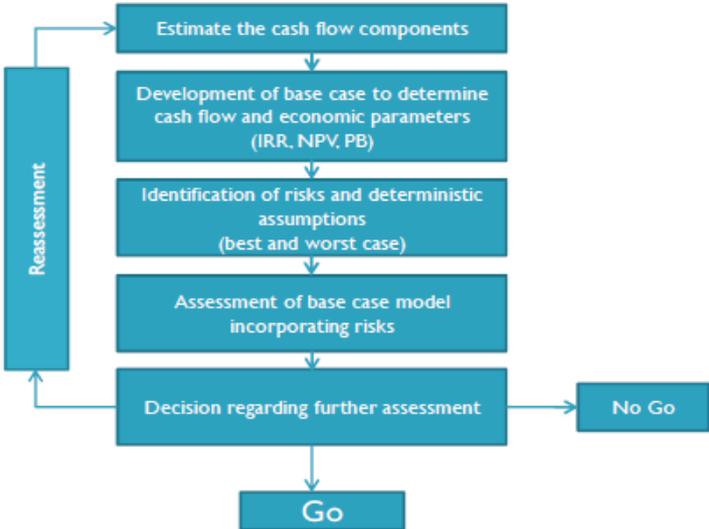


Figure 10 Diagram of the full assessment of an investment (Yescombe, 2013)

As can be seen, the assessment process begins with the estimation of the cash flow components - inputs. Based on those inputs all calculation is made and therefore they have the utmost importance and will be thoroughly assessed based on the previous project environment analysis.

3 Project Environment Analysis

In this chapter, overall conditions and trends related to the project will be discussed. Even though the global picture is important for the project of the smaller scale such as this one a closer look at local conditions, trends and prospects is much more relevant. Therefore, following chapters will be mainly in domestic perspective.

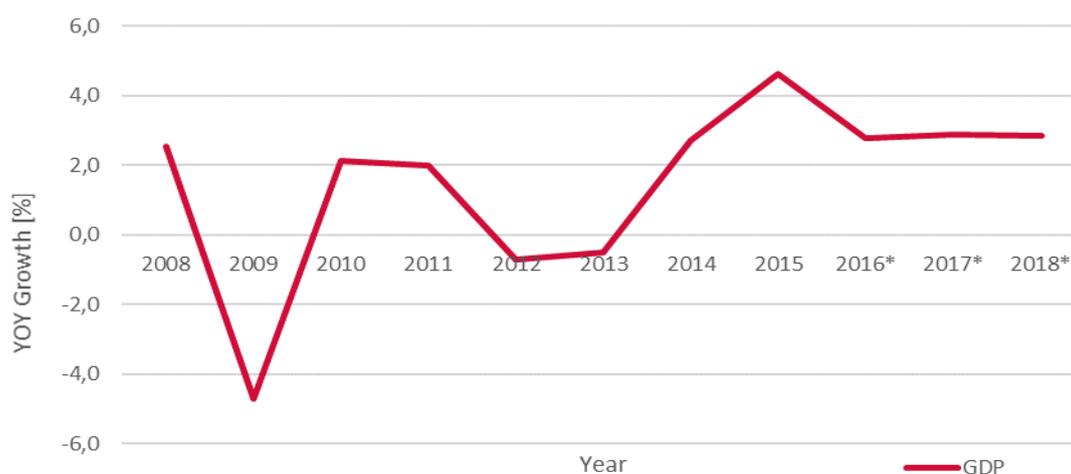
3.1 Macro environment – Czech Republic

To properly assess the current condition of the Czech market, research has to be done in historic perspective. Therefore, following analysis will not look just at the present state of things but also at what preceded. Firstly, the overall condition of Czech economic will be assessed then the financial and legal situation will be analysed focusing on real estate market. Finally, Czech real estate market current condition and trends will be described.

3.1.1 General and Social

Last economic crisis hit Czech market in the year 2009 when year on year change in GDP was - 4,7 %. The recession lasted until the year 2014 when GDP recorded growth of 2,7 %. Following the year 2015 the growth continued and even strengthen with yearly growth of 4,6 % which placed the Czech Republic among the fastest growing economies in Eurozone. The GDP year-on-year growth data are shown in Table 2.

Table 2 GDP y-o-y growth in 2008 - 2018 (Czech Statistical Office, 2016)



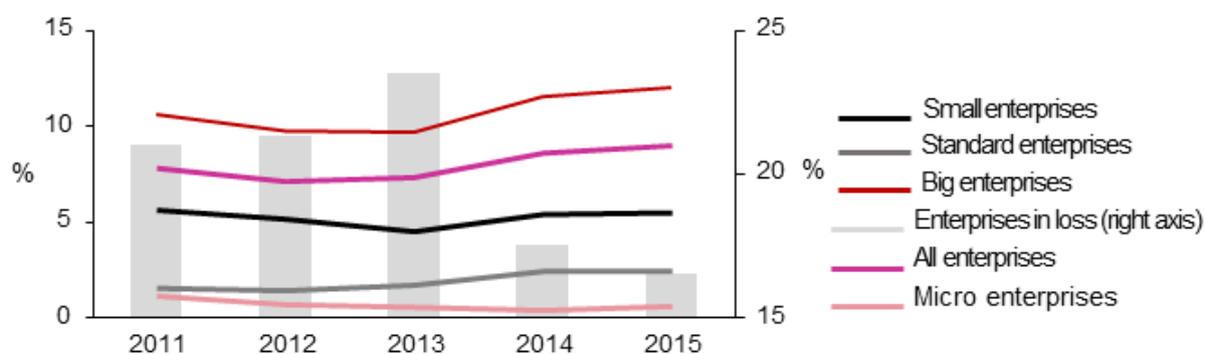
2008	2009	2010	2011	2012	2013	2014	2015	2016*	2017*	2018*
2,5	-4,7	2,1	2,0	-0,7	-0,5	2,7	4,6	2,8	2,9	2,9

*Forecast of Czech National Bank as of 12.11.2016

Outstanding growth recorded in 2015 was led by manufacturing sectors specifically the production of motor vehicles which attributed for 28,4 % of total industrial sales in 2015. Automotive sector was followed by metal and plastic manufacturing. A big role was also played by service providing sector such as IT and legal (Czech Statistical Office, 2016).

Economic growth also positively reflects on the overall condition of a non-financial business. The overall performance of this sector recorded further growth accompanied by growing profitability in 2015 and a total percentage of companies at loss has decreased as shown in Table 3. Companies are further categorised by their size.² (Czech National Bank, 2016).

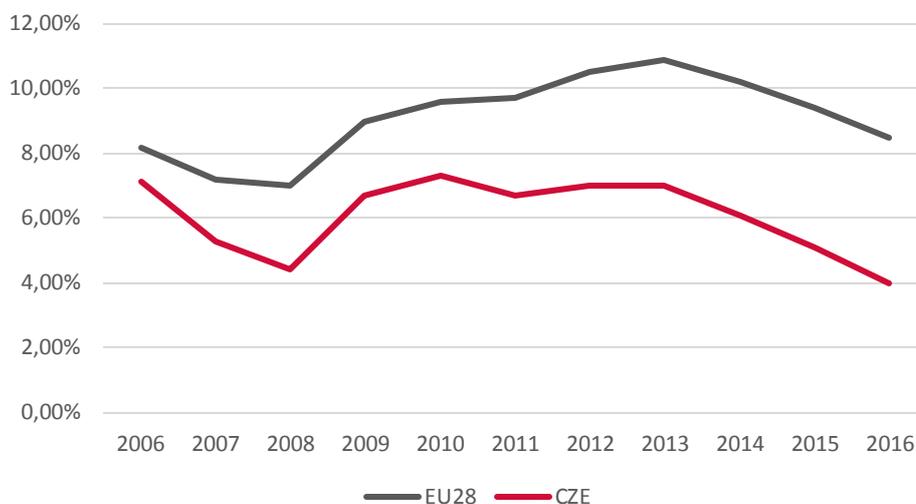
Table 3 Progression of RoE after taxes and percentage of enterprises at loss (Czech National Bank, 2016)



Growing economy and its expanding companies brought the need for more employees. In consequence of that unemployment rate fell to 5,0 % according to Ministry of Labour and Social Affairs (Ministry of Labour and Social Affairs, 2016) and according to Eurostat even to 4,1 % (Eurostat, 2016). Historic Eurostat data with comparison to EU28 are shown on Table 4.

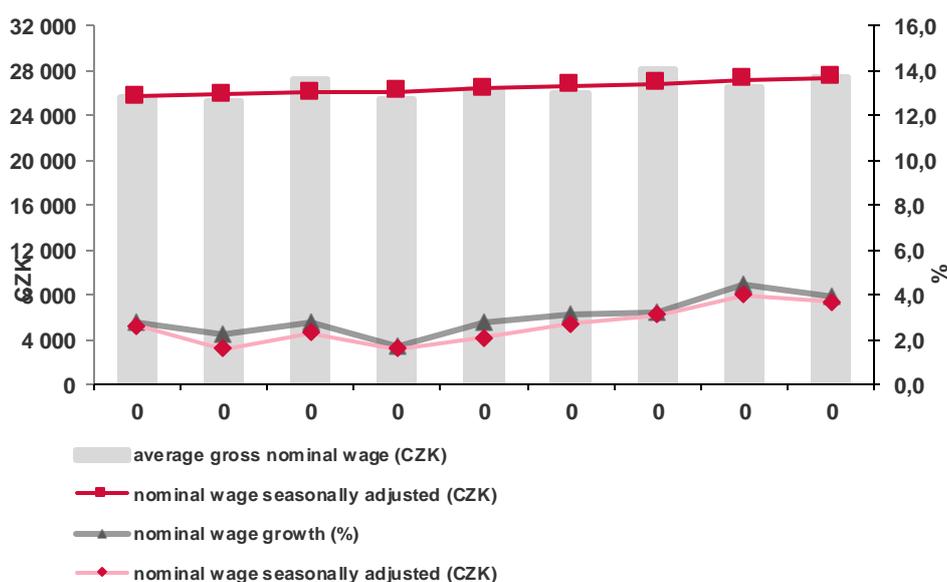
² Micro: 1 – 9 employees and turnover not exceeding 60 mils. CZK, Small: 10 – 49 employees turnover not exceeding 300 mils. CZK, Standard: 50 – 249 employees and turnover less than 1 bill. CZK, Large: above 249 employees or turnover exceeding 1 bill. CZK.

Table 4 Unemployment rate 2006 – 2016 (created by author based on data from (Eurostat, 2016))



As can be seen, so far Czech Republic has been recovering from economic crisis much faster than EU28 and with a value around 4,0 % is the country with lowest unemployment rate in Europe. Falling unemployment rate together with unsatisfied demand for new employees has driven average wages in the Czech Republic upward. (Czech Statistical Office, 2016). Nominal wage growth in first quarter of 2016 has been 4,5 % followed by 3,9 % growth in second quarter. Recent data can be seen in Table 5.

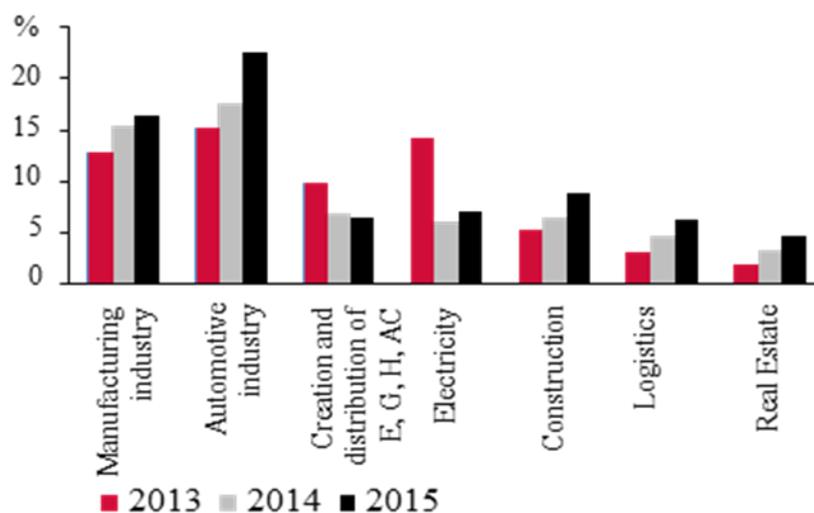
Table 5 Average monthly wage (quarter - in CZK, year-on-year changes) (created by author based on data from (Czech Statistical Office, 2016))



Data shows that due to very low inflation in recent years nominal and real growth of wage are almost identical reflecting in increasing purchase power of citizens. In the second quarter of 2016 total expenditure per household increased by 2,2 % year-on-year.

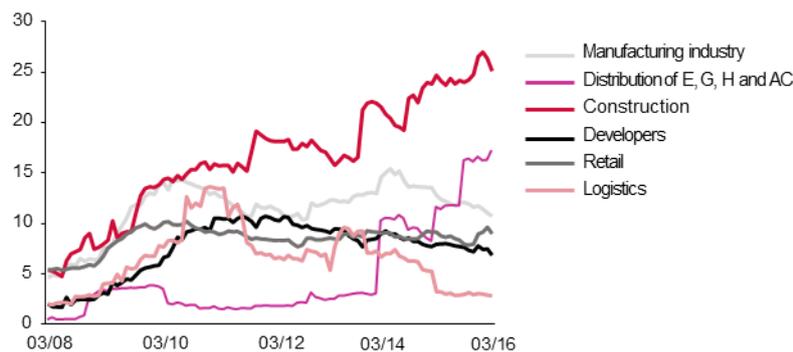
Progression of domestic demand in 2015 and 2016 has also positively influenced entities operating in real estate and construction sector which was experiencing a long-lasting downturn. Average RoE in construction and real estate business still stays very low compared to other sectors which can be seen in Table 6.

Table 6 Progression of RoE after taxes in selected sectors (Czech National Bank, 2016)



Also, the average level of debt financing risk is decreasing. Despite the overall positive trend across all sizes of enterprises, there are still great differences. When it comes to large enterprises the level of risk has already reached historical minimum approximately 2 %, nevertheless a financing risk of smaller companies is still distinctly higher than before crisis ranging from 8 to 12 %. Differences can also be seen across different sectors. A decreasing trend can be seen at development sector which represents more than 25 % of all issued debts financing for the non-financial sector. On the other hand, increased debt financing risk is showed by construction business with the risk the ratio of debt default reaching 25,1 % in March 2016 (Czech National Bank, 2016). Ratios of debts default divided by sectors can be seen in Table 7.

Table 7 Ratio of defaulted issued debt in selected sectors (Czech National Bank, 2016)



Generally, stable household consumption together with strong foreign demand, rapidly growing the automotive industry and good economic mood on market create stable and ongoing GDP growth. Growth is hindered mainly by construction industry which fell by 7,4 % year-on-year mostly due to reduced public investments into infrastructure (Czech Statistical Office, 2016).

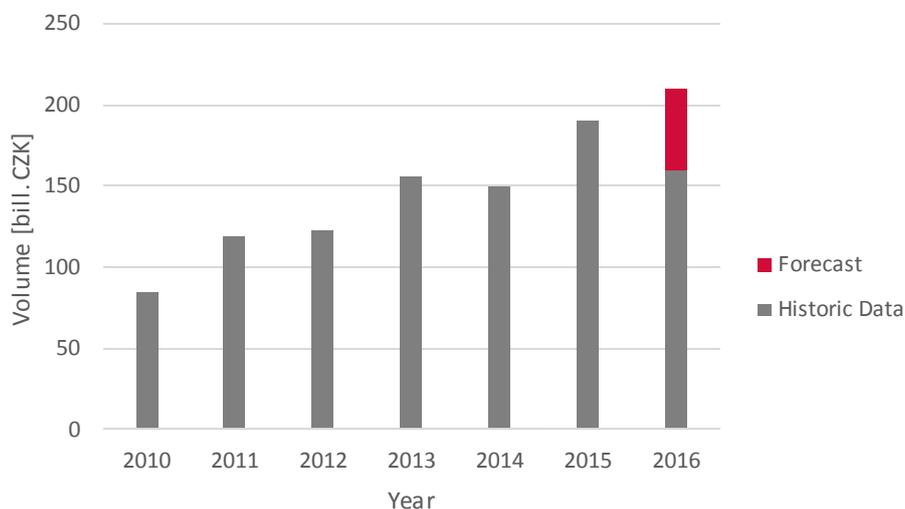
3.1.2 Financial and Legal

Positive numbers are also a result of strong foreign demand which is enhanced through artificially lowered exchange rate of Czech crown to Euro. This is a result of interventions of Czech National Bank (CNB) which has been maintaining an exchange rate around 27 CZK per EUR since 2013. According to information released by CNB interventions should end at the earliest at the second half of the year 2017 (Czech National Bank, 2016). Nevertheless, experts anticipate that CNB provides a bit misleading information concerning the intervention exit strategy to counter potential speculators. Therefore, it is possible that CNB will exit intervention strategy in the second quarter of 2017 (Hospodářské noviny, 2016).

CNB has also released a set of recommendations for commercial banks concerning providing mortgages. Since 1st of October banks should not provide mortgages with LTV higher than 95 %, furthermore, after 1st of April maximal LTV should be lowered to 90 % (Czech National Bank, 2016). Nevertheless, various representatives agree that 90 - 100 % LTV mortgages are quite rare and represent only about 3 – 5 % of all issued mortgages. Therefore, restrictions should now have a big impact on the market. The restrictions can be viewed as prevention against scenario from years 2007 to 2009 when 100% LTV mortgages created as much as 30% of bank's production (Česká televize, 2016). Restrictions are also a reaction to the rapid escalation of the volume of new mortgages. The total volume of new mortgages was almost 150 billion CZK in 2014 and further grew in 2015 to amount approximately 190 billion CZK. In 2016 total volume of new mortgages in first three quarters was almost 160 billion CZK. It is

probable that the total volume will go over 200 billion CZK (Hypoteční banka, 2016). Historic data for issued mortgages are shown in Table 8.

Table 8 Volume of mortgages 2010 – 2016 (created by author based on data from (Hypoteční banka, 2016))



The continuing growth of amount of new mortgages can be attributed to multiple factors – upcoming new legislative concerning the mortgages, all-time low interest rates on mortgages and already described restrictions of CNB (Hypoteční banka, 2016). Major legal change has been made through new law nr. 257/2016 Sb. O spotřebitelském úvěru which will be active from 1st of December 2016, therefore, replaces original law from the year 2010. Beside other changes, the most relevant for the average customer is the regulation of options of premature repayment which is in detail described in § 117. Premature repayment will be possible based on following rules (Hypoindex, 2016):

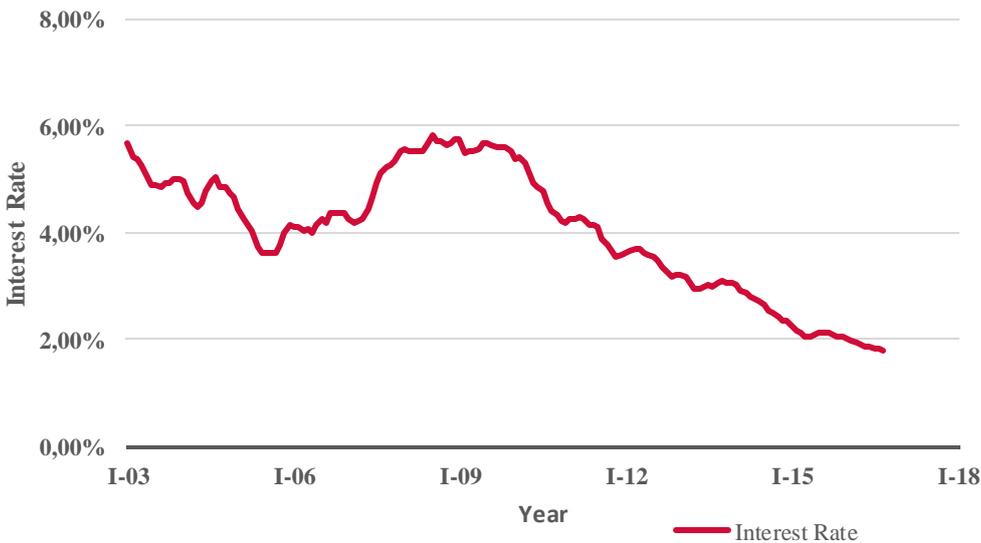
1. Once a year it is possible to repay 25 % of the total amount, no extra charge;
2. At the end of the fixed-rate period, no extra charge (same as today);
3. At the event of death, long-term illness or disability of debtor or his/her husband/wife if these circumstances lead to lower repayment ability, no extra charge;
4. In case of sale of the property for mortgages with period longer than 2 years, maximal fee 50 000 CZK; and
5. Anytime for a fee which cannot exceed the sum of interests until the end of fixed-rate period (same as today).

It is important to note that these new rules will be directly applicable only for mortgages which were signed after the 1st of December 2016. For mortgages signed before 1st of December 2016,

these rules will be applicable only after the end of a fixed-rate period. This is important mainly because it is one of the reasons bank are willing to further lower interest rates to obtain as many mortgages as they can before the new law is active (Hypoindex, 2016).

As already mentioned interest rates are on all time minimum. The major reason is the introduction of negative interest rates on the interbank market, for example, EURIBOR is currently as of 13th of November 2016 at the value of – 0,379 % (European Money Markets Institute, 2016). Therefore, money is cheap and banks are more than willing to lend it. When it comes to mortgages average interest rate on new mortgages in September 2016 was 1,82 %. Therefore, the minimal interest rate one can get is even lower than 1,8% and some banks do even offer such rates in their marketing materials. The historic data for mortgage interest rates are shown in Table 9.

Table 9 Mortgage interest rates 2003 – 2016 (Created by author based on data from (Hypoindex, 2016))



Also, the financing for development projects and income-generating projects is greatly available and banks are willing to lend. The KPMG's Property lending barometer says that 95 % of loans are safe and without any problems, 74 % are for the income-generating projects (mostly acquisition of occupied buildings) and that Czech Republic is one of the three fastest growing countries in EU when it comes to loan volumes. Standard loan is around 70 % LTV and the debt-service coverage ratio is around 1,2. The interest rates are lowest in the CEE region ranging from 2 to 2,6 % for development projects and from 1,7 to 2,1 for income generating projects (KPMG, 2016).

In conclusion, financial and legal environment is currently favourable for basically any real estate project investment mainly because of extremely low interest rates and overall willingness

of bank to lend money because of inter-bank interests which are around zero or even negative. Furthermore, investments which are directly connected to foreign demand and markets such as logistics and hotel are supported by stable and generally low exchange rate of CZK to EUR. The office market is very competitive and stabilized which leads to lowering vacancy rates. The residential market is experiencing the greatest boom of all sectors boosted by multiple positive factors including low interest rates reflecting in immense demand for mortgages and cheap leverage money, upcoming mortgage restrictions further boosting the current demand and rapidly rising prices.

3.1.3 Czech Real Estate Market

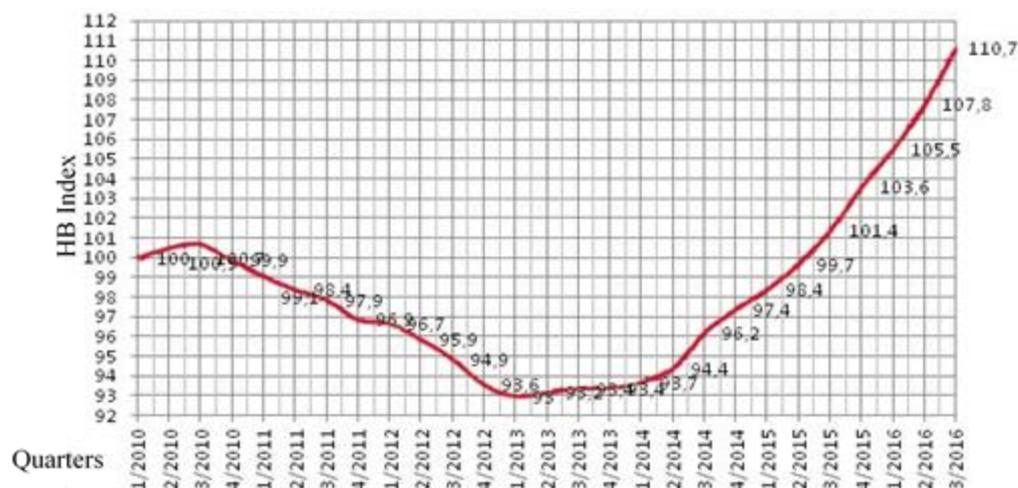
In general, real estate market is tightly connected to the overall economic cycle. Considering above mentioned – growing GDP, increasing wages, decreasing unemployment and all time low interest rates it would seem the conditions cannot be much better (Hypoteční banka, 2016). Extremely low or even negative interest rates further increase the activity on real estate market since properties are becoming very interesting and popular type of alternative investment. This is mainly due to their ability to still generate considerable returns whilst the returns of other types of more standard investment (financial investments) are very low or non-existent.

To closer review the condition of RE market, individual sectors will be analysed. As already hinted in the previous chapter, the residential sector is greatly profiting from the current economic position of Czech Republic.

Residential

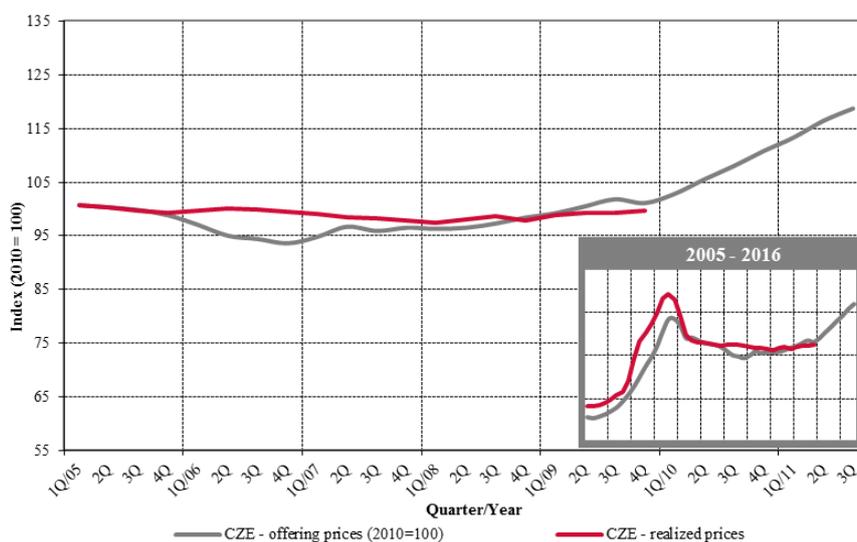
As already mentioned the demand is extremely high and largely exceeds the supply. This is reflected in rapidly rising prices of new residential development. Prices of apartments have increased year-on-year by 9,3 %. The growth of flats is accompanied by slower but still significant growth of prices of houses (+ 3,3 %) and lands (+9,2%). (Hypoteční banka, 2016). The growth of the prices of apartments according to HB Index can be seen in Table 10.

Table 10 Progression of HB Index in years 2010 - 2016 (Hypindex, 2016)



HB Index is price index reported by Hypoteční banka and his value is based on contracts of issued mortgages by the same bank. Therefore, should realistically reflect current real buying prices. The basis point of this statistic is price level at the year 2010 when the index has been firstly introduced. It is worth mentioning, that the value of HB Index differs from the values published by Czech Statistical Office which can be seen on Table 11.

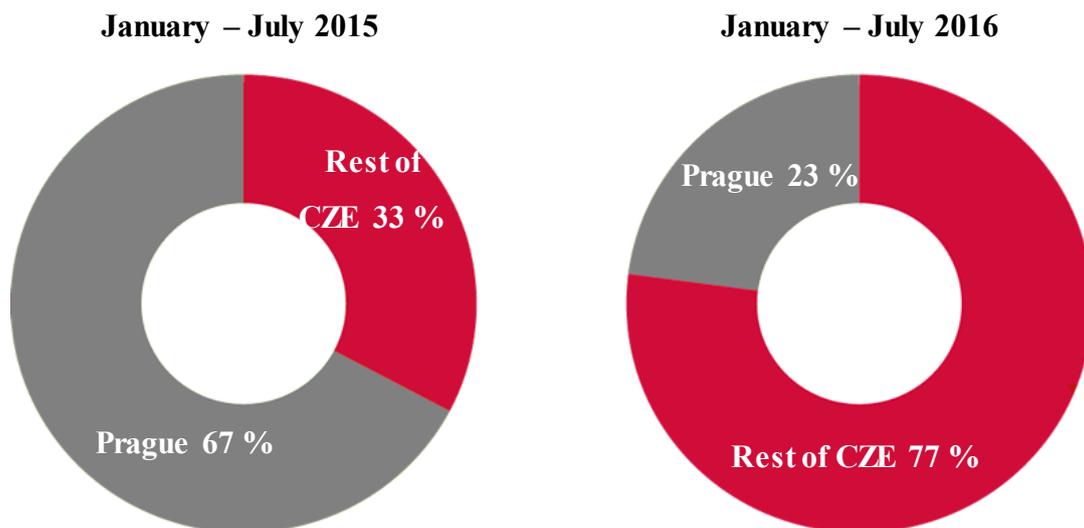
Table 11 Progression of apartment price index in years 2010 - 2016 as published by CSO (created by Author based on data from (Czech Statistical Office, 2016))



It can be seen that main difference between the two is the omission of the significant drop in years 2011- 2013 in data published by CSO. Nevertheless, data from Czech statistical office also does not include recent progression in years 2015 and 2016 which are of the utmost importance for this analysis. Therefore, data of HB Index will be further used.

Furthermore, developers do anticipate continuing but slower growth of the prices mainly supported by the lack of supply of new residential projects (Asociace pro rozvoj trhu nemovitostí, 2016). This aspect is especially relevant to the city of Prague where most of the new projects are hindered by prolonged permitting process. Subsequently, developers focus on regional development and therefore the main mass of new development is shifting from Prague to regions (Cuřínová, 2016). The trend is represented by following Table 12.

Table 12 Movement of development from Prague to regions (Cuřínová, 2016)



Concerning the Prague, where apartments are a greatly dominant type of household, the situation is critical. The amount of apartments under construction decreased by 78 % in first seven months of 2016. On the other hand, total development across the Czech Republic is on the rise reflecting in the growth 51 % excluding Prague region. The main contributors to this growth are Central Bohemian and Pilsen Region (Cuřínová, 2016).

Retail

The impact of growing the economy and generally positive mood among people can also be seen on retail sector of real estate market resulting in 5,1 % year-on-year growth in retail sales in September 2016 (Czech Statistical Office, 2016). Increasing sales and footfalls have reflected on strengthening demand for prime high street and shopping centres. The rents are increasing mainly on the luxury high streets which is forecasted to continue in Q4 of 2016 (CBRE, 2016). The supply of new retail areas is very limited with only two major openings in 2016 being AuPark in Hradec Králové – 20 900 sqm and Galerie Přerov – 13 700 sqm. The limited supply is in contrast with growing sales and increasing appetite for expanding on the side of retailers which subsequently reflects in compressing yields and significant rent growth of both prime

and regional retail areas. The progression of both yields and rents can be seen in Table 13 and Table 14.

Table 13 Progression of retail regional and prime yields in years 2006 – 2016 (created by author based on data from (Cushman & Wakefield, 2016))

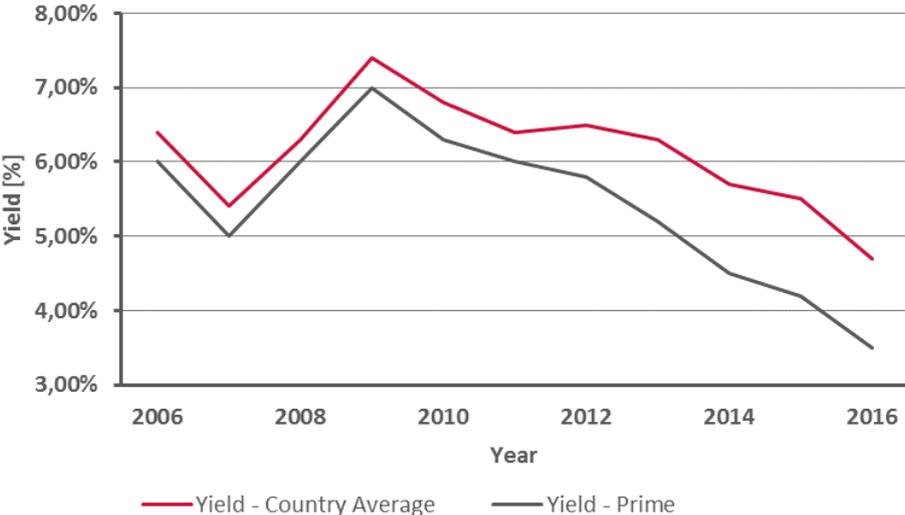
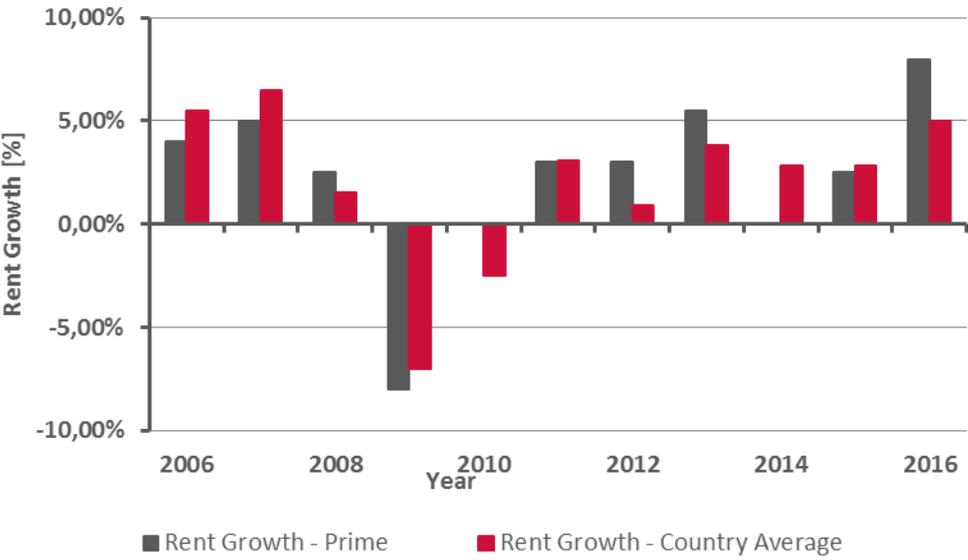


Table 14 Progression of retail regional and prime rents in years 2006 – 2016 (created by Author based on data from (Cushman & Wakefield, 2016))



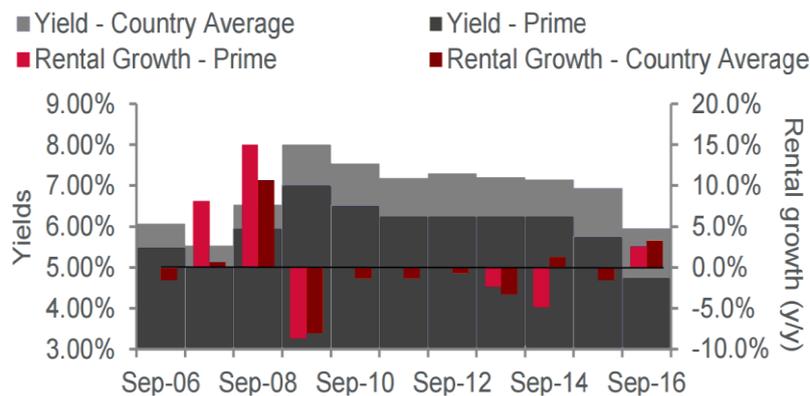
In general, it is expected that the market will maintain its positive trend (Cushman & Wakefield, 2016).

Offices

As all real estate sectors, the office sector benefits heavily from the current economic condition in the Czech Republic. The demand for office is notable increasing in Prague and Brno. The demand is led by IT companies, shared service and back office operators. However, prime rents will probably remain stable since the landlords are still offering incentives to secure the tenants.

Nevertheless, due to the lack of new completions in 2016, the average amount of incentives is evidently decreasing. Although, the decreasing trend will probably change with upcoming speculative completions scheduled for 2017 and 2018 (Cushman & Wakefield, 2016). The progression of office yield and rental growth can be seen in Table 15.

Table 15 Progression of office yields and rental growth 2006 - 2016 (September) (Cushman & Wakefield, 2016)



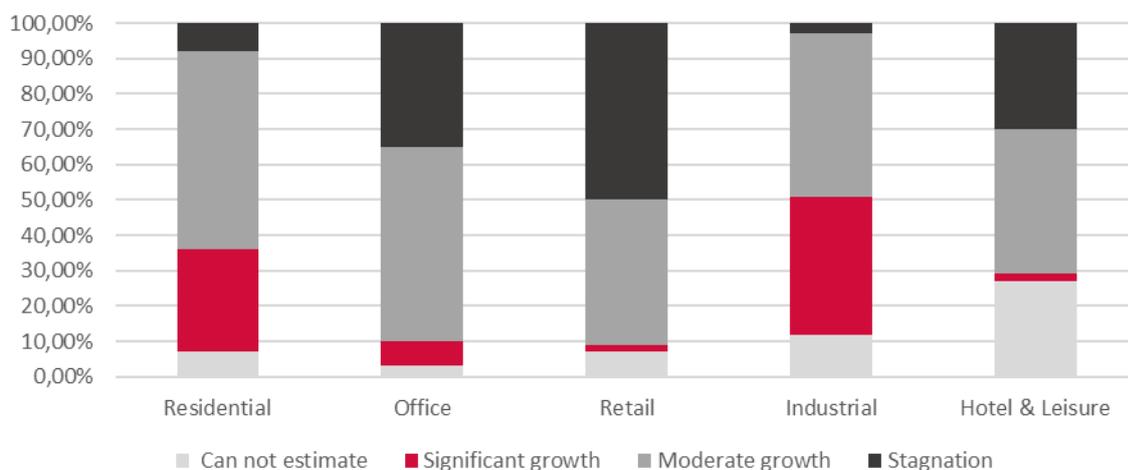
As can be seen, the compression of yield is rapid which is reflecting in 2016 values of prime yields dropping below the values before the crisis. Another important thing shown on the graph is until 2016 almost all years since 2008 rents have been decreasing. This is particularly true when it comes to country average.

New projects are being developed with a focus on green building certifications which is evidently highly attractive to occupiers. Owners of the older building are consequently searching for efficiency improvements to preserve their current tenants and attract new ones. Vacancy rates for both Grade A and B office buildings are steadily declining. Investors have very few opportunities due to the low supply pipeline and generally very high and steady demand.

Trends and Forecasts

According to the last edition of Trend Report leading development sectors will be industrial and logistics followed by residential. Concerning the residential market, most of the total volume will be in Prague followed by Brno, Plzeň and Hradec Králové (Asociace pro rozvoj trhu nemovitostí, 2016). A complete overview of expectation for individual real estate sectors can be seen in Table 16.

Table 16 Growth expectations for individual RE sectors in 2016 - 2017 based on (Asociace pro rozvoj trhu nemovitostí, 2016)



The industrial and logistic sectors benefit heavily from the stable exchange rate kept by CNB. This will probably change over the year 2017 and therefore it can be expected that the focus will shift from logistics to offices and residential. According to PwC's report, the most prospective development sectors in Europe are student housing, private rented residential and affordable housing (PwC, 2016). All of which are part of the residential sector and especially affordable housing is spelled very frequently by the experts when asked about prospective sectors of real estate. Furthermore, the financing of development and also income-generating projects should remain very affordable (KPMG, 2016).

3.2 Micro environment – Region Hradec Králové

The region of Hradec Králové lays in the North-eastern part of Czech Republic approximately 112 km from capital city of Prague. Generally, the region can be characterised as a mix of agricultural and industrial with the developed tourism sector. Industrial activities are concentrated in bigger cities and agriculture is in the lowland of Polabí. The highest concentration of tourism can be found at Krkonošské Mountains where the highest mountain of Czech Republic, multiple ski resorts and sandstone rock cities are located (Czech Statistical Office, 2016).

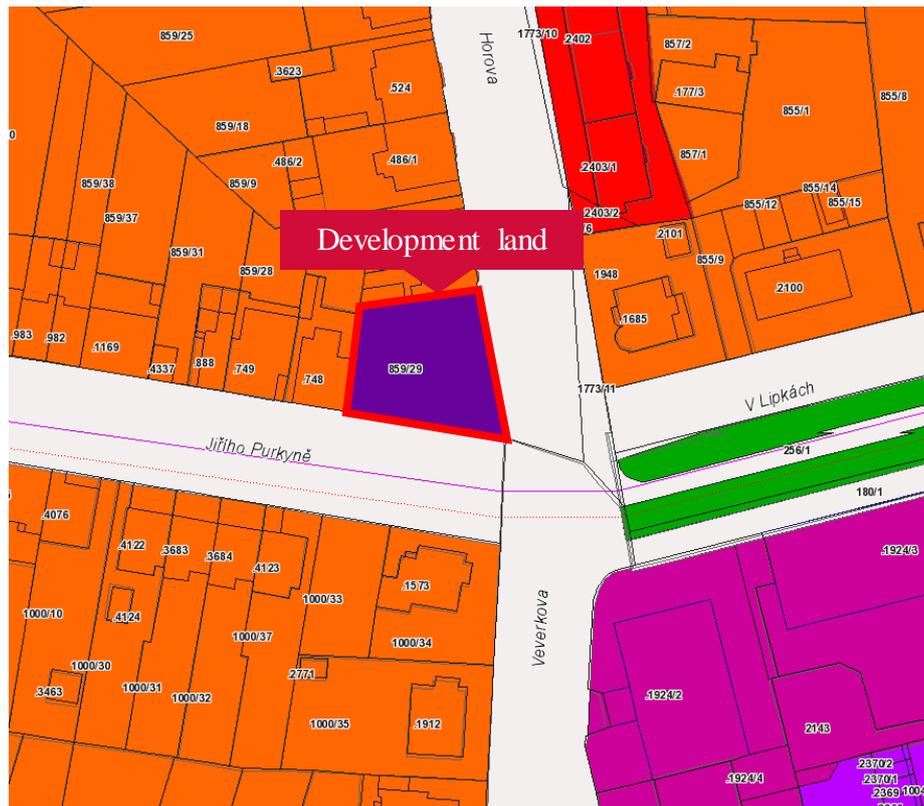
The region contributes to the GDP by 4,6 % and reached approximately 87 % of average GDP on a person in the year 2014. Which puts him beside other successful regions such as Central Bohemian or Zlín Region.

3.2.1 General

After the recession caused by the economic crisis, Hradec Králové experiences relatively big development growth. There are multiple recently completed projects and others which are currently under development or in the preparation phase. Most of the new projects are residential which will be described in the separate chapter.

Zoning Plan

Considering the permitting process in Hradec Králové recent development projects have not had any problems securing all the permits in a reasonable time (based on a private conversation with few of the local developers). The problem might arise when the zoning plan is not in accordance with the planned use of the project. Hradec Králové currently develops new zoning plan and issued a total block of any individual changes to current zoning plan until the new plan is finalized and agreed upon. Estimated time of finalization of new zoning plan is the end of the year 2017 with the latest date being the end of 2020. Nevertheless, in view of current progress where current proposal already went through public comments process and all remarks has been addressed it assumed that date 2017 can be achieved (Magistrát města Hradec Králové, 2016). Current zoning plan for the area of the project can be found on Figure 11. As can be seen, development land is currently marked as an area for public facilities of city and regional significance. Specifically, this land can currently be used for mostly anything except for the development of residential apartments (excluding apartments for employees, storages and manufacturing. Therefore, the current strategy complies with the current zoning plan. On the other hand, any residential development would need a change of zoning plan.



- Purely residential areas for high-rise building** - residential building with four and more above ground floors
- Purely residential areas for low-rise buildings** – residential buildings with less than four above ground floors
- Area for public facilities of city and regional significance**
- Mixed use areas for high rise building**

Figure 11 Zoning plan at the location of the project (created based on the information from (Magistrát města Hradec Králové, 2016))

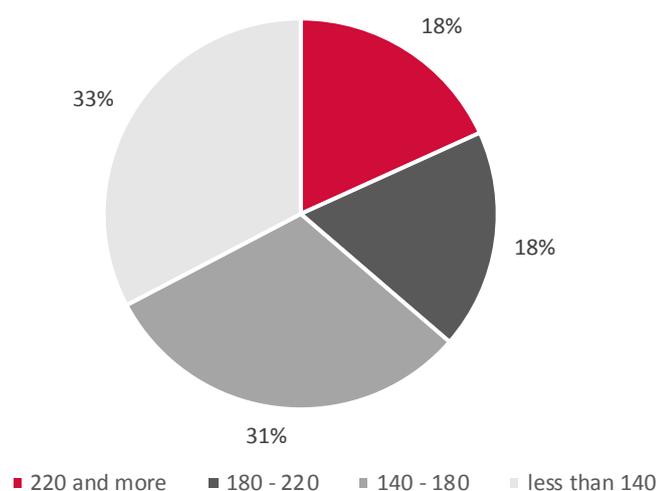
However, the current function of the land is outdated and was relevant when there used to be a playground. The rest of the area is completely residential and just a few meters away there is even high-rise residential building. Also, the immediate area went through extensive development and most of the public facilities and civic amenities are already present. Thus the investor is of opinion that it should be possible to secure this change simultaneously with the aforementioned zoning plan and relevant negotiations are already under way.

3.2.2 Commercial Development

The biggest commercial project just completed is the construction and opening of new shopping centre AuPark which introduces more than 19.000 square meters of retail (140 retail units), 1.500 square meters of offices which are already fully occupied and 1.100 parking spaces. AuPark Hradec Králové has been developed by HB Reavis Real Estate and is the first AuPark in the Czech Republic. It is the biggest new opening of retail areas in the Czech Republic in 2016. When it comes to shopping centres there are three more – Orlice Park, Futurum and Atrium. Futurum has been expanded in 2012 for its great success. The closest to recently built AuPark is Atrium which is only about 500 meters away. Otherwise, there has been next to none development of retail parks or shopping centres. Most of the development is revitalization or expansion of established businesses.

When it comes to the office market the AuPark is probably the biggest project also with its 1 500 square meters of office areas. Existing bigger office buildings in town are mostly single-tenant building such as the headquarters of T-Mobile Czech Republic a.s. or GIST, s.r.o. The rest of the big office buildings were constructed during the socialism era and are currently leased to the relatively huge amount of small tenants. Based on the gathered data average rent per square meter and a month is approximately 163 CZK or almost 2000 CZK per year. This is including much lower quality office areas in Hradec Králové. The distribution based on the rent value intervals can be seen in Table 17.

Table 17 Distribution of office rents in Hradec Králové (created by Author)



As can be seen, the majority of office areas, which were offered in Hradec Králové at the time of writing, is rented under 180 CZK/sqm/month and 31 % even below 140 CZK/sqm/month.

Nevertheless, it is also evident that higher price can be achieved. The average rent per square meter per month for top 20 % of offered offices is 255 CZK.

Main retail areas are concentrated around the historic centre of the town mainly alongside Gočárova street and Karla IV. Avenue in the direction of main train station and former bus station where AuPark is located now. The average rent per square meter on those prime retail street in their immediate vicinity is approximately 280 CZK/sqm/month. The rents for distant location fall rapidly and the average rent is mostly in a range of 160 – 195 CZK/sqm/month.

It is worth mentioning, that stated numbers are the net rent excluding service charges and are based on the research done by the author. The research data can be found in the attachments.

3.2.3 Residential Development

On the other hand, the residential sector is flourishing and multiple projects are currently under way. The outburst of new development can be attributed to recent more than favourable conditions. Recent and present residential projects are described below.

Na Plachtě

Extremely successful development project Na Plachtě is currently entering its third stage. First two stages were an immense success with all flats being sold very quickly and for above average prices. The flats from the second stage are only now being finished and will be ready for their new owners in the first half of 2017. Even though the second stage is not even finished yet flats in the third stage are being offered already and 86% of flats is already reserved – only 10 flats left. The main feature of this project is its location which is marketed as "one of the most desired residential districts of Hradec Králové" (REZIDENCE NA PLACHTĚ s.r.o., 2016). This could be true when it comes to the district – Malšovice which is truly currently of the most popular residential location. Nevertheless, the project itself is located on the border of the district and former industrial and storage zone of Petrof – piano manufacturer. Meaning most of the flats have a view either into windows of a neighbouring block of apartments or on the industrial zone and warehouses. The developer of the project is a company REZIDENCE NA PLACHTĚ s.r.o. which is owned by S group holding, a.s commonly known as a developer and contractor company SYNER s.r.o (Ministerstvo spravedlnosti České republiky, 2016).

TARABY

TARABY is next recent and successful project with a surprising location in the middle of panel blocks of flats from the previous era. The construction works began in August 2015 and are currently finalizing – Fall 2016. The amount of flats in this project is 37. At this time all flats

are already sold except one which is under reservation (TOMAS DEVELOPMENT s.r.o., 2016). The location as described above might sound a bit odd and unattractive. Nevertheless, the layouts and placement of individual flats ensure that most of the flats have an acceptable view. Furthermore, the location of the project offers a complete package of services mostly represented by nearby shopping centre Futurum, elementary and nursery school, hospital and sport facilities. For better understanding of the location see Figure 12. The project has been developed by TOMAS DEVELOPMENT s.r.o. which is owned by contractor company REKO a.s (Ministerstvo spravedlnosti České republiky, 2016). The average price per square meter is around 44 000 CZK which is the highest price among compared projects.

Medium Park

Project Medium Park has been recently announced and construction works should start during November 2016. Nevertheless, the selling process has already begun and 8 flats are already reserved. This is before the contractor even started any construction works. There are 117 flats in total which makes it one of the biggest single building projects in Hradec Králové. Project is located right beside project TARABY and therefore benefits from same factors and is also marked on the map on Figure 12. Pricing is set a little bit lower than at TARABY project reflecting in an average price per square meter approximately 43 000 CZK. The project is developed by company IMOS development, investiční fond s proměnným základním kapitálem, a.s. which is an investment fund.



Figure 12 Location of Project TARABY and Medium Park (created by Author)

Dům služeb Třebeš

Project Dům služeb Třebeš is located at the outskirts of Hradec Králové at the end station of buses number 16 and 18. Compared to previously introduced projects this one is in a relatively worse location where a big portion of new development has been realised in the past years. At the moment of writing, all flats were under reservation and the average selling price has been reaching 37 000 CZK without VAT. This is the only project in the summary which lacks dedicated parking spaces which is reflected in the price. The project has been already completed and is in a stage of hand over to the new owners. The project has been realised as a mixed used building with small retail units on a ground floor, offices on the second floor and flats in the rest. The retail is still being offered and there is no information concerning its occupancy. On the other hand, office areas of 441,7 square meters are already fully taken.

Residence Sukovy Sady

Residence Sukovy Sady is a project which is located only about 400 meters from the project in question on the same street Horova. Location profits from immediate access to new AuPark shopping centre which is only about 200 meters far away. All together projects include 34 residential units and one commercial unit on the ground floor. All the units are currently under reservations and actually have been since the second month of offering. The average price per square meter is approximately 43 000 CZK without VAT. The project is being developed by local residential developer IMO-STAR which has been active since 1999 (IMO-STAR98 s.r.o., 2016). Project is currently in the final stage of construction and should be completed first half of 2017.

All above described projects are summarized in the following Table 18 which shows their total volume - amount of apartments together with average area of apartments, and average pricing of apartments sorted by layout.

Table 18 Summary of recent residential development projects in Hradec Králové (created by Author based on available price lists)

Development Project HK	Number of Apartments	Average Area [sqm]	Average Price [CZK]	Average price per sqm [CZK]
Dům služeb Třebeš	31	40,3	1 474 324	36 713
1+kk	20	32,9	1 224 562	37 186
2+kk	11	53,8	1 928 436	35 852
Medium Park	117	53,6	2 296 953	42 983
1+kk	47	33,9	1 449 972	42 955
2+kk	28	53,4	2 302 081	43 209
3+kk	38	73,9	3 142 769	42 725
4+kk	4	94,6	4 177 826	44 187
Na Plachtě	69	67,3	2 838 909	42 059
1+kk	8	40,6	1 738 350	42 936
2+kk	33	56,9	2 378 918	41 711
3+kk	21	81,1	3 379 010	41 589
4+kk	7	105,2	4 644 914	44 109
Residence Sukovy Sady	34	53,9	2 288 747	42 890
1+kk	13	33,6	1 513 043	45 062
2+kk	12	53,4	2 173 913	40 857
3+kk	9	83,8	3 562 319	42 464
TARABY	37	53,1	2 300 776	44 024
1+kk	9	30	1 443 961	47 672
2+kk	18	50	2 175 556	43 571
3+kk	7	73	2 972 422	40 690
4+kk	3	93	4 055 362	43 574
Total	288	55	1 576 764	42 210

As can be seen from the above table, average price per square meter across all projects is approximately 42.200 CZK without VAT. Looking at the higher quality projects such as Medium Park, TARABY or Residence Sukovy Sady price increases to around 43.000 CZK without VAT per square meter. The difference is mainly due to a better location. Shown prices are excluding VAT but do include the price for single parking space (except for project Dům služeb Třebeš where are no parking spaces). The inclusion of cost of parking space has been necessary due to the fact that some projects list their prices with this price already included. Therefore, it would otherwise be necessary to deduct some estimated cost of parking space from the total cost. By far the most comparable is the project Residence Sukovy Sady. Therefore, conclusion concerning the price will be drawn based on project Residence Sukovy Sady due to its similarity and on the project Medium Park due to its future timing.

Overall selling speed across all the projects is breathtaking and underlines the immense demand and availability of resources on the market.

To lay out the full view of the residential market in Hradec Králové also apartments which are sold individually had to be assessed. These apartments are mostly in older buildings and can be further divided into two categories called „Brick" and „Panel". The group names are self-explanatory, meaning the flats in each category are located within building with relevant load bearing system. The total amount of such flats is much lower – 82 vs 288 (new development). The summary of all recently offered flats can be found in Table 19.

Table 19 Summary of offered flats by non-developer entities (created by Author based on data from www.sreality.cz)

Individual Flats	Number of Apartments	Average Area [sqm]	Average Price [CZK]	Average price per sqm [CZK]
Brick	58	69,9	2 895 660	42 240
1 + kk, 1 + 1	9	36,7	1 541 793	44 649
2 + kk, 2 + 1	22	56,5	2 487 766	44 454
3 + kk, 3 + 1	21	83,7	3 263 683	38 782
4 + kk, 4 + 1	6	120,7	5 133 985	42 608
Panel	24	65,3	2 230 627	35 094
1 + kk, 1 + 1	4	32,5	1 315 750	40 723
2 + kk, 2 + 1	10	60,3	2 030 105	34 059
3 + kk, 3 + 1	8	82,9	2 829 625	34 517
4 + kk, 4 + 1	2	86,0	2 667 000	31 315
Average	82	68,6	2 701 016	40 148

As can be seen, prices of already used flats are in correspondence with new development and when it comes to "brick" flats their prices are even nearing prices of newly constructed ones. It is worth to mention that "brick" flats which are currently offered in Hradec Králové are mostly in an inner city centre and therefore have higher add-on for location.

Presented number are also in line with numbers presented by cenovemapy.org which is a website which gathers data about recently closed deals from purchase agreements from cadastral office. Their published data for Hradec Králové region can be seen in Table 20 together with a comparison with gathered data.

Table 20 Comparison of gathered data and data from cenovemapy.org (created by Author)

Hradec Králové	CZK per sqm	
	Gathered data	cenovemapy.org
New Development	42 210	42 655
Brick	42 240	32 537
Panel	35 094	34 031

Their statistics shows that the average price per square meter for a newly developed flat in Hradec Králové are around 42 700 CZK which is basically the same as the undertaken research has shown. The biggest difference can be seen at the "brick" flats which is probably caused by the reason mentioned above – the location (~price) of the remaining flats. Overall, it can be said that the residential sector of Hradec Králové real estate market is flourishing and according to the anticipated trends should remain stable in upcoming years.

3.3 Analysis Summary

Analysis begun with the overall state of Czech economy where it was found that most of the relevant indicators are positive and should favor the project. This is including decreasing unemployment, increasing GDP, increasing wages and more. Afterward, current financial and legal environment of development has been analysed. The overall availability of capital and financing is more than sufficient and banks are generally eager to lend money at rates around 2 – 2,5 %. It was found that CNB should exit their exchange rate commitment during the year 2017. The impact of the end of the constant exchange rate is widely discussed and the opinions differ. Nevertheless, the CNB also released the set of recommendations which protect the customer and give him an opportunity to repay the mortgage prematurely without penalizations which will probably drive interest rates higher. Also, CNB urges commercial banks to stop issuing mortgages with high LTV – 90%. These upcoming recommendations and restrictions were probably part of the reason why the volume of mortgages has been all time highest in 2016.

Analysis showed that the real estate market in the Czech Republic is flourishing and should remain stable at least for the year 2017 and probably 2018. All sectors of the real estate market are profiting from the overall good economic situation in the Czech Republic. The residential sector is on the rise due to extremely low mortgage rates. Office landlords profit from the lack of supply of new office premises in Prague and also in regions which further compresses already low yields. Nevertheless, investors are still eager to invest in properties due to the lack of traditional investment opportunities.

Hradec Králové joins the upturn of residential sectors with the recent development of several residential projects where the average price per square meter exceeded 42 000 CZK. The commercial development has been represented through the development of AuPark and modernization of current supermarkets. Otherwise, there has been no office development and rents for retail and office remain around 200 CZK/sqm/month depending on location.

4 Possible Strategies and Feasibility Studies

Following the environment analysis, the original project will be introduced and the cash flow analysis undertaken. Furthermore, alternative strategies will be assessed and best alternative will be chosen for further detailed analysis. This should provide at least one alternative option for a decision concerning the future of the project in question.

4.1 Overview of the Original Project

In this chapter, the original project in question will be introduced. However, this is only to familiarize the reader with the original project and will not go into great detail.

Original project Retail and Office Building on the Street Horova (“project Horova” or just “project”) was for the first time introduced in the year 1996 by a small local company named HIOSS s.r.o (“investor”). It was supposed to be modern and exclusive office building which did not have any competition in the time of its introduction. The project was delayed by almost 10 years due to the difficulties with securing the building permit. With the building permit in hand, the financial crisis soon hit the world and project has been postponed. Until today, the project still has not been realized.

Nevertheless, the investor is considering engaging this project once again. The main motivation being that investor already secured very lucrative land in of the most prestigious location in Hradec Králové called Pražské Předměstí for this undertaking.

Based on the theory described in previous chapters, following steps will be undertaken to evaluate the feasibility of different possible strategies:

- analysis of current real estate market;
- project analysis – risk assessment, SWOT etc.;
- development of possible strategies;
- feasibility studies for selected strategies; and
- comparison of results and evaluation.

Based on the listed steps, a recommendation about how to proceed with the project in question will be formulated.

4.1.1 Short Introduction of Investor

Investor which considers the project in question is company HIOSS REAL. This company is fully owned by mother company HIOSS s.r.o. which has been established in 1992. The core

business of HIOSS is general contracting of small projects (family houses, small development, reconstructions, etc.). HIOSS REAL, s.r.o. was established in 2003 as a subsidiary of the original company.



Reconstruction of building in Hanušova street

- Year: 1994
- Financial volume: 9 mil. CZK
- Lettable area: 360 sqm
- Comment: still in ownership of Investor. Headquarters of the company since the reconstruction to this day.



Reconstruction of building on Malé náměstí

- Year: 1999
- Financial volume: 28 mil. CZK
- Lettable area: 1 200 sqm
- Comment: still in ownership of Investor. Mixed used building with retail on the ground floor and offices in upper floors.



Development of block of apartments in Smilovského street

- Year: 2003
- Financial volume: cca. 20 mil. CZK
- Size: 16 flats with total area of 768 sqm
- Comment: developed and constructed by the Investor. Sale of individual flats.



Reconstruction of buildings in Tomkova and Komenského street

- Year: 2005 & 2007
- Financial volume: 39 + 17 mil. CZK
- Size: 19 + 8 flats, total area of 830 + 400sqm
- Comment: exclusive flats for international students in the old town directly neighbouring with main town square.



Reconstruction and development of building in Wonkova street

- Year: 2009 & 2014
- Financial volume: 18 + 10 mil. CZK
- Size: 420 + 360 sqm of lettable area
- Comment: still in ownership of Investor. Mixed used building with majority of offices. Combination of historic and modern architecture.

Figure 13 Summary of major (re)development projects of HIOSS and HIOSS Real (created by Author based on internal data of Investor)

The main purpose of the company was to maintain and operate buildings owned by HIOSS, s.r.o. Since then, the mother company has limited its growth and is actually downscaling. In the year 2014, one of the owners has retired and is currently being paid off from the HIOSS, s.r.o. The HIOSS REAL, s.r.o. on the other hand has developed several successful projects which are listed below in Figure 13.

The first two projects showcased on the Figure 13 were realised through mother company in the 90s and are currently under the operation of HIOSS REAL. The rest of the projects has been

developed by HIOSS REAL and contracted by HIOSS. Aside from the projects Tomkova and Šmilovského all the buildings are still in the ownership of one of the companies.

The strategic plan of the owners is to further decrease activities in HIOSS and further increase investment and development activities of HIOSS REAL. The project Horova could be one of next projects undertaken in HIOSS REAL. Overall, owners are very conservative when it comes to the investment and so far have never financed any project with the use of debt. In other words, all of the projects have been financed 100 % through equity.

4.1.2 Technical description

As mentioned in the previous chapter, according to the original project the building is designed as a mixed-use building. It is designed as a five storey building with four stories above ground and one underground storey.

Total built up area is 583 square meters. The first story with approximately 430 square meters would offer retail spaces. Second, third and fourth floor with combined floor area over 1200 square meters would contain customizable office space.



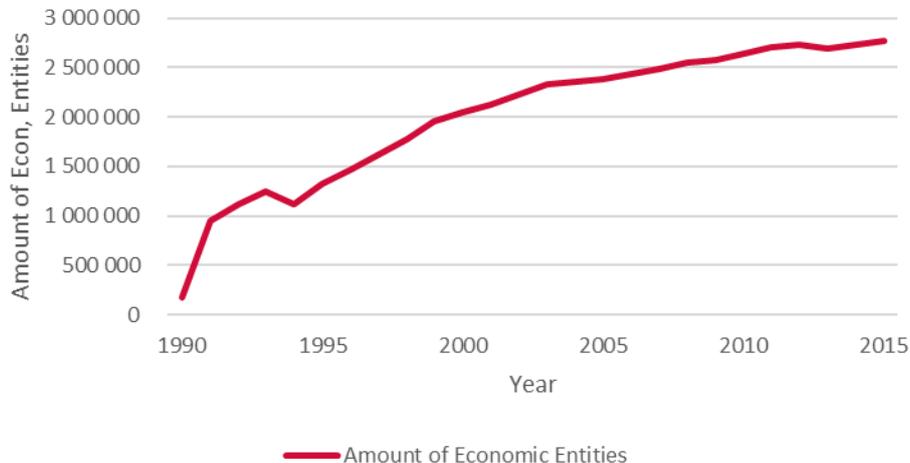
Figure 14 Visualisation of the building as designed in 1996. (internal database of Investor)

The underground floor accommodates 20 parking spaces. The building is designed as monolithic 5 five story building with concrete load bearing columns. The structural function and spatial rigidity are supplemented by load bearing brick lining with width around 300-350mm. The visualisation of the property can be seen in Figure 14.

4.1.3 Original assumptions

In the year 1995, the real estate market was still turbulent and offered very attractive opportunities. In our case of the market in Hradec Králové, there was next to none office buildings available to private entities, not to speak of modern and customizable offices. Considering the amount of newly established companies and international companies which were entering Czech Market at that time, the lack of adequate office space to accommodate these new subjects needed a fast reaction. Project Horova was meant to respond to this hole in the market with its almost 1100 square meters of office space. Furthermore, the ground floor was designed as retail space and should have offered around 350 square meters of retail for all those new entities. From today perspective it might not seem like a big undertaking, especially not if compared to today office projects in Prague and other major cities such as Brno and Ostrava. But Hradec Králové used to be and still is much smaller town. The rapid growth of the amount of economically active entities is shown on Table 21 which was created based on data from Czech Statistical Office.

Table 21 Amount of economic entities from 1990 to 2015. (Created by author based on data from (Czech Statistical Office, 2016))



As can be seen, the rapid growth has cooled down and the amount of offered office spaces had time to catch up. Another very important factor for the original project was the arrival of many international companies from west countries. Originally, the project has been projected as single-tenant building for headquarters of a major electronics company. Nevertheless, due to the long permitting process this and other companies have given up on setting up larger offices in Hradec Králové. In later years, some companies such as GIST, s.r.o. and T-Mobile have

secured permits to build their headquarters. Nevertheless, these are only individual successes where many others failed.

4.2 Analysis of Original Project

As said in the summary of Chapter 2.4, inputs and assumptions are the basis of any analysis where inaccurate inputs will reflect in misleading and incorrect results and drawn conclusions. Therefore, highest attention should be paid during their assessment. Inputs, as described below, will be used for analysis of the original proposal and where applicable also for alternative strategies. Most of the inputs are based on the previous project environment analysis and the experience of the investor with the local market. Only inputs which need special adjustment or new inputs will be specified when assessing alternative strategies.

In general, inputs can be divided into five main categories (Yescombe, 2013):

- macroeconomic assumptions – inflation, interest rates, economic growth and exchange rates where applicable (for projects with international stakeholders or where income is enumerated in foreign currency, for example, rents enumerated in EUR);
- project costs and funding structure – project costs (development costs, development fees, construction phase contract, financing costs, etc.), project funding (equity/debt ratio);
- operating revenues and costs; and
- loan drawings and debt service.

Most of the listed inputs are directly shown in Table 28 just organized in the manner which is customized for the purpose of creation of cash flow model. It is also worth mentioning that all the inputs and outputs are without VAT and other taxes. The method of dealing with the taxes will be heavily dependent on the legal form of the project meaning that the project will either be developed under one of the existing firms or new SPV would be created to undertake this project. The tax implications are quite different for those strategies and the tax optimization process would vary greatly. Therefore, the project is analysed without the impact of taxes which will mainly influence the effect of the gearing which will lose its benefit in form of a tax shield. Nevertheless, the benefit would be comparable across most of the strategies, therefore, it is disregarded since the tax optimization in small companies such is the investor can be very different on the year-to-year basis.

4.2.1 Initial Investment Costs

The initial investment is further divided into several costs – cost of land, design and engineering, construction costs (phased into 2 years) and contingency for unforeseen circumstances. The cost of land is estimated as a current selling price of similar land in that locality which is estimated to be around 2 000 000 CZK. It is not actual expenditure since the land has been acquired in the year 1996. Therefore, it can be considered as a type of opportunity cost where the alternative opportunity is to sell the land for current market value. Costs of design and engineering is known since the complete documentation has been already prepared. The total cost has been indexed for inflation and increased by 20% for necessary adjustments due to legislative changes and further engineering services. In total design and engineering costs are estimated to be around 1 100 000 CZK. Construction costs have been estimated based on a detailed bill of quantities and with use of professional program KROS Plus. Nevertheless, the estimation has been prepared 2 years ago, therefore the estimated costs have been indexed by cost inflation of construction works. The growth of construction costs in the year 2014 was 0,2 % and 0,3 % in the year 2015 (Czech Statistical Office, 2016).

4.2.2 Net Operational Income Calculation

As explained in Chapter 2.2.2, one of the fundamental output of the model is the forecasted net operational income (NOI). NOI in commercial real estate is usually calculated based on the revenue that a property generates less operating expenses. The revenue is typically generated through rent (office, retail, residential etc.), parking and servicing fees. The expenses take a form of insurance, property taxes, property regular maintenance fees, janitorial fees and more (Nickolas, 2015). The revenue of original strategy is generated through rent of retail on ground floor, offices on upper floors and parking in the basement. Therefore, following inputs need to be assessed and incorporated into the model:

Estimated Rent Value

Rent values have to be estimated for all different types of leasable areas including office, residential, retail, storage and parking areas. ERVs are one of the most important inputs. Their estimation should be based on detailed market analysis and/or extensive experience. Important to note is that all following ERVs do not account for energy, water and other services such as garbage disposal, maintenance of leased areas and more which will be paid separately and directly charged to the tenants. Also, all listed ERV are without VAT. This is in compliance with the current market convention.

1. Office ERV

Rent value for office areas has been set to 210 CZK/sqm/month or 2 520 CZK/sqm/year. This value is based on the market research done in the previous chapter and personal experience of the investor with office leases on this market. Investor considers this value achievable and realistic in correspondence to other already completed and running projects. Also, similar values were found through market research where such values were standard for offices of similar or even lesser quality.

2. Residential ERV

Based on the data from market research apartments in Hradec Králové are rented on average for 170 CZK/sqm/month. There were only three apartments for rent in a newly constructed building where rent was in average 208 CZK/sqm/month. Therefore, it will be assumed that in the case of renting the apartments rent of 200 CZK/sqm/month could be achieved. This value is based on previously mentioned average, fact that the location of the project in question is better than the location of the comparables and conservative approach of the investor.

3. Retail ERV

Retail in this area will be sub-optimal due to low footfall of the streets. The optimal variant would be renting the whole floor to either a car dealer or doctors plus pharmacy. However, this is purely speculative at this moment. Therefore, conservative rent of 180 CZK/sqm/month has been selected. The value is based on the undertaken market research and the experience of the investor with retail letting in Hradec Králové.

4. Garage Parking Space

According to the floorplans, there are 20 parking spaces planned in the underground level of the building. The price for the parking spot in the parking houses in Hradec Králové such as Parking house Katschnerka costs 6 000 CZK per year and 12 000 CZK per year in the park house RegioCentrum. The rent for parking spaces will, therefore, be set on 1 000 CZK/1parking space/month.

Areas

The basis for calculation of all rentable areas is the technical documentation of the project. The gross area of the first floor is approximately 390 square meter. It assumed that around 10% of that will be taken up by partition walls. The upper floors have approximately 1 200 square meters from which around 15 % will be used as corridors, common areas and for partitions. It is worth mentioning that in Hradec Králové it is not common to charge the tenants add-on factor for common areas and therefore this 15 % will not be counted towards the leasable area.

Incentives

Various forms of incentives such as rent free, capital contributions or stepped rent are an inseparable part of today's office market. At least when speaking about Prague office market. Nevertheless, smaller regional markets such as Hradec Králové which are not directly connected with international markets and thus with international institutions and investors are significantly more conservative. Based on a conversation with multiple office owners and investors located in Hradec Králové, tenants prefer more traditional and often more simple lease terms which is reflected in their request of lower headline rent. However, this lower value of headline rent is much closer to the effective rent value due to non-existing incentives. The absence of incentives is also connected to greatly different lengths of lease terms. Usual lease term length in Hradec Králové is one year with notice period of 3 months (Source: confidential internal data). In conclusion, incentives will not be incorporated into the model since they are not used on this particular market.

Based on those inputs so-called gross potential income of the property can be calculated. Gross potential income is income under the condition of a fully occupied property. Its calculation can be seen in Table 22.

Table 22 Calculation of gross potential income (created by Author)

Office area (1060 sqm) x Office rent (210 CZK/sqm/month)	=	222 600 CZK/month
Retail area (350 sqm) x Retail rent (190 CZK/sqm/month)	=	66 500 CZK/month
Parking spaces (20 units) x Parking rent (1000/unit)	=	20 000 CZK/month
<hr/>		
Total		309 100 CZK/month
Total (annually)		3 709 200 CZK/year

As can be seen, the gross potential income of the property is approximately 3 710 000 CZK per year. Further, gross and net operational income can be calculated. Gross operational income (GOI) is gross potential income less the credit and vacancy losses. Additional costs are generated due to a vacancy in a form of increased share on service charges.

Vacancy, credit and service charge loss

This is a compound item which introduces possible loss which could be incurred for multiple reasons. First being vacancy – this is an unavoidable cost an accounts for void periods between one tenant's exit and another tenant's start of lease, residual areas etc. Credit loss will be incurred if some tenant is not paying and leaves with unpaid debt. Furthermore, in a case of any vacancy investor will have to take part (relative to the vacant area) of service costs for common areas

on himself. Calculation of each individual cost described above would be very subjective and at this stage of the project probably not really based on hard data. Therefore, based on expert opinion of investor and other experts from office leasing business a percentage of annual income is deducted to cover these costs. Based on their experience 5 % of annual income has been chosen as an appropriate volume of these costs.

The volume of vacancy and above mentioned costs is stepped – first year 50 % vacancy, second year 25 % vacancy and third year operational vacancy 5% due to reasons described above. This scenario has been developed based on market experience and internal seminar of Přemysl Chaloupka, director of Knight Frank. The calculation of gross operational income can be seen in Table 23.

Table 23 Calculation of gross operational income (created by Author)

Gross potential income	3 709 200 CZK/year
Vacancy, credit and service charge loss (5%)	185 460 CZK/year
<hr/>	
Gross operational income	3 523 740 CZK/year

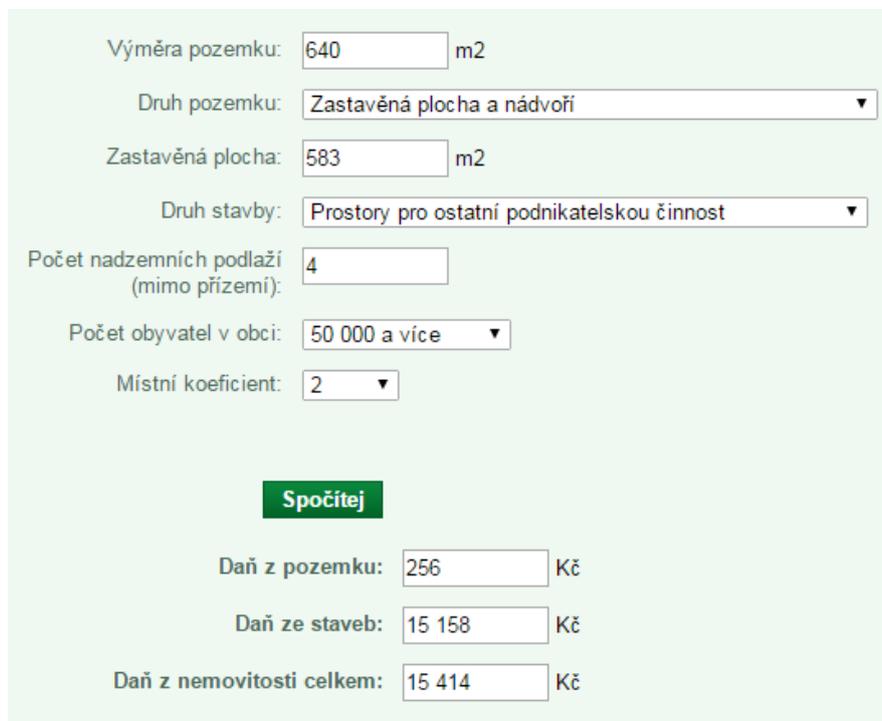
Afterward, the NOI is calculated by subtracting operational costs from the GOI. Since most of the maintenance and operational costs are directly charged to the tenants there is only limited amount of operational costs. The costs which are not commonly transferred on tenants in Hradec Králové are property tax, insurance of the property and some minor operational and maintenance costs connected with using the property such as maintenance of common areas. It is worth mentioning that in bigger office lease market even those costs are transferred on tenants. Therefore, tenants are actually directly responsible for all costs connected with operation of the property including net building insurance, net common area maintenance and net real estate taxes. Such lease conditions are called Triple Net Lease. Nevertheless, as mentioned this is common practice on bigger office markets whereas office market in Hradec Králové is quite conservative. Therefore, above mentioned operational costs have estimated as follows:

Building Insurance

The cost of building insurance was discussed with a property insurance agent who estimated that for the building of this size, type and location reasonable amount would be around 18 000 CZK per year. At this cost, level the insurance will basically cover only force majeure. The insurance coverage is based on the preference of investor.

Property Tax

The property tax has been calculated with a help of an online calculator on a website www.finance.cz. The calculation can be seen in Figure 15.



The screenshot shows a web form for calculating property tax. The input fields are as follows:

Výměra pozemku:	640	m ²
Druh pozemku:	Zastavěná plocha a nádvoří	
Zastavěná plocha:	583	m ²
Druh stavby:	Prostory pro ostatní podnikatelskou činnost	
Počet nadzemních podlaží (mimo přízemí):	4	
Počet obyvatel v obci:	50 000 a více	
Místní koeficient:	2	

Below the inputs is a green button labeled "Spočítej".

The calculated results are shown below the button:

Daň z pozemku:	256	Kč
Daň ze staveb:	15 158	Kč
Daň z nemovitosti celkem:	15 414	Kč

Figure 15 Calculation of property tax (Finance.cz, 2016)

The value of property tax is mainly dependant on the actual total volume of the building (built-up area), current use of the building, an amount of floors and location. Location defined mainly coefficients which are either generally recommended by state or regulated by a local municipality. Furthermore, the size and type of the land are also considered. The total property tax for proposed building is approximately 15 500 CZK per year.

Operation & Maintenance Costs

Operational and maintenance costs are estimated based on the investor's experience his other projects and similar properties which he currently owns and manages. Investor benefits from synergies created by simultaneously running a construction company which takes care of all technical maintenance. Therefore, the non-recoverable operational costs³ are estimated to be 3 % of gross operational income.

Based on the above-described inputs and previously calculated gross operational income NOI has been calculated, see Table 24.

³ Non-recoverable costs are costs which for any reason are not charged to the tenants

Table 24 Calculation of net operational income (created by Author)

Gross operational income	3 523 740 CZK/year
- Operational costs	138 712 CZK/year
Property tax	15 000 CZK/year
Insurance	18 000 CZK/year
Regular non-refundable O&M costs (3%)	105 712 CZK/year
<hr/>	
Net operational income (NOI)	3 385 028 CZK/year

NOI of the property is approximately 3 390 000 CZK/year. It is noteworthy, that all shown calculation are based on the basic inputs and are not indexed. The cash flow model itself does take into account indexation and therefore the actual figures will differ. Nevertheless, operational costs represent only costs connected to the property itself. When assessing the feasibility of whole project additional costs have to be incorporated into the model. Interest payments (cost of debt financing), capital expenditures and real estate agent fees, in particular, are the additional project costs which need to be deducted to arrive at the project cash flow (Wyatt, 2007).

4.2.3 Debt Financing

However, to calculate project cash flow the debt financing schedule needs to be created to subsequently calculate annual interest payments. Thus annual opening and closing debt balance have to be calculated based on the predefined regular debt repayment. The repayment is set up as a constant principal repayment plus interest payment. The interest payment gradually decreased with time as the remaining debt is being lowered through repayments. It is important to note, that development financing such as this one is only possible when the investor can prove the future profitability of the project to the financing bank. This is usually done through reservation contracts or preliminary heads of terms confirming the tenant's interest in letting premises in the property. Alternatively, when there are no such preliminary contracts available bank can demand to mortgage another of property in investor's ownership. The second scenario presents a greater risk to the investor.

Other factors to consider when simulating the use of debt financing in cash flow model are a timing of drawing the debt, beginning of repayment and the rate of repayment. An investor can delay drawing the debt until he has some equity left to finance the project or he can delay using the equity to the later stage of construction. Both approaches have their advantages, drawing the debt later decreases the interests paid during the non-operating phase of the project. On the

other hand, using the equity later enables the investor to use the equity in meantime for other investments. However, the delaying the use of equity is most of the time not acceptable by the bank because the bank needs the investor to share the risks of the project from the beginning (Yescombe, 2013). Therefore, in this analysis, the compromise is used and debt and equity are drawn equally from the beginning of the project which is common practice in the development. Beginning of the repayment mainly payment of the interest is another thing to consider. There are basically two scenarios which can be used. Either the investor pays the interest from the moment he draws the debt financing from the equity or he does not pay the interest until the project is operational and service the debt. Again there are advantages to both of scenarios where paying the interest from the beginning reduces the total amount paid for interest but increased the total equity drawdown. Paying the interest only when the project is operational means accumulating the interests into the total debt drawdown and therefore reflects in higher interests. Later described scenario has been used in the model due to the limited amount of equity of investor. When it comes to the rate of repayment most of the investor choose to prolong the repayment as much as possible to reduce the regular payments and also to take advantage of time value of money (Yescombe, 2013).

In connection to the future profitability of the project, financing banks also look very closely at debt-service coverage ratio (DSCR) which represents project ability to cover debt-service (annual repayments) by its free cash flow. DSCR is calculated as net operational income divided by debt service – interest payments and principal repayments (Yescombe, 2013). The calculation can be described by following Eq. (12).

$$DSCR = \frac{NOI}{TDS} \quad (12)$$

where

DSCR – Debt service coverage ratio;

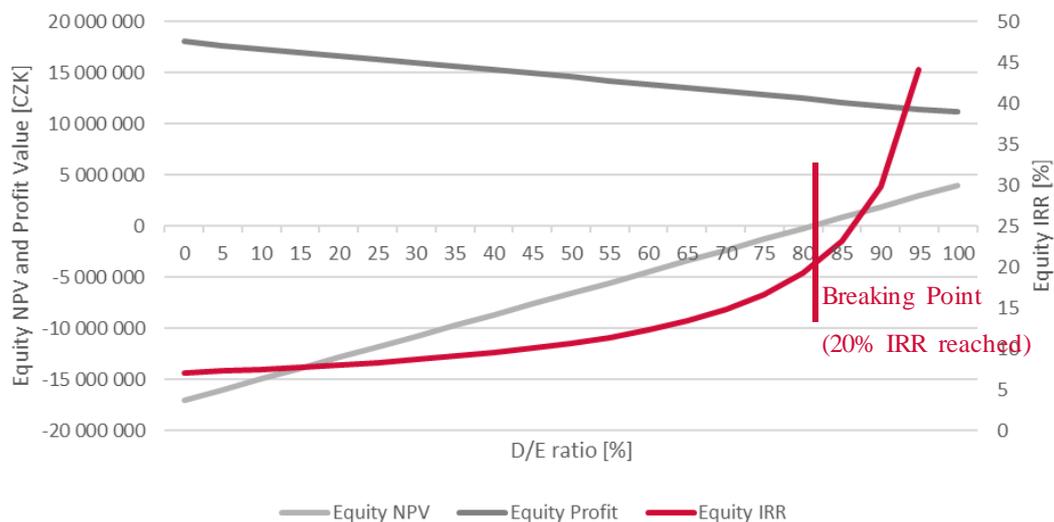
NOI – Net operating income; and

TDS – Total debt service – interest payments plus principal repayments.

The minimum DSCR requirement varies between banks and projects but in general, it has to be higher than 1 and usually banks require the minimum of 1,2:1 ratio (Mc.Mahan, 2007). If the ratio would be too close to 1 then the ability of the project to pay debt obligation is very uncertain and even slight decline in cash flow would cause inability to service its debt.

Nevertheless, before DSCR or repayment schedule can be calculated the actual volume of debt financing has to be decided. The amount is most commonly expressed through so-called debt-equity ratio or loan-to-value. Debt-equity ratio (D/E ratio) is more commonly used in development projects and loan-to-value when financing property investment. The level of debt which can be raised for the project is often a crucial factor in total evaluation from the investor point of view. This is because usually increasing debt-equity ratio also increases the equity IRR of investor through his lower equity commitment (Yescombe, 2013). In particular, for the project in question and parameters set above the relationship between debt-equity ratio and equity IRR is shown in Table 25.

Table 25 Relationship between D/E ratio and equity IRR, NPV and profit (created by Author)



As can be seen, the IRR dramatically increased with high values of the debt-equity ratio. Nevertheless, there are two factors which have to be considered. Firstly, the IRR on equity is increasing but the actual absolute profit is decreasing. Secondly, the high D/E ratios (75:25 and more) are unreachable for most of the common developers. Higher ratios are mostly achievable in project finance of PPP projects such as power stations, public infrastructure and projects of similar importance and support of local government. Another conclusion which can be drawn based on Table 25 is that for the project to meet the required investor's required rate of return D/E ratio of at least around 80:20 would have to be achieved if other assumptions would stay the same.

Debt financing has yet another advantage in form of so-called tax shield. Tax shield is realized through tax deductible costs in form of debt interest. Therefore, the base for calculation of

income tax is lowered which is just another benefit of debt financing. The process of calculation of debt financing is as shown in Table 26.

Table 26 Financing calculation example

Opening Balance (year 4)	29 808 000 CZK
- Principal Repayment repayment (year 4)	1 145 000 CZK
Interest Payment 2,5 % (year 4)	745 200 CZK
Closing Balance (year 4)	28 663 000 CZK
<hr/>	
Opening Balance (year 5)	28 663 000 CZK

At the beginning of each year, the opening balance and corresponding interest are calculated. In general, interest can be applied monthly, quarterly or annually. As indicated in the presented calculation, annual interest calculation has been applied here. Interest repayment actually counts towards project cash flow as an additional cost. As opposed to the principal repayment which is only paid from actual positive project cash flow and reflects only in final equity cash flow. After the principal repayment is paid it is deducted from the opening balance to arrive at closing balance of that year. At the end, closing balance transfers as the value for the opening balance of the following year.

4.2.4 Project Cash Flow

At this point, NOI of the property has been calculated and the amount and cost of debt financing are known. Nevertheless, in order to be able to assess the project cash flow some additional costs have to be considered. Such additional costs are particularly capital expenditures, letting agent fees and the cost of sale of the property – legal, real estate agent fees.

Capital Expenditures

Another recurrent cost which has to be incorporated into the model are capital expenditures (CAPEX). CAPEX are periodic repairs which ensure the good technical condition of the building and also property upgrades which maintain the attractiveness of the property and therefore prolong its economic life. The investor again benefits from the synergy of running the construction company, too. The investor usually carries out all construction related works by his own resources when they are idle – mainly in the winter season when most of the major construction activities are on hold. Therefore, investor's costs related to CAPEX are greatly reduced. CAPEX will be calculated by % of property value and the percentage is set by investor's experience and following CAPEX history of another of his properties which he owns for 18 years. Complete track of CAPEX related to the property on Pavla Hanuše street is shown in Table 27.

Table 27 CAPEX history on property in Pavla Hanuše street

Property: Pavla Hanuše	
CAPEX History	
Item	Cost
Revitalization of heating system and replacement of boilers	150 000 CZK
Roof renovation and heat insulation	315 000 CZK
Facade revitalization (2x)	60 000 CZK
Installation of A/C units	340 000 CZK
New lowered ceiling in restrooms	75 000 CZK
Total CAPEX	940 000 CZK
Estimated value of property	9 800 000 CZK
Time period	21 years
Total CAPEX in relation to property value	9,59 %
Annual CAPEX percentage	0,46 %

*All values were indexed to present value

Property value has been calculated based on the valuation through comparison, capitalisation and "administrative" method. The valuation estimate is a private document of the investor and therefore will not be publicly disclosed. Nevertheless, based on CAPEX history shown in Table 27 an amount representing 0,50 % of property value should be allocated for CAPEX annually. Different nature of each building has to be taken into account. Mainly that the property at Pavla Hanuše street is extremely simple from the technological and equipment point of view. The property which is to be constructed in the project Horova will have an elevator, more complex A/C system and more, which will definitely reflect in the value of necessary CAPEXs. Generally, recommended % is around 2 % of property value per year in form of creating reserve fund (Wyatt, 2007). However, this value does not take into account the synergies present in this particular case. Therefore, CAPEXs at the level of 1% of total construction costs will be assumed in the cash flow model.

Letting Agent Fees

Fees of letting agents are another aspect of office real estate market in smaller towns such as Hradec Králové compared to Prague office market. In Prague letting agents take as much as 30% of annual rent. Whereas local agents in Hradec Králové usually take approximately 1 month rent. The difference is caused mainly by the length of the typical lease term in each market.

Cost of Sale

Furthermore, a cost of sale of the property has to be incorporated into the model. Usually, a fee of a real estate agent is approximately 1,5 % of selling price for a relevant price range between

40 to 100 million CZK. Most of the time, the fee includes legal services needed for the vendor (in our case the investor) which include preparation of reservation and purchase agreement.

Exit Yield

Based on the undertaken market research and personal experience with the present market the value of exit yield is estimated at 8 %. The latest report of Cushman & Wakefield reports office country yields around 6 %. However, these report usually include Brno and Ostrava and therefore are not fully relevant to the Hradec Králové and also at the time of sale the condition will probably change. Therefore, the extra contingency of +2 %.

All above-described numeric inputs and assumptions for original project strategy are summarized in following Table 28.

Table 28 Summary of cash flow model inputs for original strategy (created by Author)

INPUTS			
Initial Investment		O&M Assumptions	
COST OF LAND	2 000 000 CZK	Vacancy and credit loss year 1	50,0 %
Design and Engineering	1 100 000 CZK	Vacancy and credit loss year 2	25,0 %
CONSTRUCTION COSTS	36 000 000 CZK	Average vacancy, credit and service charge loss	5,0 %
Year 1 CC Distribution	50 %	O&M non-recoverable costs	3,0 %
Year 2 CC Distribution	50 %		
Contingency 5,00%	1 800 000 CZK		
TOTAL DEVELOPMENT COSTS	40 900 000 CZK		
Required rate of return	20 %		
Rents		CAPEX	
ERVs		Letting fees	One month rent
office	210 CZK/sqm	Fitout contributions	0 CZK/year
residential	200 CZK/sqm	CAPEX	360 000 CZK/year
retail	190 CZK/sqm	Warranty	5 years
storage	55 CZK/sqm		
parking	1000 CZK/unit		
Areas		Financing	
office	1060 sq m	Debt-equity ratio	70 %
retail	350 sq m	All in interest	2,50 %
parking	20 units	Payment term	5 years
residential	0 sq m	Regular Repayment	1 145 000 CZK
		Amortization p.a.	4,00 %
		Exit	
		Year of exit	5 years
		Exit Yield	8 %
		Cost of Exit Sale	1,5 %

When all of the above-described inputs have been assessed project cash flow can be determined. Project cash flow is the point where described inputs are applied to relevant phases and time of the project. As described in Chapter 2.2.2 cash flow reflects periodical cash inflows and outflows – incomes and expenditures. The model developed for the calculation and analysis of the cash flow of this project can be seen in Table 29.

Table 29 Preview of cash flow model for original strategy (created by Author)

Year	1	2	3	4	5
Initial Investment					
Land acquisition	-2 000	0	0	0	0
Design and Engineering	-1 100	0	0	0	0
Construction	-18 900	-18 900	0	0	0
Property Costs&Revenues					
Rent - offices	0	0	2 698	2 725	2 752
Rent - retail	0	0	806	814	822
Rent - parking	0	0	242	245	247
Gross Potential Income	0	0	3 746	3 784	3 822
Vacancy, credit, service charge loss	0	0	-1 873	-946	-191
Gross Operational Income	0	0	1 873	2 838	3 631
Insurance	0	0	-18	-18	-18
Property Tax	0	0	-15	-15	-15
Regular non-refundable O&M	0	0	-56	-85	-109
Total Net Operating Income	0	0	1 783	2 719	3 488
Accumulated NOI	0	0	1 783	4 502	7 990
Additional Costs					
Letting Agent Fee	0	-156	-82	-68	0
CAPEX	0	0	0	0	0
Interest	-385	-725	-744	-720	-691
Cost of Sale	0	0	0	0	-654
Total Additional Costs	0	-156	-825	-788	-1 345
Accumulated Costs	-385	-1 266	-2 092	-2 880	-3 571
Exit Value	0	0	0	0	43 597
Project Cash Flow (FCFF)	-22 000	-19 056	958	1 931	45 740
Accumulated Project Cash Flow	-22 000	-41 056	-40 098	-38 168	7 573

Numbers seen in Table 29 are relevant to the inputs described in this chapter and summarized in Table 28. It is important to note that CAPEXs are equal to zero in this model. The reason being that the investor knows that he is going to sell the building when fully leased and therefore does not need to bind his equity in a form of reserve fund for future CAPEXs. Nevertheless, the project cash flow as seen in Table 29 is not clearly showing the most important thing for the investor – equity cash flow. Investor primarily looks at how much equity needs to be invested and the equity multiply he can get over the time of a project. Therefore, further analysis needs to be undertaken where the project cash flow is stripped of debt financing and shows the equity movements. Equity cash flow can be derived from the project cash flow through further deduction of the principal repayment as seen in Table 30.

Table 30 Calculation of equity cash flow (created by Author)

Project Cash Flow (year 4)	1 931 000 CZK
- Principal Repayment	1 145 000 CZK
Equity Cash Flow	786 000 CZK

Principle shown in Table 30 is applied to the whole duration of the project and following equity cash flow is derived as seen in Table 31.

Table 31 Preview of modeling the equity cash flow (created by Author)

Project Cash Flow (FCFF)	-22 000	-19 056	958	1 931	45 740
Accumulated Project Cash Flow	-22 000	-41 056	-40 098	-38 168	7 573
Financing					
Regular Repayment	0	0	-958	-1 145	-27 637
DSCR before tax	0,00	-0,22	1,00	1,42	0,12
Opening Balance	15 400	29 015	29 740	28 783	27 637
Closing Balance	15 785	29 740	28 783	27 637	0
Net Borrowing	0	0	-958	-1 145	-27 637
Equity Cash Flow	-6 600	-5 670	0	786	18 103
Accumulated Free Cash Flow			0	786	18 889
Accumulated Equity Position	-6 600	-12 270	-12 270	-11 484	6 619
Equity DCF	-6 600	-4 725	0	455	8 730
Accumulated DCF (NPV)	-6 600	-11 325	-11 325	-10 870	-2 140

As can be seen, equity cash flow is directly below discounted with the use of the required IRR (20%) as a discount rate using the Eq. (7). In the preview showed above it can also be seen that the accumulated equity position at the end of the project is 6 619 000 CZK while the minimum value accumulated equity position is – 12 270 000 CZK which translates into the maximum equity drawdown needed for this project. Equity cash flow itself is used for the calculation of IRR of the project with the Eq. (8). Based on the described calculation and modelling following outputs of the cash flow model can be acquired, see Table 32.

Table 32 Summary of cash flow model outputs (created by Author)

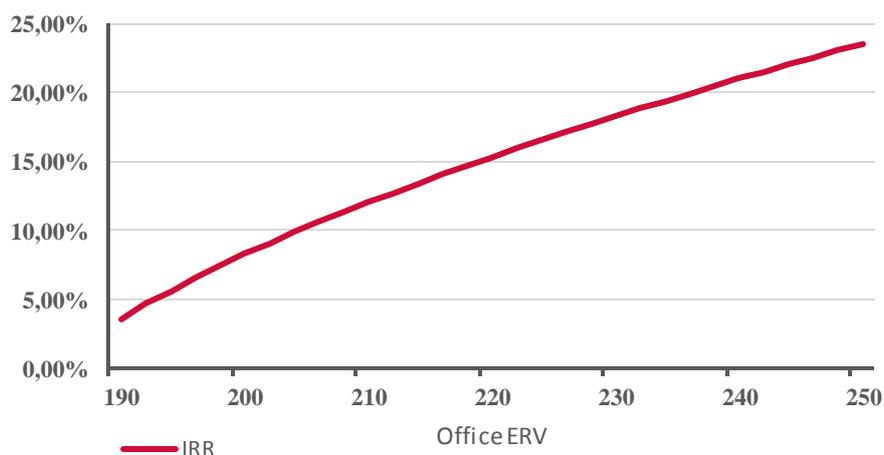
OUTPUTS	
Initial Investment	40 900 000 CZK
Annual IRR on equity	12,04 %
Equity Multiple	1,54 x
Equity NPV (rRoR 20%)	-2 140 000 CZK
Maximum Equity Drawdown	12 270 000 CZK
Total Debt Drawdown	29 740 375 CZK

It can be seen, that the project as is does not meet the requirements of the investor since the IRR is only 12,04 % which is far below the hurdle rate of 20 %. Being below the hurdle rate reflects in a negative value of NPV which is – 2 140 000 CZK. However, equity multiply is reasonable with the value of 1,54. Nevertheless, the outputs point to the fact that further analysis of the project should be undertaken based on which some of the inputs could be changed. In case the project does not perform at the required level even after adjustments the project itself should be reconsidered or the overall strategy should be changed.

4.2.5 Sensitivity Analysis

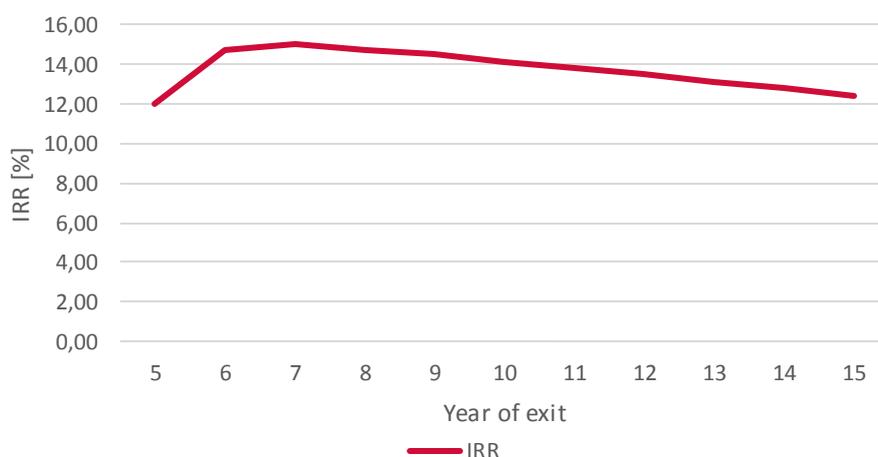
Based on the results of the original cash flow model sensitivity analysis will be undertaken and better setup of the current project will be hopefully found. It is important to mention that whenever analysing model sensitivity on one input other inputs are set at original values from the previous chapter, if not stated otherwise. First major inputs which can be reconsidered are the ERVs. Values used in the previous chapter were fairly conservative especially in the case of offices. Therefore, simulation of the impact of ERV ranging from 190 to 250 CZK/sqm/month on the IRR has been run and the results can be seen in Table 33.

Table 33 Relationship between IRR and office ERV



The graph shows that the IRR increases rapidly with the increasing office ERV and when reaching value around 240 CZK/sqm/month even reaches the hurdle rate of 20 %. Nevertheless, the market analysis showed the ERV of 240 CZK/sqm/month is basically the top rent achievable in Hradec Králové and therefore it would be very risky to assume that all the areas would be leased for such a premium rent. However, when reconsidering the project at the end of this chapter it will be taken into account that slight increase in ERV could help the project a lot. Another input sensitivity which will be analysed is the duration of the project. The original assumption has been to sell the project immediately after fully occupied (or at least 95%). So the analysis for the duration spanning from original 5 years to 15 years has been carried out, see Table 34.

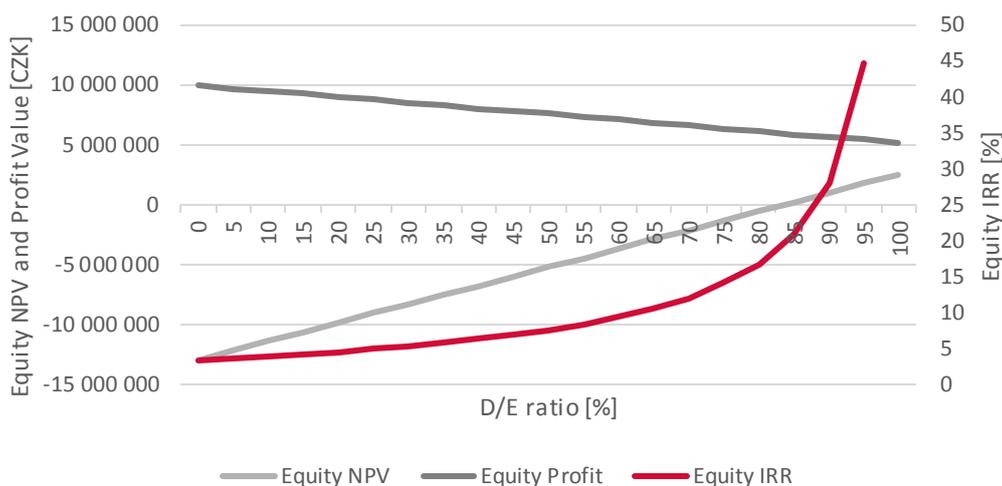
Table 34 Sensitivity Analysis - IRR on year of exit



The highest reached IRR of 14,99 % can be spotted when exiting the project in the 7th. Prolonging the ownership of the building does not present any problem to the investor. During

those years property generates considerable positive cash flow, repays the principal and CAPEXs should still remain minimal. Therefore, prolonging the project will definitely be considered. The last input which can be realistically variable with major influence over the project performance is the amount of debt financing used. The Same relationship has been already showed in the Chapter 4.2.3, the Table 35 shows the relationship for specific inputs of this project.

Table 35 Sensitivity analysis - IRR, NPV and profit on D/E ratio (created by Author)



In the context of improving the IRR of the project, the D/E ratio kicks in around 55 %- Nevertheless, the required IRR of 20 % is reached only around 85 % and above. Also, any debt financing with D/E ratio above 70 % is quite rare and usually gets distinctively more expensive. Therefore, the D/E ratio is probably not viable tool when improving the project IRR since we already assume D/E ratio of 70 %.

Based on the gathered outputs of the sensitivity analysis last model has been created. It is a sensitivity analysis researching the relationship of two inputs – office ERV and duration, on the IRR simultaneously. The D/E ratio is considered constant at the level 70% because it is unlikely that the investor would be able to get the higher level of gearing than that. The results of this analysis can be found in the Attachment 1. Based on these results it can be seen that until the ERV value of 220 CZK/sqm/month the best IRRs are gained with duration of the project of 7 years. In case ERV would rise above the 220 CZK/sqm/month duration of 6 years is preferable. Nevertheless, differences are really small and for the purpose of this feasibility analysis are negligible. More interestingly, the model shows that when the ERV drops below 200 CZK/sqm/month higher IRR is reached with longer duration of the project – exiting the project around the 11th year of the project.

Based on the undertaken sensitivity analysis following inputs will be used for further assessment of the original project strategy:

Duration:	7 years
Office ERV:	215 CZK/sqm/month
D/E ratio:	70 %

The increased office ERV is discussable since the market analysis shows that higher ERV are offered on the market. Nevertheless, based on the experience and conservative nature of the investor base case will be modelled with only slightly adjusted ERV.

4.2.6 Evaluation

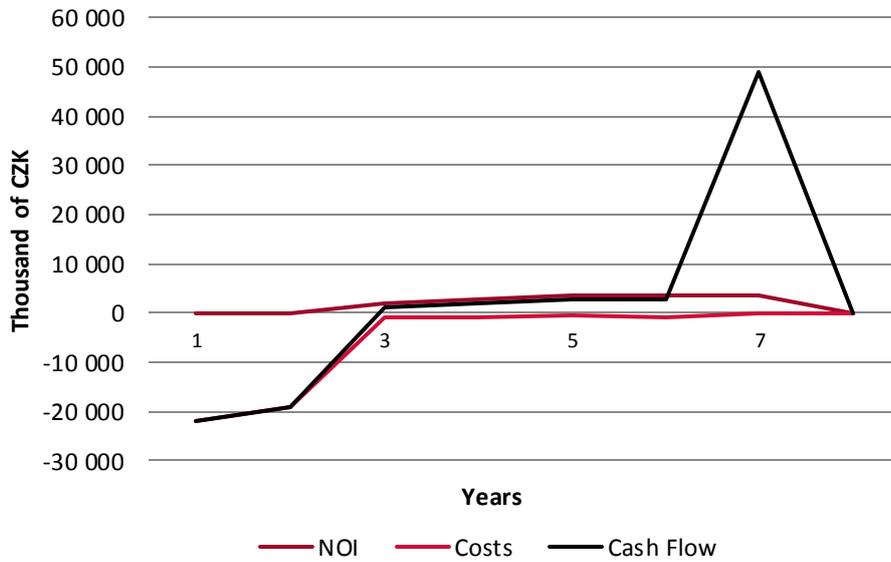
The updated base scenario has been modelled based on the alternated inputs from the sensitivity analysis, the outputs can be seen in Table 35. As can be seen, thanks to just those minor input changes the IRR increased to 16,31 % which is more 4 % difference from the previous results.

Table 36 Cash flow outputs for modified inputs (created by Author)

OUTPUTS	
Initial Investment	40 900 000 CZK
Annual IRR on equity	16,31 %
Equity Multiple	2,28 x
Equity NPV (rRoR 20%)	-1 399 000 CZK
Maximum Equity Drawdown	12 270 000 CZK
Total Debt Drawdown	29 740 375 CZK

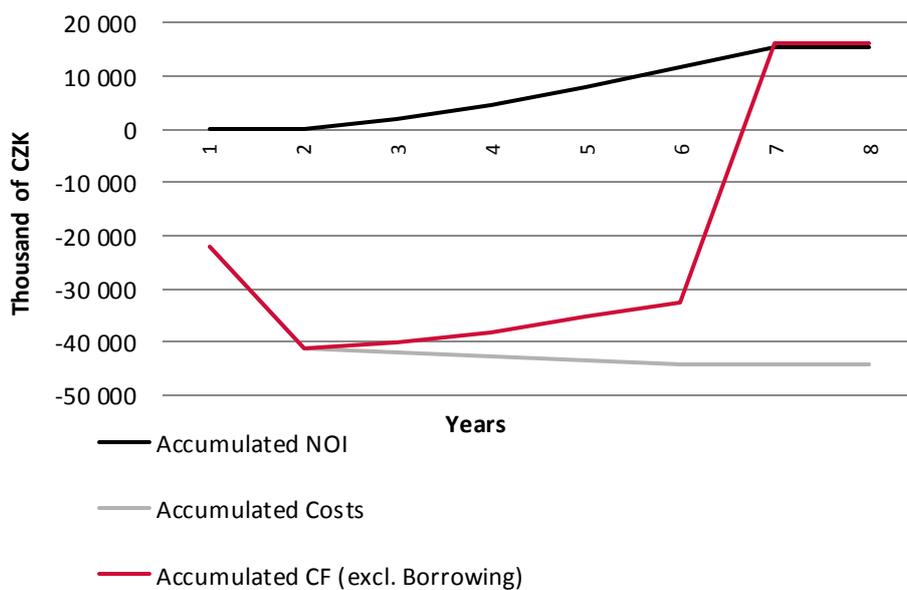
Despite the increased value of IRR, it still does not meet the requirements of the investor. Nevertheless, the net equity profit is approximately 15 300 000 CZK which reflects in the equity multiply factor of 2,28 realized in 7 years. These numbers could be acceptable by the investor. However, firstly the overall healthiness of the project will be assessed. Following Table 37 shows yearly running items such as NOI, project costs and total cash flow.

Table 37 Yearly running items for adjusted inputs (created by Author)



Since the completion of the construction works in year 2 project should generate positive cash flow. The income steadily increased over the first 3 years with increasing occupancy of the areas. The spike at seventh year of the project is caused by the sale of property for approximately 45 000 000 CZK which is more than achievable if the current trends remain the same. Next graph is demonstrating the accumulated positions of NOI, costs and project CF during the project, see Table 38.

Table 38 Accumulated NOI, project CF and costs (created by Author)



The interpretation of this graph is very similar to the previous one. Only Table 38 clearly shows that until the sale of the property the project itself is in negative numbers. Nevertheless, due to the use of gearing the main focus is on the equity position which can be seen in Table 39.

Table 39 Accumulated position of equity position, free cash flow and debt position (created by Author)

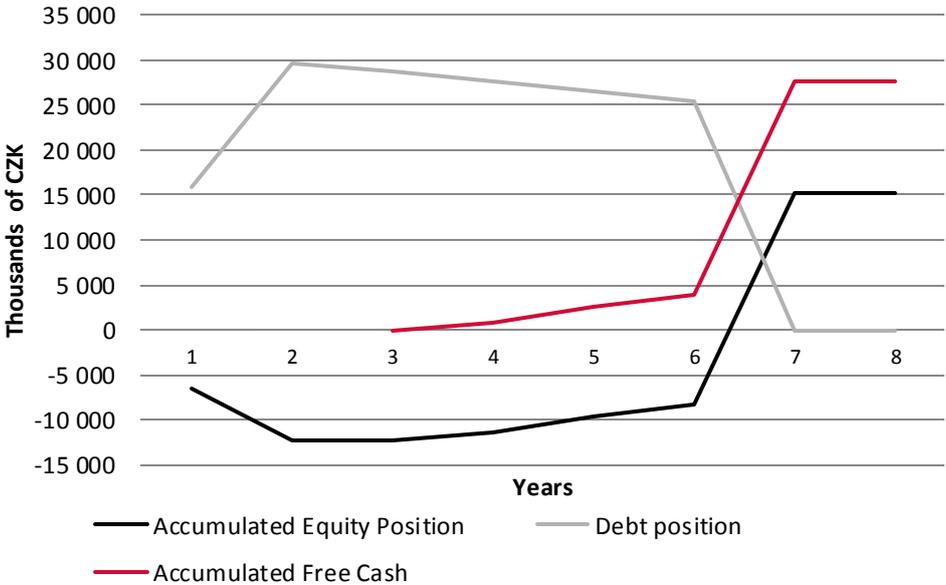
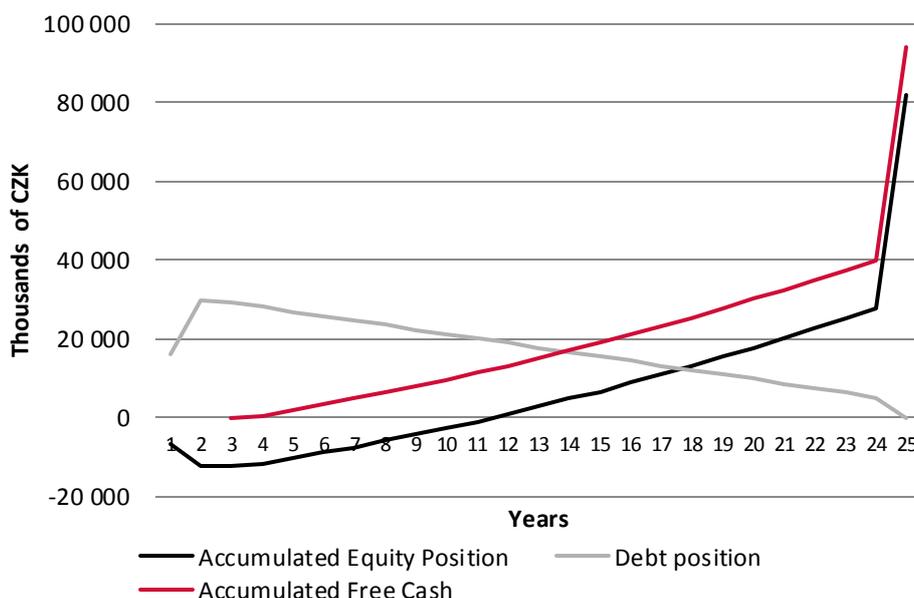


Table 39 shows the equity position and other relevant items – free cash flow and debt position. It can be seen, that project generates free cash flow for the investor already in the fourth year of the project. Free cash flow is the net profit of the investor from the project which can be immediately used for other investments. However, the equity position gets to the positive numbers again only after the sale of the property. It is also evident that the project is able to service the debt since from the second year the accumulated debt position is starting to decrease. All graphs show the immense impact of the sale of the property on the whole performance of the project. Therefore, following graph on Table 40 shows the long-term variant of the project where the investor would decide not to sell the property early.

Table 40 Accumulated position for long-term hold of the property



There can be multiple reasons for the decision not to sell the property as for example no other investment to invest the money from the sale into, property performing over the anticipation or most notably adverse condition on the real estate market reflecting in high yield required by potential investors.

4.2.7 Risk Identification

Following the assessment of the scenario with adjusted inputs, basic risk analysis will be undertaken. Any development project copes with common construction risks which mainly represent running over the budget, not meeting the deadlines or not building to the quality standard required caused by a vast amount of factors. Such risks are not the objective of this chapter. Specific risks connected to this project should be identified and shortly analysed in the following text.

As mentioned in Chapter 4.1, project Horova dealt with major problems while obtaining the building permit in the 90s. Since then the investor gathered much more experience in dealing with the local municipality and is confident that renewal of the building permit should not be a problem. Therefore, this risk has been greatly reduced and should not pose a danger to the realization of the project. Another risk is the development of another modern office building in Hradec Králové which would be much greater competition than present properties described in the environment analysis. This risk has been recently partially realized through the development

of AuPark which contains around 1 500 square meters of office areas. Nevertheless, the AuPark has been fully leased in the moment of the opening and should not act as a competition for a couple of years. On the contrary, the success of the AuPark office lease showcases that there is unanswered demand for the higher standard office in Hradec Králové. Unfortunately, lease terms nor rents in AuPark are not known on the public market the properties cannot be directly compared. Nevertheless, the risk of new office building remains and the market has to be closely monitored. Next risk is closely connected to the first risk relating to the owner of the neighbouring land and building who filled several objections in the past building permits approval process. Nevertheless, all his objections have been already rejected by the municipality and it is believed that their decision would be the same in case it is needed.

Furthermore, the future progression of the real estate market can play a significant role in the profitability of the proposed project. However, as described in Chapter 3.1.3 major developers, institutions and investors are united that the trend of rising real estate business should continue for at least 2 more years. Nevertheless, the general economic situation and real estate market are probably at their peak nowadays and therefore a downturn should be anticipated which could negatively influence the process of finding the tenants. The risk of market downturn becomes only more important with rising the office ERV in the previous modelling. This risk is very relevant and should be considered when assessing the timing of the project.

As said, this chapter should only cover the preliminary identification of the project specific risk and alert the investor of any extreme risks if any were found. However, none of the risk mentioned above should be considered as extreme but there are couple of risks which should be closely monitored and assessed regularly.

4.2.8 Summary

In this chapter, cash flow model of the original strategy has been developed. Based on the cash flow model the IRR of the project has been calculated with the value of 12,04 %. This value is far below the hurdle rate of 20 % required by the investor. Therefore, sensitivity analysis of the model has been undertaken to identify potential improvements. The sensitivity analysis showed that the performance of the project is greatly dependant on the level of D/E ratio, office ERV and planned year of exit. D/E ratio of the project is already at the maximal level for the project of this type, therefore, the adjustments of the other two inputs has been implemented. The office ERV changed from 210 to 215 CZK/sqm/month and the duration of the project changed from 5 to 7 years. These slight changes resulted in the improvement of the project performance which

has been illustrated by the growth of more than 4 % of IRR from 12 % to almost 16,31 %. Nevertheless, it is still not the value the investor requires. Furthermore, investor had already considered the value of office ERV 210 CZK/sqm/month as being on the optimistic side. This is even though the real estate market itself is in general flourishing. The explanation for the office project not being currently feasible in Hradec Králové is probably that the office rents have barely increased at the last twenty years. The tenants which are in some of the buildings of the investor have been paying the same rent since the 90s and their rent is still higher than the average which has been calculated based on the market research. However, the construction and other prices have increased appropriately with the development of the Czech Republic economy. In conclusion, the original strategy is not recommendable in the current market state.

4.3 Possible alternative strategies

Since the undertaken analysis shown that original project strategy does not perform well enough to meet investors requirements alternative strategies should be considered. Following alternative strategies will be limited to those which are worth considering and make general sense in relation to the location and investor's experience.

4.3.1 Student Accommodation

First of the alternative strategies could be remodelling the project into the student house. The investor has extensive experience with building and operating such buildings with the focus on international students. Therefore, it would be a logical continuance of his activities and an expansion of his portfolio. Such house would incorporate approximately 24 flats each with circa 40 square meters and retail areas on the ground floor as in the original strategy. The layout of the flats would be 1+kk or 2+kk which are the most demanded layouts among international students. The conversion of the upper floors into flats has been consulted with the architect of the original project and basic drafts of possible floor layouts have been prepared. The typical floor can be seen in Figure 16.

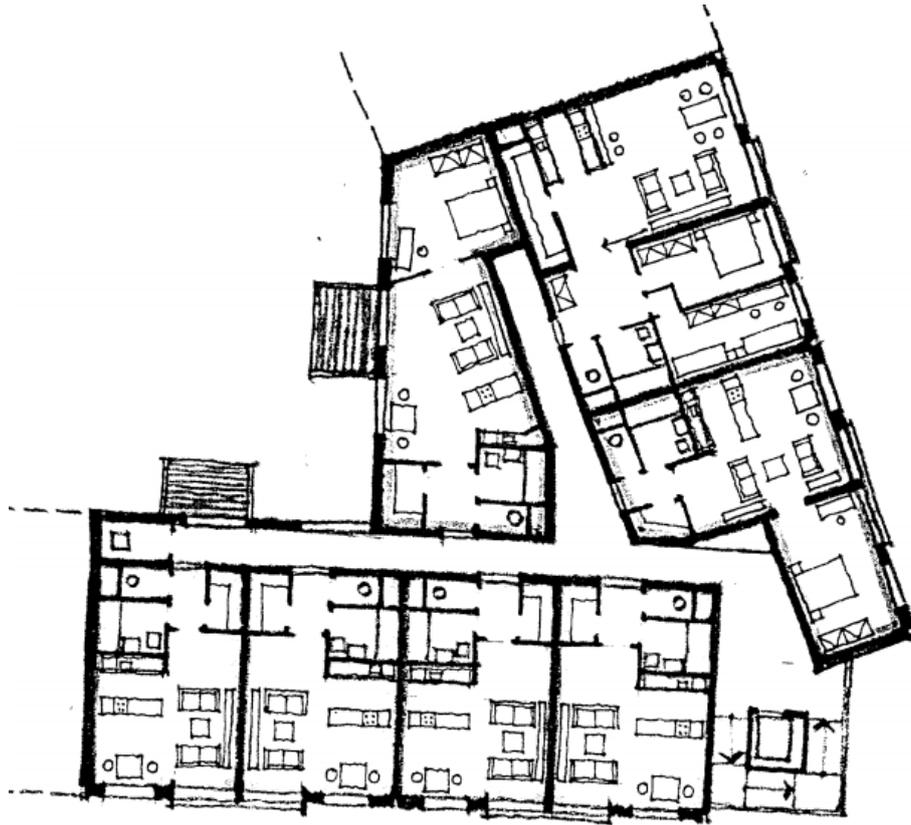


Figure 16 Layout of typical floor for residential strategy (internal database of the investor)

Nevertheless, the location of the project is not ideal. International students prefer mainly locations either near the city centre or in close proximity to their university. The location of the project is fairly close to the University of Hradec Králové which is the biggest university in town. The main campus of the university is approximately 2 kilometres away. The investor owns a building with 8 similar flats 2+kk which are rented for 12 500 CZK including service charges. The net rent is approximately 10 000 CZK. The rent for the flats in proposed project would have to be discounted due to the inferior location. Also, different layouts would have to be considered.

Overall, this strategy could be feasible under specific circumstances. Therefore, the strategy will be firstly evaluated through the residual method which has been explained in the Chapter 2.2.1. The inputs for residual appraisal were taken from the original strategy where relevant, from stavebnistandardy.cz and rest was estimated based on similar inputs and experience of the investor. Key values from the residual appraisal can be seen in Table 41.

Table 41 Key values of residual appraisal – student apartments (created by Author)

Residual Appraisal - Student Apartments		
Total Gross Development Value	56 490 000	CZK
Total Construction Costs	42 248 000	CZK
Total Development Costs	45 701 354	CZK
Developers Profit	10 788 646	CZK
Developers Profit	23,61	%

It can be seen, that the developer's profit at level of 24 % is higher than the required rate of return. Nevertheless, the residual method does not discount any cash flows and therefore the outcome is not directly comparable with the outcome of DCF method. Still, the outcome is positive and this strategy can be further considered. It is worth mentioning that the higher developer profit is mainly due to higher achievable capitalisation rates for residential development. Also, this strategy would mean a fundamental change in the duration of the project due to the long-term ownership of the property.

The risk which has to be considered concerning this strategy is the necessity of the change of the zoning plan. However, as discussed in the Chapter 4.1.1 the developer plans to engage this projects in the year 2018 earliest which provides enough time for the change of zoning plan. Furthermore, the potential value added can be found in the omission of the underground level with parking spaces due to the nature of tenants – international students which usually don't have a car. Nevertheless, regulations concerning the necessity of parking spaces in such types of buildings are not clear in Hradec Králové and this would be dependent on further negotiations with the local municipality.

However, the strategy of development and long-term ownership of student apartments is in line with the strategy of property companies and funds as described in Chapter 2.3.2. Such strategy would most likely bind too much of the investor's capital for too long and does not differ much from the development of office building which would not be sold. Otherwise, the property would have to be sold as a whole. However, finding such investor willing to buy a student house accommodation in Hradec Králové could prove problematic. Therefore, it is not optimal in this form for this investor. The residual method is based on the principle of the development value which in this project would be realised in too long period and the potential sale includes high risk of not finding the investor or necessity to provide substantial discount. Overall, the strategy suffers from the sub-optimal location for international students and the long-term duration.

4.3.2 Apartments

Traditional development of residential building such as a block of flats is also an option. As described in the market analysis, residential sector of real estate market is on the rise and the prices have rapidly increased over the past two years (+20%). It is also expected that the positive atmosphere on this sector should last for next couple of years. The growth will probably slow down but the price should remain more or less stable.

The most demanded flat layouts are 1+kk and 2+kk reflecting the rise of affordable housing. The amount of flats would, therefore, be very similar to the previous strategy. Nevertheless, the top floor provides an opportunity to develop high standard apartments with large terraces and spectacular view. The layout of the build would be:

- 1st floor – retail areas;
- 2nd floor – mix of 1+kk and 2+kk apartments;
- 3rd floor - mix of 1+kk and 2+kk apartments;
- 4th floor – high standard apartments (2-3x) with approximately 100 sqm of useable area and spacious terrace.

Therefore, the building would offer approximately 18 standard flats, 3 high standard flats, approximately 240 square meters of retail and underground parking. The inputs and results of the residual method for this strategy are very similar due to the principle of the method which does not differentiate between long-term (leasing the apartments) and short-term (selling the apartments) natures of the strategies. The results can be seen in Table 42.

Table 42 Key values of residual appraisal – residential (created by Author)

Residual Appraisal - Student Apartments		
Total Gross Development Value	59 322 000	CZK
Total Construction Costs	42 248 000	CZK
Total Development Costs	47 191 286	CZK
Developers Profit	12 130 714	CZK
Developers Profit	25,71	%

As can be seen, the profitability of this strategy is even higher. Also, development of flats for individual sale is much more conservative and standard strategy. In relation to the RE market research, the residential sector is on the rise and, therefore, this strategy seems preferable.

The parking is possibly the weakness of this strategy since Hradec Králové has very strict rules concerning the amount of parking spaces to the residential capacity of the building. The amount of currently planned parking spaces would have to be increased by 5. It could be arranged for

through offering parking spaces on a parking lot adjacent to the investor's building in the street Pavla Hanuše which is very close to the project location. Otherwise, this strategy presents the same issue with the zoning plan as the previous one but as stated before it should not present a problem due to planned start of the project in 2018. The strategy seems feasible and will be further considered.

4.3.3 Negotiate to sell the project to developer

Another option would also be to sell the project as a whole to another developer. The investor has already engaged in some negotiations. The asking price is approximately 7 000 000 CZK including the project (complete technical drawings, surveys etc.), building and zoning permits and land. Summary of the final profit is summed in Table 43.

Table 43 Investor's profit on sale of the project (created by Author)

Selling price (project, land, permits)	7 000 000 CZK
- Land value	2 000 000 CZK
- Project, engineering, securing permits	1 100 000 CZK
Investor's profit	3 900 000 CZK

As can be seen, the final profit of the investor is well below the profits which could be generated through other introduced strategies. It is worth mentioning that the land value is also estimated based on the current zoning plan and the value could be at least doubled in case of positive change of zoning plan. Addressed developers have expressed their interest in buying the land with the project in case of the change of different zoning plan. In such case, the asking price would have to be adjusted appropriately. The advantage of this strategy is zero risks taken on the side of the investor aside from the lost opportunity. However, this strategy does not present enough added value for the investor and therefore will not be further analysed in this thesis.

4.3.4 Invite third party developer to co-finance the project

The idea of inviting a third party developer/investor is based on the investor's attitude towards risk. This project exceeds usual size of projects undertaken by the investor so far. Inviting another partner would help to transfer part of the risks and would also bring valuable experience from bigger undertaking. Investor has already engaged in negotiations with some developers. Nevertheless, most of them would be interested only in residential development – the nature of these developers is purely residential. This is more of alternation of other strategies and

therefore will not be further considered. However, the option should be kept in mind when assessing how or if proceed with the any of the strategies.

4.3.5 Summary

In this chapter possible alternative strategies were formulated, described and preliminary assessed. The first alternative - student apartments for lease were appraised through the residual method with very positive results of developer's profit of 24%. However, the long-term nature of such strategy is not convenient for the investor and would reflect in very low IRR. Development and sale of residential apartments have yielded very similar results due to the principle of residual method. Nevertheless, the return on costs of approximately 26 % is even slightly better than the result of previous strategy. However, the major difference between the second and first strategy is the factor of time. The sale process of apartments yields much faster returns and therefore much higher IRRs resulting in an ability to participate in further opportunities. Selling the project does not seem as an optimal strategy due to the much lower profit gained by the investor and also due to the potential substantial increase of land value which is very probable. Last introduced strategy – undertaking the project with third party partner (most probably another developer) can be considered in case that the second strategy is chosen since most of other developers focus strictly on the residential sector. Therefore, the second strategy – development of mixed use building with retail on ground floor and flats on higher floors will be further analysed.

4.4 Feasibility Study – Residential Development

Feasibility study for this alternative strategy will not be described in such detail as the analysis of the original strategy since most of the calculation principles are very similar or identical. Only fundamental changes will be highlighted. This strategy will be modeled as a development of a block of flats with retail areas on the ground floor and parking areas in the underground floor. The major inputs which have to be assessed are the selling price of apartments and the timing of the development and sale process.

4.4.1 Additional Assumptions

The sale price of apartments is determined based on data presented in the market analysis. As previously mentioned the most comparable project is projected Residence Sukovy Sady which is on the same street as project in question. The average price per square meter in this project

is approximately 43 000 CZK without VAT. When it comes to apartments with disposition 1+kk price climbs to 45 000 CZK without VAT per square meter.

In the market analysis, it was also mentioned that basically all the flats in all of the recent projects were sold long before completion. Specifically, all the apartments in project Residence Sukovy Sady were under reservation after 2 months since the start of construction works. In other words, all the apartments were reserved when foundations were being poured. The developer of the project IMO-STAR 98 s.r.o. believes that if the apartments were sold in the later stage of the construction the selling price would be higher by 10 – 15 %. This is due to the stage of completion but also due to the rapid growth of real estate market and especially residential sector in 2016 which was described in Chapter 3.1.3. Therefore, for the purpose of this study price of 44 500 CZK without VAT per square meter will be assumed.

The sale of flats is much faster process than that of the office building due to the lack of need to fully lease the building. The flats are directly reserved by customers often already during the development and sold to them after completion. Therefore, the basic time unit for this model will be months. Furthermore, more detailed schedule of development and more importantly reservation and sales process will be put in place. The durations of individual phases incorporated in the model are showed in Table 44.

Table 44 Development and Sales Schedule (created by Author)

Schedule	
Month of development start	2
Construction period	16 months
Month of reservation start	4
Month of sale start	20
Sale period - residential	8 months
Sale period - retail	6 months
Reservation growth	8 %/month

As can be seen, the reservations will start approximately two months after the start of the construction which as has been described in the market analysis is more than common among current development projects. Additionally, marketing costs have been added to the model, different structure of agent fees have been introduced and the debt repayment linear with the sale process. The interest until the final sale of flats is financed by the reservation fees. The overview of used inputs can be seen in Table 45.

Table 45 Overview of used inputs – residential development (created by Author)

INPUTS			
COST OF LAND		2 000 000 CZK	
Design and Engineering		1 400 000 CZK	
CONSTRUCTION COSTS		34 500 000 CZK	
Contingency	5,00%	1 725 000 CZK	
TOTAL DEVELOPMENT COSTS		39 625 000 CZK	
Required rate of return		20 %	
Index rate		1,5 %	
Rents & Sale Prices			
Sale Prices			
Residential		44500 CZK/sqm	
Retail		38000 CZK/sqm	
Reservation - % of selling price		10 %	
Areas			
retail		232 sq m	
parking		20 units	
residential		920 sq m	
Costs			
Agent and legal fees		1,5 %	
Marketing			
Initial marketing		60 000 CZK	
Continuous marketing		3 500 CZK/mth	
Financing			
LTC		60,00 %	
All in interest		2,50 %	
Schedule			
Month of development start		2	
Construction period		16 months	
Month of lease start		19	
Month of reservation start		4	
Month of sale start		4	
Sale period - residential		8 months	
Sale period - retail		6 months	
Reservation growth		8 %/month	

It is worth mentioning that the retail area has decreased to make space for storage areas for flats. Also, the net area of residential is noticeably smaller than the area of offices in original strategy. This is due to the fact, that the apartments need much more common areas and corridors in comparison to the offices. Also, the LTC has been decreased to 60,00 % for the base model due to the different repayment structure which is applied in the model.

4.4.2 Cash Flow Analysis

Based on those inputs, cash flow model has been created. The full version of the cash flow model can be found on attached CD. However, the results of the model can be seen in the following Table 46.

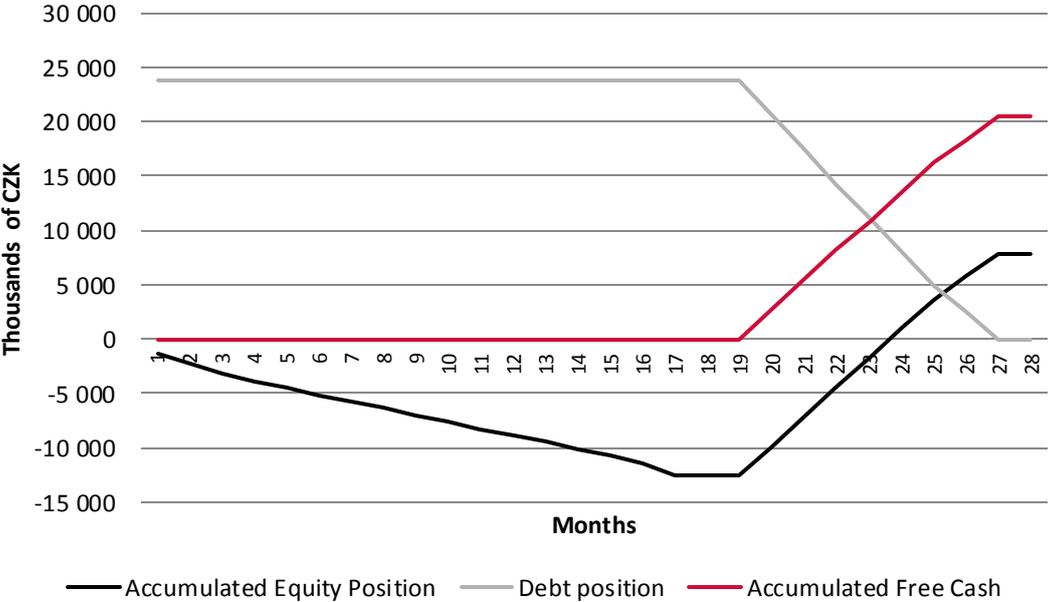
Table 46 Cash flow model outputs - residential development (created by Author)

OUTPUTS	
Initial Investment	39 625 000 CZK
Annual IRR on equity	47 %
Equity Multiple	1,63 x
Equity NPV at rRoR	3 278 809 CZK
Nominal Profit	7 878 288 CZK
Maximum Equity Drawdown	12 591 594 CZK
Total Debt Drawdown	23 775 000 CZK

The outputs show excellent IRR of 47 % corresponding with the positive NPV of almost 3 300 000 CZK. Total nominal value of profit is approximately 7 900 000 CZK which when compared to total equity drawdown of 12 600 000 CZK reflects in equity multiply of 1,63.

Furthermore, the profile of accumulated positions shows much better position for free equity cash flow which is realized much sooner than in the original strategy where the majority of free cash flow has been generated only at the end of the project through the sale of the property, see Table 47.

Table 47 Accumulated position - residential development (created by Author)

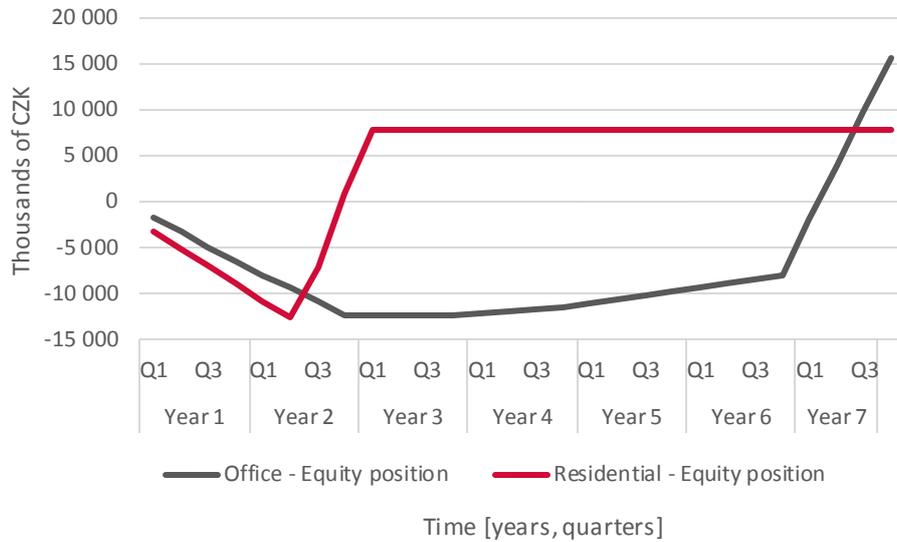


As can be seen, the free cash flow is starting to generate in the nineteenth month of the project. After creating some reserve for repayment of debt in case some of the apartments would not be sold according to schedule the free cash flow can be reinvested in other opportunities.

4.4.3 Evaluation

Overall, this strategy performs very well. The complex sensitivity analysis is therefore not needed. However, based on the previous analysis different financing scenarios have been tested and increasing the value of LTC would further improve the IRR of the project, for example, the LTC of 70 % results in 67 % IRR. However, the nominal profit of the investor would decrease and it would be hard to negotiate delayed repayment of the debt with above 60 % LTC. As commented on above, the equity position profile of the strategy is much more favourable due to the much earlier generation of free cash flow. The comparison of equity profile of both original and alternative strategy can be seen in Table 48.

Table 48 Comparison of equity positions of original and alternative strategies (created by Author)



Graph shows that the alternative strategy generates around half of the nominal profit, however, generates it more than three times faster than the original strategy reflecting in the ability to further invest earned profit. The equity cash flow profile of the alternative strategy is, therefore, much preferable to the small developer with limited available equity. The main disadvantage of this strategy lays in necessary change in the zoning plan.

4.5 Analysis Summary

In the first part of the chapter, all inputs needed for the assessment of the original strategy have been explained and described. Afterward, major principles, calculations and other assumptions used in the cash flow model were introduced and explained. Based on all these cash flow model has been created and the strategy could have been evaluated. The outcome of the analysis showed that the strategy is not feasible in the current state. Therefore, sensitivity analysis has been undertaken to find possible ways to improve the profitability of the original strategy. Further analysis showed that there is a certain room for improvements and changes were applied to the strategy and model. The performance of the project improved, but even so, the hurdle rate has not been reached.

Consequently, alternative strategies have been sought. Altogether, four alternative strategies have been found including – student accommodation, residential development, a sale of the project itself, inviting third party developer. Only residential development strategy has been chosen for further analysis based on appraisal through residual method and overall promising nature of this sector. Detailed cash flow analysis showed very positive results represented by

the value of IRR close to 50 %. Furthermore, this strategy allows the investor to draw free cash flow much sooner than original or student accommodation strategies would. Another benefit of the residential development is, that in case some of the apartments would not sell for the desired selling price investor can decide to keep them and further rent them. This would not cause any management and maintenance problems since the investor already operates multiple buildings.

5 Conclusion

The goal of the thesis has been to assess original strategy of twenty years old project in Hradec Králové in current conditions and to formulate the recommendation on how to proceed with the project. Individual steps of such assessment include detailed project environment analysis, creating financial model of the project and final evaluation of project feasibility based on the gathered data. The method of discounted cash flows has been selected as the main tool for the assessment of project financial feasibility due to its suitability for detailed modelling and testing. Other methods such as residual and capitalisation method will be used as complementary tools.

The project environment analysis showed that the Czech economic is currently strong and further growing reflecting in positive numbers across all macro indicators such as GDP growth, buying power, unemployment rate and more. Situation is favourable also concerning the availability of financing and mortgages. Interest rates have hit all-time low during the year 2016 and are expected to remain fairly low. Nevertheless, slight growth is expected due to new legislation, CNB restrictions and other factors. The current condition of the real estate market looks promising, too. Residential sector has experienced rapid growth with the average price of flats increasing by 20 % over last two years due to the lack of supply and aforementioned availability of financing. Office markets profits from the extremely low supply and one of the highest demand volumes which is further compressing yields on office investment properties under the values from pre-crisis times. Overall, it can be said that the real estate market is experiencing significant growth and is possibly peaking. The analysis of the micro locality further proved extreme demand for the apartments. However, when it comes to office rents in Hradec Králové, those have barely increased over last 20 years. Otherwise, current conditions could be hardly more positive and the forecast for next few years seems positive, too.

Based on the undertaken environment analysis key inputs could be determined and inserted into the discounted cash flow model of the project. After the optimization of the model and inputs based on the sensitivity analysis final outputs have been generated. Results showed that the project does not yield big enough IRR and overall could present great risks since it would be built as a purely speculative office development. The project could be feasible if the investor could find the final tenant and build the property with the reservation contract in hand. Nevertheless, the original project strategy has been found not feasible in the current conditions and, therefore, alternative strategies have been researched.

Four alternative strategies have been introduced including student accommodation, apartments for sale, sale of the project and co-operation with another local developer. Student accommodation is very similar to the original strategy in the cash flow parameters and assumes long-term ownership of the building. The main problem of such strategy is the slow generation of free cash flow and, therefore, binding too much of the investor's equity for too long. However, student accommodation is much more conservative and relatively safe investment. The second proposed strategy of development of flats for immediate sale has been assessed through residual method which yielded acceptable results. Therefore, it has been further analysed through the detail discounted cash flow model. The results of financial analysis were better than expected mainly due to the relatively short time duration of such project. Another option is to sell the project which yields much lower profit, however, represents zero risk approach and enables the investor to withdraw bind capital and potential profit for other projects. The co-operation with another developer could greatly reduce risks imposed by the project.

Based on the comparisons of potential benefits of each strategy, the development of apartments has been selected as the best alternative strategy. The profit is generated more than three times faster in the residential development compared to the original strategy resulting in much sooner generation of free cash flow and, therefore, in the option to further reinvest gained resources. The major risk connected to this strategy is represented by the necessary change of the zoning plan. However, based on the preliminary negotiations it seems achievable. Otherwise, the residential development is currently thriving and, therefore, represents much safer approach than speculative office development. Furthermore, in case some of the flats would not sell immediately, investor can transform them into student apartments and add them to his portfolio of similar flats he already operates in Hradec Králové.

In conclusion, based on the gathered data, researched alternative strategies and detailed financial analysis the recommendation concerning the project is to secure the change of zoning plan and proceed with development of flats for sale. The original strategy would be recommended only in case the investor could find major tenant for which the building would be specifically built. In case neither of the above proposed could be realised, the last option in form of selling the land with the project can be considered.

Bibliography

- Asociace pro rozvoj trhu nemovitostí, 2016. Trend Report 2016 - Czech Real Estate Market Survey. Available at: <http://artn.cz/cz/aktivita/trend-report/tr-2016/> [Accessed 25 Augustus 2016].
- Baum, A., 2009. *Commercial Real Estate Investment: A Strategic Approach*. 2nd ed. Exeter: Estates Gazette.
- Canda, J.R.S.W.G.W.J.A., 2004. *Capital investment analysis for engineering and management*. 3rd ed. Pearson.
- CBRE, 2016. *CBRE: Česká Republika - Aktuální Reporty*. [Online] Available at: http://www.cbre.cz/cz_cs/research/recent_reports [Accessed 4 December 2016].
- Cuřínová, P., 2016. *Stavebnictví v regionech ČR*. [Online] Available at: <http://www.statistikaamy.cz/2016/10/stavebnictvi-v-regionech-cr/> [Accessed 4 December 2016].
- Cushman & Wakefield, 2016. *Czech Republic - Retail Market Snapshot - Q3 2016*. [Online] Available at: <http://www.cushmanwakefield.com/en/research-and-insight/czech%20republic/czech-republic-retail-snapshot/> [Accessed 23 November 2016].
- Czech National Bank, 2016. *Czech National Bank*. [Online] Available at: https://www.cnb.cz/cs/verejnost/pro_media/clanky_rozhovory/media_2016/cl_16_161022_ru_snok_ln.html [Accessed 13 November 2016].
- Czech National Bank, 2016. *Financial Stability Report*. [Online] Available at: http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/cs/financni_stabilita/zpravy_fs/fs_2015-2016/fs_2015-2016.pdf [Accessed 13 November 2016].
- Czech Statistical Office, 2016. *Czech Statistical Office*. [Online] Available at: <https://www.czso.cz/csu/czso/ceska-republika-od-roku-1989-v-cislech-vy42dggohg> [Accessed 25 October 2016].
- Czech Statistical Office, 2016. *Index cen ve stavebnictví, indexy cen stavebních děl a indexy nákladů stavební výroby - 2015*. [Online] Available at: <https://www.czso.cz/csu/czso/indexy-cen-stavebnich-praci-indexy-cen-stavebnich-del-a-indexy-nakladu-stavebni-vyroby-rok-2015> [Accessed 19 November 2016].
- Czech Statistical Office, 2016. *Mzdy, náklady práce - časové řady*. [Online] Available at: https://www.czso.cz/csu/czso/pmz_cr [Accessed 19 November 2016].

Czech Statistical Office, 2016. *Tvorba a užití HDP - 2. čtvrtletí 2016*. [Online] Available at: <https://www.czso.cz/csu/czso/cri/tvorba-a-uziti-hdp-2-ctvrtleti-2016> [Accessed 19 November 2016].

Čápková, D. & Tománková, J., 2013. *Management staveb*. 1st ed. Prague: B. Kadeřábková - FinEco.

Česká televize, 2016. *ČNB zprísni hypotéky, půjčky na 100 procent hodnoty nemovitosti skončí*. [Online] Available at: <http://www.ceskatelevize.cz/ct24/ekonomika/1816433-cnb-zprisni-hypoteky-pujcky-na-100-procent-hodnoty-nemovitosti-skonci> [Accessed 13 November 2016].

DeClaron, 2016. *Express Accounting - Estimated Rental Value*. [Online] Available at: <http://www.claron.com/help/help.php?ID=22> [Accessed 3 January 2017].

European Money Markets Institute, 2016. *Euribor® Rates*. [Online] Available at: <http://www.euribor.org/euribor-org/euribor-rates.html> [Accessed 13 November 2016].

Eurostat, 2016. *Unemployment Statistics*. [Online] Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics [Accessed 19 November 2016].

Finance.cz, 2016. *Kalkulačka daně z nemovitých věcí, výpočet daně z nemovitých věcí*. [Online] Available at: <http://www.finance.cz/dane-a-mzda/kalkulacky-a-aplikace/nemovitost/> [Accessed 2016 November 19].

Gorton, G.B., 2007. Special Purpose Vehicles and Securitization. In *The Risks of Financial Institutions*., 2007. University of Chicago Press.

Hospodářské noviny, 2016. *Potvrzeno: V září Česká národní banka provedla třetí největší intervence od jejich zahájení*. [Online] Available at: <http://byznys.ihned.cz/c1-65510590-potvrzeno-v-zari-ceska-narodni-banka-provedla-treti-nejvetsi-intervence-od-jejich-zahajeni> [Accessed 13 November 2016].

Hungria-Garcia, R., 2004. *Property yields as tools for valuation and analysis*. Stockholm: Building & Real Estate Economics Department, KTH Royal Institute of Technology, Sweden.

Hypoindex, 2016. *Hypoindex vývoj*. [Online] Available at: <http://www.hypoindex.cz/hypoindex-vyvoj/> [Accessed 13 November 2016].

Hypoindex, 2016. *Nová regulace úvěrů a další legislativní novinky*. [Online] Available at: <http://www.hypoindex.cz/nova-regulace-uveru-a-dalsi-legislativni-novinky/> [Accessed 13 November 2016].

Hypoteční banka, 2016. *Hypoteční trh v ČR zaznamenal loni rekordní objem i raketový růst*. [Online] Available at: <https://www.hypotecnibanka.cz/o-bance/pro-media/tisko-ve->

[zpravy/obchodni-vysledky-cr/hypotecni-trh-v-cr-zaznamenal-loni-rekordni-objem/](#) [Accessed 13 November 2016].

Hypoteční banka, 2016. *Hypoteční trh: MMR potvrzuje rekordní rok*. [Online] Available at: <http://www.hypindex.cz/hypotecni-trh-mmr-potvrzuje-rekordni-rok/> [Accessed 13 November 2016].

IMO-STAR98 s.r.o., 2016. *O firmě*. [Online] Available at: <http://www.imo-star98.cz/imo-star-98.php>.

ISO, 2009. *ISO 31000:2009 - Risk management - Principles and Guidelines*. Geneva: International Organization for Standardization.

Kirsch, B., 2014. *Hot To Select A Discount Rate for Commercial Real Estate Investment*. [Online] Available at: <https://www.getrefm.com/discount-rates/how-to-select-a-discount-rate-for-a-commercial-real-estate-investment/> [Accessed 28 December 2016].

KPMG, 2016. *KPMG - Trendy v investicích*. [Online] Available at: http://artn.cz/assets/files/kadero/ka/kpmg_trendy_v_investicich-artn.pdf [Accessed 29 December 2016].

Lock, D., 2014. *The Essentials of Project Management*. 4th ed. Surrey, England: Gower Publishing Ltd.

Magistrát města Hradec Králové, 2016. *Územní plán a další dokumenty pro rozhodování o změnách v území*. [Online] Available at: [Územní plán a další dokumenty pro rozhodování o změnách v území](#) [Accessed 9 December 2016].

Mc.Mahan, J., 2007. *Professionall Property Development*. Mc.Graw-Hill.

Ministerstvo spravedlnosti České republiky, 2016. *Veřejný rejstřík a Sbirka listin - Ministerstvo spravedlnosti České republiky*. [Online] Available at: <https://or.justice.cz/ias/ui/rejstrik-firma.vysledky?subjektId=426062&typ=PLATNY> [Accessed 26 November 2016].

Ministry of Labour and Social Affairs, 2016. *Vývoj od července 2004*. [Online] Available at: https://portal.mpsv.cz/sz/stat/nz/vyvoj_od_072004 [Accessed 19 November 2016].

Nickolas, S., 2015. *How is Net Operational Income (NOI) used in real estate?* [Online] Available at: <http://www.investopedia.com/ask/answers/060215/how-net-operating-income-noi-used-real-estate.asp>.

Project Management Institute, 2013. *A Guide to the Project Management Body of Knowledge*. 5th ed. Project Management Institutue.

PwC, 2016. *Emergning Trends in Real Estate - New market realities*. [Online] Available at: www.pwc.com/emergingtrends [Accessed 12 29 2016].

- REZIDENCE NA PLACHTĚ s.r.o., 2016. *Úvodní stránka*. [Online] Available at: <http://www.rezidencenaplachte.cz/uvod#lokalita> [Accessed 26 November 2016].
- RICS, 2016. *Discounted cash flows - discounted cash flows - isurv*. [Online] Available at: http://www.isurv.com/site/scripts/documents_info.aspx?documentID=10114&categoryID=1373 [Accessed 24 October 2016].
- Rödlová, P., 2014. *Metodika stanovení diskontní míry pro oceňování developerských projektů v České republice*. Prague: PhD thesis.
- RTS, a.s., 2016. *Cenové ukazatele ve stavebnictví pro rok 2016*. [Online] Available at: http://www.stavebnistandardy.cz/doc/ceny/thu_2016.html [Accessed 4 November 2016].
- Sayce, S., Smith, J., Cooper, R. & Venmore-Rowland, P., 2006. *Real Estate Appraisal: From Value to Worth*. 1st ed. Malden, MA: Blackwell Publishing.
- Schneiderová Heralová, R., 2008. *Oceňování nemovitostí*. 1st ed. Prague: Česká technika - nakladatelství ČVUT.
- TEGoVA, 2016. *European Valuation Standards*. Belgium: Gillis.
- TOMAS DEVELOPMENT s.r.o., 2016. *Bytový dům - TARABY - Hradec Králové*. [Online] Available at: <http://www.taraby.cz/nabidka-byty-Hradec-Kralove.aspx> [Accessed 27 November 2016].
- Valach, J., 2016. *Investiční rozhodování a dlouhodobě financování 2*. Praha: Ekopress.
- Wyatt, P., 2007. *Property Valuation: In an Economic Context*. 1st ed. Oxford: Blackwell Publishing.
- Yescombe, E.R., 2013. *Principles of Project Finance*. 2nd ed. San Diego: Academic Press.

List of Figures

Figure 1 Types of Projects Based on their Function (created by Author based on (Rödlová, 2014))	9
Figure 2 Example Power/Interest Grid with A-H representing the placement of generic stakeholders (Project Management Institute, 2013)	12
Figure 3 Risk Impact Criterion Example (Author).....	13
Figure 4 Risk Likelihood Criterion Example (Author)	13
Figure 5 Risk Matrix Example (Author)	14
Figure 6 Risk assessment process (ISO, 2009).....	14
Figure 7 Impact of Variable Based on Project Time (Project Management Institute, 2013) ..	17
Figure 8 Key input variables in a development valuation (Wyatt, 2007).....	24
Figure 9 Calculation of income generated by property (created by Author based on (Schneiderová Heralová, 2008)	29
Figure 10 Diagram of the full assessment of an investment (Yescombe, 2013)	33
Figure 11 Zoning plan at the location of the project (created based on the information from (Magistrát města Hradec Králové, 2016))	48
Figure 12 Location of Project TARABY and Medium Park (created by Author)	51
Figure 13 Summary of major (re)development projects of HIOSS and HIOSS Real (created by Author based on internal data of Investor)	57
Figure 14 Visualisation of the building as designed in 1996. (internal database of Investor)	58
Figure 15 Calculation of property tax (Finance.cz, 2016).....	65
Figure 16 Layout of typical floor for residential strategy (internal database of the investor).	83

List of Tables

Table 1 Relationship between project NPV and IRR (created by Author).....	26
Table 2 GDP y-o-y growth in 2008 - 2018 (Czech Statistical Office, 2016)	34
Table 3 Progression of RoE after taxes and percentage of enterprises at loss (Czech National Bank, 2016)	35
Table 4 Unemployment rate 2006 – 2016 (created by author based on data from (Eurostat, 2016))	36
Table 5 Average monthly wage (quarter - in CZK, year-on-year changes) (created by author based on data from (Czech Statistical Office, 2016)).....	36
Table 6 Progression of RoE after taxes in selected sectors (Czech National Bank, 2016)	37
Table 7 Ratio of defaulted issued debt in selected sectors (Czech National Bank, 2016).....	38
Table 8 Volume of mortgages 2010 – 2016 (created by author based on data from (Hypoteční banka, 2016)	39
Table 9 Mortgage interest rates 2003 – 2016 (Created by author based on data from (Hypoindex, 2016).....	40
Table 10 Progression of HB Index in years 2010 - 2016 (Hypoindex, 2016)	42
Table 11 Progression of apartment price index in years 2010 - 2016 as published by CSO (created by Author based on data from (Czech Statistical Office, 2016))	42
Table 12 Movement of development from Prague to regions (Cuřínová, 2016).....	43
Table 13 Progression of retail regional and prime yields in years 2006 – 2016 (created by author based on data from (Cushman & Wakefield, 2016)).....	44
Table 14 Progression of retail regional and prime rents in years 2006 – 2016 (created by Author based on data from (Cushman & Wakefield, 2016)).....	44
Table 15 Progression of office yields and rental growth 2006 - 2016 (September) (Cushman & Wakefield, 2016)	45
Table 16 Growth expectations for individual RE sectors in 2016 - 2017 based on (Asociace pro rozvoj trhu nemovitostí, 2016)	46
Table 17 Distribution of office rents in Hradec Králové (created by Author)	49
Table 18 Summary of recent residential development projects in Hradec Králové (created by Author based on available price lists)	53
Table 19 Summary of offered flats by non-developer entities (created by Author based on data from www.sreality.cz)	54
Table 20 Comparison of gathered data and data from cenovemapy.org (created by Author) .	54

Table 21 Amount of economic entities from 1990 to 2015. (Created by author based on data from (Czech Statistical Office, 2016).....	59
Table 22 Calculation of gross potential income (created by Author)	63
Table 23 Calculation of gross operational income (created by Author)	64
Table 24 Calculation of net operational income (created by Author)	66
Table 25 Relationship between D/E ratio and equity IRR, NPV and profit (created by Author)	68
Table 26 Financing calculation example	69
Table 27 CAPEX history on property in Pavla Hanuše street	70
Table 28 Summary of cash flow model inputs for original strategy (created by Author)	71
Table 29 Preview of cash flow model for original strategy (created by Author)	72
Table 30 Calculation of equity cash flow (created by Author).....	73
Table 31 Preview of modeling the equity cash flow (created by Author)	73
Table 32 Summary of cash flow model outputs (created by Author).....	74
Table 33 Relationship between IRR and office ERV	75
Table 34 Sensitivity Analysis - IRR on year of exit	75
Table 35 Sensitivity analysis - IRR, NPV and profit on D/E ratio (created by Author)	76
Table 36 Cash flow outputs for modified inputs (created by Author).....	77
Table 37 Yearly running items for adjusted inputs (created by Author)	78
Table 38 Accumulated NOI, project CF and costs (created by Author).....	78
Table 39 Accumulated position of equity position, free cash flow and debt position (created by Author)	79
Table 40 Accumulated position for long-term hold of the property	80
Table 41 Key values of residual appraisal – student apartments (created by Author)	84
Table 42 Key values of residual appraisal – residential (created by Author)	85
Table 43 Investor's profit on sale of the project (created by Author)	86
Table 44 Development and Sales Schedule (created by Author)	88
Table 45 Overview of used inputs – residential development (created by Author)	89
Table 46 Cash flow model outputs - residential development (created by Author)	89
Table 47 Accumulated position - residential development (created by Author).....	90
Table 48 Comparison of equity positions of original and alternative strategies (created by Author)	91

Attachment 1 – Final Cash Flow Model – Office & Retail

*Amounts in thousands	Indexation		1 %/year				
Year	1	2	3	4	5	6	7
Initial Investment							
Land acquisition	-2 000	0	0	0	0	0	0
Design and Engineering	-1 100	0	0	0	0	0	0
Construction	-18 900	-18 900	0	0	0	0	0
Property Costs&Revenues							
Rent - offices	0	0	2 762	2 790	2 818	2 846	2 874
Rent - retail	0	0	806	814	822	830	839
Rent - parking	0	0	242	245	247	250	252
Gross Potential Income	0	0	3 811	3 849	3 887	3 926	3 965
Vacancy, credit, service charge loss	0	0	-1 905	-962	-194	-196	-198
Gross Operational Income	0	0	1 905	2 886	3 693	3 730	3 767
Insurance	0	0	-18	-18	-18	-18	-18
Property Tax	0	0	-15	-15	-15	-15	-15
Regular non-refundable O&M	0	0	-57	-87	-111	-112	-113
Total Net Operating Income	0	0	1 814	2 766	3 548	3 584	3 620
Accumulated NOI	0	0	1 814	4 580	8 129	11 713	15 333
Additional Costs							
Letting Agent Fee	0	-159	-83	-70	0	0	0
CAPEX	0	0	0	0	0	0	0
Interest	-385	-725	-744	-719	-690	-662	-633
Cost of Sale	0	0	0	0	0	0	679
Total Additional Costs	0	-159	-827	-788	-690	-662	46
Accumulated Costs	0	-159	-986	-1 774	-2 464	-3 126	-3 759
Exit Value	0	0	0	0	0	0	45 252
Total Costs	-22 000	-19 059	-827	-788	-690	-662	46
Accumulated Total Costs	-22 000	-41 059	-41 886	-42 674	-43 364	-44 026	-43 980
Project Cash Flow (FCFF)	-22 000	-19 059	987	1 978	2 858	2 922	48 918
Accumulated Project Cash Flow	-22 000	-41 059	-40 071	-38 094	-35 236	-32 313	16 605
Financing							
Regular Repayment	0	0	-987	-1 145	-1 145	-1 145	-25 317
DSCR before tax	0,00	-0,22	1,00	1,45	1,93	1,98	0,14
Opening Balance	15 400	29 015	29 740	28 753	27 608	26 463	25 317
Closing Balance	15 785	29 740	28 753	27 608	26 463	25 317	0
Net Borrowing	0	0	-987	-1 145	-1 145	-1 145	-25 317
Equity Cash Flow	-6 600	-5 670	0	832	1 713	1 777	23 601
Accumulated Free Cash Flow			0	832	2 545	4 322	27 923
Accumulated Equity Position	-6 600	-12 270	-12 270	-11 438	-9 725	-7 948	15 653
Equity DCF	-6 600	-4 725	0	482	826	714	7 904
Accumulated DCF (NPV)	-6 600	-11 325	-11 325	-10 843	-10 017	-9 303	-1 399

Attachment 2 – Simulation Results

Year of Exit	Estimated Rental Value - Offices																			
	160,0	165,0	170,0	175,0	180,0	185,0	190,0	195,0	200,0	205,0	210,0	215,0	220,0	225,0	230,0	235,0	240,0			
5,00	#NUM!	#NUM!	#NUM!	-10,14	-3,26	0,67	3,63	6,11	8,28	10,24	12,04	13,73	15,32	16,82	18,27	19,65	20,98			
6,00	-4,39	-0,67	2,10	4,39	6,37	8,13	9,74	11,23	12,61	13,92	15,16	16,35	17,48	18,57	19,61	20,62	21,60			
7,00	1,81	3,82	5,57	7,13	8,56	9,87	11,10	12,25	13,34	14,38	15,36	16,31	17,22	18,09	18,94	19,75	20,55			
8,00	4,62	6,08	7,40	8,62	9,75	10,81	11,80	12,75	13,65	14,51	15,34	16,13	16,89	17,63	18,35	19,04	19,71			
9,00	6,21	7,38	8,46	9,46	10,41	11,31	12,15	12,96	13,74	14,48	15,19	15,88	16,55	17,19	17,81	18,42	19,01			
10,00	1,50	3,08	4,47	5,71	6,83	7,87	8,83	9,73	10,58	11,38	12,14	12,87	13,56	14,23	14,88	15,50	16,09			
11,00	3,10	4,33	5,46	6,49	7,44	8,33	9,17	9,96	10,70	11,42	12,10	12,75	13,37	13,98	14,56	15,12	15,67			
12,00	4,05	5,08	6,04	6,94	7,78	8,57	9,32	10,03	10,70	11,35	11,97	12,57	13,14	13,70	14,23	14,76	15,26			
13,00	4,61	5,52	6,37	7,18	7,94	8,66	9,34	9,99	10,61	11,21	11,79	12,34	12,88	13,40	13,90	14,39	14,87			
14,00	4,93	5,75	6,53	7,27	7,97	8,63	9,27	9,88	10,46	11,02	11,56	12,09	12,60	13,09	13,57	14,03	14,48			
15,00	5,08	5,83	6,55	7,24	7,90	8,52	9,12	9,70	10,25	10,79	11,31	11,81	12,29	12,76	13,22	13,67	14,10			
16,00	5,09	5,79	6,47	7,12	7,75	8,35	8,92	9,47	10,00	10,52	11,02	11,50	11,97	12,42	12,87	13,30	13,72			
17,00	4,98	5,65	6,30	6,93	7,53	8,11	8,66	9,20	9,71	10,21	10,70	11,17	11,63	12,07	12,51	12,93	13,34			
18,00	4,78	5,42	6,05	6,66	7,25	7,81	8,35	8,87	9,38	9,87	10,35	10,81	11,26	11,70	12,13	12,55	12,95			
19,00	4,47	5,10	5,73	6,33	6,90	7,45	7,99	8,51	9,01	9,49	9,96	10,42	10,87	11,30	11,73	12,15	12,55			
20,00	4,07	4,70	5,32	5,91	6,48	7,03	7,57	8,08	8,58	9,07	9,54	10,00	10,44	10,88	11,31	11,72	12,13			

*The significant difference between year 9 and 10 is caused by the implemented condition for rising the CAPEX from the 10th year of the project.