



Università
Ca' Foscari
Venezia

Master's Degree
in Amministrazione Finanza e Controllo

Final Thesis

Corporate finance in the real estate market

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Academic Year

2018 / 2019

INDEX

INTRODUCTION	1-2
CHAPTER 1. AN OVERVIEW OF REAL ESTATE MARKET	3-18
1.1 Trends, scenarios, dynamics and innovation	3
1.2 Macroeconomic scenario	4
1.3 The Eurozone context	6
1.4 The Italian context	8
1.5 Real estate as investment	14
1.6 Asset allocation	16
CHAPTER 2. THE THEORY OF REAL ESTATE EVALUATION	19-47
2.1 Introduction to the theory of real estate evaluation	19
2.2 the Physical Comparison Methodology	22
2.3 The Methodology of the Economic-Financial Comparison	25
2.3.1 The Methodology of the Economic-Financial Comparison: the income criterion	26
2.3.2 The Methodology of the Economic-Financial Comparison: the financial criterion	29
2.3.3 The transformation process	31
2.4 The rates	33
2.4.1 The cap rate	36
2.4.2 The discount rate	39
2.4.3 The determination of rates	45
CHAPTER 3. THE CASE	49-70
3.1 The description of the case study	49
3.2 The evaluator methodology to analyse the case	51
3.3 Our evaluation	55
3.4 Our evaluation with Morri & Benedetto method	62
3.5 The results comparison	69

CHAPTER 4. CONCLUSIONS	71-74
4. 1 Conclusions	71
BIBLIOGRAPHY	75
DITTOGRAPHY	76
APPENDIX	77-79
Appendix 1 THE ESTIMATION WITH OUR EVALUATION	77
Appendix 2 1 THE ESTIMATION WITH MORRI & BENEDETTO METHOD	78
Appendix 2.2 THE ESTIMATION WITH MORRI & BENEDETTO METHOD	79
Acknowledgements	80

INTRODUCTION

This work is an analysis of the real estate market. The main focus is the description and application of the financial tools used to produce valuation analysis of the real estate assets.

The first chapter of the thesis stands as a broad overview of the real estate market. After a general description of the main trend and scenarios of this sector, it continues with a market analysis. The main focus, starting from a macroeconomic presentation, moves to an illustration of the European context and after it looks to the Italian specific market. The chapter continues with two sections “Real estate as investment” and “Asset allocation” dedicated to the description of the real estate asset in valuable part of any well-diversified portfolio.

The second chapter examines the theme of the real estate evaluation through the financial tools. It starts with an introduction of the basics for an evaluation, in other words all the elements which establish the evaluation requirement. It continues with the description of the evaluation methodologies, and it specifically shows the income criterion and the financial criterion. After that, the chapter dedicates a paragraph focus on the process of transformation. This choice was taken seeing as how Italian real estate market is mainly characterized by the restoration of the pre-existent real estate assets rather than the development of new virgin areas. The last part of this section presents the rates necessary for the evaluation process: it illustrates the cap rate, the discount rate and the way to determine them.

The third chapter concerns the application of the discount cash flow method to the

valuation of a real estate asset. It starts with a presentation of a real-life case. The asset objective of analysis, in fact, is a building for commercial use located in the Milan interlard and it is owned by a real estate fund. The estimation of the asset was given to an external and independent evaluator. After a description of all relevant data, the chapter continues with an illustration of the evaluator estimation which dates back to 2016 and it concerns the market value of the asset from the second semester of that year. In the following paragraphs, with the same data, we try to reproduce the valuation of the asset. We reproduce two evaluation through two methodologies. One is our hypothesis and the other is the attempt to apply the method proposed by Morri & Benedetto in their studies. A comparison of the results follows all the evaluations.

In the end of the thesis, the conclusion chapter, after showing the wider spectrum of the real estate world, summarises the peculiarity of this work.

CHAPTER 1

AN OVERVIEW OF REAL ESTATE MARKET

1.1 TRENDS, SCENARIOS, DYNAMICS AND INNOVATION

What are the future social trend in the real estate? How will the new environment be? Where will we live and work? What kind of new technologies will influence our life and work?

The social and economic context is characterized by the digitalization and by the variable labour market. In the same way, the market space is evolving. The new tendencies are hitting the real estate market. The old industrial logic can no more drive the real estate world. The change is affecting all the industry, from the building's logic to the commercialization's and the investment's logics. The new market is characterized by a new interest for specific residence destined for particular categories of subjects, for the co-housing or for a more flexible and shared work's space where it is possible co-working. The group's place is, moreover, considered like an integration of food service, entertainment and shopping places (Amundi, Relazione di gestione, EU, 2018).

Furthermore, new technologies like the virtual reality, the augmented reality or the use 3D photography are modifying the way to communicate the market. The platforms of big data and the geo-localization apps, make the process of selection of a real estate asset more transparent. An instrument like "BIM" Building Information Modeling (introduced by the European direction of 2014) can optimize the efficiency of design, construction and management of a real estate asset (Amundi, Relazione di gestione, EU, 2018).

Looking at our country, Italian real estate shows specific dynamics, different from the rest of the world. In fact, Italy is characterized by the restoration of the pre-existent real estate assets rather than the development of new virgin areas. The current need consists, for example, in founding new functions for abandoned industrial and artisan sites, in reconverting old buildings, or in recovering crumbling districts and rural villages.

In order to satisfy this new need, it is necessary to evaluate the real estate investment not only with an economic and financial perspective, but also with attention to sustainability. Therefore, it is necessary to conjugate the traditional evaluation with a more innovative one, which came from culture, technology and society.

1.2 MACROECONOMIC SCENARIO

Considering last year, 2018, the macroeconomic situation presented in the first semester a decreasing trend and in the second semester an increasing trend, especially in USA, Japan and United Kingdom. Some countries like China, emerging countries and Europe present a slowdown. The monetary politics have contributed to an expansive cycle, for example the increase of liquidity thanks to the BCE system and the Japan banking. Moreover, because of these kind of politics, the official rate stayed contained compared to some standard historical levels (Amundi, Relazione di gestione, EU, 2018).

In 2018 The US economy has confirmed a solid positive trajectory driven by a fiscal policy expansive, growing company profits, a thriving labour market, and a reinforcement of consumption and investments. In perspective, the fiscal stimulus will continue to strengthen the growth prospects but to an extent less than what was achieved in the last

year. Inflation remained under control, despite the partial increase in wages and the volatility of energy product prices. (Amundi, Relazione di gestione, EU, 2018).

Japanese economic activity has slowed significantly over the course of 2018 with growth estimated at + 0.9% in deceleration from 1.9% of 2017. Expectations are oriented towards a recovery in the short term, but to a limited extent, also due to the negative impact of a series of disasters natural resources that weighed on economic activity in the third quarter. The wages registered the tendency to a modest increase which should in the future sustain the expenditure of families. The Bank of Japan confirmed a monetary policy stance in 2018 particularly accommodating and most likely in 2019 it will continue to supply a considerable amount support to the economy. In 2018, the year-on-year change in consumer prices stopped at 0.9% (Amundi, Relazione di gestione, EU, 2018).

The expansion of the emerging economies, in 2018 is around the 5%, in slight increase compared to 4.9% in 2017. This good performance comes despite the generalized appreciation of the US dollar and the progressive rise in American rates, that have produced unfavourable effects on the financing conditions of this block of countries. In general, the capital flows net slowdown and the rising cost of debt were two trends that, have hit all emerging countries. Among these economies, Asia and in particular China, although marginally slowing down, confirmed itself as the engine of global growth with an expansion of GDP still above 6%. Regarding the Chinese economy, the growth has been allowed by a solid consumption dynamic and a significant fiscal stimulus. Moreover, despite the trade conflict with the United States, exports have in 2018 still expressed a relative strength largely attributable to the anticipation of orders in anticipation of the increase in duties (Amundi, Relazione di gestione, EU, 2018).

The Indian economy is showing as among the highest in the emerging economies, with a trend of around 7.8%. Also, Russia and Brazil show positive growth rates although more contained, approximately + 1.7% and + 1.3% respectively. The financial conditions regarding Turkey remain overall restrictive despite the recent stabilization of the lira. For the Turkish economy, 2018 closes with a strong one deceleration of economic activity combined with a significant rise in consumer prices (Amundi, Relazione di gestione, EU, 2018).

1.3. THE EUROZONE CONTEXT

Like 2017 also 2018 was a year of growth. Compared to the year before the trend was lower but anyway, in the Eurozone, it registered a development of internal demand, of family's consumption and levels of employment. The BCE and its policy have contributed to the companies' investments despite of the political situation was no more stable. Nevertheless, in the end of the year some sectors have registered a deceleration, like-the automotive sector (Amundi, Relazione di gestione, EU 2018).

For example, Great Britain showed a modest growth in 2018 (1.3% in 2018 compared to the 1.8% of 2017). The prices for consumption showed a growth of 2.3% (Amundi, Relazione di gestione, EU, 2018).

According to the CBRE the investment in the real estate assets in 2018 were 312 billion, in line with the trend of 2017. The interest of the investors was especially focused on British and German market. It represented around the 50% of the all investments (respectively the 23% and the 25%). The Spanish market also had a significant

development, in fact it realised an increase of the 57% which means 20 billion of investments. On the contrary, the Italian market for no-residential asset is marginally represented with respect to European context, only the 3% of the total investment (Amundi, Relazione di gestione, EU, 2018).

In 2018 8.8 billion were invested, 22% less than 2017 (11 billion of investment). The political uncertainty could justify this kind of reduction. The most important transactions were attributed to the office's sector, a total of 127.4 billion (+6% respect 2017 and equal to 41% of the total transactions). On the other hand, the retail segment decreased to 50.1 billion (-9% respect 2017). Furthermore, the logistic sector had a decrease, to 33 billion (-23% respect 2017) (Amundi, Relazione di gestione, EU, 2018).

According to the global scenario, the global economic expansion shows a positive development in the short and medium periods. The economic growth of Eurozone, could be supported by an accommodating monetary policy which could permit a marginal fiscal relaxation and a consecutive development of space demand (Amundi, Relazione di gestione, EU, 2018).

Now we can distinguish the most significant trends of the real estate market for 2018 year. The rents of office buildings increased for most of the European cities. Overall the vacancy rate decreased for all the European cities and it is marginally increased only for Rome. The retail sector presents different situations depending on the typology of high street shop or the shopping centre. In the first case, the rents remained at the same level of the year before, except for Milan where they increased. In the case of shopping centre, the rents marginally increased, but i.e. in Germany they decreased. Overall investments in the retail sector in Europe reached in 2018 € 50.1 billion, down 9% compared to 2017

and equal to 16% of total investments (Amundi, Relazione di gestione, EU 2018).

The industrial and logistic sector had a positive trend. The e-commerce was growing (from 15% to 20%) and it positively influenced the demand for warehousing (Amundi, Relazione di gestione, EU 2018).

On the contrary, the office segment showed different trends for different countries. In Great Britain, the occupancy costs remained stable both in the City than in the West End (respectively 832 €/sqm/y e a 1.257 €/sqm/y). The vacancy rate decreased to 5.4% in the City and to the 3.3% in the West End. Also in France, during the fourth quarter, the average rents stayed stationary (the centre of Paris with a prime rent¹ of € 850 €/sqm/y and the Défense with a rent of € 550 €/sqm/y). The vacancy rate was 5.2%. In Germany, the take-up² was predominantly negative (Frankfurt -15% Hamburg -14% Berlin -7%) and stable for Düsseldorf and Munich. The vacancy rate was around 4.4%. The market conditions in Spain have improved and the vacancy rate of Barcelona and Madrid were 8.30% and 10.4% respectively (Amundi, Relazione di gestione, EU 2018).

1.4 THE ITALIAN CONTEXT

According to the report “*Sale of real estate units and loans*” published by Istat on the 30 July 2019, in the first quarter of 2019, notary agreements regarding sales of real estate units were 190,904 (this data is comprehensive of sales any other kind of exchange of properties and appurtenances in return for payment). They increased by 2.0% compared

¹ It is the best rent registered in a given market at a specific time horizon.

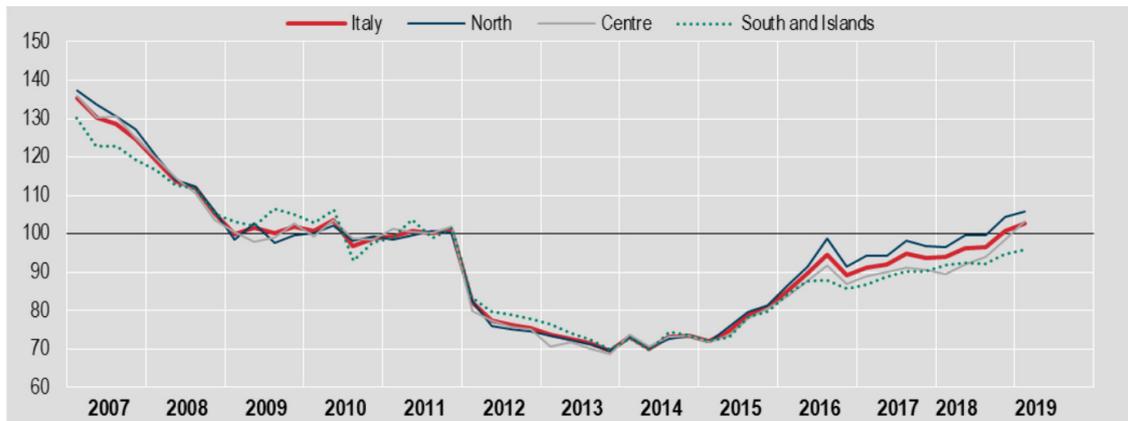
² It represents the surface of office space that come physically employed, both in ownership and in lease, by direct users, in a specific time interval.

with the previous quarter (+2.0% in the residential sector and +2.5% in the economic properties sector) based on seasonally adjusted data.³ The growth for residential sector, concerned all the geographical areas in comparison with the previous quarter (Centre +4.4%, Islands +1.9%, South +1.7%, North-West +1.3%, North-East +1.2%). For the economic sector, the growth was recorded in the Centre (+10.4%) and in the North-East (+6.3%), it was zero in the Islands (0.0%), while it decreases in the South (-3.2%) and in the North-West (-0.9%). The real estate unit exchange agreements increased overall by 8.0%, in confront of the first quarter 2018; this was the highest trend growth experimented since first quarter of 2017. The expansion affected both the residential (+8.4%) and the economic sector (+5.0%). In the first quarter of 2019 the seasonally adjusted index of sales exceeds the average values of 2010 by almost 3 percentage points. The regions with the higher level of grow are the northern regions; following by the centre regions. Also in the South, the level of sales is growing but it has not yet recovered the average levels of 2010. The seasonally adjusted index of mortgages, loans and other obligations (with the establishment of a real estate mortgage), has negative signals on the whole national territory. Only in the Centre the first quarter 2019 exceeds the average values of 2010 by 4.5 percentage points (Istat, 2019). The following figure shows the general sales index of real estate units by geographic area from first quarter of 2007 to first quarter of 2019, (figure 1.1) (Istat, 2019).

³ Data purified by specific statistical techniques, from fluctuations attributable to seasonal component (due to meteorological, customary, legislative factors, etc.) and, if significant, from calendar effects.

Figure 1.1. General index of sales of real estate units by geographical area

Q1 2007 – Q1 2019, seasonally adjusted data (base year 2010=100)



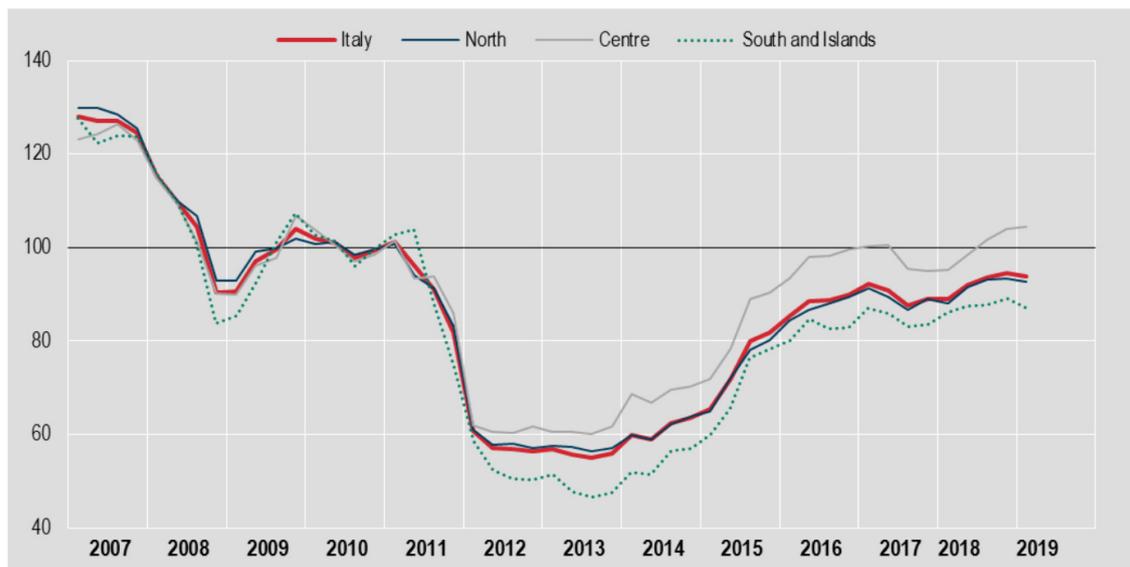
a) Agreements stipulated by notaries.

The red line identifies the general trend at country level. The other lines mark respectively the northern area (blue), the Central areas (grey) and the South and Islands (the dashed line). As written before we can see that the Northern regions are driving the sales trend (Istat, 2019).

The second figure shows the general index of mortgage-secured loans by geographical area from the first quarter of 2007 to the first quarter of 2019, (figure 1.2) (Istat, 2019).

Figure 1.2 . General index of mortgage-secured loans by geographical area

Q1 2007 – Q1 2019, seasonally adjusted data (base year 2010=100)



(a) Agreements stipulated by notaries for mortgage secured-loans.

The red line identifies the general trend at country level. The other lines mark respectively the northern area (blue), the Central areas (grey) and the South and Islands (the dashed line). Differently from the previous figure (figure 1.1) we can see that the Central regions are driving the mortgage secured loan trend (Istat, 2019).

The growth of the Italian economy in 2018 was lower compared to the expectations. The Gdp was negative for two consecutive trimesters and it represented a period of recession. According to data, we can distinguish different areas which were the more interesting for international investors (Amundi, Relazione di gestione, EU, 2018).

Focused on Milan, which is the main Italian financial centre, the demand for office space was increasing after the recession of 2008. The developed presence of international companies in the area increased the interest for industrial investment. The most requested

spaces are CBD⁴ and Porta Nuova, Centrale, Assago, Bicocca-Sesto San Giovanni and San Donato (Amundi, The Italian real estate market, 4 quarter 2018). Milan was the city with the highest investment volumes in the country: over 2 billion transacted in 2018, about 60% of the total directional investments registered in Italy. In the fourth quarter of 2018 overall sales were made in the directional sector for a volume of € 760 million, a significant increase compared to the previous quarter (+ 32%). In recent years, this city, has been protagonist of a radical change both at urban and infrastructural level. Many examples of this metamorphosis are the new business district “Garibaldi Repubblica”, the Citylife and the construction of the line M4. Another urban transformation is the corridor of railway yards, starting of Scalo Farini, in addition to the development of a new cultural hub in Porta Romana and the Falck area. More international companies have chosen the metropolis as the headquarters of their headquarters in Italy. The space demand brought in 2018 an annual take-up of over 380,000 square meters, exceeding the record value of 2017 and reducing the vacancy rate to 11.1%. However, in the fourth quarter 2018, according to the latest surveys of CBRE, the take up of office space was 74,900 square meters, down compared to the previous one quarter. The prime rent has risen, in the CBD⁵ at 570 €/sqm/year, at Porta Nuova at 550 €/sqm/year and 410 €/sqm/year in other central areas. In the remaining areas of the metropolis the dynamics of the rental values of the first properties was marked by a substantial stability: 300 €/sqm/year in the half-center and 210 €/sqm/year in the periphery are the prevailing values. The prime yields for offices in Milan have decreased, reaching 3.40% in the fourth quarter 2018. In secondary locations, the average net profit required by investors stands at 5.00% (Amundi,

⁴ Central Business District

⁵ See note 4

Relazione di gestione, EU 2018).

In Rome, the demand for new offices came from the private sector and it increased in the last two years in the suburb. Thanks to coworking, the users have changed the way to increase the efficiency in space utilisation. They require new lease scheme like for example 6+6 in order to occupied most and in shorter time (Amundi, The Italian real estate market, 4 quarter 2018). In Rome, the immediate yields of the first properties in the CBD⁶ at the end of the fourth quarter of 2018 was at 3.90%, a marginal decrease compared to the end of 2017 (-10bps). The rental space registered a take up of 167.808 square meters, confirming the very positive trend of the last 3 years (if compared to the last 10 years the result is lower only to 2011 and 2017). Despite the improvement in demand, the vacancy rate increased slightly to 12.8%. The prime rent in the CBD⁷ were still at 420 €/sqm/year. Others main areas of the capital had a better trend, i.e. the EUR zone with prime rental at 340 €/sqm/year. In the fourth quarter of 2018, investments in the management sector increased significantly recording a value of € 786.5 million, (15 times higher than the previous one quarter). 2018 was a record year with € 1,114 million of investments (it succeeds in exceed the volume of 2017). The foreign investments were around 47% of the total volume invested (Amundi, Relazione di gestione, EU 2018).

In Bologna, Firenze, Torino and Venezia the demand was raising.

We can note that an important sector for our country is the retail propriety market. This sector gives signal of strong resilience. The presence in one of the most famous and requested location is considered important from a strategic point of view by domestic and foreign investors. The greater trouble is the limited space. In order to solve this problem,

⁶ See note 4

⁷ See note 4

the conversion of space use seems to be the only driver. The demand for logistic space has a very strong growth thanks to the need of searching strategic locations from emerging businesses and e-commerce (Amundi, The Italian real estate market, 4 quarter 2018).

In general, the real estate market in Italy is mostly characterized by direct ownership of the assets (rather than building lease) compared to the other OECD Country (Casertano, 2018).

In the last 10 years in Italy it has been partially started the financing process of the real estate sector following the mature markets (i.e. UK, USA, Germany) through:

- introduction of new kind of vehicles as real estate funds, securitization, listed real estate investment trusts;
- launch and growth of innovative type of products already developed in the mature markets as shopping malls, entertainment centres, logistic complexes;
- refurbishment and investment activities;
- transit passage from greenfield to brownfield.

Therefore, in Italy we have seen the progressive integration between the stock/financial market and the real estate market (Casertano, 2018).

1.5 REAL ESTATE AS INVESTMENT

There are five common attributes that lead to include real estate in an investment portfolio:

- its potential to offer absolute returns,
- its potential to hedge against unexpected inflation,

- its potential to provide diversification against stocks and bonds,
- its potential to provide steady cash inflows,
- its potential to provide income tax advantages.

We have to add other qualities to this list. Some of them are psychological, like the prestige to own a very luxurious place or the possibility for the owners to use high degree of leverage (Garay, 2016).

On the other hand, there are three disadvantages that decrease the attractive of using a real estate asset in an investment portfolio. They are:

- a) its heterogeneity,
- b) its lumpiness, which may prevent investors from creating optimal portfolios,
- c) its non-liquidity, which may reduce the opportunity to rebalance and sell assets at fair market prices in a short period.

The first disadvantage means that every real estate asset can have different lease structure which can bring differences in the income streams. This aspect is more problematic for the due diligence process; for this reason, in order to have good real estate investments, we need a specialized analysis and managerial skills.

The second point concerns the case in which an asset is not easily divisible for the direct ownership. This problem produces high unit cost and also high transaction costs.

The last disadvantage is the most insidious/arduous. In fact, the non-liquidity makes it difficult to transact at reasonable valuations when either supply or demand evaporates (Garay, 2016).

1.6 ASSET ALLOCATION

The categorization of real estate asset can be a good instrument in order to do a more accurate analysis but, in the same time, it cannot be used to oversimplify the different aspects. Indeed, assets with the same specific type of real estate can have different prices depending on different lease contracts conditions (Garay, 2016).

The asset allocation can be divided in two types: Top-down versus Bottom-up. Top-down asset allocation is based on the analysis of the macro environment and risk premium. Bottom-up asset allocation considers as the primary driving factor the relative attractiveness of individual investment opportunities. Moreover, there are asset allocation methods that are a mix between Top-down and Bottom-up (Garay, 2016).

The categories of real estate are four:

- a) equity versus debt,
- b) domestic versus international,
- c) residential versus commercial,
- d) private versus public.

We can distinguish between equity claims and debt claims using the legal distinction between a residual claim and a fixed claim. A mortgage is a debt instrument collateralized by real estate, and real estate debt is defined as including all mortgages. Anyway, mortgages with substantial credit risk can behave more like equity, and equity ownership of properties with very long-term leases can behave like debt (Garay, 2016).

The necessity to diversify the portfolio can be satisfied with international investing. This kind of investment can be more difficult with real estate assets than with other traditional

one. In fact, an investor could have problems deriving from lack of knowledge and experience regarding foreign real estate markets or lack of relationship with foreign managers. Other difficulties could be political risk (for example investing in new emerging markets), expensive travels, loss of time and some risks in taxation difference. The derivative products related to real estate investments could help the investor to avoid the risks inherent with the internationalization (Garay, 2016).

The third point is the most considerable. It is the difference in the nature of the real estate asset. Housing or residential real estate proprieties consist in single-family homes, town houses, condominiums and manufactured housing. The main focus of institutional investor is investing in mortgages backed by housing and residential real estate. The property is usually established by mortgages.

On the other hand, the commercial real estate proprieties are: office buildings, industrial centres, data centres, retail centres (malls and shopping centres, also referred to as “strips”), apartments, health-care facilities (medical office buildings and assisted-living centres), self-storage facilities, and hotels.

Small properties may be directly and solely owned by a single investor. In the same time a real estate company, such as a publicly listed REIT, or through private equity real estate funds, own collection of smaller proprieties or large commercial propriety. These two kinds of real estate assets are usually analysed with different financial methods. The creditworthiness of borrowed assets is the criterion for the valuation of residential proprieties; on the other hand, the analysis of the net cash flow is the criterion for commercial proprieties (Garay, 2016).

The final way to categorize the real estate assets is private versus public. Private assets

are physical, direct, or non-exchange-traded real estate. They can be equity in the case of direct ownership of the propriety, or debt in the case of mortgage claim on the propriety. Public real estate takes the form of equity, debt, funds, or derivative positions or financial, indirect, or exchange-traded real estate (Garay, 2016).

CHAPTER 2.

THE THEORY OF REAL ESTATE EVALUATION

2.1 INTRODUCTION TO THE THEORY OF REAL ESTATE EVALUATION

Before starting to introduce the real estate evaluation process and technicalities, it is necessary to know the elements which establish the evaluation requirement. Morri & Benedetto, (2019), have identified some important questions that must be answered by a good evaluation.

1. what is the subject of the valuation?
2. What is the purpose of the valuation?
3. What is the value definition to be estimated?
4. What is the valuation date?

The subject of valuation is the full and exclusive right of ownership over a property. The purpose of a valuation is the require knowledge of the value of the asset. Typically, it is necessary for a transfer (i.e. M&A, sale of companies or a business branches, and expropriation procedures) or for strategic objectives or for the study of possible new economic solutions (i.e. investment decision, leasing operations etc.). In any case the evaluation has to be unequivocal and independent from the reason of the purpose. The definition of value consists in a judgement on the equivalence between a propriety (the asset which has to be analysed) and an amount of money (which is considers the unit of measurement with certain conditions and in a specific period of time). We can consider different meanings of valuation date. It can be the date on which the evaluator drafts the

report, it can be the date on which the opinion of value applies and it can be the date on which the investigation was conducted. The date, moreover, can be in the past, in the present (at the time the valuation is requested) and also in the future. The ex-post valuation refers to a past date and the observer has to take in consideration all and only the information available in that specific time (in the past) and he must be influenced from some events that he knows be subsequent (the date of valuation). This kind of analysis is useful for example in the case of tax, administrative and judicial litigations. The case study reported on chapter three consists in an ex-post valuation (it dates back to 2016 and it concerns the market value of the asset from the second semester of that year). In the case of an ex-ante valuation, the evaluator has to do a forecast based on events that have not yet happened. It is the case of a feasibility study, i.e. a development project (Morri & Benedetto, 2019). Different activities characterized the evaluation process of a real estate asset. There are three macro-phases: preliminary, operational and conclusion phases. Preliminary phase can be divided in two parts: the first is the determination of the valuation requirement, (the nature of the property and the objectives of evaluation) and the second consist in the collection and analysis of all the necessary documentation (Morri & Benedetto, 2019).

The operational phase is fragmented into five parts, they are the following:

1. the inspection of the property
2. the identification of the most suitable method to use for the assessment
3. the collection of the all market parameters
4. the calculation of the evaluation
5. the report

The last phase, conclusion phase, consists in the checking of the results (Morri &

Benedetto, 2019).

In order to do a more coherent valuation of an asset, theory and practice recognize three different approaches. According to the RICS (2017) they are the following:

- A market approach, ‘based on comparing the subject asset with identical or similar assets (or liabilities) for which price information is available, such as a comparison with market transactions in the same, or closely similar, type of asset (or liability) within an appropriate time horizon’.
- A cost approach, ‘based on the economic principle that a purchaser will pay no more for an asset than the cost to obtain one of equal utility whether by purchase or construction’.
- An income approach, ‘based on capitalisation or conversion of present and predicted income (cash flows), which may take a number of different forms, to produce a single current capital value. Among the forms taken, capitalisation of a conventional market-based income or discounting of a specific income projection can both be considered appropriate depending on the type of asset and whether such an approach would be adopted by market participants’.

Summarize we can distinguish between:

- Market Approach Methods
 - a. Direct Comparison Approach
 - b. Hedonic Pricing Model
 - c. Multipliers and Rules of Thumb
- (Depreciated) Cost Approach Methods:
 - a. Replacement Cost Approach

- b. Reproduction Cost Approach
- Income (Capitalisation) Approach Methods:
 - a. Direct Capitalisation Approach
 - b. Discounted Cash Flow Approach (DCFA)

But this kind of categorization presents some limitations. For example, the Cost approach methods often are the maximum price obtainable from a potential sale. In the same way, the market approach and the income approach methods are based on market data (Morri & Benedetto, 2019).

For these reason Morri & Benedetto, (2017), described a clear approach to classify the different methodologies for estimating the market value.

- Physical Comparison Methodology
 - a. sales comparison approach;
 - b. criterion of the hedonic prices;
 - c. multipliers and rules of thumb.
- Methodology of the Economic-Financial Comparison
 - a. income criterion;
 - b. financial criterion

2.2 THE PHYSICAL COMPARISON METHODOLOGY

In order to give a complete overview, it is necessary to make a brief parenthesis about real estate valuation through the Physical Comparison Methodology.

This approach consists in the evaluation of the assets through the comparison with other

transactions. This approach based on two fundamental principles:

- substitution principle
- equilibrium principle

The first principle consists in the idea that the value of an asset is confrontable with the price that should be paid for a perfectly identical asset. The second point based on the assumption that the price of an asset depends directly on the market and on the negotiation process (Morri & Benedetto, 2019).

The sales comparison approach (criterion inside the physical comparison methodology) uses the value of comparable assets which have been sold in the last period of time. In order to better apply this criterion there are three phases to follow.

1. The selection of comparable assets
2. The standardisation of the price of comparable assets
3. The estimating adjustments

The first phase is satisfied if the evaluator is able to find assets with similar physical features (age, conditions, etc.) and similar land (the position). No one time limit is considered better or more coherent. (I.e. the residential properties have a low level of complexity because they are frequently leased or sold and on the other hand, the commercial properties are not so easy to compare because they are not traded frequently).

The physical features that are been taken in consideration for the choice of the better comparable are: the intended use, the location, the accessibility, the connections, the size, the age, the condition and the systems. The regulatory features are for example legal (i.e. the presence of third parts) or connected with town planning and taxation system. Under the economic features, we can find the maintenance, the profitability and the agreement

(lease or sale for example). The second point consists in the identification of a unit of comparison. The surface area is the most used unit of measurement to make comparisons in the real estate sector. The searched value comes from the multiplication between the average value found on the market and the quantity of the asset that it has to be evaluated. After the collection of all data, the third phase concern in the check of the information obtained and the adjustment based on the asset to evaluate (Morri & Benedetto, 2019).

The hedonic pricing model is most applied to the estimation of residential properties. It is also practiced for evaluation of second-hand cars and precious wines. Under the hedonic pricing model principium, the supply and the demand for heterogeneous goods, correspond the supply and demand for each characteristic or attribute of these goods. So i.e. the supply for a specific kind of assets exactly corresponds to the asset put on sale and the demand consists of buyer's interest to buy that specific asset. The satisfaction that a buyer feels in the purchase corresponds to the sum of all the satisfactions that the buyers feels from all the specific characteristics of the good. The price of purchase is the sum of all the prices of the components of the good. For each characteristic, exist an implicit price and it is the "trait d'union" between supply and demand. In the case of a real estate asset, the implicit price is for example the existence of a lift, the building conditions, etc. the way to calculate the implicit price are a regression model. The strengths of this model are the significant reduction of subjectivity and the specific definition of the impact of every attribute on the value (Morri & Benedetto, 2019).

The multipliers and rules of thumb criterions are two other different approach of the Physical Comparison Methodology (Morri & Benedetto, 2017).

The multipliers are market parameters. They allow the determination of an asset value

since they are applied to economic quantities. They are frequently adopted in the practice because they are easy and immediate to use.

The rules of thumb are applied for example for the evaluation of Cinemas, hotels and golf course (Morri & Benedetto, 2017).

The physical comparison methodology will no longer be taken into account in this work and it has been presented only briefly to define the general and main lines.

2.3 THE METHODOLOGY OF THE ECONOMIC-FINANCIAL COMPARISON

One of the reasons why it is more advantageous using the methodology of the economic-financial comparison is that this method is applicable to all kind of assets. This criterion permits to express the value of a real estate asset in terms of expected income and associated risk. The economic benefit is represented by the rental fee net of operating costs and or, in the case that the owner is also the user of the asset, the economic proceeds is represented by the alternative cost or by the opportunity costs. The associated risk is represented by the capitalization rate or discounted rate. It is a measure of the performance required by the market (Morri & Benedetto, 2017).

Inside the methodology of the economic-financial comparison there are two different criteria: income and financial. The first is used to convert the forecast of expected income of a single period in an indication of value by a direct passage, which is embodied in the division of estimated income for an appropriate capitalization rate (an income and a rate). The second criterion is used to convert all future flows into a present value, discounting every expected benefit for an appropriate discount rate (plurality of flows), (Morri &

Benedetto, 2017).

In the real estate case the financial criterion is more useful of earnings criterion; in fact, the useful life of the building can be very more extensive than decades, but it is also observed that the soil component has an infinite useful life.

The main differences between the two criteria are:

- the definition of the economic benefit;
- the time horizon;
- the calculation algorithm;
- different rates.

In the case of income criterion, the earnings are the economic benefit, the time horizon is mono-period, the algorithm is a capitalization formula and the rate is the cap rate. For the case of financial criterion, the economic benefit is the cash flow, the time horizon is multi-period, the algorithm consists in the anticipation principle for discount the value of the future flows and the rate is the discount rate (Morri & Benedetto, 2017).

2.3.1 THE METHODOLOGY OF THE ECONOMIC-FINANCIAL COMPARISON: THE INCOME CRITERION

The income criterion is based on quantification of a stabilized periodic income, usually on an annual basis. Generally, it is defined as the expression of unlimited perpetual income. The assumption derives from the fact that the real estate has an extremely long life cycle and that the difference between the current value of a perpetual annuity and the value of one time-limited income assumes low values after few years. Other references

take into account that there may be limitations on the life of the asset or on its ability to generate income (i.e., a usufruct).

From a mathematical point of view the formula is:

$$V = \frac{R}{i}$$

where:

V= value

R= income

i= cap rate.

It is necessary to accurately estimate value and income.

The cap rate is defined as the expected current return, which is the relationship between the price and the relative income, for comparable goods recently traded in the market.

The economic benefit is defined by an average income capacity of the good, that is stabilized. In order to do this, the costs with multi-year value on current income have to be adjusted. It is for example the case of extraordinary maintenance costs. (Morri & Benedetto, 2017).

Table 2.1 Table of income statement for real estate

	REVENUE
a	+ Rents and potential rents
b	+ Other revenue
C=a+b	POTENTIAL GROSS INCOME
d	- actual vacancy
e	- loss on credit
F=C-d-e	EFFECTIVE GROSS INCOME
g	Property's tax (i.e., IMU, TASI)
h	Insurance
i	Registry's tax
J	Extraordinary maintenance
k	Tenant improvements
l	Property and facility management
m	Leasing fees
n	Other costs
O=g+ (...) +n	- TOTAL OPERATING COSTS
P=F-O	STABILIZED NET OPERATING INCOME

Regarding the rent, in the case of vacant units in a building, it is possible to apply the market fee. In the case of units with passing rent not in line with the market fee, the correction is difficult and it is preferable the use of financial criterion.

There are two types of operating expenses: fixed and variable costs. The fixed costs are independent from actual use, the others arise from lease of the unit. The definition for earnings is the average income, for this reason it is important to consider an investment reserve (capex) and an extraordinary maintenance as cost's item (Morri & Benedetto, 2017).

To stabilize the income, the actual rental fee has to be in line with the market fee and the occupancy rate has to be standardized. In order to have a careful analysis it is necessary to know how the rate is built and the choice of definition of income. The Appraisal

Institute (2001) supports the use of the net operating income as definition of income. In fact, NOI permits to deduct the expenses directly attributable to the specific propriety and so it is possible evaluate assets also with different cost structures. The income criterion

requires to estimate less parameters than the financial criterion and the data used are more objective because they can be extracted from market, in particular in relation to the determination of rates (Morri & Benedetto, 2017).

2.3.2 THE METHODOLOGY OF THE ECONOMIC-FINANCIAL COMPARISON: THE FINANCIAL CRITERION

The economic benefit is based on punctual definition of cash flow and so the liquidity actually produced is analysed in each period. For this reason, it is not necessary to subdivide the costs that concretely manifest themselves in a single period.

Every punctual income contributes to build the Cash Flow, for this reason it is important to consider the cash outflow for investments and extraordinary maintenance in the precise moment that they are realized.

The cap rate can be directly extracted from the market, while for the discount rate estimation processes it has a greater level of arbitrariness. For this criterion, the value of any asset depends on the economic benefits which it is able to generate and from the risk associated with them. It also depends on its flows discounted cash (Morri & Benedetto, 2017).

This methodology has two critical issues: the determination of the expected cash flows and the estimate of the discount rate. To estimate the expected cash flows, it requires the formulation of precise forecasts on income, future costs and investments for the different periods in which a horizon is divided. Unlike the long life of a real estate asset, the capacity to evaluate is limited, so it becomes necessary to define a limited time horizon

on which to conduct analysis. It is usually used a time horizon of 10/15 years or a time horizon similar to the average lease term. The time horizon should be as short as possible in order to limit the discretion in estimating future flows (Morri & Benedetto, 2017).

A distortion and an arbitrariness are, on the one hand, the choice of the growth rate of flows (from present to future) and, on the other hand, the choice of the discount rate (from the future to the present). The cap rate can be directly derived from the market, while the extraction from the market of the discount rate is only indirect, with one greater discretion on the part of the evaluator. The frequency of calculation of each flow is usually quarterly or half-yearly or monthly. The economic benefit is represented by the cash flow that is the difference between revenue and expenditure. The revenues are all the revenues net of the credit losses. The operating costs and the investments are considered as expenditures. In order to calculate the final value, it is possible to use the comparative synthetic criterion or the income criterion (Morri & Benedetto, 2017).

Regarding to the comparison of cash flows of different periods, it is necessary to convert them into equivalent flows measured at the same time instant. The discounting procedure allows future cash flows to be converted in equivalent current cash flows. The financial criterion is based on the present value formula PV, defined as the sum of all cash flows, each discounted to an adequate discount rate. The discount rate is the expected return in relation to the risk associated with the capital due on a future date. The application of a discount permits the identification of an equivalence between two capitals that have different deadlines over time. The PV formula is the following:

$$PV = \frac{F_1}{(1+k)^1} + \frac{F_2}{(1+k)^2} + \frac{F_3}{(1+k)^3} + \dots + \frac{F_n}{(1+k)^n} = \sum_{t=1}^n \frac{F_t}{(1+k)^t}$$

Where:

PV = present value

Ft = cash flow at time t

K = discount rate

n = last period in the time horizon.

With the financial criterion, the amount and the timing distribution of revenues, maintenance costs and any other disbursement by the owner are clearly explicated. It is moreover necessary to know the growth rates of the different elements of cash flow and it is important to analyse the market trend (to estimate the rent increase of the lease or the maintenance costs or legal fees). This criterion is useful to understand the sensitivity of the value of the propriety according to the variation of the parameters of evaluation. The most difficult issue of the financial criterion is the choice of the discount rate and consequently the terminal value derived (Morri & Benedetto, 2017).

2.3.3 THE TRANSFORMATION PROCESS

An application of the Methodology of the Economic-Financial Comparison is the Residual method. It is the valuation in the case of a property that currently does not generate cash flows. It is the case of the properties that have reached the end of their life cycle: their value depends on the buildings that can be built on them. The transformation process consists in identifying the "best" possible use of a soil under the constraints of legal and economic feasibility, namely: highest and best use. It is not sufficient to think

about something realizable, but it is necessary to think about something for which there is a real demand for use. The best use is not something that realises the highest value of the asset, but it is something that realises the greater margin of profit. There are two different methods of application of the procedure that differ for the number of periods considered. They are the mono-period transformation process and the multi-period transformation process (Morri & Benedetto, 2017).

The first one considers, as the name implies, the sales values and the realization costs in a single period. The price obtainable from the sale is estimated, as a future market value, throughout different methods depending on the situation. In the case of a residential propriety it is better to use the physical comparison methodology, on the other hand, in the case of a commercial propriety, it is better to use income criterion. Anyway, the estimation refers to the future date (of the possible sales). The realization costs can be distinguished into two different groups: the construction costs and the financial costs. The first category includes all the full construction costs and it is divided in two types:

- the hard costs, i.e., the edification costs,
- the soft costs, i.e., the design costs.

The financial category is divided into financial burden for the credit institutions and the cost of the investor's capital.

The financial burden is quantified in an approximative way: it is calculated considering the interest rate (which is applied by the credit institute) with an average financed capital, all in operation of the duration of the intervention. The equity pay-off is quantified in a percentage of realisation costs (both hard costs and soft costs). In the end the market value

of the soil is the difference between the two factors, as we can see in the following table.

Table 2.2 Transformation process in mono-period

+ Market value of the realizable asset
- full cost of construction
- financial burden
- property developer margin (% on the full cost of construction)
= Market value of the soil

This procedure corresponds to the application of the income criterion but, in this case, there is not income capitalization but an estimate through difference between revenues and costs. For the cash flow of a development operation, the income is composed by receipt sales (of all the units which are sold) and the expenses. The latter are predominantly composed by transformation costs, by operating costs and by transaction costs (like the brokerage fees).

The multi-period transformation process is characterised by the use of financial criterion. In fact, the return on invested capital is calculated with the financial value of time. In this case, it is necessary to estimate the cash flows with their distribution over time. This process permits to calculate the margin in a more accurate way (Morri & Benedetto, 2017).

2.4 THE RATES

The Economic-Financial methodology implies the use of rates of return, cap rate for income criterion and discounted rate for financial criterion. Both rates are a function of

the risk factors associated with expected income / cash flows. The possibility to directly pull out the rate is only for the cap rate, on the other hand, the discount rate needs more techniques.

For every kind of investment, especially for an asset that produces a periodic return, and which has a residual value, the total return comes from different components. They are the yield and the capital gain. The yield is the ratio between income and asset value. The capital gain is the ratio between the increase in the value of the period and the initial value of the asset. In the case of an investment in a real estate asset, there is a simple way to calculate the total return, because it is based on a single period. If the investment is over several periods, it is necessary to identify a “distribution/allocated” method of the performance component from capital gain. In the case of intermediate flows, the yield used is the internal rate of return IRR. The IRR represents the discount rate which makes the sum of discounted cash flows equal to zero. See formula below.

$$\sum_{t=0}^n \frac{F_t}{(1 + IRR)^t} = 0$$

The IRR is the maximum cost of capital for an affordability investment. In this way, the NPV (inclusive of initial investment) is positive. The IRR represent the implicit return of the investment. The return depends on the dimension and on the timeline distribution of cash flows. The cap rate corresponds with the current expected return (yield) and the discount rate correspond with IRR. The value of asset changes under the variation of the future cash flows. Different profitability components will come from depending on different real estate transactions. I.e. in the case of a developed operation, (with sale and not location) the capital gain is the only component of return. I.e. in the case of an existing

real estate (with not changes of cap rate or returns) the current return is the only component. In the last two example the values of expected return are different depending on the different levels of risk.

Both for the cap rate and for the discount rate the following relation works. Real estate rate is the equivalent of a sum between a risk-free rate and a risk premium. The risk-free rate is the rate for which the actual yield is equivalent of expected return. Risk-free means the absence of two kind of risks.

The first is the default risk in other words the possibility which the payee is not able to give back the investment. For this reason, usually it is used an obligation with maximum rating (a treasure bond emitted by a state with a solid economy). In order to take in consideration, the country risk, we can take a bond of the state where the real estate takes place.

The second element is the uncertainty of the reinvestment rates. In fact, a risk-free rate is a zero-coupon bond, where there is not any cash flow because they should be reinvested with a rate that we cannot know in the date of evaluation. It is necessary to choose a zero-coupon bond with a duration coherent with the time horizon considered.

After that it is necessary to consider if choose an ex ante or ex post returns. On the other hand, the risk premium is the greater return required to invest in risky activities than in no-risky activities. Two aspects are to be taken in consideration: which are the risk factors and which approach has to be used (ex-ante or ex-post).

The risk factors are more than one, in fact, there are a lot of differences between different real estate. the risk premium has to pay not only the no-diversifiable risk (market risk) but also the specific risks of the real estate which is taken in consideration. In order to

have a correct approach, we can use historical series where we can measure the risk premium like the difference between the average historical yield of the activity and the risk-free rate. In this way, we can find the historical risk premium. This technique is usually used in the evaluation of listed security, but in the case of real estate assets is less frequent. In fact, it is possible to find the difference between yield (current) and the return of the corresponding risk-free security.

Moreover, the ex post approach has two limits. One is that the past events cannot be representative of the future possibilities. The second is that all the risk facts are collected in only one value, without the possibility to establish the singular particular contribution. With the use of historical series, we have to identify the correct time horizon, in order to include the cyclic nature of the real estate market. A long period better absorbs the exceptional events and permits to reduce the weight in the risk premium.

A good alternative can be the ex-ante valuation of the risk premium. It can take as a reference the past returns and in this way, it can better identify the no-diversifiable risk factors. On the other hand, for factors of specific risk, an ex-ante valuation has to be adjusted according to the base rate. In general, the risk premium depends on the sentiment of the investors in the market (Morri & Benedetto, 2017).

2.4.1 THE CAP RATE

Generally, the cap rate is a quantity that links an assets value with the income flow generated. In the real estate market, the cap rate definition is realised by the Appraisal Institute (2002) “Overall capitalization rate: an income rate for a total real property

interest that reflects the relationship between a single year's net operating income expectancy and the total property price or value; used to convert operating income into an indication of overall property value”.

We have to distinguish between cap rate and yield. The first is the calculation element for the conversion of an income quantity into a value dimension while the yield is a return (actual or expected), (Morri & Benedetto, 2017).

There are different kind of cap rate depending on the referent date of evaluation. We can choose a present or a past date for the analysis with income criterion. In this case, we can find information about cap rate based on effective transactions that were in the market. The application of income criterion, with a future date, is not a final estimation but it is the determination of the value of the asset in the last period of flow analysis, the so-called final value. So, in relation of the time of estimation we can distinguish between different kind of cap rate:

- Going-In Cap Rate (GICR or even Initial Cap Rate) or Initial Yield: the report, on the date of the assessment, between the initial income and the value / price of the property.
- Going-Out Cap Rate (GOCR or even Terminal Cap Rate) or Exit Yield: the rate used to convert a final income to the value of the property expected at the end of the time horizon of rating. Unlike the previous one, this cannot be extracted from the market, since there are no future transactions, but it can only be estimated.

So GICR or the GOCR are the same rate, but considered in different moments. Only one GICR is possible (based on a specific date, usually the date of evaluation). On the contrary, there can be different GOCRs, depending on the time horizon chosen by

evaluator. The GICR is deducted by several techniques, the GOOCR by taking in consideration the future market. In the evaluation practice, frequently there is a positive difference between GOOCR and GICR which consist in some basis points, or “bps”,⁸ (Morri & Benedetto, 2017).

In order to explain the difference between these two rates there are many reasons. The first motivation consists in the fact that the future is unknowns and so GOOCR reflects a higher intrinsic risk. A second reason refers to the obsolescence of the building. In fact, over time, the useful economic life of the building is decreasing, i.e., in absence of any restoration intervention (capex). The reduction of the useful economic life is coherent with the wasting theory, according to, every kind of assets over time lose their productive capacity (Morri & Benedetto, 2017).

The quantification of a correct GOOCR (for the estimation of final value), is a crucial element in the application of financial criterion. Some elements can be useful in order to better identify the correct rate:

- The difference between GICR and GOOCR has sense only with an extended time horizon.
- The status of the building at the time of evaluation. A new building, with an evaluation in a short time horizon, does not need a distinction between GICR and GOOCR, on the other hand a not recent building needs an evaluation with a GOOCR different from GICR.
- The GOOCR can decrease, i.e., when there is a relevant upgrading.
- All considerations must be in relationship with the economic environment, in the

⁸ A bps represents the hundredth part of a percent point, it is 0,01%.

case of significant changes, also the considerations about rates have to be modified.

The cap rate is strongly correlated with its historical value, and its variation depends on the trend of the space market (McDonald, 2015).

2.4.2 THE DISCOUNT RATE

The discount rate is used in the present value formula in order to make comparable the future cash flow at the present moment.

It represents the expected return of an investment. Theoretically there is no difference between the use of nominal or real cash flow, but it is important the coherence with discount rate. The flows are joined with inflation and so, in practice, it is more usual to use nominal returns. The inflation anyway has an important impact to rates and flows. Now, we have to define what type of cash flow is discounted. The following elements are important point to take in consideration (Morri & Benedetto, 2017):

- the loan and the tax situation,
- the rent situation,
- the trend of interest rates.

In the case of estimation of an investment value, we can use a free cash flow from operations FCFO, (with unlevered cash flows which comes from operating activities). In other words, we can also consider the fiscal dimension (Borghi 2009). The use of free cash flow to equity FCFE is possible, instead, if we know the effective financial structure of the project (i.e., a project finance approach). In this case, we know the levered cash

flow, where we can consider the flows produced for investor, net of loans from a third party (Borghi 2009).

The market value is obtained through the use of a gross cash flow, a flow with taxes and tax burden. The reason for this decision is based on the fact that in the evaluation for the market value, the main element is the capacity of the asset to generate returns, and not the way to have a loan or the tax status of the property. (Morri & Benedetto, 2017).

We have to do a specific consideration for the rents. In principle, the discount rate is different for a building rent compared to a vacancy asset. In the second case, the rate is higher than in the first situation, in order to reflect a greater risk. But this is not the only solution. In fact, in a long period, the difference could go to zero and it is possible to hypothesize a new location with market conditions and with the assumption of a merely potential cash flows. The risk in the two situations will be different. With a contract, there will be a bigger degree of certainty, on the other hand in the second case there will only be an estimation of the future trend of the soil market (Morri & Benedetto, 2017).

It is common to find a building with rent areas and also with vacancy areas. In these circumstances, Massari (1998) suggests a different discount rate. In the rent context, we can use an intralease discount rate, in vacancy situation we can use an interlease discount rate. Practically, we can usually find a sort of blended discount rate. In other words, there is only a rate that consists in a sort of a weighted average. In this contingency, we can use a blended IRR, an average return like base to esteem the discount rate (Morri & Benedetto, 2017).

We can do the same consideration in the case of a development operation.

The two phases: the transformation and the sell phases, in fact, present two different types

of risks, but in practice, we can use a blended rate. We can also add some clarifications and specification about development operations of a residential real estate and about the development operations of a commercial real estate. The use of a single rate is possible in the case of development operations in a residential building with parcel out sell. Some sells, in fact, are at the beginning, with work in progress. In the case of a commercial building, we have to make some distinction.

When the development operations are contextually with the total transfer of all the units, in a time limited (until the commercial activity will go full speed) we can consider only one rate.

When, in the evaluation, we decide to distinguish between development operation and, consequently, the second phases of returns, we have to use two rates. In practice, the evaluators do not consider the structure of the interest rate on the basis of its possible deadline, the yield curve.

The yield curve is a function which joins the rate of the possible return of a financial instrument with their deadline. Usually this curve represents higher returns for longer maturities. It is calculated by the use of BOT and interbank rate (which are the base for estimation of equity and debt). Like before, the theory teaches that we should use different discount rates based on the differential expected return, in function of the different maturities. In practice, the evaluators use a unique discount rate for each maturity. Following this idea, the discount rate derives from an average expected return based on the investment duration. For coherence, we can look to the estimated returns of investments with the same time horizon. We have to pay attention to not calculate twice the risk, both in cash flow, and in discount rate, i.e., when the cash flows count all the

possibility of break option from the tenant and the consequently period of vacancy, the discount rate has to be smaller, because the lease risk is already included (Morri & Benedetto, 2017).

Now we have to specify the hypothesis about the capital invested. It can be equity or debt. It is necessary utilize the weighted average cost of capital, WACC, in order to represent the expected return (or also the cost of capital) of the all financial resources. When the financing sources are divided in debt and equity, the WACC formula is the following:

$$WACC = k_d * D\% + k_e * E\%$$

Where:

K_d = cost of debt

$D\%$ = debt part

K_e = cost of equity

$E\%$ = equity part

The relationship between debt and equity is estimated on the market value and the long-term goal. The difference between the evaluation of market value of an asset and the market value of an investment is that for the first case the values for required returns of debt and equity and the financial structure are objective, in other words they do not depends on the values of specific subject, but they are values usually required from the market for the specific asset. In this case, the flows used are gross from the tax burden and so the tax benefits are not considered (Morri & Benedetto, 2017).

The discount rate can be broken down into its constituent parts: finance structure, cost of

debt and cost of equity. Each part has to be estimated through its specific market parameters. The WACC formula can be also used to calculate the cap rate, and it is called “band of investment” technique. This technique permits the calculation of an equity cap rate, but it is not usual because it is very hard to directly extract the equity cap rate from the market (Morri & Benedetto, 2017).

The financial structure corresponds to the weights of equity and debt. The credit availability of a real estate investment changes in time and space and depends on the type of asset and on its specific characteristics. In relationship with time, we have to remember the access to credit is in function on the banks availability, but also on the real exposure of the sector. We can remember the credit crunch after the financial crisis of 2008 where the banks reduced the credit concessions and the limited access to credit after some years later, caused by the excessive level of risk. Anyway, we can find different credit availability forward the different geographic areas. Also, the use of debt instrument to finance real estate investments changes forward the area where the asset is located. About the difference between types, we can distinguish between an already existing building and a development operation. The availability to use debt to finance the investment is more probable in the first case, in fact, we can know the story of the building and we can have more predictable flows, and so, a little level of risk. On the other hand, the development operations present cash flows not easy predictable and also possible unexpected events, so equity is the financial instrument more adequate. We have to add that the financial structure depends also from the rent contracts and from the reliability of the tenants (Morri & Benedetto, 2017).

The cost of debt (K_d) corresponds to the current cost required from creditors, in order to

finance the investment. It is possible divided into two parts: base rate and spread. The base rate is represented by EURIRS because the loan has been considered with a fix rate (WACC simplification) and because this index is utilized for indexing the mortgages (this is a simplification of Wacc formula). The quotation of EURIRS are published with a frequency from 1 to 30 years and so it is compatible with the time horizon of real estate operations and their time horizon. The estimation of the margin, on the contrary, depends on the spread that the banks grant (Morri & Benedetto, 2017).

The cost of equity, (K_e), is the total currently expected return required from shareholders to invest in a real estate asset similar to the asset of evaluation. The K_e is always greater than K_d because its remuneration is distributed later, and so the risk is higher. In order to estimate the market value, the cash flows are calculated before the deductions and taxes. The K_e depends both on operating risk and financial risk. So, for the K_e estimation, it is necessary that the financial structure is already decided. The evaluation of K_e is extremely hard, because the real estate market is different from the others controlled market and because every asset is unique. There are two parameters for the calculation of K_e : the risk-free rate and the risk premium. In order to derive the risk-free, we can use different methods, taken in consideration the coherence with the duration of the title and the time horizon. One way considers the use of treasury bonds without default risk. In this case when we calculate the risk premium, we also have to consider the country credit risk. The other way consists into the use of a treasury bonds of the country where the asset is located or will be located. In the case of Italy, we can use BTP, “Buoni del Tesoro Poliennali”. Another choice is the use of a weighted average return of a basket of government bonds (“Rendistato” in Italy). A final option is the EURIRS index (Morri & Benedetto, 2017).

2.4.3 THE DETERMINATION OF RATES

Hypothetically, all rates are deductible from the market but in the real estate market it is difficult to extract the IRR because there is not historical series, only the yield is deductible from the comparison of market price and the return of others comparable transactions. Only the current cap rate is direct deductible, the discount rate needs other methodology. Now we can see the most used way to deduct the rates (Morri & Benedetto, 2017):

1. Direct market deduction, the use of data from similar assets (with an adequate variation) and it is utilized only for cap rate.
2. From cap rate
3. Build-up approach, sum of the different risks components
4. Analysis of the opinions on the return of the operators

Some of these methods to deduct the rates can be applied to both rates, others are specific for real estate market (Morri & Benedetto, 2017).

The method of market extraction consists in the derivation of the capitalization rates, corresponding to the current yields of the building (yield), directly from the market. The formula for cap rate extracted from the market is:

$$\text{Cap Rate} = \text{Yield} = \frac{\text{Income}}{\text{Price}}$$

For the calculation, it is considered the income for a single year divided by the sale price of the asset. The main limit of this method is that only a small number of transaction are comparable in a reasonably period of time and in the same geographical area. The assets

in order to be comparable have to have same features (i.e. the highest and best use, the location, the physical condition, the residual life, the current situation and future expectation of income and the potentiality to use the same financial structure) (Morri & Benedetto, 2019).

The discount rate can be extracted from the cap rate. In fact, the discount rate also represents the total return expected from the investment and it is possible use the relationship between IRR and the cap rate to derive the discount rate. Like in the Gordon model:

$$Value = \frac{Income}{k - g}$$

Where K is the discount rate and it is derived as the sum of cap rate (i) and the coefficient (g) which represents the future income growth rate expected ($K = i + g$). The discount rate is net of the operating costs and this technique requires the same level of income and cash flow. In the practice, the inflation is used as an approximation to the growth rate of future income. “This expedient is most used in the long term, assuming that there is a correlation between inflation, economic growth and growth in demand for space.” This operation is not used in the case of short term because a contraction may occur (Morri & Benedetto, 2019).

The Build-up approach allows to define a rate based on specific risk components. It can be used to correct the rate which are obtained by the direct market deduction methodology. The definition of the various risk components and the identification of their degree of importance are the essential elements. The evaluator is forced to use logic in order to contextualise its choices. This is, also, the main limit of this approach, based on

the estimation of risk factors. The returns required based on each risk factor can be expressed in this formula:

$$\text{Property Return Rate} = \text{risk-free rate} + \text{property risk premium}$$

The property return rate is obtainable from the sum between the risk-free rate and the property risk premium (the specific risk component). In corporate evaluation, the specific risk premium comes from many elements: “risk of equity investment, dimensional risk, sector risk, financial risk, the degree of diversification, growth prospects, etc. Each factor explains part of the specific risk and can be quantified by a number of basis points of specific additional return required by market participants to bear this specific risk” (Morri & Benedetto, 2019).

The last way to deduct markets rates is the analysis of the opinions of market players on the return expected. It can occur when some consultancy companies publish reports based on the opinions of the market players. The main problems of this method consist in the average values based on the opinions connected with the past. This approach can be a starting point to build rate through the building up method.

CHAPTER 3

THE CASE STUDY

3.1 THE DESCRIPTION OF THE CASE STUDY

In this part of the thesis, a real-life case is presented as an example of how to apply, in practice, the financial instruments to a real estate sector.

The real estate property objective of analysis is a building for commercial use located in the Milan interlard. There are four upstairs floors and one downstairs for parking use. There is a garden and an uncover parking. It is located in an industrial zone and it is near the main streets. It is also easy reachable with public transport. The building was built in the first 2000 years and its conditions are good. In the table 3.1 all the asset's technical information is summarised.

Table 3.1 The technical data sheet of the asset

TECHNICAL DATA SHEET OF THE ASSET	
Construction period:	2004
Last renovation:	//
Gross surface area:	15.218 sqm
Position: Device Validity position:	Good
Finishing level: Good Maintenance status: Good	
Property type:	Heaven / earth
Prevailing destination:	Office
Factory Bodies:	1
Floors above ground:	4
Floors within the ground:	1
NOTES: Rentable commercial area 9.127 sqm, including 86 covered parking spaces and 85 parking spaces external.	

The owner of the building is a real estate fund. Some of its parts are rented and at the date of evaluation (2016) it has a vacancy percentage of 60%.

The evaluator estimation dates back to 2016 and it concerns the market value of the asset from the second semester of that year. At the date of observation, the amount of the specific units is listed in the following table (3.2).

Table 3.2 The report of gross and commercial area

TENANT/INTENDED USE	OFFICIES (sqm)	CAFETERIA (sqm)	WAREHOUSE ARCHIVE (sqm)	COVER PARKING SPACE (sqm)	UNCOVER PARKING SPACE (sqm)	COMMON SPACE (sqm)	COMMERCIAL AREA (sqm)
WEIGHTING FACTOR	100%	100%	50%	50%	30%	0%	
TENANT A		460			341		562
TENANT B	1618			297	220		1832
TENANT C	485		52	193	55		624
TENANT D	635			73			672
VACANCY	5005		46	612	344	4783	5437
TOT. GROSS SURFACE (sqm)	7743	460	98	1175	959	4783	15218
TOT. COMMERCIAL SURFACE (sqm)	7743	460	49	588	288	0	9127

Every area is subdivided among the tenants. There are six kind of areas, respectively offices, cafeteria, warehouse, cover parking, uncover parking and common area. For every kind of area is assigned a weighting factor (100% for office's and cafeteria's area, 50% for warehouse's and cover parking's area, 30% for uncover parking's area and 0% for common's area). The gross surface is the sum of all the surfaces of all the tenants. In order to obtain the total commercial surface, the weighting factors are applied for all the surfaces. The commercial area for tenant A is the result of the sum between 460 multiplied for the weighting factor 100% and 341 multiplied for the weighting factor 30%. In the same way, the commercial area for tenant B, C, D and vacancy are calculated. The sum of these areas give the total commercial surface, 9127 sqm.

The building' status is good and only some little interventions are needed. The budget, under CAPEX voice, considers a restyling of 204.000€.

The rent roll, reported in table 3, shows the rental rate for each of the landlord’s properties.

Table 3.3 The rent roll

TENANT	COMMERCIAL AREA (sqm)	PASSING RENT (€)	PASSING RENT (€/sqm)	INDEXING	STARTING DATE	DEADLINE
TENANT A	562	28000	49,79	75% ISTAT	01/04/2015	01/04/2017
		40000	71,14	75% ISTAT	01/04/2017	31/03/2026
TENANT B	1832	248470	135,60	75% ISTAT	01/01/2016	31/08/2022
TENANT C	624	70000	112,19	75% ISTAT	01/08/2015	01/08/2016
		75000	120,21	75% ISTAT	01/08/2016	01/08/2017
		80000	128,22	75% ISTAT	01/08/2017	31/07/2026
TENANT D	672	90946	135,44	75% ISTAT	01/08/2014	31/07/2022
VACANCY	5437					
TOTAL	9127					

As you can see, the current contracts are divided into two parts: two contracts are “a scaletta”⁹, (contracts of tenant A and C), two contracts are standard, (contracts of tenant B and D). This information is relevant in order to calculate the asset’s market value. In fact, the asset’s market value is calculated taken in consideration also the future revenues which will come from the future rents.

3.2 THE EVALUATOR METHODOLOGY TO ANALYSE THE CASE

Now we will disclose the evaluator methodology to analyse the case. The market analysis is conducted by the evaluator and shows data about a rent of similar buildings in the close area. The estimated rental value which comes from the analysis shows that:

- the units for office use have a rent of 125€/sqm -year,
- the units for cafeteria use have a rent of 75€/sqm-year.

⁹ Rent which gradually increases up to full speed.

In order to find the value market of the asset at the date of June 30, 2016, the evaluator decided to use the discount cash flow methods and, in his report, he explained some hypothesis and data obtained at that time. The time line of the report is divided into semesters.

The evaluator assumptions are the following:

- a. there are no break options,
- b. all contracts are brought to deadline,
- c. after the deadline, there will be a restyling (no constructions operations but only a refurbish),
- d. after the restyling, the units will be re-rented out based on the ERV (mentioned above),
- e. the new contracts will have a duration of 6+6 years and with the final transfer at the end,
- f. for the vacancy portions 21 month are expected and after this period they will be located with contracts based on ERV (mentioned above),
- g. after the fifteenth year, all the building will be sold to an investor.

For the calculation of cash flow, the evaluator considered both the inflation that the trend of market. In fact, he incorporated an inflation forecast (for the indexation of costs) and the performance of the real estate market (for indexing of revenues). The inflation trend is brought out from the “consensus forecasts” of April 2016. It is 0.05% for the first semester, 0.55% for the second semester, 0.55% for the third semester, 0.70% for the fourth semester and the inflation for the long period is estimated as 1.70%. The trend of

market is brought out from the forecasts made at the time by Nomisma. It is -0.48% for the first semester, 0.33% for the second semester and for the third semester, 0.83% for the fourth semester. In the long period the evaluator assumed that the trend of market is aligned with the long run inflation.

The risk free is calculated by taking into consideration the BTP (equivalent to 3.2%). The Kd is calculated considering the EURIRS index, equivalent to the average of the last 12 month before the date of evaluation. It is equivalent to 1.2% yearly.

In order to deduct the cap rate, the evaluator took the gross cash flow (cash on cash return). In other words, the expenses charged to the property (taxes) are not deducted from the rental income (as the real estate taxes, insurance, property management, etc.). Quite the opposite, the discount cash flow comes from the cash flow net from “real estate costs” (that are near the 12% of the gross rents). In this way, the evaluator considered the capitalization procedure as a constant perpetual income (and therefore it is net of the future performance of the real estate market), while for the DCF he took into account the costs and revenues (indexed on the basis of the foreseeable inflation and market trends). The return of the real estate investments is directly deducted from a market investigation. Based on that analysis, the different kind of risks are defined. On the contrary, the remuneration of equity is obtained through the leverage and from the cost of a similar real estate investment. So, the WACC methodology was no taken in consideration for the determination of the discount rate.

The deadline is the fifteenth year because in this year where there will be the normalization of the cash flow and the terminal value is obtained with the direct capitalization of the last cash flow with the GOOCR.

The database with all costs is directly achieved by the property. It is reassumed from the following table (3.4)

Table 3.4 The costs

DATA	VALUE	NOTE
OPERATING EXPENSE:		
PROPERTY'S TAX (IMU, TASI)	81482	€/year
INSURANCE	5397	€/year
% REGISTRY'S TAX	0,5%	on the annual rent
EXTRAORDINARY MANTEINANCE	65000	€/year
PROPERTY AND FACILITY MANAGEMENT	1%	on rent
INVESTMENTS:		
CAPEX	204000	yearly
TENANT IMPROVEMENTS	728100	yearly
LEASING FEE	10%	on the rent of first year
IRRECOVERABLE % RENTS	2%	on the annual rent
BROKERAGE FEE	1,50%	on the terminal price

The evaluator calculated the income that came from the rent of tenants. He distinguished the income from “a scaletta”¹⁰ contract and the following income of the contract at full speed. After the natural deadline, he used the ERV to calculate the new rents. For all the tenants, he supposed six month of vacancy after the deadline of the rents, in order to re-allocate the units. In the periods of vacancy, he considered some tenant improvements. As we can see in the table 3.5, he considered also expenses for the vacancy units (in order to prepare the unit for the new possible tenant).

¹⁰See note 9

Table 3.5 The tenant improvements

TENANT	TENANT IMPROVEMENTS	DATE
TENANT A	28.100 €	30/06/2026
TENANT B	91.600 €	31/12/2022
TENANT C	31.200 €	31/12/2026
TENANT D	33.600 €	31/12/2022
VACANCY	271.800 €	31/12/2017
	271.800 €	30/06/2020
TOTAL	728.100 €	

The evaluator indexed all the rents for the 75% of the inflation percentage (as civil code in the case of contracts rent). To the gross income from rents, he subtracted the percentage of irrecoverable rents (2%) and so he obtained the effective income.

The costs were distributed, and the evaluator indexed all of them for the trend of market. The capex was not indexed. The leasing fee and the brokerage fee were joined the other costs.

The evaluator found the cash flow through the difference between revenues and costs. After that, she discounted the intermediate cash flow for a discount rate equal to 7.19%. He considered a cap rate equal to 6.24% and a spread percentage of 0.38%. He used a GOCR of 6.62% (the sum of GICR and the spread) in order to capitalize the final cash flow. In the and he applied the discount rate also for final cash flow and the result is a market value equal to 14.500.000 €.

3.3 OUR EVALUATION

We will try to reproduce the evaluator estimation, in order to obtain a market value of the asset. In doing this, we will use the historical data from the previous analysis. So, the

year of our evaluation is 2016 and we will estimate the market value of the asset from the second semester of that year. The hypothesis is to use the tables above (area, rent roll, costs and tenant improvements tables).

We start with the income, we distinguish for every periods the income from “a scaletta”¹¹ contracts and the following income of the contract at full speed. After the natural deadline, we use the ERV to calculate the new rents. For all the tenants, an average of seven month of vacancy after the deadline of the rents is assumed, in order to re-allocate the units. Nomisma, in fact, shows that the average time for re-allocation of an office in the interlard of Milan is about seven months (Nomisma, 2016). According to “the principle of permanence of the conditions”, we apply the hypothesis of seven months as average time for re-allocation also for the other years after the date of estimation. We sum all the rents for each specific period, and we index the total gross income from rent to the 75% of the tax of inflation. It is necessary to proceed in this way for each period, both for the current rent and also for the potentially rents (the rents which are calculated with ERV value).

After this operation, we subtract the irrecoverable percentage, the 2% of the annual rent, in order to obtain the effective total income from rent. We create the period “0”, to split the percentage with the correct “weight” in each period. (In fact, every semester can have different amount of rent).

The following table can show the results of income calculation (table 3.6).

¹¹ See note 9.

Table 3.6 The income calculation (our evaluation)

TOTAL PERIODS																																					
INFLATION TREND																																					
INDEXING																																					
				30/06/2016	31/12/2016	30/06/2017	31/12/2017	30/06/2018	31/12/2018	30/06/2019	31/12/2019	30/06/2020	31/12/2020	30/06/2021	31/12/2021	30/06/2022	31/12/2022	30/06/2023	31/12/2023	30/06/2024	31/12/2024	30/06/2025	31/12/2025	30/06/2026	31/12/2026	30/06/2027	31/12/2027	30/06/2028	31/12/2028	30/06/2029	31/12/2029	30/06/2030	31/12/2030	30/06/2031			
INCOME				total mq	office/cafeateria sm	RENEGOTIATE RENT		RENT																													
TENANT A				562,306	460	28000																															
% OCCUPATION				100%	100%	50%																															
RENEGOTIATE RENT (after deadline 1)						40000																															
% OCCUPATION				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
RENEGOTIATE RENT (after deadline 2)				ERV	42,173																																
% OCCUPATION																									50%	33%	100%	100%	100%	100%	100%	100%	100%	100%			
ACTUAL GROSS INCOME A				14000	14000	17000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	10000	7029	21086	21086	21086	21086	21086	21086	21086	21086		
TENANT B				1832,342	1618	248,470																															
% OCCUPATION				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
RENEGOTIATE RENT (after deadline 1)				ERV	229,043																																
% OCCUPATION																																					
ACTUAL GROSS INCOME B				124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235	124,235		
TENANT C				623,919	485	70000																															
% OCCUPATION				100%	17%																																
RENEGOTIATE RENT (after deadline 1)				75000																																	
% OCCUPATION				83%	100%	17%																															
RENEGOTIATE RENT (after deadline 2)				80000																																	
% OCCUPATION						83%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	6667											
RENEGOTIATE RENT (after deadline 3)				ERV	77990																																
% OCCUPATION																										0	25997	38995	38995	38995	38995	38995	38995	38995	38995		
ACTUAL GROSS INCOME C				35000	37083	37500	39583	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	6667	25997	38995	38995	38995	38995	38995	38995	38995	38995		
TENANT D				671,5	635	90,946																															
% OCCUPATION				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
RENEGOTIATE RENT (after deadline)				ERV	83,938																																
% OCCUPATION																																					
ACTUAL GROSS INCOME D				45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473	45,473		
VACANCY				5436,899	5004,56																																
% OCCUPATION																																					
RENEGOTIATE RENT (after deadline vacancy)				ERV	679,612																																
% OCCUPATION						169903	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	169903	0	
RENEGOTIATE RENT (after deadline 1)																																					
% OCCUPATION						50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	113269	339806
ACTUAL GROSS INCOME (EX VACANCY)						169903	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	169903	113269	339806
TOTAL GROSS INCOME FROM RENT				218708	220791	224208	229291	399611	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514
INDEXING INCOME FROM RENT				218708	294241	297161	302246	523085	739173	732965	726792	720653	714550	708549	702583	696653	690342	684042	677852	671662	665471	659281	653091	646901	640711	634521	628331	622141	615951	609761	603571	597381	591191	585001	578811	572621	566431
IRRECOVERABLE % RENTS				2%	ANNUAL RENT	0,853%	1,147%	0,992%	1,008%	0,829%	1,171%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	
IRRECOVERABLE RENTS				1865	3376	2946	3048	4335	8657	7361	7237	7237	7115	7115	6996	7822	4775	5299	7125	6606	6495	6495	6387	6486	5558	6061	6248	6175	6071	5969	4473	3203	11689				
EFFECTIVE TOTAL INCOME FROM RENT				216843	290865	294214	299198	518750	730515	725605	719555	713416	707435	701434	695487	689540	683593	677646	671699	665752	659805	653858	647911	641964	636017	630070	624123	618176	612229	606282	600335	594388	588441	582494	576547		

Now we can calculate the costs. We use the assumptions of the evaluator. We index the costs like the income from rent, at the 75% of the inflation of period. (It was decided to apply this percentage, because some of costs are expressed as a percentage of the income, and the income is indexed by 75%). We consider the “extraordinary maintenance” as a cost which is confirmed every year. We consider the “property and facility management” as 1% of the rent of each semester. It is necessary to distinguish between operating and investments costs.

Capex are not indexed, on the other hand the tenants improvements are indexed on 75% of inflation, like Morri and Benedetto in their second example (Morri & Benedetto, 2017).

The following table shows the costs calculation (table 3.7).

After the calculation of total costs, we determine the intermediate cash flow like the difference between the effective total income from rent and the total costs. Now we can calculate the discount factor, through apply the discount rate (7,19%) for the intermediate cash flow.

In order to find the terminal value, we divide the effective total net income from rent of the final cash flow, for the GOCR (6,62%) and we subtract the brokerage fee (1,5% of transfer value). The terminal value is equal to 17.044.274 €.

In the end, we discount also the final cash flow for discount rate. The market value is the result of the sum between the total discounted intermediate cash flow and the discounted final cash flow, and it is equal to 14.218.476 € (14.218.500 € rounded). The following table shows the final result of analysis: the market value of the asset (table 3.8).

3.4 OUR EVALUATION WITH MORRI & BENEDETTO METHOD

Now we will try to reproduce the evaluator estimation, in order to obtain a market value of the asset with Morri and Benedetto methodology. In doing this, we will use the historical data from the previous analysis. So, the year of our evaluation is 2016 and we will estimate the market value of the asset from the second semester of that year. The hypothesis is to use the tables above (area, rent roll, costs and tenant improvements tables).

We start with the income, we distinguish between the rent of actual tenants, the rent of the market and the potential rents. The first category is rent which comes from the actual contracts (both the “a scaletta”¹² contracts and the contract at full speed). The second category is the rent which comes from rents calculated with ERV values. This part is in line with the hypothesis that after the restyling, the units will be re-rented out based on the ERV (mentioned above). The potentially rent consists on the sum of contractual rent (when it exists) and the ERV rent. (If there is not a contractual rent, the ERV rent is considered).

Now we have to consider the vacancy, (% and € values). According to the starting data, the vacancy is counted at the beginning of the plan and, moreover, it is counted every time after the end of a tenant contract (for the hypothesis of 7 month as in the valuation previously presented). Regarding the vacancy, we use an expedient: we calculate a rent (the equivalent of ERV).

¹² See note 9

Taking in consideration the potential rent, we calculate the irrecoverable percentage of rent (the 2% of the annual rent, as in the valuation previously reported). We create the period “0”, to split the percentage with the correct “weight” in each period. (In fact, every semester can have different amount of rent). Thanks to this operation, we obtain the potential gross income. From this voice, we subtract the vacancy value (previously explained). In this way, we achieve the effective gross income.

As Morri and Benedetto did, we index each rent to the 75% of the tax of inflation (Morri & Benedetto, 2017). We use three index of inflation: the index of the first year, equal to 1.0005%, the index of the second year, equal to 1.0115% and the index for long/medium period, equal to 1.7% (all that index come from the report of evaluator and therefore we use them like starting information).

The following table shows the income calculation with Morri & Benedetto method (3.9).

Now we can calculate the costs. We use the assumptions of the evaluator. We index the costs like the income from rent, at the 75% of the inflation of the period (we apply this percentage because some of the costs are expressed as a percentage of the income, and the income is indexed by 75%). We consider the “extraordinary maintenance” as a cost which is confirmed every year. We consider the “property and facility management” as 1% of the rent of each semester. It is necessary to distinguish between operating and investments costs.

Capex are not indexed, on the other hand the tenant improvements are indexed on 75% of inflation, like Morri and Benedetto do in their second example (Morri & Benedetto, 2017). The following table shows the costs calculation (table.3.10).

Table 3.10 The costs calculation (with Morri & Benedetto method)

		TIME																														
		30/06/2016	31/12/2016	30/06/2017	31/12/2017	30/06/2018	31/12/2018	30/06/2019	31/12/2019	30/06/2020	31/12/2020	30/06/2021	31/12/2021	30/06/2022	31/12/2022	30/06/2023	31/12/2023	30/06/2024	31/12/2024	30/06/2025	31/12/2025	30/06/2026	31/12/2026	30/06/2027	31/12/2027	30/06/2028	31/12/2028	30/06/2029	31/12/2029	30/06/2030	31/12/2030	30/06/2031
PERIODS FOR EVALUATION	30	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
INFLATION OF PERIOD			0,499%	0,499%	0,504%	0,504%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%	0,846%
INDEX OF INFLATION (FROM YEAR 1)			1,000	1,005	1,010	1,015	1,020	1,029	1,038	1,046	1,055	1,064	1,073	1,082	1,091	1,101	1,110	1,119	1,129	1,138	1,148	1,158	1,168	1,177	1,187	1,197	1,208	1,218	1,228	1,238	1,249	1,260
		TIME																														
		30/06/2016	31/12/2016	30/06/2017	31/12/2017	30/06/2018	31/12/2018	30/06/2019	31/12/2019	30/06/2020	31/12/2020	30/06/2021	31/12/2021	30/06/2022	31/12/2022	30/06/2023	31/12/2023	30/06/2024	31/12/2024	30/06/2025	31/12/2025	30/06/2026	31/12/2026	30/06/2027	31/12/2027	30/06/2028	31/12/2028	30/06/2029	31/12/2029	30/06/2030	31/12/2030	30/06/2031
PERIODS FOR EVALUATION	30	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
OPERATING EXPENSE	INCIDENCE																															
PROPERTY TAX (IMU, TASI)	81482 €/year	40741	40741	41149	41356	41565	41917	42271	42629	42990	43354	43721	44091	44464	44840	45220	45603	45989	46378	46771	47166	47566	47968	48374	48784	49197	49613	50033	50456	50884	51314	
INSURANCE	5397 €/year	2699	2699	2725	2739	2753	2776	2800	2824	2847	2872	2896	2920	2945	2970	2995	3021	3046	3072	3098	3124	3151	3177	3204	3231	3259	3286	3314	3342	3370	3399	
% REGISTRY'S TAX	0,5% on the annual rent	0,250%	0,248%	0,252%	0,250%	0,250%	0,249%	0,251%	0,249%	0,251%	0,249%	0,251%	0,253%	0,247%	0,247%	0,253%	0,249%	0,251%	0,249%	0,251%	0,250%	0,248%	0,252%	0,249%	0,251%	0,249%	0,251%	0,249%	0,251%	0,249%	0,500%	
REGISTRY'S TAX		1390	1390	1432	1421	1417	1430	1455	1448	1474	1467	1493	1507	1447	1431	1509	1492	1513	1511	1533	1536	1529	1533	1578	1572	1592	1592	1612	1612	1632	3242	
EXTRAORDINARY MAINTENANCE	65000 €/year	32500	32500	32825	32991	33157	33438	33721	34006	34294	34584	34877	35172	35470	35770	36073	36378	36686	36997	37310	37626	37944	38265	38589	38916	39245	39577	39912	40250	40591	40935	
PROPERTY AND FACILITY MANAGEMENT	1% on rent	5550	5601	5684	5681	5673	5746	5796	5819	5870	5893	5945	5967	5848	5800	5956	5990	6032	6067	6109	6138	6124	6177	6266	6307	6347	6387	6428	6469	6509	6485	
TOT OPERATING COSTS		82879	82930	83815	84188	84565	85306	86044	86726	87476	88170	88932	89658	90174	90811	91752	92484	93266	94025	94820	95591	96314	97122	98012	98810	99639	100456	101299	102130	102987	105375	

After the calculation of total costs, we determine the intermediate cash flow like the difference between the effective total income from rent and the total costs. Now we can calculate the discount factor, through the application of the discount rate (7.19%) for the intermediate cash flow.

In order to find the terminal value, we divide the effective total net income from the rent of the final cash flow, for the GOCR (6.62%) and we subtract the brokerage fee (1.5% of transfer value). The terminal value is equal to 19.297.947 €.

In the end, we also discount the final cash flow for the discount rate. The market value is the result of the sum between the total discounted intermediate cash flow and the discounted final cash flow, and it is equal to 14.124.045 €, (14.124.000 € rounded). Table 3.11 shows the terminal value calculation.

Table 3.11 The terminal value calculation (with Morri & Benedetto Method)

		TIME																																
		30/06/2016	31/12/2016	30/06/2017	31/12/2017	30/06/2018	31/12/2018	30/06/2019	31/12/2019	30/06/2020	31/12/2020	30/06/2021	31/12/2021	30/06/2022	31/12/2022	30/06/2023	31/12/2023	30/06/2024	31/12/2024	30/06/2025	31/12/2025	30/06/2026	31/12/2026	30/06/2027	31/12/2027	30/06/2028	31/12/2028	30/06/2029	31/12/2029	30/06/2030	31/12/2030	30/06/2031		
PERIODS FOR EVALUATION	30	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
EFFECTIVE GROSS INCOME		213133	215175	218593	225227	395592	567267	574555	579631	581881	587021	589299	594505	596725	504573	508867	595556	599035	603210	606673	610901	603291	571419	604741	626646	630695	634662	638736	642754	447351	383220	648489		
TOT OPERATING COSTS			82879	82930	83815	84188	84565	85306	86044	86726	87476	88170	88932	89658	90174	90811	91752	92484	93266	94025	94820	95591	96314	97122	98012	98810	99639	100456	101299	102130	102987	105375		
		TIME																																
		30/06/2016	31/12/2016	30/06/2017	31/12/2017	30/06/2018	31/12/2018	30/06/2019	31/12/2019	30/06/2020	31/12/2020	30/06/2021	31/12/2021	30/06/2022	31/12/2022	30/06/2023	31/12/2023	30/06/2024	31/12/2024	30/06/2025	31/12/2025	30/06/2026	31/12/2026	30/06/2027	31/12/2027	30/06/2028	31/12/2028	30/06/2029	31/12/2029	30/06/2030	31/12/2030	30/06/2031		
PERIODS FOR EVALUATION	30	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
STABILIZED NET OPERATING INCOME			132295	135663	141411	311405	482703	489248	493587	495154	499545	501130	505574	507067	414399	418056	503804	506551	509943	512648	516081	507701	475105	507619	528634	531885	535023	538280	541455	345221	280233	0		
INVESTMENTS																																		
CAPEX	204000 at the end of the contracts		102000	102000																														
TENANT IMPROVEMENTS	728100				274519										136641							32532	36426											
LEASING FEE TOTAL	10% on the rent of first year		0	0	0	67961	0	0	0	0	0	0	0	0	31340	0	0	0	0	0	0	0	4217	7799	0	0	0	0	0	0	80319	0	0	
TOT INVESTMENTS			102000	102000	274519	67961	0	0	0	0	0	0	0	0	167981	0	0	0	0	0	0	36749	44225	0	0	0	0	0	0	80319	0	0		
INTERMEDIATE CASH FLOW			30295	33863	-133108	243443	482703	489248	493587	495154	499545	501130	505574	507067	246417	418056	503804	506551	509943	512648	516081	470951	430879	507619	528634	531885	535023	538280	541455	264902	280233			
TIME			0,25	0,75	1,25	1,75	2,25	2,75	3,25	3,75	4,25	4,75	5,25	5,75	6,25	6,75	7,25	7,75	8,25	8,75	9,25	9,75	10,25	10,75	11,25	11,75	12,25	12,75	13,25	13,75	14,25	14,5		
DISCOUNT FACTOR	7,19%		0,983	0,949	0,917	0,886	0,855	0,826	0,798	0,771	0,744	0,719	0,695	0,671	0,648	0,626	0,604	0,584	0,564	0,545	0,526	0,508	0,491	0,474	0,458	0,442	0,427	0,413	0,399	0,385	0,372	0,365		
DISCOUNTED INTERMEDIATE CASH FLOW			29774	31954	-122042	215590	412888	404208	393878	381647	371894	360344	351135	340156	159664	261633	304539	295752	287574	279235	271513	239316	211482	240647	242058	235237	228551	222096	215784	101968	104189	0		
TERMINAL VALUE																																		
GOCR	6,62%																															19591824		
BROKERAGE FEE	1,50% ON TRANSFER VALUE																															293877		
FINAL CASH FLOW																																19.297.947 €		
DISCOUNTED FINAL CASH FLOW																																7.051.381 €		
TOTAL DISCOUNTED CASH FLOW			29774	31954	-122042	215590	412888	404208	393878	381647	371894	360344	351135	340156	159664	261633	304539	295752	287574	279235	271513	239316	211482	240647	242058	235237	228551	222096	215784	101968	104189	7051381		
TOTAL DISCOUNTED INTERMEDIATE CASH FLOW			7.072.664 €																															
DISCOUNTED FINAL CASH FLOW			7.051.381 €																															
MARKET VALUE			14.124.045 €																															
ROUNDED MARKET VALUE			14.124.000 €																															

3.5 THE RESULT COMPARISON

In the end, we can make same consideration about the result of analysis.

Taking in consideration the same starting data, the ours two analysis differ for the results.

In the first analysis, we obtain a terminal value equal to 17.044.274 € and a market value of 14.218.476 €. In the second analysis, we achieve a terminal value of 19.297.947 € and a market value of 14.124.045 €.

We can notice that the first big difference is the calculation of income from rent. The indexing is different between the two case.

We can explain this taking in consideration the inflation index. For the first we index each semester for the 75% of the specific inflation of the semester considered. With Morri and Benedetto method, we index each rent to the 75% of the tax of inflation (as in the first case) but we use only three index of inflation: the index of the first year, equal to 1.0005%, the index of the second year, equal to 1.0115% and the index for long/medium period, equal to 1.7%.

Another justification is the way through we calculate the leasing fee voice. This kind of cost is calculated on the rent of the first year of the new contracts (with the ERV). In the case of first our valuation, the rent of the first year is indexed for 75% of the inflation, with the second method of Morri and Benedetto, they are not indexed. Like in the example of the two professors, the rent of market has nothing growth for the early periods of plan, but they will start to increase in the following periods.

The way through we calculated the vacancy does not change the result, in fact the Morri and Benedetto is only an expedient, and it does not an effective effect on the valuation.

Now we can analyse the difference between our two analysis and the evaluator estimation.

The evaluator value of the market was equal to 14.500.000 €.

One of the differences between our methods and the evaluator estimation is that the latter

indexes the income with the trend of inflation, and the costs with the trend of market. This is an inaccuracy because doing this it is not possible to have homogeneous values in the discount cash flow model.

It is unavoidable that in practice it is necessary to adopt some simplifications; nevertheless, evaluators should avoid significant distortions and inconsistency of discounted cash flow model.

In this work, we analysed a single case study, nevertheless these observations can be extended to all evaluations in the real estate market.

The last consideration concerns the subject of taxation. Although this element is taken into account in terms of corporate finance, in the real estate practice it is not taken in consideration. In fact, the terminal value is free from this component.

CHAPTER 4

CONCLUSIONS

4.1 CONCLUSIONS

This work is an analysis of the real estate market with a main focus in the description and application of the financial tools used to produce valuation analysis of the real estate assets.

The broad overview of real estate sector describes an environment characterised by the digitalization and by new trends for the space request like the for the co-housing or for a more flexible and shared work's space where it is possible co-working. Also, the way to communicate the market are changed by the new technologies like the virtual reality, the augmented reality or the use 3D photography. At the same time the new impacts with the old. Italy is an example of this fact. In the same space, modern and ancient coexist. Like the new buildings are necessary, also the rescue and the reconversion of old areas are needed.

The macroeconomic scenario presents during the last year (2018) a first semester with decreasing trend and in the second semester an increasing trend, especially in USA, Japan and United Kingdom. Some countries like China, emerging countries and Europe present a slowdown but anyway they are characterised by a growth trend. In particular China, confirmed itself as the engine of global growth with an expansion of GDP still above 6%. Also, India, Russia and Brazil show positive trend, in opposite with Turkey.

From a European point of view, the 2018 was a year of growth. In general, it registered a development of internal demand, of family's consumption and levels of employment; the investment in the real estate assets in 2018 were 312 billion, in line with the trend of 2017. The British and German market remained the most area of interest for investors. Anyway,

also the Spanish market had a significant development, in fact it realised an increase of the 57% which means 20 billion of investments. The most important transactions were attributed to the office's sector, a total of 127.4 billion (+6% respect 2017 and equal to 41% of the total transactions). The retail segment and the logistic sector decreased respectively to 50.1 billion (the retail sector), and to 33 billion (logistic sector).

Italy presents 2019 a growth for residential sector, which concerned all the geographical areas in comparison with the previous quarter (Centre +4.4%, Islands +1.9%, South +1.7%, North-West +1.3%, North-East +1.2%) and the economic sector, the growth was recorded in the Centre (+10.4%) and in the North-East (+6.3%), it was zero in the Islands (0.0%), while it decreases in the South (-3.2%) and in the North-West (-0.9%). In 2018 the grow rate was lower compared to the expectations (The Gdp was negative for two consecutive trimesters and it represented a period of recession). Anyway, Milan was the city with the highest investment volumes in the country: over 2 billion transacted in 2018, about 60% of the total directional investments registered in Italy. This success is due to a radical change both at urban and infrastructural level.

The attention of this work moved on the principal theme that is the real estate evaluation through the financial tools. The need of evaluation comes from the purpose of the knowing the correct value of an asset, necessary, for example, for any type of transaction. The description of the evaluation methodologies is necessary to know what type of evaluation is more coherent with the analysis that have to be conduct. The thesis specifically shows the Economic-Financial Comparison in order to make evaluations. This approach is more advantageous because it is applicable to all kind of assets. This criterion permits to express the value of a real estate asset in terms of expected income and associated risk. The economic benefit is represented by the rental fee net of operating costs. The associated risk is represented by the capitalization rate or discounted rate. It is a measure of the performance required by the market. Inside the methodology of the

economic-financial comparison the thesis presents also, two different criteria: income and financial. The first is used to convert the forecast of expected income of a single period in an indication of value by a direct passage, which is embodied in the division of estimated income for an appropriate capitalization rate (an income and a rate). The second criterion is used to convert all future flows into a present value, discounting every expected benefit for an appropriate discount rate (plurality of flows). During the study of the financial tools, the work emphasises the logics and rules that are used in the “practice” in the case of a real estate evaluation. One of this is for example the subject of taxation. Although this element is taken into account in terms of corporate finance, in the real estate practice it is not taken in consideration. Another point is the use of inflation. It is used as an approximation to the growth rate of future income. “This expedient is most used in the long term, assuming that there is a correlation between inflation, economic growth and growth in demand for space.”

In order better understand these technicalities in the third chapter the work shows the attempt to apply the discount cash flow method to the valuation of a real-life case, a building for commercial use located in the Milan interlard and owned by a real estate fund. After an illustration of the evaluator estimation which dates back to 2016 the work reproduces two evaluation through two methodologies. One is our hypothesis and the other is the attempt to apply the method proposed by Morri & Benedetto in their studies. The comparison of the results shows that the ours two analysis differ for the results. The main differences are:

- the calculation of income from rent because the indexing is different between the two case. (The indexing of each semester for the 75% of the specific inflation of the semester rather than the indexing of each rent to the 75% of the tax of inflation but with the use of only three index of inflation)
- the calculation of the leasing fee voice which is calculated on the rent of the first

year (indexed for 75% of the inflation, rather than not indexed).

In practice, it is necessary to adopt some simplifications; nevertheless, the evaluators should avoid significant distortions and inconsistency of discounted cash flow model like for example the inaccuracy that comes from the evaluator estimation of the case study: the indexing of the income with the trend of inflation, and the costs with the trend of market.

In conclusion, the real estate market presents specific trend and logics and this work tries to show some peculiarity in the analysis of case study.

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Appendix 1 The estimation with our evaluation

TOTAL PERIODS	30																																			
INFLATION TREND	1,0005																																			
MARKET TREND	0,9952																																			
INDEXING	75%																																			
	30/06/2016	31/12/2016	30/06/2017	31/12/2017	30/06/2018	31/12/2018	30/06/2019	31/12/2019	30/06/2020	31/12/2020	30/06/2021	31/12/2021	30/06/2022	31/12/2022	30/06/2023	31/12/2023	30/06/2024	31/12/2024	30/06/2025	31/12/2025	30/06/2026	31/12/2026	30/06/2027	31/12/2027	30/06/2028	31/12/2028	30/06/2029	31/12/2029	30/06/2030	31/12/2030	30/06/2031					
INCOME	total mq	office/cafe/teria sm	RENEGOTIATE RENT		RENT																															
TENANT A	562,306	460	28000		14000	14000	7000	50%																												
% OCCUPATION	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%					
RENEGOTIATE RENT (after deadline 1)			40000	10000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000					
% OCCUPATION		ERV	42,173																																	
ACTUAL GROSS INCOME A	14000	14000	17000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000					
TENANT B	1832,342	1618	248.470		124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235					
% OCCUPATION	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%					
RENEGOTIATE RENT (after deadline 1)		ERV	229,043																																	
ACTUAL GROSS INCOME B	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235	124.235					
TENANT C	623,919	485	7000		35000	5833	17%																													
% OCCUPATION	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%					
RENEGOTIATE RENT (after deadline 1)			75000	31250	37500	6250	17%																													
% OCCUPATION			80000	83%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%					
RENEGOTIATE RENT (after deadline 2)			8000	33333	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000					
RENEGOTIATE RENT (after deadline 3)		ERV	77900	83%																																
ACTUAL GROSS INCOME C	35000	37083	37500	39583	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000					
TENANT D	671,5	635	90.946		45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473					
% OCCUPATION	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%					
RENEGOTIATE RENT (after deadline)		ERV	83,938																																	
ACTUAL GROSS INCOME D	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473	45.473					
VACANCY	5436,899	5004,56																																		
% OCCUPATION	100%	100%																																		
RENEGOTIATE RENT (after deadline vacancy)		ERV	679,612																																	
ACTUAL GROSS INCOME (EX VACANCY)	169903	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806	339806					
TOTAL GROSS INCOME FROM RENT	218708	220791	224208	229291	399611	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514	569514					
INDEXING INCOME FROM RENT	218708	294241	297161	302246	523085	739173	732965	726633	714550	708549	702583	696653	690725	684800	678875	672950	667025	661100	655175	649250	643325	637400	631475	625550	619625	613700	607775	601850	595925	590000	584075					
IRRECOVERABLE % RENTS	0,853%	1,147%	0,992%	1,008%	0,829%	1,171%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%	1,004%	0,996%						
IRRECOVERABLE RENTS	1865	3376	2946	3048	4335	8657	7361	7237	7237	7115	7115	6996	7822	4775	5299	7125	6606	6495	6387	6486	5558	6061	6248	6175	6071	5969	4473	5969	4473	5969						
EFFECTIVE TOTAL INCOME FROM RENT	216843	290865	294214	299198	518750	736515	725605	719555	713416	707435	701434	695587	688832	682977	677122	671267	665412	659557	653702	647847	641992	636137	630282	624427	618572	612717	606862	601007	595152	589297						
COSTS	INCIDENCE																																			
OPERATING EXPENSE																																				
PROPERTY TAX (BMU, TASI)	81482	€/year	54294	53997	53704	53329	52878	52434	51992	51553	51116	50687	50260	49836	49414	49000	48588	48179	47772	47368	46970	46576	46184	45794	45408	45024	44643	44268	43896	43527	43160					
INSURANCE	5397	€/year	3596	3577	3557	3532	3502	3473	3444	3415	3386	3357	3329	3301	3273	3246	3218	3191	3164	3137	3111	3085	3059	3033	3008	2982	2957	2932	2907	2883						
% REGISTRY TAX	0,5%	on the annual rent	0,286%	0,248%	0,252%	0,208%	0,292%	0,251%	0,249%	0,251%	0,249%	0,251%	0,249%	0,280%	0,220%	0,232%	0,268%	0,251%	0,249%	0,251%	0,249%	0,260%	0,248%	0,252%	0,251%	0,249%	0,251%	0,249%	0,251%	0,249%						
REGISTRY TAX	833		729	754	1077	2136	1822	1791	1761	1732	1693	1654	1615	1576	1537	1498	1459	1420	1381	1342	1303	1264	1225	1186	1147	1108	1069	1030	991	952						
EXTRAORDINARY MAINTENANCE	65000	€/year	43312	43075	42841	42542	42182	41828	41475	41125	40777	40434	40094	39755	39419	39088	38760	38433	38109	37786	37467	37155	36842	36531	36223	35917	35613	35314	35017	34722						
PROPERTY AND FACILITY MANAGEMENT	2909	1% on the rent	2942	2992	5187	7305	7256	7196	7134	7074	7014	6956	6898	6841	6784	6727	6670	6613	6556	6500	6443	6387	6330	6274	6217	6161	6104	6048	5991	5935						
TOT OPERATING COSTS	104944		104320	103848	103668	103600	103532	103464	103396	103328	103260	103192	103124	103056	102988	102920	102852	102784	102716	102648	102580	102512	102444	102376	102308	102240	102172	102104	102036	101968						
INVESTMENTS																																				
CAPEX	204000	at the end of the contracts	102000	102000	358280	88960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
TENANT IMPROVEMENTS	728100	10% on rent of first year	102000	102000	358280	88960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
LEASING FEE																																				
TOT INVESTMENTS	102000		102000	102000	358280	88960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
TOTAL COSTS	206944		206320	206320	462128	194629	108003	106812	105898	105018	104114	103254	102371																							

Appendix 2.2 The estimation with Morri & Benedetto method

RENT		552939	554981	560095	568433	568061	567267	574555	579631	581881	587021	589299	594505	596725	584754	579977	595556	599035	603210	606673	610901	613835	612448	617739	626646	630695	634662	638736	642754	646880	650949	648489							
POTENTIAL GROSS INCOME		552939	554981	560095	568433	568061	567267	574555	579631	581881	587021	589299	594505	596725	584754	579977	595556	599035	603210	606673	610901	613835	612448	617739	626646	630695	634662	638736	642754	646880	650949	648489							
VACANCY		339806	339806	341502	343206	172469	0	0	0	0	0	0	0	0	80181	71110	0	0	0	0	0	10543	41029	12998	0	0	0	0	0	199529	267729	0							
EFFECTIVE GROSS INCOME		213133	215175	218593	225227	395592	567267	574555	579631	581881	587021	589299	594505	596725	504573	508867	595556	599035	603210	606673	610901	603291	571419	604741	626646	630695	634662	638736	642754	447351	383220	648489							
OPERATING EXPENSE		INCIDENCE																																					
PROPERTY TAX (IMU, TASI)	81482 €/year	40741	40741	41149	41356	41565	41917	42271	42629	42990	43354	43721	44091	44464	44840	45220	45603	45989	46378	46771	47166	47566	47968	48374	48784	49197	49613	50033	50456	50884	51314								
INSURANCE	5397 €/year	2699	2699	2725	2739	2753	2776	2800	2824	2847	2872	2896	2920	2945	2970	2995	3021	3046	3072	3098	3124	3151	3177	3204	3231	3259	3286	3314	3342	3370	3399								
% REGISTRY TAX	0,5% on the annual rent	0,250%	0,248%	0,252%	0,250%	0,250%	0,249%	0,251%	0,249%	0,251%	0,249%	0,251%	0,253%	0,247%	0,247%	0,253%	0,249%	0,251%	0,249%	0,251%	0,250%	0,248%	0,252%	0,249%	0,251%	0,249%	0,251%	0,249%	0,251%	0,249%	0,251%								
REGISTRY TAX		1390	1390	1432	1421	1417	1430	1455	1448	1474	1467	1493	1507	1447	1431	1509	1492	1513	1511	1533	1536	1529	1533	1578	1572	1592	1592	1612	1612	1632	3242								
EXTRAORDINARY MAINTENANCE	65000 €/year	32500	32500	32825	32991	33157	33438	33721	34006	34294	34584	34877	35172	35470	35770	36073	36378	36686	36997	37310	37626	37944	38265	38589	38916	39245	39577	39912	40250	40591	40935								
PROPERTY AND FACILITY MANAGEMENT	1% on rent	5550	5601	5684	5681	5673	5746	5796	5819	5870	5893	5945	5967	5848	5800	5956	5990	6032	6067	6109	6138	6124	6177	6266	6307	6347	6387	6428	6469	6509	6485								
TOT OPERATING COSTS		82879	82930	83815	84188	84565	85306	86044	86726	87476	88170	88932	89658	90174	90811	91752	92484	93266	94025	94820	95591	96314	97122	98012	98810	99639	100456	101299	102130	102987	103575								
STABILIZED NET OPERATING INCOME		132295	135663	141411	311405	482703	489248	493587	495154	499545	501130	505574	507067	414399	418056	503804	506551	509943	512648	516081	507701	475105	507619	528634	531885	535023	538280	541455	345221	280233	0								
INVESTMENTS																																							
CAPEX	204000 at the end of the contracts	102000	102000																																				
TENANT IMPROVEMENTS	728100				274519																				136641			32532	36426										
LEASING FEE TOTAL	10% on the rent of first year	0	0	0	67961,238	0	0	0	0	0	0	0	0	0	31339,994	0	0	0	0	0	0	4217,295	7798,9875	0	0	0	0	0	0	80318,799	0	0							
TOT INVESTMENTS		102000	102000	274519	67961	0	0	0	0	0	0	0	0	0	167981	0	0	0	0	0	0	36749	44225	0	0	0	0	0	0	80319	0	0							
INTERMEDIATE CASH FLOW		30295	33663	-133108	243443	482703	489248	493587	495154	499545	501130	505574	507067	246417	418056	503804	506551	509943	512648	516081	470951	430879	507619	528634	531885	535023	538280	541455	264902	280233									
TIME		0,25	0,75	1,25	1,75	2,25	2,75	3,25	3,75	4,25	4,75	5,25	5,75	6,25	6,75	7,25	7,75	8,25	8,75	9,25	9,75	10,25	10,75	11,25	11,75	12,25	12,75	13,25	13,75	14,25	14,5								
DISCOUNT FACTOR	7,19%	0,983	0,949	0,917	0,886	0,855	0,826	0,798	0,771	0,744	0,719	0,695	0,671	0,648	0,626	0,604	0,584	0,564	0,545	0,526	0,508	0,491	0,474	0,458	0,442	0,427	0,413	0,399	0,385	0,372	0,365								
DISCOUNTED INTERMEDIATE CASH FLOW		29774	31954	-122042	215590	412888	404208	393878	381647	371894	360344	351135	340156	159664	261633	304539	295752	287574	279235	271513	239316	211482	240647	242058	235237	228551	222096	215784	101968	104189	0								
TERMINAL VALUE																																							
GOCR	6,62%																										19591824												
BRKERAGE FEE	1,50% ON TRANSFER VALUE																										293877												
FINAL CASH FLOW																											19.297.947 €												
DISCOUNTED FINAL CASH FLOW																											7.051.381 €												
TOTAL DISCOUNTED CASH FLOW		29774	31954	-122042	215590	412888	404208	393878	381647	371894	360344	351135	340156	159664	261633	304539	295752	287574	279235	271513	239316	211482	240647	242058	235237	228551	222096	215784	101968	104189	7051381								
TOTAL DISCOUNTED INTERMEDIATE CASH FLOW				7.072.664 €																																			
DISCOUNTED FINAL CASH FLOW				7.051.381 €																																			
MARKET VALUE				14.124.045 €																																			
ROUNDED MARKET VALUE				14.124.000 €																																			

Acknowledgements

I would like to thank Professor Cervellati for giving me the opportunity to discover the using of the real estate's financial instruments and for guiding me through all the phases of this work.

I would like to thank Professor Faggiani for her help and for welcoming me and my work.

I am grateful to my fabulous family, for giving me faith and encouragement. My family taught me values and the strength to go on, despite the obstacles and the contrary opinions.

I thank Matteo, for his capacity to stay close to me and respecting my goals and my time.

Finally, I thank all my friends, near and far. I know they always cheer on me.

Anna Casagrande