

MASTER

In which European high streets should property investors shop?

a forecast of property market total returns of high street shops, based on regional developments

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Award date:
2004

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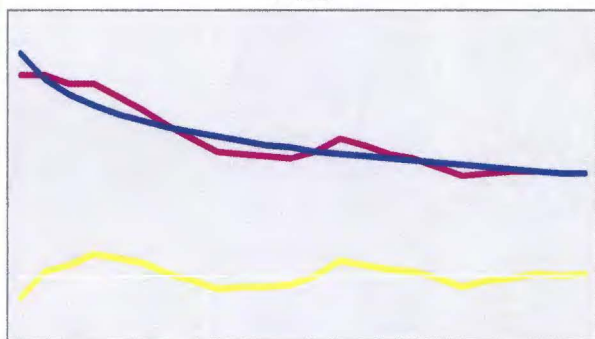
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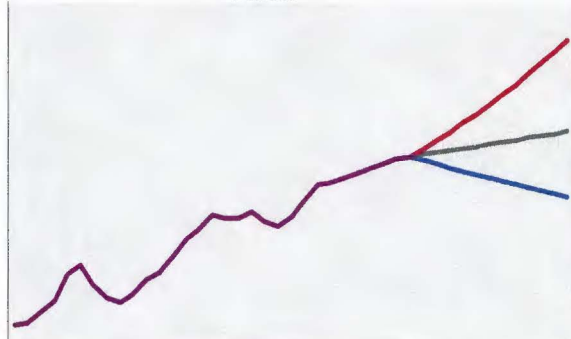
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In which European high streets should property investors shop?

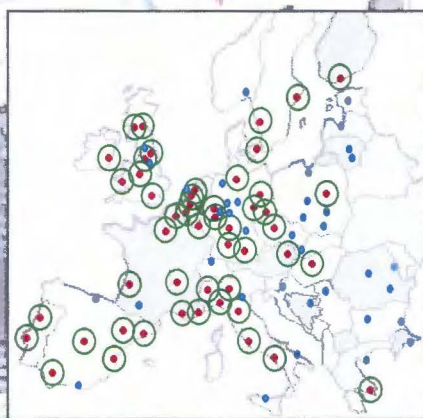
Yield



Rent



A forecast of property market total returns of high street shops, based on regional developments.



ing. A.J.J. Teuben
Master thesis Eindhoven University of Technology
Real estate management
July 2004

In which European high streets should property investors shop?

A forecast of property market total returns of high street shops, based on regional developments.

July, 2004

Master thesis

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Preface

The pace of developments in the world of property is rapid. A number of factors are forcing the actors in the real estate market to become increasingly professional. Large sums of money are involved in the real estate sector and the stakeholders expect their investments to be managed professionally. To set themselves apart from competitors it is important for market players to have the necessary knowledge of the property market and preferably to know more about it than other actors.

One way of increasing professionalism is to understand historic developments. By understanding past developments and the reactions to them it is possible to predict future developments. A professional actor will act in response to predictions of future developments, but also trust his intuition. Reacting solely to predictions made in research papers is unreliable. One thing is certain: what actually happens will differ from the predicted developments but the predictions will assist decision-making and suggest the direction future event will take. The forecasts made on the basis of the model will prove useful in formulating business strategies.

With my research I have tried to identify ways of improving professionalism in the property market and in particular my knowledge of that market. I would like to express my appreciation for the help provided by a number of people in producing the results presented in this paper. First of all I want to thank the members of my graduation committee, in particular Professor Willem G. Keeris MRICS and Ingrid I. Jansen of the Eindhoven University of Technology for their recommendations on the organization of the research and their critical comments on the content and composition of the paper. Secondly, I want to thank the real-estate investment company Redevco, and in particular Dick Vos and Bram Dekker, for the valuable feedback and support they provided on the basis of their knowledge of the market, during my graduate traineeship, and not least for their friendly cooperation and for taking the time to improve the results presented in this thesis.

The real estate market is not an isolated field of study but has overlaps with several disciplines. My research also involved the study of economics and econometrics. I would like to thank Pim Ouwehand for his assistance in the field of econometrics, a discipline I am not familiar with. And last but not least I want to thank my parents for their support during my study.

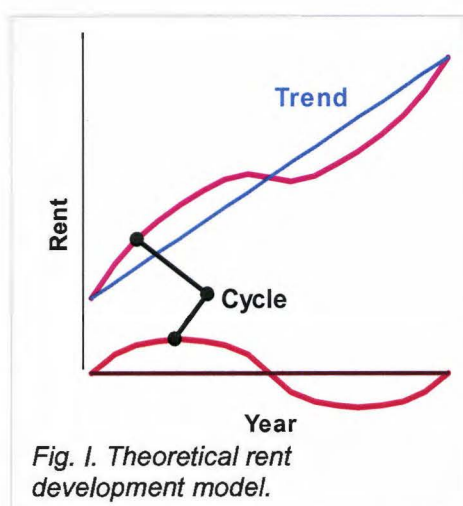
Bert Teuben,
Amsterdam, June 2004.

Summary

Real estate investment requires a professional approach. Many investors play it by ear in making decisions, but the management and stakeholders of real estate investors want a professional approach. The thesis produces a forecasting model to support decision making. The model selects attractive high streets for further research. For the composition of the model a pan-European approach has been taken in view of the internationalization of the real estate actors, both tenants and investors, and in particular Redevco's portfolio and the European Union enlargement. In the thesis a model has been constructed which can be used to select attractive high streets on the basis of the criterion total return. The study also mentions other criteria for determining attractiveness, such as risk, liquidity and diversification. The research is carried out for the real estate segment high street shops. The method could also be used for other real estate segments, but other drivers would have to be selected for the composition of the model.



The real estate investment market is discussed in the first part of the thesis. The factors influencing market return are identified and broken down into the income return and capital growth. Based on their impact on the return the following factors; the rent and the value growth, by the initial yield, are selected for further examination in this thesis. The operating expenditure is taken to be 10% of the total rental income and depreciation is fixed at zero. For the rent development, the development of the catchment area is examined rather than the building quality or the shopping area quality. For the initial yield development the investment market is examined. The expected relationship between the initial yield and the investment market is based on a literature study, which states that the expected rental income, the risk and the performance of other asset classes influence the yield development.



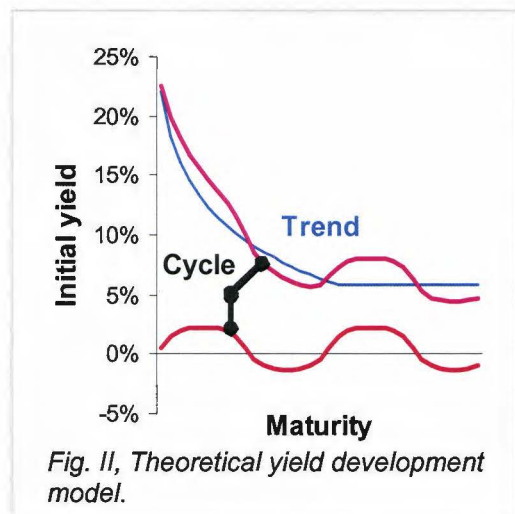
Rent

The model is based on past developments. The pattern, shown in figure 1, is recognizable for almost all cities. A theoretical model has been constructed for the rent development. The model could be seen in figure 1. The rent development is split into two components, the trend development and a cycle. The trend is a structural change in the rental level and in the rest of the paper it is studied in relation to permanent changes in the catchment area, demographic changes and prosperity. The addition of retail floor space is expected to have no influence on the rent. In addition to the trend, a cyclical pattern has been determined in the difference between the actual rent and the trend development. The cycle is caused by temporary changes in

demand from retailers. The cycle is irregular in length and amplitude and is affected by the business cycle. The cyclical development is also examined in relation to changes in the catchment area and in particular changes in demand from retailers.

Yield

Figure II shows a diagram of the yield development. The model is based on developments in the past. The trend is only recognizable for a real estate market developing from immature to mature. The trend is horizontal in mature markets. The cyclical pattern can be seen in all cities. The total yield development is also split into two components. These components are the same as for the rent development: a trend and a cycle. The trend is the structural change in the yield level. The structural change is expected to have a relationship with the risk of investing in real estate and depends on the real estate market maturity. The cycle is compared to the expected relationship with the demand from investors to invest in high street shops. The demand depends on the performance of other asset classes, the expected rent development and possible risks.



Real estate data

A source is selected for the real estate data on the rent and yield development. The selected sources are broker reports rather than real estate indices and published records of transactions. The selection is based on the criteria: reliability, uniformity, high street coverage, availability of historical data and the country and city coverage. Based on the decision to conduct a pan-European study 18 countries were selected in the European Union. At least one city in each country is examined, and to compare regional differences in some countries more than one city is selected. A total of 50 cities are examined, and for half of the cities data on the real estate development is available from 1980. The review of the development of rents is based on the average of the published data of brokers and the yield development is based on the data of three selected brokers for the whole time-period covered in the study. The decision to select a couple of brokers instead of taking the average of all broker data is made due to the different backgrounds of the published brokers. Some brokers in some countries publish data based on net initial yield, excluding operating expenses, and in other countries the published data are based on gross initial yields including transaction costs. To compare the developments in cities with the developments in the catchment area, the latter area has to be defined. The catchment areas are defined at provincial or state level, which matches the NUTS classification of Eurostat. Eurostat is the statistical office of the European Union. Eurostat was founded in 1958 and has published regional data since 1968. The catchment area level corresponds with the recreational consumers in the defined high streets.

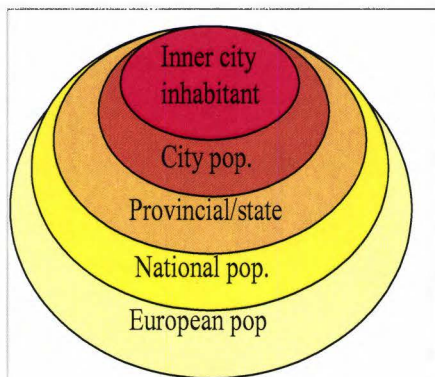


Fig. III. Total market return for the UK Market.

Statistical analysis

The statistical analysis is carried out to determine the relationship between the real estate data, rent and yield development and the developments in the catchment area and the investment market. A regression analysis is performed to determine the trend in the rent and yield development in relation to the selected drivers. The drivers represent the permanent changes at catchment area level and in the investment market. A correlation is carried out to determine the influence of the cyclical pattern of the yield and rent development and the selected drivers. The drivers are selected on the basis of temporary

changes in both the catchment area and the investment market. All drivers are selected from a study of literature and are supplemented by retail-specific drivers. Following an analysis of the retail shops in the high streets special attention is given to consumer expenditure on clothing and footwear. Over 50% of all retail outlets in the high streets as defined sell clothing and footwear, apart from French high streets, which have more service agencies and restaurants. Table 1 presents an overview of the most influential drivers. The calculated rent and initial yield development, based on the formula composed by the statistical outcomes, and the actual development, based on the published broker's data, are compared. The comparison produces satisfying results.

Table 1. Overview influencing drivers in order of influence, the first mentioned drivers have the largest influence on the development of the components.

Trend rent	Cycle rent	Trend yield	Cycle yield
+ Trend consumer expenditure on clothing and footwear (N)	+ Retail confidence (N)	- (Real estate) maturity (N)	+ Unemployment (R)
- Ageing (R)	+ Consumer confidence (N)		- Retail confidence (N)
+ Employment structure (R)	- Unemployment (R)		- Consumer confidence (N)
+ Population (R)			+ Shares returns(N)
			+ Long term interest (N)

(N = national, R = regional, + = positive and - = negative relation)

According to the statistical results, with the regional approach only the trend of the rent development is influenced by regional factors, with the influence of ageing being fairly negative. The other components, cyclical rent, trend and cyclical yield have a relationship with national developments.

Model

Based on the identified factors, rental income, calculated as the rent minus 10% for operating costs, and the initial yield development, a model has been constructed for calculating the total market return. The reliability of the model is compared to publications of return by a real estate index. A real estate index is only available for the UK market since the early 1980s, so a comparison is made between the English market and the model. The model produced satisfying results, but for the comparison with the real estate index the model has to be adjusted. Based on a literature study the model could react with a time lag to market total returns. The length of lease contracts and smoothing of valuations cause the time lag. When the adjustment to the time lag is made to the model, by a moving average of two years, the comparison is very satisfying, with a correlation coefficient of over 0.75.

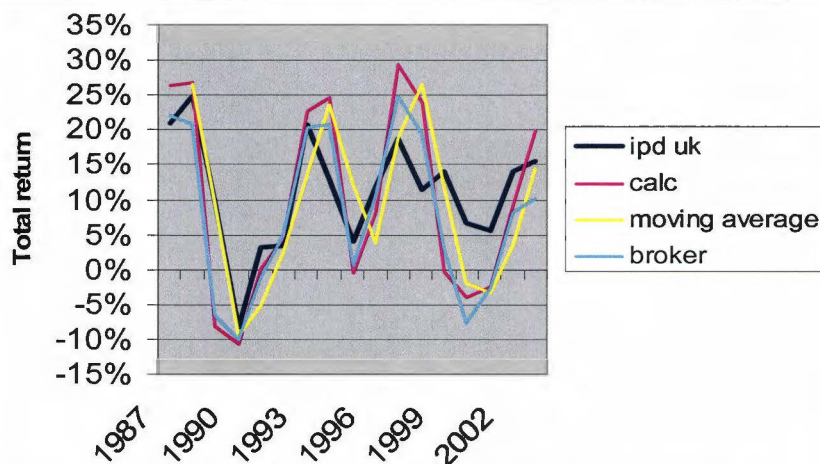


Fig. IV. Overview consumer attraction to the inner-city shopping

Forecasts

A forecast is made for the return based on the past relationship between the return, for each component, and the forecasts for the drivers. For the forecasts two assumptions are made:

- The forecasts for the drivers are correct;
- The relationship in the past will also exist in the future.

The actual development of the return may differ from the forecast returns. The differences would arise due to the incorrect forecasts for the drivers and differences compared with the relationship in the past. The forecasts for the drivers have to be frequently updated to the changed forecasts to get the most reliable results. For the forecast of the relationship between the drivers and the return the forecast will be based on the relationship found for the particular city and on the European average. The European average is used because of the internationalization of both the chain stores and the real estate investors. In figure # there is a comparison of the total markets based on both the regional and European model. Based on the available forecast for the drivers the cyclical pattern is forecast up to 2008 and the trend up to 2014. Figure V illustrates the average total returns for all examined cities except Luxembourg, Dresden and Leipzig due to a lack of data. The regional approach produces differences within a country of approximately 2.5 % in Germany, Italy, France and Spain. Figure IV presents a forecast for the UK market up to 2008. The regional differences in expected market total returns could lead to out-performance in a country.

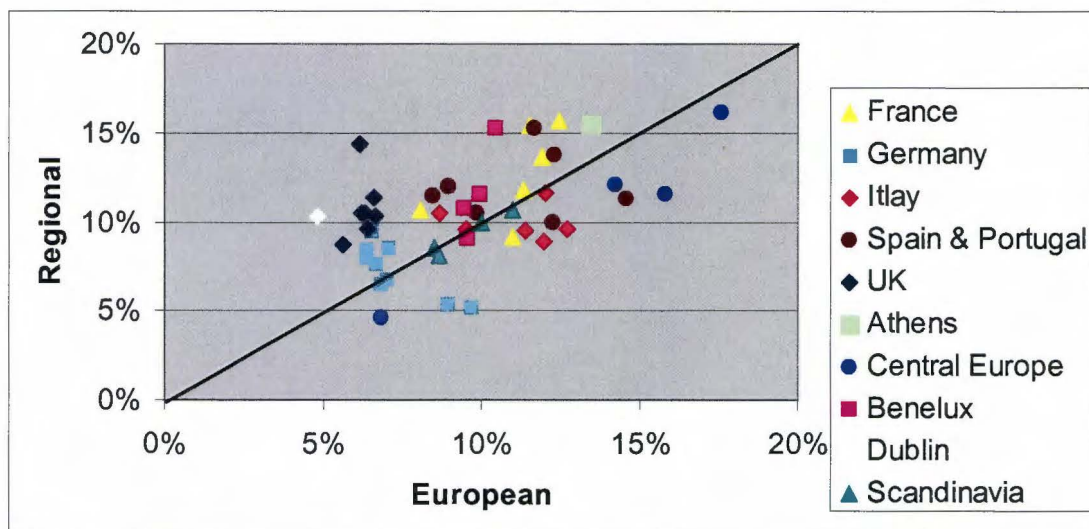


Fig. V. Comparison forecasts for the market return till 2014 based on the Pan European model and the other hand the model based on European drivers but city coefficients.

The most attractive cities, based on the expected total return, are the cities in France, Spain and Portugal. Warsaw, Budapest (over 20%) and Athens are also expected to generate high market total returns, but the total return is probably overestimated. The large amount of construction in immature real estate markets has a negative effect on the actual return development. The degree of immaturity is based on the kind of actors active in a real estate market, the companies in a market, transparency, the expected return and the country risk. The market total returns are one factor for the selection of investment opportunities. Other criteria also have to be examined for a realistic decision to invest in a particular high street. Criteria for the decision to invest in a high street could include local market knowledge, transparency, expected risk, liquidity, taxes and legislation.

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1 Introduction

This thesis attempts to give a scientific answer to the question “In which European high streets should real estate investors shop?”. The findings are intended to help real estate investors in the selection of outperforming high streets in Europe. The paper determines out-performance by high street shops on the basis of a market total return. The criteria used to determine the market total return are discussed in chapter 2. The present chapter discusses the context of the graduate assignment. That context leads to the definition of the problem as encapsulated in the title of this paper. There are several factors that influenced the decision to conduct this research. They include the geographic expansion of the activities of real estate investors and tenants, EU enlargement, sector allocation, professionalism, transparency, regionalization, demand for forecasting, retail real estate research carried out and the popularity of retail real estate. The structure of the study is discussed at the end of this chapter.

1.1 Occasion

Geographic expansion

A large number of institutional real estate investors own properties or participating interests in foreign countries. There are many factors that explain why institutional investors seek geographic expansion: the expectation of higher returns, the quest for diversification, the domestic market is too small, to spread risk, transparency, relative maturity of real estate markets and the expectation of reducing risk, to attract more (international) tenants, the enlargement of the European Union, the increased liquidity of the real estate markets, greater uniformity of legislation due to the European Union and the disappearance of currency risks in the euro zone¹. Nevertheless, many investors are reluctant to invest in foreign markets. The reasons for this caution among investors are disappointing actual returns, a lack of knowledge of the local market, management problems, the lack of transparency of the local real estate markets and the absence of real estate management companies and supporting companies, taxes disadvantages and the greater risks². At the moment banks, insurance companies and pension funds such as ABP, ABN AMRO, MN Services, ING Real Estate and PGGM all have real estate investments outside the Netherlands. Other listed and private real estate companies such as AZL Vastgoed, Corio, NSI, Redevco, Rodamco, VastNed, Eurocommercial and Wereldhave also own foreign properties. Even companies such as Bouwfonds, KFN and Amvest are studying the possibilities of investing in foreign real estate. Because of the absence of an exchange-rate risk these companies are mainly active in the euro zone. Some companies are selling their investments in the United States and relocating their portfolios to the euro zone³. Real-estate development companies in particular have been opening offices in Eastern European countries in the last few years in anticipation of the European Union enlargement in 2004.

EU enlargement⁴

In May 2004 ten new countries joined the EU, mainly countries that were part of the former East bloc until 1989. The downfall of the communism led to the introduction of the free-market economy in those countries. State property, including real estate, was privatized and foreign companies entered those markets. In the early days the property didn't match the standards in Western European countries. Developers then entered those markets and the quality of the property has improved so now the first real estate

¹ Troostwijk, *Vastgoedbeleggingsbeleid van de grote Nederlandse institutionele beleggers en vastgoedfondsen 2002*

² Elliot, C., and Halliday, R., *The institutional view of European property investment*

³ Rompelman D.A., *Scherpe daling direct Nederlands vastgoedbezit in buitenland*

⁴ Klomp, G., *De gevolgen van de EU uitbreiding voor de vastgoedmarkten in centraal Europa*

investors are entering those countries. After 1999 the first foreign investments in offices by institutional investors took place in Prague, Warsaw and Budapest. The increased political stability is benefiting foreign investment. Developments in the East European countries are expected to follow the pattern in the countries in southern Europe during the Nineties and in north-west Europe during the Seventies. Nowadays many real estate developers and investors from north-west Europe are active in the southern European countries of Spain, Italy and Portugal. And more companies are operating in Greece, attracted by the Olympic Games in Athens in 2004. The southern European countries enjoyed the strongest economic growth in the Nineties and the East European countries will probably record the highest economic growth in the current decade⁵. As well as the economic conditions, the political situation in the East European countries in the late Eighties and early Nineties was also similar to the former situation in Spain and Portugal, which were dictatorships until the Seventies.

Sector allocation

Besides expanding geographically, real estate investors are also making changes in the allocation of their portfolios among real estate sectors. The real estate sector can be broken down into four major sectors: offices, housing, retail and industrial. A shift is underway from investment in offices to investment in retail real estate due to the low risk profile of retail properties. The office sector has historically had a higher risk profile than retail. The total return in the office sector is very volatile and more susceptible to macroeconomic developments than retail and housing. Due to the level of vacancies in the offices segment many investors are shifting into more stable real estate investments such as the retail segment.

Professionalism

The (Dutch) real estate market is becoming more and more professional. This professionalism will lead to a better standard of real estate management and development. The progressive professionalism, based on scientific studies, will improve the quality of decision making in real estate management. This thesis concentrates mainly on the real estate investment market. The improved (quality) of knowledge about real estate investment and in particular the knowledge of the factors that influence the development of the return will improve decision making on real estate investments. The knowledge about investing in real estate will help in decisions on whether to invest in real estate rather than shares and bonds. Investors are willing to take a risk if the return is commensurate. The increased professionalism will reduce the likely risks. Nowadays, many investments are made on instinct but with professionalism the scientific arguments for decisions will improve. Furthermore, some developments in the real estate market, such as greater transparency and the demands of investors, require professionalism. Besides these developments, geographic expansion and growing real estate portfolios demand a professional approach due to the large capital sums involved in real estate investment.

Transparency

Real estate markets are becoming more and more transparent. Details of transactions are increasingly being published and real estate brokers and real estate research institutions publish data on real estate markets. Besides the greater availability of data, the comparability of the data makes them more reliable. Transparency is connected with the maturity of a real estate market and it isn't the same everywhere in Europe but it is improving in every market. While the real estate markets are becoming more transparent, statistical data on national developments such as economic growth and population trends are also becoming more accessible and reliable.

⁵ Wit, de, R, *Enlargement of the European Union*

Regionalization

With the disappearance of the international borders in Europe and the geographic expansion of companies in Europe the scale on which the attractiveness of geographic areas has to be determined is larger. In the past investment decisions were taken mainly on the basis of developments at national level, because there were no data available for specific regions and little was known about the influence of the region, rather than the country, on the return. Nowadays, the region in which the city situated is, is increasingly determining the attractiveness of a city. There are two reasons for adopting a regional scale for this analysis. On the one hand the decision is based on the availability of data. The other reason is the collaboration between regions in different countries. For instance, within Germany there is a large difference between the former West Germany, which has closer ties to the Benelux, and the former East Germany, which has stronger relationships with the East European countries.

Forecasting

Forecasting is becoming more and more important for the investment market, in particular for the developing markets. Forecasting is intended to define the attractiveness of an investment. Past returns indicate the expected attractiveness of the investment category. The allocation of assets is determined on the basis of forecasting at portfolio level. Some scientific research has been carried out at portfolio level by students of the department of real estate management of Eindhoven University of Technology. Ruud van Maanen examined forecasting of the real estate cycle for the office sector. In the study, Maanen examined the influence of indicators on the demand and supply ratio of office space and their effect on the real estate cycle. An initial effort at regional forecasting has been made by Guido Aben. Aben produced a forecasting model which selects regions in the Netherlands which are expected to outperform in terms of economic growth. The same study has also been carried out for the Dutch office market. As well as the university, research institutes have also carried out studies for the selection of outperforming regions. For instance, the Stec Groep and Buck Consultants International have carried out studies for the selection of attractive industrial locations. Van Doorn performed a study for the selection of attractive regions in Europe⁶. Cladera and Burns also investigated the development of prime office rentals in Europe⁷. No pan-European research has been carried out for the selection of attractive regions for the high street retail real estate segment. PMA, an English research institute, publishes pan-European research reports for shopping centres. JonesLangLaSalle has made an analysis of retail sales and did pan-European research on the influence of the consumer and consumer confidence on retail sales but didn't make any connection between that and real estate development⁸.

Retail real estate research

At the Eindhoven University of Technology Michael Vrins⁹, Harry de Kroon¹⁰ and Sebastiaan Buvelôt¹¹ have carried out studies into shopping centres. Steffen Hageman¹² examined the retail real estate sector in general and the characteristics of the different kinds of retail segments. Solitary shop properties have large similarities to shopping centres but different drivers influence their returns. Inner-city retail locations have lengthy histories and in many cases have formed the main shopping area in a city for a long time. The return is influenced by the attractiveness of the total shopping environment to compete other cities and retail locations. The shopping environment in inner-city locations is rather difficult to transform compared to public areas in shopping centres. In both retail

⁶ Doorn-Gröniger, van, L.F.E. and Jansen, T.M.R.A., *Regionale ontwikkeling bepaalt beleggingsstrategie*

⁷ Cladera, dr. J.R. and Burns, M.C., *Understanding prime office rentals within the European property market*

⁸ JonesLangLaSalle, *European retail checkout*

⁹ Vrins, M., *Renovatie en flexibiliteit van winkelcentra*

¹⁰ Kroon, de, H., *Wie kent de waarde?*

¹¹ Buvelôt, S., *Meer dan winkelen alleen*

¹² Hageman, S., *Segmentatie van winkelvastgoed*

locations consumer spending is very important for the return on the shop property. The students of TU Eindhoven did not study solitary shop properties during their graduation project. Torto and Wheaton wrote a research paper analyzing retail sales and the development of retail space¹³. The main conclusion was that retail space construction far outpaced the growth of retail sales as a result of new shopping centre developments. In the study differences were found in the returns on different levels of shopping centres, neighbourhood centres, community centres and regional centres. In Europe the regional shopping centres are comparable in drawing power to inner-city shopping areas. Regional centres have generated the best returns but have also seen a decline in sales per square meter. As well as the assistance from TU Eindhoven this thesis was produced with support from Redevco. Redevco is a European private real estate investor with a focus on high street retail. Redevco's specialisation in high street retail originates from its split-off from fashion retailer C&A. Most C&A stores are located on high streets and have large shopping floor spaces. Barbara Enekes¹⁴ and Amadeo Brenninkmeijer¹⁵ have both carried out scientific studies of solitary high street retail locations for Redevco and have carried out analyses of the quality and ageing of shopping areas in Europe. There is no complete forecasting model available for high street shop property containing factors based on regional developments that influence returns.

1.2 Formulation of the problem

The problem to be examined in this thesis has been formulated in the light of the developments in the real estate market set out in the previous section. The main factors behind this study are the movement, temporary or otherwise, towards retail real estate investments, the geographic expansion of investment and the relative lack of research on high street shop property as well as the other reasons mentioned in the previous section. The problem is stated as follows:

What is the expected real estate market total return for solitary shop property in the high streets for European cities?

The market return is determined by the capital growth and the income return. The capital growth is determined by the difference in the value of the property at the end of a year compared with the start of the year. The income return consists of the cash flows. The formula for the market return is:

$$\text{Market total return} = \frac{\text{Market income return} + \text{Market capital growth}}{\text{Average market value}}$$

1.3 Objective

This study is designed to help improve the professionalism of the real estate sector. Greater professionalism will improve the scientific basis for making decisions on retail real estate investment proposals. Based on the problem definition the following objective has been formulated:

To produce a model for forecasting the development of market total return on solitary high street shop property based on past trends, for a large number of European cities.

¹³ Wheaton, W.C. and Torto, R.G., *Retail sales and retail real estate*

¹⁴ Enekes, B., *How the demographic circumstances will change the real estate markets in Europe?*

¹⁵ Brenninkmeijer, A., *Boulevard of broken Dreams*

To achieve this objective the definition of the problem is broken down into the following sub questions:

1. *What are the factors that influence returns on investment in high street retail real estate?*
2. *Which cities in Europe have to be examined to achieve reliable results and sufficient depth in the examination of developments in Europe?*
3. *What has been the trend in the influential factors for high street shops in the defined cities in the past?*
4. *Which components should be examined to forecast the income return and the capital growth?*
5. *What are the drivers that influence the income return and what is their impact on the components of the income return?*
6. *Which drivers influence the capital growth and what is their impact on the components of the capital growth?*
7. *What are the expectations for the market returns for the defined high streets?*

1.4 Report structure

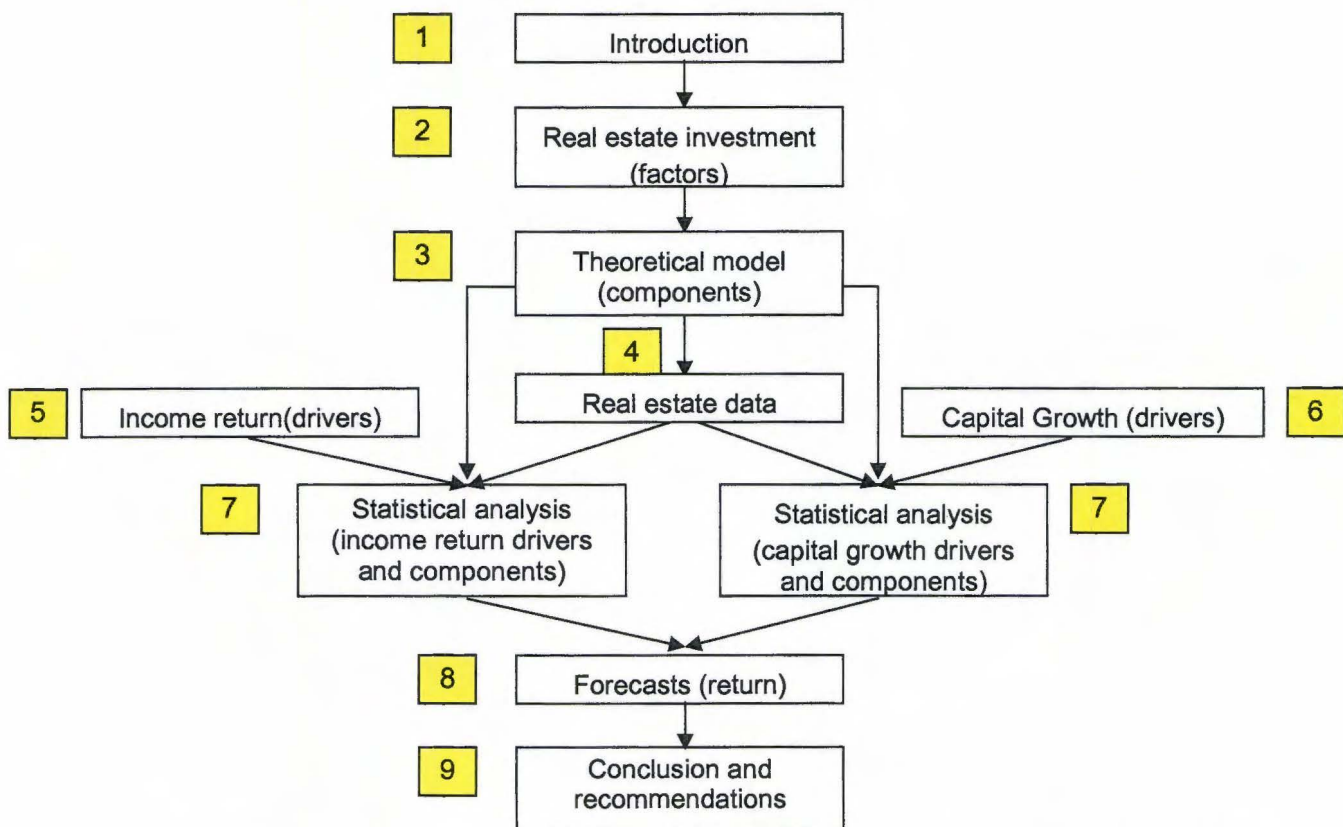


Fig. 1. Report structure, the number correspond to the chapter, containing information about the topic.

In the first chapter the introduction, containing the occasion, problem definition, the approach of the problem and the thesis structure was illustrated. In chapter 2 the characteristics of real estate investment and high streets shops in particular will be explained. Based on the real estate characteristics a selection of the analysed real estate

characteristics the return influencing factors will be composed. Based on the selected factors a theoretic model will be selected based on the impact on the total return. In the theoretic model the development of the selected factors in the past will be examined. Based on the historic development of the factor a theoretic model will be composed. In the theoretic model, components will be selected on recognizable patterns. A theory will be shortly mentioned in this chapter for the developments of the factors.

For measuring the developments in the past a source has to be selected. The selection of the source for the real estate return measurement will be discussed in chapter 4. Based on the components and the theory shortly mentioned in chapter 3 drivers will be selected. The drivers will probably affect the development of the defined components. The drivers are discussed in the chapter 5 and 6 and the expected relation is mentioned to the development of the components. To make a foundation and to check the reliability of the theoretic model a statistical analysis will be carried out in chapter 7. Based on data on the drivers, the real estate data (components) and the theoretic model, a statistical analysis will be made in chapter 7. The statistical analysis has two functions; on one hand to check the reliability of the formulated theoretic model and on the other hand the formulation of the forecasting model.

To make a forecasting for the income return and the capital growth, input is required. The input is based on the formulated model in chapter 7. If the input is available a forecast for the market return will be made in chapter 8 based on the relationships in the past and the forecasts for the drivers. The conclusion of the graduate thesis will be formulated in the final chapter and recommendations for future research will be also added in this chapter.

2 Real estate investment return

2.1 Introduction

This chapter discusses the selection of factors that influence the return on real estate investment, which are examined in this thesis. It also discusses a theory of real estate investment returns on the basis of which the factors affecting the real estate performance discussed in this thesis are selected. The criteria for the selection of the factors are their impact on the return, and the availability and objectivity of data about them. The total return is split into the two components specified in the introduction and the problem definition: income return and capital growth. The return is also influenced by the transactions costs, for instance the conveyance taxes and broker fees. Because the annual transaction costs vary greatly and depend on the length of time for which the property is held they are not examined in this thesis. Another reason is that the transaction costs are included in the determination of the market valuation as discussed in section 2.4. The transaction costs range from 5% of the purchase price in Sweden and the UK to approximately 12% in Spain and Portugal¹⁶.

2.2 Return

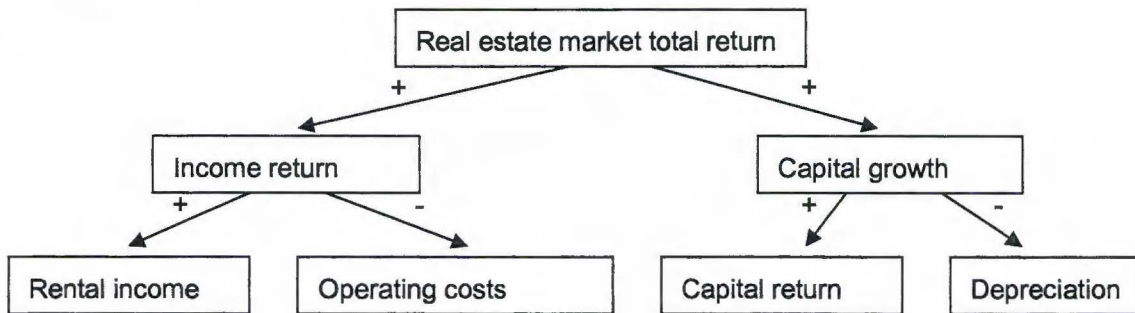


Fig. 2. Overview of return-influencing factors.

The factors that influence return are rental income, operating costs, depreciation and capital return¹⁷. It is impossible to examine all of the factors due to the lack of data and the complexity of the drivers. The four most influential factors will be discussed in the following two sections, which are devoted to income return and capital growth respectively. The factors affecting income return and capital growth have a significant influence on the total return of retail real estate as table 1 shows. The table shows the measured returns of the whole retail sector, including shopping centres and unit shops, in the past few years. In chapter 8 the forecasts based on the model in this thesis will be compared with the total returns in the past.

Table 1. Overview average annual return for retail real estate.

	Period	Total return	Income return	Capital growth
Finland retail	1998-2003	9,10%	7,80%	1,50%
Germany retail	1996-2002	3,70%	4,90%	-1,20%
Ireland retail	1993-2003	20,20%	6,90%	13,30%
Netherlands retail	1995-2003	10,60%	7,80%	2,80%
Sweden retail	1997-2003	10,10%	5,90%	4,10%
UK retail	1980-2003	11,40%	6,40%	5,00%
Average		10,80%	6,60%	4,20%

(Source: various real estate indexes)

¹⁶ Callender, M., *An overview of European investor strategies and portfolio activity*

¹⁷ Kroon, de, H., *Wie kent de waarde?*

2.3 Income return

The income return is the net result of the following elements: the gross rental income less the operating costs. The rental income depends on a number of developments and the operating costs include a large number of items of expenditure.

$$\text{Income return} = \frac{\text{Gross rental income} - \text{Operating expenditure}}{\text{Capital value (year-beginning)} + \frac{1}{2} \text{Capital (dis)investments}}$$

Rent

The development of the rent depends on several forces occurring at different levels, including developments in the catchment area and the quality of the shopping area and the shop properties. All of these forces will be discussed in this chapter. At the end of this section there is a list of the drivers that influence the development of the rent that are examined in the thesis. The influential drivers at the different levels were selected on the basis of a study of the literature.

Shop property quality

One important factor for deciding on the attractiveness of a real estate investment is the quality of the building. The quality of the property can be divided into two components: the quality of the construction and the quality of the location. The construction quality can be influenced by the owner of the property and aspects that influence it include the layout of the shop, the tenant, architecture, maintenance, floor space, number of storeys and accessibility. The quality of the location cannot be influenced by the owner. The quality of the location is determined by factors such as the surface area of the site, the property's location in a shopping area and the footfall. Table 2 gives a list of the most important drivers and a complete list of the drivers drawn from a study of the literature is provided in appendix VI.

Shopping environment

Brenninkmeijer carried out a study for Redevco to determine the quality of shopping areas in the Netherlands. Brenninkmeijer identified the following influential factors at shopping area level: security, accessibility, ambiance and retail offer. A complete list of the influential drivers at shopping area level drawn from a study of the literature is given in appendix V. A short list of the drivers influencing the quality of the shopping area is added in table 2.

Catchment area

The catchment area determines the total potential expenditure of the population living in the defined area. Consumer expenditure is based on the number of inhabitants, the extent to which the local population buys in a city and the net income of the consumers. The influence of the drivers on the rent components will be discussed in chapter 5. Table 2 includes a short list adapted from a study made by Lipsch. Due to the availability of data at regional level and the lack of data on shopping area quality on a pan-European scale, the research will be based on developments at catchment area level.

Table 2. Short list of rent influencing drivers for solitary high street shop property.

Building quality ¹⁸	Shopping area ¹⁹	Catchment area ²⁰
Floor space	Tenant mix	Population size
Relation front and dept store	Restaurants	Purchasing power
Lay-out of shop property	Amusement	Supply / competition other shopping areas
Constructional quality	Compactness	Future plans government
Foot fall	Parking facilities	Composition of the population
Architecture	Public transport	Shopping behaviour
Tenant	Maintenance	City attraction
Landownership	Ambiance/history	
Location in shopping area	Pedestrian area	
Number of storeys	Security	
Maintenance		

In the thesis the development of rents over time will be compared to the development of the drivers in a catchment area. The catchment area is selected as the scale for the comparison in view of the availability of (quantifiable) data. The data have to be measurable since qualitative analyses have already been carried out in the past on the drivers building quality, shopping area and catchment area. It is difficult to collect data on building quality and the data isn't comparable on a pan-European basis. For shopping areas, the shopping areas in all cities have to be examined. The quality of a shopping area is a matter of personal judgment and is therefore not comparable. Moreover, it depends on the perception of the local consumer. Another problem is the lack of historical data on both building quality and the shopping area. Given the inadequacy of data on the building quality and the shopping area, the development of rents will be examined in terms of the catchment area. The catchment area developments are discussed in chapter 5 with the drivers of rent development.

Operating costs

The operating costs are all expenses for maintenance management, and taxes. The operating costs are related to the value and rent development of the property. In many cases the real estate management organization is paid a fee based on a percentage of the rent. The turnover taxes are directly related to the rental income and the ownership taxes are linked to the value of the property. Besides the relationship between the value and rental income of the property, the maintenance and management costs have a significant impact on the operating costs. Both the maintenance and management are closely related to the company's policy towards the quality of the maintenance of the shop property, and the size of the company. The costs of maintenance for the interior are at the expense of the tenant, and by contrast with shopping centres there are no public areas requiring maintenance. The size of the property also dictates the amount of operating costs; for instance a large property has lower administrative costs and has relatively few commercial costs. A survey of some different markets produced the following results. The operating costs were approximately 12% of the total gross income for the retail segment as a whole, including shopping centres, in the Netherlands and France, 9.5% in Spain and 15% in Germany over the last nine years²¹. Shopping centres have higher operating costs due to the public space. The total operating costs are approximately 10 % for high street shops. In Spain the operating costs for other retail property are half those of shopping centres and two-thirds of the average operating costs

¹⁸ Brauwer, de, en Middel, *Visies op winkels*.

Veen, Van der, O. en La Fors, J., *Huurprijzen winkelcentra*.

¹⁹ Brenninkmeijer, A., *Boulevard of broken Dreams*

Zijl, S., *Leisure and retail*

BMVB en Kolpron consultants, *De aantrekkelijkheid van middelgrote binnensteden in Nederland*

Buvelôt, S., *Meer dan winkelen alleen*

²⁰ Lipsch, H.M.B., *Quick scan voor het binnenstedelijk winkelgebied*

²¹ Several real estate indices

of the whole retail benchmark²². The interior maintenance of the property is for the account of the tenant in most countries, apart from Sweden and Finland. The costs were fairly constant, as a percentage of the rental income, in the examined time-period. For the purpose of the forecast of the return in chapter 8 the operating costs are fixed at 10% of the gross rental income, but the factor for the operating costs can be adjusted to the factor in the past for each country and even for the specific real estate company. Based on the income return mentioned in table 1 and the percentages mentioned above, the impact of the operating costs on the total return is less than 1% and is fairly constant over time.

2.4 Capital Growth

Capital growth in one year is the difference between the value of the property on January 1 and December 31. The value is determined by the change in the initial yield, depreciation and the (dis)investments. The (dis)investments will not be discussed in the thesis since market developments have no influence on this factor.

$$\text{Capital growth} = \frac{\text{Capital value (year-end)} - \text{Capital value (year-beginning)} - \text{Capital (dis)investments}}{\text{Capital value (year-beginning)} + \frac{1}{2} \text{Capital (dis)investments}}$$

Capital value

Initial yield

The initial yield is equal to the expected net initial yield for the buyer. Therefore the transaction takes place at the net transaction price for the buyer and the gross transaction price for the seller inclusive of the transaction costs²³. In theory the initial yield consists of a couple of components²⁴. The components are:

- a risk-free return;
- a premium for the country risk;
- a premium for real estate risk in general;
- a premium for the high street real estate segment in general;
- a premium for specific property risks.

These risks can be divided into two types: the investment risk in general and the real estate risk. The investment risk leads to a premium for country risk. The structural risk should remain the same if the country risk stays the same. The country risk would be high for immature markets declining to low for mature markets. The change from an immature to mature market will cause the initial yield to decline. The risk is the chance of a negative or positive difference between the expected development and the actual development and affects the return on the real estate property, portfolio or company²⁵. Possible risks are mentioned in table 3.

²² Comparative report Redevco analysis, IPD France, 2001

²³ Keeris, prof. ir. W.G. MRICS, *Vastgoedbeheer lexicon*.

²⁴ Baum, A., *Commercial Real Estate investment*

²⁵ Peeters R.H.L. *Risico's nader beschouwd*

Table 3. Risk categories split up in return influencing categories for retail real estate.

Demographic risk	Economic risks	Social/culture/ risks	Technological risks	Ecologic risks	Politic risks
Population development	Interest development	Lifestyle	ICT	Ground pollution	Rent policy
Income development	Inflation	Social processes	E-shopping	Sustainable building	Permit procedures
Household size	Economic cycle	Social safety		Social acceptance	Zoning plans
Age structure	Returns alternative asset classes				Construction permit
Education level					
Development disposable income	Bankruptcy tenant				Rent law

(source: Adapted from R. Peeters)

Some of the risks mentioned in table 3 are examined in the discussion of the drivers of for rent development. The social/cultural, technological and ecological risks will not be examined due to the lack of information about the risks and measurements of developments. All the other risks are examined or are replaced by another driver of the rent development.

Yield levels also depend on the willingness of investors to invest in a specific asset class, in this case high streets shops. The willingness to invest depends on the expected return, the expected risk and the attractiveness of other asset classes.²⁶ The expected return is determined by the rent minus the operating costs, but also by the selling price of the property and depreciation. The expected return will be based on the factor initial yield as well as the rent itself. The attractiveness of other asset classes will be examined by analyzing the return on shares and the long-term interest rate.

Depreciation

Depreciation affects the capital value as well as the rental income and the initial yield. Depreciation of the property can be broken down into two components; costs of obsolescence of the building and the land value. The major component in the total value of the property in high streets, land value, doesn't depreciate due to the economic quality of the location. The footfall will remain relatively high in future due to the central location in the shopping area. The average age of the building and relatively small value of the building compared to the total property value result in a small level of depreciation. Moreover, the costs will be the same for some years and don't react to the cycle of demand and supply. The depreciation costs shall not be examined in the thesis.

The value of the property is calculated by:

$$\text{Value} = \frac{\text{Gross rental income} - \text{Depreciation}}{\text{Initial yield}^*}$$

* The initial yield is the market direct return (gross rental income) divided by the market transaction price, excluding the acquisition costs in most cases; for more information see the discussion of problems with definitions in chapter 4.

²⁶ Kruijt, Prof. Dr. B, *A new concept of risk*

Capital (dis)investments

The capital (dis)investments are based on the capital expenditure on (re)developments and the income from sales of parts of the property. In view of the specific character of each (dis)investment the influence of this factor isn't examined in the thesis. The normal expenditure on maintenance is included in the operating costs.

2.5 Time period

The model forecasts the market return in the long term. Forecasting for a longer period, over 2 years, is difficult due to possible economic and real estate developments. There are five reasons for deciding to forecast rent and yield development in the long term:

1. The period for which an investor holds a property is long due to the high transactions costs compared to other asset classes like shares;
2. The long lease contracts. For instance, in the Netherlands 5 + 5 years;
3. The model is being constructed for real estate investors and not for real estate traders;
4. The return on the portfolio depends on the owner's selling price based on the forecast of the return for the new investor;
5. Many investors construct IRR or DCF models based on a period of 5 to 10 years to determine the attractiveness of an investment.

These reasons lead investors to make decisions based on forecasts for the market return over ten years. The forecasts for the rent and yield development will be examined for a period of 5 to 10 years.

2.6 Conclusion

Real estate return. (chapter 1):

$$\text{Market total return} = \frac{\text{Market income return} + \text{Market capital growth}}{\text{Average market value}}$$

Chapter 1 gave a short introduction to the market total return. The chapter examined the market total return and identified several factors used to determine the market total return. These are shown in the following formula.

Yield influencing factors literature:

$$\text{Market total return - acquisition costs} = \frac{(\text{Market rent} - \text{operating costs}) + (\Delta (\text{Market rent} / \text{Market net initial yield}) - \text{depreciation})}{\text{Average (Market rent / Market net initial yield)}}$$

Two factors from the overall formula for the market total return have been selected for the thesis, which analyses the rent development and the yield development. The operating costs are not examined since they are specific to each investor and the annual percentage of the gross rental income represented by the operating costs over the examined time period is similar. An average of 10 percent of the total rental income is adopted for operating costs. The depreciation of the value of the property isn't examined in the thesis given the weight of the land component in the total value of the property in high street locations and the fact that the depreciation of the land value is approximately zero. The depreciation of the building itself is limited compared with, for instance, industrial real estate, in view of the long economic life of high street buildings. Capital (dis)investments are also excluded due to the specific character of those revenues and expenditure for each property and the lack of data about this factor. The forecast of the

yield and rent development will be examined over the longest possible period to make the most reliable forecast. The forecast will be for a period of 5 to 10 years, which is the investment horizon of investors due to the term of lease contracts and the size of the transaction costs. Figure 3 gives an overview of the factors and the level of the influential drivers examined in the thesis. The calculation of the market total return is reproduced in formula and will be repeated with actual figures in chapter 8.

Determined factors, examined in the thesis:

$$\text{Market total return} = \frac{(90 \% \text{ of market rent}) + \Delta (\text{Market rent} / \text{Market net initial yield})}{\text{Average} (\text{Market rent} / \text{Market initial yield})}$$

It is possible to change the percentage of the operating costs in the model. In addition, additional factors can be inserted in the formula which are set at zero for the purpose of the thesis but could be examined in the future. Those factors are transactions costs and depreciation. Depreciation is added to make the model useful for other real estate sectors where depreciation plays a role, such as industrial real estate.

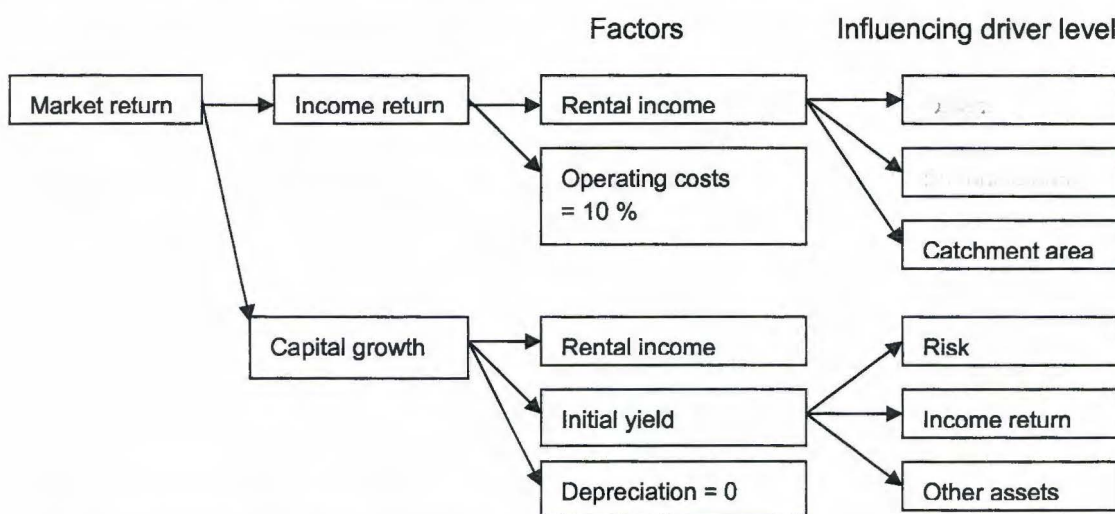


Fig. 3. Overview of the determined influencing factors and drivers level for examination in the thesis.

3 Theoretic model

A theoretical model has been constructed based on the return factors identified in chapter 2, the rent and yield development. To produce the theoretical model the past development of the factors was analysed. The theoretical model forms the basis of the analysis in this thesis. The development of rent and yield will be examined separately and each has its own theoretical model.

3.1 Rent development

The development of rent is a result of the development in the supply of property and the demand from tenants for property to rent.

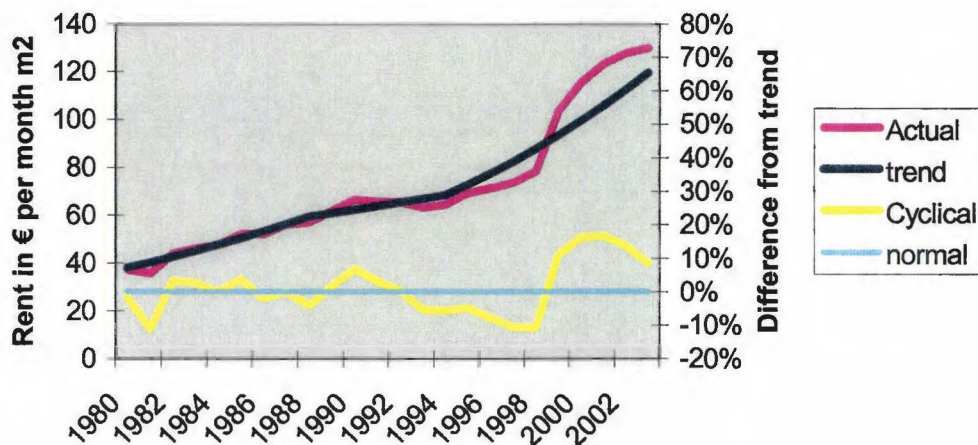


Fig. 4. Example rent determination Amsterdam.

Figure 4 illustrates the rent development for Amsterdam. Two patterns are recognizable in the figure: a trend and a cyclical development. To make a good forecast the two developments will be analysed separately, but to do so the two developments have to be distinguished. The first step is to separate the trend in the total rent development. The trend is determined first since it has the most recognizable pattern. The best way to determine the trend is to establish the average development between two peaks and two bottoms in figure 4. The cyclical component can then be determined; the cyclical development is the difference between the actual rent development and the trend.

The theory formulated in this section is later used to produce an analysis for all the cities examined in the thesis. The city selection is discussed in chapter 5. The patterns for both components; the trend and the yield, are recognizable for almost all cities, although for some cities it is hard to determine. For instance a pattern is scarcely discernible in Amsterdam until 1990 but later a clearly recognizable pattern emerges, see figure 4. For the cities of Dresden and Leipzig there was no clearly recognizable pattern, due to the absence of historical data or because development in those cities differed from those to in the other examined cities. Some remarks need to be made about the developments of the components. The development of the trend in the rent was positive for all cities, but the year-on-year percentage change isn't equal over time or for all cities. For some cities it is hard to determine the cyclical pattern due to the short period for which data are available and non-cyclical behaviour over a period of time, so the cities of Dresden and Leipzig will be excluded in the analysis. The year-on-year percentage growth ranges from approximately 2% in Germany to almost 10% for some French cities. The cyclical pattern also differs in amplitude for the examined cities and over time. The length of the cycle period (in years) also differs from one city to another and varies from 8 to 14 years. The cyclical amplitude is determined by a percentage amplitude, calculated by the nominal

rent amplitude divided by the trend in the examined year. The transformation in percentage terms makes the cycle development comparable between cities and over time. The cyclical amplitude ranges from 10% for some cities in the Benelux and Germany to 35% for some cities in the UK, Italy and Spain.

3.2 Rent development model

The model constructed is based on past developments. The model is based on the trend and cyclical developments mentioned above. The total rent development is the sum of the cyclical rent and the trend calculation.

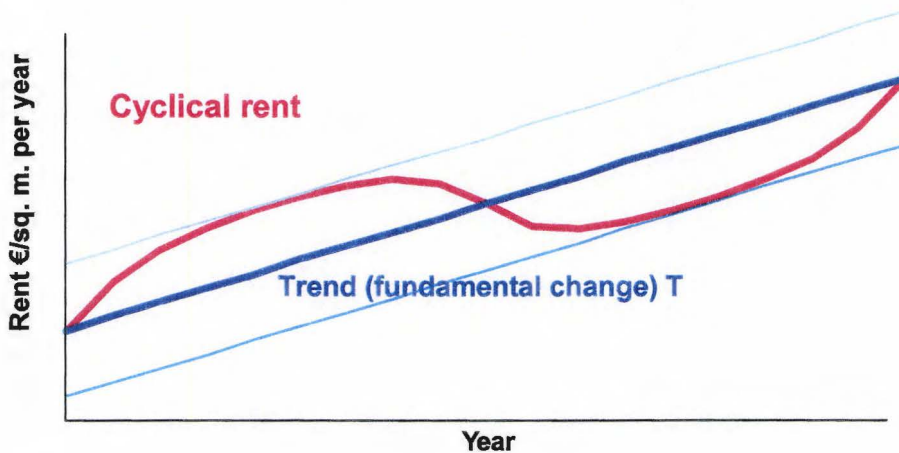


Fig. 5. Theoretical rent development model.

Trend

As discussed in the previous chapter, in the thesis the trend will be considered in the context of changes in the catchment area. The trend is the result of permanent changes in the catchment area. The permanent changes probably occur due to increased prosperity and real estate construction in the catchment area. Rent is a result of the demand of retailers and the supply of retail real estate. For the rent development, changes in the catchment area will be analysed in terms of drivers which have no cyclical components or for which they have been filtered out. The developments will be discussed in chapter 5 and chapter 7 includes a statistical analysis to determine the reliability of the findings concerning the impact of the drivers on the trend in rent development. Using the analysis the rent development will be calculated on the basis of the development of drivers discussed in chapter 6, and the influence on the rent development based on the statistical analysis in chapter 7.

Cyclical rent development

Cyclical behaviour is affected by temporary changes arising from temporary economic developments. The cyclical component of the total rent development will be examined on the basis of cyclical changes in the catchment area brought about mainly by the business cycle. The cyclical changes affect the supply and demand for high street shops. Developments in the catchment area will be analysed in terms of cyclical drivers and drivers without fundamental components. Due to an analysis the rent development will be compared to the development of the drivers, discussed in chapter 5, and the influence on the rent development, based on the statistical analysis in paragraph 7.5. Cyclical changes in rent can occur as a result of (delayed) reactions to developments in the catchment area. The possible time lag will be mentioned in chapter 5 and a statistical foundation will be given in chapter 7.

3.3 Yield development

The yield development is a result of developments in the supply of real estate and the willingness to invest in a property

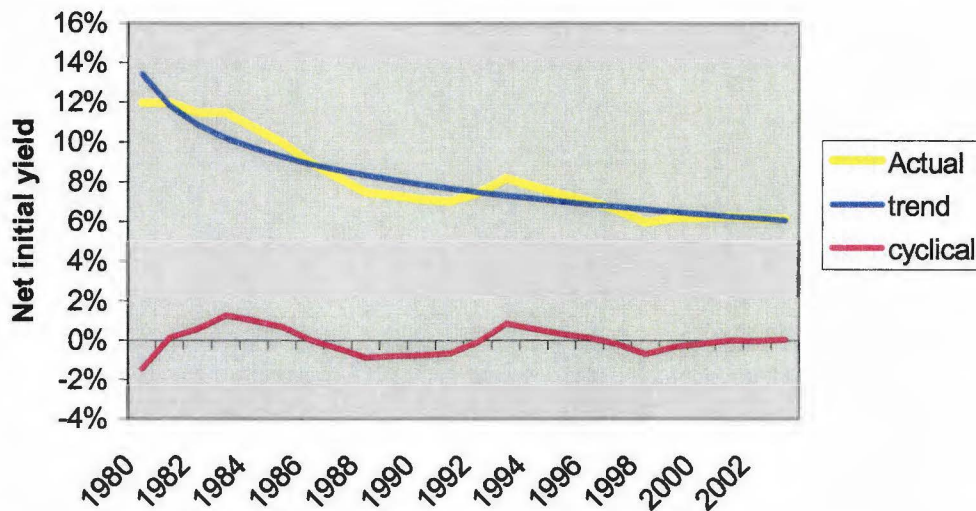


Fig. 6. Example yield determination Barcelona.

Figure 6 shows the yield for Barcelona. As with the rent development, there are two recognizable patterns in the figure. The yield development is broken down into two aspects: a trend and a cyclical development. The trend is determined first since there is a clear pattern in the development of the trend. The trend is based on an exponential trend-line. The trend-line is determined by the most appropriate line with the smallest deviation of values from the actual yield development line. An exponential line is used due to the larger changes in the beginning and the gradual flattening out. The cyclical component is determined by the difference between the actual rent development and the trend.

On the basis of the theory defined in this section an analysis is later made for all cities examined in the thesis. The selection of the cities is discussed in chapter 6. For several cities both trend and cyclical patterns are recognizable. The trend isn't recognizable for all cities. The patterns appear to have emerged in the past in immature real estate markets such as Barcelona in the Eighties and Warsaw in the Nineties. The trend appears to be flat for all cities at a certain point in time. For some cities it is hard to determine the pattern. Some remarks need to be made about the development of the components. The trend in the yield development was negative for all cities. The highest point at which the trend development starts is approximately 20% in cities such as Lisbon, Porto, Madrid, Barcelona, Warsaw and Prague. For all cities with a mature real estate market the trend development is horizontal from a certain point in time. The horizontal yield development appears to occur between two limits. The upper limit is approximately 8% for the French cities and the lower limit is approximately 5% for the English and German cities. The cyclical pattern also differs in amplitude for the different cities and over time. The length of the cycle (in years) also differs for the cities studied and varies from 9 to 15 years. The cyclical amplitude is determined by a nominal difference from the trend component and the actual development. The cyclical amplitude ranges from 0.4% for some German cities to 1.5% for some cities in the UK, Netherlands and Spain.

3.4 Yield development model

A model has been formulated based on past developments. The model is based on the trend developments and cyclical developments mentioned above. The total yield development is the sum of the cyclical yield and the trend calculation.

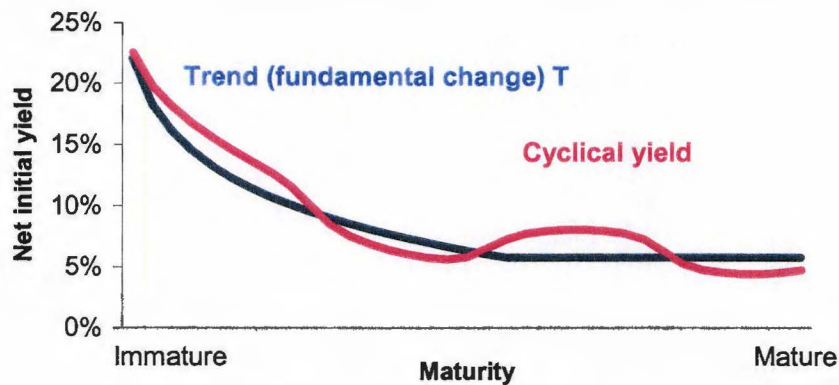


Fig. 7. Theoretical initial yield development model.

Yield development trend

The trend will be based on permanent changes in the catchment area. The willingness to invest in real estate depends on several factors: risk, expected return and the attractiveness of other assets, see chapter 6. Due to the permanent change (see figure 7) in the yield and the cyclical behaviour, of the factors: the expected return and attractiveness of other assets, and expected permanent change in the risk, the risk is selected for further analysis of the relationship between the investment market and the trend of the yield. The (permanent) risk development will be analysed in terms of drivers with no cyclical components or for which they have been filtered out. The trend is also subject to cyclical risks, such as vacancy, which will not be examined. The permanent changes are due mainly to the maturity of the real estate sector.

Cyclical yield development

The cyclical component of the total yield development is based on temporary changes in the catchment area. The cyclical changes are affected by the supply and demand for high street shops. The temporary changes are affected by temporary changes of risk, the expected return and the attractiveness of other assets. The development of the catchment area will be analysed in terms of cyclical drivers and drivers without fundamental components. The analysis will consider the yield development based on the development of the drivers discussed in chapter 6, and the influence on the rent development based on the statistical analysis in paragraph 7.7. Cyclical changes in the yield can occur due to (delayed) reactions to developments or anticipation of future developments in the investment market. The possible time lag will be mentioned in chapter 6 and a statistical foundation will be provided in chapter 7.

3.5 Conclusion

Chapter 3 surveyed the rent and yield development in the past and a theoretical model was constructed on the basis of this examination. The rent development model consists of a trend, arising from the level of prosperity in a catchment area, and a cyclical pattern, attributable to demand from retailers. The yield development model also consists of a trend, arising from the maturity of the real estate market, and a cyclical pattern, arising from supply and demand from investors. The next three chapters will explain the drivers used to determine the developments of each component mentioned in this section. These are real estate data, the catchment area development and the investment market. Chapter 7 presents a statistical analysis of the theoretical model and the drivers that were briefly mentioned in this chapter and are explained in more detail in the next three chapters. The theoretical model is also suitable for other real estate segments. The developments referred to will apply for all real estate segments, and although the drivers are different the components will be the same. The components mentioned in this chapter are the dependent variables for the statistical analysis carried out in chapter 7. The independent variables, the drivers, are discussed in chapters 5 and 6. A complete list of return-influencing factors and the components is added in appendix IIX.

4 Real estate data

The input for the model is based on the rent income and the yield development. This chapter discusses the sources of the data concerning the development of rent and yield for real estate. The criteria for the selection of the real estate data are reliability, uniformity, high street coverage and availability. The reliability depends on the way the data is collected and the definitions used in the data. The data could be based on actual transactions or market opinion. The reliability also depends on details of rent concessions, which often aren't published, and the transparency of the data. Uniformity is important for the comparability of the data collected from different sources. The criterion of high street coverage means that the data must cover specifically the high street and not shopping areas as a whole. The availability of the data refers to the need for historical data to be available for all the defined markets. The sources include brokers, real estate indices and published transactions. The return for a particular investor isn't a useful source, due to the choice of the determination of market rent and initial yield developments. A list of the sources used for the analysis is given at the end of the chapter. But first the high street shop property segment has to be defined.

4.1 High street segment

Before deciding on the relevant real estate data the high street real estate segment has to be defined. High street shops are located in inner-city shopping areas and have the highest rent in a city. High streets have the highest footfall in a shopping area. Consumer spending in a high street depends on the footfall and consumer expenditure per passer-by. Compare, for instance, the Dutch shopping centre Hoog Catherijne in Utrecht which has a high footfall but low expenditure per passer-by and P.C. Hoofstraat in Amsterdam, which has a low footfall but high level of spending per passer-by. No specific definitions of the characteristics of the high street can be given based on the cities and catchment areas examined and the maturity of the real estate market, but some general characteristics can be mentioned.

Characteristics of high streets are that they have the largest footfall in a shopping area, a large number of national and international chain stores, and in particular shops selling clothing and footwear, the land value representing a large component of the total value, rents are relatively high and food stores account for a maximum of 10 % of the retail offer²⁷. Other characteristics that are mentioned are the presence of anchor tenants; it is often a pedestrianized area with shops on both sides of the street and shopping attractiveness²⁸. These latter characteristics apply for the Dutch retail market but not, for instance, to the Champs Elysées, which isn't a pedestrian area, so they aren't pan-European criteria.

4.2 Broker information

In addition to their other activities such as valuation and brokerage, brokers publish market reports. The market reports present their opinions on a specific market. In the publications specific markets are defined. The information is published for the market segments retail, residential, offices and industrial in general. The information published on retail is for a particular city and is generally based on high street real estate but also covers shopping centres and retail warehouses. The published information encompasses market rental levels, market initial yields and sometimes even vacancy rates.

²⁷ Hagemen, S., *Segmentatie van winkelvastgoed*

²⁸ Janssen, ir. Ing. I.I., *Beheer van winkels en winkelcentra*

Brokers publish real estate data for all important markets. The data are published once the real estate market has become reasonably transparent. For many European high streets rent and yield levels were first published in the early 1980s, and even the late 1970s for cities such as London and Brussels. With the greater transparency of the market the number of cities in each country and the number of countries for which data are available has increased. Besides the number of markets reported on, the frequency of publication of reports is also increasing, from annual to twice a year or even quarterly.

A problem with broker reports is the definition and measurement of the real estate data. Each broker determines the rent and yield in his own way, and some brokers even report in a different way for each country. To be able to compare the data the method by which the data are determined has to be analysed. Rent concessions made to tenants aren't published in the reports so the data are not completely reliable.

4.3 Real estate indices

Real estate indices are a new development in continental Europe. These indices started in the Anglo-Saxon countries in the 1980s but found their way into continental Europe in the late 1990s and early in this century as a result of the increased transparency of the real estate markets. The indices report the return on real estate markets and give annual figures for the return on retail real estate. They produce a single figure for all retail real estate sub-markets in a country. The figures aren't suitable for an analysis of high street real estate due to the large component of shopping centres and retail real estate at other locations in the data. The reported rental income is based on rents stipulated in contracts and is not the same as the market rent. Vacancies and rent concessions are incorporated in the figures, and for some countries there are even data about operating costs.

Table 4. Overview real estate indexes in Europe.

Country	Index	Year start (retail index)
Denmark	DEI/IPD index	2000
Finland	KTI/IPD Finish index	1998
France	BD2/IPD France index	1998
Germany	DIX German Index	1996
Ireland	SCS/IPD Irish property index	1984
Italy	IPD/Nomisma Italian index	2001
Netherlands	ROZ/IPD index	1994 (1976)
Portugal	Immometrica/ IPD	2000
Spain	IPD Spanish property index	2001
Sweden	SFI/IPD Swedish property index	1997
UK	IPD UK property index	1981

(Source: several real estate indexes)

4.4 Published transactions

Some journals also publish data about completed transactions. If no transactions have taken place journals don't publish market rents and yields, whereas brokers publish their opinions about the market even when no transactions have taken place. The circumstances of the transactions aren't published so some extraordinary circumstances could influence the published information. The problem with using records of transactions is the non-availability of data due to the lack of transparency in some markets and the difficulty in collecting historical data. Rent concessions made to tenants aren't published in the journals so the data isn't completely reliable.

Table 5. Overview journals publishing real estate transactions.

Country	Source
Austria	Immobilien manager
Belgium	Belgimmo
Czech	Czech & Slovak Construction Journal
France	La lettre M2, www.webimm.com
Finland	Suomen Kiinteistölehti
Germany	Immobilienmanager, Immobilien zeitung
Netherlands	PropertyNL, Vastgoedmarkt
Poland	Construction Journal Poland
Spain	Metros2
Sweden	Datscha
UK	Estate Gazette

4.5 Selected real estate data source

Table 6. Properties real estate rents and yields data sources.

Source	Reliability	Uniformity	High street coverage	Availability		Overall
				Historic data	Country coverage	
Broker reports	*	**	***	***	***	**/***
Indexes	**	***	*	**	**	**
Published transactions	***	*	**	*	**	*/**

Table 6 gives a comparison of the characteristics of the different sources of real estate data. The reliability is determined by whether the data is based on a well-founded opinion (**) or actual transactions (***). Based on the findings, the source selected is broker reports. The problem, a lack of reliability, has to be recognized. The problem of the uniformity of the data and the results are discussed in section 4.6.

4.6 Data comparability

Broker high street shop specifications

Broker reports define the specifications of shop properties. Table 7 gives the specifications for the floor space as determined by different brokers. The streets mentioned in the reports have the same characteristics and selected because they have the highest footfall and rent in a city. The relationship between the floor space and the rental level was examined by Bolt and is visualized in appendix VI²⁹. Enquiries about the specifications used by brokers revealed that the differences are due to the historical background of cities and the retail structure in a city³⁰. The specifications of the brokers are purely indicative and are formulated on the basis of their home market and the historical background of the city.

²⁹ Bolt Drs. E.J., *Waarde winkelpanden*

³⁰ Telephonic conversations were made to: August Gotink of CB Richard Ellis, Hajo Frieman of Cushman & Wakefield, Healey & Baker, Dignus Hoen and Arjen Veldhuis of JonesLangLasalle, Robert Das and George ten Have of Boer Hartog Hoof/Oncor and Nicholas Barnes of DTZ. Results of yield determination are shown in Appendix IV.

Table 7. *Overview floor space specification shop-property by broker.*

Broker	Floor space	Shop properties	
		Front	Depth
Atis Real	120 m ²	6 m	20 m
C&W Healey & Baker	150 m ²	6 m	25 m
DTZ Belgium	100 m ²	5 m	20 m
CB Richard Ellis	150 m ²	6 m	25 m
JonesLangLasalle Europe	200 m ²	8 m	25 m
JonesLangLaSalle Germany	100 m ²	6 m	15 m
ONCOR	140 m ²	6 m	18 m

(Source: several broker reports)

Rent determination

The brokers referred to in the analysis determine the rent in almost the same way, by taking the highest possible rent for the high street in a market after excluding exceptionally high and low rents. The data used in the thesis is the average of all brokers.

Yield determination

The determination of initial yield is more complex. Different brokers use different specifications. The brokers in different countries use different bases to determine the yield. The method used is based on local custom. For instance, the initial yield published by brokers in their reports in the Netherlands is based on a gross yield, by contrast with the net yield in the United Kingdom for instance. The data on a local market reported by a broker is composed in the same way for the whole examined time-period. The composition of the yield is also different for the brokers in the same market due to the background of the broker and the composition of the reports. The definition of net initial yield also differs from one broker to another, for instance at JonesLangLaSalle it is based on net income excluding operating and acquisition costs while CB Richard Ellis determines the initial yield by the gross income excluding acquisition costs and DTZ determines the initial yield in the Dutch market by the gross rental income including the acquisition costs. The determination of the initial yield differs considerably between brokers. These different approaches could result in large differences in the initial yield since different brokers may collect the data about a particular city over time. To get a clear picture of the movements in the markets, therefore, the composition of the group of brokers has to be the same for a city throughout the entire examined period. In appendix IV an overview of the approaches of the different types of broker is added. The data of three brokers are used for the initial yield determined over the whole time period. In most cases the three brokers are CW Healey & Baker, Oncor and a third broker. The three brokers were selected because their data was available over the whole time period and in view of their different backgrounds. CW Healey & Baker is the most important retail real estate broker in Europe. Oncor is an international consortium of national brokers or research institutions with participants from each country. This local approach means that Oncor has knowledge of the local market. A third broker is added to give a third opinion about the yield, which increases the reliability. The third broker is selected on the basis of availability of data for the local market.

4.7 Conclusion

Broker information is used for the purpose of the analysis. The broker data has the advantage that it exclusively covers the high streets, is available for a long period and is available for a larger number of countries and cities than information from indices and publications. This chapter also addressed the issue of uniformity. Since every broker determines yield differently data on yield development is taken from a number brokers over the whole time period. The rent development is examined on the basis of the average of all brokers since rent is determined in the same way by the brokers. The historical time period examined depends on the transparency of the local real estate market and but is as long as possible.

5 Catchment area

The income returns for the cities will be examined in terms of the rent development. The components discussed in chapter 3, the trend and historic cyclical development of the rent will be examined. This chapter examines the drivers for those at the catchment area level and determines the independent variables for the statistical analysis made in chapter 7. The selection of the drivers and their expected effect on the components will be discussed.

The rent is a result of the supply of real estate and the demand from retailers. Given the length of the period being studied the development of supply could have an influence on the rent development³¹. The expected influence of construction of retail floor space will be discussed on the basis of a literature study. The demand is examined from the perspective of the development of the catchment area so the borders of the catchment area have to be determined. But first the cities to be examined have to be selected and the term catchment area has to be defined. The catchment area is the geographical area containing inhabitants who depend on a particular shopping area for their purchases. The catchment area depends in part on the type of purchase, which will be discussed in section 5.2.

5.1 Selection of cities

A selection has been made of the cities which will be examined in this thesis. The selection was made on the basis of several criteria including the availability of broker data on the rents and yields development, the retail importance of the city, the number of inhabitants of the cities, whether or not the country concerned is a member of the European Union and geographical distribution across European and research carried out by research institutions. Approximately 50 cities were selected, which is a practical sample and large enough to provide a scientific foundation. The most important criterion is the availability of real estate data. No analysis can be made without data. The data is broker data, see chapter 4. The data for the analysis has to be available for at least ten years. This criterion eliminated several cities in less transparent countries from the analysis. The second criterion is retail importance. CW Healey & Baker publish a report with data on all important retail streets in Europe. This criterion also eliminated several cities³². The third criterion is the number of inhabitants and the fourth is current and planned research by research institutions for both real estate and economic developments. Almost all the selected cities are mentioned in the publications *European Regional Prospects* and *Urban Audit*³³. The first is an annual study published by international research institutions and the second is a publication by Eurostat, which compares the quality of life in different cities. The quality of life can be added due to intended research to measure the quality of the shopping area. Besides cities selected on the aforementioned criteria, the capitals of the countries have also been selected. Appendix II contains a complete list of the cities and the high streets studied.

5.2 Catchment area determination

To determine the size of the consumer base the extent of the catchment area has to be defined. The visitors to the high streets in the cities determine the catchment areas. To simplify things, the attractiveness of the shopping areas in each city is assumed to be similar. The catchment area can be subdivided into three segments as described table 8, which defines the characteristics of the consumers.

³¹ Fisher, Hudson- Wilson and Wurtzbech, 1993. *Equilibrium in Commercial Real Estate Markets: Linking space and capital markets*

³² Cushman&Wakefield, Healey&Baker, *Mainstreets across the world 2003*.

³³ ERECO, *European Regional Prospects 2003*

Eurostat, *The Urban audit*

Table 8. Overview of consumer spending pattern characteristics.

Buying power bond	Consumers	Retail real estate
Daily shopping	Inner-city inhabitants	Neighbourhood shops / shopping centres
Non-daily shopping	City inhabitants	District shopping centre
Recreational shopping	Provincial/national inhabitants	Regional shopping centres Inner-city shops

(Adapted from EIM, DHV and Kolpron)

The attractiveness and purchasing power bond³⁴ also depend on the range offered by the total inner-city shopping area and the attractiveness of other retail locations such as large shopping centres or competing cities. A city's catchment area could encompass different geographic areas based on the characteristics of recreational shopping mentioned in table 8. In table 9 there is an overview of the catchment areas of the cities studied.

Table 9. City catchment area characteristics based on buying power bond. The cities put in brackets will not be examined.

Global	European	National	Provincial or federal state	
			Single	Competitive
Paris	Milan	Brussels	Cardiff	Nice-Marseille
(New York)	London	Amsterdam	Gothenburg	Cologne-Düsseldorf-
(Hong Kong)	Barcelona	Dublin	Antwerp	(Essen)
	Athens	Prague	Lyon	Stuttgart- (Karlsruhe)
		Madrid	Lille	Glasgow-Edinburgh
		Vienna	Bordeaux	Manchester- Leeds
		Copenhagen	Frankfurt	(Liverpool)- (Sheffield)
		Helsinki	Hamburg	Dresden-Leipzig-
		Stockholm	Munich	(Chemnitz)
		Budapest	Rome	Rotterdam-
		Warsaw	Naples	(The Hague)
		Luxembourg	Genoa	
		Lisbon	Turin	
		Berlin	Porto	
			Zaragoza	
			Seville	
			Valencia	
			Cardiff	

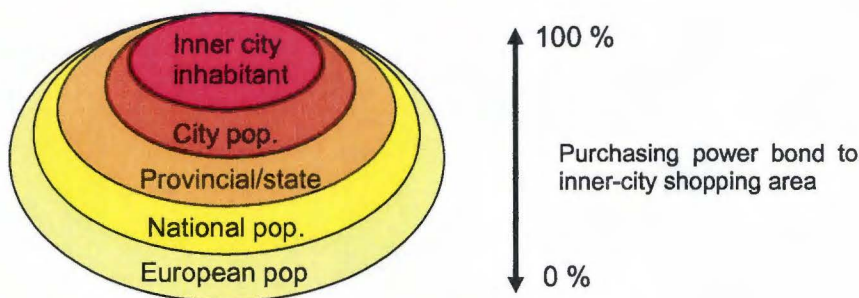


Fig. 8. Buying power bond of a city. In red the consumer with a large purchasing power bond of the selected inner city is determined and yellow indicates a low buying power bond.

Based on the buying power bond of the consumers for the examined high street shopping area a selection has been made to compare the rent development to provincial/state data. The selection is based on the largest number of cities in the

³⁴ The share of all expenditure that is spent in a particular shopping area. The purchasing power (spending) tied to that shopping area.

category with a provincial or federal state, see table 9. At a higher catchment level, for instance national or European cities, see table 9, the populations of the cities also have a large purchasing power bond in addition to the consumers from the rest of the country or Europe. Figure 9 visualises the purchasing power bond for different catchment areas. The catchment area for inner-cities shopping areas is about a distance of 100 km or travelling time of one hour respectively for recreational shoppers. The total possible purchases in the geographic area determine the total purchasing power in the catchment area and the purchasing power bond determines the part of the total purchasing power spent in the defined shopping area. The distance and travelling time for the consumer from the provinces or federal state to the examined cities is about 100 km or one hour respectively. Besides the travelling time, the attractiveness of the shopping area and competitive retail locations determines the purchasing power bond. But car ownership, the quality of public transport and the appetite to travel also differ within Europe. Keeris gives a definition of the catchment area based on the retail sales in the inner-city shopping area. The primary city population accounts for approximately 50% of all retail sales; the secondary, regional population for approximately 35% and the tertiary catchment area for approximately 15% of the inner-city retail sales³⁵. The percentages differ considerably from the purchasing power bond shown in figure 8.

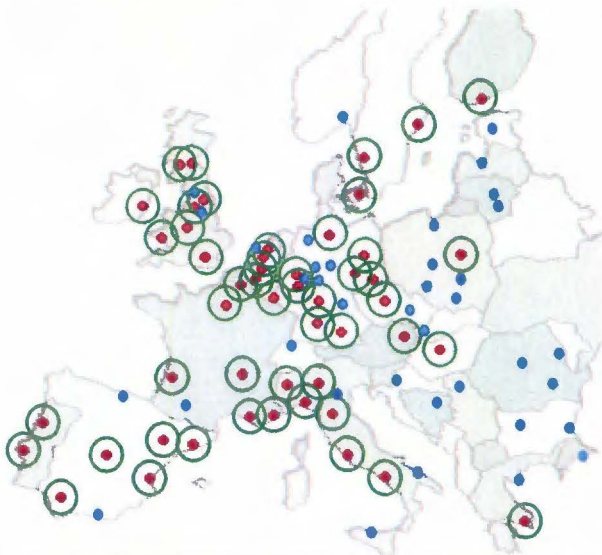


Fig. 9. Overview total competitive cities and catchment areas (100 km). Top 150 cities, by population, across Europe besides cities in Russia and former Eastern Bloc countries. Red: examined cities. Green: determined secondary catchment area. Blue: other cities.

This thesis is a pan-European study, so a pan-European classification would be useful. Eurostat is the European Union's statistical office and it publishes comparable data for all European Union member states. As more and more regional data became available it established a classification for the harmonization of the data called the Nomenclature of Territorial Units for Statistics (NUTS). The data is available at four levels as shown in table 10.

Table 10. NUTS classification determination.

NUTS	Description	Population	
		Minimum	Maximum
Level 0	Country		
Level I	Major socio-economic regions	3 million	7 million
Level II	Basic regions	800.000	3 million
Level III	Small regions	150.000	800.000

(Source: Regions, Nomenclature of Territorial Units for Statistics, NUTS-2003, European Union, 2003.)

³⁵ Keeris, prof. ir. W.G. MRICS, *Vastgoedbeheer lexicon*

The data for this thesis is collected at NUTS level II when data is available. NUTS level II corresponds with the level of provinces in the Netherlands and other countries. If no data is available at NUTS level II, data at NUTS level I will be used. The NUTS level I corresponds with the level of federal states or a region of a country, for instance in Germany and the UK. The following sections will discuss the identification of drivers using the catchment area data. The drivers to be discussed in the following sections will ideally have the same scale as the selected catchment area; otherwise the scale will depend on the development of the driver, for instance because the driver reacts in the same way at regional as at national level.

5.3 Supply development

Regional shopping centres construction

Besides inner-city shopping areas in other cities, large regional shopping centres are competitors of inner-city shopping areas. Large regional shopping centres also attract recreational consumers. The addition of competitive retail floor space, in new or expanded shopping centres, for instance, could influence the rent development in the high streets, due to the shift of consumer spending to those locations. To have any influence on the existing high street the shopping centres have to be large and attractive enough. To be attractive enough for consumers, competing shopping centres are selected on size (over 50,000 square meters) or the number of stores (over 100 stores). The selection is made to show that the same kind of shopping visitors, the recreational shoppers, are visiting the inner-city shopping area. A complete list of regional shopping centres is added in appendix III.

Out-of town regional shopping centres developments

Large out-of town developments have very extensive catchment areas and their trading effects are widespread³⁶. The centres affect shopping areas of different sizes in their catchment area in different kind of ways. The effect depends on the distance from the consumers from the new shopping centre and the attractiveness of the competing centre. The greatest impact isn't felt in the nearest shopping areas but in the weaker shopping centres and the weaker parts of existing centres on the fringes. Existing regional and sub-regional centres, as well as district and local centres, generally performed better than medium-sized town centres. The explanation given is that large centres, although in direct competition, are more resilient because of their size and substantial retail offer and because they are likely to have undergone development and environmental improvement in recent years. The factor of the competitiveness of out-of town regional centres isn't included in the thesis.

In-town regional shopping centres developments

In-town regional shopping centre developments have different effects on the existing shopping area. To start with, retailers will leave the high street for the shopping centre where high-quality shops are being developed with large floor space. Those retailers leave the high street and the vacancy rate increases for a short period, about one or two years. As the high street retailers leave, retailers from the weaker parts of the shopping area, the so-called secondary or B-locations of the shopping areas, also leave for the shopping centres or to the vacant properties in the high streets. The overall attractiveness of the shopping area increases and the number of visitors increases due to the larger number of retailers. The demand for property on the high streets will increase

³⁶ Oughthon, M., Crosby, N. Palmer, s. and Lizieri, C., *The local economic impact of Regional In-town Shopping centres*

so the rental level will rise again, due to the increased numbers of consumers in the shopping area. But the weaker locations of the shopping centres will see high vacancy rates due to the lack of demand, and a decrease in the rental level³⁷. The total effect on the high streets in the examined cities will be small due to the large amount of existing floor space compared with the relatively small volume of floor space of the new developments. Due to the relatively small expansion of the floor space and the short duration of the effect on the high streets this factor isn't included in the thesis.

The construction of shopping centres will lead to a more mature market with a large number of clothing and footwear shops in the high streets. Shops with household goods for instance will depart to newly built shopping centres or out-of-town retail centres.

The rent for a high street shop is determined by the supply of outlets and the demand from retailers. The supply of shops in the high street is fairly constant. The study focuses on the prime locations in a city. The prime locations, and the shops studied, are limited and the situation remains stable. So only the demand side will be examined. The demand from retailers depends on different drivers which indicate the (forecasts of) retailers' profits. The profits do not necessarily mean cash flows but could also mean brand familiarity or market share. Appendix II gives an overview of regional shopping centres used to determine all additional retail space in the cities' catchment area. Development of large competitive regional shopping centres could affect the development of rents in undeveloped inner city shopping areas. This could result in different rental developments.

5.4 Determination of rent drivers

The thesis only studies the characteristics of catchment areas. Several qualitative studies have previously been carried out to determine the influential drivers at macro or catchment area level, but no statistical quantitative analysis based on regional data has ever been carried out at a pan-European level. The drivers listed in table 11 are selected on the basis of a literature study.

Table 11. Possible rent component drivers.

Drivers by literature	Examined drivers
Population	Population
Consumer spending	Consumer spending
Economic growth	Economic growth
Occupants per household	Income development
Infrastructure	Age development
Income development	Consumer confidence indicator
Visitors other catchment areas	Unemployment
Age development	Inflation
Consumer confidence indicator	Retail confidence
Unemployment	Consumer expenditure on clothing and footwear
Inflation	Employment in the service sector

(Sources: Arets, L.L.D., *Het selectieproces van vastgoedmarkten van een Europese vastgoedportefeuille*, Kos, J.W., *Vastgoedmarktindicatoren*, Aben, G., *Regionale forecasting*, Lipsch, B., *Quick Scan voor het binnenstedelijke winkelgebied*)

The possibility of collecting data and the completeness of the data for the drivers listed in table 11 were checked. No data was available for some potential drivers. For instance, data about infrastructure is quite scarce and there are no historical data before 1980. However, there are also reservations about the examined data and the background of the data. For example, although the infrastructure in the catchment area might be good the number of visitors could still be disappointing. In other words, infrastructure isn't the right driver; the accessibility of the shopping area or high street would be a better name for the

³⁷ Fleers, E., *Winkelnieuwbouw leidt niet tot versterking van concurrentiepositie*

driver. Accessibility is dictated at the level of the shopping area and is not examined in the thesis. The number of visitors from other cities was already discussed in the previous section in discussing the determination of the catchment area's size. Since retailers rent shops the performance and the expectations of retailers could influence the rent development so the retail confidence indicator is added to the list of drivers. Based on the characteristics of the high streets mentioned in section 4.1 the factor "retail supply in the high street" is added. The retail supply is discussed in the next chapter, but the main conclusion is the significance of the supply of shops selling clothing and footwear. The factor "expenditure on clothing and footwear" is added to the identified drivers. The driver "occupants per household" isn't examined in this thesis because of the insignificance of its relationship to consumer spending on clothing and footwear examined by Eurostat³⁸. Eurostat mentions the expected influence on consumer spending on clothing and footwear by the employment in the service sector. This driver is also added for the catchment area. The next section discusses all the selected drivers and their likely influence on the components. Table 15 also provides an overview of the rent drivers which are examined in the thesis.

5.5 Demand drivers

Population

The population determines the number of possible consumers in an area. The actual number of consumers in the high street couldn't be given due to the lack of data about the footfall in the main streets of the 50 cities studied. But the development of a region's population gives an indication of the potential development of the number of consumers for the defined shopping area. The actual spending by the total number of consumers depends on their purchasing power bond. The population number is based on the populations of each NUTS area as published by Eurostat or if those data are insufficient data from local statistical offices are used. The population is defined as the number of registered inhabitants or the number of inhabitants based on a census on a given date plus the figures for migration and births and deaths. All data are produced by national offices and consolidated by Eurostat. The population development is permanent and the relationship to the rent trend component will be analysed in chapter 7.

Inflation

Inflation is measured by the consumer price index (CPI). The CPI measures changes in the price of a fixed basket of goods and services. The CPI is influenced by the production costs and the willingness of consumers to buy goods. When consumer confidence, production costs and personal income increase inflation will rise. Inflation figures are reported at national level and are almost the same in all countries. The prices of goods, for instance clothing and footwear, are generally the same throughout a country. But some small differences arise due to price differences for services. Inflation affects the rent development due to indexation of the rent to the CPI, as discussed in the section on legislation and lease contracts.

Gross domestic product

Gross domestic product is the value-added produced in the domestic economy regardless of the origin of the production factors. The regional GDP is based on a regional breakdown of the national gross value-added according to by the most recent data. The figures presented are based on the regional GDP values divided by the mean annual population. The figures for GDP in this thesis are based on purchasing power parities (PPS). The use of purchasing power parities has two purposes. First, to illustrate exchange rate effects, and second to compare living standards across countries. By giving the GDP in PPS it is possible to compare living standards and the development of living standards at national level. As living standards rise consumer spending is likely to increase. The driver will also be used for examination of the economic growth of a region.

³⁸ Eurostat, *Consumer in Europe, fact and figures*

The GDP differs greatly between regions. In countries such as Germany, France, the UK, Spain and Italy the differences can be approximately 100 % between regions. The increase in prosperity is an on-going process and the relationship with the rent trend component will be analysed in chapter 7 but the year-on-year percentage increase is related to the business cycle and the relationship to the cyclical rent component will also be analysed.

Table 12. Differences of GDP at national level by PPS (purchasing power parities) on regional levels in 2003 for the selected examined cities catchment areas.

Country	Average	Minimum		Maximum	
		City	GDP (PPS)	City	GDP (PPS)
France	25800	Lille	19800	Paris	38700
Germany	24000	Leipzig	16000	Hamburg	40700
Italy	24800	Naples	15400	Milan	31000
Spain	21800	Seville	15600	Madrid	27700
UK	26500	Cardiff	20700	London	41100

(Source: Eurostat)

Employment

Employment consists of five components: the unemployment rate, the population size, the age structure, the female and male employment participation. The factor of ageing has a negative correlation to employment and will be examined separately. The participation of the persons aged between 15 and 65 in the workforce has a large influence on the development of employment.

The population size has already been examined and the regional development of the unemployment rate is examined on the basis of regional data. The influence of the age structure will be examined in the next section. The employment participation rate of male employees is fairly constant at approximately 73%. The actual male employment participation differs by about 2 % from the average and is related to the unemployment rate. The unemployment rate is the number of unemployed persons as a percentage of the total potential workforce in a region. The figures are based on the average annual unemployment rate. The registered or representative results for regions of labour force surveys break down the total national unemployment rate into regional data. The unemployment figure gives an indication of the number of persons on a low income and could lead to labour market-related political decisions and general political trends. The political decisions and the number of persons with low incomes influence consumer confidence. The unemployment rate is influenced by the economic growth of a region. The data presented is regional. The employment rate among females has grown strongly in the last decade. The female labour participation rate has grown from 40 % in some countries a decade ago to approximately 70 % in Scandinavian countries. The female labour participation rate is strongly related to the growth of employment in the service sectors. The female employment factor is examined by the growth of the service sector's share in employment as a whole.

Employment structure

Disparities in employment rates are partly explained by differences in the skills composition of the working population and by differences in sectoral specialisation, which affects the ability to mobilise female participation and reduces per capita GDP. The service sector is the most dynamic sector for employment.³⁹ The transition from agriculture to services marks an increase in GDP but could lead to unemployment if the employees lack the necessary skills. The employment structure differs considerably from one region to another. The data on the employment structure are available at regional level. The employment pattern has changed dramatically in the European Union in the past. The main conclusions are:

³⁹ European commission, *Employment in Europe 2002*

- The employment rate in the agriculture sector has declined to less than 5% in Europe as a whole;
- The employment rate in the industrial sector has declined in most European regions, although in some regions the decline has followed a period of expansion. This development occurred in the late Eighties in some regions of Spain and Italy.
- The employment rate in the service sector has increased in almost all regions in Europe, although in some regions in Spain, Italy and Portugal the employment in this sector declined for a few years in the early Nineties, before rising again at the end of that decade. Employment in the service sector reaches a maximum of between 80 and 90% of the total employment.

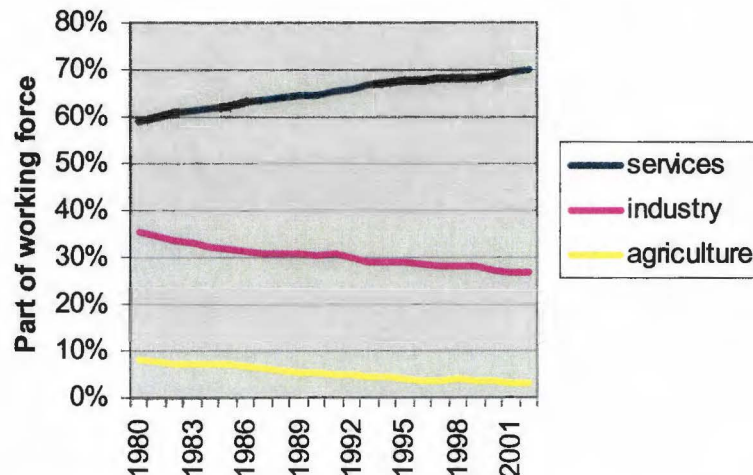


Fig. 10. Transformation employment structure in Europe. (Adapted from Eurostat)

The decline of employment in industry in percentage terms doesn't mean that employment in the sector has declined in absolute terms. Employment in industry declined in relative terms due to the rise in the total number of employees, in female labour participation and in the population. The employment structure is permanent and the relationship to the rent trend component will be analysed. Unemployment is related to the business cycle and will be analysed to the cyclical rent component.

Consumer confidence

The consumer confidence indicator contains the following components: financial situation over the next 12 months, general economic situation over the next 12 months, unemployment expectations over the next 12 months and savings over the next 12 months. The data used for this indicator are available at national level. The indicator probably doesn't react differently from the national indicator at a regional level due to the influence of the media. But consumer incomes also affect confidence, so unemployment weakens confidence and future expectations due to the loss of jobs. When consumer confidence increases rents are likely to rise. The data is only available at national level, but the effect on consumer confidence is expected to be the same throughout a country due to the influence of communication, such as television and public opinion. Consumer confidence is related to the business cycle and is likely to be cyclical in nature, and will be studied in relation to the cyclical rent component.

Retail trade confidence

The components of the retail confidence indicator are business activity over recent months, assessment of stocks and expected business activity. The data for the indicator are available at national level. The figure probably doesn't react differently in individual regions due to the performance of retailers. Retailers in the high streets are increasingly branch stores of a multiple shop business. The overall performance of the entire

business depends on national or even international performance. The total performance will influence the willingness to occupy a specific high street shop and probably affect the rental level. Retail trade confidence reacts to consumer confidence and willingness to spend and the results of the retailer. If the retail trade confidence increases the retailer is likely to make investments and expand his business, which has a positive effect on the rent development. The data is only available at national level, but the effect of retail confidence is expected to be the same throughout a country since the area of operations is becoming national or even international due to the presence of chain stores in the high streets. Retail confidence is related to the business cycle and is expected to be cyclical in behaviour so it is analysed in relation to the cyclical rent component.

Total consumer expenditure

Total consumer expenditure consists of the spending of individuals. Consumer expenditure accounts on average for approximately 57% of a country's total GDP, ranging from 50% in Finland and the Netherlands to 65% in Spain and Portugal. The consumer spending depends on consumer confidence, incomes and life cycles of incomes and the composition of the household. The data is available at national level so national data will be used for the analysis. Consumer expenditure is related to prosperity, which is as a permanent ongoing process and the influence will be analysed in relation to the rent trend component. But the year-on-year percentage increase of total consumer expenditure is related to the business cycle and is expected to be cyclical in behaviour and will be analysed in relation to the cyclical rent component.

Consumer expenditure on clothing and footwear

Retailers of clothing and footwear are the most important retailers in the high street. Table 15 presents an analysis of the composition of high street retailing. Over 60% of all retailers in the high streets in the study are related to consumer spending on clothing and footwear, so this is the single most important factor in determining spending in the high streets. No data for expenditure on clothing and footwear are available at a regional level. The nature of the influence is expected to be the same as regional level as that of total consumer expenditure on clothing and footwear.

Table 13. Overview market share retail sales categories in the examined high streets

Average retail mix in high streets		Percentage	
Consumer expenditure on food and drinks			9 %
	Food	2 %	
	Restaurants	7 %	
Consumer expenditure on clothing and footwear			60 %
	Clothing	38 %	
	Footwear	10 %	
	Personal accessories	9 %	
	Leather goods	3 %	
Consumer expenditure on housing and household goods			4 %
	House wares	4 %	
Consumer expenditure on health			8 %
	Health	8 %	
Other consumer expenditure			19 %
	Services	11 %	
	Department store	2 %	
	Other	6 %	

(Composed by data of RetailP)

Demand for clothing is influenced by demographic changes, lifestyle choices and relative prices⁴⁰. The increase in recent years was caused by the growing number of female employees in the services sector and their need to adapt to particular dress codes. Ageing will affect consumer spending through the absence of the need to adapt to dress codes. Clothing and footwear expenditure follows the business cycle to a certain extent.

Effect of ageing on consumer expenditure

Ageing has a major influence on consumer expenditure although the effect is not the same everywhere in Europe. Household expenditure has been converted to per capita expenditure using published information from Eurostat to calculate the effects of ageing on consumer expenditure⁴¹.

Table 14. Overview consumer expenditure by age class.

Age Class	Per capita expenditure on clothing and footwear (€)													
	A	B	DK	FIN	F	D	GR	IRE	I	NL	P	E	SE	UK
<30	776	702	698	615	479	684	824	755	832	795	431	478	409	1017
30-44	761	719	728	482	561	611	737	565	983	669	391	402	513	756
45-59	954	827	829	453	741	765	1150	710	1180	867	554	678	566	791
60>	762	471	527	283	495	734	805	375	984	762	421	646	637	529
Average	842	700	713	444	592	731	843	669	926	804	403	543	582	733
Age Class	Per capita total consumer expenditure, 1999 (x 1000 €)													
	A	B	DK	FIN	F	D	GR	IRE	I	NL	P	E	SE	UK
<30	9.46	10.48	11.26	9.33	8.26	10.68	7.77	11.61	10.95	13.25	6.34	6.37	6.71	15.18
30-44	11.19	11.23	11.56	8.92	8.91	10.02	7.76	9.12	11.04	10.63	5.84	5.15	9.33	11.99
45-59	14.02	14.78	14.55	10.79	12.35	12.53	13.21	10.92	14.93	13.76	8.40	9.04	11.31	15.20
60>	13.14	13.46	11.97	8.86	11.50	14.12	11.18	9.15	14.05	14.12	7.25	9.23	13.84	13.56
Average	12.73	12.95	12.86	9.91	10.66	12.80	9.76	9.37	12.21	13.38	6.35	7.26	11.76	14.06

(Adapted from OECD, Eurostat and Euromonitor)

Per capita expenditure on clothing and footwear is high in Italy, Austria, UK, Greece and the Netherlands and below average in Finland and Portugal. The population in the age group 45-60 spends relatively large sums on clothes and footwear and people over 60 years spend relatively small amounts on clothes and footwear. Consumer expenditure on clothing and footwear represents approximately 7% of total consumer expenditure and has risen more slowly than total consumer expenditure so this item of consumer expenditure has decreased in relative terms. The decline is caused by a relative increase in expenditure on transport, luxury goods and services. The ageing is permanent and will be analysed in relation to the rent trend component.

5.6 Conclusion

Visitors to high street shops include recreational shoppers as well as daily and non-daily shoppers. The recreational shoppers travel to a city because of its attractiveness and its shopping area, including the retail offer. To measure the potential development of consumption in the high street the developments in the catchment area will be examined. The catchment area selected at provincial or federal state level in this analysis in view of the place of origin of the consumers in the high streets. The provinces and federal states correspond to Eurostat's NUTS classification and the catchment areas can therefore be compared. The rent development is a result of demand and supply developments in the catchment area. The development of supply in high streets is constant and the influence of shopping centres is considered to be small and isn't examined in the thesis. The demand for locations in high streets depends on the performance of retailers. The performance of retailers is dictated by the spending of consumers and is probably related

⁴⁰ Eurostat, *Consumer in Europe, fact and figures*

⁴¹ Eurostat, *Consumer in Europe, fact and figures*

to the rent development. Consumer spending is examined on the basis of the drivers examined in this chapter. Unfortunately data are not available for all drivers on a provincial or federal state level so some drivers are examined at national level. The drivers' influence on the indicators of the rent components, mentioned in chapter 3, is examined in chapter 7 by means of a statistical analysis. In appendix VIII a complete list of the drivers studied and their likely influence on the components is added.

Table 15. Overview selected drivers with an expected influence on the defined rent components.

Rent influencing factors	Driver	Component
Economic	GDP	Cycle/ Trend
	Inflation	
Employment	Employment structure	Trend
	Unemployment	Cycle
Demographic	Population size	Trend
	Ageing	
Consumer	Total consumer expenditure	Trend/ Cycle
	Consumer on clothing and footwear	Cycle
	Retail confidence Consumer confidence	Cycle

6 Investment market

The capital growth will be examined in terms of the development of the initial yield as discussed in the previous chapters, which will in turn be examined in terms of developments in the investment market. The value is the rental income divided by the initial yield. The yield is a result of the supply of investment opportunities and demand by investors for real estate. The investment market will be discussed in terms of three developments; the expected income return, the risks and the returns on other asset classes. The real estate risks and the returns on other asset classes will be discussed later in this chapter and the next paragraph will explain the determination of the rental income.

Risk premium could be determined by the liquidity of the investment and by the sensitivity of the cash flow to shocks caused by inaccurate forecasts of unforeseen events. Baum mentions the following components of the risk premium: sector risk, town risk and object risk⁴². Due to the pan-European character of the research a premium for the country risk and the real estate market maturity will be added.

Some real estate investors and researchers mention the relation between the initial yield and a risk free return. Their mentioned relation is a premium of 2 percent on the long-term interest rate. Kruijt examined this relationship and came to the conclusion that it varies a lot over time and isn't correct and isn't the same for all real estate segments⁴³. This chapter determines the drivers for the components discussed in chapter 3. The drivers are the independent variables for the statistical analysis in chapter 7.

6.1 Income return

The rental income was already discussed in chapter 5 and will be analyzed in chapter 7. The income return is the difference between the rental income and the operating costs. For the purpose of determining the income return it is assumed that the rental income is reduced by 10%. This assumption is explained in chapter 2.

6.2 Risk

Risk is the difference between the expected development and the actual development of the return and the difference could be negative or positive⁴⁴. Investors are prepared to take risks but when they take a risk they want to be compensated for doing so. The compensation is expressed as a premium on the risk-free return. This section discusses several different kinds of risks: country risk, real estate risk in general, high street real estate risk and object risks.

Country risks

The country risk expresses the risk of investing in a particular country. The country risk also influences the risk of investing in bonds and shares; this relation is already examined by Prudential. The country risk depends on several factors including political, financial and economic developments. Some institutions produce information about the risks involved in doing business and investing in a particular country; some even give information for specific companies in the form of credit ratings, such as Standard & Poor, Moody's and the PRS Group. The PRS Group defines risk as a composite of political, financial and economic factors⁴⁵. The PRS Group produces the data in a publication called the International Country Rating Guide, in which different types of indicator are combined in a single rating. The combined indicators are shown in table 16.

⁴² Baum, A., *Commercial Real Estate investment*

⁴³ A Kruijt, Prof. Dr. B, *A new concept of risk*

⁴⁴ Peeters R.H.L *Risico's nader beschouwd*

⁴⁵ PRS Group, *International country risk guide*

Table 16. Composition country credit rating

Political	%	Financial	%	Economic	%
Economic expectations vs. reality	6	Loan default	5	Debt service % of exports of good	5
Economic planning failures	6	Delayed payment	5	International liquidity	3
Political leadership	6	Repudiation of contracts	5	Foreign trade collection experience	3
External conflict	5	Losses from exchange controls	5	Current account as % of goods and services	8
Corruption in government	3	Expropriation of private investments	5	Parallel foreign exchange rate market indicators	3
Military in politics	3				
Religion in politics	3				
Law and order tradition	3				
Racial and nationality tensions	3				
Political terrorism	3				
Civil war	3				
Political party development	3				
Quality of bureaucracy	3				
	50		25		25

(Source: PRSgroup)

The ratings vary from 0 to 100. In table 18 the rankings are given for the countries in 1984, the year the ratings started, 1994 and 2003. In table 17 the classification of risk categories is shown.

Table 17. Risk rating categories

ICRG rating	Risk category
0 - 50	Very high risk
50 - 60	High risk
60 - 70	Moderate risk
70 - 80	Low risk
80 - 100	Very low risk

(Source: PRSgroup)

Country risks which could influence the real estate sector include the law and order tradition, see table 16. The legal factors could include the objectivity of court judgements, which could influence future real estate development. But bureaucracy and the political leadership also determine the risk of a country. For instance in recent years the Vlaams Blok (Belgium), Pim Fortuyn (Netherlands), Jörg Haider (Austria), Jean-Marie Le Pen (France) and Silvio Berlusconi (Italy) have had an influence on the political stability in Europe. The debt of a country also has an impact on the country risk since debt could lead to an increase in the foreign exchange risk.

Table 18. Risk ratings European countries.

1984		1994		2003	
Country	ICRG	Country	ICRG	Country	ICRG
Germany	94	Germany	92	Luxembourg	91
UK	90	Netherlands	89	Ireland	87
Netherlands	86	France	87	Sweden	87
Austria	82	Luxembourg	86	Finland	87
France	79	UK	85	Austria	86
Sweden	77	Austria	85	Denmark	86
Finland	73	Belgium	80	Netherlands	86
Belgium	73	Sweden	77	Belgium	85
Italy	71	Denmark	77	UK	84
Denmark	69	Italy	74	Germany	82
Spain	62	Spain	74	Italy	80
Ireland	61	Ireland	70	Spain	80
Greece	55	Finland	69	France	79
Portugal	49	Portugal	65	Portugal	79
Hungary	43	Czech	50	Czech	78
Poland	9	Greece	48	Hungary	77
		Hungary	45	Greece	76
		Poland	29	Poland	76

(Source: PRSgroup)

In general the country risk is becoming smaller in Europe. The Eastern European countries have benefit from the enlargement of the European Union. The risk in the major European countries, Germany, the UK and France, has increased a lot, due to the changed political situation, the threat of terrorism, the increasing foreign debt and ethnic tensions.

Real estate maturity risks

The real estate risk refers to the risks associated with investing in real estate in general. The risk depends on the maturity of the real estate market, while the maturity of the real estate market depends on several developments. Table 19 gives an overview of factors determining the maturity of a real estate market. The overview is based on the actors present in the real estate market and their characteristics. The results were compared with the ICRG rating discussed in the previous section. The relationship isn't perceptible in all markets but is mentioned to give a notion of the relationship between the driver and the real estate market maturity. The size of the country also determines the kind of actors active in the real estate market and has no relation to the political risk, but the potential market size and number of actors. This is noticeable for instance in the cases of Luxembourg and Russia. In Russia actors find the market attractive due to the size of the market and are willing to take more risk, while in Luxembourg the market is small and not attractive enough to open a local office or do business there. Due to the lack on actors the liquidity in a market could be small, which is also a risk. The maturity of the real estate market is measured by the professionalism of the real estate market actors and the Planning policy also influences the real estate risks. The real estate market maturity is also reflected in property transactions. The liquidity depends on the number of actors investing in real estate in a specific market. The borders aren't as clearly defined as suggested below. For instance, Redevco is somewhere between the 3rd and 4th generation, and in 2003 the situation in Russia was somewhere between the 1st and 2nd generation.

Table 19. Overview real estate maturity indicators.

	Immature ←————→ mature				
Generation	1	2	3	4	5
Type of investment	Speculative	Speculative	Non-speculative	Non-speculative	Non-speculative
Time-period	Short term	Short term	Long term	Long term	Long term
Return	High	High	Medium	Medium	Low return
Real estate actors	Opportunity investors	Local investors Owner/occupier	Established dev. First investors	Property funds	Pension funds, REIT
Real estate companies	Entrance brokers	Carrefour, Ikea, Ahold, Interspar, Metro real estate	Chelverton, Hines, AM, ING development General Electric	Corio, Rodamco Redevco, ING investment	Bouwfonds ABP, Deka, CGI, ING finance
Situation 1994	Poland	Portugal, Czech republic, Greece	Italy, Spain, Austria, Ireland	Scandinavia	Western Europe
Situation 2003	Albania, former Yugoslavia	Russia, Turkey, Rumania, Baltic states, Ukraine	Czech republic, Poland, Portugal Greece, Ireland	Italy, Spain, Austria	Western Europe, Scandinavia
ICRG rating (indication)	< 60	60-75	75-80	80-85	> 85

(source: Adapted from Koba, International Real estate consultants, and Knight Frank Research)

There are no quantifiable historical data available about the real estate market maturity. Due to the relationship between the political risk and the maturity of the real estate market, the latter is measured by the country credit rating. Two exceptions are Austria and Ireland, which have a relatively low political risk and a relatively low real estate maturity. The real estate actors, established developers and property investors, are now entering those two markets. The real estate market is not equally mature everywhere in a country; there can be considerable differences within a country. In Italy, for instance, Northern Italy is at generation 4 and Southern Italy is at generation 3, with the construction of large numbers of shopping centres constructions in the next couple of years.

Sector risk for high street shops

Specific sector risks are dependent on several criteria. The difference between the other risks is the independency of the real estate market maturity. The sector risks differ for the each specific real estate sector. For instance the risk of a shift to more on-line purchases could lead to an increasing demand for logistic real estate and on the other hand could lead to a decrease of demand for high street real estate. The sector risk depends on criteria such as the length of leases and break clauses in lease contract, the sensitivity to economic developments and tenant protection. Specific location characteristics of high street properties differ from other retail real estate sectors. For instance, the risk for moving of footfall in a shopping area or the movement to other retail locations and developments in the population of the catchment area, such as ageing and a shrinking population is smaller due to the large size of the catchment area. The sector risk generally remains the same over the years. But for instance in the UK the sector risk and in particular the tenant risks increased due to the decreased length of lease contracts from 25 years to a shorter period. The permanent change of the sector risk will not be examined in this thesis as it would involve an examination of the differences between real estate sectors and not the differences between cities. But for instance the possible bankruptcy of tenants could result in an increase of the sector risk. The possibility of this particular risk is examined by the retail confidence indicator mentioned in the previous chapter.

Object risks

Object risks concern the characteristics of the building and are different for each property and each location. The risks at object level are building-, lease- or location-specific risks. Risks for the objects include, for instance, fire or the collapse of the building but also risks associated with property management. A lease-specific risk could be the bankruptcy of the tenant or discussions on rent renewals. The risks of the location are connected with a possible change in the flow of passers-by or ground pollution. The building risks will stay the same over the whole time period. The tenant risks will be cyclical in character, arising for instance from the possible bankruptcy of tenants, and are likely to be related to retail confidence. The object risks will not be examined in this thesis. The location risk depends on the quality of the location. For the purpose of this thesis the location risk is fairly small as it considers prime locations rather than secondary locations. The risk in secondary locations are greater, for instance from the addition of large shopping areas, see the previous chapter on the influence of the development of supply.

6.3 Performance of other asset classes

The return on other asset classes influences the willingness to invest in real estate and in particular in high street shops. The attractiveness of other investments depends on the risks involved in the asset class and the expected return on the particular asset, but can also be influenced by factors such as liquidity. The return consists of two components: a risk-free rate and a premium for the risk involved and the expected return.

Risk-free rate

An investment has to generate a return which is equal to that of a risk-free investment. In the Dutch market the risk-free rate is equal to the rate on 10-year government bonds⁴⁶. The risk-free return is based on the yield of a government bond for the period of the investment. In the US, Sweden and Canada, the benchmark for the short-term risk-free rate is 90-day T-bills (Treasury bills) and for the long-term risk-free rate it is the 10-year treasury yield. The risk-free rate depends on the investment horizon. As the time horizon for real estate investments is approximately 5 to 10 years the risk-free rate would be a Treasury bill with roughly the same time horizon, so for the time horizon the 10-year government bond can be used. For stock markets, the short-term risk-free rate is used. Table 20 provides an overview of the risk-free rate used to determine the necessary return on real estate investment in each country

Table 20. Risk-free rate for the determination of the required return for long-term investments.

Country	Long-term risk free rate
United states	30-year government treasury bill
France	10-year government bond
Germany	8-15-year government bond
Australia	10-year government bond
UK	Consol bond, a Consol bond is a bond with an infinite lifespan
Japan	7-year government bond
Netherlands	10-year government bond

The IMF has mentioned the 10-year government bond as the risk-free rate on the assumption that ten years is a representative investment horizon for real estate. The collected data is determined on 10-year government bonds. Rates are published by the OECD, and for countries without 10-year government bonds the long-term interest rate for 10 years has been used. Based on the results in table 20 the 10-year government bond rate will be used to determine the risk-free rate and the influence on the initial yield.

⁴⁶ Keeris, prof. ir. W.G. MRICS, *Portefeuillemanagement*

Return on stock exchange

For the return on other asset classes the performance of the stock exchange, with the exception of bonds, will be examined. Shares and bonds are the largest asset classes for institutional investors such as pension funds and insurance companies. The return on bonds is examined by the long-term interest rate. The return on shares is affected by the capital growth of the shares and the dividend return. The dividend return accounts for just a small part of the total return on shares and is fairly stable. The capital growth shows far greater fluctuation and is more or less cyclical. For some countries the total return on shares is measured in the analysis, but for most countries the capital growth from January 1 to December 31 is measured.

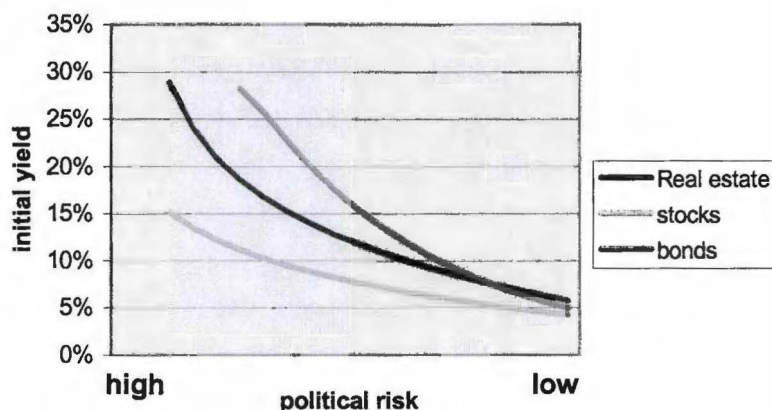


Fig. 11. Initial yield comparison. (Adapted from Prudential)

The returns on other asset classes will be measured by the long-term interest rate and the return on shares. In figure 11 a comparison has been made on the initial yield on the different asset classes. For all asset classes there is a decline in the initial yield due to the maturity of the investment market and the decline of the political risk and currency risk. The initial yield on bonds of countries with a high political risk is high. The relatively high yield occurs due to the high inflation and the relation of inflation and political risks. In a situation of low political risk (mature markets) the initial yield is the highest for real estate due to the risk involved in investing in real estate. The low initial yield for stocks is due to the expected development of the return on stocks.

6.4 Conclusion

This chapter examines the investment appetite of investors for high street shops. The appetite arises from three factors: the return on other asset classes, the expected rental income and the risk of investing in high street shops. In the chapter the drivers, the returns on other asset-classes, were examined by the return on shares and the long-term interest rate. The risk of investing in high street shops comprises four components: country risks, the risks of investing in real estate, the risk of investing in high street shops in general and object-specific risks. The premium for the risk of investing in high street shops is considered to be constant. But the risk for real estate in general changes due to the maturity and transparency of the real estate market. The expected income, the rent development, isn't examined in this chapter, but was examined in chapters 4 and 5 in the selection of the drivers. The next chapter includes an analysis of the relationship between the drivers and the yield development. Appendix VIII provides a complete list of the drivers and their expected influence on the components.

Table 21. Overview of selected drivers with their expected influence on the defined yield components.

Initial yield influencing factors	Driver	Component
Rental income	Determined in chapter 5	Cycle
Performance other asset-classes	Shares performance Long-term interest rate Inflation	Cycle/ Trend
Risks		
Country risk	Country credit rating	Trend
Real estate maturity	Country credit rating Employment structure	Trend
High street segment	Constant (not examined)	-
Object risks		
Location	Constant for A-locations (not examined)	-
Tenant	Retail and consumer confidence	Cycle
Object	Constant (not examined)	-

7 Statistical analysis

This chapter examines the relationship between the developments in the real estate data for the components discussed in chapter 4 and the influence exerted by the drivers discussed in chapter 5 and 6. The expected relationship is discussed using the theoretical model in chapter 3. The relationship will be analysed using a statistical analysis. With a statistical analysis it is possible to determine the potential and nature of a relationship between two or more variables⁴⁷. The data used in the analysis are numerical data at different times at equally spaced time intervals. The time intervals are one year. Because the dependent variable and independent variable for the analysis are available at equal (yearly) time intervals a time-series analysis has to be used. In this chapter the analysis will be explained and carried out, starting with the selection of the most suitable method of analysis. The general composition of the most appropriate drivers and coefficient for the rent and yield development are discussed and the main drivers are selected on the basis of the general pan-European model. For each city a model will be composed to determine the proper coefficients for the most influential drivers from the pan-European average. The thesis does not include formulas for all the cities.

7.1 Econometric models

An assumption made in the time-series approach is that the drivers that caused demand in the past will persist in the future⁴⁸. Time-series analysis can help to identify and explain any regularly recurring or systematic variation in the behaviour of the cycle. The analysis helps to identify trends in data and the growth rate of these trends. By trend is meant the basic tendency of a measured variable (real estate data) to grow or decline over a long period of time. Time-series models can help to identify and explain cyclical patterns that recur in the data. A cycle is usually irregular in depth and duration and tends to change in economic expansions and contractions. It is commonly referred to as the "business cycle". The trend and cyclical movements in the data should be explicable by using economic and demographic theory. The difference between pure time-series analysis and econometric analysis is that for econometric models a relation is made between developments of the drivers, the independent variables. In a pure time-series analysis only the development over time is examined and no relationship is established between independent variables. In the thesis the dependent variables are the real estate data for the components, and the independent variables are the drivers, from the catchment area data and the investment market data.

7.2 Forecasting techniques

There are different kinds of statistical analysis techniques. Each technique has different requirements. Table 22 provides an overview of requirements for the different types of forecasting technique.

In view of the data properties (24 years with an annual time interval), the patterns identified in the theoretical models (cyclical and trend pattern), the time period (long term) and the accuracy and applicability, the regression model will be used. The choice is based on the characteristics of the quantitative statistical analysis techniques referred to in table 22. The prediction of turning points is less accurate than with the ARIMA (autoregressive integrated moving-average) and TCSI (trend-cycle-seasonal-irregular) decomposition regression techniques. ARIMA models are used for time-series in which a seasonal pattern is present. TCSI models are also used for time-series in which a seasonal pattern is present but with an irregular pattern caused, for instance, by the

⁴⁷ Statistics for business and economics. Paul Newbold, 1984.

⁴⁸ The modern forecaster, the forecasting process through data analysis, Hans Levenbach and James P. Cleary, 1984.

number of trading days or an Easter effect. To determine only the turning points, one of these analysis methods would be used to get the most accurate results for the forecasts up to two years. In this thesis both trend and cyclical pattern will be analysed using a regression model based on the characteristics of the data, the defined components, the forecasting horizon and the complexity of the model.

Table 22. Comparison of quantitative statistical analysis and forecasting techniques.

Selection criteria forecasting techniques	Requirements/properties	Summary statistics	Moving average	Exponential smoothing	ARIMA	TCSI decomposition	Trend projections	Regression model
Recognized and handled patterns*	Horizontal	X	X	X	X	X	X	X
	Trend	X	X	X	X	X	X	X
	Seasonal	X	X	X	X	X		X
	Cyclical	X			X	X		X
Minimum data requirements**		5 points	5/10 points	3 points	3 years by month	5 years by month	5 points	4 years by month
Time horizon for which model is appropriate***	Short term 0-3 mo.	X	X	X	X	X	X	X
	Mid-term 3 mo.-2 years	X	X	X	X	X	X	X
	Long-term 2 years and more	X					X	X
Accuracy (scale 0 to 10: 0 smallest and 10 highest)	Predicting patterns	2	2	3	2	7	4	8
	Predicting turning points	-	2	2	6	8	1	5
Applicability (scale 0 to 10: 0 smallest and 10 highest)	Time required to obtain forecast	1	1	1	7	5	4	6
	Ease of understanding and interpreting the results	10	9	7	5	7	8	8

* Based on the theoretic models in chapter 3 both trend and cyclical pattern have to be examined.

** The data is available for a time-period of 23 years on yearly time-interval, based on the real estate data in chapter 4.

*** The required forecast has to be appropriate for the long-term 5 to 10 years, as discussed in chapter 2.

(Source: Wheelwright and Makridakis)

Time period

There are different analysis techniques for the recognized patterns, trend and cyclical developments, and the relationship to the drivers. As discussed in table 22, the patterns are horizontal, trend, seasonal and cyclical. The difference between seasonal and cyclical is the difference in the time intervals and amplitude of the cyclical pattern. The time intervals in the analysed real estate data range from a cycle length of 8 years to 15 years for both the rent cycle and the initial yield cycle for all cities.

Trend

The relation of the trend development (component) mentioned in chapter 3 to the drivers will be analysed for the drivers mentioned in the previous chapters. There are two methods of regression for determining the trend:

- All regression coefficients;
- Step-wise regression.

The 'all regression coefficients method' gives an indication of the coefficients of all variables. In this case all variables are quoted. The method could result in relations coefficients for which probable positive relations result in negative relations to fine tune

the general outcome for one specific city. The most appropriate regression analysis would be based on entering the input for all cities in a single model which then determines the most appropriate regression coefficients. In the formula, 50 cities and seven independent drivers for each of the 50 cities have to be entered in a model for a period of 23 years. In the model the dependent variable (trend rent and yield) is linked to the independent variables. The formula is:

$$\begin{array}{rcl}
 R_a & & (X_a) \quad (Y_a) \\
 R_b & = & \alpha + \beta_1 \times (X_b) + \beta_2 \times (Y_b) + \dots \\
 R_c & & (X_c) \quad (Y_c)
 \end{array}
 \quad
 \begin{array}{l}
 R \quad = \text{return component} \\
 \alpha \quad = \text{constant} \\
 \beta \quad = \text{regression coefficient} \\
 X_a \quad = \text{driver city A}
 \end{array}$$

The formula is based on an analysis of all drivers for all cities. This method isn't feasible due to the lack of a method/program which would produce clear results that are capable of interpretation. SPSS cannot calculate the regression coefficients in accordance with the previously mentioned requirements, in particular the link between city components and the city drivers. The all regression coefficients method will probably calculate the best results but will not be used in this thesis.

Given the nature of the input a step-wise regression will be used. This method starts with the selection of the most influential driver. The second step is the selection of the second most influential driver for the trend development, which is selected for the part of the trend development remaining after the influence of the first driver, has been deducted from the total trend development. The third driver is selected on the basis of the third most influential factor based on the analysis of the remaining development minus the influence of the first two selected drivers. A maximum of four drivers will be selected. The formula will be:

$$\begin{array}{rcl}
 \text{First step} & R_a & (X_a) \\
 & R_b = \beta_1 \times & (X_b) \\
 & R_c & (X_c) \\
 \\
 \text{Second step} & R_a & (X_a) \quad (Y_a) \\
 & R_b - \beta_1 \times & (X_b) = \beta_2 \times (Y_b) + \dots \\
 & R_c & (X_c) \quad (Y_c)
 \end{array}$$

Cyclical

The cyclical development will be examined using a correlation analysis. A regression analysis estimates the relationship between a dependent variable (cyclical rent component) and one or more independent variables (drivers). The analysis will be made using a Pearson correlation analysis. This is the appropriate method for a linear analysis based on normally distributed and quantitative variables. Since all the conditions are met the Pearson analysis is the appropriate one. The correlation coefficients range from +1 (a perfect positive correlation) to -1 (a perfect negative correlation). Zero indicates there is no linear relation. Besides the coefficients, significance is the basis for the decision on whether or not to reject the null hypothesis. A time-shift has to be applied to examine the real estate performance lagging or prior to developments in the drivers. The time-shift will be explained by theoretical and statistical evidence.

7.3 Selection components and drivers for analysis

The drivers mentioned in chapter 5 and 6 will be analysed to make the forecast. For this a relationship will be established between the drivers and the real estate developments. Based on the characteristics of the drivers and the real estate components, the relationships mentioned in table 23 will be analysed. The specified relationships are based on the conclusions and assumptions made in chapters 5 and 6 from the study of the literature. The cyclical rent and yield component are examined in terms of purely cyclical drivers, such as unemployment and confidence, but also cyclical components of other drivers. An example of a cyclical component of a driver is the development of GDP due to the business cycle effect. GDP growth is apparent in almost every year, but the growth rate differs considerably between one year and another.

Table 23. Relationships, which will be analysed.

	Trend rent	Cycle rent	Trend yield	Cycle yield
Cycle rent development				X
Population	X			
Ageing	X			
Regional GDP	X	X		
10-year bond			X	X
Inflation	X	X	X	X
Unemployment		X		X
Consumer confidence		X		X
Retail trade confidence		X		X
Returns shares				X
Total consumer exp.	X	X		
Clothing and footwear exp.	X	X		
Employment structure	X		X	
Country Credit Rating			X	

The method used in the analysis and the results of the statistical analyses are discussed in the next four sections.

7.4 Trend rent development

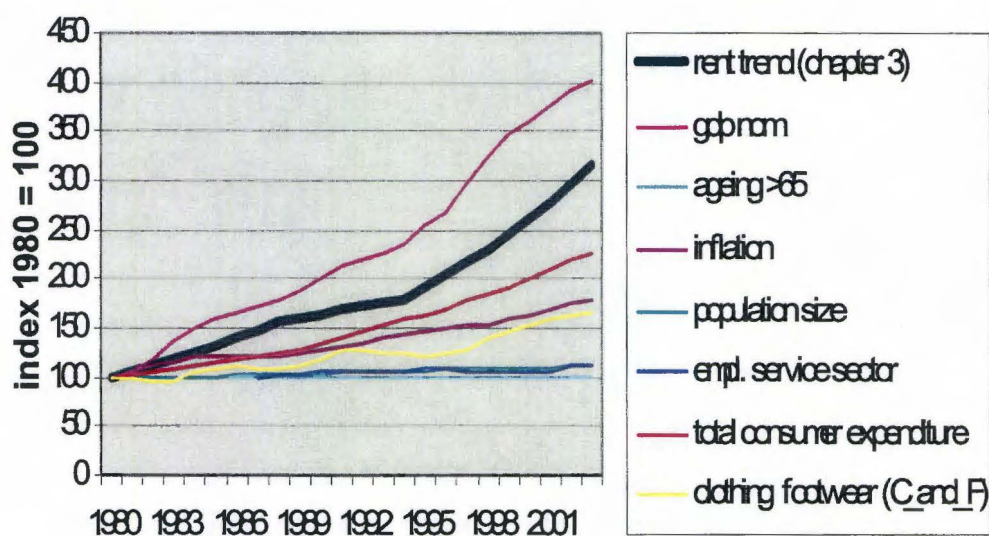


Fig. 12. Trend rent development in relation to other drivers for Amsterdam.

Each driver develops differently than the trend rent component. No single factor shows the same development as that of the rent trend, as can be seen in figure 12. Some drivers affect each other, such as inflation, GDP growth and consumer spending. But these drivers display different growth trends and their relationship to the rent development is also different. The GDP indicates the general standard of living. The total consumer expenditure is related to the GDP but could differ considerably due to taxes and other government measures. Consumer spending on clothing and footwear is also related to total consumer spending. Consumer spending on clothing and footwear increased by less than total consumer expenditure, which was due to the increase in the share of consumer spending on transport and services. To identify the best driver for the trend rent the relationship between all the drivers mentioned in table 23 and the trend will be examined statistically.

Selection of economic driver

Due to the relationships between and mutual dependency of the development of all economic drivers, one economic driver will be selected. The selected driver is the most suitable driver or combination of economic drivers examined in chapter 5. In figures 13 and 14 the relations between some of the drivers are illustrated and table 24 shows the statistical outcomes and the economic driver that is selected as the most suitable. The economic drivers are GDP growth, total consumer expenditure, consumer spending on clothing and footwear and inflation. Based on the statistical results in table 24, which shows not only the individual economic drivers but also combinations of economic drivers, consumer expenditure on clothing and footwear is selected as the most suitable driver. The cities of Warsaw, Prague and Budapest weren't examined due to the large difference in the development of the drivers compared to the other cities.

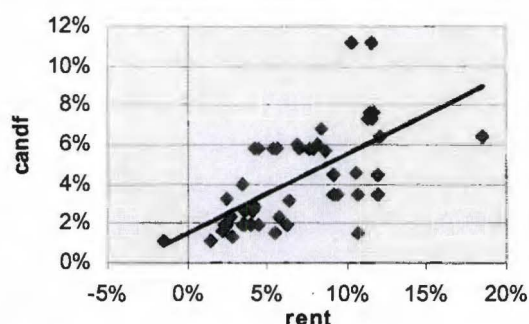


Fig. 13. Relation rent and consumer expenditure on clothing and footwear (C_and_F).

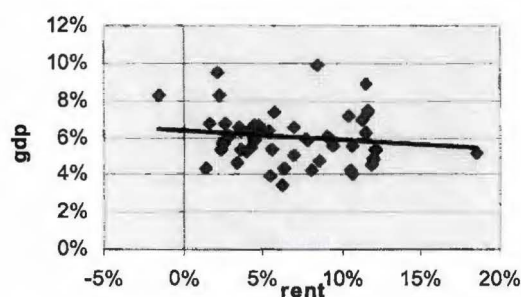


Fig. 14. Relation rent and GDP.

The driver selected as the most suitable economic driver is consumer expenditure on clothing and footwear due to the "goodness-of-fit" (R^2) based on the results shown in table 24. This is the most suitable economic driver based on both the analysis of Europe as a whole and the analysis excluding the cities of Warsaw, Prague and Budapest. Consumer expenditure on clothing and footwear is the driver used in the first step in the step-wise regression analysis.

Table 24. Overview results of comparison between fundamental rent development and economic drivers.

	All cities			All cities without: Warsaw, Prague and Budapest		
	linear	constant	R ² (*)	linear	constant	R ² (*)
Clothing & footwear (C and F)	0,1914	0,0366	0,0412	0,4009	0,0154	0,3988
Total consumer expenditure	0,0667	0,0614	0,0054	0,2858	0,039	0,3475
Inflation	0,1415	0,0352	0,0458	0,2675	0,0222	0,366
GDP	-0,0498	0,0635	0,0195	-0,0304	0,0615	0,0073
Avg. C and F, cons and inflation	0,1332	0,0444	0,0265	0,3181	0,0255	0,3843
Avg. C and F + GDP	0,0417	0,0539	0,0069	0,1438	0,0435	0,167
Avg. total	0,0874	0,0492	0,018	0,2309	0,0345	0,3035

(*) The goodness-of-fit (R²) or coefficient of determination is the statistic selection criterium for the selection of the best driver. The data mentioned in the table determine the selection of best fitted driver. All drivers have a goodness of fit above 0,8 compared to the rent development.

Second step

In the second step of the regression analysis the influence of the first driver, consumer expenditure on clothing and footwear, on the rent development is eliminated from the total rent trend component. What remains of the trend will be analysed in relation to the development of the other drivers. On that remaining part a regression analysis has been carried out. The spread of the regression coefficients can be seen in figure 15. The results of the second step in the step-wise regression analysis are also shown in table 25.

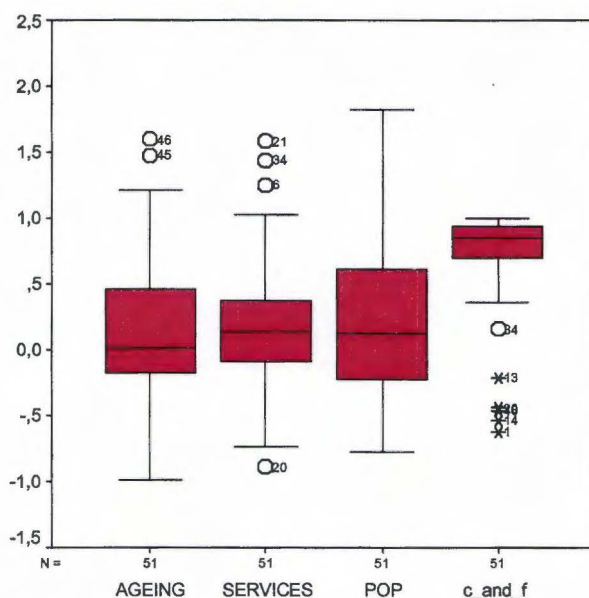


Fig. 15. Spread of the regression coefficients, based on the rent development trend excluding the coefficients of the influence of the consumer expenditure.

Based on the results shown in figure 15 and in table 25, employment in the service sector is selected as the second driver for the rent trend component, since it has the smallest spread of coefficients and the smallest standard deviation. There are five exceptions to the regular relationship between the development of the employment structure and the rent trend: negative for Luxemburg and Warsaw and positive for London, Valencia and Leipzig. Leipzig, Valencia, Warsaw and Luxemburg could have the same relationships but the results may differ because of the relatively short period for which real estate data are available. London already had a relatively high number (84%) of employees working in the service sector in 1980 compared with the average of 60% for the whole of Europe. The employment structure development for London is practically zero.

Table 25. Table regression results based on step-wise regression based on exclusion of consumer expenditure on clothing and footwear.

	Standardized regression coefficients			
	Clothing and footwear	excluded clothing and footwear		
		Ageing	employment services	population
Average	0,713	0,111	0,240	0,302
Standard deviation	0,389	0,657	0,653	0,699
Median	0,863	0,005	0,129	0,121
Upper bound (95%)	0,845	0,298	0,426	0,501
Lower bound (95%)	0,588	-0,759	0,055	0,103

Selection of other drivers

The next step in the step-wise regression analysis is the analysis of the demographic drivers. Both the size of the population and its composition by age are examined, by means of a regression analysis on the rent trend minus the influence of the employment structure and consumer expenditure on clothing and footwear drivers. Both drivers have a large spread. Based on the statistical analysis the population size will be entered in the formula for the trend. The spread of the influence of ageing is very wide and seems to depend on climate; it varies from negative and random in Germany, Copenhagen, Ireland, Netherlands, Sweden and Vienna to positive in France, Portugal, Greece and Spain. After making a division is between southern and northern Europe, the relationship was examined. The results of this analysis are shown in figure 16. The cities in southern Europe respond in a different way to the ageing due to the movement of wealthy elderly people to the cities and the free time they have. In northern Europe the ageing effects are negative for spending in the high streets. Besides the spread of the ageing in Europe also a spread arise for the population development. The spread mainly arises due to a negative relation in Italy and the UK, compared to a positive relation for the population and rent increase in the rest of Europe. The negative reaction of the population developments in English and Italian cities occurs as a result of an overestimated calculation of the trend to the model results. The UK and Italy had the largest increase in growth of consumer spending. Due to the over-estimation of the model for the rent in the past a negative adjustment has been made for population development for the UK and Italy. Figure 16 shows the spread of the distribution of the regression coefficients and table 26 shows the statistical results.

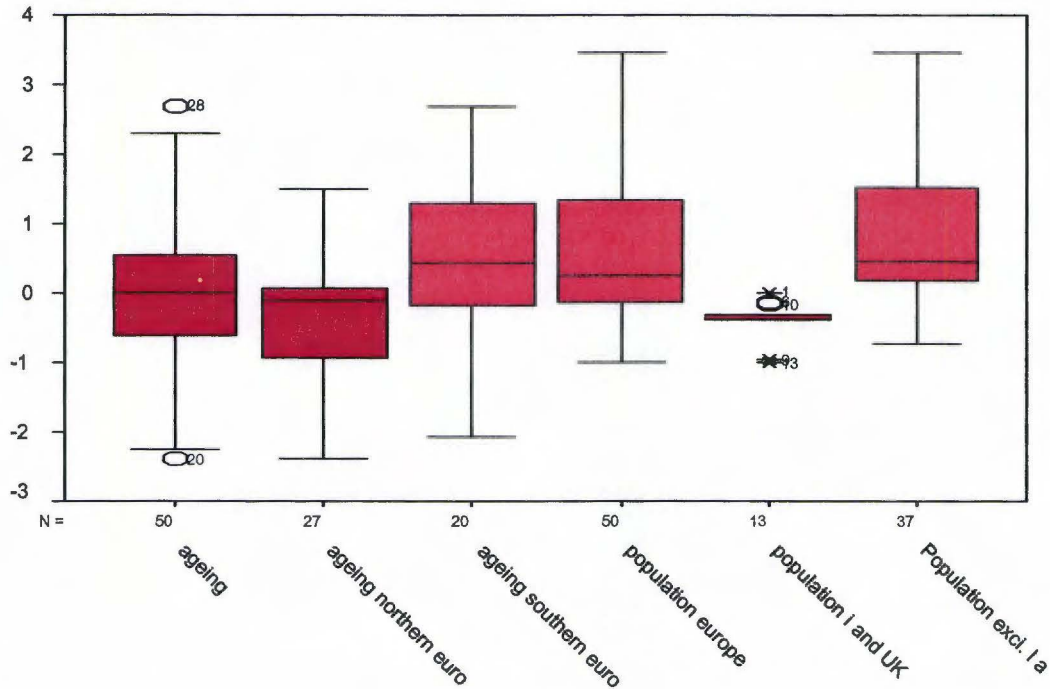


Fig. 16. Spread of the regression coefficients, based on the rent development trend excluded the coefficients of the influence of the consumer expenditure and the employment in the service sector.

The third step in the regression analysis involves the population development, based on the spread in figure 16, with the exception of Italy and the UK. The standard deviation in table 26 is also the smallest for the population factor. The fourth and final step involves the ageing. The analysis of the effect of ageing is performed separately for northern European cities and southern European cities, with a negative relation in northern Europe and a positive relation in southern Europe.

Table 26. Table regression results based on step-wise regression based on exclusion of consumer expenditure on clothing and footwear and employment structure split up into defined characteristics.

	Ageing total Europe	Ageing Southern Europe	Ageing Northern Europe	Population total Europe	Population UK and Italy	Population excl. UK and Italy
Average	0,029	0,553	-0,339	0,617	-0,400	0,975
Standard deviation	1,116	1,204	0,975	1,106	0,286	1,064
Median	0	0,429	-0,109	0,257	-0,376	0,447
Upper bound (95%)	-0,287	1,097	0,046	0,302	-0,228	1,329
Lower bound (95%)	0,347	-0,030	-0,726	0,931	-0,574	0,9
Number of cities	47	27	20	50	13	37

Formulas:

Trend rent: + Consumer spending on clothing and footwear
 + Employment service sector
 + Population
 - / + ageing Northern and Southern Europe

The above indicators were used to determine the most suitable coefficients. Based on the calculations, three conclusions were drawn:

- The large-scale construction of retail real estate in the cities of Leipzig, Dresden, Budapest, Warsaw, Porto and Lisbon could have a negative effect on the rent development.
- The development of rents in the German cities of Stuttgart, Cologne and Munich was slower in the Nineties. The German market has to be divided into two parts: the former East Germany and the former West Germany. Developments in consumer expenditure have been broken down into two elements for Germany as could be seen in figure 17.
- Europe has to be split into two for the effect of ageing on the trend rent. In northern Europe there was a negative effect on the trend and in southern, there was a positive effect of ageing in the past decade.
- French cities had larger than predicted rent increases in the Nineties.

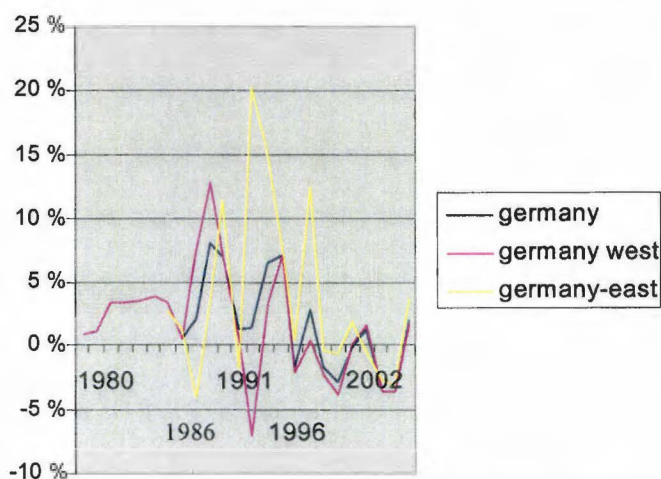


Fig. 17. Consumer expenditure growth and the difference based on the economic growth difference between Eastern and Western Germany. (Source: Eurostat)

The results of the calculations for Germany, after the country was split into two parts with different economic developments, fit in with the rule formulated for the whole of Europe with differences varying between -10% and 25%, as shown in figure 18.

Compared to the developments calculated by the model, based on the drivers and the actual rent trend, the development of rent in cities in France was higher than expected. Besides the demand, differences in shopping areas are examined. The rent formula is based on consumer spending on clothing and footwear in view of the large component of those retail units in the high streets, see table 27. In France the retail composition of the high streets examined differs from the rest of Europe. The shopping streets on average have fewer units selling clothing and footwear. The model is adjusted by the change in the total consumer expenditure developments in cases where fewer than 30% of the units in the high street are in the clothing and footwear branch.

Table 27. Overview retailers in the defined high streets in France compared to other European cities.

City	streets	food	clothing	footwear	accessories	leisure	health	services
Bordeaux	Rue St Cathérine	21%	28%	10%	7%	9%	10%	11%
Lille	Rue Neuve	8%	47%	15%	4%	4%	11%	0%
Lyon	Rue de la République	15%	23%	10%	7%	4%	10%	26%
Marseille	Rue St Ferréol	3%	43%	16%	15%	4%	10%	9%
Nice	Rue Jean Médécin	16%	26%	11%	8%	5%	8%	20%
Paris	Av. Des Champs Elysées	26%	18%	5%	5%	4%	9%	20%
Germany	average examined high str.	11%	40%	10%	8%	4%	9%	10%
Benelux	average examined high str.	13%	47%	12%	4%	6%	6%	8%
Southern Europe	average examined high str.	8%	42%	10%	14%	3%	7%	12%
Europe	average examined high str.	10%	41%	10%	11%	4%	7%	11%

(Source: Retailp)

Figure 18 presents a comparison of the differences between the calculated and the actual trend of the rent development. The adjustments noted in this section are all incorporated in the model. In Portugal, Warsaw and Budapest as well as the other East European cities the actual development is smaller than the calculated European average. The differences are due to the relatively large volume of additional retail floor space. The rent development in Dublin was lower than predicted, but according to the model all influential drivers showed the greatest development in the past and in 1988, when the first real estate data were available, this real estate market was rather immature. The cities in France and Spain displayed a stronger rent development than the pan-European average. The difference was due to the relatively low rent at the start of the period examined.

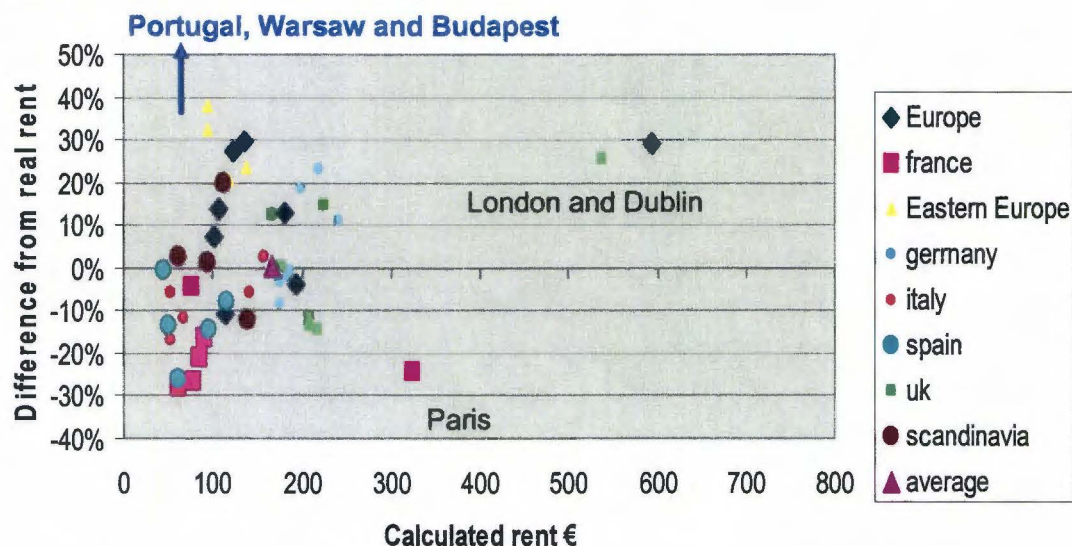


Fig. 18. Overview difference between calculated rent development and actual rent development for the European cities.

The standard deviation of the predicted results and the actual trend development is 16% on the average rent development over the examined period, as can be seen in figure 18. The average rent development was 200% and the annual average rent development was 7.7% over the whole period since 1980. These are good results, based on the actual rent trend development and the corresponding calculation based on the driver's development and the average European relationship of the driver to the rent trend.

Rent development trend:

$$\text{Rent}_{\text{trend}} = \text{Rent (t0)} + 1,630 \times (\text{Cons exp. C_and_F}) / 1,630 * (\text{total consumer expenditure if less than 30 \% consist out of units for clothing})$$

$$+ 0,860 \times (\text{employment services})$$

$$+ 1,650 \times (\text{Population})$$

$$- 0,800 \times (\text{ageing})$$

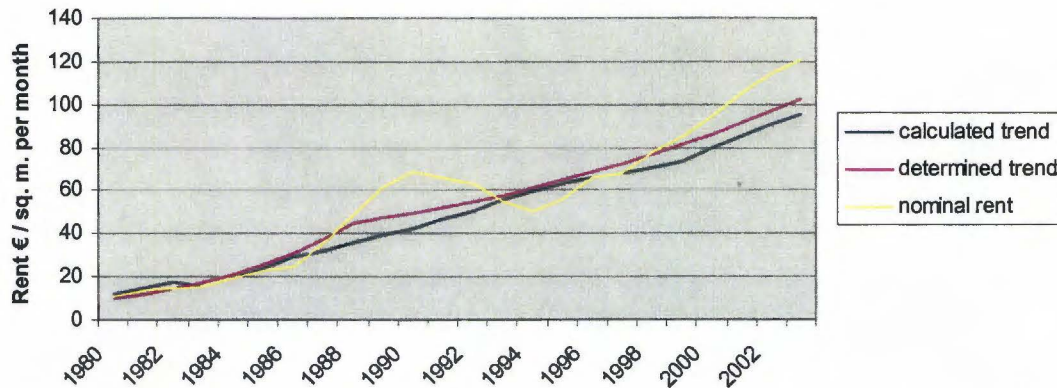
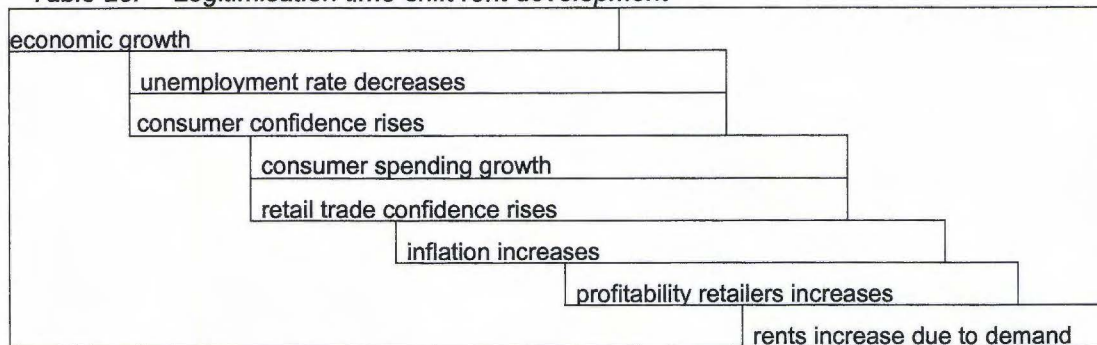


Fig. 19. Overview calculated rent trend versus real rent trend component in Barcelona. Calculated rent differs 11 % from the actual determined rent. The calculated rent has a multiple R of 0.99, which indicates a strong relationship for the real trend and the calculated trend.

7.5 Cyclical rent development

All drivers of cyclical rent development can be incorporated in one factor that depends on the business cycle. All the drivers have a leading or lagging reaction to the rent development and business cycle and can be put into one predictor. The predictor indicates the demand of the retailer and the rental level. Due to the fairly constant supply of high street retail estate space, this predictor will be used to forecast the cyclical rent development.

Table 28. Legitimation time-shift rent development



In figure 20 the validation of the time-shift of the drivers shown in table 28 has been visualized by the actual development of the component. The validation makes clear the delayed reactions to economic growth and finally the expected relation to the cyclical rent component. The relation between the two drivers, retail trade confidence and consumer confidence, and the cyclical rent component, is shown in figure 20. The figure also shows the negative relation between the rent cycle and unemployment.

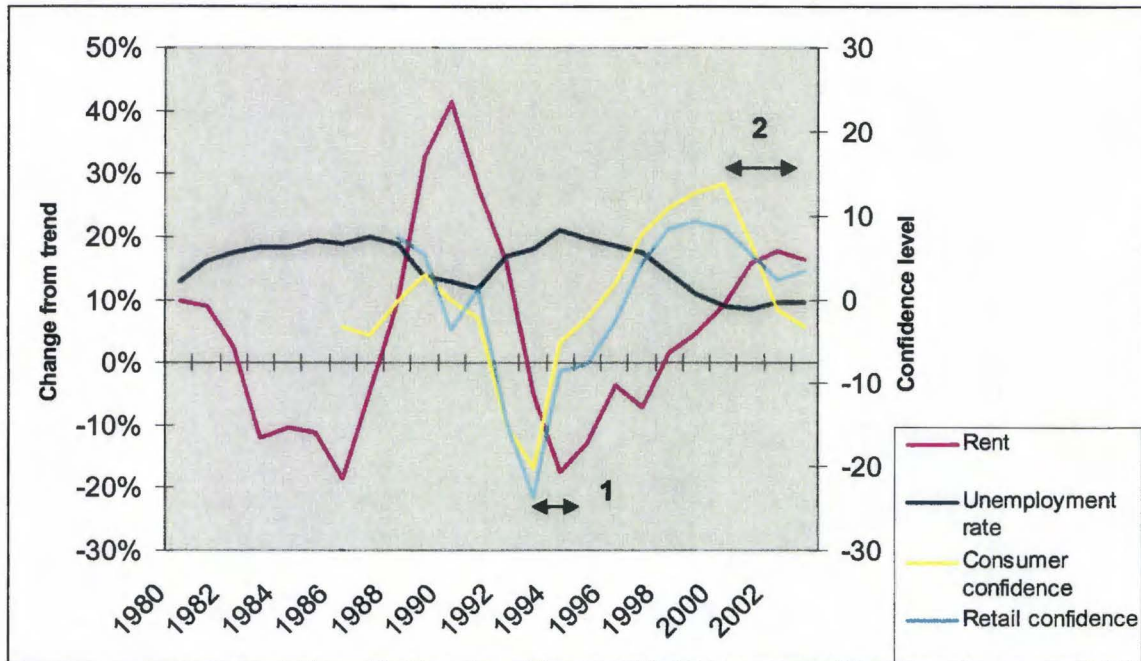


Fig. 20. Cyclical rent development for Barcelona in relation to other drivers.

A correlation analysis has been carried out. The analysis also includes a time-shift to investigate the availability of predictors of the rent development. The results are given in table 29. Different colours are used to show the shares of cities with a significant correlation to the cyclical rent development.

Table 29. Correlation coefficients cyclical rent development.

Year	-2	-1	0	Correlation
GDP	0,146	0,302	0,471	Reliable over 50 % of cases
Inflation	-0,392	0,152	0,533	Reliable over 15 % of cases
Unemployment	-0,302	-0,525	-0,596	Reliable over 50 % of cases
consumer confidence	0,587	0,641	0,477	Reliable over 15 % of cases
retail confidence	0,678	0,596	0,451	Reliable over 50 % of cases
consumer expenditure	-0,398		0,622	Reliable over 15 % of cases
Clothing and footwear exp.	0,215	0,461	0,466	Reliable over 50 % of cases

Formula cyclical rent =

- + consumer confidence (-2 and -1)
- + retail confidence (-2 and -1)
- + GDP (0)
- unemployment (-1 and 0)

An adjustment has to be made for the cyclical development of the rent due to the different influences of GDP development on the rent cycle. Unemployment has a negative influence on the rent development, with the exception of the UK market. Consumer spending reacts negatively to unemployment because of the decline in interest rates and increase in purchasing power of the consumers in the UK. In the UK consumer confidence shows a positive relationship to unemployment compared to a negative relationship in the other countries. There is a clearly negative relationship between consumer confidence and the rent. Mortgage interest rates and contracts are more flexible in the UK than in the rest of Europe. When interest rates decline the free disposable income increases and the consumer spending increases.

A country factor is added because not all markets display the same volatility. The country coefficients are added in table 30.

Cyclical rent development:

$$\text{Rent}_{\text{cycle}} = ((0.011 \times (\text{Cons conf t-2}) + 0.011 \times (\text{Cons conf t-1}) + 0.012 \times (\text{retail conf t-2}) + 0.012 \times \beta(\text{Retail conf t-1}) \pm 2.86 \times (\text{unemployment t-1}) \pm 2.86 \times (\text{unemployment t0})) + 0.05 \times (\text{country factor})$$

Table 30. Overview country coefficients.

Volatile		Constant	
Poland	0.80	Belgium	0.20
Italy	0.70	West Germany	0.20
Denmark	0.70	Netherlands	0.20
France	0.60	East Germany	0.25
Portugal	0.50	Sweden	0.30
Finland	0.50	Spain	0.30
Greece	0.40	UK	0.40

Based on the formula for the rent cycle and the development of the drivers, a comparison has been made with the actual development, the results of which are shown in figure 21. In general the cities with a low correlation are immature real estate markets: Leipzig, Porto, Genoa, Seville, Prague, Athens, Florence, Dresden, Lille, Lisbon, Valencia and Zaragoza. Exceptions are the cities of Antwerp, Stockholm and Stuttgart, and no particular explanation for the difference in developments can be given for these cities.

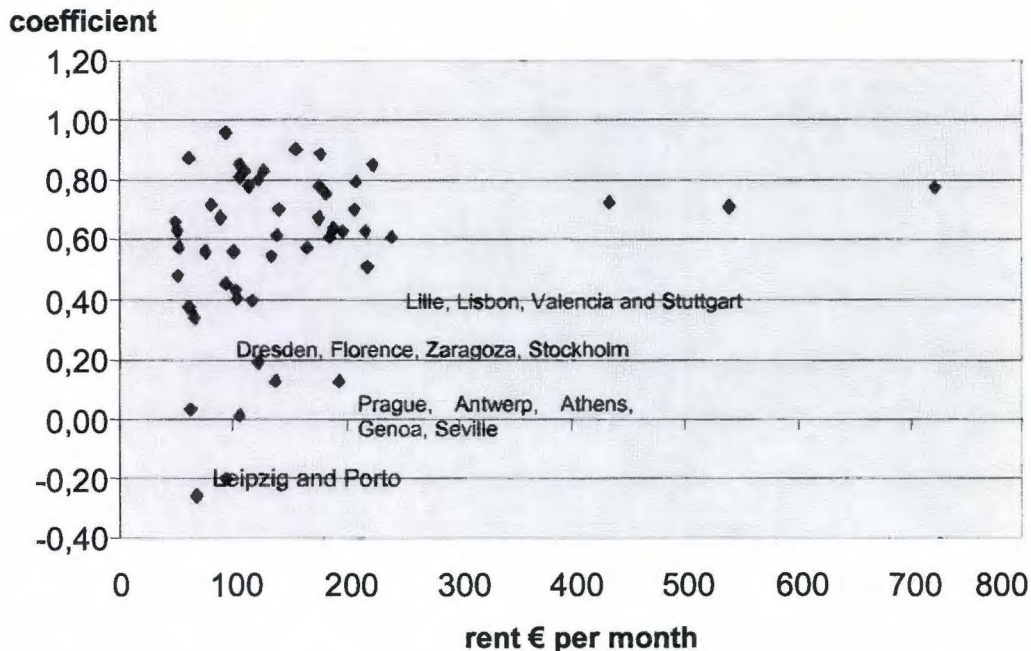


Fig. 21. Overview correlation results for the defined formula for the cyclical rent development. +1 indicates a perfect positive relation and -1 indicates a perfect negative relation and zero means there isn't a relation.

7.6 Trend yield development

The yield trend component can't be clearly determined for all European cities. One clear example of a city that is evolving from an immature to a mature market with an obvious decline in the initial yield is Barcelona.

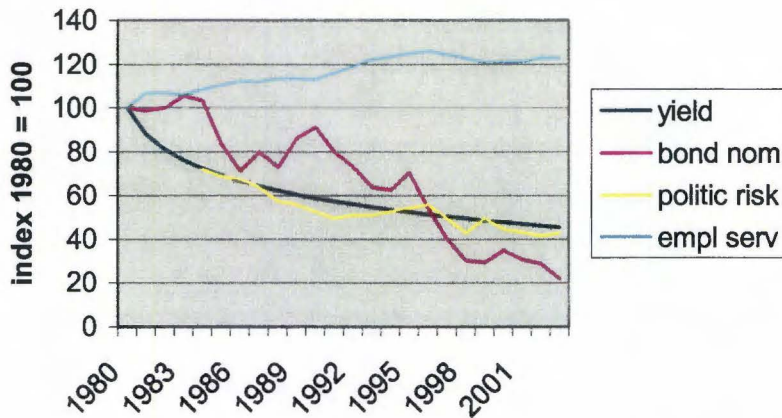


Fig. 22. Trend yield development in relation to other drivers for Barcelona.

The relation of the trend of the yield to the expected influencing drivers, the long-term interest rate measured by the bond yield, the political risk measured by the ICRG rating and the employment share in the service sector is shown in figure 22. The political risk provides the best measure of the development from an immature to a mature market. Drivers such as inflation and financial risk are included in this factor, which helps to compose a risk premium.

Table 31. The cities developing from an immature into mature market are:

Country	cities
Belgium	Antwerp, Brussels
Czech republic	Prague
Denmark	Copenhagen
Greece	Athens
Ireland	Dublin
Italy	Rome, Milan, Naples, Turin
Netherlands	Amsterdam, Rotterdam
Poland	Warsaw
Portugal	Lisbon, Porto
Spain	Barcelona, Madrid, Seville, Valencia

A regression analysis has been made to examine the relationship between the drivers; political risk, long-term interest rate, inflation and employment structure and the yield development. The single most significant relationship is the political risk, based on the country credit rating, which incorporates a rating for the political, financial and economic risk.

The relationship between the yield trend and the country credit rating isn't equal over time. The larger the political risk the greater the change in the yield based on the calculation of the country credit rating. Figure 23 shows the results for a number of cities to illustrate the relationship between the political risk and the yield development trend.

Yield development trend.

$$\text{Yield}_{\text{trend}} = \text{yield}(t_0) - 0.01 * (\text{maturity coefficient}) * (\text{change credit rating})$$

Table 32. Maturity coefficients.

Country credit rating	Coefficient for adjustment
Country < 60	0,50
60 < country < 75	0,10
75 < country < 80	0,05
Country > 80	0

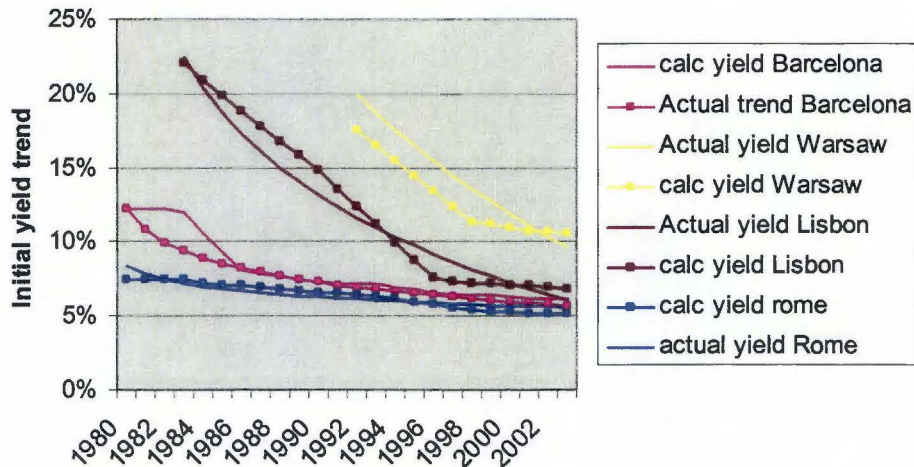


Fig. 23. Overview relation actual initial yield and calculated initial yield development of several cities developing from an immature into mature market.





7.7 Cyclical yield development

In the literature three different factors influencing the yield development are mentioned: the expected rent development, the risk and the return on other asset classes. The relationship between the risk and the yield development has already been examined. The relationship of the following drivers to the cyclical yield development will now be examined:

- The returns on other asset classes, for instance long-term interest rates and stock exchange performance;
- The expected rent development, determined by the real rent development and the driver with the best correlation to the rent development, consumer confidence.

A correlation analysis has been carried out to verify the relationship between the cyclical yield and the different drivers. In the analysis a time-shift has also been made to examine the availability of predictors of the rent development. The results are given in table 33. Different colours are used to show the spread of reliable outcomes. The main conclusion is that there is also a relationship between retail confidence and the yield cycle. The relationship with the expectation of future rent developments is strong. There isn't a strong relationship between the year-on-year development of the returns on the other asset classes and the cyclical yield, but if the larger trend of the drivers and yield development is examined there is a relationship.

Table 33. Correlation coefficients cyclical yield.

Year	-2	-1	0	Correlation
Rent	0,135	-0,019	-0,498	 Reliable over 50 % of cases
Bond			0,356	 Reliable over 15 % of cases
Inflation	0,385	0,210	-0,271	 Reliable over 50 % of cases
Unemployment	0,049	0,055	0,231	 Reliable over 15 % of cases
Consumer confidence	-0,673	-0,539	-0,480	
Retail confidence	-0,500	-0,674	-0,622	
Consumer expenditure	0,458	0,399	0,078	
Shares			0,111	

Formula cyclical rent =

- + consumer confidence (0)
- + retail confidence (-2 and -1)
- unemployment (-1 and 0)
- rent (0)
- long term interest rate (0)
- + shares (-1 and 0)

An analysis of the cities and the expected relationships shows that one driver, unemployment, has a different correlation in one country, the UK. Apart from the UK market all cities show a positive relationship between the yield cycle and unemployment. When unemployment in the UK increases the yield decreases. This reaction is caused by intervention on the part of the British government to cut the long-term interest rate to attract more investment and reduce the unemployment rate.

Cyclical yield development

$$\begin{aligned} \text{Yield}_{\text{cycle}} = & (-0,16 \times (\text{Cons conf } 0) - 0,135 \times (\text{retail conf}-2) \\ & - 0,135 \times (\text{Retail conf}-1) + 65,5 \times (1-\text{UK}) \times (\text{unemployment}0) \\ & + 65,5 \times (1-\text{UK}) \times (\text{unemployment}-1) \\ & + 9,25 \times (\text{long term } 0) + 0,9 \times (\text{shares } -1 + 0))/100 \end{aligned}$$

A country factor has to be added. The country factor consists of an adjustment due to the time interval. The UK and Sweden react faster to the drivers. The unemployment driver has a negative relation to the yield development in the UK and a positive relation in the other cities. The time period in those cities has to be reduced by one year. The amplitude for all cities is equal to the formula, apart from the German cities. The German cities have the smallest standard deviation of the initial yields. In figure the results based on the pan-European coefficients for all cities are shown and compared with the actual development.

Based on the formula for the yield cycle and the development of the drivers a comparison has been made with the real development. The results are shown in figure 24. In general, for the German cities the correlations between the calculated and the actual development of the yield cycle are small. The difference is probably due to the background of the investors. In the other markets the demand from investors is based on expected return and in the German market the demand is based on the income of the investors. The same phenomenon, demand based on the income of investors, could occur in other countries due to the popularity of, for instance, the REITs (Real estate investment trusts) in the UK and CV (limited partnership) in the Netherlands. The exceptions to the correlation between the calculated and actual yield cycle are the cities of Lille and Copenhagen, but no particular explanation can be given for the different development.

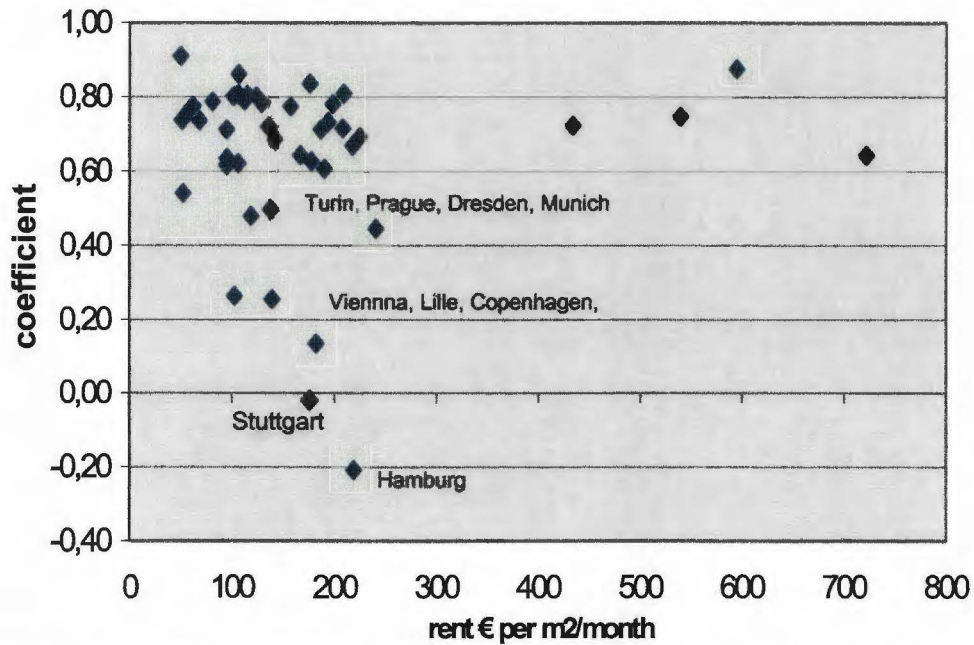


Fig. 24. Overview correlation results for the defined formula for cyclical yield development. +1 indicates a perfect positive relation and -1 indicates a perfect negative relation and zero means there isn't a relation.

7.8 Rent development

Based on the analysis of the trend and cyclical rent, the drivers and the formulas the development of the rent in the past has been calculated. The statistical results of the analysis are added in appendix VII for the cities of London and Barcelona. The results are based on the combination of both trend and cyclical components determined in the theoretical model in chapter 3. The calculated rent is the sum of the calculated trend and the calculated cycle based on the drivers and coefficients discussed in sections 7.4 and 7.5.

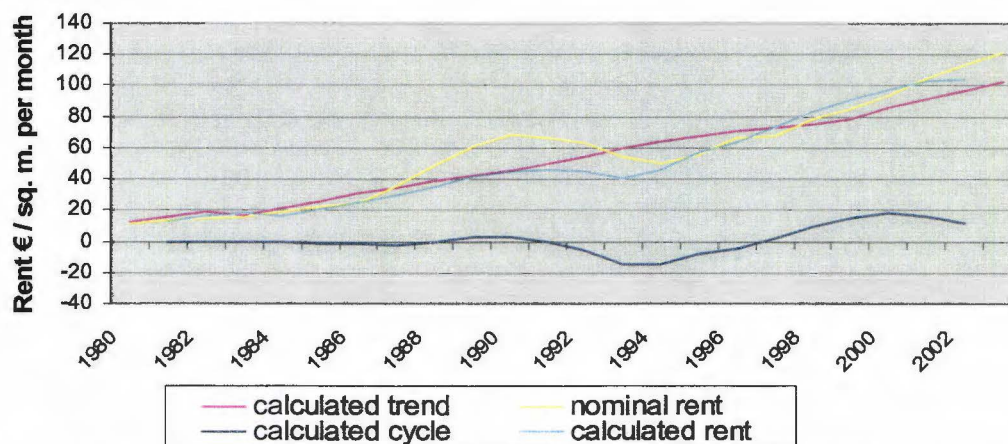


Fig. 25. Relation actual rent development and the calculated rent components based on the development of the rent cycle and trend for Barcelona. The goodness of fit is 0,933, which is a sufficient result.

7.9 Yield development

Based on the analysis of the trend and cyclical yield, the drivers and formulas for the yield development, the yield in the past has been calculated. The statistical results of the analysis are added in appendix VII. The results are based on the theoretical model mentioned in chapter 3. The calculated development is compared with the sum of the calculated rent and the cyclical development as discussed in sections 7.6 and 7.7.

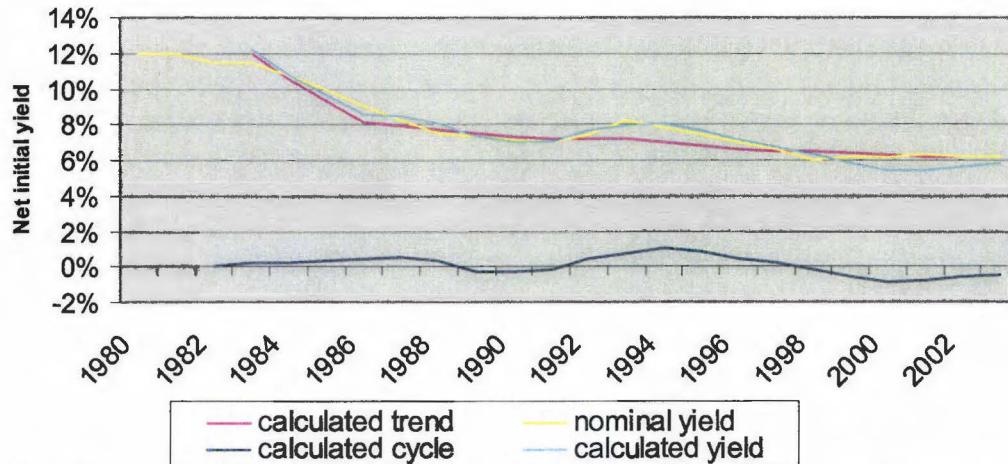


Fig. 26. *Relation actual yield development and the calculated yield development based on the development of the cyclical and trend yield development for Barcelona. The goodness of fit is 0,951, which is a nice result.*

7.10 Conclusion

This chapter included an analysis of the real estate market, in terms of the rent and yield development and the influential drivers, the catchment area development and the investment climate for high street shops. The analysis is based on the theory formulated in chapter 3 and on an econometric analysis. The trends were analysed by regression analyses and the cyclical patterns are based on a correlation analysis. Four analyses were made. The pan-European results are encouraging, but the method can be fine-tuned by analysing the driver's relationship of the drivers and the components for each city separately. An overview of the most influential factors is added in appendix VIII. The adjustments to and exceptions of the pan-European model were discussed in this chapter.

8 Forecasts

A model has been constructed on the basis of the statistical analysis in chapter 7. The forecasting model is used to calculate both income return and capital return. This chapter starts with an overview of the construction of the model and the input. The formula will then be evaluated for reliability and the chapter concludes with an overview of expected returns. The total forecasts are added in appendix IX.

Definition of forecasting:

Forecasting is making a statement about what is likely to happen in the future, especially in connection with a particular situation⁴⁹.

8.1 Model

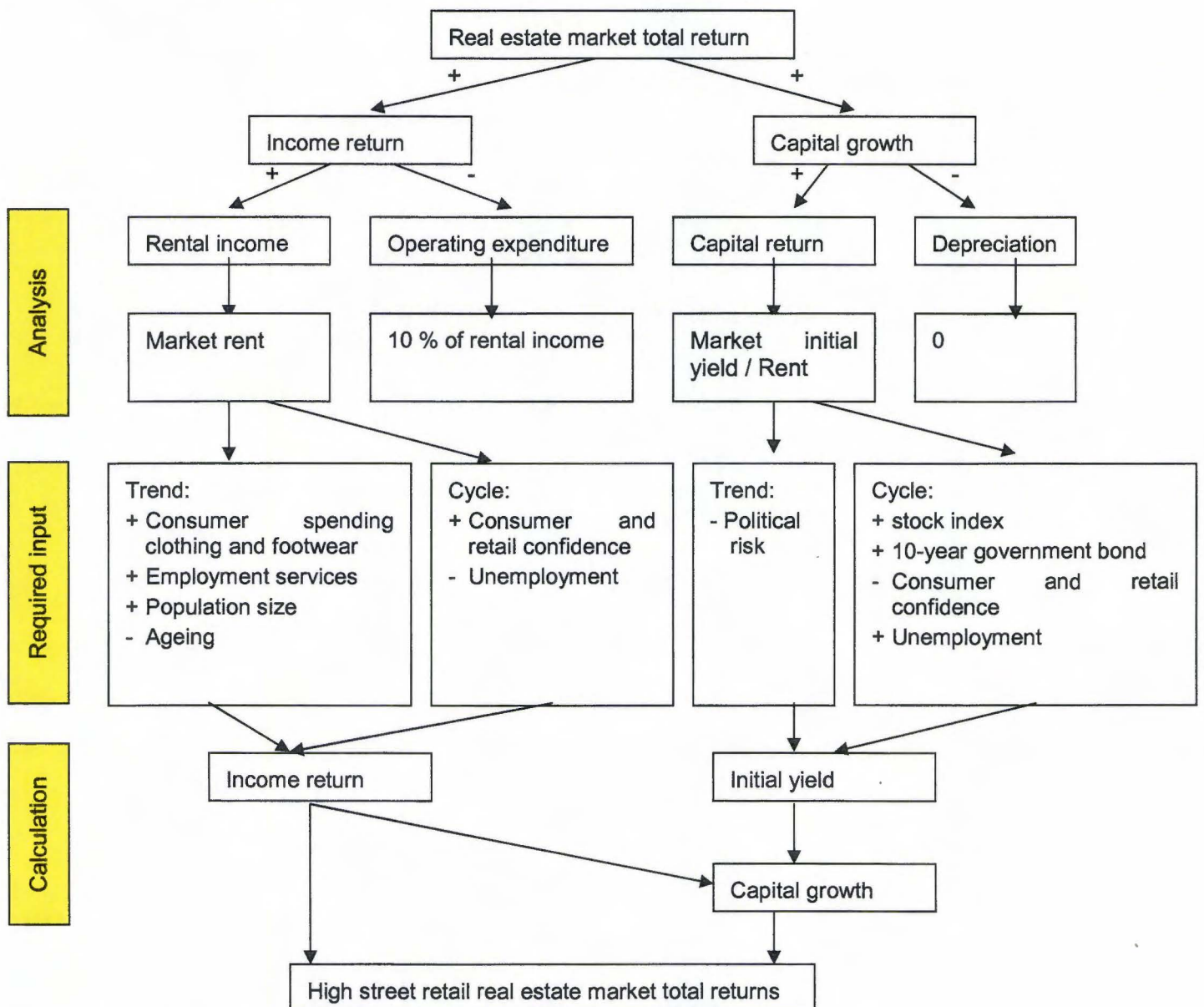


Fig. 27. Overview of forecasting model

⁴⁹ Cambridge advanced learner's dictionary.

Figure 27 provides an overview of the forecasting model. The input required was selected on the basis of the statistical analysis in chapter 7. In the model a coefficient is added for each driver, but figure 27 only shows the kind of relationship, negative or positive. To make a forecast the required data has to be collected and entered in the model. The calculation produced by the model can be used to make a forecast of the total returns of high street retail real estate. The transaction costs will be excluded in the model. Due to the fact the costs are included in the net initial yield. The model is based on the net initial yield, which is published by most brokers and in most markets to comprise of the transaction price minus the transaction costs. Including the transaction costs separately in the model would result in their being calculated twice.

8.2 Reliability

The reliability of the model will be verified by comparing the results with developments in the past. The verification will be based on a review of actual data (broker data); the calculated development based on the development of the components and the real estate returns as reported in an index. There is a lack of available historical total returns on retail real estate. IPD publishes real estate indices but data is only available for the UK, Irish and Dutch markets for a period longer than ten years. In figure 28 a comparison of the return calculation based on the model and the published returns of the IPD UK index is made for the UK real estate market. In table 34 the correlation with the model calculations and the published returns of other market is shown, based on a correlation analysis. A remark has to be made about the composition of the indices. The real estate indices studied here reflect the total return for all retail real estate, including shopping centres and shop property in secondary locations. The correlation of the data will be compared statistically.

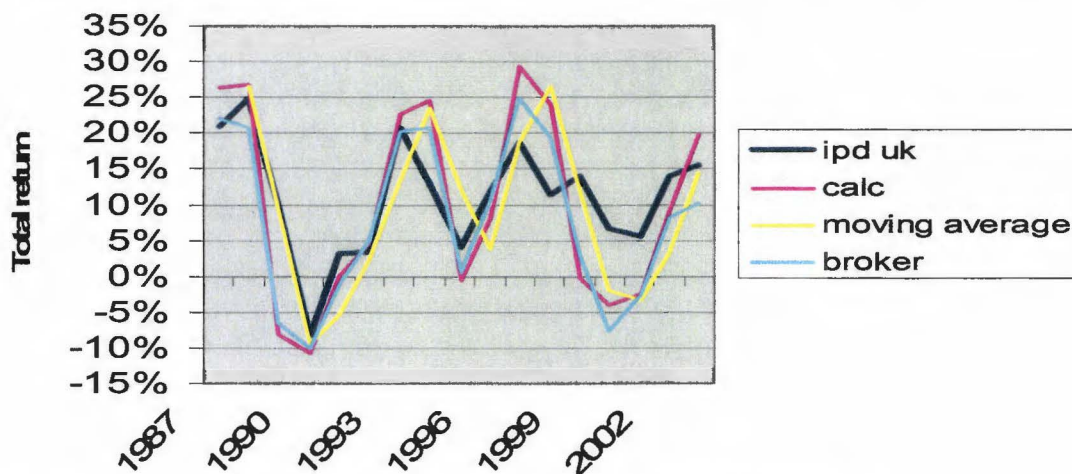


Fig. 28. Comparison of UK performing calculations to IPD index⁵⁰.

The market return isn't equal to the IPD results. The difference could be caused by a delayed reaction to the market developments because lease contracts don't react immediately to market changes. The average length of a contract in Europe is approximately 5 years and ranges from 3 to 10 years. The delayed reaction of rental incomes to market rents due to the length of lease contracts results in differences between the market returns and the published returns. The published total returns will be compared to the moving average of the market total returns. Besides the delayed reaction of rental income, valuations aren't equal to market values, which also results in smoothing of the results. The smoothing of valuations arise due to the fact the appraiser considers also the previous taxations. The market total return is more volatile than the

⁵⁰ IPD UK annual index 2004, Published by Investment Property Databank 2003.

measured total return⁵¹. Research papers reveal that the so-called “valuation smoothing” doesn’t distort real estate investments. The volatility is examined in the analysis. The standard deviation declines by 30% due to the smoothing and is equal to the standard deviation of equity returns. But due to valuation smoothing and the lease contracts the volatility declines by 30%. A comparison with the real estate return for Germany, the U.K. and the U.S. produces a significant decrease in volatility of the return for all markets due to smoothing⁵². The smoothing effect is considered to last 3 years for the German market. In figure 28 an overview of the average return for the UK market is illustrated. The return is based on the market return. The 2-year moving average is compared to the IPD UK retail index.

Table 34. Correlation of the model results.

Measuring index	Correlation broker	Correlation model	Correlation moving average of model (2 year)
IPD UK	0.783	0.759	0.782
ROZ/IPD NL ⁵³	0.798	0.728	0.804
SCS/IPD ⁵⁴	0.345	0.526	0.718

8.3 Input

The input for the forecasting model was collected. Forecasts are not available at regional level for all drivers for the period until 2014. Data for some drivers are available at national level so a transformation into regional data can be made. For each driver the data is collected or composed. The input for each driver is discussed in this section.

Employment in services

No regional data are available about forecasts for the employment in the service sector. The data was available by region in the past. Developments in the past were examined to determine the expected regional developments in the future. Based on the developments in the past the following assumption is made. Employment in the service sector increases to a level of 80 to 90% of the total employment. For the calculation of the employment in the service sector the employment is assumed to increase by 0.2% year-on-year for regions with less than 70% employment in the service sector, by 0.1% for regions with service sector employment of between 70% and 80% and not to increase for cities with service sector employment of over 80%.

Population size

For almost all regions a projection has been made for the population size up to 2015. Some regions have published projections extending to 2025; the population increase is assumed to be the same in every year. For Sweden no regional data are available. The data for the population development are expected to be the same as developments in the past.

Ageing

The ageing is taken to be equal to the population aged over 65 years. Data are available at regional level for almost all regions. For Spain, Finland and Sweden no regional data are available. Based on a comparison of the regional and the national age structure no significant differences could be identified for those countries so the national trend in ageing is converted into regional data.

⁵¹ Booth, P, and Matysiak. G., *Unsmoothing real estate returns*

⁵² Characteristics Maurer, R., Reiner, F., and Sebastian, S., *Characteristics of German real estate return distributions*

⁵³ Hordijk, A. C., H. M. de Kroon and M. A. J. Theebe, *Long-run return series for the European continent.*

⁵⁴ SCS/IPD Irish property index.

Political risk

The country credit risk guide also publishes forecasts for the rating. The rating is predicted for the next year and for 2009. The change in the risk rating for the whole period up to 2014 is taken to be zero compared with the situation in 2009.

Long-term interest rate

The long-term interest rate is expected to be equal to the 10-year government bond yield. The long-term interest rate is forecast for the period until 2014 and on a yearly basis until 2009. The consensus forecast is a forecast based on an average forecast from different sources such as Eurostat, OECD, research institutions and banks⁵⁵.

Consumer spending on clothing and footwear

The expectation for consumer spending on footwear isn't published in forecasts. The most common forecasts for the economic drivers examined are for GDP, inflation and total consumer expenditure. Based on developments in the past, GDP increased the most and total consumer expenditure also grew faster than consumer expenditure on clothing and footwear. The increase in consumer expenditure on clothing and footwear was almost equal to inflation over the whole examined time-period. When the relationship is examined inflation was equal to consumer spending growth in the years up to 1990. From 1990 to 2003 the relation between consumer expenditure on clothing and inflation isn't equal. The equal development from 1980 till 1990 was probably due to the high inflation in this period. The relationship between consumer spending growth and the growth of consumer spending on clothing and footwear was the greatest in the period 1990 to 2003, compared to the relation to the GDP and inflation. The relationship between the two developments is expected to be equal to the developments in the past and range from 70% and 90%. The forecast for the consumer spending growth is based on the consensus forecasts at national level for total consumer spending and the relationship in the past decade with consumer spending on clothing and footwear for the specific country.

Unemployment

The unemployment forecasts are published at national level and will be transformed into regional data. The unemployment is forecast for the period up to 2014 and on a yearly basis up to 2009.

Stock index

The stock index performance is rather difficult to forecast. Forecasts for the development of the stock index vary considerably. The stock index anticipates future economic developments. In the analysis economic development will be predicted by the expectations for economic development in the next year. Data for annual economic development are forecast until 2009, so the stock index performance is available up to 2008.

Consumer and the retail confidence

No forecasts are available on the consumer and the retail confidence up to 2008. The development of consumer and retail confidence has been related to the unemployment rate in the past. The future development is expected to be related to the unemployment rate.

City coverage

The input data is available for almost all cities. No national forecasts are available for Luxembourg and no forecast will be made for Luxembourg. Forecasts are not available for all drivers for the period to 2014. The trend can be forecast up to 2014 but the cyclical development can only be forecast up to 2008 due to the lack of data about cyclical drivers.

⁵⁵ Consensus forecasts, *a digest of international economic forecasts*

8.4 Relation between drivers and components

The forecast is based on the following two assumptions.

- The expectations for the input are correct;
- There is a relationship between the drivers and the components.

The relation between the dependent variables (components) and the independent variables (drivers) are determined in the statistical analysis. The statistical analysis in the previous chapter determined the relationship with the best fit for all European cities, in the past. Based on the statistical analysis the major drivers will be used to determine the future relationship (coefficients) for a particular city between the components and the drivers and is carried for all cities. One thing is clear: both assumptions will not come about. The economic forecasts, for instance, are adjusted monthly or quarterly. It is therefore necessary to update the data used. The most reliable data will be used to ensure the quality of the forecast. For instance, the Consensus forecast is used for economic forecasts⁵⁶. The Consensus forecast is based on the average forecast of economic development of 240 prominent financial and economic forecasters.

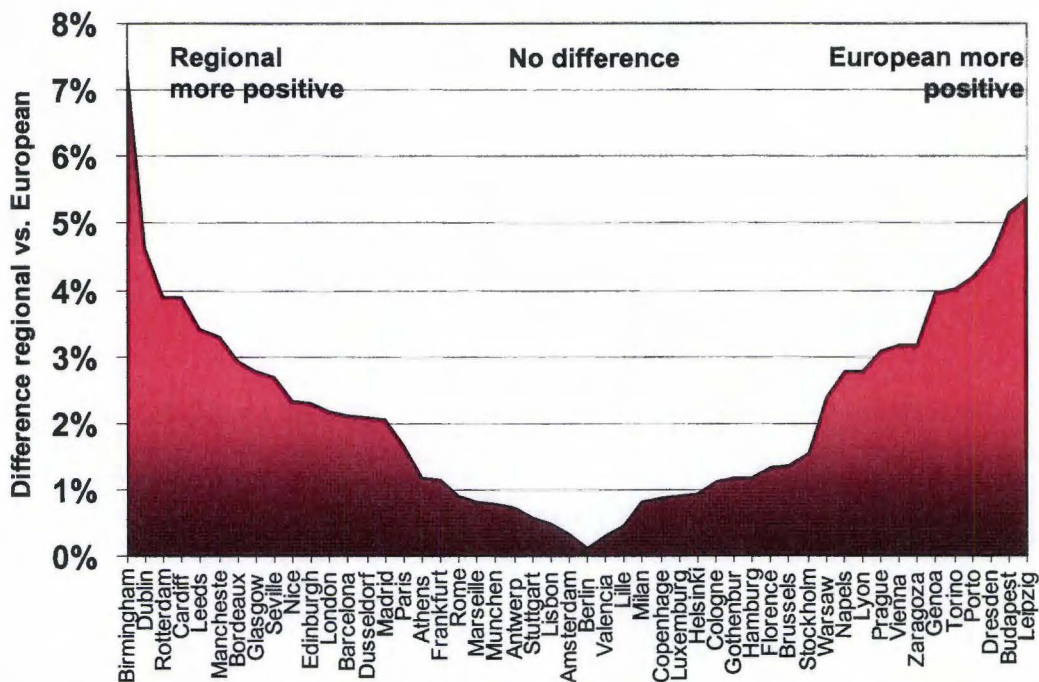


Fig. 29. Comparison of the calculation differences for the total market return based on regional and the European coefficients.

Future relationships between the drivers and the total return may also differ from relationships in the past. One alternative is that the future relationship will stay the same as in the past for each city. The second alternative is that the relationships will become more similar across Europe. It is not expected that future developments will differ from the average of all cities. A forecast will be made based on the average of the relationship between the drivers and the total return for all European cities as well as the regional relationships. In figure 29 the differences according to the European model and the regional model based on the city relationships are shown. The extremes, both positive and negative, are the immature real estate (retail) markets in general. One exception is the positive regional relationship for the UK cities. This highlights a difference between continental Europe and the UK and Ireland. The selected relationship between the

⁵⁶ Consensus forecasts, a digest of international economic forecasts

drivers and the return is made clear in figure 30. A European average has been chosen due to the internationalization of the real estate actors, the tenants and the investors. Based on the European and regional models the average of the two models will be used to make the forecast.

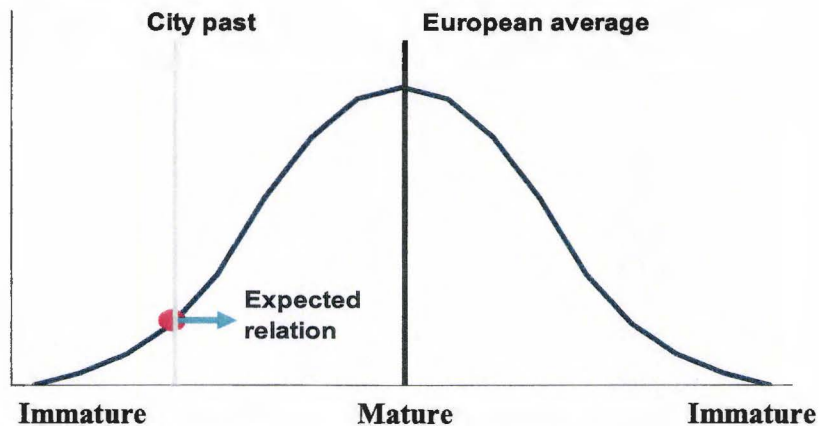


Fig. 30. Overview of selected relationships.

8.5 Results

Based on the pan-European model a forecast has been made for the identified coefficients for each driver for the whole of Europe. A statistical analysis has been carried out for each city to determine the influence of each driver on the rent development. Based on the driver's influence at city level a forecast has also been made at regional level. Figure 31 presents comparison of the pan-European and the regional forecast. Ideally, the results have to be on a line through 0 and 9% for the forecasts based on both the regional and European models, which means the relationships between the drivers is the same for the whole of Europe. The differences are in the range of 0 to 2%. The results of the European model are more positive for the UK and the Iberian Peninsula than the regional forecast, and for some French and German cities the European model is more negative than the regional model.

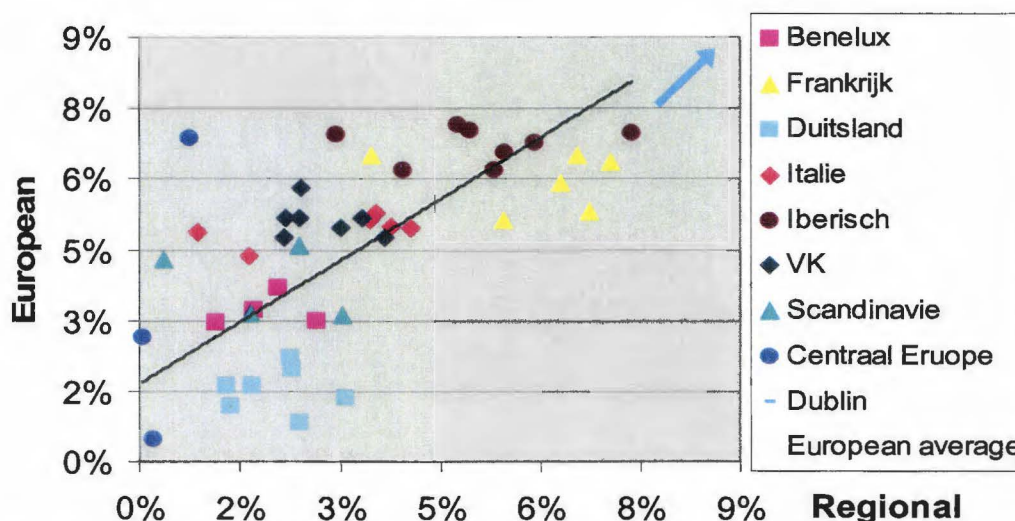


Fig. 31. Comparison forecasts for the average rent development till 2014 based on the Pan European model and the other axis the model based on European drivers but city coefficients.

Based on differences between the two forecasts and the uncertainty of the actual relationship, in the future for each city between the drivers and the components development, it was decided to take the average of the two forecasts; one based on European coefficients and one based on city coefficients. The forecast total returns were satisfying and aren't extremely high or low compared to the developments in the past based on the total return mentioned in table 1 in chapter 2 and reproduced in table 35. The forecasts shown in figure 32 are also based on the regional and pan-European model. The regional model is based on the regional coefficients for both the rent and yield development drivers.

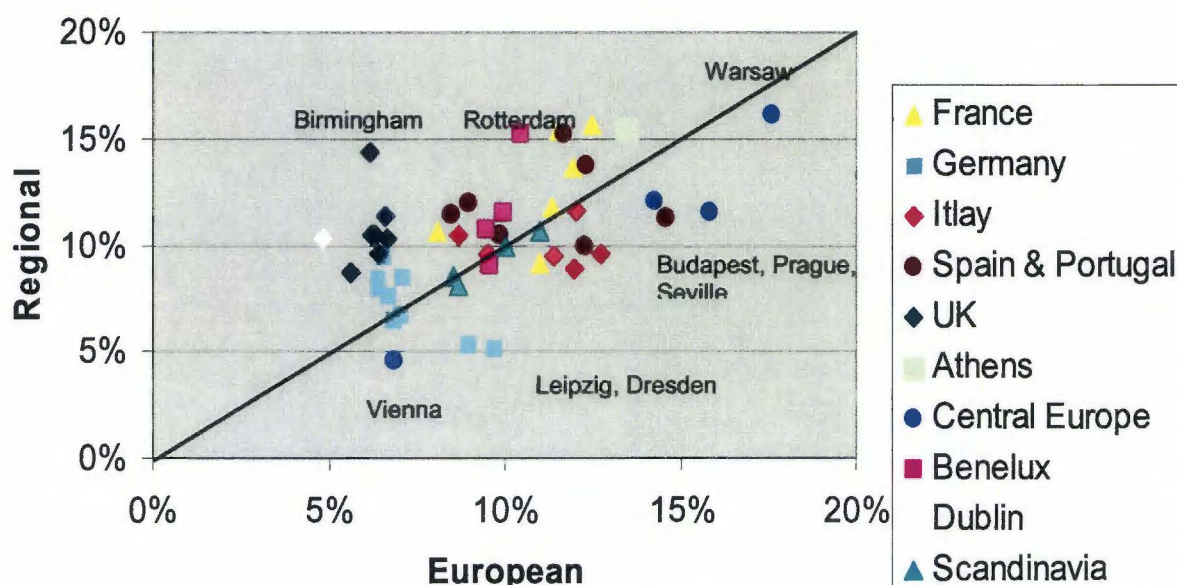


Fig. 32. Comparison forecasts for the market return till 2014 based on the Pan European model and the other hand the model based on European drivers but city coefficients.

Table 35. Overview of average annual total return in the past, published by retail indexes, and the forecasted total returns for the high street shops.

	Period	Total return	Forecasted total return 2004-2014
Denmark retail	2000-2003	9,3%	8 %
Finland retail	1998-2003	9,1%	10 %
France retail	1998-2003	15,8%	12 %
Germany retail	1996-2002	3,7%	7 %
Ireland retail	1993-2003	20,2%	8 %
Netherlands retail	1995-2003	10,6%	11 %
Portugal retail	2000-2003	14,1%	13 %
Sweden retail	1997-2003	10,1%	10 %
UK retail	1980-2003	11,4%	9 %
Average		11,6%	10,1%

There is a forecast for a cyclical pattern until 2009, with amplitudes equal to the past developments, and average (trend) forecasts until 2014. The time-period of the forecast is the selected period of approximately 5 to 10 years, as discussed in chapter 2. The main conclusions of the forecasts are poor returns in the coming two years on a European scale and satisfying results up to 2014. Spanish and French cities are expected to have the best market total return (approximately 13% annual market total return up to 2014) and the German cities to have fairly poor returns (approximately 6% annual market total return up to 2014). The poorest performance is expected in Vienna. For Vienna the regional model produces rather poor expectations in light of the poor

development in the past decade. The return in the regional model is probably too low. The expectations for the cities of Leipzig and Dresden are also poor in the regional model due to the large additions of retail floor space in the past decade. The best performance will probably be in the city of Warsaw, but close attention has to be given to the likely construction of retail floor space. The expected market total returns could differ by about 2% between countries, which could mean under-performance or out-performance of a benchmark on a national scale. Appendix VIII presents a complete list of forecasts for all cities. No analysis was made for the city of Luxembourg due to a lack of data about future developments.

8.6 Conclusions

The forecasting model was constructed on the basis of the components identified in chapter 3 and the influence on the components of the drivers identified in chapter 7. The operating costs are fixed at a constant 10% of the rental income, and the depreciation is expected to be zero as discussed in chapter 2. The forecast is based on the assumptions that the forecasts for the drivers are correct and the relationship between the dependent variable (components) and the independent variables (drivers) will remain the same as in the past or tend towards the European average. Based on these two relationships the average of the European and regional coefficients will be used to make the forecast. This chapter discussed the data on the drivers that were used and how the data were calculated when no data was available. Once the relationship was established and the independent variables had been collected a forecast was made on the basis of the projections made for the drivers. The results were compared with the developments in the past. Neither the cyclical pattern of the total return calculated by the model, compared with the total return for the English market as published by the IPD nor the trend pattern, compared with the average IPD total returns for some countries, of the total return shows any extreme differences from past developments. The forecast seems to be realistic, but the actual developments could always differ from the expected developments. The forecast average market total return for the cities is expected to decline from 11.6% in the past decade to 10.1% in the coming decade. The full forecasts for the rent development, initial yield, market total return and the moving average of the market total return are given in appendix IX. The moving average has a better correlation with the total return published by real estate indices due to the smoothing effect caused by valuations and the length of lease contracts.

9 Conclusions and recommendations

This final chapter summarises the conclusions of the research and makes some recommendations for future research. The chapter gives an answer to the question posed in the title of this paper: *“In which high streets should property investors shop?”*

9.1 Conclusions from research

The main conclusions of the research carried out in this thesis are:

- It is possible to forecast the market total return using a mathematical model. The results in the past according to the model correspond with the total returns published in real estate indices, for instance in England, the Netherlands and Ireland.
- The model presents different forecasts of total returns for each specific city. The total market returns in different cities in an individual country vary by up to 3 percent.
- The more mature a market is the more similar the results of the European and regional models are. The maturity of a real estate market depends on its transparency, the real estate actors and the political stability. The real estate returns for the UK cities have different relations/coefficients for the drivers than continental Europe, which results in a relatively large difference between the forecasts based on the European and the regional model.
- The addition of some retailer-specific drivers: consumer expenditure and consumer and retail confidence has a large influence on the development of the components. In particular the addition of consumer expenditure on clothing and footwear has a strong relation to the rent development trend. Over 50 % of retailers in the high streets examined are in the clothing and footwear branch.
- The regional approach only helped in determining the trend of the rent development. National drivers affect the other components, the trend rent and the yield trend and cycle. The influence of the national drivers occurs due to two factors. The first is the lack of specific data at regional level, such as data on consumer expenditure, and second is the actual influence of those national factors, for instance the fact that the retailer and investor operate at national or even international level.
- The cyclical patterns are expected to steadily converge on European scale due the internationalization of both retailers and investors.
- The problem of inconsistency in definitions, in particular the definition of yield, complicates the determination of the initial yield and the choice of definitions. Because of this problem only three brokers were selected for data collection on the initial yield. This choice doesn't represent the best opinion of the markets since there are many brokers and many opinions about a market.
- The operating costs have only a small effect on the expected total return of less than 1%.
- Retail confidence also influences the initial yield cyclical component. That influence could be due to the tenant risk as well as the expectations for the rent development.
- Ageing had a negative effect on consumer expenditure in the past and will probably have a similar effect in the future.
- In the past two decades the increase in employment in the service sector has boosted consumer expenditure on clothing in many cities.
- The return differs by at most 3% within a country and by a maximum of 10% over the whole of Europe for the examined high streets.

- The forecast returns are somewhat lower than the returns in the past decade, but are still approximately 10% for the next decade compared to 13% in the past decade. 2004 will be a tough year due to an increase in the initial yield, which will lead to declines of approximately 10% in the capital values of the properties in the event of an increase in the initial yield of approximately 0.5% for the whole of Europe.
- According to the model, the most attractive cities to invest in are Warsaw, Athens, Nice, Budapest, Seville and Lisbon. But the expected returns for all five cities, except Nice, could be somewhat lower due to the construction of retail floor space in those rather immature markets. The cities expected to perform best and worst in terms of return in five countries are shown in table 36. The selection criterion forecast return is just one of the criteria for investing in a particular city. To answer the question posed in the title "*In which high streets should property investors shop?*" other criteria have to be examined, such as:
 - *What is the expected risk?*
 - *Do I have enough local knowledge or can I gather the required knowledge?*
 - *Does the investment improve my diversification?*

But the first criterion, "What is the expected return?" is answered in this thesis.

Table 36. *Best and worst expected return in some European countries.*

Country	Best	Return	Worst	return
France	Nice	14,1 %	Paris	9,4 %
Germany	Stuttgart	7,8 %	Hamburg	6,7 %
Italy	Naples	10,5 %	Milan	9,6 %
UK	Birmingham	10,3 %	Edinburgh	8,0 %
Spain	Seville	13,5 %	Zaragoza	9,9 %

- The model isn't useful for forecasting the rent development for immature real estate markets where large volumes of retail space are being added. The maturity depends on the political risk, transparency and the real estate actors active in a market. In mature markets, with an attractive and properly functioning shopping area, the rent isn't influenced by the construction of new shopping centres.
- The model isn't useful for forecasting the yield development in Germany. The income of the investors has a large influence on the yield development rather than the attractiveness of the real estate investment itself. The volatility of the initial yield development was the smallest in Europe and has just a small effect on the value growth.

9.2 Recommendations

The model is based on developments and reactions to those developments in the past. It isn't certain that the future relationships will be the same as in the past. The shopping pattern may change due to fundamental changes on both the demand and the supply side. The supply side could be affected in the long term by factory outlet centres and on-line sales. Potentially influential developments on the demand side include changes in the population. Not only is the population ageing, the consumer expenditure of immigrants can also differ from that of the native population and particularly in the examined cities immigrants make up a considerable share of the whole population. Ageing has had a negative relationship with the rent development in the past according to the analysis. The next generation of elderly, the baby-boomers, may display different consumer spending patterns than the elderly people nowadays. The first baby-boomers will reach the age of 65 in the coming decade. These potential radical changes in the shopping pattern could result in fundamental changes in the rent trend. Some research

has already been carried out on those factors and their impact on the shopping pattern, in particular on the high street, but the existing knowledge could be deepened.

In addition to the fundamental change in the rent trend, the yield trend could also change. In the past the yield trend was downwards or horizontal, but the yield trend may perhaps start to rise. This upward movement could occur due to pension funds converting their investments into cash. On the other hand, the emergence of REITs in Europe could lead to a downward trend in the initial yield similar to that in the German market. (The forecasting model for the initial yield doesn't work for the German market.)

Other recommendations for future research are:

- The data collection could be extended to include more regional data on consumer expenditure and consumer confidence in particular;
- The data coverage is now based on yearly data, but quarterly data could improve the forecasting of turning points of the cyclical rent and yield development;
- The yield development is compared with the return on shares and the long-term interest rate. The thesis doesn't examine the possible relationship between the total return and the components and the developments in other real estate segments such as offices, industrial and housing;
- Extending the study to smaller and less important retail cities could provide a stronger foundation for the formula;
- Quantitative research on the influence of shopping area attractiveness on the real estate market return could be carried out. Eurostat measures the quality of life for all examined cities, and this may have a relationship with the attractiveness of the shopping area. The influence of large shopping centre developments compared to the existing retail floor space in immature markets was mentioned but could be examined more precisely.

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Real estate data

Real estate indexes

DEI/IPD Denmark index
 DIX German property index
 IPD France
 IPD/Nomisma Italy index
 IPD Portuguese index
 IPD Spanish property index
 IPD UK annual index 2004
 KTI Finnish index
 ROZ/IPD Dutch property index
 SCS/IPD Irish property index.
 SFI/IPD Sweden index

Broker reports / market opinions

European:

ATIS Real	European retail
DTZ	European retail property markets
CBRE	International Property bulletin
DBRE	European real estate
King Sturge	Global real estate forecast
JonesLangLaSalle	European Property Investment
C&W Healey&Baker	Mainstreets across the world 2003. Retail snapshots
ONCOR	European Property Bulletin

DriversHistorical data

OECD	OECD economic outlook, 2003, Long-term interest rate National account statistics, main aggregate and detailed tables
ICRG	International country risk guide
RetailP	City, high street, retail lists
Eurostat	Regions: Statistical yearbook; 1981-2002 Eurostat yearbook Long and short term indicators Retailing in the European economic area, 1997 Retailing in the central European countries, 1996 Regional Gross domestic product in the European Union 1998-2001 Development for short-term statistics in the candidate countries Consumers in Europe facts and figures, data 1996-2000
Euromonitor	European marketing data and statistics, 1996, 2001 and 2003
Mintel	European retail handbook
PRS Group	International country risk guide

Forecasts

PRS Group	International country risk guide																																				
EU	Examination of the stability and convergence programmes																																				
Consensus	Eastern Europe Consensus forecasts, a digest of economic forecasts Consensus forecasts, a digest of international economic forecasts																																				
Population	National statistical offices: <table> <tr> <td>Statistik Austria</td> <td>Austria</td> </tr> <tr> <td>NIS</td> <td>Belgium</td> </tr> <tr> <td>CSU</td> <td>Czech republic</td> </tr> <tr> <td>DST</td> <td>Denmark</td> </tr> <tr> <td>Statistics Finland</td> <td>Finland</td> </tr> <tr> <td>INSEE</td> <td>France</td> </tr> <tr> <td>DEStatis</td> <td>Germany</td> </tr> <tr> <td>NSSG</td> <td>Greece</td> </tr> <tr> <td>KSH</td> <td>Hungary</td> </tr> <tr> <td>POS</td> <td>Ireland</td> </tr> <tr> <td>ISTAT</td> <td>Italy</td> </tr> <tr> <td>STATEC</td> <td>Luxembourg</td> </tr> <tr> <td>CBS</td> <td>The Netherlands</td> </tr> <tr> <td>GUS</td> <td>Poland</td> </tr> <tr> <td>INE</td> <td>Portugal</td> </tr> <tr> <td>INE</td> <td>Spain</td> </tr> <tr> <td>SCB</td> <td>Sweden</td> </tr> <tr> <td>ONS</td> <td>United Kingdom</td> </tr> </table>	Statistik Austria	Austria	NIS	Belgium	CSU	Czech republic	DST	Denmark	Statistics Finland	Finland	INSEE	France	DEStatis	Germany	NSSG	Greece	KSH	Hungary	POS	Ireland	ISTAT	Italy	STATEC	Luxembourg	CBS	The Netherlands	GUS	Poland	INE	Portugal	INE	Spain	SCB	Sweden	ONS	United Kingdom
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SCB	Sweden																																				
ONS	United Kingdom																																				

Appendix I. List of used abbreviations

GDP	Gross domestic product
C_and_F	Consumer spending on clothing and footwear
CPI	Consumer price index
DCF	Discounted cash flow
ICRG	International country risk guide
IPD	Investment property databank
IRR	Internal rate of return
NUTS	Nomenclature territorial units for statistics
OECD	Organization for Economic Co-operation and development

Countries abbreviations

EU	European Union
A	Austria
B	Belgium
CZ	Czech Republic
D	Germany
DK	Denmark
ES	Spain
FIN	Finland
F	France
Gr	Greece
H	Hungary
I	Italy
IRE	Ireland
L	Luxembourg
NL	The Netherlands
P	Portugal
PL	Poland
SW	Sweden
UK	United Kingdom

Appendix II. The selected main streets

Country	Cities	Examined NUTS area (Eurostat)	Streets ⁵⁷
Austria	Vienna	Vienna	Kärntnerstraße, Mariahilferstraße
Belgium	Brussels	Brussels	Rue Neuve, Avenue Louise
	Antwerps	Antwerps	Meir
Czech Republic	Prague	Prague	Na Prikope, Wenceslas Square
Denmark	Copenhagen	Denmark	Østergade, Vimmelskaftet, Kobmagergade, Lyngby
Finland	Helsinki	Uusimaa	Aleksanterinkatu, Keskuskatu, Pohjoisesplanadi
France	Lyon	Rhone-Alpes	Rue de la République
	Paris	Ile de France	Champs Elysées
	Nice	Provences	Rue Jean Médicin
	Marseille	Provences	Rue St Ferréol
	Lille	Nord-pas-de-Calais	Rue Neuve
	Bordeaux	Aquataine	Rue St Catherine
Germany	Berlin	Berlin	Tauntzienstraße (south)
	Cologne	Nordrein-Westfalen	Neumarkt, Schildergasse
	Frankfurt	Hessen	Zeil
	Hamburg	Hamburg	Mönckebergstraße
	Munich	Bayern	Kaufingerstraße
	Dresden	Sachsen	Pragerstraße
	Leipzig	Sachsen	Peterstraße
	Düsseldorf	Nordrein-Westfalen	Königsallee
	Stuttgart	Baden-Württemberg	Königstraße, Calwerstraße, Schulstraße
Greece	Athens	Attiki	Ermou, Tsakalof
Hungary	Budapest	Közép-Maggarország	Váci Utca, Haris Koz
Ireland	Dublin	Ireland	Grafton street, Henry street
Italy	Milan	Lombardia	Via Montenapoleone, Via della Spiga, Corso Vittorio Emmanuelle
	Rome	Lazio	Via Condotti, Via del Corso, Via Cola di Rienzo
	Naples	Campania	Via Toledo
	Turin	Piemonte	Via Roma
	Genoa	Liguria	Via Roma
	Florence	Toscane	Via de Tornabuoni, Via Calzaiuoli
Luxembourg	Luxembourg	Luxembourg	Grand Rue, Avenue de la Gare
Netherlands	Amsterdam	Noord-Holland	Kalverstraat
	Rotterdam	Zuid-Holland	Lijnbaan
Poland	Warsaw	Mazowieckie	Ul. Chmielna, Ul. Nowy Swiat
Portugal	Lisbon	Lisabon	Rua Augusta, Rua Garrett, Rue do Como
	Porto	Norte	Rua de Santa Catarina
Spain	Barcelona	Cataluña	Portal de l'Angel, Paseo de Gracia
	Madrid	Madrid	Serrano, Preciados
	Zaragoza	Aragon	Pl de la Independencia
	Seville	Andalucia	Tetuan
	Valencia	Comunidad Valencia	Colon
Sweden	Gothenburg	Västsverige	Kungsgatan
	Stockholm	Stockholm	Biblioteksgatan
United Kingdom	Birmingham	West Midlands	High Street
	Edinburgh	Scotland	Princes Street
	Glasgow	Scotland	Buchanan Street
	Leeds	Yorkshire and the Tumber	Commercial Street
	London	London	Convent Garden, Oxford Street, Brompton Road
	Cardiff	Wales	Queens Street
	Manchester	North West	Market square

⁵⁷ Cushman & Wakefield, Main streets across the world 2003 and website RetailP www.retailp.com

Appendix III. Overview regional shopping centres.

Overview regional shopping centres competitive for inner city shopping areas.

Country	Cities	Shopping centre	GLA (m2)	Opening
Austria	Vienna	Donaucentrum	99.627	1975
		Huma einkaufscentrum	63.421	1987
Belgium	Brussels	Woluwe	42.667	1968
		Westland shopping centre	36.800	1972
		City 2	50.900	1999
	Antwerps	Wijnegem	57.440	1993
Czech Republic	Prague	Metropole Zlicin	59.000	2002
		Novy Smichov	53.000	2001
		Letnany shopping centre	52.000	1999
		Fisketorvet	49.000	2000
Denmark	Copenhagen	City 2	58.000	
Finland	Helsinki	Itakeskus Shopping centre	100.000	1984
		Forum	44.000	1985
France	Lyon	La Part-dieu	110.000	1975
	Paris	Les Quatre Temps Auchan	108.000	1981
		Rosny 2	102.000	1973
		Velizy 2	102.000	1972
		Auchan les 3 Fontaines	87.000	1972
		Italie 2	57.122	1976
		Forum des Halles	57.000	1979
		Cap 3000	40.100	1969
	Nice	Grand Littoral	116.300	1996
	Marseille	Euraille	78.000	1994
	Lille	Rives des Arcins	55.000	1995
	Bordeaux	Gropius	81.000	1995
	Germany	Berlin	Huert Park	76.000
Gropius Passagen			62.000	1997
Cologne		Du mont Carre centre	20.000	2001
		Huert Park	49.600	
Frankfurt		Nordwestzentrum	60.000	1968
Hamburg		EKZ Hamburg	45.000	1970
Munich		Olympia EKZ	65.000	1972
		PEP Perlach Einkaufs Park	58.000	1981
Dresden		Elbe Park	81.000	1995
Leipzig		Paunsdorf Centre	115.000	1994
		Saale Park	125.000	1991
Düsseldorf		Huma Einkaufspark	45.000	1977
	CentrO	70.000	1996	
Stuttgart				
Greece	Athens	Maroussi centre	60.000	2004
Hungary	Budapest	Arkad centre	53.000	2002
		West End city	49.737	1999
		Mammut shopping centre	44.408	2000
		Polus centre	44.000	1996
		Campona	40.000	1999
		Lurdy Haz	33.000	1998
		Duna Plaza	30.279	1996
Ireland	Dublin	The Blanchardstown	44.375	1996
		Life Valley	35.892	1998
Italy	Milan	Auchan	58.000	1993
	Rome	Panorama	98.000	2006
	Naples	Volcano	120.000	2005
	Turin	Shopville Le Gru	60.000	1993
	Genoa	LaFiutama	26.500	2002
	Florence	I Gigli	67.800	1997
San Donato		45.000	2005	
Luxembourg	Luxembourg	Auchan-Kirchberg	21.000	1996
Netherlands	Amsterdam	Amsterdamsche poort	72.000	1986
		Rotterdam	Alexandrium	140.000
		Zuidplein	65.000	1973
		Beurstraverse	60.000	1996

Country	Cities	Shopping centre	GLA (m2)	Opening
Poland	Warsaw	Janki shopping centre	70.000	1999
		Galeria Mokotow	60.000	2001
		Targowek	50.000	1998
		Bemowo	47.000	1999
		Wola Park	43.000	2002
Portugal	Lisbon	Centro Colombo	120.000	1997
		Vasco da Gama	47.500	1999
		Amoreiras Shopping centre	38.100	1985
	Porto	Parque Nafcente	56.000	2003
Spain	Barcelona	Diagonal Mar	87.085	2001
		Maquinsta	82.500	2000
		Gran Via 2	47.000	2002
	Madrid	Madrid Xanadu	134.000	2003
		Parquesur	105.130	1989
		Madrid 2-La Vaguada	85.500	1983
		Tres Aguas	65.000	2002
	Zaragoza	Gran Casa	67.015	2002
	Seville	Nervion Plaza	24.500	1998
	Valencia	Nuevo	112.000	1982
		El Saler	47.013	1995
	Sweden	Gothenburg	Nordstans Affarscentrum	68.850
Frolunda Torg			43.069	1966
Stockholm		Skarholmens centrum	62.095	1968
		Kista Galleria	55.000	1977
		Taby centrum	46.643	1968
Farsta	43.348	1960		
United Kingdom	Birmingham	Bullring	111.480	2003
		Merry Hill	157.141	1987
	Edinburgh	Gyle	30.000	1993
	Glasgow	St. Enoch	70.000	1988
		Buchanan	60.000	1998
	Leeds	White Rose	60.387	1997
	London	Bluewater	153.285	1999
		Lakeside	126.530	1990
		Brent cross	78.410	1976
	Cardiff			
Manchester	Trafford centre	130.021	1998	
	Arndale	116.125	1976	

Appendix IV. Yield determination

CB Richard Ellis ⁵⁸	The published initial yield is the initial yield based on the gross purchase price minus the transaction costs.
JonesLangLaSalle ⁵⁹	The published initial yield is the lowest initial yield in a market based on the gross purchase price minus transaction costs and operating costs.
Healey & Baker ⁶⁰	The published initial yield is the lowest initial yield in a market based on the gross purchase price minus transaction costs. The Netherlands are an exception due to the publication of gross initial yields.
DTZ ⁶¹	The published initial yield is the initial yield based on the gross purchase price minus transaction costs and all fixed costs such as taxes. The Netherlands are an exception due to the publication of gross initial yields.
ONCOR ⁶²	The published initial yield is the lowest initial yield in a market based on the gross purchase price minus transaction costs and fixed costs such as taxes.
Keeris ⁶³	The percentage is equal to the expected net initial yield for the buyer. Therefore the transaction takes place based on the net transaction for the buyer and the gross transaction price for the seller including the transaction costs.

⁵⁸ Telephonic conversation Mr. August Gotink

⁵⁹ Telephonic conversation Mr. Veldhuis/Mr. Dignus Hoen (Den Haag/Amsterdam)

⁶⁰ Telephonic conversation Mr. Hajo Frieman

⁶¹ E-mail correspondence Mr. Nicholas Barnes, associate director of DTZ research London.

⁶² Telephonic conversation Mr. Robert Das/ dhr. G.G.M. ten Have (Boer Hartog Hoofst)

⁶³ Keeris, prof. ir. W.G. MRICS, *Vastgoedbeheer lexicon*

Appendix V. Shopping area return influencing indicators

Tenant mix

The retail offer is one of the important considerations for a visit to a shopping area. The retail offer in the high streets mainly consists out of the clothing and footwear branch. The offer has to be large enough and has to be various. The variety could be achieved to a mix a chain stores and independent stores. The consumer has to be surprised and on the hand the stores and retailers have to recognizable due to the familiarity of chain stores. At some parts of shopping areas retailers clutter for instance shops selling footwear.

Anchor

A shopping area consists out of a number of anchor tenants which appeal many consumers. The retailers consists mainly of department stores in the Netherlands for instance out of V&D and Bijenkorf, Kaufhof in Germany and House of Fraser in the UK. Other retailers want to be located next to those companies due to the high footfall and attractiveness of those anchor tenants. The anchors tenants consist out of large depart stores or large clothing stores with high brand awareness.

Facilities

Besides the retail offer facilities have to be available in the shopping area. The facilities have to benefit the stay in the shopping area. The catering industry benefits the time period visitors stay on a specific location. The catering industry in shopping areas consists out of: lunchrooms, terraces, fast-food restaurants or are located inside department stores. Other facilities in shopping areas could for instance be toilets and a day nursery.

Amusement

Amusement benefits the appeal to consumers which want to combine a culture visit with a visit to the shopping area. Amusement facilities are for instance the presence of a theatre, cinema or museum. But besides the before mentioned facilities also culture events increase the appeal to consumers.

Compactness

The shopping area has to be compact. The compactness benefits the consumer to reach all shops. The compactness is measured by the distance between the maximum walking distance between two stores in the shopping area. The shops will be combined in a shopping area to make maximum appeal to consumers by a large retail offer.

Accessibility

The accessibility of a shopping area determines the possibility of consumer to go to a shopping area. If a shopping area is bad accessible, many consumers cannot reach the shopping and shop at other locations. The accessibility is split up into three indicators the provisioning possibilities, the accessibility by car and public transport.

Parking facilities

Many consumer travel by car to the shopping area and want to park their car. The parking facilities can be located in the shopping area or at park and ride locations with a good accessibility by public transport to the shopping area. The parking facility quality is influenced by the price, the attractiveness of the route to the shopping area, distance from shopping area and security. Retailers want to be located besides next to anchor tenants and the high streets also be located on the routes consumers travel to other shops.

Public transport

Public transport consists out of the consumer travelling by other means of transport than their own vehicles. The public transport could be busses, trains, tram and metro. The consumer travelling by public transport increases due to the quality of the public transport and the lack on car accessibility. In general the size of the city is related positive to the share of travelling by public transport in a city.

Provisioning possibility

The provision of the stores mayn't lead to inconvenience of the consumers. Provisioning has to take place ideally on regulated times and has to be outside the peak hours in the shopping area.

Security

The security in the shopping area benefits the pleasure of shopping. Consumer who have been pock picked don't want to visit the shopping area a second time. The security could increased by availability of police in the shopping area. In general the security is better in a shopping centre.

Pedestrian area

The safeness of the shopping area consists besides pock pickets out of road safety. Many shopping areas are pedestrian area, which improves the inconvenience of other road transport with other travel speeds.

Maintenance

The cleanness of the shopping area benefits the quality of pleasure of shopping. Waste and animal faeces don't benefit the pleasure of shopping.

Design of shopping area

The design of the shopping area such as lightning and the pavement benefits the safety of the shopping area. Besides those indicators also the route signs, seats and waste-paper basket benefit the quality of the shopping area.

History

The history of the shopping areas and the building determine the architectural quality of the shopping area. The number of tourists is strong related to the history of the city.

Appendix VI. Building quality return influencing indicators

Floor space

The floor space is the most important factor for the rental level. Tenant select possible shop property based on criteria. The first criterion is the floor space of the shop property⁶⁴.

The rental levels are considered to be dependent on different zones. The relation of the zones and the rental level can be calculated by:⁶⁵

- 125 % for the corner of a shop property located on the corner of two shopping streets
- 100 % for the first 10 metres of the shop
- 50 % for the next 10 meters on the ground floor
- 30 % for the remains of the floor space on the ground floor
- 50 % for the first ten metres from the front on the first storey
- 40 % for the remains of the floor space on the first storey
- 20 % for the second storey
- 10 % for the third storey
- 30 % for the basement

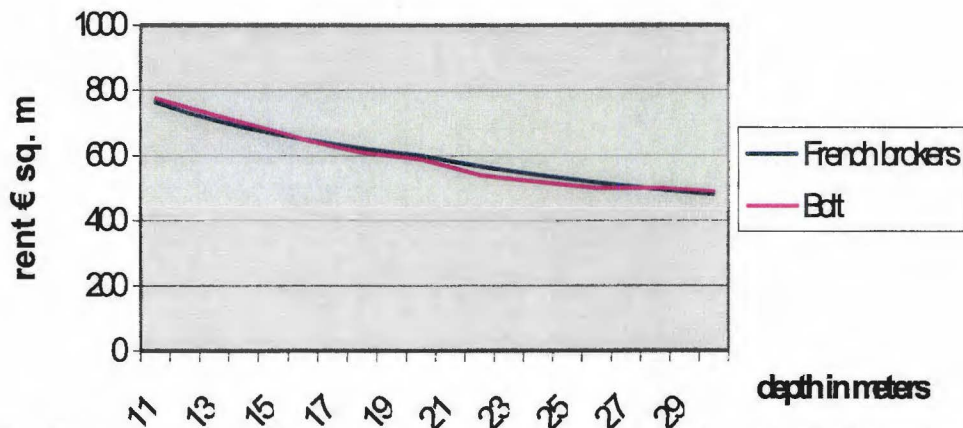


Fig. 33. Comparison of the relation of the rent and the depth of shop property determined by Bolt and a corporation of French brokers.

Lay-out of the shop-property

The lay-out of the shop determines the possibilities for retailers to furnish the shop property with their inventory. Some restrictive drivers are small story height, pillars in the shop, pantries and the situation of staircases. But also for investors the lay-out of the shop determines the possibility to split the shop-property into more units.

Constructional quality

The constructional quality of the building depends on several criteria but isn't of high importance for the determination of the attractiveness of a property. The main criterion is the property has to rain and water proof. The retailer is responsible, in the most countries, for the interior quality of the shop property but when a shop property isn't attractive for a retailer it is also not attractive for an investor. The comfort of the property is also an influencing factor for the total constructional quality of the shop property. For the comfort the following indicators are important: the climate (control) and the inconvenience of noise and smell.

⁶⁴ Brauwer, de, en Middel, *Visies op winkels*

⁶⁵ Healey & Baker, *Methode Commune de pondérations des surfaces de commerce*

Relative location

Besides the floor space the situation of a particular shop property determines the most influencing indicator for the rental level. The foot fall determines the quality of the location in the shopping area and the expenditure per passer-by. This hasn't to be in direct relation notice the difference between the Hoog Catherijne shopping (largest footfall of the Netherlands, located in Utrecht) and the P.C. Hoofstraat (exclusive shopping street, located in Amsterdam, with a small footfall). The footfall depends on the location relative to anchor tenants, parking places, public transport, clusters of specific retailers such as footwear retailers, but also the location relative to catering services and squares. The comfort could also determine the quality of the location. For instance on the shadow side of the Champs Elysées in Paris the rental level is half of the rent on the sun side.

Landownership

For some investors the landownership of the property is of high importance for the determination of the initial yield. The land value determines approximately 2/3 of the total value of the shop property, depends on the location. The landownership is different for countries but could also differ in a country. In the UK some investors don't want to buy buildings with less than 100 year during ground lease contracts.

Tenant

The quality of the tenant determines the risk involved with rent payments. A solvable tenant has smaller risks for the investors. In general chain stores have got less tenant risks due to the low involved risk for the income. Besides the tenant the duration of the lease contract could mean a risk. A better spread of lease contracts expiration dates in a real estate portfolio results in less risk. Expiration of lease contracts could also mean a positive risk for possible rent increases. Some sources mention even the retail branch determines the rental level. But the relation to retail branch is also related to the floor space and the influence of both indicators isn't examined separately.

Appendix VII. Statistical results

Table 37. Regression results for the relation for the actual rent development and the calculated rent development based on the formula for Barcelona.

<i>Regression Statistics</i>							
Multiple R		0,965					
R Square		0,933					
Adjusted R Square		0,929					
Standard Error		8,207					
Observations		22					

<i>ANOVA</i>					
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	18794	18794,75	279,031	3,26E-13
Residual	20	1347	67,35721		
Total	21	20141			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>
Intercept	10,00995	3,493798	2,865063	0,009571	2,722	17,2	2,722
X Variable 1	1,008261	0,06036	16,70422	3,26E-13	0,882	1,13	0,882

Table 38. Regression results for the relation for the actual rent development and the calculated rent development based on the formula for London.

<i>Regression Statistics</i>							
Multiple R		0,961					
R Square		0,924					
Adjusted R Square		0,921					
Standard Error		7,628					
Observations		22					

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	14341,76	14341,76	246,4589	1,04E-12
Residual	20	1163,825	58,19127		
Total	21	15505,58			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>
Intercept	6,252882	4,632422	1,349808	0,192158	-3,410	15,915	-3,410
X Variable 1	1,01552	0,064687	15,69901	1,04E-12	0,880	1,150	0,880

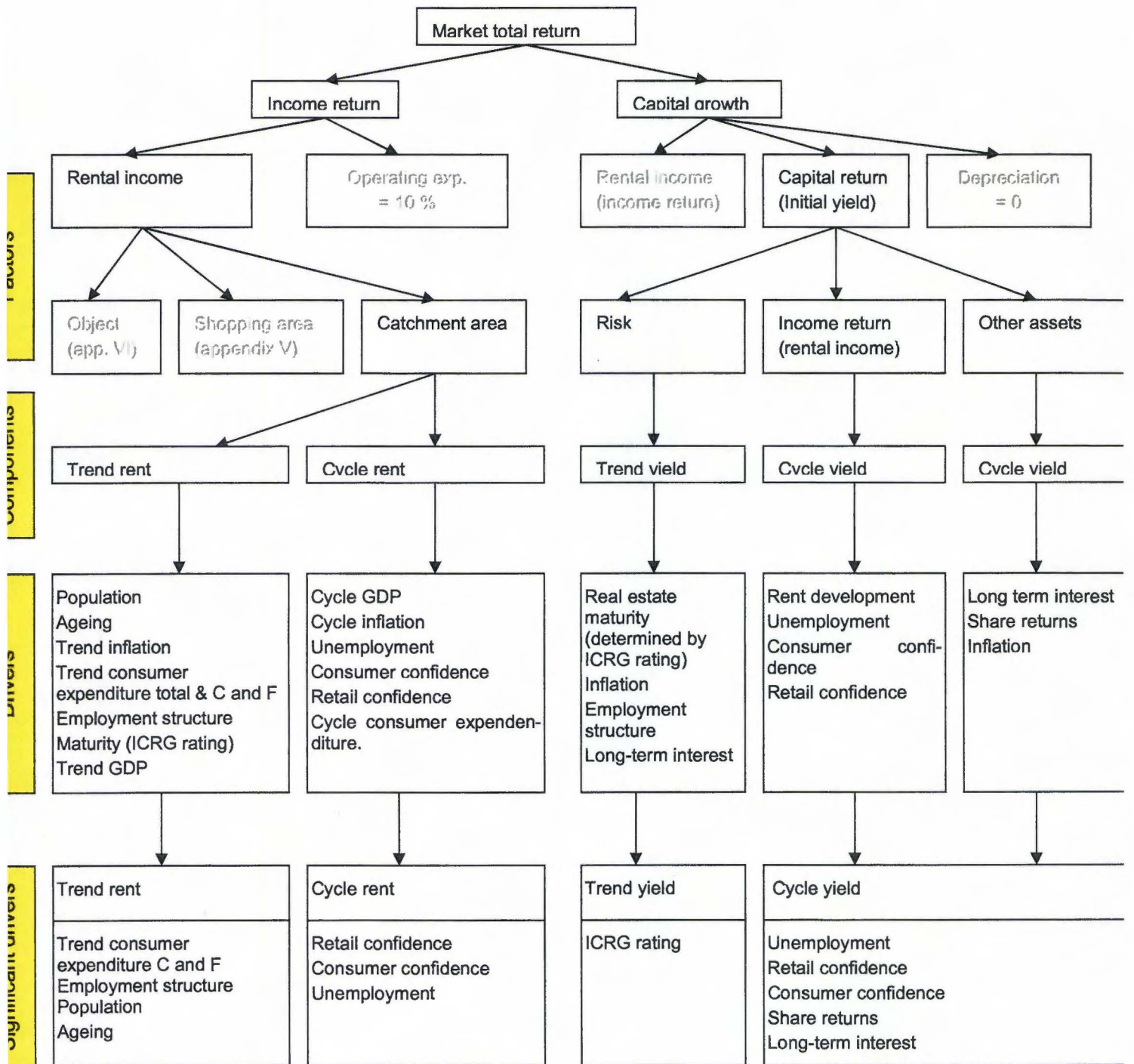
Table 39. Regression results for the relation for the actual yield development and the calculated yield development based on the formula for Barcelona.

<i>Regression Statistics</i>	
Multiple R	0,975
R Square	0,951
Adjusted R Square	0,949
Standard Error	0,0039
Observations	21

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0,005863	0,005863	375,8902	5,6E-14
Residual	19	0,000296	1,56E-05		
Total	20	0,00616			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>
Intercept	-0,00907	0,00443	-2,04651	0,054796	-0,01834	0,0002	-0,018
X Variable 1	1,105591	0,057025	19,38789	5,6E-14	0,986237	1,2249	0,9862

Appendix VIII. Overview return influencing factors, components and drivers



Appendix IX. Forecasts

Appendix X. Data appendix