Property yields as tools for valuation and analysis

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Summary

This project was started in order to get an overview of conceptual problems, measurement problems, theories of determinants of yields, the use of yields in different contexts and how the actors on the Swedish market looked upon yields. Important issues discussed in the report is the need for:

- Conceptual clarity: A number of different yield terms exist on the market and it is very important to be clear about how the specific terms are defined.

- Operational clarity: There are measurement problems both concerning rental incomes, operating and maintenance costs and property values. This means that reported yields can be "manipulated" by choosing suitable operationalisations and pushing estimations of uncertain factors in directions that are favourable to the actor in question.

- Specify the purpose for which the yield should be used. The most important distinction is between using yields/income returns for valuation purposes and using yields as benchmarks or bubble indicators. In the first case various types of normalization of the net operating income can be rational. In the second case it is important that the figure reflects "actual" incomes and costs, and that the concept is standardized and in such a way that the room for manipulation is small.

- A clear view about how yields/income returns should develop according to different theories, e.g how the relate to the real return on other investments, inflation levels, risks and expectations about the development of the net operating income. Theories can always be questioned but they give a framework that are helpful in getting a perspective on what is happening on a specific market, and evaluate e.g. if property prices develop in a way that could be a bubble on the market.

Sammanfattning

En svensk rapport som tar upp motsvarande frågor finns tillgänglig på avdelningens hemsida. Rapportens namn är: "Direktavkastning och direktavkastningskrav för fastigheter: En analys av begrepp, mätproblem, påverkande faktorer och användbarhet."

Preface

Yields are today important in a number of real estate contexts:
- Property valuations can be based on information from the market about yields demanded. When cash-flow methods are used exit yields are often used to calculate the value at the end of the period for which a more explicit prediction is made.
- When the returns from property should be compared with other forms of investment and between property markets in different countries.
- Supervising authorities follow initial yields (income returns) on the market in order to evaluate whether property is overvalued and if a price bubble might be forming on the market.

This project was started in order to get an overview of conceptual problems, measurement problems, theories of determinants of yields, the use of yields in different contexts and how the actors on the Swedish market looked upon yields.

Formally the work was carried out in two cooperating sub-projects. This research report was written by Rosane Hungria-Garcia, and a Master's thesis was written by Björn Karlsson titled "Property yields: Concepts, determinants and measurement problems" (available at the website of the Division of Building and Real Estate Economics). They made the interviews and some of the data collection together. The focus of the reports are however somewhat different, with more focus on measurement problems and the role of yields in cash-flow methods in Karlsson's report, and more focus on yields as benchmarks and on the development of yields in Sweden in Hungria-Garcia's report. A shorter report in Swedish, summarizing the main points, is also available.

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1 INTRODUCTION

Shares, bonds and real estate are the main asset types available in the capital market. Real estate is usually negatively correlated to shares, what makes it attractive for the purpose of risk diversification. On the other hand, bonds and real estate goes along in their volatility. One difference between these assets is that property is unique and its data on price transactions is not computed on a daily basis; on the contrary, it is very difficult to gather data on prices of similar properties. Shares and bonds have in this respect identical characteristics and it is easy for investors to assess their performance at high accuracy levels.

In the real estate market the situation is not as simple as that. Investors are never sure about the value of a certain property if they were about to sell or rent it. Property valuation methods are needed for estimating the most probable value of a property on the market. The accuracy of valuations is tested when an estimated value equals or approximates the purchase price, which, in this case, represents the investment cost.

One of the most popular property valuation methods applied in Sweden is the discounted cash-flow (DCF) method, which measures income returns by subtracting expenses from gross rental income. Cash-flow growth expectations are crucial to the rationality or efficiency of the property market (Hendershott and MacGregor, 2003). Standardization of income measures, based on yield rates, is a must to the transparency and accuracy of portfolio performance measurement; that is the only way investors truly know if investments are paying off.

1.1 Objective and conceptual framework

In this study, the focus will be given to the *yield* term, which reflects an investor's analysis of risk. Its straightforward application has as objective the conversion of annual net operating income expectancy into price or value (BOMI Institute, 2003).

The need for standardizing and clarifying the meaning and use of this concept has risen at a point where investors, managers and supervising authorities in the real estate market look for more reliable information about the situation in the market.

Theories on macroeconomics, finance and valuation cannot be viewed separately when examining the yield concept and its determinants. As yields can be used as a benchmark to performance, or as determinants of property value or even as an indicator of bubbles in the property market, macroeconomic determinants, and financial theories for the general financial market and for the specific property market cannot be overlooked.

Financial theory on yields in the general financial market is crucial for this study, as it will serve as a comparison of to which extent general financial and property-related financial theories match. There is a tendency to say that they differ at some point, being this fact the probable cause to the generalized confusion surrounding yield conceptualization. Thus, in the first part of this paper, the concept of yield will be demystified; from general financial market to property-specific usage.

The second part covers yields used in property valuation methods, where the sales comparison approach and the income capitalization method are the yield-related methods. The usefulness of yields will also be focused on this chapter, with a broader overview of yield usage in other countries. A discussion regarding property yields and bubbles will also be undertaken in the final part of chapter two.

The third part covers theories related to yield determinants. In the forth part, yield movements in Sweden will be analyzed in a six-year frame, since 1998. Finally, a conclusive part comes up with suggestions of what can be done or changed to improve the conceptualization and standardization of yield terms in the property market.

1.2 Methodology

The methodology applied in this study is based on data collected from multiple sources, such as literature review, face-to-face interviewing, property-related companies' financial documents, and databases.

Face-to-face interviews were delimited to real estate and consultancy companies that mainly deal with Stockholm, Gothenburg and Malmö property market regions. A total of sixteen key companies were interviewed with the intention of confronting yield related theories to its usage in the Swedish property market.

More information about the interview study and its results can be found in appendix 1 and in Karlsson (2003).

2 UNDRESSING THE OVERALL CONCEPT OF YIELD

2.1 Basic concepts

For a correct assessment of yield ratios it is necessary that the terminology is standardized and accepted by market participants in the property market. In Sweden, the yield concept is yet not very clear and must be worked through its inputs, even though many believe that yields are taken from the market. But then, the question on "*how did the market come to the conclusion that the yield was X%?"* is raised.

Property values keep changing over time. As discussed in Persson (2003), the value of a real estate is attached to the interest behind the objective of its valuation. The assessment of a property is based, however, on four basic conditions: *need*, *limited supply*, *right of disposal* and *transferable assets* in the market. Once values change, yields are prone to follow its movements, but in opposite direction. To better understand its relation, it is important to see how yields relate to property values.

Property values are classified in three groups, as follows:

1. Market-related value

   Efforts have been made to concentrate *market value* around one central concept. According to EVS 2000 and TEGoVA recommendations, the market value concept is defined as follows:

   > *"Market value is the estimated amount for which a property should exchange on the date of valuation between a willing buyer and a willing seller in an arm's length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without compulsion."*

   It is important to perceive the difference between *value* and *price*. The latter refers to an amount in currency in the time when transaction takes place.

2. Income-related value

   Income value is related to an investor's expectancies regarding future inflows of capital into his/her investment and it should, thus, be regarded separately for each investment (individual nature). In Person's (2003) words,

   > *"Income value is the present value of expected future returns of a subject property."*

Sometimes, the income value of the subject property is said to have a built-in *long-run intrinsic value*, which implies stable returns over time. It is also said that a *market-adapted income value* exists, which assumes it possesses parameters that reflect the market. In other words, it is regarded as a form of *market value*, but estimated out of a return calculation model.

3. Cost-related value

   The *cost value* is calculated in special circumstances, where:

   - Market is inexistent for special properties
   - In an insurance context
   - In countries where the property market is not functional

   Even if the *cost value* concept is of little extent applied in the Swedish market, one should not ignore its existence in certain contexts.

It is important to notice that a number of other value concepts exist in the property market, which makes the debate concerning the standardization of concepts through the creation of *new ones* fiercer.

Going-concern is not a basis of valuation but a pre-requisite for it since the property and the business depend on each other. It represents the value created by the business operation in the property and it is, therefore, more related to the business than to the property itself. The value generated is capitalised on the profits of the business' turnover and its calculation is similar to as property valuation (Frykblom *et al*., 1998).

IVSC defines *value-in-use* as "the value a specific property has for a specific use to a specific user" and TEGoVA adds, "in accountancy terms, value-in-use is the maximum amount recoverable from continuing ownership and ultimate disposal of the asset". Value-in-use is, therefore, related to the going-concern concept and it may probably be related to both market and investment values (Frykblom *et al*., 1998).

Real value is an accounting term that is a synonym to market value of an asset.

Acquisition value is either the price paid for, or the cost of, producing a resource.

However, for a normal value assessment it is only necessary to define clearly the *basic concepts* of value, known as *market value* and *income value*.

The relation between both concepts varies accordingly to the point in time when properties are assessed, as it has been observed that both concepts' preferences are strongly correlated to macroeconomic aspects. The relevancy of each value depends on the objective of the valuation and to whom the valuation is done. An interesting finding is

that during economic crises, preference was given to the *income value*. In opposite situations, the *market value* was applied.

Income Rates

The *yield rate* is a *rate of return* on capital, usually expressed as a compound *annual percentage rate* (Appraisal Institute, 2001).

According to the Appraisal Institute (2001), yield rates can, thus, be expressed as:

- *interest rate*: usually refers to the yield rate for debt capital, not equity capital.

- *discount rate*: used to convert future payments or receipts into present value. The resulting present value represents the amount of capital to be invested so that the investor's expected yield equals the specified discount rate.

- *internal rate of return (IRR)*: is earned or expected for a given capital investment over the period of ownership. According to IVSC (2003), the IRR is the discount rate that equates the present value of the capital investment; it is the rate at which the *net present value* (NVP) equals *zero*. The IRR reflects both the return on the invested capital and the return on the original investment.

- *overall capitalization rate (R_0)*: an income rate for a total real property interest that reflects the relationship between a single's year's net operating income and the total property price or value; used to convert net operating income into an indication of overall property value ($R_0 = I_0/V_0$).

- *equity capitalization rate (R_E)*: an income rate that reflects the relationship between a single year's cash flow expectancy and the equity investment; used to convert equity dividend into an equity value indication; also called the cash on cash rate, cash flow rate, or equity dividend rate (R_E = equity dividend/equity invested).

The return on investments should compensate the investor for "foregoing present benefits and accepting future benefits and risks". This return is commonly called *interest* by lenders and *yield* by equity investors.

2.2 Investment Yields

Investment yields are measures of expected return. According to Hoesli and MacGregor (2000), there are two types of yield in investment; a measure concerned with *total return* and a measure related to the *initial income return*.

2.2.1 Total Return

The *internal rate of return (IRR)* is the measure that assesses the total return on investments. An example of a total return measure is the *gross redemption yield*, which is related to gilts held to redemption, in the UK market. The RICS (1997) defines its term as "the guarantee return to an investor before tax, given a purchase at the market price and the stock is held until redemption" for government fixed interest stock or gilts.

In the stock market, the standard measure of return is (Hoesli and MacGregor, 2000):

$$HPR = \frac{(P_1 - P_0) + D_1}{P_0}$$

Where, HPR = holding period return
P_0 = price
P_1 = the value at the end of the holding period
D_1 = dividend

Other measures, such as the *earnings per share* (EPS), the *price to earnings ratio* (P/E ratio) and the *dividend payout ratio* (DPR) are used as indicators of future returns on shares. It is interesting to note that the P/E ratio is the inverse of the *dividend yield* and analogous to the years' purchase rate (YP) in the property market. The *equated yield* is the measure of total return applied in the property market, and consists of rental and capital values changes (Hoesli and MacGregor, 2000).

2.2.2 Income Yields

Current income and current capital value are measured by *income yields*. Each financial instrument uses different income yield terms to differentiate one from another. As the focus of this study is property-specific yield terms, only a brief description of income yields related to other financial assets will be given.

In the gilt market (UK), the income yield is variously known as *interest yield*, *running yield* or *flat yield*. For shares, the income yield is known as the *dividend yield* (Hoelsi and MacGregor, 2000). The *dividend yield* formula in the stock market is equivalent to the *total return rate* (*effektiv avkastning*) in the Swedish property market, with the exception that, instead of dividends we will have *income return* plus *capital growth* for the forecasting period in the formula (Gustafsson, 2003).

For the property market, the income yield is known as the *initial yield* or the *all risks yield* (ARY) and it represents the ratio of net rental income to price or current market value. The *years' purchase* (YP) is the inverse ratio of the income yield in the real estate market, and is equivalent to the present value of $1 received annually in perpetuity and discounted at the *initial yield rate*.

According to Hoesli and MacGregor (2000), the income yield is used to make assumptions about market expectations of risk, growth and depreciation. Their relation is expressed as follows:

- The higher the expected risk, the higher the income yield;
- The higher the expected income growth, the lower the income yield; and
- The higher the expected depreciation, the higher the income yield.

2.2.3 Property-Specific Yields

The words rate, return and yield are used indiscriminately as synonyms (JLW Glossary of Property Terms, 1989) to describe the ratios between income and capital value or cost (Estates Gazette, 1993) in the property market. The subtle difference among these terms lies in time path of data and sources of value and capital. Estates Gazette (1993) defines them as follows:

> *"Yields are generally defined as annual percentage amounts expected to be produced by an investment. They are also used as the measure for capitalization of income in the specific context of investment valuation. The yield is therefore identified very much as a measure of market expectation. Returns on capital, on the other hand, are defined as the annual percentage amount produced by an investment by reference to its cost or value. Returns can be distinguished from yields in that the value, on which they are based, is not necessarily a market value. Rates of interest, finally, are simply the annual percentage amounts payable on borrowed money and are further used in the context of discounting to reflect the time value of money."*

The property *yield* or *cap rate* universal formula consists on annual net operating income divided by selling price (Ambrose and Nourse, 1993). The net operating income is characterized by the actual or anticipated remaining net income after deducting all operating expenses from effective gross income, but before deducting mortgage debt service (Whipple, 1995).

Potential gross rents
plus other income
= potential gross income
less vacancy and credit losses
= effective gross income
less operating expenses
= net operating income

The universal property yield term was broken down into other sub terms, depending on the objective of the measurement. IVSC (2003) defines the following terms:

- *Initial yield* is the initial net income at the date of transaction or valuation expressed as a percentage of the sale price or valuation. The term *going-in capitalization rate*, is North American usage; *initial yield* is Commonwealth usage (according to Hoesli and MacGregor (2000), the *initial yield* term is the same as the *all risks yield*);

- *Reversion Yield* (or *Yield on Reversion*) the capitalization rate used to convert income into an indication of the anticipated value of the property at the end of the holding period or property resale value. In North America, the *terminal capitalization rate* is also called a *residual capitalization rate* or a *coming-out capitalization rate*. In the Commonwealth, it is known as a *reversion yield*;

- *All-Risks Yield* represents the interest rate or yield at which the annual net income from an investment is capitalized to ascertain its capital value at a given date. The term overall capitalization rate is North American usage; all risks yield is Commonwealth usage;

- *Exit Yield* is used in DCF appraisals and represents the capital value of the investment property at the end of the period of analysis (exit value) expressed in percentage terms. The exit value is the net amount which an entity expects to obtain for an asset at the end of the period of analysis after deducting the expected costs of disposal (in this definition, *exit value* is similar to *residual value*);

- *Years' Purchase* is the ration between the sale price or value of a property and the average annual income or income expectancy. It may be based on gross or net income. It is applied to income to arrive at capital value. The term *income multiplier* is North American usage, while *years' purchase* is Commonwealth usage.

RICS (1997) adds three more concepts of property-related yields:

- *Equivalent Yield* is the discount rate applied to all income flows, producing a present value equal to the capital value of the investment. The income reflects current actual rents and costs and current levels of rental values; it is the IRR where cash flow changes are allowed for implicitly;

- *Equated Yield* is the IRR applied to the flow of income expected during the life of the investment so that the total amount of income discounted at this rate equals the capital outlay. Rent reviews, lease renewal or re-letting take account of expected future rental changes due to variations in the value of money; inflation is taken into consideration. It is the IRR where cash flow changes are allowed for explicitly (the equated and the income yield are common concepts; the former is a measure of total return while the latter is a measure of initial income return (Hoesli and MacGregor, 2000));

As not all these terms are applied in Sweden, and since the focus if this study is the Swedish property market, emphasis will be given to the terms applied in the country, such as *yield*, *initial yield* and *exit yield*.

In table 2.1 below there is a summary and comparison of different yield terms.

General Financial Income Yields	Property-Related Income Yields
Weighted Average Cost of Capital (WACC) r = NOI / MV (of firm)	**Cap rate, Income return (Direktavkastning)** Cap rate = NOI / Price or MV
Earnings Yield (EY) EY = (Full earnings per share/ Market price of share) x 100	**Initial Yield or All Risks Yield (Initial Avkastning)** Initial Yield = (NOI, Year 1 / Price or MV) x 100
Dividend Yield Dividend yield = (Dividends + Price Growth) / Value **Bond Yield** Bond yield = (Interest + Price) / Value	**Total Return (Totalavkastning = Effektivavkastning)** Total return = (Income return + Capital growth) / Value
	Exit Yield or Valuation Yield Exit Yield = NOI, n+1 / Exit value (restvärde)
P/E Ratio P/E ratio = Price or Value / Earnings	**Year's Purchase (YP)** YP = Annual PV of $1of n / (1 + initial yield)^n **Gross Income Multiplier (GIM)** GIM = Price / Gross Income **Net Income Multiplier (NIM)** NIM = Price / Net Income

Source: Compiled by the author.

Table 2.1 *Comparative table of income yields.*

3 THE USE OF YIELD FOR VALUATION AND ANALYSIS

Valuation methods estimate the value of an asset based on expected future profits in relation to a property, and to an individual or organization (Persson, 2003). The assessment of a market value can occur through the appliance of one of the following methods:

a. Comparable sales methods
b. Income methods
c. Cost methods
d. Conventional procedures in valuation of groups of properties
e. Other (based on "rules of thumb")

The ideal situation would be to achieve the same value for a certain property utilizing any of the methods mentioned above..

As yields usually are calculated through the comparable sales and the income methods, the other methods will not be covered in this study.

3.1 The Sales Comparison Approach

The uniqueness of commercial properties makes it impossible to value such a property by a "direct" sales comparison approach. Observed prices on the market must be related to something in order to make them useful for valuing other properties. A number of such "quotas" can be calculated, e.g. price per square meter or price per unit of rental income. One such alternative is to use observed prices on the market to calculate the *yields* - the capitalization rates in the American terminology - that actors on the market have been trading at. If these capitalization rates are assumed to be constant within a specific market, then they can be used to estimate the probable price for a property if the net operating income is known.

Once the relevant capitalization rate - yield - has been determined, an estimative of property value can be obtained, by applying the universal valuation formula:

$$Value = \frac{Income}{Cap\ rate} \qquad Or: \quad V = \frac{I}{R}$$

In the comparable sales methods, as seen above, the yield can be computed in the *net capitalization method*, which is based on estimated *net operating income* (NOI) divided by *purchase price*.

This net capitalization method used to be the most applicable method in the world for valuation of commercial properties. Unfortunately, it turned out to be also the most misused, due to a mechanical application of capitalization rates. The method can only be used if there are reasons to expect that the capitalization rates observed for a certain number of properties are relevant for the property to be valued. This is not obvious as the capitalization rates can differ depending on e.g. investment needs or expectation of future rents for the specific property.. It is common to hear that the yield for the Stockholm CBD is 6,5 percent. However, it should vary from 3 to 10 percent in special cases.

One problem with this method is that it is not that easy to compare the subject property's income variables (rent, rental area, what is included and excluded in terms of heating, taxes etc.) to *comparables' variables*. The same problem is applied to *operating* and *maintenance costs*. Data about comparable net operating income might not be available.

A special problem is whether actual or market adjusted data should be used when computing the net operating income.. It can be necessary to find out and give information on both real circumstances and circumstances adjusted to market conditions regarding rents, vacancies, operating and maintenance costs, and the estimative regarding their value must be openly showed in one's calculations (Persson, 2003). The diagram below can illustrate the problem. In that case the current NOI is 500 SEK/m^2, but when the current contract expires it is expected to be 1000 SEK/m^2.

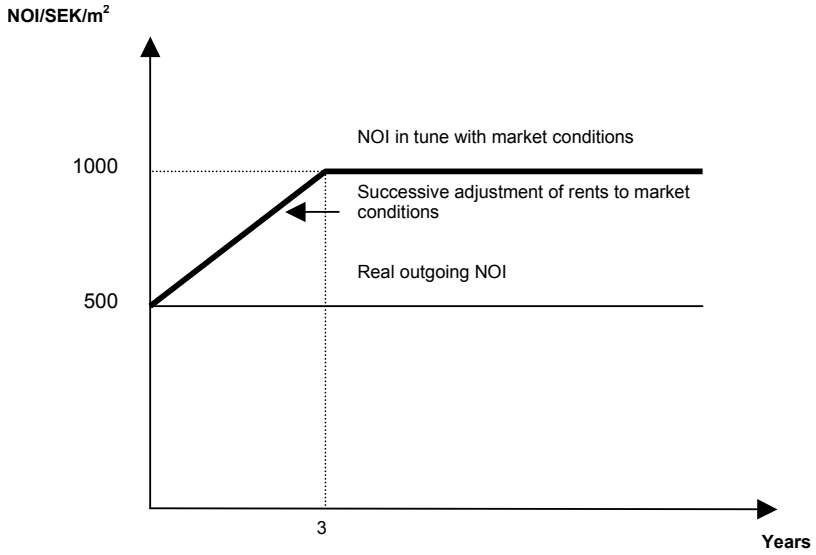


Figure 2.1 *Market-adjusted and real NOI, per square meters.*

A common procedure in this case is to use the market adjusted NOI of 1,000SEK/m^2. If the yield is 10%, for example, then the value of the property will be 1000/0,1 = 10,000

SEK/m^2. But then a value reduction must be made for the differences between the real net operating income and the net operating income based on market conditions for the period of calculation. In the example in Figure 2.1, the period was 3 years. In this case, the estimated market value must be corrected with the present value of the differences between real and rent based on market conditions for the three-year period.

The alternative is to base the valuation on the real net operating income, in this case, 500 SEK/m^2, and then make upward adjustments for the fact that the NOI soon will rise.

A crucial issue is of course what the "market yield" is based upon for type of properties. If the observed yield is computed for sold properties with a NOI-profile like the one in figure 2.1, then no adjustments at all will be needed. This discussion shows why the "simple" method of valuation by capitalization rates is not so simple after all.
The yield is usually deduced from the above mentioned market analysis. If there is lack of comparable material the alternative is to apply a more theoretical financial approach in order to assess yield . In the appendix it can be seen that Swedish appraisers use both these methods. The yield is then estimated out of investment analyses with risk-adjusted yield requirements. The yield can be, thus, simplified as follows:

Interest rate = Real interest rate + Inflation + Risk premium

And

Yield = Interest rate – Return changes or Value changes

The calculation can be done in nominal or real terms; the important aspect is that one should be consequent. Naturally, the inflation factor disappears towards a real term calculation and yield changes or value changes are given in real terms as well (deduced inflation).

The usefulness of yields in the sales-comparison method in the end depends upon whether it is possible to find any stable relations between net operating income and property price. It is somewhat surprising that it is hard to find any studies that systematically compare e.g. stability of yields and the stability of the gross income multiplier for a number of actual transactions in a certain submarket at a certain point in time.

3.2 The Income (Capitalization) Approach

Income methods are based on basic investment analysis methods, which do not mean that the sales comparison and the cost approaches are no good for valuing income properties. The problem with the sales comparison approach lies on the fact that income properties are not frequently traded, so the available sample becomes so small that it is very difficult to apply that method. Due to the characteristics of income properties, the cost approach is

also difficult to be applied. In this case, the income approach is the most appropriate method to assessing this type of properties (Lusht, 1997).

The income methods are divided in two groups (Persson, 2003):

- Capitalization methods in perpetuity (including the Gordon's formula)
- Discounting methods (including the Discounted Cash-Flow method)

Depending on the objective, type of property and access to a database, the calculation can be done in different complexity levels. For income-based method, the following is generally needed:

a) Calculation model
b) Income, detailed input data
c) Time horizon (fixed calculation period)
d) Interest rate
e) Possible exit value

The comparison needs to be based on rental (on a *pro-rata* basis) and the initial yield achieved on sale. The difference between the rental and initial yield reflects the interaction between two submarkets – the occupational market and the investment market (French & Byrne, 1996). The first concerns the status of occupancy of a property, which can be owner-occupied or occupied by a third party. In the last case, the tenant will be the one to generate income (pay the rent) to the landlord. The level of rent is determined by supply and demand factors and its value, therefore, represents the "annual value of the property to the type of property in the market". The income valuation model should, thus, mirror the process of determining the worth of the cash flow (French & Byrne, 1996).

The Yield Method

The yield method is based on a "perpetual capitalization" of forward-looking calculations of *net operating income* for the first years. The net operating income for the subject property is calculated out of the *annual surpluses of rental payments* discounting *operational and maintenance costs* (including property tax and eventual rent for leasehold site) drawn from the *gross income*. Payments regarding investments, stamp duty and other acquisition costs should not be taken into consideration in the net operating income calculation (Persson, 2003).

The net operating income of year-one, that is, rents and operating costs for the first year underlie the entire calculation period (in principle, in perpetuity). The model does not include any exit value. The method is simple in its structure, but it holds a succession of problems that limits its usage.

$$Value = \frac{Normalized\ NOI,\ Year\ 1}{}$$

Initial Yield

The Gordon's formula expressed below is a variation of the yield method and is in principle identical, but more explicit.

$$Value = \frac{NOI,\ Year\ 1}{p - g}$$

Where, NOI = normalized net operating income for year one
g = annual value or yield change in percentage
p = interest rate
p – g = yield

The yield method's formula is similar to the net capitalization's, which assesses market value based on market conditioned quotients of net operating income and purchase price, so called net capitalization factor or yield. From the interviews carried out - see appendix 1 - it can be seen that there are different views about how to look at "yield methods" in property valuation. This is not surprising as these methods on the one hand can be seen as rather pure sales-comparison methods with yields derived from observations on the market, but on the other hand can be seen as simplified estimations on value based on expected future net operating income and rated of returns derived from financial models. In reality valuers seem to mix actual market data, predicted market data (e.g. future rents) and more theoretically derived data (e.g. rates of returns) in a way that is not always transparent.

3.3 Yield and The DCF Valuation Method

Discounting methods are another main procedure in value assessment. It is mainly structured on a present sum value of discounted future net operating income during a settled calculation period and a present value of an estimated exit value (EV) in the end of the calculation period.

The main difference between discounting methods and the yield method is the calculation period that is divided in two parts – a shorter period of usually 5 to 10 years and a following period of perpetual capitalization of net operating income of the first year after the first calculation period brought to present value based on a discount rate.

$$PV = \sum_{t=1}^{n} NOI_t \frac{1}{(1+p)^t} + \frac{EV_n}{(1+p)^n}$$

Where, $EV_n = \frac{NOI_{n+1}}{Exit\ Yield}$

p = appropriate periodic yield
or discount rate

n = number of periods in the projection

The Discounted Cash-Flow Method

The *discounted cash-flow (DCF) method* is constructed in the same way of the previous discounting method but is based on current payment (in- and outflows). It does a forecast of in- and outflows during the period of calculation. In practice, valuations make use of cash-flow models with different objectives (Persson, 2003):

- Assessment of market value (market simulation)
- Consequence analysis of assessed market value
- Assessment of an individual yield rate

To better understand the usefulness of the cash-flow method it is absolutely necessary to distinguish the objective of the calculation. The only thing that can differ is the size of input variables, such as rent, operational and maintenance costs, discount rate etc.

The DCF method makes a forecast of the flows for the calculation period and estimates an exit value at the end of the same period. The calculation period can vary from 5 to 10 years, depending on e.g. the length of the lease contracts.

It is interesting to note that the DCF analysis estimates a property present value in the same way investment analysis for other assets does: based on *expected future cash flows*. At first sight, the refinement of the DCF model gives the impression that accurate outputs will be given. However, the problem that arises in this model is exactly the role that expectations play. Future expectations always lead to *uncertainty*, as no one can predict the future. The assessed value, therefore, can be completely over- or underestimated, giving an incomplete picture of the liquidity of the asset during the assessed year.

It is important that basic inputs be as much complete and correct as possible so that an accurate analysis of the relevancy of the information given can be made. Information based on the "experience of the market" must be discarded, unless it can be well justified.

The input of a "correct" annual return and its development is a primary condition for the establishment of a functional calculation of the income value. Data on rental income and costs or, alternatively, on cash inflows and outflows are needed, depending on the calculation model used. A considerable amount of more complex property- and market-related variables is required, such as information on lease contract conditions or production results, on operational and maintenance costs, on mortgage and tax conditions, and so on.

Data collection is very important and requires not only good property-specific knowledge but also good knowledge on macroeconomic factors. With expertise, rent, vacancy rate, type of contract, and costs should be adjusted to market level. Further, estimative regarding macroeconomic factors, such as business cycles, inflation, interest rate, and so on, must be "correctly" estimated.

As the *net operating income* is one of the main input variables in *income valuation methods*, a small error in its inputted value can cause a tremendous misinterpretation in the process of assessing the value of a property. The complexity in the valuation process increases in conjunction with the length of the calculation period. Therefore, assumed values for inflation, yield, and interest rate must be consistent.

The DCF analysis, according to the Appraisal Institute (1992), can also be used to achieve two other purposes:

1. Estimate the present value of an income-property (market value)
2. Extract a discount rate from a comparable sale

In order to estimate the market value using a DCF method, it is important to input current data related to the subject property. This process allows input values to diverge from market-influenced conditions and, therefore, a realistic market adjustment can be done during the calculation period. The result makes it possible to control for market influence through the use of market ratios, such as the *yield* and the *value per square meter*.

The DCF valuation method is the one recommended by the Swedish Property Index and served as the basis for the implementation of the index in the country. However, other methods, such as the income capitalisation and the comparable sales, are also accepted. The value formula for the DCF method used by the Swedish Property Index is expressed as follows:

$$V = \sum_{t=1}^{n} \frac{(H - D - U - F - T + RB - I)_t}{(1+p)^t} + \frac{R_n}{(1+p)^n}$$

where: V = present value
H = rental income
D = operational costs
U = maintenance costs
F = property tax
T = ground rent
RB = interest subsidies
I = capital expenditure (investments)
R = exit value
n = analysis period
t = time variable
p = discount rate

The above formula can be used to estimate the following:

- Total property value;

- Loan value;
- Equity value;
- Leased fee value;
- Leasehold value; or
- Other interests in real property

But how can one determine an "appropriate" yield (the discount rate) to estimate all the above-mentioned values?

The Discount Rate

The choice of a discount rate is not an easy task in cash-flow analysis. To select an appropriate rate, a valuer must "verify and interpret the attitudes and expectations of market participants, including buyers, sellers, advisers, and brokers"(Appraisal Institute, 1992).

Although the current yield on an investment cannot be computed until the transaction of a property is done, an investor "may set a target yield for the investment before or during ownership". Historical yield rates derived from transaction of comparables may be relevant, however, they do not embrace the future, where investor's interests lie. Thus, focus should be given to forecast of yield rates. Forecast rates are estimated whether through interviewing market participants and asking their points of view regarding future market expectation, or through making an indirect assessment of income expectancies. The latter is achieved by comparing the physical, economic and financial characteristics of a comparable property against competing assets in other financial markets, including risk.

"Yield rates are primarily a function of perceived risks."
(Appraisal Institute, 1992)

The assessment of the discount rate is done based on general economic conditions combined with specific property market conditions.[1] The interest rate is computed as follows:

Discount rate = Real interest rate on risk-free assets + Inflation + Risk factor (market risk)

Or

Discount rate = Nominal interest rate for risk-free asset + Risk factor

[1] Deriving the IRR from analysis of market transactions of similar properties having comparable income patterns is a proper method for developing market discount rates for use in valuations to arrive at a market value (IVSC, 2003).

The mathematical formula for the discount rate is based on Fischer's formula:

Nominal discount rate = (1 + Real interest rate for risk-free asset) x (1 + Inflation) x (1 + Risk)

From the formula, we can draw the conclusion that expected inflation and expected market risk influence changes in nominal discount rates.

In order to better understand the estimative of an income value for a property, a long-term outlook is required, even though short-term interest rate fluctuations in the market plays a major role in its assessment. In a market valuation context, a long-run outlook is also fundamental to justify a certain estimated yield (percent of net capitalization).

Real interest rate for risk-free asset + Inflation + Risk factor = Yield +/- Capital growth

In property finance literature, the discount rate is analogous to the required return. The required return comprises two parts, known as the risk-free rate and the risk premium. The former is common to most investments, and the latter varies depending on the investment risk (Hoesli and MacGregor, 2000). The nominal required return formula is shown below:

$$R_N = RF_N + RP$$

Where, R_N = nominal required return
RF_N = nominal risk-free rate
RP = risk premium

As risk level may differ in distinct parts of flows in forecasting future income, so may yield rates vary. Depending on the objective of the valuation, different yield rates may be applied to different portions specified in the cash-flow analysis. For example, an *A* yield rate should be applied to discount the series of net income, while a *B* yield rate should be applied to discount the reversion, in a lease valuation. The *A* yield rate, in this case, reflects the creditworthiness of the tenant and the benefits, constraints, and limitations of the contract, while the *B* yield rate reflects open-market conditions. Applying a single yield rate to all benefits or applying different rates to different benefits is a matter of "investor's actions in the market" (Appraisal Institute, 1992).

3.4 Yield as a Benchmark

Unambiguous definitions of terms affect the smooth running and implementation of performance measures. Performance measures are largely used in the stock market and provide bond traders, managers of traders and investors insights to what the sources of returns of a portfolio are, over a past measurement period. To ensure equal understanding, terms need to be standardized and industry-wide participation level are needed to provide reliable information.

Over the past 20 years, average property yields of 12.1% have exceeded the returns on bonds at around 0.7%, but eclipsed by returns on equities that have been averaged 16.1% for the same period, maintaining its position as the second best asset class (Swedish Property Index, April 2003).

A crucial difference between gilts, equities and properties is the published information on their respective yields, where gilt yields (the *gross redemption yield*) represent the return the investor will receive while yields on equities and properties, the *P/E ratio* and the *All Risks Yield*, respectively, do not represent investors' required or anticipated return (Dubben & Sayce, 1991).

It is vital, however, that market participants agree on certain instruments that can serve as references (or benchmarks) to make market adjustments based on new information move efficiently towards a new equilibrium (Wooldridge, 2001). With this view, attempts have been made in the property market in order to make property investment performance measures look as more reliable as possible through the creation of real estate appraisal-based indices, such as the NCREIF Index in the U.S., the IPD Index[2] in most European countries (France, Germany, Portugal, The Netherlands, Spain, Sweden, and The UK), the KTI Index in Finland, and the Investment Performance Indices in Australia and New Zealand. In this section we will give an overview of how property yields are defined in different countries and what information about yields that are presented.

3.4.1 Sweden

According to the Valuation Guidelines for the Swedish Property Index (SFI/IPD, 2003), the *yield* term is a ratio between the property's *net income* divided by its *market value*. The market value is obtained through comparable sales valuation method for the current specific property market. In the net income calculation, a long-term vacancy rate[3] related to the subject property should be assumed and based on an estimated average for a full property market cycle.

Net Income

[2] It is important noticing that the IPD does not make valuation recommendations; its indices calculations are based on secondary data received from participants. Exception is made to the Swedish Property Index, which makes valuation standardization a core assumption for the Index construction.

[3] The SFI/IPD assumes that it is unreasonable to presume that there is no long-term vacancy rate and, thus, a zero value should only be applied under very special circumstances.

SWEDEN $Yield = \frac{}{Market\ Value}$

The net income, according to the Valuation Guidelines of the Swedish Property Index, should be derived from the gross income generated by income properties minus the property-related costs (maintenance and operating costs, property tax and ground rent).

Gross Income
- Operating & Maintenance Costs
- Administrative Costs
- Ground Rent
- Property Tax
= Net Income

From the above inputs, we can see that the property yield can vary depending on what companies include or exclude in their calculation of net operating income and also depending on the property's book/market value that is used and what is eventually excluded from its estimation.

The following tables, extracted from the property company Tornet's annual report (2002), shows four different alternatives for calculating the property yield. Every output of net operating income is dependent on whether regional administration or property development are included or not in the calculation of the NOI, and if property development is also included or not in the calculation of the average book value of properties.

	Operating surplus incl. regional adm. and property develop., SEK M	*Average book value incl. property develop., SEK M*	*Yield, %*
Alternative 1	***1 403***	***18 311***	***7,7***
	Operating surplus incl. property develop. excl. regional adm., SEK M	*Average book value incl. property develop., SEK M*	*Yield, %*
Alternative 2	***1 520***	***18 311***	***8,3***
	Operating surplus incl. regional adm. excl. property develop., SEK M	Average Book value Excl. property develop., SEK M	Yield, %
Alternative 3	***1 400***	***17 960****	***7,8***
	Operating surplus Excl. property develop. And regional adm., SEK M	Average Book value Excl. property develop., SEK M	Yield, %
Alternative 4	***1 517***	***17 960****	***8,4***

** Includes the book value of exploited land.*
Source: Tornet's Annual Report 2002.
Table 3.1 *Yield and book value – Different calculation alternatives.*

If we compare yields based on the market value, we have:

	Operating surplus incl. regional adm. and property develop., SEK M	*Average market value incl. property develop., SEK M*	*Yield, %*
Alternative 1	***1 403***	***21 480***	***6,5***
	Operating surplus incl. property develop. excl. regional adm., SEK M	*Average market value incl. property develop., SEK M*	*Yield, %*
Alternative 2	***1 520***	***21 480***	***7,1***
	Operating surplus incl. regional adm. excl. property develop., SEK M	Average market value excl. property develop., SEK M	Yield, %
Alternative 3	***1 400***	***21 380***	***6,5***
	Operating surplus Excl. property develop. And regional adm., SEK M	Average market value excl. property develop., SEK M	Yield, %
Alternative 4	***1 517***	***21 380***	***7,1***

Source: Tornet's Annual Report 2002
Table 3.2 *Yield and market value – Different calculation alternatives.*

From *Table 3.2*, we can see that yields calculated on a market value basis are lower than ones derived from the book value. The book value is usually lower than the market value as it is the capital amount at which an asset is carried on the account books of a corporation, while market value is an estimate of the amount by which a property should be sold or exchanged (Appraisal Institute, 2001). In Swedish legislation the book value must be reduced if it is higher than the market value, but it is not allowed to increase the book value when the market value rises. As the relation between yield and value therefore is of a negative correlation, yield figures based on market value tend to be lower than the ones based on a property book value, unless market values are underestimated.

3.4.2 Finland

One of the most used valuation techniques to assess commercial properties in Finland is the capitalization method. Based on the rental yield, the method determines the capitalized yield value that an investor is willing to pay (Leväinen & Lahdes, 1996).

FINLAND (1)

$$Value = \frac{Rental\ Yield}{Yield\ Requirement}$$

Problems concerning the application of this method lie on some uncertainty factors, such as the *rental yield capacity*, the *maintenance costs*, and the *applicable interest rate* or *investor's yield requirement*. Here, the cap rate is based on comparative data on sales of lease targets in the market. Thus, the conditions of lease contracts should be examined

(rent, rental revision, length of lease). Moreover, it should be stated whether rents correspond to the market level or not (Leväinen & Lahdes, 1996).

To estimate the *yield requirement*, one should also make use of sales of comparable lease targets. If the market situation were stable, there would be no great problems with estimating this rate; the same does not occur in a changing market environment. The yield requirement should be calculated, theoretically, using the following equation (Leväinen & Lahdes, 1996):

$$K = p + i + r - g + d$$

Where:
K = initial yield
p = real yield level of safe investments
i = inflation
r = risk premium
g = gearing (expected value growth)
d = depreciation

In other words, the Finnish yield requirement is derived from mathematical models and from the market.

The Finnish property benchmark index is produced by the KTI – Institute of Real Estate Economics –, in co-operation with RAKLI (The Finnish Association of Building Owners and Construction Clients) and 22 largest property owners in Finland – measures the returns on direct investments on property. They maintain a database consisting of leases of over 24 000 commercial properties from more than 50 cities, from which rent indices, benchmarking reports for property owners, and market information are derived.

The formula for the total return is as follows:

FINLAND (2)[4]*, ,*
,

$$T = \frac{CV_t - CV_{t-1} - C + NI}{CV_t - 1 + \frac{1}{2}C - \frac{1}{2}NI}$$

Where:
T = total return
CV = Capital value
C = Net ongoing capital expenditure / receipts on standing investments
NI = net rental income
T = year-end
t-1 = year-beginning

The total return is calculated as the sum of capital growth and net income, expressed as a percentage of capital employed during the year. The formula assumes continuous rental income and the net income is derived from rents receivable during the year, net of property-specific operating costs.

[4] This formula is also used in France, Germany and the Netherlands.

3.4.3 France

In France, the most used valuation method to assess investment properties is the capitalization method, which is often used combined with the comparable sales method (Bardouil & Malaquin, 1996).

The determination of yield is influenced both by the property and the financial markets. Valuers relate their choice of yield to rates of return on traditionally safe investments, such as bonds. If possible, they analyze transactions of comparables, which help them ascertain the appropriate level of yield (location, type, characteristics, rental prospects, and lease covenants). In most valuations, all the risks inherent to the property are reflected in the yield. French valuers usually apply four different yields, depending on the perspective of rents; gross or net (Bardouil & Malaquin, 1996):

Gross initial yield (GIY) on gross passing rent

GIY = gross rent passing / CV , where CV = capital value

Net initial yield (NIY) on gross passing rent

NIY = gross passing rent / (CV + purchaser's costs)

Net initial yield on net passing rent

NIY = net rent passing / (CV + purchaser's costs)

Net initial yield on estimated rental value (ERV)

NIY = ERV / (CV + purchaser's costs)

It is important to remark that the DCF method is not often used due to the fact that valuation assumptions are implicit rather than explicit in France (Bardouil & Malaquin, 1996).

The total return formula applied in the IPD French Property Index is the same used in the KTI Finnish Index and publishes measures of return on capital employed on standing investments. The latter means properties held from one annual valuation to the next and management, valuation and accounting records are collected directly from investors. To construct the French property index, more than 90 percent of the properties were assessed by external valuers that used a combination of comparable sales, income approach and DCF methods.

3.4.4 Germany

In Germany, valuers may use three different methods to assess the market value of a property (Downie *et al*., 1996).

1. the capital comparison method
2. the investment income method
3. the depreciated replacement cost method

The valuer is instructed to use at least two of these methods, depending on the type of property assessed.

The yield, which is calculated out of the investment income method, depends on two variables: the land value taken from comparable transactions and the capitalized net income attributable to the building. The investment income method can be modelled in two ways:

a) Yearly income attributable to the building capitalized for its useful life at *p%* plus the land value

$$= (I_T - pV_L)\frac{(1+p)^n - 1}{(1+p)^n p} + V_L$$

b) Total yearly income capitalized for the useful life of the building at *p%* plus the land value deferred *n* years at *p%*

$$= I_T \frac{(1+p)^n - 1}{(1+p)^n p} + \frac{V_L}{(1+p)^n}$$

Where, I_T = total net annual income
$I_T - pV_L$ = net income attributable to the building
V_L = land value from the land value plan
p = real property interest rate
n = remaining useful life of building, in years

In order to compute the net income attributable to the building, the real property interest rate, *p%*, is required. The latter can be derived from analyzing sales of let properties or by aggregate data on such sales, produced by the Board of Expert Valuers (Gutachterausschuß).

The German property yields are usually published in market reports, either from the Board of Expert Valuers or from property agents and consultants. When a yield range is published, the valuer should take into account that market changes may have occurred since the time of publication of the report.

The yearly gross income had to be derived from the market in case the rent paid differs from the market rent; the gross income relies on sustainable rent. If the rent is higher than the market rent, one should not take it into account, as it is not sustainable. In case the rent received and the market rent cannot be broken up with a reasonable period of time, the investment income method has to be adjusted to reflect these differences in order to calculate the market value (Downie *et al*., 1996).

The DIX/IPD German property index covers the total value of properties included in the DID Databank. In 2002, it totalled 48 billion euros. The total value of investment property stock in Germany is estimated to be around 265 billion euros. The Databank represents 42 percent of the institutional market and the Index over 30 percent (DIX/IPD 2002).

The DIX property index started in 1995 when all participating investors agreed to value properties in an annual basis, in accordance to the investment income method. The index return formula is the same applied in both Finnish and French indices. However, the German formula also includes the impact of transactions and developments, "adding net capital inflows from transactions and developments to the top line (or subtracting net capital outflows from it), and adding half of capital expenditure on developments to the bottom line, plus total purchase expenditure including costs, minus the total start-year capital value of properties sold, both money-weighted to month of sale/purchase" (DIX/IPD 2002).

The total return is derived from the sum of capital growth and net income, expressed in relation to the capital employed during the year. It is assumed that all rental income is equally distributed throughout the year. The net income is calculated from rents receivable during the year, net of property-specific operating costs. The latter are property tax, insurance premia, property management and maintenance fees, fitting out and letting costs. Capital growth is the annual rate of change for consistent sets of properties. Reversionary yield is the ratio of sustainable rent to net capital value, while initial yield is the ratio of rent passing to net capital value.

3.4.5 The Netherlands

In the Netherlands five well-known valuation methods can be identified if one considers actual market value, based on whether current or future information is applied. Each method is used as a basis for different purposes (Vos & ten Have, 1996).

Actual Information	*Future Information*
Comparative method	Income method (DCF)
Cost method	Profits method
Residual method	

The comparative method, which includes the rental capitalization technique, is the most frequently used approach, while the other methods are applied less often. In the capitalization technique, the conventional method of calculating the actual price of a property with an adjusted cash flow received annually in arrears is expressed as follows (Vos & ten Have, 1996).

$$P_0 = R_0 / p$$

Where, P_0 = actual maket value (capital value)
R_0 = initial net rental market value
$P = k - g$ (k = discount rate or required average rate of return; and g = annual expected average growth rate in rental income

For simplicity purposes, valuers prefer to use initial rental yield, which is the difference between the required rate of return and the growth rate.

As rental contracts usually appear to be fixed for a certain number of years, with periodic rent reviews, rents are not adjusted on a yearly basis; however, a periodic rent review pattern is included. If the period between two rent adjustments is n years then, using the DCF model, the market value can be expressed as follows:

$$P_0 = \frac{R_0}{k - k\,[(1 + g)^n - 1/(1 + k)^n - 1]}$$

Where, n = period between rent reviews

The initial yield, being $P_0 = R_0 / p$ substitution gives:

$$P_0 = k - k\,\frac{(1 + g)^n - 1}{(1 + k)^n - 1}$$

These formulas express the mathematical relationship between the initial yield, the rental and capital growth, and the average total return of property with the value of property estimating by capitalizing the net initial rental value with the help of the *all risks yield*.

The ROZ/IPD Netherlands property index covers the total value of properties included in the ROZ/IPD Databank, accounting for 38.8 billion euros. Public statistics on the total value of the Dutch institutional property market is inexistent, but it is believed that it amounts ca 45 billion euros. Based on this value, the Databank represents around 85 percent of the market. The index return formula is the same as for the Finnish, French and German indices (ROZ/IPD, 2002).

3.4.6 The United States

In the United States, three main valuation methods are used:

- The income approach (direct capitalization and DCF analysis)
- The sales comparison approach
- The cost approach

The dominating method applied to income-producing properties is the income approach. For using this method, the valuer prepares an estimate of applicable revenue and expense items, either for a single year or for a presumed holding period. The first estimate is used in direct capitalization, while the latter is employed in discounted cash flow analysis. Finally, an appropriate capitalization rate or discount rate must be developed for use in the analysis (Gelbtuch, 1997).

For properties with long-term lease contracts in which the level of cash flows is uncertain, appraisers may be willing to value property using the direct capitalization method. This process entails the estimation of a single-year's income and expenses and the application of an *overall capitalization rate*, or *cap rate*, to NOI. Data on overall capitalization rates are readily available, but such data should be used with caution (Gelbtuch, 1997).

For income forecasts, the DCF method is used. Income forecast are usually based on a presumed 10-year holding period. The subject property is valued with the expectation that the investor will receive 10 years of revenue and then sell the property to another investor. This future sale price is called the reversion, and it is derived from applying a capitalization rate to the estimated NOI for the eleventh year. Then, the sale proceeds are discounted to draw an estimate of present value (Gelbtuch, 1997).

For large investments, comparable sales provide a useful check on the results of the income approach. It would be unusual for investors to purchase an income-producing property solely on the basis of its price (Gelbtuch, 1997).

The NCREIF Property Index consists of both equity and leveraged properties, but the leveraged properties are reported on an unleveraged basis. So, the Index is completely unleveraged. The value of the Index is set at 100 at the fourth quarter of 1977. Calculations are based on quarterly returns of individual properties before deduction of asset management fees. Each property's return is weighted by its market value. Income and Capital Appreciation changes are also calculated. The current quarter's return is considered preliminary and subject to adjustment in the subsequent quarter, and previous quarter returns may be slightly adjusted annually as data submission errors are corrected (NCREIF, 2003).

The NCREIF index calculates the following rates of return:

- **Total Return:** includes appreciation (or depreciation), realized capital gain (or loss) and income. It is computed by adding the Income and Capital Appreciation return on a quarterly basis.

- **Income Return:** Measures the portion of total return attributable to each property's net operating income (NOI). It is computed by dividing the NOI by the average quarterly investment.

  Income Return Formula:

$$\frac{\text{NOI}}{\text{Beginning Market Value} + 1/2\ \text{Capital Improvements} - 1/2\ \text{Partial Sales} - 1/3\ \text{NOI}}$$

- **Capital Appreciation Return:** measures the change in market value adjusted for any capital improvements/expenditures and partial sales divided by the average quarterly investment.

  Capital Appreciation Return Formula:

$$\frac{(\text{Ending Market Value} - \text{Beginning Market Value}) + \text{Partial Sales} - \text{Capital Improvements}}{\text{Beginning Market Value} + 1/2\ \text{Capital Improvements} - 1/2\ \text{Partial Sales} - 1/3\ \text{NOI}}$$

- **Annual and Annualized Returns:** are computed by chain linking quarterly rates of return to produce time-weighted rates of return for the annual and annualized periods under study. For time periods beyond one year, the annualized returns are expressed as an average (geometric) return per year.

- **Quartile Ranges:** the distribution of annual total returns and annual total property type returns is characterized by calculating quartiles and percentiles. The lower quartile break is the property return in the Index such that one-fourth of the property returns in the Index are below it; the upper quartile break is the return in the Index such that three-fourths of the property returns in the Index are below it (or alternatively) such that one-fourth of the property returns in the Index posted higher returns.

- **Mean and Median Returns:** the median is the exact midpoint of the distribution whereby one-half of the properties have a better return and the other half a poorer return. The mean is the equal weighted arithmetic average of returns determined by summing the one-year returns and dividing by the number of properties in the Index.

3.4.7 The United Kingdom

There are five main methods of valuation in the United Kingdom (Mackmin, 1997):

- Comparison method
- Income or investment approach
- Contractor's cost method (for properties not normally bought or sold)
- Profits method (for properties normally bought and sold)
- Residual or development

The income capitalization approach is the preferred market approach for income-properties, given good market evidence for rents and sale prices. Income divided by yield (capitalization rate) produces an estimation of market value (Mackmin, 1997).

In this simple method, the yield, or all risks yield rate, is the market capitalization rate derived from the analysis of sales of comparables. The valuer uses market experience to adjust the ARY for differences between market evidence and the subject property (Mackmin, 1997).

When property is current let at a rent below market rent, capitalization is performed in two or more parts; the contracted rent and future reversionary benefit are treated as separate trenches of income and the rent is always adjusted for any operational expenses to be paid by the freeholder before capitalization (Mackmin, 1997).

The income capitalization method usually applied an all risks yield to capitalize contracted rents and reversionary benefits assessed in terms of the rents obtainable at the date of valuation. The DCF analysis, in its turn, can follow this practice, adopting a more accurate assessment of net income and the timing of net income receipts, or it can be developed to incorporate rental growth. Valuers are, nevertheless, reluctant to use DCF techniques, as they are not thought to reflect market behaviour. Valuers are even more reluctant to use DCF analysis linked to future forecasts of rental income, as evidence from the last 10 years showed how volatile the rental market can be over the critical first 10 years of the holding period. For these reasons, the DCF method is primarily used as "a tool of analysis, rather than a method of valuation" (Mackmin, 1997).

The IPD/UK Annual Index measures returns to direct investment in commercial property. The IPD collects valuation figures of individual buildings in complete portfolios directly from investors. All valuations are conducted by valuers that follow RICS valuation guidelines in an annual basis (IPD/UK, 2002).

The total return published on the index is the overall return on capital employed, and is the sum of income return and capital growth on a monthly basis. Yield levels are, however, given at the year-end for properties held as standing investments at year-end. The initial yield is the current net income divided by capital value. The equivalent yield is the rate that discounts the projected cash flow – taking into account all adjustments to rental value through review or expiry – to the capital value. The yield impact, also

published in the annual results, shows the impact of equivalent yield movements on the capital values of standing investments. It is, thou, different from changes in end-year equivalent yield, which also reflects changes in the composition of samples (IPD/UK, 2002).

3.5 Yield and Bubbles

The maintenance of a healthy and functional financial system is of public interest to any nation. In Sweden, the public interest regarding the financial system is mainly concerned with the banking and real estate sectors. The first is the one that provides the means of payment in the financial system while the second is the main driver of financial loans provided by the first, as the great part of lent capital is directed to the property market. In few words, both sectors are dependent on each other.

The bank crisis of the 1990's was mainly caused by an imbalance in the property market. It was recorded that 44% of the loan losses were related to property (Blåvarg, 2003). Therefore, the concern of the Swedish Central Bank (Sveriges Riksbank) in controlling for achieving financial stability through implementing regulations, supervising individual institutions (preventive controls) and doing crisis management, focus on both banking and property sectors.

Commercial properties are of special concern to the Swedish government as most of the losses during the property cries came from this sector. In order to analyze the country's financial stability, variables such as price, rents, vacancies, as well as supply and demand factors related to commercial properties, are taken into consideration. A crucial issues is to find what might be called "bubble indicators". A bubble is then defined as a situation where the price of an asset does not reflect "fundamentals" on the market, e.g. through too optimistic beliefs of investors that expected future higher prices or net operating incomes justify today's high price (Stiglitz, 1990).

The central bank has worked with two different bubble indicators. The first is the *income return* and the idea is that if the income return is "low" in relation to the return on government bonds it indicates that the market expect that property prices will go up. If the income return is low, it means that property prices are increasing independently from what income is being generated by properties. This relationship is visualized as follows:

$$Income\ return = \frac{Net\ Income}{Transaction\ Price}$$

Following the development of the gap between the income return on commercial properties and the return of secure bonds, then can give warning signals that maybe the market prices on properties are too high and might fall soon. In chapter 5 we will return

to a discussion about the actual development of yields on the Swedish property in recent years.

The second indicator used by the Swedish Riksbank is the gross income multiplier. Björklund and Söderberg (1999) suggest that although macroeconomic variables influence property price – i.e., interest rate, unemployment rate, gross domestic product etc. –, they do not affect it directly, but through influencing the "real" property price fundamentals, that are:

- *Income*;
- *Income growth;* and
- *Required rate of return*.

Thus, Björklund and Söderberg (1999) propose that the *Gross Income Multiplier* (*GIM*) could be a helpful tool[5] for identifying various phases of the property cycle. For a better visualization, the GIM can be expressed as:

$$GIM = \frac{Transaction\ Price}{Gross\ Income}$$

The interpretation of whether bubbles exist or not in the property market, one should look at income and price. If both are affected in relative equal proportion as the cycle progresses, the GIM should remain unchanged. On the other hand, if the GIM varies over the cycle together with price, then one can infer that a possibility of a bubble exists (Björklund and Söderberg, 1999). In other words, there would be no reason for prices to vary if income is kept nearly unchanged. It would, then, signify that growing prices could be a reflection of expected future income growth, and this could be a warning signal that price is not based on rational fundamentals.

The Swedish Riksbank is also following the development of property related lending to households. As lending to households represented 40% of the bank lending in 2002 against 37%, 18% and 5% to non-financial companies, to property companies and to other lendings, respectively, the interest that the Swedish government has to analyzing price movements of residential property is big. According to Blåvarg (2003), the factors that most influence price shifts on that type of property are: the real interest rate (after tax), the disposable income, and the share price index.

Identifying bubbles in the prices of single-family houses are even more difficult than identifying bubbles on the commercial market. This can be seen in the current debate (see e.g. Economist 2003 and Krainer 2003) whether there is a bubble on the residential market or not. A number of different bubble indicators has been presented but also criticized, e.g.

[5] They encourage further research on other property rates, such as the *Net Income Multiplier* (*NIM*) and the *Equity Yield Rate*, that can equally show the price-income relationship.

- *House prices in relation to household incomes*. An increase in this relation might however be related to lower interest rates.
- *House prices in relation to rent levels*. An increase in this relation might however be related to differences in how quick prices vs rents adjust to lower interest rates.
- *Interest payments in relation to household incomes*. Even if this quota does not rise it might be the case that people are paying too much, e.g. if households to a higher extent is using short-run finance with lower interest rates or if inflation is falling so a constant quota indicates that the "real" burden of the loans increases in a long run perspective.

3.6 Concluding comments

Yields, and especially income returns, are used in a number of different contexts and the context affect what is a "good" interpretation of the concept. Here are some examples.

Valuation. If income returns or initial yields observed on the market are used directly to value properties, the important thing is to find something that is *stable between different transacted properties*. Using a "normalized"/"market adjusted" net operating income might in this case be motivated as the relation between this kind of NOI and the expected price on the market might be more stable than the relation between actual NOI and price. A typical example is where two properties have the same actual NOI, but where the rental contract expires soon on one of the properties and that a much higher rent is expected in the new contract.

Benchmark. From a benchmark perspective the key issues are standardization, transparency and than the figures cannot be manipulated. The kind of adjustments that can be rational from a valuation perspective, can be very questionable and dangerous from a benchmark perspective. If "normalized" returns instead of actual returns are presented, then overoptimistic expectations about future development can affect also the income return presented. The recent accounting scandals of e.g. Enron and Worldcom also show that "actual returns" are far from easy to measure. This has further underlined the need for standardization and transparency.

Bubble indicator: If yields and income returns are used as a bubble indicator, the need for a transparent concept that is difficult to manipulate is even bigger. One argument from the Swedish Riksbank for focusing on the gross income multiplier instead of the income return is that the GIM is less dependent on questionable measurements, e.g. concerning what is a cost and what is an investment. The GIM is more difficult to manipulate than the income return.

4 THEORIES ABOUT THE DETERMINANTS OF YIELDS

Dubben and Sayce (1991) enumerate some factors that determine the yield levels in the property market. It is important to bear in mind that differences between property yields are dependant upon the type of property they are related to.

The following are the determinants of property yield levels described by Dubben and Sayce (1991):

- Prospects for rental growth;
- Investment quality;
- Development/refurbishment potential;
- Risk; and
- Comparative returns.

But before analyzing each factor that affects the movement of property yields, it is useful to understand yield gaps between property and other competing financial instruments, named bonds (or gilts for the UK market) and company equity shares. Dubben and Sayce (1991) discuss the following points:

- Investments fixed in money terms become unattractive in an inflationary economy if compared with those in which income growth can be achieved;

- Based on the above affirmative, as gilts become less attractive, prices fall forcing yields to rise; and

- Many investors require a higher overall return from investment in equities and properties than they do for gilts, due to the perceived risk attached to the former assets.

Prospects for Rental Growth

The prospects of obtaining rental growth will determine very largely the level of attraction to investors and, consequently, the *initial yield* of any particular property. To clarify its relation, an example is given (Dubben and Sayce, 1991).

If two properties have just been let at SEK 100,000 per annum with the rents fixed for the next five years, in the next time rent reviews take place, it will be based on the open rental market value. Property A is expected to achieve a rental growth of 10% p.a., and Property B only 2%. If the growth targets are achieved within the five years frame, Property A will have a rental value of SEK100,000 compounded at the rate of 10 percent per annum, which is:

$$\text{SEK100,000} \times (1{,}1)^5 = \text{SEK100,000} \times 1.61051 = \text{SEK161,051}$$

On the other hand, Property B will have a rental value in five year's time of:

$$SEK100,000 \times (1,02)^5 = SEK100,000 \times 1.1041 = SEK110,410$$

If one makes an assumption that both properties will be sold under the period of rent review at the same all risks yield, say 8%, then Property A would sell at approximately SEK2,000,000 while Property B at only SEK1,300,000.

With this unrealistic example, one can see how the level of rental growth can affect the amount that a property is worth to an investor. A property with continuing prospects for rental growth will sell on the basis of a lower yield in order to reflect its inherent growth potential.

Investment Quality

The words "prime" and "secondary" are used to describe the overall quality of an investment. Low yields are attached to investments that are considered to be prime since it requires higher demands for potential purchasers. On the other hand, highest yields are usually related to secondary properties that, although are less attractive to institutional investors, they are still important means to alternative investments (Dubben and Sayce, 1991). Prime investments can be considered in terms of:

- *Location*: as far as yields are concerned, certain locations are regarded as prime, i.e. the level of tenant demand is high and is likely to remain so. However, what is considered a good location may change over time due to factors such as new adjoining developments, population migration, employment trends and changes in transport patterns;
- *Sector*: the utility of a property is one of the most important factors that affect the yield that is achievable. This relation is based on the differing levels of rental growth that is also a product of underlying economic conditions.
- *Structure*: the physical state of a property combined with its susceptibility to obsolescence will have an impact on yield patterns. If a property requires substantial sums of money to its maintenance or repair, the costs of ownership or occupation and management will increase, which reduces purchaser attraction, leading to higher yields.
- *Tenure*: restrictive terms on lease contracts, such as the restriction on use enjoyment or redevelopment, will push up yield rates.. The same happens if the landlord retains liability for the costs of repairing and maintaining the building, when necessary deductions need to be made from the rental flow.
- *Covenant*: it is possibly the most important factor. As the occupier is the one that creates income flows and, hence, creates the value, the quality of the covenant is of important consideration. A good property let to a first class covenant will sell on a lower yield than a comparable property whose tenant is not of the same caliber.

Development/Refurbishment Potential

Even if during the change of property ownership prices are based on the property *use value*, properties that present a potential for total redevelopment or refurbishment will play a role in their price determination. For such cases, the initial yield at which the transaction is concluded may bear little or no relationship to the income passing or, as a matter of fact, the full rental value of the property in its existing use and structure (Dubben and Sayce, 1991).

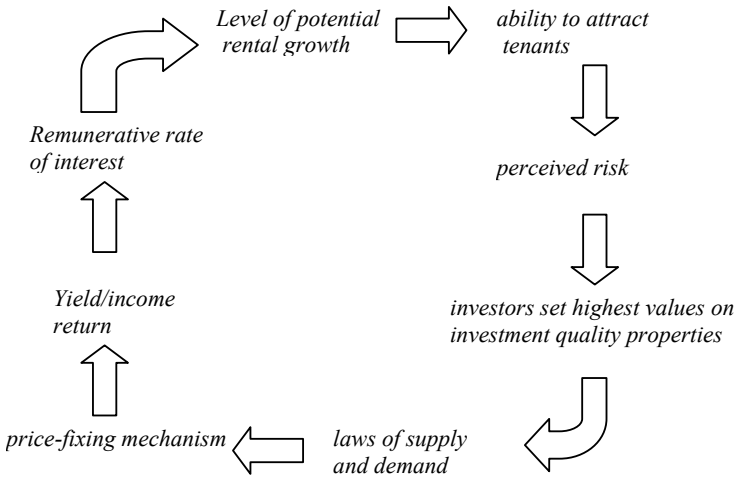
Risk

In the property sector, those properties that are generally regarded as low risk, such as prime retail properties, present the lowest yields. Over time, perceptions of risk may change and so, the pattern of yields.

Comparative Returns

In order to make a good investment decision, investors should not only look at returns and risks related to a property but also compare returns among other financial assets.

Summing up the determinants of property yields, we have:



In trying to identify yield levels, Sivitanides *et al*. (2003) found two major issues:

1. The "type" of yield represented by the data; and
2. The accuracy of the data.

There exist two broader types of yields (Sivitanides *et al*., 2003):

a. Appraisal-based yields calculated on the basis of appraised value, as opposed to transaction price, and the net operating income of the subject property; and

b. Transaction-based yields that are derived using prices of properties involved in completed transactions and their net operating income.

According to Sivitanides *et al*. (2003), all types of yield data suffer from accuracy issues, to some degree, due to the quality-mix[6] of the specific properties involved in the yield estimates and the type of NOI measure underlying the yield calculations for each property. An accurate index of yield movements should refer to samples that are exactly identical through time in terms of quality-mix characteristics. It is difficult, however, to collect such information due to the following (Sivitanides *et al*., 2003):

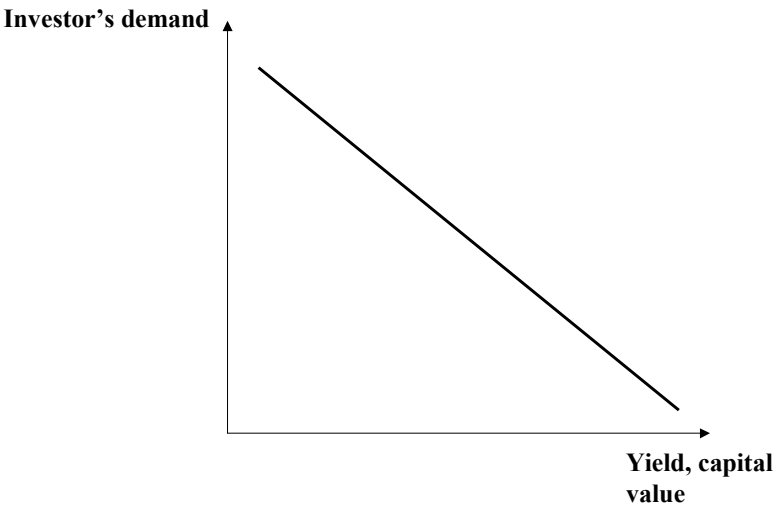
- High heterogeneity across individual properties
- Scarcity of property transactions
- Varying quality of properties actually transacted at different points in time

Another accuracy issue is raised regarding the NOI measure associated with estimated or reported yields. The NOI measure can be referred to as the year's net operating income or to a "stabilized" net operating income, which reflects the average of the projected NOI stream over the investor's holding period. These two NOI measures could lead to extremely different yield rates estimates, and depending on which measure is the basis of each period's calculations, they could introduce noise in estimates of historical yields series (Sivitanides *et al*., 2003).

These inaccuracies could diminish as the sample used to calculate historical series becomes larger. The reason for that is that "the larger the underlying sample of properties for each period, the more likely it is that random deviations above and below the average – in terms of the quality and the characteristics of the properties involved, as well as the NOI measure underlying the cap rate figures – would cancel out" (Sivitanides *et al*., 2003).

An important aspect of yield measures is that, it is also based on investor's sentiment concerning different types of assets. According to the UK Property Report (August 2003), published by ING Real Estate, it remains a "significant arbitrage between property yields and interest rates". In other words, property yields continued to be slightly decreasing even though rental values are falling; yields should be going up, not down. One cause to that would be that many investors are chasing property, but sellers are very few; what leads to a repricing of property.

[6] Sivitanides *et al.* (2003) relate quality-mix to as the quality, lease-rollover and degree of market "exposure" of the properties in the sample for which yield data are available.



Source: Ball et al. (1998).
Figure 4.1 *Relation between investor's demand and property yield.*

Investor's demand for property tends to move yields more than any other economic fundamental. The higher the investor's demand, the lower the yield, due to the reduction in the risk premium (Ball *et al*., 1998).

Another expectation for the British property market is that property yields will not be sustained by general price inflation any longer. If the long-term nominal return from property is 12 percent per annum, it cannot be achieved if inflation is only 2 or 3 percent. In this case, investors should be more concerned with real returns. If income return is around 6.5 or 6.75 percent per annum and one adds an inflation rate to that, say, 2 percent, then this would provide a return of around 8.5 percent. Adding an estimated reversionary potential of the property minus depreciation, investors would get about 8 to 9 percent. The expectation is, then, that investors are accepting lower rates of return and are, therefore, bidding yields down further (ING Real Estate, 2003).

In the table below the determinants of yields in a number of empirical studies are summarized. The factors presented can be divided into three groups:
1. "Direct" determinants in term of rate of return on alternative investments and expectations of future net operating income.
2. Property related factors: type and location. These will differ in terms of expectations of future income and also in terms of risk level.
3. Macroeconomic factors: that can affect both return on alternative investment, risk levels and expectations concerning net operating incomes.

Papers/Component	Return on alternative investments	Expected (real) development of NOI	Type of property	Property Location	Valuation method	Macro-economic factors
Ambrose & Nourse (1993)	X		X			X
Jud & Wrinkler (1995)	X					
Hendershott & Turner (1997)		X	X	X		
Sivitanides et al. (2001)	X	X				
Hendershott & MacGregor (2003)	X	X				
Berglund & Lundgren (2001)		X			X	
Sivitanides et al. (2003)		X	X	X	X	
Lundström (2000)	X	X				X
Kishore (1996)	X					
McGough & Tsolacos (2001)	X	X				
Cieleback (2003)						X
Gunnelin et al. (2003)		X	X	X		

Table 4.1 *Categorizing the literature on yield determinants.*

5 YIELDS IN SWEDEN

5.1 Introduction

According to the recommendations of the Swedish Association of Financial Analysts' (Finansanalytikerna, 2003), the real estate yield should be represented by the percentage of *operational surpluses*. In other words, the yield should be the percentage of *rental income* minus *operating costs* for the calculation period.The *rental income* calculation should not include rental values for vacant areas and expected rental value changes that are caused by increases in the property index, renegotiation of rental contracts, exchange of tenants, or by new lettings. The *operating costs* calculation must include accounted costs for real estate management that include maintenance costs, adjustment costs for tenants with specific needs, perpetual ground rent, and property tax (Finansanalytikerna, 2003).

"Pro forma" yields are used when properties are acquired or sold through huge transactions during a certain calculation period and, thus, its value is provided in advance of the following calculation period (Finansanalytikerna, 2003).

Three rates of return, or yield assumptions, are used in discounting valuation methods:

- Initial yield (or "Going in cap rate", in American usage)
- Discount rate
- Exit yield (or "Exit cap rate", in American usage)

Do these rates adequately represent market expectations for real estate in the Swedish market? Do these rates reflect investor's return expectations?

The *exit yield,* which is used to determine the property's *exit value* in a time frame of five to ten years, should be based on market characteristics, such as property location, expected market trends and property's economic life cycle. In the appraisal of the *exit value*, *rental fees* should not be included (SFI/IPD, 2003).

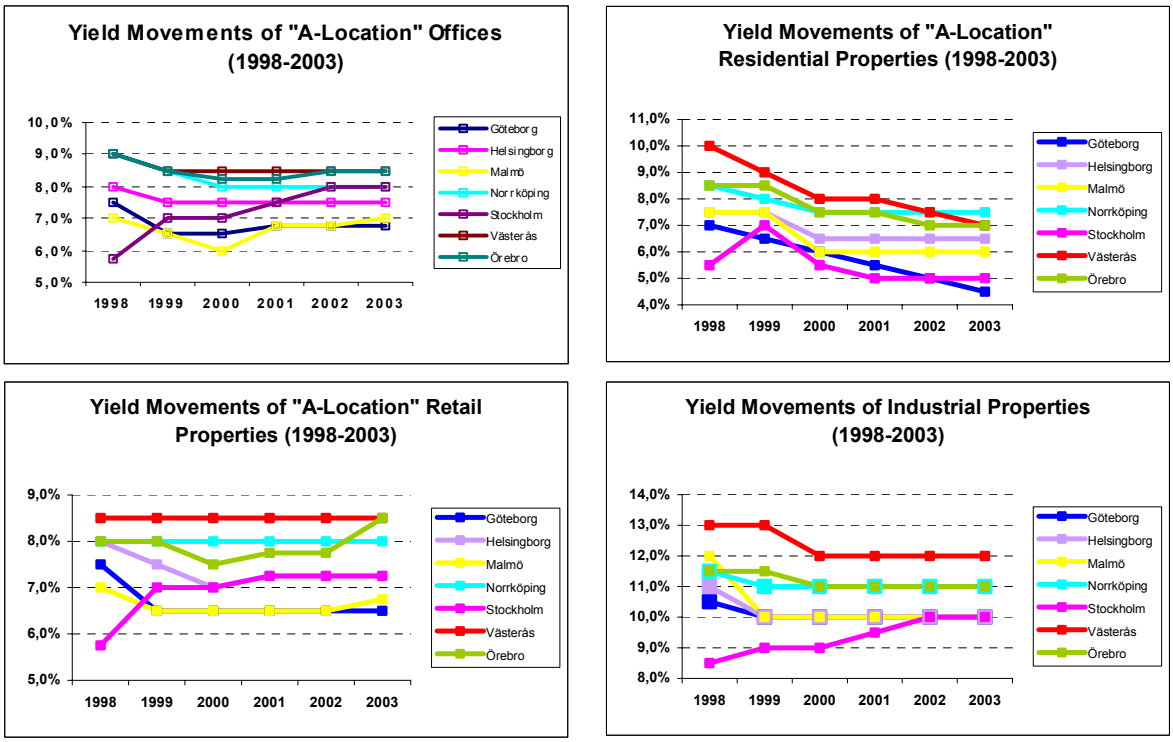
According to Gustafsson (2003), the exit yield published in the Swedish Property Index cannot be used as a benchmark since it is not based on any calculation made by the Swedish Property Index company; it is simply secondary data produced by the index' participating companies. The only measure related to yields published in the Index that can be applied as a form of benchmark, is the *total return* (*totalavkastning*).

In the following sections we will look at how yields have developed in Sweden in recent years with a special focus on the relation between changes in yields and the business cycle. Has the yields developed in the way we should expect according to the theories?

5.2 *Data from "The Property Indicator" and SFI/IPD Swedish Property Index*

There are two sources of information about income returns in Sweden. One is the so-called Property Indicator, primarily based on material/judgments from local appraisers. The second source is the SFI/IPD Swedish Property Index where the calculation are based on data about net operating incomes and appraised values from the participating firms.

The data presented in Figure 5.1 comes from the Property Indicator. It can be seen from the figure that there is a big difference between yields relating to property of different types, with especially high yields on industrial properties. However, it can be seen from the graphs that the yields of all property types tended to decrease from 1998 to 1999 and after that, they have been rather stable in the last four years for the main Swedish cities, with exception to some regional markets. According to these indicators, the residential market is the one that most faced yield rates decline. One important explanation of this is that values have increased because of the opportunity to convert rental housing to condominium. The yield figures for the office market declined, in general, from 1998 to 1999 but rose again in the following two years, being rather stable since 2001. The retail market, on the other hand, rose in Stockholm in the same period the other market yields declined.



Source: Svensk Fastighetsindikator, Fastighets Världen.
Figure 5.1 *Yield Movements of Commercial Property in Seven Swedish Cities.*

If one compares the above figure with the *income return* (*direktavkastning*) produced by the SFI/IPD Swedish Property Index for the last six years, considerable differences will be found. However, it is important to consider in its analysis that the yields published on the Swedish Property Indicator (Svensk Fastighetsindikator) are figures estimated from *sales price information*, while the ones produced by the Swedish Property Index are based on the following formula:

$$D\% = \frac{\sum D_i}{\sum_i (MV_{i0} + 0{,}5I_i + - 0{,}5D_i)}$$

Where, D% = Income return, %
i = Property number in the portfolio
D = Real net income receivable incl. interest subsidies as reported in the accounts for the year, SEK
MV_{i0} = Assessed Market value of property at the beginning of year, SEK
I = Capital expenditure, SEK

The SFI/IPD Swedish Property Index show the following figures for the income return during the last seven years.

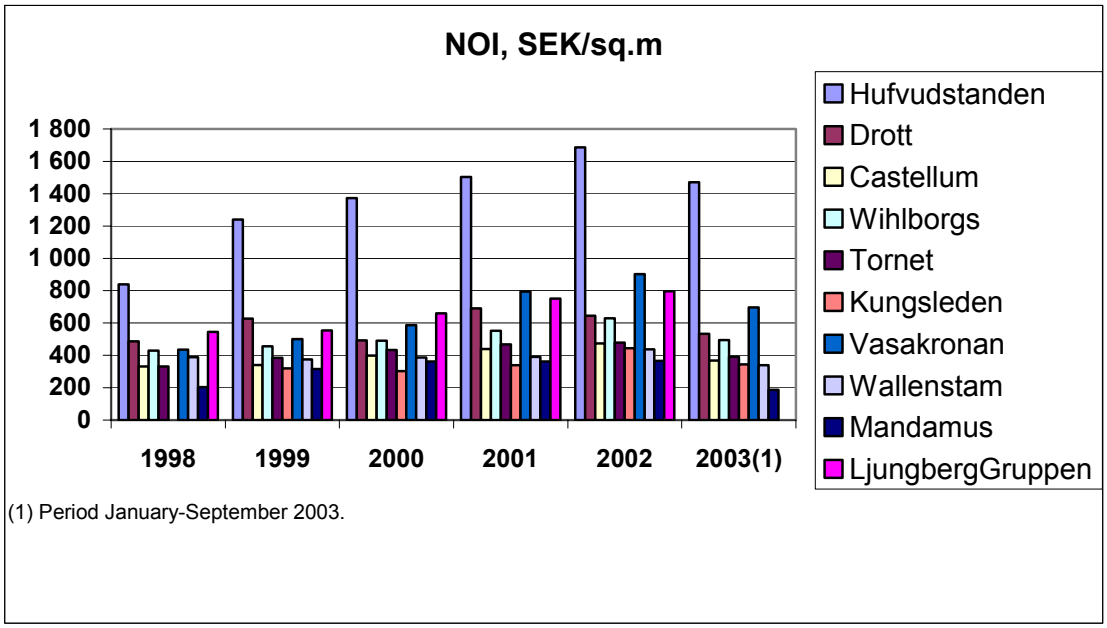
	1997	1998	1999	2000	2001	2002	2003
Retail	6.4	6.5	5.9	5.9	5.8	5.6	5.6
Office	6.8	6.7	6.3	5.8	5.6	5.9	5.9
Industrial	7.7	8.2	7.6	6.7	7.4	7.5	7.4
Residential	7.4	6.7	6.8	5.9	5.6	5.0	4.7
All Property	6.9	6.8	6.4	5.9	5.7	5.8	5.8

Source: SFI/IPD Swedish Property Index (2004).
Figure 5.2 *Income returns as annual percentages.*

In contrast to the results of the Swedish Property Indicator the income return or yield figures shown above are declining in the last four years, the main being the industrial sectors that have increased in the last years.

In order to better understand the yield behaviour, one should look at its components: net operating income and the market value.

We have analyzed the net operating income per square meters of the ten largest Swedish real estate companies, published in their respective annual reports since 1998. This is presented in the table below. (The details can be found in appendix 2).



Source: Annual reports
Table 5.1 The development of net operating income.

The NOI of all companies have increased until some time in 2002.[7] The vacancies have increased dramatically in the large Stockholm region, and the net operating income should be expected to fall in the coming years, especially when the contracts entered at high rent levels in 1999-2000 expires.

The market values and the book values are presented in tables 5.2 and 5.3. . In a general view, market values tended to increase from 1998 to 2002. So far there has been no dramatic changes in market values even though there his been a clear decline in office demand in some major regions

Market value, M SEK

RE Companies	1998	1999	2000	2001	2002	2003(1)
Hufvudstanden	N/A	N/A	N/A	N/A	N/A	N/A
Drott	21 600	24 800	42 000	39 300	40 200	N/A
Castellum	10 735	12 670	14 500	16 230	17 585	N/A
Wihlborgs	N/A	N/A	21 200	23 500	20 800	N/A
Tornet	14 047	15 700	16 459	16 304	21 380	N/A
Kungsleden	N/A	5 785	7 433	10 495	10 938	N/A
Vasakronan	22 280	27 200	34 193	35 104	34 063	N/A
Wallenstam	7 268	7 441	9 600	10 435	10 596	10 647
Mandamus	5 420	5 900	6 100	6 535	7 070	N/A
LjungbergGruppen	N/A	N/A	N/A	N/A	N/A	N/A

(1) Period January-September 2003.
Source: Annual reports

[7] As the figures for 2003 are until September only, we cannot draw further conclusion from that yet.

Table 5.2 The development of market values.

Book Value, M SEK						
RE Companies	**1998**	**1999**	**2000**	**2001**	**2002**	**2003[1]**
Hufvudstanden	7 086	7 116	10 535	10 563	10 566	10 590
Drott	18 616	25 023	37 287	35 001	35 978	29 228
Castellum	8 695	10 242	11 044	12 176	12 915	13 561
Wihlborgs	19 665	20 391	19 850	21 900	19 900	20 150
Tornet	13 093	14 311	14 278	14 021	19 346	19 217
Kungsleden	N/A	5 229	6 487	9 477	10 130	10 815
Vasakronan	16 508	18 159	19 654	22 244	22 191	24 009
Wallenstam	5 824	5 962	6 388	6 846	7 224	7 317
Mandamus	4 926	5 433	5 432	5 720	5 698	5 492
LjungbergGruppen	2 070	2 201	2 665	2 780	3 060	N/A

[1] Period January-September 2003.

Source: Annual reports

Table 5.3 The development of book values.

If one looks at the book values of properties of the same companies, the same trend seemed to occur.

5.3 Analysis

How should we expect the income return to develop over the business cycle and has the yields on the Swedish market developed as expected?

One way of looking at this is to argue that when net operating income increases during a boom, the market values will increase *less* than the NOI as the NOI can be expected to fall when the business cycle turns down. This means that we should expect that income return increase during the boom. When the NOI falls in a recession property values falls considerably less and the income return falls.

As can be seen from the figures above this is not the way the income return has developed on the Swedish market. There seems to be a tendency for income returns to fall during the cycle, at least according to the figures from the SFI/IPD index, indicating that property values increased more than the NOI. There are several possible explanations of this:

- One explanation is of course that this is a sign of a bubble. The falling income return is then related to an overvaluation of the properties and irrational beliefs that the NOI will continue to increase.
- A second possible explanation is lags in the NOI. When demand increases in the office market in takes time for rents to increase as not all contracts are renewed immediately. The actors on the market can then expect that when the NOI start to increase it will

continue to increase for a number of years, which pushes up market values more than the increase in the current NOI.
- A third possible explanation is that property prices have risen for other reasons than those related to the NOI. An obvious candidate for this is that interest rates have been falling. The downturn on the stock market after the year 2000 can also have let to a reduction in the return demanded on the property market.

The dramatic downturn on the office market in Stockholm in the last two years will lead to a reduction in the NOI in the coming years. One possible scenario is then that market values also will fall considerably as actors on the market demand a rather constant income return. So far market values have been rather stable, and the most probably explanation so far is the entry of large foreign investors that has reduced the rate of return they demand because of the international economic downturn. The coming years will be very interesting to follow, and we should either see rather dramatic reductions in the income return or rather dramatic falls in property values - unless of course the general economic development turns more positive rather rapidly.

6 CONCLUSIONS

As conclusions we would like to underline the following issues:

- Conceptual clarity: A number of different yield terms exist on the market and it is very important to be clear about how the specific terms are defined.

- Operational clarity: There are measurement problems both concerning rental incomes, operating and maintenance costs and property values. This means that reported yields can be "manipulated" by choosing suitable operationalisations and pushing estimations of uncertain factors in directions that are favourable to the actor in question.

- Specify the purpose for which the yield should be used. The most important distinction is between using yields/income returns for valuation purposes and using yields as benchmarks or bubble indicators. In the first case various types of normalization of the net operating income can be rational. In the second case it is important that the figure reflects "actual" incomes and costs, and that the concept is standardized and in such a way that the room for manipulation is small.

- A clear view about how yields/income returns should develop according to different theories, e.g how the relate to the real return on other investments, inflation levels, risks and expectations about the development of the net operating income. Theories can always be questioned but they give a framework that are helpful in getting a perspective on what is happening on a specific market, and evaluate e.g. if property prices develop in a way that could be a bubble on the market.

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APPENDIX 1 – INTERVIEW RESULTS

Introduction

The purpose of the questionnaire was to get an overview of what actors in the market thought about yields (especielly income returns). Is it a clear or useful concept or not? What is it that determines yields? More information about how the respondents were selected and how the interviews were carried out can be found in Karlsson (2003). Twnty persons from leading property firms and real estate consultancies were interviewed.

Difficulties and precision issues in capital value determination

Due to the significant relation between valuation and yields, we have assessed some issues concerning valuation practices.

Precision in valuation and yield are interdependent. The yield figure is often perceived to be an exact figure, while the valuation figure has an error attached to it. In practice the valuation error does directly influence the yield figures. Respondents are aware that there is a degree of uncertainty in the valuation figures. Its magnitude is around 10 percent, but the answer will depend on whether the valuation is for single property or properties in a portfolio, and there might be some differences in interpretation of the question[8]. No respondents said that they have done an analysis or critical assessment of the accuracy.

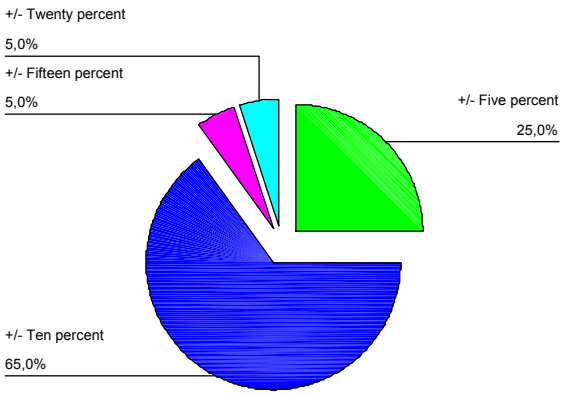


Figure A1: Uncertainty in property valuations

The respondents were asked to select up to five factors they considered to impede a more accurate assessment of property values. The following chart shows the results:

[8] Valuation of the individual property was the aim and some respondents gave two separate figures regarding the accuracy.

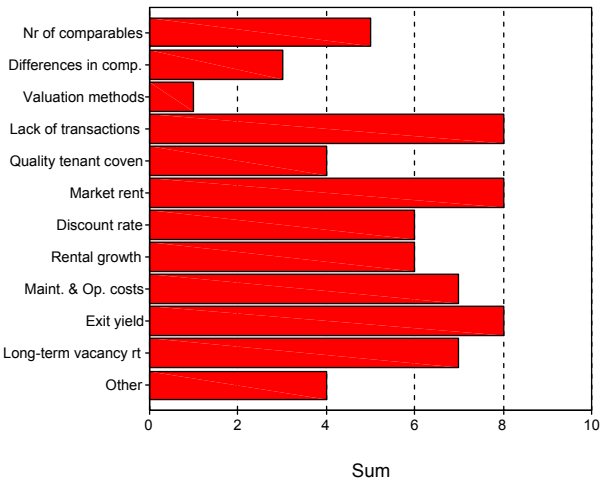


Figure A2: Factors that impede more certain valuations

As the most used valuation method in Sweden is the cash flow analysis, most respondents regarded difficulties in valuations concerning that method. The three main obstacles encountered in applying valuation methods were lack of transactions, market rent, and the exit yield.

The assessment of discount rate is not regarded to be very difficult, but for a cash flow valuation it is an important factor. Some respondents say that the discount rate originates from the yield figure[9]. The frequency of that answer is likely to be greater if the question was asked explicitly about the discount rate.

The market rent and the rental growth are important as expected, since rent is the major determinant of property value. Long-term vacancy rate is also one of the determinants in rental value, together with maintenance and operating costs.

Many respondents mean that even if you are not very good at estimating the costs you can still achieve a 'correct' market value of the property, even though this makes the valuation method less transparent. Furthermore, the majority of the respondents claim that costs are adjusted from valuation to valuation.

The differences between fitting a property out (hyresgästanpassning) and investment costs were also discussed. The majority of respondents seem to agree that the nature of costs depends on the period it is written off. Fitting out is written off during the term of the lease, while investments during the expected life of the property.

Many of the respondents stated that there is no data to estimate a long-term vacancy rate. Undoubtedly, the long-term vacancy rate gives a significant impact on the income for

[9] In the Swedish Property Index Quality Evaluation Report 2003 it is mentioned that some valuation softwares might have an automatic function between discount rate and exit yield.

property. In general the short-term vacancy rate should be turning around the long-term vacancy rate, but respondents also believe valuers tend to be too optimistic.[10]

Those with an educational background as real estate economists and those with a general economic education have different views when it comes to uncertainty in valuations. Real estate economists believe the errors to be around 10 percent and, generally, they do not see problems with valuations. General economists, however, are more sceptical towards valuations and believe uncertainty has a greater role. Many of them prefer models with fewer assumptions and tend therefore to view valuations as a simple formula in which one inputs values. They also believe in the influence of macroeconomic variables.

View of yield as a measure and How to determine yields

The view of the yield as a performance measure differs. Fifty percent of the respondents believe it to be an arbitrary measure, while the other half sees it as a well-worked measure. It is more a personal view of each respondent, and there is no real motivation for the answer. However, they do not fully agree on how it is assessed and what composes it. Many believe it to be based on market evidence and that it includes growth as well as depreciation. Depreciation is then accounted for separately or within the growth figure.

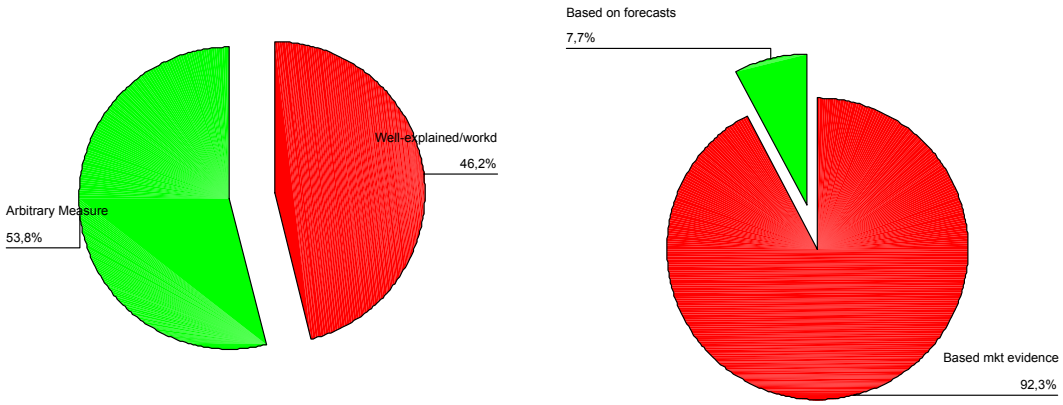


Figure A3: General view on yields

[10] Some respondents say that the difference is natural since it is a part of their strategy.

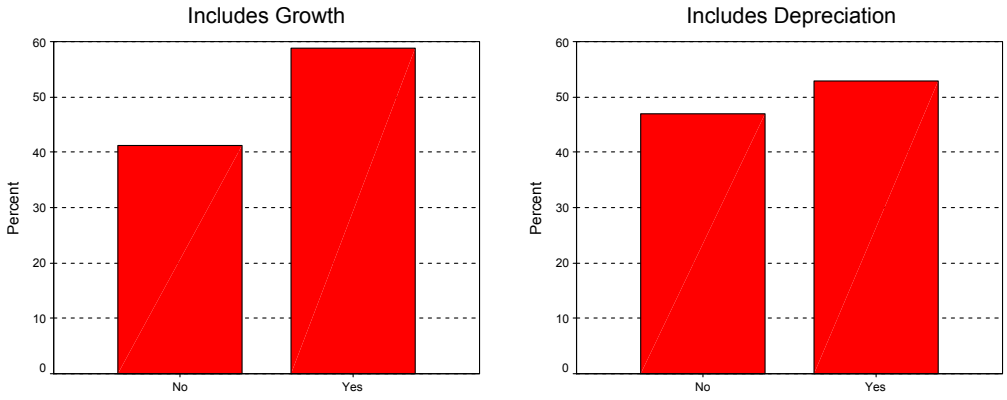


Figure A4: Yields, growth and depreciation

There are two ways for determining yields; either by market evidence or through some kind of model. Most of the respondents uses market evidence, but points out that there are also models for doing yield calculation. The latter is used almost exclusively in conjunction with market evidence.

Figure A4: How yields are determined

The respondents' answer on how the exit yield is determined is not always consistent with how yields in general are assessed. Some agree that there could be a rule of thumb, while others use the same figure as the initial yield. Many stress that it is based on market evidence. Initial and exit yield are sometimes understood as being the same measure as some respondents do not make a distinction between them. There is evidence that, the ones that do usually have a solid background from doing valuations on a daily basis.

Does (exit) yield reflect the risk in property

More than 60 percent of respondents agree that the yield reflects property risk. Usually the discount rate does this, but that is, according to many of the respondents, based on the yield figure adjusted for inflation. The respondents did not always say a clear yes or no from the start. A common answer was that in theory it should reflect the risk premium, but in reality it does not do that fully.

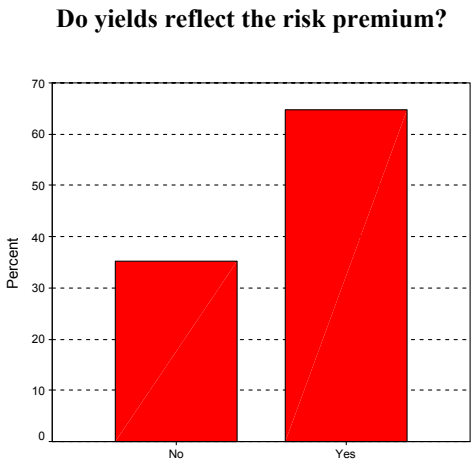


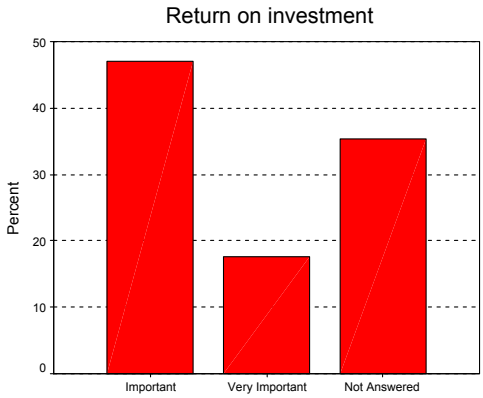
Figure A5: Yields and risk

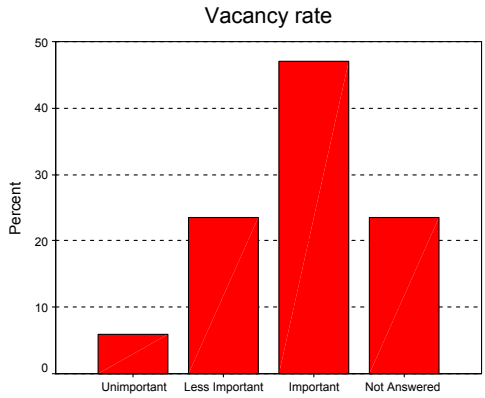
Factors that influence yields

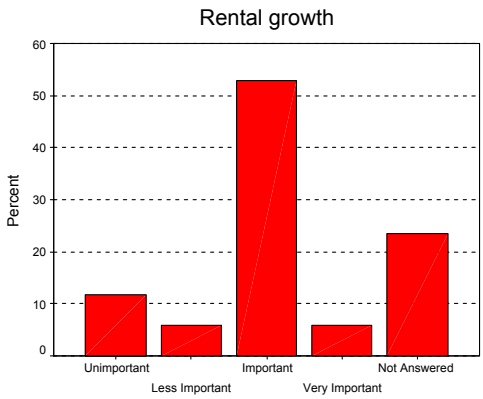
It may not be easy to point out all the factors that influence yields. This may be due to the fact that yields may not be purely based on market information but adjusted by a general feeling about the situation on the market.

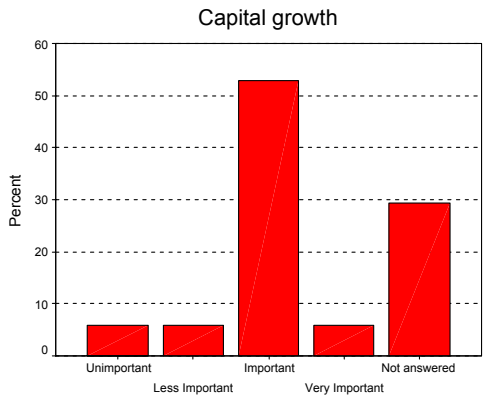
According to respondents, important determinants were return, which usually refers to the owners return on total capital or return on equity[11], rental growth, vacancy rate and capital growth. Many respondents stated vacancy rate to be a relatively unimportant factor. Regarded as also unimportant are inflation and precision in valuation. Most answers are in line with the theories discussed in chapter 4 above.

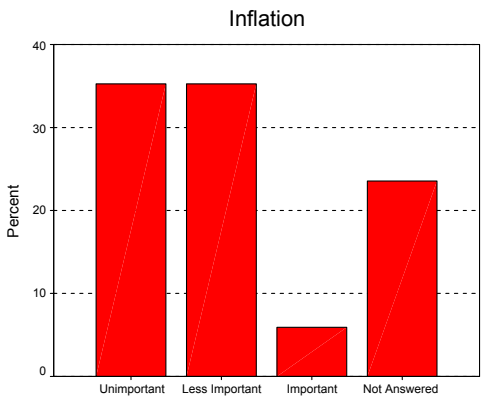
[11] The question was concerned with a return requirement in general set by the owner or shareholders.

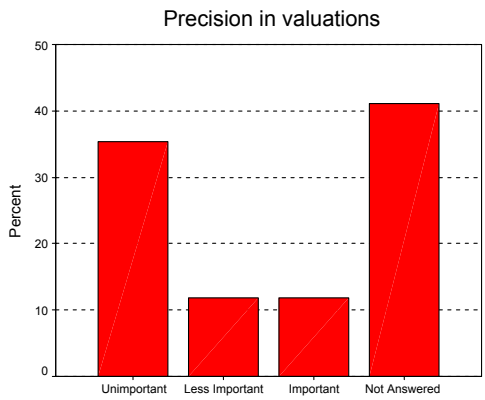

Return on investment
Percent
50
40
30
20
10
0
Important
Very Important
Not Answered


Vacancy rate
Percent
50
40
30
20
10
0
Unimportant
Less Important
Important
Not Answered


Rental growth
Percent
60
50
40
30
20
10
0
Unimportant
Less Important
Important
Very Important
Not Answered


Capital growth
Percent
60
50
40
30
20
10
0
Unimportant
Less Important
Important
Very Important
Not answered


Inflation
Percent
40
30
20
10
0
Unimportant
Less Important
Important
Not Answered


Precision in valuations
Percent
50
40
30
20
10
0
Unimportant
Less Important
Important
Not Answered

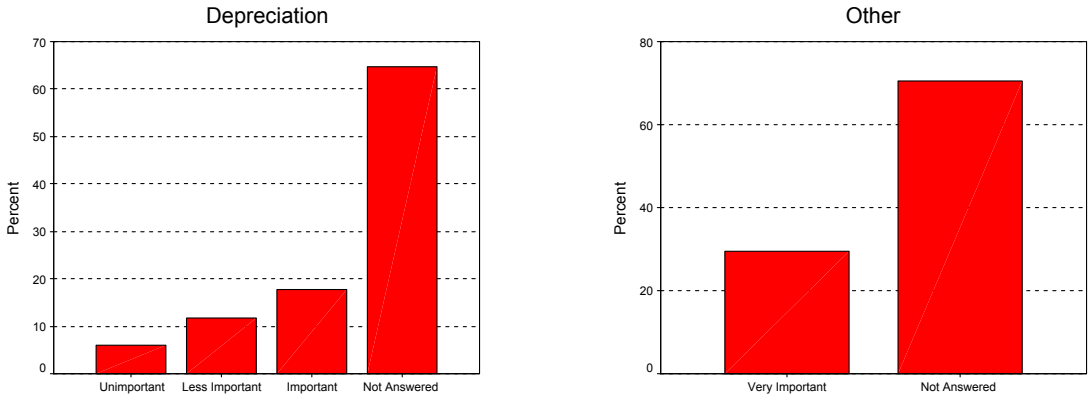


Figure A6: Factors that influence yields

The respondents that came up with alternatives of their own mentioned macroeconomic factors such as GDP growth, unemployment rates, capital supply to property and the economy in general. They also mentioned that property markets in other countries drive local markets. Interest rates, liquidity, property type, tenant covenant/quality of tenant, lease length, location and nominal yields over time were important to consider.

This question was also of the character to test whether yield is used actively. The lack of answers may point to that yield figures just are what they are. The owners set requirements and they have their own benchmark, usually return on equity or total capital. Most respondents agree that the yield demanded is a residual figure that can be calculated when the other requirements are set.

Another influential factor to yields is the capital supply to property, where more money means higher prices and that means lower yields.

The nature of yield (history and future development)

This question refers to the income return development, but it also shows how yield requirement is expected to develop.

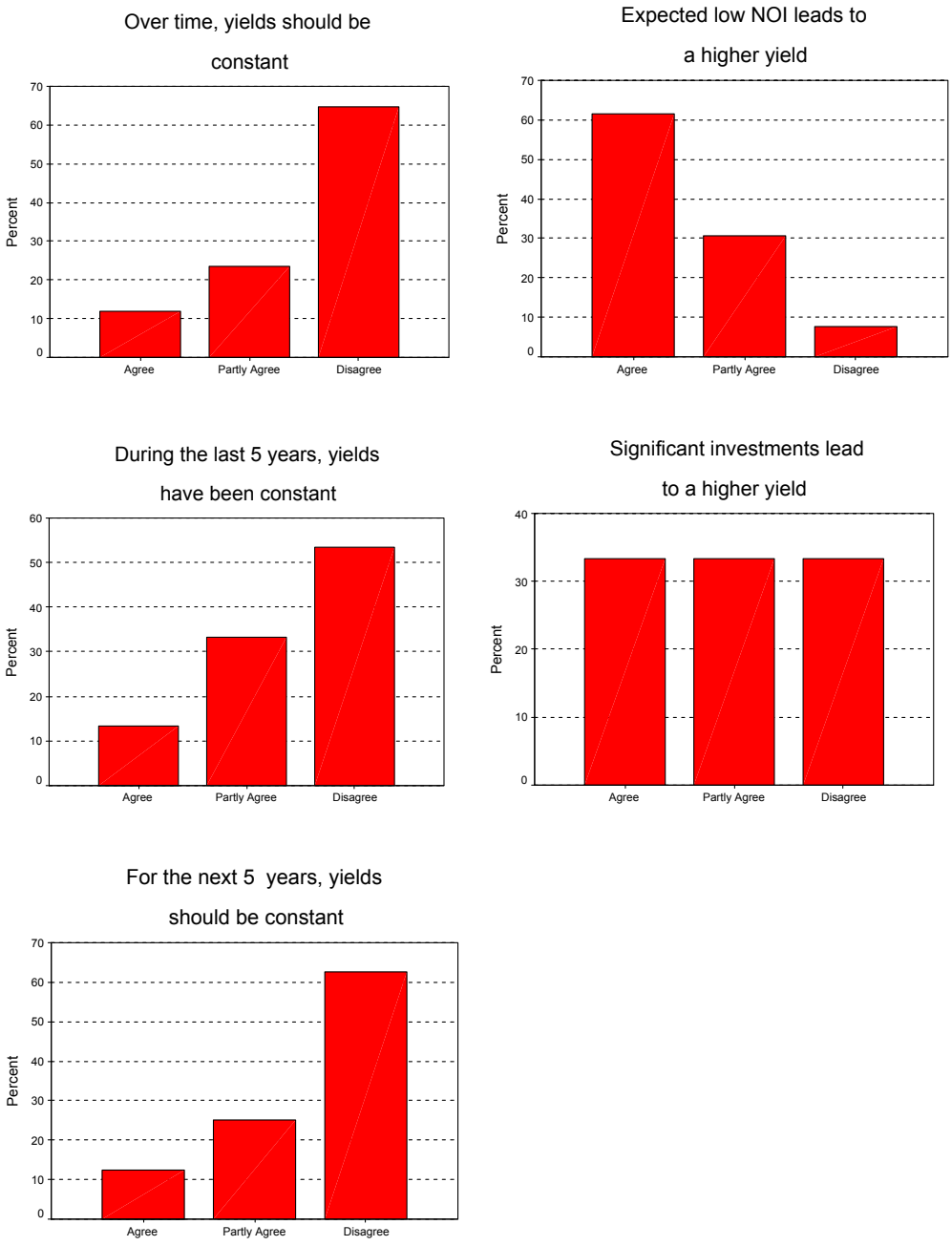


Figure A6: Beliefs about the development of yields

The majority believes that income return and yield have a cyclical behaviour. The first three answers indicate that the income return is shifting around a rather constant trend line.

The fourth question refers to the net operating income. If NOI is expected to decrease, the common reaction is to adjust the yield upwards and, consequently, the value of the property is lowered.

The fifth question relates to whether a property holder will get his money back if he or she does investments or refurbishments. Some respondents believe that investments carry positive returns. Others have a different view; they believe that maintenance costs are usually underestimated and therefore an investment does not fully pay off.

Interviews' overview

It is interesting to note that the respondents' background made a significant difference in assessing each question. In our sample, we have interviewed economists and real estate valuers. Different perspectives for certain questions were also observed on whether companies were listed real estate companies or institutional investors.

From the start it was assumed that all respondents would know about the yield theories, most even in detail. Our impression from the interviews was that this was not actually the case for many respondents. This should be taken into account when the answers are interpreted, and in certain cases the respondents maybe answered some questions the way they thought it "should be" without really having a clear view of the matter.

APPENDIX 2 – RENTAL INCOME AND PROPERTY COSTS

Rental Income and Property Costs in MSEK

Company	Hufvudstanden	Drott	Castellum	Wihlborgs	Tornet	Kungsleden	Vasakronan	Waller
1998								
Rental Income	734	2 439	1 200	2 210	1 693	458	2 042	
Operating, Maintenance & Adm Costs	-173	-836	-441	-733	-734	-207	-871	
Ground Rent	-15	-49	-15	-32	0	-5	0	
Property Tax	-54	-134	-58	-107	-95	-21	-108	
Net Income	**492**	**1 420**	**686**	**1 337**	**865**	**226**	**1 063**	
1999								
Rental Income	866	2 498	1 256	2 194	1 975	718	2 380	
Operating, Maintenance & Adm Costs	-255	-811	-425	-728	-822	-277	-922	
Ground Rent	-18	-50	-15	-33	0	-6	0	
Property Tax	-61	-135	-55	-96	-100	-32	-121	
Net Income	**532**	**1 502**	**761**	**1 337**	**1 053**	**404**	**1 337**	
2000								
Rental Income	1 050	3 416	1 435	2 239	1 969	785	2 662	
Operating, Maintenance & Adm Costs	-331	-1 097	-442	-757	-786	-285	-931	
Ground Rent	-38	-58	-16	-29	0	-8	0	
Property Tax	-91	-182	-55	-91	-94	-31	-154	
Net Income	**590**	**2 079**	**922**	**1 362**	**1 089**	**461**	**1 577**	
2001								
Rental Income	1 135	3 748	1 571	2 076	1 933	1 039	2 725	
Operating, Maintenance & Adm Costs	-347	-1 184	-471	-700	-775	-346	-895	
Ground Rent	-31	-65	-16	-29	0	-10	0	
Property Tax	-103	-191	-57	-86	-83	-45	-163	
Net Income	**654**	**2 308**	**1 027**	**1 261**	**1 075**	**638**	**1 667**	
2002								
Rental Income	1 236	3 634	1 684	2 282	2 367	1 291	2 899	
Operating, Maintenance & Adm Costs	-338	-1 195	-473	-727	-856	-411	-820	
Ground Rent	-33	-68	-15	-36	0	-13	0	
Property Tax	-129	-215	-68	-107	-108	-49	-197	
Net Income	**736**	**2 156**	**1 128**	**1 412**	**1 403**	**818**	**1 882**	
2003[(1)]								
Rental Income	948	2 641	1 310	1 526	1 797	1 033	2 247	
Operating, Maintenance & Adm Costs	-182	-883	-375	-585	-633	-341	-610	
Ground Rent	-25	-47	-11	0	0	-10	0	
Property Tax	-98	-152	-49	0	-88	-35	-156	
Net Income	**642**	**1 559**	**875**	**941**	**1 076**	**647**	**1 481**	

[(1)] Period January-September 2003.

APPENDIX 3 – SWEDISH-ENGLISH GLOSSARY OF PROPERTY YIELDS

Swedish Term	British Term	North American Term
Initialtavkastning	Initial yield	Going-in capitalization rate
Avkastningskrav, direktavkastningskrav	Exit yield, valuation yield	Exit cap rate, terminal capitalization rate
Direktavkastning	Income return	Income return
Totalavkastning, Effektivavkastning	Total return	Total return

Source: Compiled by the author.