

CHAPTER 2

REVIEW OF LITERATURE

CHAPTER 2

TABLE OF CONTENTS

PAGE NO.

2.1	INTRODUCTION	85
2.1.1	Available Literature	86
2.1.2	Structure	86
2.1.3	Approach	87
2.2	IDENTIFICATION AND ANALYSIS OF EXISTING ECONOMETRIC MODELS	88
2.2.1	Introduction	88
2.2.2	Additive Models	88
2.2.3	Quantitative Models	90
2.2.3.1	Miscellaneous Studies	90
2.2.3.2	Dokko et al Study	91
2.2.3.3	Zisler Study	93
2.2.3.4	Jones Lang Wootton Study	94
2.2.4	Summary, Areas For Further Research And Conclusions	
	- Identification And Analysis Of Existing Econometric Models	98
2.2.4.1	Summary	98
2.2.4.2	Areas For Further Research	98
2.2.4.3	Conclusions	99
2.3	REVIEW OF PROPERTY THEORY LITERATURE	99
2.3.1	Overview And Approach To Literature	100
2.3.2	Identified Groups Of Issues	104
2.3.2.1	Alternative Investments	104
2.3.2.2	Building	106
2.3.2.3	Economic Situation	107
2.3.2.4	Growth	107
2.3.2.5	Legal Environment	109
2.3.2.6	Location	109
2.3.2.7	Planning	110
2.3.2.8	Risk	111
2.3.2.9	Sentiment	112
2.3.2.10	Separable Asset Class Characteristics	113

2.3.2.11	State Of The Property Market	114
2.3.2.12	Tenant	114
2.3.2.13	Overlapping Between Identified Groups Of Issues	115
2.3.2.14	Summary, Areas For Further Research And Conclusions	
	- Identified Groups Of Issues	118
2.3.2.14.1	Summary	118
2.3.2.14.2	Areas For Further Research	119
2.3.2.14.3	Conclusions	120
2.3.3	Pilot Studies	121
2.3.4	Evolutionary Issues	125
2.3.5	Summary, Areas For Further Research and Conclusions	
	- Review Of Property Theory Literature	129
2.3.5.1	Summary	129
2.3.5.2	Areas For Further Research	131
2.3.5.3	Conclusions	131
2.4	REVIEW OF FINANCE, COMMERCE AND ECONOMIC THEORY	
	LITERATURE	132
2.4.1	Valuation Approaches To Other Asset Classes	133
2.4.1.1	Earnings And Dividend Valuation Models	133
2.4.1.2	Earnings Multipliers	136
2.4.1.3	Summary - Valuation Approaches For Other	
	Asset Classes	138
2.4.2	g	138
2.4.2.1	Application In The Finance and Commerce Literature	139
2.4.2.1.1	Retention Rate (RR)	140
2.4.2.1.2	Return On Equity (ROE)	140
2.4.2.2	Capital Growth	141
2.4.2.3	Summary- g	142
2.4.3	k	143
2.4.3.1	Conceptual Approach To Risk	144
2.4.3.2	Qualitative Approach To The Risk Premium	146
2.4.3.3	Quantitative Approach To The Risk Premium	147
2.4.3.4	Summary - k	150

2.4.4	Summary, Areas For Further Research And Conclusions	
	- Review Of Finance, Commerce And Economic Theory Literature	152
2.4.4.1	Summary	153
2.4.4.2	Areas For Further Research	153
2.4.4.3	Conclusions	153
2.5	REVIEW OF PROPERTY FINANCE LITERATURE	154
2.5.1	Application Of Valuation Approaches From The Finance, Commerce And Economic Theory Literature To Property	155
2.5.2	g - Application To Property	158
2.5.3	k - Application To Property	161
	2.5.3.1 Qualitative Approaches - Application To Property	163
	2.5.3.2 Quantitative Approaches - Application To Property	163
2.5.4	Summary, Areas For Further Research And Conclusions	
	- Review Of Property Finance Literature	169
	2.5.4.1 Summary	169
	2.5.4.2 Areas For Further Research	170
	2.5.4.3 Conclusions	171
2.6	SUMMARY, AREAS FOR FURTHER RESEARCH AND CONCLUSIONS - REVIEW OF LITERATURE	171
2.6.1	Summary	172
2.6.2	Areas For Further Research	179
2.6.3	Conclusions	179

FIGURES

2.1	Summary Taxonomy	102
2.2	Factors Determining Investors' Yield Requirements and Valuers Capitalisation Rates	103
2.3	Macro Taxonomy	105
2.4	Dodecagon of Micro - Taxonomy Linkages	117

TABLES

2.1	Summary of Results - Jones Lang Wootton (1992A)	96
2.2	Links Between Identified Groups of Issues	116
2.3	Summary of Findings of 1993 Pilot Study	122
2.4	Descending Hierarchical Classification Of Systematic And Idiosyncratic Influences Found In The Property Finance Literature Reviewed	167

APPENDICES

2.1	Micro Taxonomy 1
2.2	Micro Taxonomy 2
2.3	Micro Taxonomy 3
2.4	Micro Taxonomy 4
2.5	Micro Taxonomy 5
2.6	Micro Taxonomy 6
2.7	Micro Taxonomy 7
2.8	Micro Taxonomy 8
2.9	Micro Taxonomy 9
2.10	Micro Taxonomy 10A
2.11	Micro Taxonomy 10B
2.12	Micro Taxonomy 11
2.13	Micro Taxonomy 12

2.1 INTRODUCTION

The previous Chapter sought to review a wide range of issues concerning the capitalisation of income method of valuation, establish the general problem area and identify the particular aspect of the problem to be investigated in this Thesis, which may be restated as follows:

that the current method of capitalisation rate determination is subjectively based, informal, heuristic and lacks a framework which accords with property, finance, commerce and economic theory, so contributing to an unacceptably high level of variability in capitalisation rate adjustment between properties at a point in time.

It was contended that this defined Thesis Problem may be solved by investigating and identifying a more consistent approach to adjustment, between properties at a point in time, which will contribute to a reduction in the variability between valuers in capitalisation rate selection.

Further, it was proposed that the use of an econometric model would ensure objectivity, consistency and formality in such determination and adjustment with such a model being defensible if in accordance with property, finance, commerce and economic theory, so contributing through application to a reduction in the level of variability in capitalisation rate adjustment and selection

A three step approach to the solution of the Thesis Problem was suggested with the first step to comprise a review of literature to :

- identify and analyse existing econometric models; and
- identify and collate, from property, finance, commerce and economic theory, those issues relevant to the determination of the capitalisation rate,

which will be considered as the central and peripheral topic areas, respectively, to be addressed in this Chapter.

Having established the range and nature of such relevant issues, subsequent steps will then consider modelling same and testing the Thesis Hypothesis through the application of the model to ascertain if it solves the Thesis Problem, followed by commentary upon the results, the identification of areas for further research beyond the scope of this Thesis and a summary of the conclusions that may be drawn therefrom.

The review of literature for this Thesis is placed within the context of the vast body of literature available for consideration and evaluation as follows.

2.1.1 Available Literature

The realm of literature reviewed included texts from land economy, valuation, economics, commerce, finance, law, statistics, econometrics and psychology. Relevant material has been sourced from books, journal articles, conference papers, doctoral and other theses, unpublished manuscripts, court documents and private correspondence. The majority of references were accessed in the UK, USA, Canada, South Africa or Australia through university libraries, professional bodys libraries or personal collections with very extensive use of electronic literature searching. The literature review is limited to material sourced prior to 1st January, 1994 (with the exception of several papers by the author which are of direct relevance to this Thesis). The considerable assistance provided by the staff of UTS Markets Library in Sydney is hereby gratefully acknowledged.

2.1.2 Structure

From a perusal of other, recent doctoral theses in the area of land economy, it would appear that two principal approaches to a review of literature have been traditionally pursued, namely:

- a catalogue of all texts relevant to the topic area in chronological order, including a summary of the contents of each; or
- a collation (in a logical order pre-determined by the thesis author) of ideas or comments on particular issues selected from relevant texts.

For the purposes of this Thesis, the latter alternative is considered to be, arguably, the more appropriate. It is inherent in the adoption of such an approach that the majority of the vast body of literature considered is ultimately not cited specifically within the review of literature, though the contents of such works are highly influential upon both the structure of and approach to such a review.

Accordingly, those texts to which specific reference is given below are collated at the end of this Chapter as 'References' and a comprehensive summary of all the relevant literature considered is provided in the Bibliography.

2.1.3 Approach

The following review of literature has been through numerous editions and has finally been resolved into the following central and three peripheral topic areas:

Identification And Analysis Of Existing Econometric Models

This is the central topic area in the review of literature and seeks to establish whether other authors have found a solution to the Thesis Problem. Existing econometric models are identified and considered in the context of the various aspects of the Thesis Problem;

Property Valuation Theory Literature

A peripheral topic area which seeks to review that literature concerning property valuation theory in order to identify those groups of issues which authors have considered to be influences upon the capitalisation rate;

Finance, Commerce And Economic Theory Literature

This peripheral topic area seeks to identify principles of finance, commerce and economic theory relevant to the determination of the capitalisation rate;

Property Finance Literature

The final, peripheral topic area which seeks to reconcile the findings of the property theory literature review with those of the finance, commerce and economic theory literature review through a review of property finance literature.

Each topic area ends with a summary, the identification of areas for further research and a statement of the conclusions that may be drawn therefrom. Finally, a summary of the entire literature review is provided from which conclusions are drawn, potentially explanatory equations for capitalisation rate determination are specified (based on and consistent with the respective bodies of property, finance, commerce and economic theory) and various areas for further research in this Thesis are identified.

2.2 IDENTIFICATION AND ANALYSIS OF EXISTING ECONOMETRIC MODELS

2.2.1 Introduction

The following Section of the review of literature focuses on the central topic area, seeking to establish whether other authors have found a solution to the Thesis Problem through the development of rigorous, defensible econometric models of the determination of the capitalisation rate, between properties at a point in time, which accord with property, finance, commerce and economic theory.

It is proposed to endeavour to identify and analyse existing econometric models, to ascertain whether they overcome the problems of subjectivity, informality and heuristics identified in the current method of capitalisation rate selection, whether they consider adjustments between properties at a point in time and to determine whether they accord with property, finance, commerce and economic theory.

If identified existing models overcome the problems of the current method between properties at a point in time and accord with theory, it is contended that they would be likely to be rigorous and defensible and so contribute to a reduction in the level of variability in capitalisation rate determination and adjustment.

The review of literature concerning this central topic area is divided into two sections, as follows:

Additive Models - which considers the simple multi-factor summation models identified; and

Quantitative Models - which considers the more complex multi-factors models identified,

prior to a brief summary of the findings of this Section of the literature review, identification of areas for further research and statement of the conclusions that may be drawn therefrom.

2.2.2 Additive Models

Two principal groups of more objectively based approaches to the determination of the capitalisation rate were identified within the literature and may be summarised as:

- those comprising the use of differing rates for land and building components (for example, Hanford (1976), Reynolds (1980)); and
- those comprising the use of a risk free rate plus allowances approach, for example: including risk and management (Student (1959)), numerous risk and other factors (Thomas (1964)), risk, operating expenses and illiquidity less psychic income and growth (Baum and Crosby (1988)) and risk, expected long run real rental growth and depreciation (Baum and MacGregor (1992)).

Whilst the above are often illustrated with numeric examples, each lacks any underlying quantitative research to confirm or refute the deconstruction proposed, with only Baum and Crosby (1988) acknowledging this aspect.

Thomas (1964) confirms that the application of such approaches depends upon the analysis of the capitalisation rate from comparable evidence being conducted in the same way as the construction of the capitalisation rate proposed, but interestingly makes all adjustments in multiples of 0.5% rather than any lesser denomination. The unreliability of such approaches, being founded on the subjective assessment of each element, is confirmed by Hanford (1976).

Whilst an approach to expressing the capitalisation rate between properties at a point in time as a series of contributory elements is more objective and so to be welcomed, the authors provide no defence or substantiation for the validity of the elements identified. Similarly, the subjective assessment of each element (excluding the risk free rate) renders consistency and formality unlikely to be achieved, requiring the heuristic assessment of several contributory variables.

Further, though the second group embraces the broad concepts of finance, commerce and economic theory through the involvement of the risk free rate, the other variables to be identified remain to be subjectively assessed and hence, potentially, inconsistently and informally derived.

Whilst such literature adds to the general understanding of influences upon the capitalisation rate within a comparison between two properties at a point in time, the absence of rigorous quantitative research limits its further usefulness in objectively defining the potential contribution of each proposed influence.

Accordingly, such approaches and models do not effectively remove the subjectivity, informality and heuristics from the determination of the capitalisation rate and so do not solve the Thesis Problem.

2.2.3 Quantitative Models

A review of the literature highlights several studies which have used data collection and analysis to investigate aspects of the determinants of the capitalisation rate and to propose econometric models, which may be summarised as follows:

- 2.2.3.1 Miscellaneous Studies;
- 2.2.3.2 Dokko et al Study;
- 2.2.3.3 Zisler Study;
- 2.2.3.4 Jones Lang Wootton Study

and will be considered sequentially below.

2.2.3.1 Miscellaneous Studies

A simple but highly relevant study by Leigh (1992) used "Investment Profiles" to make percentage adjustments to a benchmark "prime" capitalisation rate to reflect differences between it and the subject. The author proposes a list of issues for which adjustment may be required under the groupings of tenure, tenancies and sub-sectors, with offices attracting such categories as unusual restrictions in lease, quality of tenant less than perfect, no lift, appearance unattractive and town planning restrictions.

Leigh tests the approach using a small sample of valuers and properties, finding that the traditional capitalisation rate selection approach and the "Investment Profiles" approach provide results which correlate to give a coefficient of 0.8466 which is considered to be a good result given the sample size, lack of familiarity of the sample with the "Investment Profiles" approach and the unusual characteristics of some of the properties within the sample.

Whilst the principle of objectively adjusting a benchmark capitalisation rate for a defined set of criteria is both directly relevant to this Thesis and highly interesting, the quantitative analysis is, regrettably, too small to provide definitive results. Further, the approach is dependent upon the sample making a series of judgements which, whilst being more explicit than one global capitalisation rate adjustment, still relies on subjectively derived, informal and therefore potentially inconsistent assessments. Though the approach does not accord with property, finance, commerce and economic theory, it is, however, a significant contribution to quantitative research into capitalisation rate determination which indicates that such may be a modellable process. Apart from Leighs "Investment Profiles", the literature review did not reveal any other models which sought to compare two specific properties at a point in time.

Whilst not considering individual property to property comparisons at a point in time, more detailed, though not as directly relevant, quantitative research into aspects of capitalisation rate determination may be found within the American literature. For example, Ambrose and Nourse (1993) summarise the findings of three other studies using capitalisation rate data, though these are not directly relevant to this Thesis. Nourse (1987) investigates the impact of tax changes on capitalisation rates, but does not consider the potential variation contributed by property types as only the mean capitalisation rate for all property is used as the dependent variable. Evans (1990) investigates the time series properties of capitalisation rates but focuses primarily on a comparison with the stock market price/earnings ratio. Froland (1987) finds that the capitalisation rate is a function of the mortgage contract rate, the spread between Treasury bills and bonds and the corporate price/earnings ratio, though the author did not consider the impact of property type or time variations.

The relationship of location and property type to capitalisation rate behaviour is specifically considered by Ambrose and Nourse (1993). The authors attempt to explain variations in quarterly mean capitalisation rates (from first quarter 1966 through fourth quarter 1988) using the average capitalisation rate reported from property on which mortgage commitments have been made by the largest life insurance companies, through the ACLI data base, based on property sub-sector/type and five geographical groupings (north, south, east, west and foreign). By proposing a band of investment approach based model to explain the capitalisation rate and by testing this model using Seemingly Unrelated Regression and cross-sectional/time-series regression, the authors find that while differences across property types are important in evaluating capitalisation rates, location has a relatively insignificant relevance, though the crude macro measure of location is acknowledged to be limiting.

Whilst the survey provides a quantitatively based contribution which further indicates the process to be modellable, it is disappointingly basic. Though more objective, the analysis does not address property to property adjustments at a point in time nor consistency with property, finance, commerce and economic theory. To find that capitalisation rates are influenced by property sector is not questioned in the property theory literature (see Section 2.3.2.11, below), nor is the relevance of location. However, given the large number of cities and dissimilar range of office buildings therein within the sample, to find limited locational impact on the capitalisation rate based on quadrants of the USA is not surprising. Accordingly, the analysis does not solve the Thesis Problem.

2.2.3.2 Dokko et al Study

Dokko, Edelstein, Pomer and Scott Urdang (1991) investigated the impact upon the equilibrium rate of return of the simultaneous interaction of land use, regional locale and the macro-economic environment. Using a sample of 102 non-residential properties, the authors analysis suggests that the real rate of return appears to be systematically related to the parcels locale, with significant correlations for certain

types of property controlled for location. Further, the addition of time as a variable showed significant correlations indicating that changing economic conditions do impact on returns.

The finding that return may be expressed as a function of property use specific, location/geographic market specific, time specific and pure random components is interesting, as is the finding that the effect of the location and property use influences make any shocks dissipate quickly such that relatively specific factors comprise a more significant part of the explanation of property return behaviour than systematic factors.

Consistent with such findings, the authors suggest that returns for existing owners are dependent upon the overall economic strength of the local marketplace, the state and unique characteristics of which will impact upon its exposure to inflation and similar forces. Inflation, the authors argue, has the effect of accentuating the supply/demand features for the existing market and so impacting upon returns indirectly (eg. periods of low supply and high inflation combining to give a dramatic escalation in rents). Thus the authors propose that the risk component for non-residential property is a function of variations in rent and vacancy rates, which in turn are a function of a series of other identifiable sub-sectoral variables¹.

The empirical findings by Dokko et al (1991), whilst regional rather than intra-property comparative, using macro rather than micro variables and over time rather than at a point in time, identify influences which may still be relevant for each of the latter. To find that return is heavily influenced by a particular property, location and time with a significant unexplained factor still existing is a notable contribution to the understanding of capitalisation rate construction, both underlining its complex nature and further indicating it to be modellable.

Whilst more objective and more consistent with property, finance, commerce and economic theory, this research does not solve the Thesis Problem, though the recurrence of certain issues is contended to be potentially highly relevant for the modelling of the determination of the capitalisation rate. It is apparent that a combination of both local and market wide issues may influence the capitalisation rate over time, that these may be both inter-active and dynamic and that a significant unexplained component may still exist.

¹ Including the turnover rate of tenants, the notice period prior to vacation, the shape of the demand function for rental space, the operating cost function of landlords, expected future changes in rent, the rate of new construction relative to existing stock, the assumption of an acceptable benchmark vacancy rate, supply lags between recognition of demand and provision of new office space and demand lags due to shifts in demand arising from unanticipated changes in economic fundamentals.

2.2.3.3 Zisler Study

In what appears to be the most directly relevant literature to the Thesis topic, Zisler in Maginn and Tuttle (1990) and Jones Lang Wootton (1992) (JLW) (see Section 2.2.3.4, below) investigate the application of the Arbitrage Pricing Theory (APT), to explain property returns for a range of different property types and geographic locations and to determine the equivalent yield for prime CBD office property, respectively.

With the acknowledged co-operation of Ross, Zisler in Maginn and Tuttle (1990) endeavours to apply the APT to explain property returns, using the following systematic risk variables:

- unanticipated inflation;
- investor confidence (being the spread between the return on corporate (Baa) and US Government (Aaa) bonds);
- long run expected inflation;
- strength of the economy, being monthly industrial production; and
- strength of the economy, being per capita consumption growth.

Curiously, Zisler does not include any property market related variables but, instead, applies variations on the traditional APT economic state variables to property market sourced data. Whilst the concept of the APT is applied, Zisler fails to tailor the APT to the market under consideration by selecting state variables relevant to the property market through the simple and intuitive financial theory advocated by the APT's originators. Thus, Zisler endeavours to explain the performance of sectors of the property market based solely on non-property market related variables.

Using the FRC Property Index from 1978, the author examines the sensitivities of each state variable for the total index and then by property type (office, retail, R&D, warehouse) and geographic location (east, midwest, south, west). Inflation variables were found to show weak relationships (though the effect of inflation was argued to be obscured by lease structures), real estate returns were found to increase as investor confidence erodes and quite strong relationships were found between real estate and the business cycle variables (industrial production and consumption growth), though the R^2 for the total FRC index equation was only 0.09.

Significant differences were found between the total FRC index correlation coefficients and those for the office sector, with the office sector having a higher negative correlation coefficient with investor confidence and monthly industrial production than the index as a whole, but markedly higher and opposite sign correlation coefficients for unanticipated inflation and long run expected inflation. Whilst

the R^2 for the office sector equation was only 0.18, the findings suggest that it reacts to the state variables in a different manner to the whole property market.

Though objective and consistent with finance, commerce and economic theory, the low R^2 s, may not be unexpected given the absence of variables from property theory. However, the study highlights a range of potential influences on property returns for consideration, but does not contribute directly to a greater understanding of the issues impacting upon capitalisation rates between properties at a point in time and therefore does not solve the Thesis Problem

2.2.3.4 Jones Lang Wootton Study

Conversely, Jones Lang Wootton (1992) investigate influences upon the equivalent yield for prime, Sydney CBD office property specifically, which is of direct relevance to this Thesis. Noting that property yields are sensitive to conditions within the local property market as well as conditions within the economic and financial environment and with an acknowledgment of the contribution of Zisler, JLW propose the following model for testing:

$$Y_t = c_0 + c_1P_t + c_2I_{t-2} + c_3E_t - c_4R_t + c_5D_{t-2} + c_6Y_{t-1} \quad \text{Equation 2.1}$$

where: t	= current time period	Y	= equivalent property yield
t-1	= six month prior to current period	P	= annual Sydney inflation rate
t-2	= one year prior to current period	I	= real 10 year Govern. bond rate
c_0	= constant or intercept term	E	= interest rate differential
$c_{1,2,3,}$	= coefficient attached to each variable	R	= annual real rental growth
		D	= all industrials dividend yield.

The authors provide a rationale for each variable, as follows:

Annual Sydney Inflation Rate

Whilst using current period inflation, the authors note that there is little correlation between inflation and Sydney CBD office yields due to other factors (such as over supply) having a disproportionately greater effect. The relevance of including this variable is, therefore, undermined from the outset;

Real 10 Year Government Bond Rate

The prevailing level of the ten year bond rate (as the generally accepted risk free rate) may be logically expected to have an influence on the total required return and so on the capitalisation rates determined by property market participants. An adjustment to remove the impact of inflation on the bond rate may also be rationally anticipated as the market may be contended to be likely to consider both the level of inflation, the bond rate and the real bond rate in a pricing decision. However, to lag such rate by one year would appear to be an arbitrary selection of time period, possibly justified more from the viewpoint of achieving a higher correlation coefficient than from any notion of applied economic or property market fundamentals - excepting the argument that the property market is slow to react to changes;

Interest Rate Differential

The authors claim (though substantiation is not apparent) that a strong correlation was, however, evident between future inflationary expectations (defined as the difference between long and short term government debt rates) and yields. This presupposes that the difference in rates is, *prima facie*, an expression of inflationary expectations which may not necessarily always be the case. The relative level of longer term government borrowing rates reflects a variety of factors including inflation but the JLW model makes no provision to exclude any non-inflationary factors;

Annual Real Rental Growth

Working from the proposition that falling yields reflect investor expectations of greater rental growth and from the close correlations between real rental growth, vacancy and supply, JLW propose annual real rental growth as an appropriate property variable which would appear quite defensible;

All Industrials Dividend Yield

The authors sought to include a variable to reflect the influence of the stock market on the property market on the premise that "studies (*unreferenced*) have shown that recovery in share prices in the midst of a recession usually points to an expectation of economic recovery within six to twelve months ...". Hence, not only is the model reliant on *unreferenced* material, but also on a premise which involves a lag of variable length. There is also no justification given for the adoption of the All Industrials Dividend Yield,

lagged by a year, instead of other broader indices such as the All Ordinaries Index or a sector relevant index such as the Property Trust Index;

Equivalent Property Yield, Six Months Prior

The inclusion of equivalent property yield, lagged six months, was not considered in the literature and so was discussed, at length, with Jones Lang Wootton. The sub-optimal principle of including the equivalent yield in a model to forecast the equivalent yield was acknowledged as a flaw, with the lag of six months found to be primarily attributable to the achievement of a higher correlation coefficient rather than an application of theory. Such findings were regrettable as they effectively undermine the purity of an otherwise relatively interesting application of the APT.

The model was applied to capitalisation rate data for prime, Sydney CBD office properties from the JLV databank which, whilst not transaction based, is at least consistent in its derivation and collation so offering considerable integrity. The multiple regression equation developed tracks capitalisation rates closely from 1976 to 1990 (R^2 93%) but fails to forecast the continued strength of capitalisation rates during 1991, offering some interesting coefficients and t statistics as summarised in Table 2.1.

Independent Variables	Coefficient	T-Statistic
Annual Sydney inflation rate	0.04	4.4
Real 10 year bond rate, lagged	0.05	3.2
Interest rate differential	0.08	4.7
All indls div yield, lagged	0.07	2.5
Annual real rental growth	-0.02	5.8
Equiv yield, lagged	0.47	5.5

Summary Of Results Jones Lang Wootton (1992)

Table 2.1

Given the generally high t statistics, a strong R^2 from the model, though not necessarily always occurring, is not surprising and 93% is an exceptionally good result. This does, however, solely reflect the variables having been combined in a specially designed multiple regression equation to explain a known capitalisation rate over the same period. The choice of variables and lagging periods would

suggest that the model has been refined to achieve the best historic correlations, rather than relying on a pure application of finance, commerce and economic theory through the use of variables based on intuitive assessment of theoretical relevance and then accepting whatever level of correlation this provided.

The result of such manipulation is clearly evident as the equation accurately forecasts capitalisation rates over the study period but fails completely to forecast the direction of capitalisation rates for the two quarters following the end of the study period.

The high R^2 may be largely attributable to the significance of the independent variable for lagged yield. The t statistics suggest that lagged yield and real rental growth are the most significant variables but the correlation coefficients show that lagged yield is, by far, the most important variable. Real rental growth has an almost insignificant correlation coefficient, with each of the other variables being only marginally better. Accordingly, the forecast of capitalisation rates is very heavily influenced by the lagged capitalisation rate itself which is contrary to the aims of the APT and of little use if the lagged capitalisation rate cannot be established with any certainty - as in protracted periods without sales evidence.

Effectively, the JLW model merely suggests that the best forecaster of the future capitalisation rate is the most recent capitalisation rate though, given that individual yield changes tend to be small, when occurring, this is not surprising. However, the models inability to forecast either the direction or quantum of the next period movement in the capitalisation rate is contended to be a fundamental flaw attributable to the models sub-optimal construction and lack of consistency with the principles of the APT.

The relative size of the correlation coefficient for lagged yield indicates that all other variables are limited in significance such that a distorted picture of their potential importance is provided. It is not possible, categorically, to determine the relative levels of importance of the equity market, bond rate or inflation as each is dwarfed by the lagged capitalisation rate. The incorporation, however, of real rental growth with economic and capital market variables is an interesting and useful variation to the work of Zisler.

Whilst the JLW model offered significant promise, the results were disappointing. The model focuses on market wide factors plus the capitalisation rate over time to forecast the next period capitalisation rate, which does not assist in the analysis of differences between capitalisation rates at a point in time. Whilst the model is based on quantifiable data and so addresses the problems of subjectivity, informality and heuristics, it is contended that it does not accord purely with finance, commerce and economic theory. Accordingly, the model does not solve the Thesis Problem.

The manipulation of data to primarily achieve strong correlations rather than to primarily accord with theory (with the outcomes secondary) results in a model with an excellent fit to the past but without capacity to forecast the future. However, the contribution of JLW (1992) in identifying issues which influence the capitalisation rate and confirming same to be modellable should not be underestimated.

2.2.4 Summary, Areas For Further Research And Conclusions - Identification And Analysis Of Existing Econometric Models

2.2.4.1 Summary

Whilst the Additive Models considered the comparison between properties at a point in time, their composition did not overcome the problems of subjectivity, informality and heuristics identified in the current method of capitalisation rate determination and such models were not entirely consistent with each of the bodies of property, finance, commerce and economic theory.

The problems of subjectivity, informality and heuristics were, however, partially addressed by the Quantitative Models though, conversely, these did not consider the comparison between properties at a point in time. Further, such models were contended to inadequately accord with each of the bodies of property, finance, commerce and economic theory.

2.2.4.2 Areas For Further Research

As an existing, rigorous and defensible econometric model for the determination of the capitalisation rate was not identified within the literature reviewed, it is contended to be appropriate to consider the construction of such a model, consistent with the findings of the above literature review, for use in reducing the variability in capitalisation rate adjustment between properties at a point in time, so addressing the Thesis Problem.

Accordingly, to ensure that such a model accords with each of the bodies of property theory and of finance, commerce and economic theory, it is proposed to review the literature concerning each, below, to identify and collate the range and nature of issues from such bodies of theory which are relevant to the determination of the capitalisation rate.

2.2.4.3 Conclusions

Though a range of econometric and other models of the determination of the capitalisation rate were identified within the literature reviewed, following consideration none were found to solve the Thesis Problem by overcoming the problems of subjectivity, informality and heuristics identified in the current method of capitalisation rate determination between properties at a point in time through accordance with property, finance, commerce and economic theory.

The literature reviewed does, however, identify various economic, property market and individual building issues relevant to the determination of the capitalisation rate and indicates that the determination process, whilst apparently wide and complex, may potentially be modellable.

Accordingly, it is contended that the analysis of those existing models identified indicates that they are neither rigorous nor defensible, thus failing to solve the Thesis Problem by contributing to a reduction in the variability of capitalisation rate adjustment and selection.

2.3 REVIEW OF PROPERTY THEORY LITERATURE

The preceding Section of the review of literature focussed on the central topic area, being the identification and consideration of existing econometric models for the determination of the capitalisation rate between properties at a point in time, establishing that a rigorous and defensible model, which could solve the Thesis Problem by contributing to a reduction in the variability of capitalisation rate adjustment and selection, could not be identified from the literature reviewed

It was, therefore, contended to be appropriate to consider the construction of such a model. To ensure that same accords with each of the bodies of property theory and of finance, commerce and economic theory, it was proposed to identify and collate the range and nature of issues relevant to the determination of the capitalisation rate from a review of relevant literature.

Whilst the existing models considered in Section 2.2 identified a range of economic, property market and individual building issues potentially relevant to the determination of the capitalisation rate, the following comprises the first of the peripheral topic areas, seeking to review that literature concerning valuation or property theory in order to identify those groups of issues which authors have considered to

be influences upon the capitalisation rate for subsequent empirical analysis. To facilitate clarity, such property theory literature has been considered within the following sections:

- 2.3.1 Overview And Approach To Literature
- 2.3.2 Identified Groups Of Issues
- 2.3.3 Pilot Studies
- 2.3.4 Evolutionary Issues

prior to a brief summary of the findings of this Section of the literature review, identification of areas for further research and statement of the conclusions that may be drawn therefrom.

2.3.1 Overview And Approach To Literature

The property and valuation literature reviewed herein includes the principal valuation and land economics teaching texts together with relevant journal articles, conference papers and doctoral and other theses. A summary of the findings of this literature review is contained in Excursus 2, annexed hereto, with the key findings being briefly considered below

As the Thesis addresses the prime, CBD office investment property sub-sector, extensive comments by authors concerning retail, industrial and other types of property are disregarded, except where such are common to the office sector or generic to the property asset class.

As several of the authors reviewed identified the same groups of issues and given that it is impractical to accredit each author individually for each such determinant below, their respective contributions are duly accredited here. Where particular authors made a significant independent contribution to the analysis of a given group of issues, their work is accredited specifically below.

It should also be noted that some authors give certain groups of issues different names to those adopted below and the use of the standardised classification proposed herein is not intended in any way to denigrate the approach of other authors.

The property theory literature is notable for devoting relatively little detailed attention to the groups of issues which influence the capitalisation rate, with relevant information being unco-ordinated and comprising oblique references at differing points within each text. The literature is predominantly qualitative and descriptive, with little quantitative or statistical analysis, which is in marked contrast to the economics, finance and commerce texts considered below.

The predominant role of the property theory literature as teaching texts would appear to be to contribute to the broad education of the valuer such that he obtains a general understanding of all matters relevant which, with the assistance of practical experience, he is then able to distil within the selection of the capitalisation rate, rather than seeking to provide the student with a comprehensive and definitive analysis of capitalisation rate construction.

Having reviewed the property theory literature, it is proposed that the numerous issues which authors argue to be relevant in the determination of the capitalisation rate may be classified into twelve proposed groups² which may be described as either factors or concepts influencing the capitalisation rate. For brevity, these are arranged in alphabetical order (rather than any other order of priority or relevance) in a Summary Taxonomy (Figure 2.1) with each being detailed diagrammatically in Micro Taxonomies 1 - 12 (Appendices 2.1 to 2.13) which are original to this Thesis.

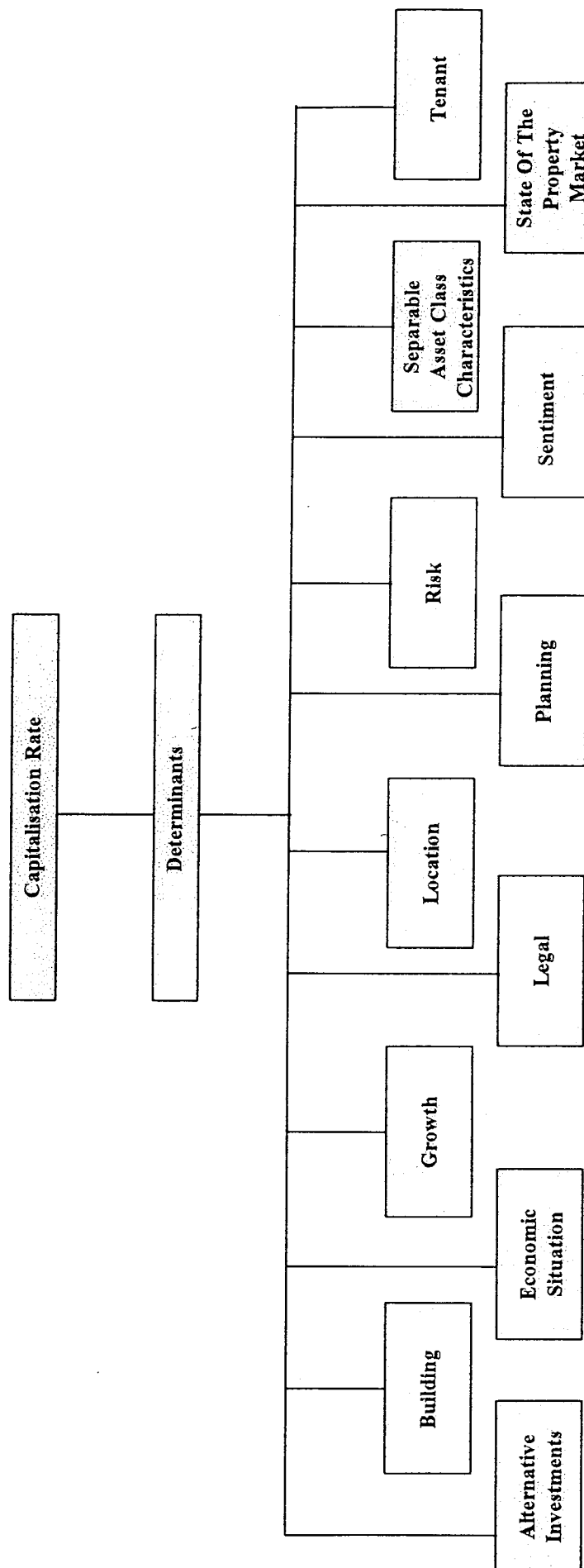
It is contended that factors may be distinguishable from concepts within the twelve proposed groups of issues. Factors are notable as being a group of issues which are clearly identifiable and capable of succinct definition whereas concepts are groups of issues which lack clear delineation or definition but are generally associated. Which of the factors and concepts may be determinants of the capitalisation rate, by having a direct, determining impact on the adjustment of the capitalisation rate, will be progressively discussed below.

It became increasingly apparent during the review of literature that those concepts identified below as growth and risk were not only common to the work of many authors in principle (though in a variety of guises) but also displayed the greatest range of differing definitions and constituent components amongst the contributions of the various authors. Indeed, Brown (1984) suggests that growth and risk may be the only relevant determinants as "many property investment decisions are based on a single figure representing investors' beliefs concerning risk and the expectation of future growth."

Accordingly, the matters considered below under the headings of growth and risk are a purist review of the property theory literature authors specific comments on each, being exclusive of any matters which could be classified under any of the alternative headings identified. The inconsistency with the work of some other authors in this regard is hereby acknowledged.

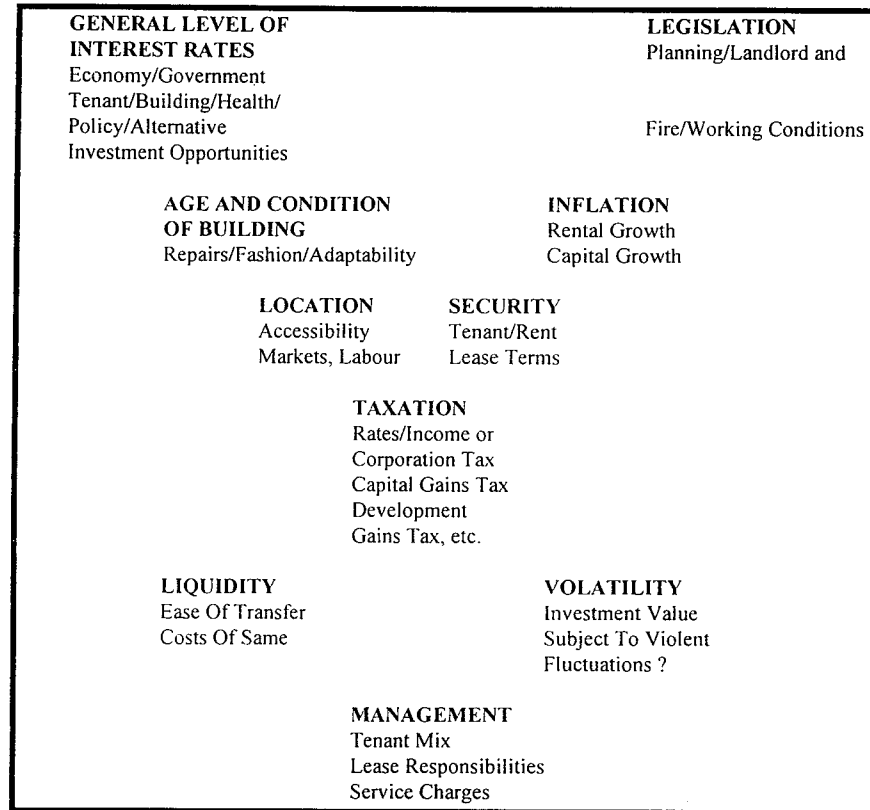
Significantly, the property theory literature offers little guidance for the assessment of the capitalisation rate (Brown (1984A)) and a comprehensive list of the determinants of the capitalisation rate was not found in the literature.

² The list of twelve determinants of the capitalisation rate is acknowledged to have been included in a thesis submitted for the degree of Master of Commerce. All subsequent aspects are, however, original to this Thesis.



Summary Taxonomy
Figure 2.1

Baum and Mackmin (1979), however, proffer a simplistic but illuminating guide to the “factors determining investors’ yield requirements and valuers capitalisation rates” which is reproduced in Figure 2.2.



**Factors Determining Investors’ Yield Requirements And Valuers Capitalisation Rates
(Baum and Mackmin (1979))**

Figure 2.2

Capitalisation rates are noted to be a composite of many contributing factors being "single measures of a complex amalgam of the advantages and disadvantages of an investment" (Baum (1984)) with such factors being both numerous and varied ("...a great number of smaller points, too many for separate enumeration" (Shepherd (1935), echoed by Baum (1984) and Brown (1992)).

The determinants of the capitalisation rate may be independent and inter-dependent (Brown (1984A)), of differing weights or significance (Brown (1984A) and Brown (1992)), with a relativity to each other (Brown (1984A)) and dynamic, varying over time.

As noted above, twelve groups of issues were identified from the property theory literature, each of which is nominated and considered individually in the following Section.

2.3.2 Identified Groups Of Issues

The Summary Taxonomy (Figure 2.1) lists the twelve determinants of the capitalisation rate identified from the literature review. In order to overview the key issues, which authors have argued to be relevant within each group, a Macro Taxonomy (Figure 2.3) has been prepared.

The Summary, Macro and Micro Taxonomies (Appendices 2.1 - 2.13) within this Thesis are the first attempt to bring order to the predominantly discursive character of the literature. Given the pervasive nature of many of the groups of issues, considerable conceptual overlapping between Micro Taxonomies, as suggested by the literature, was found to occur. Two principal areas of commonality emerge:

- where the same thing exactly appears more than once, but under different groups; and
- where similar ideas, concepts or features appear under different groups of issues which suggests potential relationships, linkages or overlaps between such groups of issues influencing the capitalisation rate.

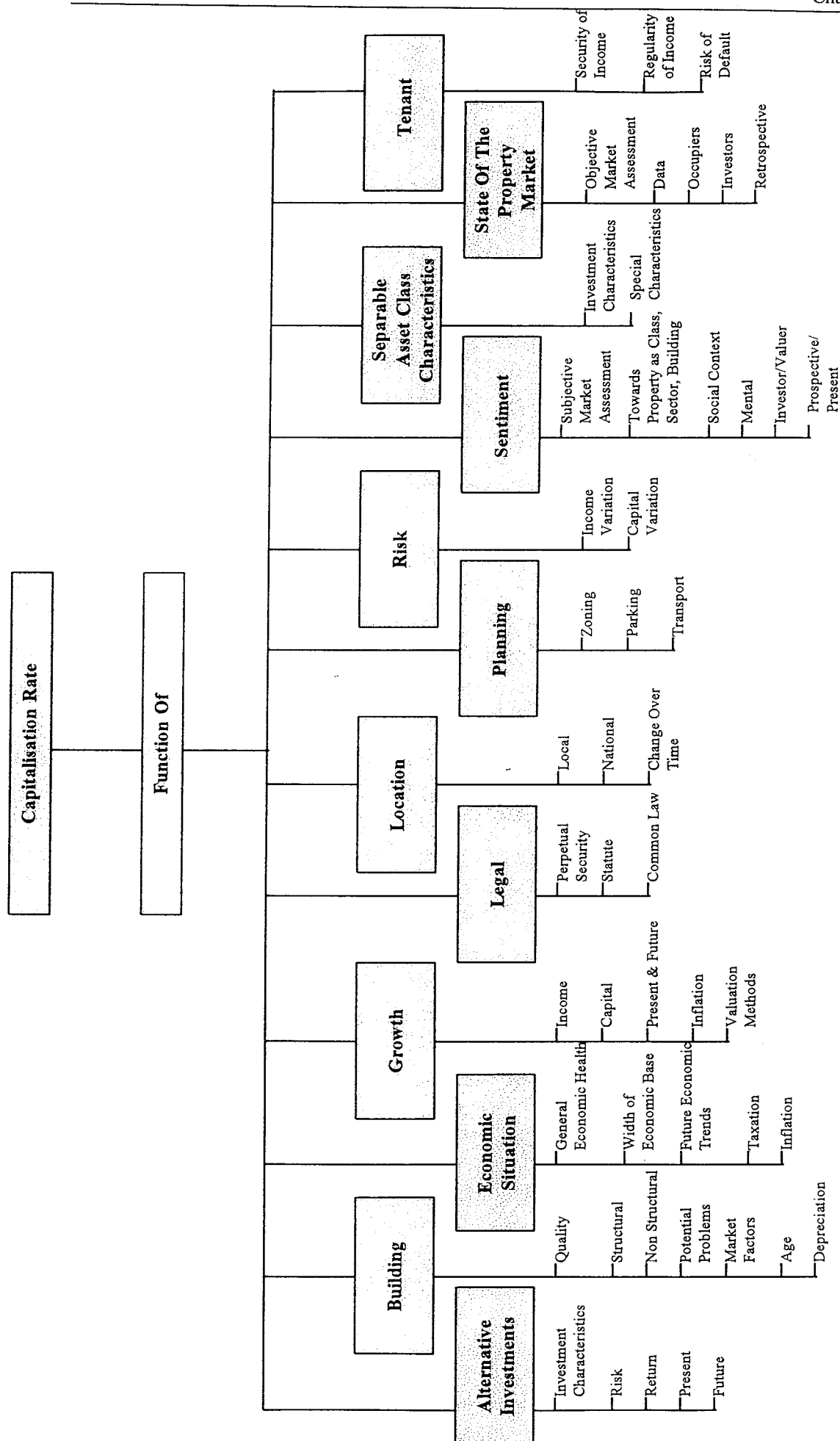
The second group of apparent overlaps have been highlighted on each Micro Taxonomy by a shaded box on the bottom line, indicating those other determinants with which the literature would appear to suggest there may be a link. Such boxes are then summarised into a dodecagon of linkages which is discussed in Section 2.3.2.13, below.

The taxonomising of issues and division into factors or concepts influencing the capitalisation rate, given below, is original to this Thesis and serves as a summary of the varied classifications adopted by other authors in previous works. The twelve proposed groups of issues influencing the capitalisation rate are considered in alphabetical order below, with the Macro Taxonomy (Figure 2.3) further amplified by individual Micro Taxonomies (included as Appendices 2.1 - 2.13).

A more comprehensive review of the literature concerning each group of issues is contained in Excursus 2, annexed hereto.

2.3.2.1 Alternative Investments

Micro Taxonomy 1 (Appendix 2.1) outlines a group of recurrent issues identified within the literature concerning the role of alternative investments as an influence upon the capitalisation rate. Three alternative asset classes, being equities, bonds and cash, are commonly identified for comparison on a



Macro Taxonomy
Figure 2.3

risk and return basis relative to property and for each of which the valuer should have some knowledge.

Property yields are relative to and influenced by those of other asset classes (Baum and Crosby (1988), Fraser (1985), Cairns (1983), Richmond (1975)), reflecting the different characteristics of each.

Furthermore, intra-asset class yields (such as between different grades of office property) are argued to be relevant (Cairns (1983), Millington (1979)) as is the relativity of the bond or risk free rate (Brown (1984A)).

Though devoid of quantitative analysis and typified by generalist, qualitative statements, the property theory literature attributes extensive discussion to the role of alternative investments as an influence upon capitalisation rates, acknowledging the relativities of risk and return and the role of property within the range of investment alternatives available.

Such discussion suggests an extensive range of potential relationships with other determinants and these are illustrated on Micro Taxonomy 1 (Appendix 2.1). As the group of issues summarised as alternative investments are capable of delineation and definition, it is likely that they will be a factor influencing the capitalisation rate. Whilst it is possible to determine from the literature that this is likely to be an important factor, any further conclusions cannot be drawn at this stage.

2.3.2.2 Building

The role of the building in the assessment of the capitalisation rate is given considerable attention within the property theory literature, with building qualities (which are widely defined) being recurrent elements as shown in Micro Taxonomy 2 (Appendix 2.2).

Structural aspects such as cladding, elevation, orientation, views, appearance and timelessness are cited within the literature as are non-structural aspects such as internal configuration, foyer, spaciousness, finishes, services, technology, core to wall dimensions, ceiling heights, parking, age and condition with acceptable standards changing over time (Richmond (1975), Cairns (1985)).

Baums seminal doctoral thesis on depreciation and obsolescence, (Baum (1989)), changed the approach of property theory to the determinant of building. Following empirical analysis, Baum found that the major impact of depreciation on yield struck at years 11 to 17 whilst the major impact on rental value occurs at years 17 to 26, noting that:

“building quality is a better explanation of depreciation than is age.” (page 220)

and stating that buildings should be preferred if they are flexible in terms of configuration, internal specification and external appearance which are suggested to, therefore, be likely to be significant contributors to the role of building as a determinant of the capitalisation rate.

As noted in Micro Taxonomy 2 (Appendix 2.2), the various groups of issues considered under building impact extensively upon aspects of other groups of issues and are capable of delineation and definition, such that it is likely they will be a factor influencing the capitalisation rate. Accordingly, the dynamic role of the building within the property valuation process might be expected to contribute to this being an important factor influencing the capitalisation rate.

2.3.2.3 Economic Situation

A common feature of the property theory literature is the absence of any detailed analysis of the relationship between the property market and the economy which logic suggests should exist. A range of general issues can be identified from the literature and these have been summarised within Micro Taxonomy 3 (Appendix 2.3).

General comments are found within the literature concerning the relevance of economic health (Litchfield (1958), "Student" (1959), Richmond (1975), Millington (1979)), economic trends and cycles (Cairns (1985)), inflation (Jones Lang Wootton (1991), Baum and Crosby (1988)) and taxation (Fraser (1985), Baum and Crosby (1988)) but are both relatively limited and superficial regarding the nature of the relationship with the capitalisation rate.

The pervasive nature of the economic situation across all capital markets suggests potential inter-relationships with other capital market determinants, as expressed in Micro Taxonomy 3 (Appendix 2.3). As the group of issues summarised as economic situation are capable of delineation and definition, it is likely that they will be a factor influencing the capitalisation rate. However, given that the economic situation pervades not only all asset classes but also all sectors and sub-sectors of the property asset class, it is unclear how important economic situation may be for prime, CBD office investment property capitalisation rates.

2.3.2.4 Growth

The property theory literature contains a disparate, ill defined and amorphous amalgam of issues cited by authors when considering growth. The principal common theme within the property theory literature is that of growth being a determinant in its own right and implicit within the capitalisation rate. A precise definition of growth is elusive and it is generally addressed in terms of influences upon rental or

capital value appreciation, inflation, outlook and methodological assumptions. The range of issues referred to by authors when considering growth are summarised in Micro Taxonomy 4 (Appendix 2.4).

A nexus between the expectation of growth and a willingness by the investor to accept a lower yield is evident in the literature (Ratcliffe (1978), Rost and Collins (1990)). Brown (1984) identifies such factors as location, type of tenant, depreciation and age as relevant to growth and Baum and Mackmin (1979) note that the capitalisation rate effectively incorporates the markets forecast of future expectations.

The relationship between growth and risk is considered within the literature with Brown (1984A) describing the capitalisation rate as a single figure expression of “investors beliefs concerning risk and the expectation of future growth”. Growth is generally viewed as a positive influence providing rental or capital appreciation, with few references to negative growth. The roles of hunch and intuition in the adjustment of the capitalisation rate, to reflect such positive influences, is a recurrent theme throughout the property theory literature.

Baum and Mackmin (1979) provide a worked example comparing traditional capitalisation and discounted cash flow approaches to confirm that growth is implicit within the capitalisation rate. Inflation is acknowledged as relevant with considerable research undertaken into real value methodologies (Wood (1972) and Crosby (1985)).

Rather than investigate the role of growth within the determination of the capitalisation rate, the literature pursues growth explicit approaches despite their limited acceptance in practice. Given the amorphous character of growth whilst implicit within the capitalisation rate, its appeal to practitioners is understandable as it is a relatively non-mathematical expression, easy to use and dependent upon the mystique of judgement with adjustments to the capitalisation rate defensible by the ubiquitous ‘better’ or ‘poorer’ growth.

Reflecting the wide range of issues considered within the literature as relevant to growth (see, for example, Brown (1984), and Section 2.5.2. below) a significant level of inter-relationship with other groups of issues may be expected and is evident in Micro Taxonomy 4 (Appendix 2.4).

Given that the succinct definition of growth beyond that of rental and capital appreciation is challenging, the wide range of issues found to influence growth and the extent of possible links that is evident, it is contended that growth has the disparate and ill-defined characteristics of a concept rather than a factor. As such, it is capable of distinction from those factors cited above and below. In acknowledgment of this, it is considered that growth may be likely to be an important concept but that

the level of importance and the way in which growth might influence the capitalisation rate are somewhat unclear.

2.3.2.5 Legal Environment

The property asset class is affected by the law to an extent not found for other asset classes as is apparent from the summary of the literature in Micro Taxonomy 5 (Appendix 2.5). Legally based distinctions between ownership, possession, use, transfer and other aspects arise from common law and statute which, together with indefeasibility or perpetual security of title (and, hence, income and other issues that flow therefrom), are fundamental to both investment in and valuation of office property and are commonly cited within the literature.

Excluding rare, sudden changes to common law or statute (such as the 1972-74 UK rent freeze (Britton et al (1980)), which are challenging to incorporate, most variations in the legal environment are gradual and progressive in their introduction allowing a similar response by the property market.

Within the legal environment, the structure of the lease document is of the utmost importance for investment property with the nature and terms of the lease creating the nature and terms of the investment (Richmond (1975)).

The intrusion of the legal environment into certain others aspects of determinants of the capitalisation rate is clearly shown by the moderate number of identified inter-relationships in Micro Taxonomy 5 (Appendix 2.5) with its capability for delineation and definition reinforcing that it is a factor influencing the capitalisation rate. Given the fundamental nature of these issues to the valuation process, the legal environment may either be a potentially significant determinant of the capitalisation rate or considered to be sufficiently slow changing to be a relatively dormant determinant - from the literature, it is unclear which.

2.3.2.6 Location

Location, location and location are traditionally taught as the three most important considerations in property investment. The property theory literature confirms that the optimal location for a given use is a common determinant of value, with Brown (1984A) citing location as an influence upon the capitalisation rate.

Micro Taxonomy 6 (Appendix 2.6) summarises the physical and temporal locational issues found in the literature, including location within an established area for that use, situation / neighbourhood, position

including views (Hughes (1952), Shepherd (1935)) and the changing relativity of the quality of locations over time.

Whilst property lore may suggest that location is the most important influence upon the capitalisation rate, the literature neither supports nor refutes such a proposition. Though the principle of inferior locations commanding higher capitalisation rates is commonly expounded, no apparent guidance is given within the literature as to degree. Whilst the clarity of delineation and definition confirm that it is a factor influencing the capitalisation rate, the moderate number of inter-relationships with other determinants (as shown in Micro Taxonomy 6 (Appendix 2.6)) questions the importance of location within the capitalisation rate, despite the high esteem in which it is traditionally held.

2.3.2.7 Planning

Litchfield (1958) cites planning as "one of the major influences on value" with the property theory literature concentrating primarily on issues of use rights, traffic, parking and public transportation which, together with the unique nature of planning as only applicable to the property asset class, are summarised within the description of the determinant in Micro Taxonomy 7 (Appendix 2.7).

The importance of establishing zoning during valuation is confirmed by Newell and Fibbens (1991), even though zonings may have been established for many years and changes are both rare and well publicised.

It is, however, arguable that for prime, CBD office investment property, where development is generally high density and long term, planning may be a relatively dormant rather than dynamic determinant excepting cases of sub-optimal development.

Whilst planning is clearly an important factor in the valuation process, the property theory literature devotes relatively little attention to its significance as an influence upon the capitalisation rate. Indeed, it is debatable whether or not it is a factor which determines the capitalisation rate. Planning is probably the most property specific issue identified from the property theory literature and effectively irrelevant to other asset classes.

Given the conceptual base of planning in the control of the built environment, moderate inter-relationship may be anticipated with those other determinants which are grounded in the physical aspects of property and this is apparent in Micro Taxonomy 7 (Appendix 2.7). The relatively clear understanding and definition of planning within the literature would suggest that it is a factor influencing the capitalisation rate. However, given the essentially static nature of planning within a

CBD core, if planning is an influencing factor it may be expected to be relatively dormant though its level of importance is unclear from the literature.

2.3.2.8 Risk

Whilst risk is commonly discussed within the traditional property texts, a succinct, clear and concise definition is elusive with a myriad of issues considered. To facilitate future analysis and consistent with the approach adopted within the literature, the various relevant issues cited are grouped as income and capital value varying issues respectively and are summarised in Micro Taxonomy 8 (Appendix 2.8).

A common approach within the literature is to cite causes of potential change to income or capital value and classify same as risk, an approach reminiscent of that to growth. Given the lack of concise definition within the property theory literature, the only feasible paraphrase for the description of risk in the literature is “the possibility of events not occurring as anticipated.”

Risk appears to be considered as a determinant in its own right within the literature, being implicit within the capitalisation rate and reflecting many issues including such specific issues as type, style, age and location of the property (“Student” (1959)), quality of the tenant covenant (Hughes (1952)) and general issues such as the investment characteristics of property as an asset class (Millington (1979), Richmond (1975)), the prospect of loss of capital or capital appreciation (“Student” (1959)) and of rental growth or decline (Britton et al (1980)).

Whilst issues relevant to risk are widely discussed and adjustment to the capitalisation rate advocated as an expression of relative riskiness, the literature does not provide guidance as to the direction or quantum of such adjustment nor as to how it is to be made, other than by reference to intuition.

Interestingly, the capitalisation rate is often referred to as the “all risks yield”, rather than the all-growth yield or the all-implicit yield, with the ubiquitous ‘its riskier’ offering a blanket justification for otherwise inexplicable adjustments to the capitalisation rate. Such an approach is supported by the broad, amorphous and ill defined consideration of risk found within the literature.

Whilst the principle of risk being manifest as a variation in capital and income returns is embryonically evident, little rigorous, quantitative research is found in the property theory literature concerning the nature of risk in office property investment nor the role of risk in the adjustment of the capitalisation rate.

Given the wide range of issues associated with risk within the literature and the lack of a clear definition of risk, it is suggested that risk is a concept rather than a factor. As such, it may be distinguished from

identified factors and potentially considered in a similar manner to growth. Micro Taxonomy 8 (Appendix 2.8) suggests a large number of potential links between risk, the other identified factors and growth. Having regard to this, it is considered that risk is likely to be an important concept but the level of importance and the manner in which it influences the capitalisation rate are far from clear.

2.3.2.9 Sentiment

A range of metaphysical issues are suggested, within the property theory literature, to impact upon the current and future value of commercial property. Such "psychic income" (Baum and Crosby (1988), Baum (1984)) or "psychological influences" (Rost and Collins (1990)) as optimism, pessimism, perceptions and feelings, both rational and irrational, are cited as relevant influences upon the capitalisation rate and may be summarised as a particular disposition of the mind being a subjective perception of the property market or of a given investment now and in the future (Cohen (1979), Brown (1992), Rost and Collins (1990)). A factual, objective or measured view of the current or previous market may be distinguished as "state of the property market" which will be considered as a separate issue, below.

Micro Taxonomy 9 (Appendix 2.9) distinguishes between sentiment towards the property asset class, specific sectors or particular buildings which may differ between property market participants at a point in time and through expectations. Being based on perceptions of what may be happening rather than knowledge of what is happening, sentiment may be anticipated to exhibit a relationship with risk and growth as manifestations of pessimism or optimism. Given its unsubstantiable nature, sentiment is linked in the literature with an extensive range of other groups of issues as shown in Micro Taxonomy 9 (Appendix 2.9) but is contended to be capable of delineation and definition, such that it may be expected to be a factor influencing the capitalisation rate.

Analysis of sentiment, however, is particularly challenging. Does an investors sentiment determine his requirements or vice versa? What causes sentiment and how is it changed? If a market is overheated or depressed, sentiment may reflect the state of the market but when and why will it change? It is not proposed to consider such issues further here except to note that, whilst investment requirements may be capable of logical assessment and definition, the literature suggests that sentiment is both highly subjective and contagious, with a propensity to over-ride more objective considerations. Such characteristics may contribute to it being an important determinant of the capitalisation rate.

2.3.2.10 Separable Asset Class Characteristics

Millington (1979) devotes a discursive chapter to those special, separable characteristics of property which distinguish it from other asset classes with Enever (1981) providing a schedule of such characteristics. The distinguishing characteristics of property have been summarised in Micro Taxonomy 10 which is divided into:

- those factors which influence the position of property amongst such traditional investment characteristics as liquidity and marketability (investment characteristics - Micro Taxonomy 10A (Appendix 2.10)); and
- those factors which are unusual to the property asset class such as management and the ability to create subsidiary interests (special characteristics - Micro Taxonomy 10B (Appendix 2.11)).

Within the capitalisation of income method of valuation, each office investment may be expected to comprise a differing combination of the above distinguishing characteristics expressed through the capitalisation rate.

Such characteristics include heterogeneity which is contended to be particularly significant, as it renders comparison between properties problematical, providing a fundamental issue for the adjustment of the capitalisation rate. Further, Brown (1984A) considers the characteristic of imperfect knowledge and limited information, a problem which also impacts upon the adjustment of the capitalisation rate.

Although common to all CBD office properties, it might be expected that certain buildings may benefit from or be prejudiced by the various separable characteristics to differing degrees. The property theory literature, however, does not appear to consider in detail such relativities within a given sub-sector of the property market. Extensive potential links with other groups of issues are suggested within the literature and these are detailed within Micro Taxonomies 10A and 10B (Appendices 2.10 and 2.11).

Given that the separable characteristics are capable of delineation and definition, this group of issues might be anticipated to be a factor influencing the capitalisation rate. It could be further anticipated that, as such characteristics pervade the sub-sector, they could be likely to be of significance as a determinant by exception only though conversely the extensive range of inter-relationships could lead to separable characteristics being an important determinant.

2.3.2.11 State Of The Property Market

As referred to above, the state of the property market can be distinguished from sentiment by the former being an objectively measured statement of affairs which is either current or retrospective while the latter is a subjective, unsubstantiated perception that is either a current view or a prospective expectation. The range of issues suggested within the literature as aspects of the state of the property market are outlined in Micro Taxonomy 11 (Appendix 2.12).

Brown (1992) and Colliver (1946) consider regard to the state of the property market as essential in capitalisation rate determination and most major agencies regularly publish data on the state of the property market (see, for example, Jones Lang Wootton (1993)) including both investor / occupier and supply / demand aspects, dysfunctionality between which may be contended to have a significant impact upon the state of the market.

To measure the imbalance between such aspects is to assess the state of the property market. Whilst acknowledging the principle, the property theory literature does not go on to consider in detail how the state of the property market actually impacts upon the capitalisation rate. Are there lags? If so, how long? Is there a relationship between a change in the state of the property market and a change in the capitalisation rate? The property theory literature would suggest that the prevailing state of the property market is both a factor and highly relevant in determining the capitalisation rate, with a significant number of other influential groups of issues likely to be of significance as shown in Micro Taxonomy 11 (Appendix 2.12).

Given the economic principles of supply, demand and price, state of the property market could be expected to be a very important issue for a pricing mechanism such as the capitalisation rate.

2.3.2.12 Tenant

At its most economically fundamental, an investment property is merely a series of cash-flows with the value attributable to such cash-flows influenced by the quantum and quality of that income stream as determined by the characteristics of the payer (covenant and default risk) and the terms for payment (lease document). This is found, not surprisingly, to be a relevant influence upon the capitalisation rate within the property theory literature which considers the role of the tenant in enhancing or diminishing the quality and appeal of the investment. The various issues addressed are classified as tenant quality, lease quality and tenant default issues within Micro Taxonomy 12 (Appendix 2.13) and are typical of the special characteristics of property as an asset class.

Hughes (1952) associates an improvement in tenant quality with a reduction in the capitalisation rate and Rost and Collins (1990) cite confidence in regularity and security of income as a significant aspect of risk with McGowan (1984) considering the use of ratio analysis and quantitative techniques to determine the substance of the tenant.

Brown (1992) notes the capitalisation rate to be influenced by tenancy structure, tenancy quality, length of leases, remaining term certain on leases and rent review cycles with Newell and Fibbens (1991) confirming that valuers sight leases as part of the valuation process.

The lease document also addresses non-financial matters such as alienation, use and repair and maintenance which may impact upon the value of office property if not in conformity with standard investor expectations. Furthermore, the existence or otherwise of a ratchet within the rent review clause is a particularly topical aspect of the lease in Australia, currently, affecting the relevance of the use of the capitalisation rate.

With the exception of McGowan (1984), the property theory literature is notably silent on how to assess the quality of the tenants covenant or the acceptability of the lease document and how to then reflect these assessments within the capitalisation rate, though the implications of both on the capitalisation rate are clearly acknowledged. The central role of the tenant to the fundamental quality of the investment is illustrated within the property theory literature through the significant number of connections with other identified determinants, as shown in Micro Taxonomy 12 (Appendix 2.13). In view of this, tenant is clearly a factor of and is probably a very important influence on the capitalisation rate.

The property theory literature review (a more comprehensive version of which for the respective groups of issues is included in Excursus 2, annexed hereto) also suggests conceptual overlapping between the identified factors and concepts, which is highlighted upon each Micro Taxonomy and considered further below.

2.3.2.13 Overlapping Between Identified Groups Of Issues

Having collated the identifiable groups of issues from the property theory literature and noted the similarities and possible overlaps on each Micro Taxonomy, the links between groups of issues can be expressed as a dodecagon (Figure 2.4). Whilst a dodecagon conventionally has twelve equal sides, it should be noted that the property theory literature does not give any indication of the spatial relationship between the respective groups of issues. Accordingly, equal distances have been assumed between groups of issues for the purposes of illustration only.

The links shown upon the dodecagon (Figure 2.4) are either in one direction only (from one group of issues to another - 'Sole') or in two directions (each group of issues in a pair having an apparent link with the other - 'Dual') and are summarised in Table 2.2. Such expressions of links between identified groups of issues are original to this Thesis and contended to significantly amplify the inter-relationship aspects of the identified groups.

Number Of Links	Group Of Issues	Sole/Dual Balance
5	Economic Situation	All Dual
6	Legal	More Dual
6	Location	More Dual
6	Planning	Equal Sole/Dual
7	Alternative Investments	More Dual
7	Building	More Dual
7	Sentiment	More Dual
8	Separable Characteristics	More Sole
9	State Of Property Market	More Sole
9	Tenant	More Sole
11	Growth	More Dual
11	Risk	More Dual

Links Between Identified Groups Of Issues

Table 2.2

There are a significant number of links in total (46) of which Dual links comprise 63% (29) and Sole 37% (17), approximately half the number of Dual. This would appear to suggest that a greater proportion of the groups of issues may inter-relate with each other rather than unilaterally relate, making the capitalisation rate a potentially complex interactive multiplier.

The only group of issues which had a Dual link with each other relevant group was economic situation and none of the groups of issues appeared independent by either showing all Sole links or having no links whatsoever. It may be anticipated that those groups of issues showing more Dual than Sole links may be likely to be the more inter-related groups, with the opposite likelihood for those showing more Sole than Dual links. Interestingly, planning was the only factor to have an equal number of Dual and Sole links which may suggest that it is of a different character to the other groups of issues.

Perhaps the most significant aspect of the dodecagon (Figure 2.4) is the difference in the level of links between groups of issues identified as factors and those identified as concepts (growth and risk). As

DODECAGON OF MICRO - TAXONOMY LINKAGES

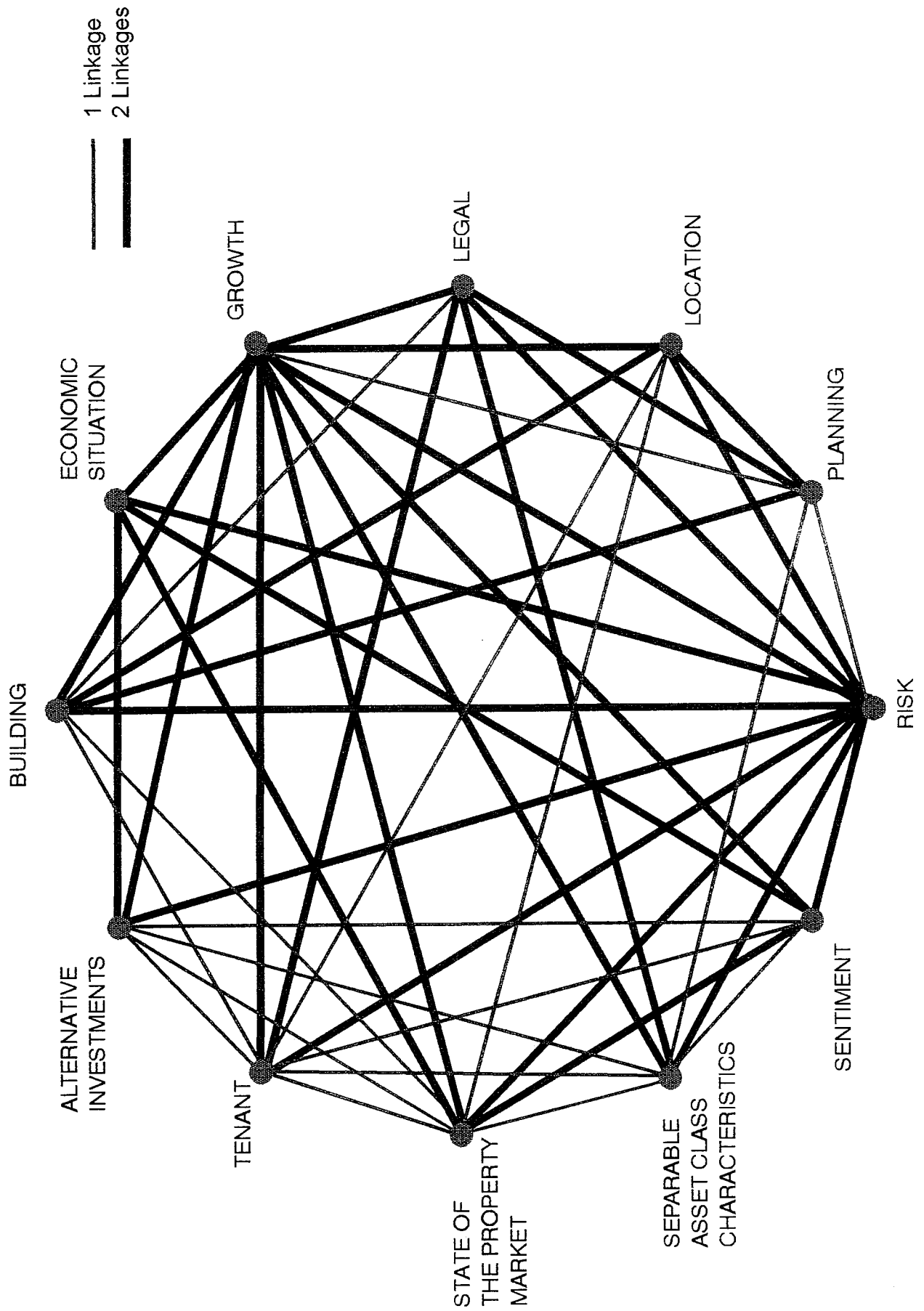


Figure 2.4

well as showing the largest number of links, both growth and risk showed Dual links with every other group except planning. Further, growth and risk both showed Dual links between each other suggesting a potential relationship between the two concepts. This strengthens the conclusion derived from the property theory literature review that growth and risk are concepts of a potentially different character to the factors identified.

It is intriguing to note from Table 2.2 that as the number of links increases so does the propensity for a majority of Sole links, with the significant exceptions of growth and risk and the slightly out of line position of planning. Given that the links were derived from the taxonomies in independent isolation and prior to any empirical research, to find such a trend is somewhat surprising. Setting aside growth and risk which are clearly distinguishable, Table 2.2 would appear to suggest that a significant minority of factors could potentially move independently and affect others by so doing, but may not themselves be affected should those others move independently. Conversely, the majority of factors would appear likely to display a far more complex web of inter-related movements, which could make modelling the capitalisation rate particularly challenging and raise a whole range of issues for further research.

2.3.2.14 Summary, Areas For Further Research And Conclusions - Identified Groups Of Issues

2.3.2.14.1 Summary

The property theory literature reviewed devotes very little attention to the determinants of the capitalisation rate generally and even less to the determinants for prime CBD office investment property specifically. Significantly, no doctoral or other higher degree theses or research papers investigating the determinants of the capitalisation rate were identified during the review of literature process.

A comprehensive previous list of the determinants of the capitalisation rate was not found in the property theory literature identified herein. Accordingly, the above represents the first attempt at taxonomising the influences on the capitalisation rate and related analysis, being original research per se.

Predominantly qualitative, the literature is generally retrospective, unstructured, inconsistent and without order or classification, leading to references to the determinants of the capitalisation rate being not only rare but also disparate. Little attention is given to the selection of the capitalisation rate with the focus on methodology and the assumption that when advised to adjust the capitalisation rate accordingly to reflect a given issue, the practitioner will know how to do so.

The property theory literature reviewed suggests twelve groups of issues which may influence the capitalisation rate and which may be classified as follows:

Factors

(being groups of issues which are clearly identifiable and capable of succinct definition)

Alternative Investments	Location	Separable Asset Class Characteristics
Building	Planning	State Of Property Market
Economic Situation	Sentiment	Tenant
Legal Environment		

Concepts

(being groups of issues which lack clear definition or delineation)

Growth
Risk

It is contended that the above list, as the main contribution of the property theory literature, is not insignificant.

Given their ill-defined and amorphous nature, it is contended that the concepts of risk and growth are potentially inadequately considered within the property theory literature and will be investigated further, within the finance, commerce and economic theory literature, below.

The literature suggests that links between groups of issues may exist and that, when analysed, the number of links may relate to the level of reciprocity between groups of issues, so further distinguishing certain groups of issues from others. Furthermore, analysis of the property theory literature reviewed raises questions as to the role of the legal environment and planning as factors and their similarity or otherwise of behaviour to that of other factors. It is, however, clear from the literature and the resulting dodecagon that growth and risk are concepts relevant to the determination of the capitalisation rate but may not be factors influencing the rate - what they are, however, is unclear and will require further research to clarify.

2.3.2.14.2 Areas For Further Research

Whilst the property theory literature provided a disparate range of information concerning issues influencing the capitalisation rate, its predominantly qualitative and inconsistent character limits an ability to draw absolute conclusions.

Accordingly, of relevance to the determination of the capitalisation rate between properties at a point in time, the following are contended to be amongst the areas requiring further research:

- are the twelve groups of issues correctly identified or are there more or less?;
- is the division between factors and concepts, proposed above, relevant or appropriate?;
- are the groups of issues of the same relative and proportionate importance?;
- is there an hierarchy of determinants?;
- how do the links between groups of issues operate and are they correctly deduced from the literature?;
- can planning and legal be distinguished as differing from the other identified factors?;
- how do growth and risk relate to other groups of issues and to each other within the determination of the capitalisation rate?

and are initially considered through the findings of a series of pilot studies, outlined in the following Section.

2.3.2.14.3 Conclusions

From the property theory literature reviewed, twelve groups of issues were identified which, whilst apparently overlapping or linked (rather than independent), may be of potentially differing weights or significance, are related and cumulatively influence the capitalisation rate. Such identifiable groups of issues, however, are not static, appearing to be dynamic or evolutionary, changing in character and emphasis over time. Whilst the groups of issues may be distinguished into ten definable factors which potentially directly impact upon the capitalisation rate and two more general concepts, the literature does not lead to a conclusion as to whether each contributes to the determination of the capitalisation rate similarly or differentially and so whether each can be classified as determinants. It may be posited that growth and risk are concepts relevant to the determination of the capitalisation rate, but may not be factors which directly influence the capitalisation rate themselves.

A dearth of quantitative analysis is evident within the property theory literature with such analysis generally being sparse and superficial. Further research is principally required in developing the qualitative findings of the literature review with quantitative analysis.

In review, the property theory literature suggests that the capitalisation rate is effectively a repository for all that cannot be explicitly incorporated elsewhere within the valuation process. Whilst contributing a range of issues which are relevant to the determination of the capitalisation rate, the literature

recommends that the practitioner recognise and reflect each within the selection of the capitalisation rate but proffers no guidance as to how.

It cannot be concluded from the literature whether the twelve identified groups of issues determine the capitalisation rate and so can be defined as determinants. Identification does, however, facilitate the opportunity for quantification from which it may be possible to model the groups of issues and so identify the determinants of the capitalisation rate.

2.3.3 Pilot Studies

Whilst the review of the property theory literature identified twelve influences upon the determination of the capitalisation rate, it offered only general comments regarding the completeness of the list, the relative and proportionate importance of the determinants, the extent to which the determinants may be hierarchical or the existence or nature of any relationships between the determinants.

Other issues for attention, arising from the property theory literature review, include whether planning and legal can be distinguished as of a different character to the other identified factors, the relationship between the concepts of growth and risk and each of the identified factors and whether the division between factors and concepts, as proposed in the property theory literature review, is relevant or appropriate.

Given the dearth of empirical research into the determinants of the capitalisation rate, the absence of research into comparable property capitalisation rates at a point in time and to investigate the above issues, a series of annual pilot studies were undertaken in 1991, 1992 and 1993 based on a practitioner survey which was the pre-cursor of the format adopted for Thesis data collection in Chapter 3.

The methodology and results are described at length by the author in numerous refereed and unrefereed published journal and conference papers which are reviewed in Excursus 3, annexed hereto. A copy of these published papers of direct relevance are also included in Excursus 3, annexed hereto. Given the consistency of the methodology adopted in each year, comparison of the findings between years is both valid and interesting with each years findings being individually considered therein.

Hierarchy	Class'n	Determinant	Relative Importance 1993	Proportionate Importance 1993	Inter-Relationship
Primary	PS	Tenant	1	23%	9%
	G	Growth	2	14%	16%
	PG	State Of Market	3	12%	14%
	PS	Location	4	9%	6%
	PS	Building	5	9%	6%
Secondary	PG	Economic Situation ^(Primary?)	6	6%	9%
	R	Risk ^(Primary?)	7	7%	13%
	PS	Legal	8	4%	1%
	PG	Sentiment	9	4%	6%
	PG	Separable Characteristics	10	4%	7%
	PG	Alt Investments ^(Tertiary?)	11	5%	10%
Tertiary	PS	Planning	12	3%	3%

Summary Of Findings Of 1993 Pilot Study

Table 2.3

As the final pilot survey was the most developed format, only its results will be briefly considered below and only to the extent that they are relevant to the development of an econometric model of the determination of the capitalisation rate. The results of the 1993 survey are summarised in Table 2.3 with each of the categories being briefly defined as follows:

Hierarchy:

Based on the recurring distribution of scores for relative importance in each year of the survey with Primary being the top portion, Secondary the middle and Tertiary the consistent last;

Relative Importance:

A simple 1-12 descending order reflecting the relative importance attributed to each by the respondents;

Proportionate Importance:

A percentage score, totalling 100%, attributed to each determinant by respondents to reflect proportionate importance;

Inter-Relationship:

A percentage score, totalling 100%, indicating the sum of the extent to which respondents considered each determinant to be linked to others;

Classification:

PG	Property Generic - generic to all CBD office properties;
PS	Property Specific - varying between specific CBD office properties;
R	Risk;
G	Growth.

The following significant findings are contended to be worthy of specification:

- none of the respondents sought to add or delete any identified influences, despite being repeatedly encouraged to do so. It would, therefore, appear that the list is complete and therefore likely to comprise the determinants of the capitalisation rate;
- considerable consistency in the rankings of determinants between years was evident, though some temporal variation was apparent, being partially explicable by the changed market conditions in each year;
- relative importance score ranges indicate that respondents are simultaneously mentally juggling a number of factors and concepts which, whilst having a discernible order of relative importance, are not necessarily far apart;
- as the proportionate importance results indicate, a small number of determinants are discernibly more significant with the top three to six (or seven) determinants appearing to contribute the majority of the decision on capitalisation rate determination and the bottom half contributing only one quarter of the decision;
- an hierarchy of determinants is clearly discernible, but with some migration of determinants between Primary and Secondary over the survey periods;
- clear differences in the level of inter-relationship between determinants is evident with legal and planning practically independent and state of the property market apparently highly inter-related with other determinants.

Significantly, risk and growth show relatively high levels of inter-relationship with the other identified determinants.

It should, however, be noted that such investigation into links between determinants is acknowledged to be very unsophisticated and the results therefore should be considered as only broadly indicative, at best;

- interestingly, the occurrence and significance of relationships between determinants found by the 1993 practitioner survey generally accords with and supports the links suggested by the property theory literature review;
- the imposition of classifications indicates a greater propensity for Primary determinants to be Property Specific and for Secondary determinants to be Property Generic which suggests respondents are focussing more closely on issues specific to an individual prime, CBD office property than on issues common to all properties when considering the determination of the capitalisation rate.

Accordingly, those influences determining the capitalisation rate are clearly complex, dynamic and interactive but the recurrency of results appears to suggest a basic framework or structure may be capable of identification which augurs well for the development of an econometric model.

The findings suggest state of the market, tenant and growth are particularly significant with location, building, economic situation and risk also being of greater significance than the remainder of determinants and that extensive inter-relationships between determinants occur. Greater levels of inter-relationship are found within Property Generic determinants as a group and within Property Specific determinants as a group with little inter-relationship between the two groups. However, where such inter-relationship was evident, tenant and building appear to be the principal conduits.

Having regard to the particular issues arising from the property theory literature review, it would appear that planning can be clearly distinguished and that legal is potentially distinguishable in character from the other identified factors.

Significantly, the concepts of growth and risk are clearly of importance, exhibit particularly strong levels of relationship with various factors and appear to behave very differently to such factors, so supporting their distinction from the identified factors as appropriate. They appear to be principally linked to Property Generic determinants though exhibit extensive inter-relationships. It is suggested that risk and growth appear to differ significantly in character to other determinants and may potentially be

some form of influence on or expression of other determinants, rather than being determinants in their own rights.

Accordingly, the pilot studies findings suggest that the capitalisation rate may be principally a function of the state of the market, economic situation, tenant, building and location with growth and risk having a significant but somewhat ambiguous role.

The results of the pilot studies would, therefore, suggest that the twelve identified groups represent a complete list of the issues influencing the capitalisation rate and which may be considered to be the determinants of the capitalisation rate, with orders of relative and proportionate importance of such groups, a discernible hierarchy and significant potential inter-relationship apparent.

Further, the results indicate a stronger nexus between Primary groups of issues and the Property Specific classification and between Secondary groups of issues and the Property Generic classification. Interestingly, the results also suggest that planning and legal may be distinguished as of a different character to the other identified factors and that growth and risk are appropriately separated as concepts which behave in a different manner to factors and warrant further attention.

Given the significance of the differences emerging between growth, risk and the other ten identified factors, it is contended to be appropriate to reconsider their interpretation within the property theory literature.

As noted in Sections 2.3.2.4 and 2.3.2.8, above, the property theory literature suggests that growth and risk are each determinants in their own rights and implicit within the capitalisation rate. This is, however, the prevailing view towards the end of this century and it is contended that a clearer understanding of the current roles of risk and growth within the determination of the capitalisation rate may be gained from a brief review of their development within the evolution of the method since the turn of the century, which is undertaken in the following Section.

2.3.4 Evolutionary Issues

The evolution of the capitalisation of income method of valuation during the twentieth century was briefly considered in Chapter 1 (Section 1.1.5) with a more comprehensive review contained in Excursus 1, annexed hereto, both of which draw heavily upon the seminal work of Crosby (1985) and Baum and Crosby (1988). It is contended to be of relevance here to focus upon the changing roles of growth and risk during such evolution in an endeavour to ascertain from the literature whether an historic justification may exist for their difference in character from the identified factors determining

the capitalisation rate. The following, again, draws heavily on the research of Crosby (1985) and Baum and Crosby (1988).

The recognition of growth and risk within the capitalisation of income method of valuation has changed significantly over the course of the twentieth century. The literature review suggests that in 1890 and 1990 the role of the discount rate was common. However, in 1890 the discount rate and the capitalisation rate were effectively the same but by 1990 the two were different, separated principally by the role of growth.

The capitalisation rate as a variable within the capitalisation of income method of valuation was grounded in a period of very limited growth when fixed rents and long leases allowed the use of a slightly greater reversionary income stream to be an adequate reflection of growth and the adoption of the prevailing bond rate plus a risk premium to derive the appropriate capitalisation rate was sufficient regard for risk. The logic was simple and economically defensible, being based on the then future expectations of valuers and investors with the capitalisation rate and discount rate being interchangeable.

Up to World War II, the capitalisation rate and the discount rate were, effectively, the same. Risk was reflected in practice through the capitalisation rate being the bond rate plus a premium and in theory through the two rate convention. Growth, however, was only indirectly acknowledged through the reversionary income stream being greater than the term income stream.

Following World War II, practitioners started to adopt the two rate convention and changes in the structure of both capital and property markets led to the emergence of significant rental growth. Such growth became manifest in greater reversionary income streams achievable sooner through rent reviews of increasing frequency, which compounded the risk aspects attaching to such reversionary income streams. The pace of change was beginning to render the capitalisation rate a transmission mechanism for an increasing number of complex inter-relating issues. The adoption of the two rate convention and an increasing distinction between the two rates, within the capitalisation of income method of valuation, meant that the capitalisation rate and the discount rate were ceasing to both perform the same function and becoming progressively less inter-changeable.

The Reverse Yield Gap is contended to have been a watershed in the evolution of both the capitalisation of income method of valuation and the capitalisation rate, being that point at which the capitalisation rate ceased to be a clear application of economic principles.

The Reverse Yield Gap lead to the capital markets repricing each asset class relatively, based on their respective abilities to cope with the new order growth environment. Valuers did not adjust their

techniques to reflect this fundamental change and of the two available rates, clung to the least opportune. Through continued use of inappropriate valuation methodology, valuers failed to reflect the fundamental changes affecting all asset classes in the way they explained the pricing of the property asset class. Rather than return to basics and develop applications of the discount rate, they sought to amend existing tools and clung to the use of the wrong or least appropriate rate, the capitalisation rate.

The increased role of growth led to the discount rate and the capitalisation rate becoming distinguishable and performing significantly different functions, being no longer inter-changeable.

Such adherence to the capitalisation rate precluded explicit regard for risk and growth in the new era of asset pricing which followed the emergence of the Reverse Yield Gap. As the finance, commerce and economic theory literature review will contend below, the capitalisation rate comprises the difference between the discount rate and the growth rate but valuers failed to adequately appreciate this.

In the confusion of ever-accelerating change and with a lack of theoretical understanding and computing tools, the use of decapitalised comparables gained a grip that has not subsequently weakened. Slavish adherence to the capitalisation rate led to the self-perpetuating reliance on the devaluation of comparable sales and the emergence of the capitalisation rate as the principal medium through which differences between properties and markets could be reflected. Hence, a clear nexus with the pricing of other asset classes was lost and the myth of property as a special asset class was nascent.

Through ignorance, practitioners effectively deemed both growth and risk to be implicit within the capitalisation rate rather than appreciating that the capitalisation rate implies risk and growth relative to the discount rate. Valuers effectively had only one medium through which to reflect both risk and growth, its importance albeit slightly diluted by the maintenance of the two rate convention and the assessment of the reversionary income stream.

Therefore to reflect better growth prospects or less risk the only logical direction in which to adjust the capitalisation rate was downward and the rejection of explicit methodologies lead to the acceptability of such unsubstantiable adjustments to the capitalisation rate.

Gradually, stealthily and irreversibly, it is contended that the notion of growth and risk being implicit within the capitalisation rate gained momentum as part of property valuation practise and so became property valuation lore. Theory and practise were no longer synchronised. Economic law was supplanted by valuation lore.

The nexus with the discount rate and an approach based on the relativity of the bond rate, risk premium, capitalisation rate and growth rate became totally lost. The exclusive use of the capitalisation rate necessitated increasingly extensive application of practitioner judgement and intuition in the valuation

process. Despite such inherent limitations, the capitalisation of income method remained in common use:

"It would appear strange that techniques have not changed since the 1960's given the changes in investor's perceptions. Although the logical base of the conventional model appears to have collapsed it is still in almost universal use in the UK for the market valuation role" (Baum and Crosby (1988)

with that which, in the pre-Reverse Yield Gap era, was a simple discounted cash flow becoming "a wholly implicit model in which complex growth expectations were hidden alongside equally complex risk judgements" (Baum and Crosby (1988) page 95).

Having clung to an approach which had lost a sound theoretical base, valuers have continued to use a fundamentally flawed and highly inadequate methodology for over three decades, despite continued criticism and the further complications of reflecting rental and capital growth and the overlay of varying review periods deferring access to growth. Simultaneously, the teaching of property valuation theory perpetuated valuation lore that risk and growth were implicit within the capitalisation rate.

It is contended that, at this point, the use of the capitalisation rate as the reflection of all those aspects of the investment that could not otherwise be explicitly addressed meant that a distinction between such individual aspects became obscured. This is contended to be particularly significant for risk and growth which ceased to be considered individually and explicitly, simply becoming part of the amorphous amalgam that comprised the capitalisation rate.

It is contended to be significant that the capitalisation rate when originally adopted at the turn of the century reflected risk only and explicitly by an identifiable margin over the bond rate, with any growth reflected separately and explicitly in the reversionary income stream.

Over the last fifty years, the capitalisation rate has ceased to act as a discount rate and has been progressively mutated by the practitioner such that both risk and growth became alleged to be implicit within the capitalisation rate, not implied by it as a measure relative to a discount rate. Despite being fundamentally flawed, the allegation has been perpetuated by the use of comparables and the methods of teaching property valuation theory and practise adopted by academia and the valuation profession.

The remarkable simplicity of a capitalisation rate selection decision justified by better or poorer growth or risk prospects is, therefore, considered to be a direct result of the incredible ignorance perpetuated by valuation lore.

Accordingly, it is contended that the concepts of growth and risk being implicit within or determinants of the capitalisation rate, as derived from the property theory literature review, is fallacious and that property theory has, effectively, ceased to accord with finance, commerce and economic theory.

If, therefore, risk and growth are not implicit within or determinants of the capitalisation rate, how should they be reflected within the property valuation process and how might their relationship with each other and with each of the other factors influencing the capitalisation rate be addressed?

To better understand how the bond rate, the capitalisation rate, risk, growth and the discount rate are related within finance, commerce and economic theory, it is proposed that the relevant literature regarding same be briefly reviewed which will be undertaken in Section 2.4, below, following a brief summary of the property theory literature review undertaken in this Section.

2.3.5 Summary, Areas For Further Research and Conclusions - Review Of Property Theory Literature

2.3.5.1 Summary

Having established, in the previous Section, that a rigorous and defensible model could not be identified which would solve the Thesis Problem, by contributing to a reduction in the variability of capitalisation rate adjustment, it was contended to be appropriate to consider the construction of such a model.

To ensure that such a model accords with each of the bodies of theory, it was proposed to identify the range and nature of and to collate those issues relevant to the determination of the capitalisation rate from a review of the relevant literature.

This Section comprised the first of the peripheral topic areas, being a review of the literature concerning valuation or property theory to identify those groups of issues which authors have considered to be influences upon the capitalisation rate, for subsequent empirical analysis. The literature was considered in three groupings comprising the identification of groups of issues, findings of pilot studies and the review of evolutionary issues.

The identification of groups of issues from the literature was rendered challenging by the qualitative and unstructured nature of the property theory literature. Ten factors and two concepts were identified from the literature as relevant to the determination of the capitalisation rate and summarised diagrammatically in the form of taxonomies, being:

Factors:	Alternative Investments	Planning
	Building	Sentiment
	Economic Situation	Separable Asset Class Characteristics
	Legal Environment	State Of The Property Market
	Location	Tenant
Concepts:	Growth	Risk

Given the apparent absence of formalised taxonomies of the determinants of the capitalisation rate within that literature reviewed, these are contended to be original research per se.

The concepts of risk and growth were found to be ill defined and amorphous, being suggested by the literature to be implicit within rather than implied by the capitalisation rate. The role of the factors of planning and legal environment within the determination of the capitalisation rate was also questioned, given their identified characteristics.

Whilst the literature identified a group of issues to be relevant, which were also found to significantly overlap conceptually, it was contended that further research was required to clarify the identity of each determinant and the nature of the relationship between each. Accordingly, that literature concerning the findings of a series of pilot studies was reviewed which, whilst acknowledged to be only preliminary, provided significant further information and insights.

The pilot studies were found to suggest that the list of groups of issues identified was complete and that an hierarchy of issues was discernible with an apparent order of relative and proportionate importance. The suggestion of significant potential inter-relationships was supported by the pilot studies findings as was the suggestion that planning and legal environment may be capable of distinction as of a different character to the other identified factors.

The findings of the pilot studies also supported the separate classification of growth and risk as concepts, which behave differently to factors and warrant further attention. Finally, the pilot studies suggested consistency between the proposed Property Generic and Property Specific classifications and the balance of the findings, with an apparent nexus identified between Property Specific and Primary factors and between Property Generic and Secondary factors respectively.

The review of evolutionary issues provided an interesting insight into the development of the role of the capitalisation rate within the capitalisation of income method of valuation over the century. It was contended that the concept of growth and risk being implicit within or determinants of the capitalisation rate was fallacious, arising from a lack of understanding of the discount rate in finance, commerce and economic theory, such that property theory would appear to be ill founded and in discord with finance, commerce and economic theory.

The review of property theory literature, therefore, identified those groups of issues which authors have considered to be influences upon the capitalisation rate and raised a range of areas for which further research would be beneficial.

2.3.5.2 Areas For Further Research

Whilst the pilot studies found the factors to be relevant in the determination of the capitalisation rate, they were acknowledged to be based on a small sample only. Accordingly, it is appropriate to confirm such findings through a larger sample survey and to identify and address any differences that may arise.

Reference to the finance, commerce and economic theory literature is also required to determine if the identified groups of issues accord with such theory and to further investigate how risk and growth might be addressed within a model to accord with such theory, which will be undertaken in the following Section.

Having reviewed the finance, commerce and economic theory literature and reconciled the findings to those of the property theory literature review, the potential composition of and approach to a model of the determination of the capitalisation rate may then be specified accordingly.

2.3.5.3 Conclusions

Though a peripheral topic area, the review of property theory literature is contended to have been particularly worthwhile as it identified not only those factors determining the capitalisation rate but also suggested that some form of structure existed between them.

The identification of risk and growth as concepts which may be distinguished from factors and whose role is contended to be erroneously considered within the property theory literature are significant conclusions of the review of literature.

As the groups of issues determining the capitalisation rate are identifiable from the literature they may be quantifiable and so, potentially, modellable. Given their derivation from property theory, a model

based upon such groups of issues would accord with property theory but the approach to growth and risk within such modelling requires further investigation.

Complementary to such investigation, it is necessary to also establish that the identified factors similarly accord with finance, commerce and economic theory in order to provide the basis for a rigorous and defensible model.

2.4 REVIEW OF FINANCE, COMMERCE AND ECONOMIC THEORY LITERATURE

The preceding Section in the review of literature investigated the first peripheral topic area, comprising a review of valuation or property theory literature, seeking to identify the range and nature of those groups of issues which authors have considered to be influences upon the capitalisation rate.

Twelve influences within some form of structure or framework and with levels of inter-relationship were identified. Of these, ten were classified as factors and two as concepts, being growth and risk, which appeared to behave differently and to warrant further attention. It was contended that the approach to growth and risk within property theory had now ceased to accord with finance, commerce and economic theory and that a clearer understanding and application of the latter may clarify the role of growth and risk within the determination of the capitalisation rate.

Accordingly, the following comprises the second peripheral topic area which seeks to identify principles of finance, commerce and economic theory relevant to the determination of the capitalisation rate. It is proposed to briefly review the relevant finance, commerce and economic theory literature to investigate the approach adopted to growth and risk and their relativity to the discount rate.

To facilitate clarity, the finance, commerce and economic theory literature has been considered within the following sections:

- 2.4.1 Valuation Approaches to Other Asset Classes
- 2.4.2 g
- 2.4.3 k

prior to a brief summary of the findings of this Section of the literature review, identification of areas for further research and statement of the conclusions that may be drawn therefrom.

2.4.1 Valuation Approaches To Other Asset Classes

Three groups of valuation approaches to other asset classes were identified from the finance, commerce and economic theory literature, being:

- earnings and dividend valuation models - which are conceptually akin to over time, cash flow valuation methodologies for property;
- earnings multipliers - which are conceptually the most similar to the capitalisation rate for property;
- other methods³,

with the first two being considered, respectively, below.

2.4.1.1 Earnings And Dividend Valuation Models

The fundamental concept of discounting future income rather than capitalising current, net income to derive value/price is central to the finance and commerce literature. Reilly (1989) proposes three basic determinants of value for any earnings asset (including bonds, stocks and real estate):

- stream of expected returns - including size and form (earnings, capital appreciation);
- time pattern of expected returns;
- required rate of return on investment (as opposed to opportunity cost of capital) - determined by a combination of:
 - the nominal risk free rate, being the economy's risk free rate plus the expected rate of inflation; and
 - the risk premium, reflecting the uncertainty of returns and which may be considered as:
 - business risk, financial risk, liquidity risk, exchange rate risk, or
 - a function of the systematic risk of the asset and the prevailing market risk premium.

³ Reilly (1989) advocates the use of a combination of valuation methods appropriate to the characteristics of the company being valued, with particular reference to the "Flexible Growth Model" developed by Mao (1966) which explicitly reflects different growth stages. The finance and commerce literature contains a range of other valuation models including Estep's T-Model (Reilly (1989)), the Goldman Sachs Model (Reilly (1989)), the Wells Fargo Model (Elton and Gruber (1987)) and the Gordon-Shapiro Equity Valuation Model (Maginn and Tuttle (1990)), each of which require some form of expected growth estimate.

The roles of growth and risk in returns are, therefore, central to the basic valuation approach advocated in the finance and commerce literature with Maginn and Tuttle (1990) focusing on the relevance of expectational inputs that may affect each of the three basic determinants of value.

Reilly (1989) contrasts the valuation of bonds⁴, where the stream and time pattern of returns are known, with that of equities where they are unknown. It is contended that property bears a greater resemblance to equities than bonds in these respects. Effectively the value of the bond is the present value of the expected future cash flows, with cashflows being the periodic interest payments and final payment at maturity which are known. The absence of a growth factor places the emphasis in the valuation of bonds purely on the discount rate adopted.

Hence, the only unknown is the discount rate (or promised yield to maturity) which is a function of the prevailing nominal risk free rate plus a risk premium (Reilly (1989)). Acting in a similar manner to an IRR with assumed reinvestment at the same rate, all relevant influences are manifest in the discount rate including economic forces (RFR + I) and issue characteristics (RP) (Reilly (1989))⁵.

It is, therefore, notable that growth is not an explicit factor in the bond valuation process which is principally an exercise in the explicit pricing of relative risk through the discount rate.

⁴ Reilly (1989) proposes the following equation for the valuation of bonds:

$$P = \sum_{t=1}^n C_t \frac{1}{(1+i)^t}$$

where: n = number of periods in investment horizon - known as term to maturity
 C_t = cash flow (periodic interest income and principal) received in period t
 i = the rate of discount (or market yield) for the issue

⁵ Reilly (1989) defines the risk free rate as:

$$\text{Nominal RFR} = (1 + \text{Real RFR}) (1 + \text{Expected Rate of Inflation}) - 1$$

describing the risk free rate as a basic exchange rate which assumes no uncertainty about the level and timing of future flows or risk of default, being a "pure time value of money". The investor defers consumption in return for a rate of interest, which is influenced by four principal factors:

1. psychological preferences for current or deferred consumption;
2. available investment opportunities;
3. relative ease or tightness in capital markets;
4. expected inflation,

with each of the four factors affecting all investments equally. Reilly (1989) comments specifically that the estimation of the expected rate of inflation is a crucial part of the valuation exercise and that the real risk free rate should be close to the underlying real growth rate of the economy.

Brealey and Myers (1981) comment that the real interest rate is that price which equates the supply and demand for capital, with the former depending on individuals willingness to save or postpone consumption and the latter depending on opportunities for productive investment. Interest rates, therefore, change as the supply of and demand for capital changes or as the expected rate of inflation changes (Fama (1976)). Whilst the expected real interest rate does vary over time, changes to expected inflation are the most important determinant of changes in nominal interest rates (Brealey and Myers (1981)).

Those inputs which were known for bonds are unknown for the valuation of common stocks, resulting in all inputs requiring assessment. Elton and Gruber (1987) cite the three principal earnings and dividend valuation models for common stocks to be those of Gordon (1962), Malkiel (1963) and Molodovsky, May and Chottinger (1965).

Reilly (1989) expresses a dividend valuation model based on the assumption that investors forecast dividends from the present to perpetuity, noting that the equation can be simplified by assuming that future dividends grow at a constant rate for an infinite period:

$$V_j = \frac{D_0(1+g)}{(1+k)} + \frac{D_0(1+g)^2}{(1+k)^2} + \frac{D_0(1+g)^n}{(1+k)^n} \quad \text{Equation 2.2}$$

where: D_0 = dividend payment in current period
 g = constant growth rate of dividends
 k = required rate of return on stock j
 n = number of periods - assumed to be infinite.

Equation 2.2 is based on the following fundamental assumptions (Reilly (1989)):

- a constant growth rate;
- an indefinite time period; and
- the required return on the investment (k) being greater than the expected growth rate (g).

Under such a constant growth model, both price and dividends per share grow at the same rate through time and the following model is commonly derived⁶:

$$V_j = \frac{D_1}{k-g} \quad \text{Equation 2.3}$$

⁶ See also Maginn and Tuttle (1990) - Gordon-Shapiro Perpetual Dividend Discount Model:

$$V_0 = \frac{D_0}{k - g_D}$$

where: V_0 = value at time zero
 D_0 = dividends received during time period zero
 k = constant discount rate
 g_D = constant growth rate of dividends

and Haugen (1993) who reinforces the role of expectations:

$$V = \frac{E(D_1)}{E(r) - E(g)}$$

where D_1 represents the current dividend (D_0) multiplied by $(1 + g)$. Accordingly, as D_0 is known, the only variables for assessment are k (required rate of return) and g (expected constant growth rate).

For a rack rented, freehold investment property, the capitalisation rate is, therefore, the spread between the required rate of return and the expected constant growth rate. Accordingly, the capitalisation rate implies a certain relationship between k and g . As Reilly (1989) notes,

"The crucial relationship is the spread between the required rate of return and the expected growth rate" (page 322)

with a decline in the spread leading to an increase in price/value and vice versa and a small change in either having a potentially large effect.

It is contended that a change in the capitalisation rate could, therefore, result from a change in either the discount rate (k) or the growth rate (g). The finance, commerce and economic theory literature on the composition of k and g will be reviewed further, below, in an endeavour to gain a better understanding of each.

The constant growth models assumption of infinite periods is contended to be significant for property valuation as it replaces the concept of capital growth with the assumption of perpetual income growth at a given rate. Accordingly, the value on sale is simply the discounted value of all future dividends (income) beyond the sale date (Reilly (1989)), which will also be considered further, below.

The constant growth dividend valuation model offers a clear expression of the basic, underlying economic relationships contributing to the value of an income producing asset. The model clearly identifies k and g as the principal variables for assessment and further consideration in both the finance and commerce literature, with the potential for application in the property investment valuation process.

2.4.1.2 Earnings Multipliers

The literature suggests that the earnings multiplier is an important method of valuation for common stocks but, in contrast to the property theory literature, suggests that the principal factor for consideration in the Earnings Multiplier Method is likely earnings rather than the multiplier, with the prospective direction of change being more significant than the quantum (Reilly (1989)).

Significantly, the principal influences on earnings at a macro level are found to be the economy and the stocks industry, with the company itself having relatively limited relevance though, at a micro level, the

companies policies may impact. P/e ratios are also found to possess valuable information (Basu in Reilly (1989) Peavy and Goodman (1983) and Canistrano in Brealy and Myers (1981)).

The finance and commerce literature indicates that whilst earnings growth expectations are fundamental to the assessment of the p/e ratio, forecasting of same is surprisingly controversial and unreliable (Haugen (1993)) with no "magic formula for predicting earnings" having been found (Elton and Gruber (1987)). The top down approach is implied in the property theory literature but explicit in the finance and commerce literature with economic, industry and company factors all relevant for the assessment of earnings, though company factors are argued to be the most difficult to accurately estimate (Elton and Gruber (1987)). Accordingly, if a similar approach were to be applied to property valuation, those factors concerning the individual property could be expected to be the most challenging to estimate.

Reilly (1989) uses the dividend growth model (Equation 2.3) to identify the relevant variables influencing the earnings multiplier as being k and g . The role of the multiplier as the spread between the discount rate and the growth rate is found to be central to the finance and commerce literature which is in contrast to the property theory literature, as is the focus, within the finance and commerce literature, on the variables that influence the discount rate and the growth rate rather than the influences upon their respective result, the multiplier, as found in the property theory literature.

Brealey and Myers (1981) note that a high p/e ratio indicates that investors think a stock has good growth opportunities, that earnings are relatively safe and that it deserves a low capitalisation rate. Thus, a range of growth and risk characteristics are interpreted by the investor from the p/e ratio, a clear parallel with the valuers view of the capitalisation rate.

Reilly (1989) also notes that a stocks p/e ratio is generally positively related to the firms growth rate of earnings. Further, it is necessary to predict the growth rate of earnings over next 2-3 years because past growth rates are not good indicators of future p/e ratios with growth rates not being correlated over time. The author comments that the p/e ratio is negatively related to alternative measures of risk (such as business risk, financial risk, variability of earnings, etc) and may be influenced by the accounting methods employed.

Accordingly, the approaches to determining the influences on earnings found within the finance and commerce literature differ significantly to those found in the property literature. However, the principles of the finance and commerce literature approach could be applied to investment property and the relative roles of macro influences compared to the roles of micro influences is contended to be potentially significant.

2.4.1.3 Summary - Valuation Approaches For Other Asset Classes

The concept of, approach to and role of risk and growth within valuation methods for other asset classes is found to be significantly different to those for investment property valuation. The explicit roles of k and g in both earnings and dividend valuation models and in the earnings multiplier contrast starkly with the approaches to growth and risk in the determination of the capitalisation rate found within the capitalisation of income method of valuation.

Further, the emphasis within the Earnings Multiplier upon earnings (principally forecast using a top down approach) rather than on the multiplier is also in marked contrast to the approach in the property theory literature as is the role of expectations in each of the valuation approaches for other asset classes.

The concept of the capitalisation rate as the spread between k and g is fundamental to the finance and commerce literature. It is notable that the emphasis upon the capitalisation rate as an outcome of other implicitly more significant variables, rather than being the principal variable of significance, is the converse of that found in the property literature. Accordingly, changes in the capitalisation rate should not be considered as such but as the outcome of changes in the discount rate and/or the growth rate.

The application of this principle to the assessment of the capitalisation rate for property is contended to be very significant and a fundamentally different approach to that identified in the property theory literature.

As the capitalisation rate is, effectively, found in the literature to be the difference between g and k and as k is a function of the real risk free rate, inflation premium and risk premium (with the risk premium being the only component to vary between asset classes) it is appropriate to further investigate g and k , respectively, in the finance, commerce and economic theory literature.

2.4.2 g

Significantly, the finance, commerce and economic theory literature approaches g as an explicit component of the discount rate, rather than as an implicit aspect of the capitalisation rate. Indeed, the capitalisation rate is that which arises after explicit regard to growth. This is in fundamental contrast to the property theory literature, where g is considered as a determinant of the capitalisation rate in its own right.

Within the approaches to the valuation of common stocks identified in the literature, growth and risk have significant roles. Assuming equal risk and no significant difference in payout ratios between firms, the principal variable affecting earnings multiples is the difference in growth estimates (Reilly (1989)) with the same general principle being applicable to dividend and earnings valuation models. The growth estimate must, therefore, consider the rate of growth and the duration of expected growth (Reilly (1989)), with Haugen (1993) noting that growth horizons may change, though the latter models assume an expected constant growth rate.

As noted above, the principal influences upon the growth in earnings at a macro level are found to be the economy and industry, with the company itself contended to have little relevance. Whilst expectations are cited as significant, the difficulty in forecasting earnings growth is also acknowledged in the literature.

By reviewing the approach to and role of g within the finance, commerce and economic theory literature, it is proposed to endeavour to place the valuation of investment property in a relative context and gain a better appreciation of how growth might be addressed within the property valuation process.

2.4.2.1 Application In The Finance and Commerce Literature

The concept of g as a key variable in the dividend discount model which is based on two principal contributing variables is in stark contrast to the range of amorphous contributors to growth identified in the property theory literature.

Both Reilly (1989) and Brealey and Myers (1981) define g as:

$$g = f(RR, ROE)$$

Equation 2.4

where:

g	= growth rate of equity earnings (eps) without external financing
RR	= retention rate
ROE	= return on equity

which will be considered individually below. Accordingly, a corporate can influence growth by varying RR and/or ROE (Reilly (1989)).

Alternatively, Haugen (1993) notes that the average future growth rate may be assessed by reference to the past growth rate for a broad index and subjectively modified to account for differences in the respective economic environments, with specific regard to inflation.

Haugen (1993) validly notes that g is both an expectation and a measure relative to an average rate, which may be positive or negative. If there is an expectation that dividends will grow faster than an average rate, investors will be prepared to bid up the price of the stock relative to the level of dividends per share, effectively paying in advance for a higher than average growth expectation. There is, therefore, an expectation in terms of both direction and quantum, which may or may not be fulfilled, depending on whether there is an under or over-estimate of growth, which has a pricing impact. The application of such principles to g in the context of property valuation is intuitively appealing.

2.4.2.1.1 Retention Rate (RR)

The internal growth rate of an economic unit (industry or company) is a function of the resources retained for reinvestment and the rate of return derived thereon (Reilly (1989)). Similarly, the level of retained earnings is directly and inversely related to the level of dividend paid, being fundamentally a management decision. Reilly (1989) defines RR as follows:

$$RR = I - D/E \quad \text{Equation 2.5}$$

Brealey and Myers (1981) note that the use of retained earnings is often the line of least resistance for financing in most companies, being preferable to the use of debt and typically covering the majority of firms capital requirements.

Given that there is effectively no distinction between earnings and dividends in the assessment of income streams from property, RR is contended not to be a relevant concept in the assessment of growth for property.

2.4.2.1.2 Return On Equity (ROE)

The level of expected growth, positive or negative, in the return on equity is a fundamental component of g . Whilst changing RR is basically a management decision, changes to ROE require changes in the operation of the company (Reilly (1989)).

Reilly (1989) defines ROE as follows:

$$ROE = \frac{\text{Net Income}}{\text{Equity}} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Equity}} = \text{Profit Margin} \times \text{Equity Turnover} \quad \text{Equation 2.6}$$

which clearly identifies the sales forecasts and estimated profit margins as significant components. The author goes on to note that economic factors affect all industries and that industry performance

influences each company in that industry, which together with company factors are all important in such assessments.

Maginn and Tuttle (1990) extend this approach, advocating a review and forecast of:

- macro-economic factors - GNP, real output;
- the industry in which the company sits - including performance of competitors, labour costs, raw materials costs, government actions; and
- a financial markets perspective - what has happened to the stock market in terms of price level and total return

and with regard to:

- systematic influences, including worldwide or countrywide factors;
- unsystematic influences, including sector or industry factors which influence a group of stocks (such as where the product sits in its life cycle, character of the competitive environment, etc); and
- company factors, including the effect of unique factors on future earnings,

which may be both current and prospective.

The top-down approach to the assessment of influences on sales forecasts and estimated profit margins, as the principal contributors to ROE, is in stark contrast to the approaches to be found in the property theory literature. Given that ROE is the relationship between net income and equity, it is basically a capitalisation rate expectation as it is inappropriate to decompose ROE into sales forecasts and profit margins for property. The emphasis on influences external to the company is much greater in the finance and commerce literature than in the property literature, where internal or property specific influences gain much greater attention.

2.4.2.2 Capital Growth

The attention to capital growth within the property theory literature is remarkable given its apparent absence in the finance, commerce and economic theory literature. The dividend discount valuation model has no allowance for capital growth in stock value, with the literature noting that such growth is merely a function of an enhanced growth rate for the income stream in perpetuity.

Reilly (1989) notes that capital gain for a stock is a function of three factors:

- size of percentage of earnings retained for reinvestment;
- relationship between firms rate of return on investments and firms required rate of return; and
- time period for the superior investment - ie: sustainability of investing to earn above the required return with such time factors cutting across the infinity assumption of the basic model.

Accordingly, the assumption of capital growth in property valuation (as may be manifest in the adoption of a lower terminal yield within a discounted cash flow valuation) is merely an expression of a higher income growth rate to perpetuity in a multi-stage model. Arguably, given that property becomes obsolete as time passes (though this may be deferred by refurbishment), for such a higher growth rate to be applicable there must be a significantly greater level of offsetting positive factors.

The conceptual difference between the capital growth of the property theory literature and the perpetual income growth at differing levels of the finance, commerce and economic theory literature is contended to be highly significant. Effectively, the finance, commerce and economic theory literature suggests that there is no such thing as capital growth.

2.4.2.3 Summary - g

Having ascertained that g is considered within the finance, commerce and economic theory literature to be an explicit component of the discount rate which is assumed to be constant for an indefinite period, the literature went on to quantify g as a function of RR and ROE which has limited direct application to property.

However, the approach to determining ROE found within the literature is contended to be instructive as it advocates a structured top down approach to and emphasis on the relevant influences external to the company, from macro-economic issues through markets and industry levels, to the individual company itself and internal influences, which are attributed less emphasis, with a focus on the prospective or expectational.

Further, the non-existence of capital growth as a concept in the finance, commerce and economic theory literature contrasts dramatically with the property theory literature and serves to focus attention more closely on those issues influencing RR and growth in ROE . Accordingly, it is contended that capital growth as a distinct concept, may be discarded from an investigation of the determination of the capitalisation rate based on finance, commerce and economic theory literature principles.

It is contended, therefore, that the finance, commerce and economic theory literature offers the following significant contributions regarding the approach to and identification of growth:

- that growth as a concept may be distinguished in the finance, commerce and economic theory literature from that of the property theory literature;
- that growth may be positive or negative;
- that growth is an expectation in terms of both quantum and direction;
- that growth is capable of under or over-estimation which has a pricing impact;
- that growth is subject to economic, industry and company influences;
- that systematic, unsystematic and company factors are relevant in the assessment of growth;
- that capital growth is not a concept distinct from income growth but merely a function of a differing level of perpetual income growth.

The reconciliation of such findings with those of the property theory literature review will be considered further below.

Based upon the literature, it is contended that growth is unlikely to be a determinant of the capitalisation rate in its own right but more likely to be a positive or negative aspect of other influences upon the capitalisation rate, which places considerable emphasis upon the correct identification and interpretation of such influences.

Accordingly, the approach to g within the finance, commerce and economic theory literature was found to differ significantly from that of the property theory literature, being notably more explicit and structured with a primary focus external to the subject being valued. Having briefly considered g , it is now proposed to investigate the approach to k found within the finance, commerce and economic theory literature.

2.4.3 k

The discount rate, k , was noted in Section 2.4.1.3, above, to be a function of the real risk free rate, inflation premium and risk premium with the risk premium being the only component to vary between asset classes. Accordingly, for brevity, it is proposed to focus on the risk premium within the finance, commerce and economic theory which, in itself, is a very significant body of literature.

Both Maginn and Tuttle (1990) and Brealey and Myers (1981) cite Fishers (1930) classic expression of the discount rate:

$$DR = RRFR + IP + RP$$

Equation 2.7

where:	DR	=	discount rate
	RRFR	=	real risk free rate
	IP	=	inflation premium
	RP	=	risk premium

which Reilly (1989) restates in two alternative forms representing the qualitative and quantitative approaches found within the finance, commerce and economic theory literature. Significantly, Reilly (1989) also notes that the overall level of required rates of return for all investments changes dramatically over time and that there exists a wide range of required rates of return for alternative investments.

It is proposed, therefore, to approach the finance, commerce and economic theory literature concerning the risk premium as follows:

- 2.4.3.1 Conceptual Approach To Risk
- 2.4.3.2 Qualitative Approach To The Risk Premium
- 2.4.3.3 Quantitative Approach To The Risk Premium

prior to a brief summary of the findings of the review of literature concerning k.

2.4.3.1 Conceptual Approach To Risk

The conceptual approach to risk in the finance, commerce and economic theory literature reviewed differs significantly from that found within the property theory literature. As considered in Section 2.3, the property theory literature consistently acknowledges the existence of risk and its intrinsically challenging nature though a precise grasp of the concept appears elusive. MacGregor notes (in Venmore Rowland et al (1991)) that "risk is a well known concept, if only intuitively" with Waldy (1989) citing Baums (1987) comment that practitioners only have an "extremely imprecise conception" of the application of risk to commercial property.

A fundamental theme in the finance, commerce and economic theory literature reviewed is the inalienable alliance between risk and return in the context of the capital markets, particularly the equities markets. Indeed, the trade off between the two is a common introduction to the topic of risk

before the text moves swiftly on to consider variance, the systematic/unsystematic risk distinction and diversification with little, if any, other introduction or discussion of risk (see for example, Elton and Gruber (1987) and Brealey and Myers (1981)).

Concise definitions of risk are rare but the concept of risk as the movement in returns, as distinct from a specific contributor to returns, is commonly found - for example, Reilly ((1989) and (1985) respectively) refers to risk as the "uncertainty of future outcomes" and the "uncertainty regarding the expected rate of return from an investment". Such a definition is echoed in contemporary property investment analysis literature by Fraser (1985):

"a simple and intuitively attractive definition of risk is the variability (or volatility) of annual returns" (page 1292)

Maginn and Tuttle (1990) take the concept of risk as a variation in returns a step further by dwelling on returns being better or worse due to a particular aspect arising from "sources of investment return". This conceptually links the variation in returns with a series of separable causes or sources of return, viewing return as a composite rather than as an independent expression. Indeed, referring to the risk premium within k , Reilly notes that it "represents a composite of all uncertainty" with the investor requiring a compensating incremental rate of return for the given uncertainty in the level and timing of income receipts. The contrast with the concept of risk as an identifiable determinant of the capitalisation rate in its own right could not be greater.

Whilst the variance in returns may be positive or negative, Brown (1992) notes that attention to the negative ("a chance of loss") is usual and Reilly (1989) reiterates such a concentration by describing risk as "the probability of an adverse outcome".

As a variance in return, risk is generally considered retrospectively by the finance texts. The variance of return over a specified historic period is commonly considered as the assessment of risk for a particular security. However, when the concept of risk as the variance in returns is linked to expectations of returns, a further dimension to risk is created.

Ross et al (1988) describe expected return as that return which stockholders predict based upon all information available at the time and upon their understanding of what influences the stock, thus incorporating both expectations and the concept of return arising out of a series of contributory influences. Stockholders are, therefore, argued to incorporate within their assessment of expected return an allowance for risk or variance in the contributory elements of return which they anticipate in the future from the point in time at which the assessment is made.

Ross et al (1988) go on to define total return as the sum of expected return plus unexpected return or "surprise". The latter arises from information that is revealed over time (such as economic information, company specific information, financial markets changes, etc) and comprises the difference between actual return and expected return or, effectively, the difference between the investors expectation of variation and the actual variation experienced in the various contributory elements of return. Hence, Ross et al acknowledge in theory the greater probability of investors expectations not being matched by events in the future which contributes a further risk component in itself, that of the potential magnitude of the "surprise" for any security.

The qualitative approaches to risk found in the property theory literature contrast to the heavily quantitative approaches found in the finance, commerce and economic theory literature. The concept of risk as the variation (which may be positive or negative) in return arising from changes in the contributory elements of that return, rather than risk as a variable in itself, is central to both capital market theory and the finance, commerce and economic theory literature, being a significantly different approach to that found within the property theory literature reviewed above. It is through the quantitative analysis of the variation in returns that the finance, commerce and economic theory literature develops divisions or groupings of risk which may be capable of application to property as an asset class.

However, it should be noted that such quantitative analysis was developed from and for application in the equities market, which has levels of liquidity, marketability, centrality, homogeneity and divisibility not found in the property markets. Despite such limitations, it is contended that the fundamental principles identified may be applicable to the further interpretation of the findings of the property theory literature review and may also provide guidance as to how risk might relate to growth and so will be considered, further, below.

2.4.3.2 Qualitative Approach To The Risk Premium

As noted above, Reilly (1989) qualitatively describes the risk premium as a function of four contributors:

$$k = f(RRFR, I, BR, FR, LR, ERR)$$

Equation 2.8

where:	k	=	required rate of return
	I	=	expected rate of inflation
	BR	=	aggregate business risk
	FR	=	aggregate financial risk
	LR	=	aggregate stock market liquidity risk
	ERR	=	exchange rate risk.

The literature commonly considers the four classifications of influences contributing to variations in returns, with the definitions of Reilly (1989) being adopted below:

- **Business Risk:**

Being the uncertainty of income flows caused by the nature of the firms business, such as sales volatility and operating leverage;

- **Financial Risk:**

Being the uncertainty of returns caused by the method of financing the investment;

- **Liquidity Risk:**

Being the uncertainty introduced by the secondary market for an investment, including the uncertainty involved in buying/selling the investment, how long will it take to convert the investment into cash and how much will be received; and

- **Exchange Rate Risk:**

Being uncertainty due to changing exchange rates when investing outside a given country.

Significantly, Reilly notes that the four classifications are consistent with and complementary to the quantitative analytical approaches to risk considered in Section 2.4.3.3 below.

Whilst the application of such classifications to property is not immediately apparent, the literature concerning same will be considered in Section 2.5.3.1, below.

2.4.3.3 Quantitative Approach To The Risk Premium

The basic capital market theory equation for expected returns is given in Brown (1991) as follows:

$$E(r_j) = r_f + \beta_j [E(r_m) - r_f] \quad \text{Equation 2.9}$$

where:

$E(r_j)$	=	expected return on asset j for the period under consideration
r_f	=	riskless rate of return for period under consideration
$E(r_m)$	=	expected return on the market portfolio
β_j	=	systematic risk of the asset j.

The finance and commerce literature concerning aspects of quantitative risk analysis arising from Equation 2.9 is massive. The consideration herein is grouped into four principal areas being variance, beta (including consideration of single beta applications, multi-beta and fundamental beta applications and the Arbitrage Pricing Theory), diversification and risk classifications which renders specific referencing challenging. It should, however, be noted that a more comprehensive review of relevant literature, concerning the principal concepts is included in Excursus 4, annexed hereto, which is fully referenced.

It is proposed, in the following sub-sections, to endeavour to highlight a few key points only from the literature reviewed in Excursus 4, annexed hereto, which are relevant to the consideration of the finance, commerce and economic theory literatures approach to risk in the context of the determination of the capitalisation rate.

The concept of risk as the movement in returns is commonly approached in the finance and commerce texts through the use of the statistical function, variance. Some texts (see for example, Elton and Gruber (1987) and Brealey and Myers (1981)) devote practically no attention to the description or discussion of risk and launch immediately into the statistical concept as a pre-cursor to the introduction of the systematic/unsystematic risk distinction. Reilly (1989) breaks variance into systematic variance and unsystematic variance with Haugen (1993) referring to the latter as residual variance.

The principle of diversification is central to modern portfolio theory with the ultimately diversified portfolio comprising the "market universe" (Reilly (1989)) or a combination of every single risky asset (Haugen (1993)). In such an ultimately diversified portfolio or market portfolio, the only risk which can impact upon the portfolio is that systematic risk caused by those economic variables which influence all risky assets (Reilly (1989)). Accordingly, in such a large and diversified portfolio, unsystematic risk is eliminated (Reilly (1989)) and not rewarded at the portfolio level. Only the bearing of systematic risk is rewarded such that investors seek to diversify in order to eliminate unsystematic risk (Reilly (1989)).

As the portfolio comprises a group of individual securities, it is notable that the proportion of systematic to unsystematic risk at the single security level may vary significantly. Indeed, it is such differences between individual securities that provide the diversification benefits when grouped in a portfolio. It is apparent from a brief review of the standard texts that the roles of systematic and unsystematic risk at both the individual security and portfolio level are fundamental issues within the concept of diversification.

The concept of risk as the variance in returns is a philosophically different approach to that of the property theory literature, with the attribution of such variance to the contributory elements of return, grouped as systematic and unsystematic, of considerable significance. However, the subsequent

development of these principles through advanced mathematics, founded on a series of assumptions, tends to focus the attention of the authors on the statistics rather than the underlying assets leading to a potential for limiting the direct applicability of the findings to other asset classes. Various authors, such as Sharpe (1974), investigate multi-beta and fundamental beta applications in the equities market. An approach to viewing return as a combination of contributing elements is contended to be philosophically significant. The notion of a series of descriptors being accumulated together to comprise one of a series of variables is fascinating and the applicability of the structure of such models to property intuitively attractive. Such a structure allows the effect of individual changes to be not only manifest but also manifest relatively within a given part of the company's (or assets) performance structure.

Whilst the number of variables which may be adopted varies significantly (such as from 7 to 101 (Elton and Gruber (1987))), a combination of economic, asset class wide, industry wide and company specific influences may be incorporated. Accordingly, unsystematic and idiosyncratic risk influences are effectively adopted to contribute to an explanation of a measure of systematic risk.

The nature and characteristics of risk are developed in the concept and practical application of the Arbitrage Pricing Theory (APT) proposed by Ross (1976). The APT provides a framework within which the single factor risk of the CAPM (the single number beta of the asset class against the market index) is replaced by a series of identified systematic pricing or risk factors of an economic character and a single idiosyncratic pricing or risk factor, which will be considered further below.

Detailed attention to capital markets risk classifications within the finance, commerce and economic theory literature is both limited and inconsistent, with the basic classifications of systematic and unsystematic risk attributed a variety of names by the various authors. In order to meaningfully distinguish between systematic and unsystematic risk influences, the contributions of the various authors reviewed were collated and a framework developed which may be summarised as follows:

Systematic Risk

Economy wide, asset class wide and industry wide influences of a descending, hierarchical character, common to all companies, pervasive and beyond the control of an individual company;

Unsystematic Risk

Industry wide and company specific influences of a descending, hierarchical nature limited to either individual companies or groups of companies and so pervasive only at the industry level and potentially within the partial control

of the company. The elimination of unsystematic risk through diversification results in relatively limited, somewhat confused and inconsistent attention to unsystematic risk within the literature.

Significantly, the proponents of the Arbitrage Pricing Theory adopt a third classification of risk, entitled Idiosyncratic Risk, attributable to those "influences that are not systematic to the economy as a whole, influences that impinge upon individual firms or particular industries but are not directly related to overall economic conditions" (Roll and Ross (1984))

Ross et al (1988) note that the term idiosyncratic was used merely to stress that the information within the idiosyncratic term is limited to the specific company or asset alone. This is distinguished from unsystematic risk which is argued to be capable of referring to a group of companies or assets.

Accordingly, it could be proposed that unsystematic risk comprises those influences which affect the returns of an industry group or asset class whereas idiosyncratic risk comprises only those influences which affect the returns of a particular company or asset. Haugen (1993) reinforces this proposition when noting that all covariances between rates of return for securities will be attributable to the identified factors leaving the residual idiosyncratic factor uncorrelated between companies.

It is contended, therefore, that the following capital markets risk classification may be proposed:

Systematic Risk
 Systematic - Economic
 Systematic - Non-Economic
Unsystematic Risk
 Idiosyncratic Risk

for application to the relevant asset classes.

2.4.3.4 Summary - k

Though k is a function of the real risk free rate, an inflation premium and the risk premium, the latter is the only component to vary between asset classes and so was solely considered within the review of finance, commerce and economic theory literature concerning k .

The concept of risk as the variation in returns (which may be positive or negative) is fundamental to the finance, commerce and economic theory literature and may be distinguished from the concept of risk found within the property theory literature. Despite frequent references to the qualitative analysis of

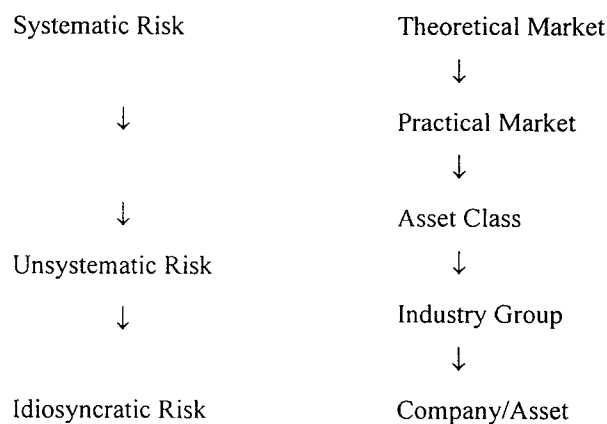
risk, the focus on variance in returns and beta as the principal measure of risk within the finance, commerce and economic theory literature is overwhelming.

Further, the finance, commerce and economic theory literature focuses on risk arising from the sources of investment return and on the role of expectations which are based on available information, leading to returns being better or worse than expected and the role of “surprises”. Within the finance, commerce and economic theory literature, risk is considered as a composite result which contrasts to the view of it as an independent input in the property theory literature.

Whilst the qualitative and quantitative approaches to risk analysis are complementary, the latter is contended to facilitate a closer understanding of the sources of investment return through the concepts and application of variance, beta and diversification. Such an understanding is further clarified through the findings of research into multi-beta and fundamental beta applications and the Arbitrage Pricing Theory which, cumulatively, establish the capital markets risk classification of sources of investment return as systematic, unsystematic and idiosyncratic.

The concentration of the finance and commerce texts on the quantitative aspects of risk analysis has been at the expense of the qualitative, descriptive aspects. Confusion and inconsistency as to what constitutes systematic and unsystematic risk elements is in stark contrast to the clarity of the algebra and the succinct definition of idiosyncratic risk. It is significant that no comprehensive, applied examples of the range of factors that may influence a security's return, classified under the respective risk headings, were found within the literature reviewed. The consistent disregard of unsystematic risk due to its capacity for elimination through diversification was particularly disappointing.

However, the various authors comments may be combined into the proposition of a framework within which the roles of systematic, unsystematic and idiosyncratic risk may be hierarchically incorporated:



It is not clear, however, where the role of systematic risk gives way to that of unsystematic risk if, in fact, it does. Arguably, systematic and unsystematic may be names adopted merely to distinguish between those factors which are incorporated within capital market pricing concepts and those which are disregarded, consistent with the role of the market in capital market theory.

Given Roll and Ross (1980) total familiarity with the principles of modern portfolio theory and the capital asset pricing model, their inclusion of an idiosyncratic factor within the Arbitrage Pricing Theory is contended to be particularly significant and to extend the notion of systematic/unsystematic risk influences to exclude those influences specifically associated with a given security or asset.

It appears, therefore, that risk is a function of a wide range of contributing influences, including a proportion which may be attributable to the characteristics of the individual asset, with those of the industry and economy being common to each of those assets within that particular class or sub-sector. Accordingly, it is contended that the idiosyncratic characteristics of a particular asset may be of considerable importance in fully understanding the risk profile of that asset.

The review of literature concerning systematic, unsystematic and idiosyncratic risk may be of most use in highlighting that sources of variation in return may be grouped by their differing levels of pervasiveness. Given that the return of an asset comprises a combination of separate sources of return, each of which may vary (with risk being capable of consideration as such variance rather than as a return variable in itself), the classification of factors which may vary into a hierarchy is potentially very significant.

Based upon the literature, it may be contended that risk is unlikely to be a determinant of the capitalisation rate in its own right but more likely to be an outcome of the relative positive and negative contributions of the various respective sources of investment return to that return.

2.4.4 Summary, Areas For Further Research And Conclusions - Review Of Finance, Commerce And Economic Theory Literature

This Section comprised the second peripheral topic area which sought to identify principles of finance, commerce and economic theory relevant to the determination of the capitalisation rate. The Section focussed on the approach within the finance, commerce and economic theory literature to valuation approaches for other asset classes and to growth and risk and their relativity to the discount rate.

2.4.4.1 Summary

The approach to growth, the discount rate and risk within the finance, commerce and economic theory literature was found to be conceptually very different to that within the property theory literature, with the nexus between the three being theoretically very clear.

Risk and growth were each found to be treated explicitly within the literature, which may be contrasted to the implicit treatment within the property theory literature. Further, the role of the capitalisation rate as merely the difference between k and g was as fundamental to the finance, commerce and economic theory literature as it was absent in the property theory literature.

For both growth and risk, the finance, commerce and economic theory literature was found to emphasise sources of or influences on ROE and on investment return respectively, which, it is contended, may often be the same influences. The commonality of the top down approach and proposition that such sources of or influences upon return may be attributable to economic, market, industry or company contributors is consistent with the classification of systematic, unsystematic and idiosyncratic, respectively.

In addition, the non-existence of capital growth as a separate concept in the finance, commerce and economic theory literature together with the emphasis on the role of expectations (including those of quantum and direction with a pricing impact) may be contrasted to the findings of the property theory literature.

2.4.4.2 Areas For Further Research

Having identified a focus, within the finance, commerce and economic theory literature, on the sources of investment return and the attribution of movement in such return to influences arising from the economy, markets, industry or the company itself which may be classified as systematic, unsystematic and idiosyncratic, the application of such a focus to property investment would be worthy of further attention through a brief review of the relevant property finance literature.

2.4.4.3 Conclusions

An explicit relationship between growth, risk and the discount rate is clearly expounded within the finance, commerce and economic theory literature. Further, the emphasis within the finance, commerce and economic theory literature on growth, risk and the sources of investment return is contended to be a fundamental outcome of the literature review with potential application to the findings of the property theory literature review concerning factors which contribute to the determination of the capitalisation

rate. Further, the suggestion that aspects of the asset itself may influence return is contended to be potentially particularly significant in the context of property.

Whilst distinguished as concepts in the property theory literature review, it is contended that growth and risk are unlikely to be determinants of the capitalisation rate in their own right, but more likely to be a positive or negative expectational influence upon sources of investment return or an outcome of the relative positive and negative contributions of the various respective sources of investment return to that return.

The following Section, therefore, seeks to reconcile the findings of the property theory literature review with those of the finance, commerce and economic theory literature review through a review of property finance literature.

2.5 REVIEW OF PROPERTY FINANCE LITERATURE

The preceding Section in this review of literature investigated the second peripheral topic area, comprising a review of finance, commerce and economic theory literature to identify principles relevant to the determination of the capitalisation rate, with a particular focus on the approach to growth and risk and their relativity to the discount rate.

It was established that a clear relationship between growth, the discount rate and risk existed within finance, commerce and economic theory literature. Growth and risk were contented to be capable of consideration as a positive or negative expectational influence upon sources of investment return, with such sources being attributable to economic, market, industry or company contributors and capable of classification as either systematic, unsystematic or idiosyncratic.

Given the significant difference of approach to growth and risk found in the finance, commerce and economic theory literature compared to that in the property theory literature, it was contended that an investigation of the reconciliation of the two approaches through a brief review of property finance literature may be worthwhile. Such reconciliation may contribute to a clearer understanding of how the principles derived from the finance, commerce and economic theory literature review might be applied to those of the property theory literature review concerning the determination of the capitalisation rate.

Accordingly, the following comprises the third and final peripheral topic area, being a review of that property finance literature which seeks to reconcile property theory with finance, commerce and economic theory as far as is relevant to the determination of the capitalisation rate.

Whilst the traditional property texts in the UK and Australia provide a general introduction to property valuation and alternative methodologies for use in teaching, numerous more specialist texts have appeared during the last ten years which concentrate on property as a form of investment and which are referred to herein as the property finance literature

A review of the property finance literature is contained in Excursus 5, annexed hereto, with the key aspects summarised below. It is notable that the property finance literature has regard to and considers the principal issues identified in the finance, commerce and economic literature in the context of property.

To facilitate clarity, the property finance literature has been considered within the following sections:

- 2.5.1 Application Of Valuation Approaches From The Finance, Commerce And Economic Theory Literature To Property
- 2.5.2 g - Application To Property
- 2.5.3 k - Application To Property

prior to a brief summary of the findings of this Section of the review of literature, identification of areas for further research and statement of the conclusions that may be drawn therefrom.

2.5.1 Application Of Valuation Approaches From The Finance, Commerce And Economic Theory Literature To Property

Within the property finance literature, references were found to not only valuation approaches which were more consistent with the finance, commerce and economic literature but also to the role of expectations and the view of the capitalisation rate as merely the difference between k and g which are each considered, briefly, below.

Brown (1991) adopts a significantly different approach to that found in the other property finance literature (such as Baum and Crosby (1988) and Pyhrr et al (1989)), by suggesting that for a valuation model to have a positive role in the selection process, it must assist in identifying whether a given property is over or underpriced. Whilst valuation by comparison will provide a guide to the best value

that can be achieved in the market place, it does not assist in determining whether the property is over or under-priced in an economic sense. (Brown (1991)).

The author contends this to be a matter of economics, not mathematics, with a mathematically correct model capable of derivation once the economic principles are established (though the reverse may not be the case). Brown (1991) then reviews the equivalent yield, equated yield and Rational Valuation Models and comments on their respective economic validity, highlighting the benefits and deficiencies in each.

Consistently, Brown (1991) argues that the required rate of return is determined in the market place by reference to other assets of equivalent risk whilst the growth rate is determined by macro and micro economic factors affecting the property - the difference between the two determining the property's yield.

Starting from economic principles, Brown (1991) builds a valuation model which accords with finance, commerce and economic theory literature. Drafted, significantly, in terms of expectations, Brown (1991) proposes:

$$E(V_t) = f[E(a, k, g)] | \emptyset_t \quad \text{Equation 2.10}$$

$$\text{or: } E(V_t) = f[E(a, y)] | \emptyset_t \quad \text{Equation 2.11}$$

where:

- $E(V_t)$ = expected value at time t
- a = income
- k = required return
- g = expected growth rate
- y = yield
- \emptyset_t = information subset available at time t ,

with the expected value of the property being a function of expected income, required return and expected growth (or required return and expected growth combined to give a yield) for a given subset of information. Interestingly, Brown (1991) cites such expectations being dependent upon location, lease structure, tenant, reversions, quality of building, voids and so on. As different valuers may have different views concerning the subsets of information and weights attached, different values may arise with that based on the closest knowledge being more likely to represent the consensus of market opinion. As Brown (1991) notes, there is no correct answer.

Brown (1991) develops this basic expression noting that the return for the second year may differ from that for the first, being determined by the riskiness of the asset and the term structure of interest rates prevailing at the time. Brown (1991) proposes a model, drafted in terms of expectations, which has income received each period and discounted at the rate appropriate to each period. As such, the proposed model embodies three fundamental factors which ensure its economic correctness:

- each cash flow is expressed in nominal terms, being the price structure prevailing at the time they occur;
- each discount rate is expressed in nominal terms, so embodying investors expectations concerning inflation; and
- the required rate of return also embodies a premium for risk, with higher risk assets requiring a higher return.

To simplify the model, Brown (1991) proposes certain assumptions including drafting income as an initial amount assumed to grow at a constant annual rate, being the average of all annual growth rates in perpetuity. Similarly, an average of all future annual rates of return may be used to discount cash flows based on a risk free rate (such as the yield on long term gilts, being an expression of term structure expectations) plus a premium for risk for the characteristics of the particular property under consideration.

As Brown (1991) notes, for a property let with annual rent reviews, the current expected value may be expressed as:

$$E(V_0) = \frac{E(a)}{E(k) - E(g)} \quad \text{Equation 2.12}$$

where: $E(a)$ = expected initial rent
 $E(k)$ = long term expected required rate of return
 $E(g)$ = long term expected growth rate in rent,

which clearly places the capitalisation of income method of valuation within the context of the valuation approaches found within the finance, commerce and economic theory literature.

Brown (1991) proposes that the role of the valuer is to assess the required rate of return, adjusted for risk and the expected growth rate for rental, having regard to (interestingly) the type of property, condition, location and economic prospects of the area, with a difference between valuers arising from differences in expectations which, provided it is random, should not matter. It is contended that the

contrast to the capitalisation rate selection method advocated within the property theory literature could not be greater.

Interestingly, Brown (1991) suggests:

"Although valuers are aware of required rates of return and growth rates, for simplicity they prefer to make use of yields" (page 74)

adding that, whilst valuers are capitalising at a single yield figure which is the required rate of return less the growth rate, it is not necessarily clear that valuers understand that they are doing so for simplicity (Brown (1991)).

The role of expectations in the property pricing process is more apparent in the property finance literature than in the property theory literature which is, of course, entirely consistent with the view of risk and growth in the finance, commerce and economic theory literature. Regarding risk, MacGregor in Venmore-Rowland et al (1991) notes that "risk is, therefore, a measure of what is expected to happen, not actually happening" and, interestingly, links several concepts by suggesting risk as a measure of the expected return not being achieved from an investment.

The property finance literature, therefore, moves the emphasis in the valuation process from the capitalisation rate to the required rate of return, risk premium and growth rate, clearly embracing the concept of the capitalisation rate as the difference between the required rate of return and the expected growth rate.

2.5.2 g - Application To Property

Whilst various authors consider g on the basis adopted in the finance, commerce and economic theory literature, considerable confusion regarding the treatment of capital growth is apparent. Jones Lang Wootton (1992) identify g , but provide relatively little attention to its role and function. The authors refer to the "rigid assumption" of "a constant rate of annual income growth in perpetuity which equals annual capital growth" as a disadvantage of the capitalisation rate, citing as justification "the fact that rental growth is not expected for a number of years in most Australian CBD office markets contradicts this implicit growth assumption".

French (1992) refers to g as a "linear average figure", indicating that growth rate required if an investor is to pay a certain price for the investment to achieve a required rate of return. The author notes that this does not mean that the growth pattern will actually happen and if it eventuates at a lower level, the

investor will have paid too much. Brown (1984) confirms that g is a simplified assumption concerning the pattern of future rental changes, such that a single years rental growth of +30% could be consistent with a long term growth rate of +8%, thus correcting the numerous erroneous conclusions of Jones Lang Wootton (1992), above.

Brown (1984) further notes that the valuation model assumes constant rental value growth over an infinite time horizon or, alternatively, it may imply growth for a period of, say, 15 years and then capitalise the remaining income stream at the initial yield. Whilst not incorrect, the author comments that this obscures the need to estimate the growth rate beyond the 15 year period, which has inherent dangers. For example, if the risk class of the property is unchanged, a future rental growth rate could be implied 15 years hence which inadequately covers depreciation and the property's ability to maintain high rental value growth.

As Brown (1984) comments, use of the all risks yield does not obviate the need to estimate the long term income growth rate, the former merely obscures the latter. Further, as the author notes, whilst the capitalisation rate comprises total return less growth, "it is not easy to separate the impact of each accurately, but we are getting better".

It was particularly interesting to find sources of growth for property identified in the property finance literature, such as by Brown (1984):

- impact of technological change;
- demand;
- location;
- type of tenant;
- impact of depreciation on the particular building

and to find that such factors generally focussed on the property itself, rather than upon the economy, markets or industry (market sub-sector).

Interestingly, the author cites the following as of significance to total returns **and** the growth rate, though acknowledges that there is little guidance as to the level of such significance:

- | | |
|------------------------------------|-----------------------|
| - state of economy; | - security of income; |
| - general level of interest rates; | - age of building; |
| - location of property; | - lease terms; |
| - future rental growth prospects; | - size of property. |

Accordingly, Brown (1984) adds to the above list of influences on growth but does not distinguish in this list which influence k and which g , nor if such distinction is, in fact, relevant.

Whilst k and g may be potentially independent and capable of distinction and separate enumeration in the finance, commerce and economic theory literature, the level of overlaps within the property theory literature suggests that such separation may not be quite so straightforward when applied to property investment valuation.

Significantly, Brown (1984) notes that:

“In estimating the level of growth, is it possible to quantify the impact of these *(the other determinants of location, tenant, age and quality of building)* factors? Up to a point the answer is “yes”. This can be done at the aggregate level by setting valuations equal to a number of specific factors. The relative weight of these factors can then be determined by regression analysis.

This, however, would give an indication of the weight of each factor at the aggregate level: the relative impact on individual properties would have to be made by adjusting these weights.

This type of analysis is useful because it draws attention to those factors which are important in assessing growth. If carried out over several periods it is also possible to see whether certain factors are stable over time and how the market reacts to them.” (page 704)

Whilst some authors acknowledge the applicability of g from the finance, commerce and economic theory literature, it is contended that Brown progresses its application in a property valuation context farthest by suggesting a range of relevant influences. It will be contended, below, that further development of such principles may provide an instructive approach to growth within the capitalisation rate determination process.

Growth, therefore, appears to be attributable in the property finance literature to property specific features as well as to more general economic and market influences, which comprises a broader approach than the majority view within the finance, commerce and economic theory literature of growth as being predominantly attributable to influences external to the company (asset).

Whilst Equation 2.12 accords with the finance, commerce and economic theory literature and treats capital growth as perpetual income growth, this is not consistent across all of the property finance

literature. Interestingly, Brown (1991) identifies capital growth and income yield as the two components of total return with Jones Lang Wootton (1992) and Toxward (1993) both stating that the capitalisation rate formula ($r-g$) implies that the rate of capital growth will be the same as that of income growth. Jones Lang Wootton (1992) go on to note that in weak markets, investors expect current income to provide a greater portion of return to compensate for low expected rental and hence capital growth, placing a downward pressure on prices. Baum and Crosby (1988) also refer to g in Equation 2.3 as anticipated growth in income and capital.

Whilst, interestingly, capital growth is described as a result of income growth (which would accord with the finance, commerce and economic theory literature), it is notable that the two are still distinguished (consistent with the property theory literature).

It is interesting, therefore, that even that property finance literature which most embraces the approaches of the finance and commerce literature still clings to capital growth as a separate or distinct concept. However, it should also be noted that this area tends to be only superficially addressed in the property finance literature with little specific, detailed attention to or analysis of capital growth identified.

Accordingly, it is apparent that the general approach to g found in the finance, commerce and economic theory literature is being applied to property investment analysis in a preliminary manner within the property finance literature. Whilst there is ambiguity over the contributors to g and the role of capital growth, the applicability to property of finance, commerce and economic theory concepts (particularly through the pioneering work of Brown) cannot be disputed.

2.5.3 k - Application To Property

Whilst the discount rate is frequently referred to in the property finance literature, its decomposition and the role of risk, both as a concept and as a premium, receives less attention.

Pyhrr et al (1989) unequivocally embrace the concept of risk as the variance in returns though other references within the property finance literature are relatively limited and considerable attention is given to the handling of risk through intuitive techniques (comprehensively considered by Waldy (1989)) and adjustments or alterations in valuation methodology which, whilst helpful, do not adequately address the sources of risk in a property context.

One of the most detailed reviews of risk in the single property asset context is provided by Waldy (1989) which suggests an apparent philosophical change from that proposed in the property theory literature, being that risk is not necessarily considered as a variable in itself but as an aspect of or feature

inherent within other variables. Waldys research significantly adds to the knowledge of risk treatment in the valuation process in practice, but it is regrettable that the author did not investigate further the sources of risk at the individual property level.

Whilst a quantum shift to the finance, commerce and economic theory approach of viewing risk primarily as the variation in actual or expected return does not yet appear to have eventuated, a drift of thinking towards such a view and away from the traditional, property theory view of risk as an independent variable is apparent.

Approaches to the derivation of the discount rate within the property finance literature are very broad, with relatively little consistency and a combination of quantitative and qualitative approaches advocated. With little apparent regard for the basic principles of the finance, commerce and economic theory literature, various authors suggest methods of assessing k , including:

- derivation from known sales provided sufficient information is available, which is acknowledged to not usually be the case (Toxward (1993));
- discussion with investors to ascertain their views (Toxward (1993) and Jones Lang Wootton (1992));
- discussions with valuers (Jones Lang Wootton (1992));
- discussions with participants in the market (Jones Lang Wootton (1992));
- adoption of the ten year government bond rate and addition of a risk premium (Toxward (1993));
- assuming the market is efficient, combining the current capitalisation rate with expected inflation and expected real income growth for the asset over the term of the investment (Jones Lang Wootton (1992));
- the weighted average of all possible returns, where the weights are the probabilities of occurrence (Pyhrr et al (1989));
- a combination of expressions of opportunity cost, inflation and certainty of payment or risk (Pyhrr et al (1989));
- the risk adjusted opportunity cost of capital (Jones Lang Wootton (1992)).

It is contended to be remarkable, in the otherwise relatively sophisticated property finance literature, that the first four methods arise as each may have equal applicability to the derivation of the capitalisation rate and accordingly may suffer the same problems.

The variations of approach found within the property finance literature to the concept of the discount rate as a combination of the risk free rate plus a risk premium appears to suggest that some authors were not totally familiar with the principles of the finance, commerce and economic theory literature. For

example, whilst various authors suggest that the risk premium reflects a range of both macro and micro influences, they do not appear to adequately distinguish between the potential role and significance of each.

Brown (1984) offers some clarification, noting that diversifiable risk or specific risk factors will have an impact on growth prospects but not on the risk class within which each property investment lies, citing location and tenant characteristics, lease terms and the age of the property as diversifiable risk factors. Whilst this contribution is contended to be significant, it is regrettable that the author does not develop such application of principles further.

The quantum of the risk premium is considered by various authors with Brown (1984) noting that it is "believed to be in the region of 1.5% to 2%". Toxward (1993) suggests a margin of 2%-5% over the 10 year bond rate, also noting a 2.5% margin which evolved during a period of high bond rates.

It is, therefore, apparent from the property finance literature that authors are starting to embrace a concept of risk which accords with the finance, commerce and economic theory literature but that approaches to the discount rate and the risk premium remain relatively unsophisticated. The application to property of the qualitative and quantitative approaches to risk identified in the finance, commerce and economic theory literature will be considered, respectively, below.

2.5.3.1 Qualitative Approaches - Application To Property

The qualitative application of the concept of risk as business, financial, liquidity and exchange rate risk and variations thereon, is discursively considered in the literature (see, for example, Reilly (1985), Baum and Crosby (1988), Venmore-Rowland et al (1991) and Pyhrr et al (1989)) but application to property is relatively unsuccessful, as the majority of risk in a property context is found in the literature to appear as business risk.

2.5.3.2 Quantitative Approaches - Application To Property

Whilst the property finance literature contains a wide range of references to variance, beta and diversification with some very sophisticated, quantitative research identified, it is contended that the key points relevant to this Thesis may be summarised as follows:

- rather than portfolio risk, single property risk is an important issue as few investors are large enough to adequately diversify away all unsystematic risk given the large lot sizes prevalent in investment property (Waldy (1989));

- that single property risk is neglected in research and overshadowed by portfolio risk⁷ contributing to an incoherent picture of property risk (MacGregor in Venmore-Rowland et al (1991));
- that systematic risk levels vary over time (Maginn and Tuttle (1990)) and that geographic location and property type diversification may assist in reducing systematic risk. (See also, Miles and McCue (1982) and Hartzel, Heckman and Miles (1986));
- that the correlation of returns between properties is very low and in many cases negative, due principally to specific factors relating to individual properties (Brown (1985));
- that property exhibits a much higher level of specific risk than equities (Brown (1985), MacGregor in Venmore-Rowland et al (1991));
- that the riskiness of the UK property market has not been constant over time, as noted by Brown (1991), with a high level of volatility or riskiness in the late 1970s compared to a lower level of volatility or riskiness during most of the 1980s. The author also notes that the risk premium for each sector should differ, reflecting differences in market risk and that, whilst the risk premium is not defined, it is implied in the yield figure used; and
- that multi-beta, fundamental beta and Arbitrage Pricing Theory approaches may have significant applicability to property (MacGregor in Venmore-Rowland et al (1991); Zisler in Maginn and Tuttle (1990); Jones Lang Wootton (1992) and see Section 2.2.3, above).

The significance of idiosyncratic risk for property is therefore apparent within the property finance literature, principally attributable to the differences between individual properties. Maginn and Tuttle (1990) quote Ibbotson and Brinson (1987):

⁷ With the majority of quantitative research being at the portfolio level, Pyhrr et al (1989) summarise the principle areas of research as follows:

- basic studies addressing the performance of real estate compared to other investment media, such as common stocks, including Roulac (1976), Wendt and Sui (1965), Kelleher (1976) and Ricks (1969);
- further studies into individual properties rather than portfolios which found higher returns and lower risks than for other financial assets, including Miles and Rice (1978), Sirmans and Webb (1978) and Chudleigh and Brown (1978);
- followed by studies which consider real estate portfolios, such as REITs and CREFs, compared with stocks and bonds, including Miles and McCue (1982);
- and studies investigating better methods of measuring risk and return, the derivation of efficient portfolios, diversification issues and market efficiency, such as Jaffe and Sirmans (1984), Hartzel et al (1986) and Webb, Curcio and Ruebens (1988).

“Residual (unsystematic) risk is endemic to real estate”

with Maginn and Tuttle (1990) adding that much of what is usually systematic risk may be viewed as unsystematic risk for real estate (such as liquidity, marketability, imperfect information, heterogeneity, etc) which prevents a full cancellation of unsystematic risk through diversification.

Brown (1991) suggests that unsystematic influences may be dominated by locational factors specific to each property and also adds type of construction and quality to the list of unsystematic influences. Significantly, the author also notes that much work remains to be done in this area and that little is known about how the returns generating structure is affected by changes in each of these factors. The author suggests, however, that they form a unique combination for each property and it is this uniqueness which contributes to the low correlation of returns with other properties and with the market such that there may be merit in diversifying solely within one sector, a view echoed by Maginn and Tuttle (1990).

There appears to be an acknowledgment within the property finance literature that each of the sources of investment return for property are more attributable to the individual asset than may be the case for other asset classes. Whilst the quantitative analysis focussed on the portfolio level and upon the economy, market and sector as sources of return, qualitative comments within the literature suggested a range of property specific sources of return.

However, as found in the finance, commerce and economic theory literature, there was little commonality in the approach to and application of the various risk classifications within the property finance literature. This is contended to be attributable to the absence of a common definition of the market - which was variously considered as the market of all investable media, the property market, the office market and so forth from asset class level through sectors and subsectors.

If the extent of the market can be defined, the literature suggested a variety of approaches to the determination of which influences were systematic and which were unsystematic. The literature suggests a variety of influences that are systematic and the characteristics of pervasiveness, non-diversifiability and externality are common with returns being influenced in a systemic and associative way. Similarly, a range of unsystematic influences are identified (though these are notably fewer than the systematic influences identified) and the characteristics of diversifiability, asset specific application and a micro or localised nature are common.

The literature does, also, note that the systematic and unsystematic influences may overlap and differ in their application to property from that of other asset classes. The finance and commerce literature

distinction of eliminability through diversification appears to be incapable of direct and clear application to property and it is contended that a test of pervasiveness may be the preferable approach to distinguish between risk influences.

Given the muddled distinction between risk classifications, it is contended that a classification by asset class, sector, sub-sector and asset for property would be beneficial in order to accommodate all the types of risks identified in the property finance literature. Such an approach would allow identification of influences which are truly pervasive at an asset class or market level and those which are unique to a particular asset, being systematic and idiosyncratic, respectively. Interestingly, the authors are consistent in the identification of tenant and location as idiosyncratic or individual property specific risks, confirming the proposition that those risks which are unique to a given property may be distinguished as idiosyncratic. Accordingly, therefore, what is not identified as idiosyncratic is either unsystematic at the sub-sector, sector or asset class level or systematic at the next ascending level. With systematic and idiosyncratic being easier to identify, the balance remaining must, by default, be unsystematic risk influences.

If the various references within the property finance literature are grouped as influences upon the property market, office sector, CBD office sub-sector and a particular CBD office building respectively, a descending, hierarchical framework may be proposed as given in Table 2.4 (see, for example, Maginn and Tuttle (1990), Brown (1991), Fraser (1985), Baum and Crosby (1988)). The consuming nature of the ascending order of influences is clearly apparent in Table 2.4 as sub-sector influences include individual property influences and, accordingly, sector influences include sub-sector and individual property influences. The use of systematic and unsystematic as classifications based on the level of pervasiveness of the respective influences is potentially confusing, as only idiosyncratic influences are not pervasive at some level.

The size of the respective groupings in Table 2.4 is consistent with the findings from the property finance literature that property has much higher levels of unsystematic and idiosyncratic risk than systematic risk. It further suggests that each property's risk profile may be predominantly a function of the particular characteristics of the given property rather than those of the sub-sector, asset class or property market.

Systematic	
Macro - Economic Factors	
National economy	
Interest rates / finance charges	
Inflation	
Investor confidence	
Economic cycle effects	
Relativity of property asset class risk to other asset classes	
Other Factors	
Tax base / taxation	
Construction costs	
Regional factors	
- economic base	
- planning / legal	
Local economic environment	
Property Related Factors	
Construction costs	
Demographics	
Leasing market fundamentals	
- vacancy rates	
- effective income	
Rental levels	
Market movement in which asset traded	
Legislation	
Structural	
Sector	
Regional / metropolitan location	
Local economic environment	
Tax benefits - depreciation deduction	
Local orientation of real estate market	
Rental levels	
Sector	
Planning	
Legal	
Sub-Sector	
Socio-economic effects	
Supply / demand / regional and metropolitan	
Sector	
Planning	
Legal	
Idiosyncratic	Building
	Size / indivisibility
	Location - regional and metropolitan
	Highest and best use
	Size and design structure
	Age / condition / depreciation
	Property enhancement - Building quality
	Ability to function / obsolescence/ unexpected obsolescence
	/structural failure
	Nature of lease / lease structure/ lease
	Credit quality of tenants / tenant default / reliable tenant
	Recoverability of operating expenses
	Uniqueness of each parcel
	Tenant
	Construction
	Legal effects / legal
	Planning
	Voids
	Falling rental values / rents failing to reach growth expectations

Descending Hierarchical Classification Of Systematic, Unsystematic And Idiosyncratic Influences Found In The Property Finance Literature Reviewed

Table 2.4

It is significant that such idiosyncratic variables as tenant, location, legal and building are particularly familiar, as these were also commonly identified determinants of the capitalisation rate in the property theory literature reviewed. If such idiosyncratic variables are unique to each property and incapable of exact replication, then they might be anticipated to be significant factors in the pricing mechanism for a given property relative to comparable evidence. When coupled with certain non-idiosyncratic variables, such as supply and demand, as suggested by Maginn and Tuttle (1990) above, a hierarchy of pervasiveness begins to emerge for the determinants of the capitalisation rate. This concept will be investigated in further detail and developed below. Interestingly, Maginn and Tuttle (1990) suggest that pure unsystematic risks are uncorrelated. If a pure unsystematic risk is that type of unsystematic risk identified by Brown (1991) above (which is, effectively, an idiosyncratic risk) then this proposition would appear invalid as a strong correlation between a prime location, high quality building and strong tenant may be anticipated in the context of a given office property.

Further, a strong correlation between quality of location, building and tenant between properties within the prime office sub-sector may also be anticipated which renders the proposition potentially invalid at the industry level also.

It was disappointing that no significant empirical work was found which related the determinants of the capitalisation rate to the roles of risk and growth as identified from the finance, commerce and economic theory literature. The applications of the Arbitrage Pricing Theory identified from the property finance literature held considerable promise for property analysis, given the theory's attention to a range of contributing influences and the role of the idiosyncratic factor. It was regrettable that, for an asset class for which unsystematic risk was so significant, the authors chose to model predominantly systematic influences and give relatively little regard to the idiosyncratic term. The use of a greater number of unsystematic or asset specific variables may have led to more interesting and useful results from such analysis (see, for example, Dokko et al (1991), Zisler in Maginn and Tuttle (1990), Jones Lang Wootton (1992)).

Whilst not extensive, the research would appear to suggest that high levels of unsystematic risk exist at various stages of property classification, including at the property type, geographic region and individual property levels. This would suggest that the role of systematic risk within property investment may be limited, possibly being confined to national and property market wide influences only, with the role of unsystematic and idiosyncratic risk potentially more significant.

Whilst it appears generally agreed that property exhibits relatively high levels of unsystematic and specific or idiosyncratic risk and this is supported by quantitative analysis, such analysis has focussed principally on the portfolio level. However, qualitative commentary within the property finance literature suggests a wide range of sources of return that may be classified into the systematic,

unsystematic and idiosyncratic hierarchy. The significant proportion of such sources of return which may be classified as idiosyncratic is contended to be broadly consistent with the above interpretation of the findings of the limited amount of quantitative analysis identified in the property finance literature.

2.5.4 Summary, Areas For Further Research And Conclusions - Review Of Property Finance Literature

2.5.4.1 Summary

Whilst research into the application of finance, commerce and economic theory principles to property is in its infancy, the property finance literature clearly indicates the potential applicability and quantitatively confirms that property behaves differently to the other asset classes. Though the property finance literature may be limited, it is of particular interest and that by Brown ((1984), (1985) and (1991)) considered to be the most relevant.

The property finance literature clearly places the valuation of property in an economic context and embraces the concept of the capitalisation rate as the difference between the discount rate and the growth rate with an acknowledgment of the role of expectations.

Though the property finance literature sought to consider growth in the context of the finance, commerce and economic theory, ambiguity was found concerning the nature of contributors to growth (which were often similar to those for risk) and the treatment of capital growth. However the principles of finance, commerce and economic theory, identified previously, were found to have applicability and the focus upon contributions to growth from building specific influences contended to be significant and contrary to the emphasis found in the finance, commerce and economic theory literature.

The conceptual approach to risk found in the finance, commerce and economic theory literature was also identified in the property finance literature though the level of quantitative analysis was far lower than that found in the former. The business / financial / liquidity / exchange rate risk classification would appear to be less applicable than the systematic / unsystematic / idiosyncratic risk classification. The discount rate as the sum of the risk free rate and the risk premium appeared generally accepted within the property finance literature though the sources of the discount rate identified in the property finance literature were reminiscent of the sources of the capitalisation rate found in the property theory literature.

Though systematic, unsystematic and idiosyncratic influences on return were considered within the property finance literature, a focus on the idiosyncratic in the context of property was evident. It is contended, however, to be significant that each of the groups of issues collated as factors in the property theory literature review (Section 2.3) were also found in the property finance literature and appear within one or more of the classifications of influences given in Table 2.4.

2.5.4.2 Areas For Further Research

In order to apply the finance, commerce and economic theory literature principles concerning growth and risk to the property valuation process, the following areas would be worthy of further research:

- the application of capital market risk classifications of systematic, unsystematic and idiosyncratic influences to property;
- the application of the concepts of positive and negative risk to property valuation;
- the commonality between and inter-relationship between those aspects influencing risk and those aspects influencing growth;
- the distinction between positive risk and negative growth and the various combinations thereof,

Whilst Brown has begun to investigate several significant areas quantitatively, numerous property related areas remain for further research including the reconciliation of capital market theory assumptions with the characteristics of the property market, measurement of risk and return, diversification issues, market efficiency issues and a range of property specific issues such as whether beta varies between property and each of the respective asset classes, whether beta varies between property sectors and over time for property and the potential application of multiple and fundamental betas to property. As Pyhrr et al (1989) note:

“During the next decade research in this field will surely make dramatic progress, and the extensive use of portfolio selection models for real estate portfolio management is sure to become a reality.” (page 660)

Having established that, in theory, the respective bodies of literature may be capable of reconciliation, it remains to define the nature of such relationship, which will be considered in Section 2.6, below.

2.5.4.3 Conclusion

The review of property finance literature clearly indicates the applicability of the principles derived from finance, commerce and economic theory to property. The findings would appear to confirm that risk and growth are not determinants of the capitalisation rate in their own rights but may be considered as positive or negative expectational influences on the identified sources of investment return.

Further, the property finance literature suggests that the identified sources of return for property would appear to include and to potentially comprise those factors influencing the determination of the capitalisation rate which were identified from the property theory literature review in Section 2.3.

Given the commonality between the finance and commerce literatures approach to capital market risk classifications and the assessment of growth through ROE forecasts, the relationship between the identified determinants of the capitalisation rate, growth influences and such risk classifications is contended to be likely to be significant.

Accordingly, it is contended that the property finance literature suggests that the findings of the property theory literature review may be capable of theoretical reconciliation to accord with those of the finance, commerce and economic theory literature review which will be further considered in the next Chapter.

2.6 SUMMARY, AREAS FOR FURTHER RESEARCH AND CONCLUSIONS - REVIEW OF LITERATURE

This Chapter comprised the first step in the sequential approach proposed to solve the Thesis Problem, being a review of the relevant literature to:

- identify and analyse existing econometric models; and
- identify and collate issues relevant to the determination of the capitalisation rate from property finance, commerce and economic theory,

which were the central and peripheral topic areas, respectively. Having identified the relevant issues from theory, subsequent steps were proposed to comprise the econometric modelling of such issues (in a

theoretically based and therefore defensible model) and then to test the Thesis Hypothesis through an application of the econometric model in order to determine if such a model solved the Thesis Problem. The final step was proposed to be a commentary on the results of such a test, the identification of areas for further research beyond the scope of this Thesis and a summary of the conclusions that may be drawn therefrom.

2.6.1 Summary

As indicated by the Bibliography and Excursi, the range of literature reviewed was extensive and the information derived therefrom copious, such that whilst the heavily condensed version of key points contained within this Chapter sought to include all relevant matters, some nuances and finer points of technical accuracy may have been lost in abbreviation. It is, however, contended that this is unlikely to significantly affect the findings of the review and the conclusions drawn therefrom.

Within the central topic area, a range of existing econometric models were identified and considered within the context of the various aspects of the Thesis Problem. It was established that a model could not be identified which overcame the problems of subjectivity, informality and heuristics found in the current method of capitalisation rate determination, nor which accorded with each of the bodies of property, finance, commerce and economic theory and which was applicable to the adjustment between properties at a point in time. However, a range of interesting and potentially useful influences upon the determination of the capitalisation rate were suggested within the literature which were adopted in later consideration, below.

Three peripheral topic areas were investigated comprising the reviews of literature concerning property theory, finance, commerce and economic theory and property finance, respectively. Each provided significant insights into the capitalisation rate determination process and contributed to the construction of a theoretical framework for use in the subsequent modelling of same.

The review of property theory literature, which comprised the first peripheral topic area, sought to identify those groups of issues which authors had considered to be influences upon the capitalisation rate. Interestingly, the literature was found to devote relatively little attention to the determinants of the capitalisation rate generally and even less to the determinants for prime, CBD office investment property. The literature was predominantly qualitative and unstructured with a dearth of quantitative analysis which was in marked contrast to the finance, commerce and economic theory literature.

Ten factors (clearly identifiable and capable of succinct definition) and two concepts (amorphous and ill defined) were identified, which were contended to influence the determination of but to be implicit

within the capitalisation rate, being dynamic and varying over time, with the taxonomies developed for each contended to be original research per se.

Considerable overlapping between the identified influences was noted, together with the apparently different behaviour of the identified concepts to that of the factors. Whilst none of the influences appeared to be independent, the role of legal environment and planning as relevant factors was noted to be worthy of further investigation.

From the review of property theory literature, the following explanatory equation for the determination of the capitalisation rate may be derived and proposed:

$$y = f(k_1, k_2, k_3, k_4, k_5, k_6, k_7, k_8, k_9, k_{10}), (c_1, c_2) \quad \text{Equation 2.13}$$

where:	y	= capitalisation rate	k ₇	= sentiment
	k ₁	= alternative investments	k ₈	= separable asset
	k ₂	= building		class characteristics
	k ₃	= economic situation	k ₉	= state of property market
	k ₄	= legal environment	k ₁₀	= tenant
	k ₅	= location	c ₁	= growth
	k ₆	= Planning	c ₂	= Risk,

As the nominated influences upon the determination of the capitalisation rate within Equation 2.13 are derived from theory, their theoretical defensibility should be undisputed.

The literature reviewed concerning the pilot studies undertaken to investigate the identified influences upon the determination of the capitalisation rate provided a significant number of further insights into their behaviour, suggesting that the twelve influences were both correctly identified and a complete list, with risk and growth being confirmed as of a different character to the ten identified factors.

Significantly, each of the factors and concepts were found to be of differing levels of relative and proportionate importance and to be capable of grouping. The adoption of Property Generic and Property Specific distinctions and the classification of influences as Primary, Secondary and Tertiary were found to provide some consistency in results and to afford a clearer understanding of the findings of the pilot studies. As suggested by the property theory literature, risk and growth were found to behave significantly differently to the identified factors and were suggested to potentially be some form of positive or negative influence rather than being necessarily determinants in their own rights.

In accordance with the findings of the literature review concerning the pilot studies undertaken, Equation 2.13 may be restated as follows:

$$y = f [(k_9, k_3, k_7, k_8, k_1), (k_{10}, k_5, k_2, k_4, k_6)], [(c_1), (c_2)] \quad \text{Equation 2.14}$$

or, given the potentially greater significance of certain factors, as:

$$y = f [(k_9, k_3), (k_{10}, k_5, k_2)], [(c_1), (c_2)] \quad \text{Equation 2.15}$$

The review of evolutionary issues concerning the capitalisation rate, as used within the capitalisation of income method of valuation, investigated the ubiquitous defence of changes to the capitalisation rate as being attributable to either “different growth prospects” or to being more or less “risky”. It was contended that, following the emergence of the Reverse Yield Gap, the capitalisation rate became the transmission mechanism for an increasing number of complex, inter-relating issues and ceased to perform the same function as a discount rate. Accordingly, the distinction between the discount rate and the capitalisation rate attributable to the role of growth and the manner in which risk is addressed within the discount rate both became blurred and progressively lost.

Regrettably, rather than adopt explicit discount rate based methodologies, valuers chose to continue to use capitalisation approaches despite their growing inappropriateness and by a process of mutation through ignorance, implied growth and risk into the capitalisation rate rather than appreciating that the capitalisation rate implies growth relative to the discount rate and that risk is also an expression relative to the discount rate. Accordingly, it is contended that the important distinction between implicit within and implied by was lost and its demise perpetuated by valuation lore, the use of comparable sales as the basis of valuation and the education methods of the valuation profession.

It was, therefore, concluded and contended that growth and risk are not implicit within nor, necessarily, determinants of the capitalisation rate such that Equation 2.14 may be potentially restated as:

$$y = f [(k_9, k_3, k_7, k_8, k_1), (k_{10}, k_5, k_2, k_4, k_6)] \quad \text{Equation 2.16}$$

which completed the review of property theory literature comprising the first peripheral topic area.

The second peripheral topic area sought to review relevant literature to identify the principles of finance, commerce and economic theory which may be of relevance to the determination of the capitalisation rate, with a particular focus on the approach to risk and growth.

The roles of risk and growth within the valuation models investigated in the finance, commerce and economic theory literature were found to differ significantly from those found within the property theory literature. Whilst the Earnings Multiplier was noted to be conceptually similar to the capitalisation rate, the greater emphasis on earnings rather than the multiplier was found to be in marked contrast to the property theory literature. Similarly, the focus on each of k and g respectively rather than their spread, the capitalisation rate, together with the concept of perpetual income growth rather than capital growth within both the dividend and earnings valuation models were both significant differences identified in the finance, commerce and economic theory literature compared to the property theory literature.

A definition of the capitalisation rate consistent with finance, commerce and economic theory may be proposed as follows:

$$y = k - g \quad \text{Equation 2.17}$$

where:

y	= capitalisation rate
k	= discount rate
g	= constant annual growth rate

The explicit attention to each of k and g and to their composition and contributory influences within the finance, commerce and economic theory literature contrasted with the implicit approaches of the property theory literature. The literature was found to contend that growth was a product of other factors and not a factor on its own, being an expectation based on the information set available at the time. As such, an assessment of the rate and duration of expected growth was required as a measure relative to an average rate, which rendered growth capable of over or under estimation with a resulting pricing impact.

The finance, commerce and economic theory literature defined growth as:

$$g = f(RR, ROE) \quad \text{Equation 2.18}$$

where:

RR	= retention rate
ROE	= return on equity

As the retention rate was contended to be of less relevance for property, a focus on the return on equity found the principal contributors to be economic factors, industry factors and company specific factors which may be considered as systematic, unsystematic and idiosyncratic influences, though with less emphasis found on company or idiosyncratic influences than upon the remainder.

It was, therefore, contended that, to accord with finance, commerce and economic theory, growth would be unlikely to be a determinant of the capitalisation rate in its own right. Having considered the literature relevant to growth, that relevant to the discount rate was addressed with k found to be defined and composed as follows:

$$k = r_f + RP \quad \text{Equation 2.19}$$

where: r_f = risk free rate
 RP = risk premium

and: $RP = f(S, U, I)$ Equation 2.20

where: S = Systematic Influences
 U = Unsystematic Influences
 I = Idiosyncratic Influences

with the risk free rate being common to all asset classes, such that only the risk premium and its contributors vary between asset classes.

The concept of risk as the variation in returns, which may be positive or negative, was central to the finance, commerce and economic theory literature. On this basis, risk was found to be a function of a wide range of separable contributory influences or sources of return, being effectively an expression of the outcome of a range of influences expressed or measured relative to an average rate with the movement potentially being positive or negative. Such influences were found to include economic, industry and company influences with each involving an expectation in terms of both quantum and direction being based on information available at the time and so capable of over or under estimation which, with the inclusion of possible “surprises” may have a resultant pricing impact. It was, therefore, contended that, to accord with finance, commerce and economic theory, risk would be unlikely to be a determinant of the capitalisation rate in its own right.

The clarity and depth surrounding the use of beta as a quantitative risk expression contrasted to the inconsistent and limited attention to the qualitative descriptions of the risk classifications of systematic, unsystematic and idiosyncratic. The potential to eliminate unsystematic risk through diversification was contended to contribute to its limited attention within the literature, which was disappointing given its potential significance for property. Similarly, the limited attention within the finance, commerce and economic theory literature to single asset risk was contended to be regrettable.

The finance, commerce and economic theory literature reviewed was found to have a common emphasis on the sources of investment return and upon expectations in its approach to both growth and risk. This view of growth and risk being manifest as positive or negative expectational influences upon the sources of investment return was a significantly different approach to that found within the property theory literature and the principal finding of the second peripheral topic area.

The third and final peripheral topic area sought to reconcile the findings of the property theory literature review with those of the finance, commerce and economic theory literature review through a review of the property finance literature. Significantly, the property finance literature adopted the conceptual bases of sources of investment return and expectations as applicable to risk and growth in a property context.

The property finance literature suggested the sources of return to be identifiable and capable of classification as systematic, unsystematic and idiosyncratic. Property was found to have relatively high levels of unsystematic and idiosyncratic risk with the suggestion that systematic risk influences are generally found to be less significant for property, which is arguably consistent with its heterogeneous nature. The emphasis on idiosyncratic influences was contended to be significant within the literature suggesting that such idiosyncratic influences may be likely to be unique to a given property, such that the risk profile of a property may be predominantly a function of the particular characteristics of that property rather than of its sub-sector, asset class or property market.

The sources of investment return for property were identifiable from the property finance literature and capable of classification in a framework of systematic, unsystematic and idiosyncratic influences by application of a pervasiveness test. Significantly, it was found that each of the factors determining the capitalisation rate which were identified in the property theory literature review were also identifiable amongst the sources of investment return in the property finance literature. Further, the property finance literature suggested a commonality amongst the identified sources of return for growth and risk, indicating that they may have an applicability to both growth and risk.

Accordingly, the review of the property finance literature would suggest that the principles identified in the finance, commerce and economic theory literature review have applicability to property and may be reconciled as consistent with the findings of the property theory literature review.

Having investigated the three peripheral topic areas, it is contended that the findings of each may be combined and a potentially explanatory equation for the determination of the capitalisation rate derived and proposed:

If	$y = k - g$	Equation 2.17
and	$k = r_f + RP$	Equation 2.19
then	$y = (r_f + RP) - g$	Equation 2.21

and if	$g = f(RR, ROE)$	Equation 2.18
then	$y = (r_f + RP) - f(RR, ROE)$	Equation 2.22
or	$y = (r_f + RP) - f(G_S, G_U, G_I)$	Equation 2.23

where

G_S = Systematic Growth Influences

G_U = Unsystematic Growth Influences

G_I = Idiosyncratic Growth Influences

or	$y = ((r_f) + (f(R_S, R_U, R_I))) - f(G_S, G_U, G_I)$	Equation 2.24
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where

R_S = Systematic Risk Influences

R_U = Unsystematic Risk Influences

R_I = Idiosyncratic Risk Influences

Where y does not equal the risk free rate, it may be assumed that $f(R_S, R_U, R_I)$ does not equal $f(G_S, G_U, G_I)$. Accordingly, whilst the influences upon each may have commonality, it is proposed that each such influence does not necessarily affect the risk and growth sides of the expression to same extent and/or in same direction.

Accordingly, from the review of literature in this Chapter, two potentially explanatory equations for the determination of the capitalisation rate may be derived and proposed:

$$y = f[(k_9, k_3, k_7, k_8, k_1), (k_{10}, k_5, k_2, k_4, k_6)], [(c_1), (c_2)] \quad \text{Equation 2.14}$$

or

$$y = ((r_f) + (f(R_S, R_U, R_I))) - f(G_S, G_U, G_I) \quad \text{Equation 2.24}$$

for further consideration in subsequent Chapters.

2.6.2 Areas For Further Research

Whilst the review of literature identified those factors which property, finance, commerce and economic theory suggested should be relevant to the determination of the capitalisation rate between two properties at a point in time, it did not confirm whether or not they are practically relevant.

Further, the property theory literature review and the finance, commerce and economic theory literature review resulted in the proposition of two consistent but different explanatory equations for the determination of the capitalisation rate which require reconciliation into a single, potentially explanatory equation.

2.6.3 Conclusions

A solution to the Thesis Problem was not found within the literature reviewed, as an existing econometric model for the determination of the capitalisation rate was not found which overcame the aspects identified, accorded with property, finance, commerce and economic theory and addressed the differences between properties at a point in time.

The review of literature did, however, identify a range of issues that may be relevant to the determination of the capitalisation rate between properties at a point in time and proposed two potentially explanatory equations for their relationship.

The property theory literature review found ten factors to be identifiable with some form of associative structure, but contended the concepts of risk and growth to be invalidly addressed within the literature. As the factors influencing the determination of the capitalisation rate are identifiable, it is further contended that they may be quantifiable and therefore modellable.

The roles of risk and growth were placed in an economically and theoretically defensible context by the finance, commerce and economic literatures emphasis on the capitalisation rate as the result of the difference between k and g and the significance of the role of expectations. Similarly, the literatures focus on the sources of investment return and their potential classification provided a framework within which to order the factors identified from the property theory literature review.

The property finance literature affirmed the applicability of the principles derived from finance, commerce and economic theory to property, confirming that risk and growth were not determinants of

the capitalisation rate. Significantly, the commonality found amongst the identified sources of return for each was contended to indicate that they may have an applicability to both growth and risk.

Further, given the inclusion of each of the factors identified from the property theory literature review amongst the list of the identified sources of return in the property finance literature, within a framework derived from the finance, commerce and economic theory literature, there may be contended to be consistency between the findings of each and reconciliation of the respective bodies of theory.

The determination of the capitalisation rate may, therefore, be contended to be a function of the ten identified factors or sources of investment return with risk and growth manifest as positive or negative expectational influences upon such sources of investment return.

Accordingly, therefore, the review of literature confirmed the absence of an existing, robust and defensible econometric model for the determination of the capitalisation rate and identified those issues which property, finance, commerce and economic theory suggest should be relevant to the determination of the capitalisation rate between two properties at a point in time. Therefore, an econometric model based on the findings of the review of literature would be contended to accord with property, finance, commerce and economic theory and therefore be theoretically defensible.

Given that the factors have been identified and accord with theory, it is contended that they may be quantifiable such that the single, potentially explanatory equation may be econometrically modellable, in order to assess the practical relevance or otherwise of the factors to the determination of the capitalisation rate.

This is consistent with the sequential approach proposed to address the Thesis Problem. Having completed the first step, the review of literature, the next step was proposed to be the econometric modelling of such issues and the application of the model to test the Thesis Hypothesis, in order to determine if such a model solved the Thesis Problem. The final step was then proposed to be a commentary on the results of such a test, the identification of areas for further research beyond the scope of this Thesis and the conclusions that may be drawn therefrom.

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