

CHAPTER 3

ALGEBRAIC MODELLING AND DATA COLLECTION

CHAPTER 3

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3.1 INTRODUCTION

The previous Chapter sought to review relevant literature to identify and analyse existing econometric models for the determination of the capitalisation rate and to investigate and collate those issues relevant to such determination in property, finance, commerce and economic theory.

Having reviewed the relevant literature, an existing econometric model for the determination of the capitalisation rate between properties at a point in time was not identified which overcame the problems of subjectivity, informality and heuristics evident in the current method of capitalisation rate determination and which accorded with each of the bodies of property, finance, commerce and economic theory.

However, those issues relevant to the determination of the capitalisation rate, between two properties at a point in time, were investigated, identified and collated from the review of literature and it was contended that such determination was a function of ten specified factors or sources of return with risk and growth being manifest as positive or negative expectational influences upon such sources of investment return. The findings of the review of literature were expressed as two consistent but different potentially explanatory equations, each of which were consistent with the findings of the respective reviews of literature of each of property, finance, commerce and economic theory, respectively.

The review of literature undertaken in the previous Chapter comprised the first step in the proposed sequential approach to the solution of the Thesis Problem, which may be restated as follows:

that current methods of capitalisation rate determination are subjectively based, informal, heuristic and lack 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.

Having contended that the solution to the Thesis Problem was to investigate and identify a more consistent approach to capitalisation rate adjustment between two properties at a point in time which will contribute to a reduction in the variability between valuers in capitalisation rate selection, it was proposed that the use of an econometric model may achieve this by providing a deterministic, measured, objective, consistent and formal approach (based on rational and logical criteria which more closely simulate the approach adopted by investors to an appraisal of worth) if it accords with property, finance, commerce and economic theory, so contributing to a reduction in or elimination of the reliance upon the interpretation of comparables.

Accordingly, having ascertained that such an econometric model does not currently exist and having derived and proposed two consistent but different potentially explanatory equations for the determination of the capitalisation rate from property, finance, commerce and economic theory which, therefore, accord with such theory, the next step (being the second step) in the proposed sequential approach to the solution of the Thesis Problem comprises the modeling process.

The modelling process will be undertaken in three parts being:

- Part 1 the establishment of the data requiring collection and its collection;
- Part 2 the analysis of the data collected; and
- Part 3 the development of an econometric model for the determination
 of the capitalisation rate,

respectively. Furthermore, within the three parts of the modelling process, those aspects of current practise in the capitalisation rate selection and adjustment process identified as worthy of further research in Chapter 1 will also be considered, being:

- the identification of current methods of capitalisation rate selection;
- the identification of sources of the capitalisation rate;
- the identification of approaches to capitalisation rate adjustment;
- an assessment of whether the adjustment process is always to the nearest 0.25%; and
- confirmation of the extent of the determinants of the capitalisation rate.

The first part of the modelling step will be undertaken in this Chapter, comprising:

- reconciliation of the two explanatory equations into a single, potentially explanatory equation for subsequent econometric modelling (Section 3.2 Derivation Of A Single, Potentially Explanatory Equation For Econometric Modelling);
- identification of the data to be collected to investigate those areas for further research identified in Chapter 1 and to facilitate quantification of the components of the single, potentially explanatory equation for use in subsequent econometric modelling (Section 3.3 - Identification Of Data For Collection); and

- collection of such identified data (Section 3.4 - Data Collection).

The second part of the modelling process, being the analysis of data collected, will then be undertaken in Chapter 4.

The third and final step, comprising the econometric development of the model will be undertaken in Chapter 5 using cross sectional multiple regression analysis of that data collected in this Chapter, in order to assess the practical relevance or otherwise of the factors to the determination of the capitalisation rate. Chapter 5 will also then detail the application of the model to investigate the Thesis Proposition:

that the use of an econometric model will reduce the variability in capitalisation rate adjustment

through testing of the Thesis Hypothesis:

that the standard deviation of a sample of capitalisation rates calculated by an econometric model will be below that of a sample selected by property valuers using current methods of capitalisation rate determination

to ascertain if the econometric model solves the Thesis Problem. The third and final step in the proposed sequential approach to addressing the Thesis Problem will then comprise a summary of the approach adopted in, the identification of areas for further research beyond the scope of, the conclusions that may be drawn from and the policy recommendations arising out of this Thesis.

3.2 DERIVATION OF A SINGLE, POTENTIALLY EXPLANATORY EQUATION FOR ECONOMETRIC MODELLING

From the review of literature in Chapter 2, two consistent but different potentially explanatory equations for the determination of the capitalisation rate were proposed, having been derived from property, finance, commerce and economic theory and which, therefore, accord with such theory. It was proposed in Section 3.1, above, that the two equations be reconciled into a single, potentially explanatory equation for subsequent econometric modelling which will be approached in this Section as follows:

- further consideration of risk and growth and the proposition of a single, potentially explanatory equation consistent with the findings of the property, finance, commerce and economic theory review of literature (Section 3.2.1 - Reconciliation Of Two Equations);
- further consideration of risk classifications in the context of individual properties and the single, potentially explanatory equation (Section 3.2.2 - Identification Of Idiosyncratic Sources Of Return); and
- specification of those assumed theoretical principles upon which the single, potentially explanatory equation is based (Section 3.2.3 - Assumed Theoretical Principles Underlying The Single, Potentially Explanatory Equation),

being undertaken, respectively, below.

3.2.1 Reconciliation Of Two Equations

The two consistent but different potentially explanatory equations for the determination of the capitalisation rate, for adjustment between properties at a point in time, derived from the review of literature in Chapter 2, may be restated as follows:

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

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

Each equation is contended to be consistent with its respective theoretical base, as derived from the review of literature, with each equation seeking to explain the same result, the capitalisation rate or y .

Following the review of literature, it was contended that the determination of the capitalisation rate may be a function of 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.

Further, the respective approaches to risk and growth within the literature were found to indicate a significant number of conceptual similarities and a small, but notable, number of conceptual differences which may be summarised as follows:

Conceptual Similarities

Both risk and growth are considered as:

- an expectation
- based on all information available at the time
- capable of over/under estimation, which has a pricing impact
- a measure relative to an average rate
- may be positive or negative
- attributable to sources of investment return
- affected by systematic, unsystematic and idiosyncratic influences

Conceptual Differences

Risk is considered as a variation in returns

Risk and growth are differentially impacted by systematic, unsystematic and idiosyncratic influences with:

- growth having an emphasis on systematic and unsystematic influences, with idiosyncratic influences being less significant; whereas
- risk has an emphasis on unsystematic and idiosyncratic influences, with systematic influences being less significant. Effectively, those idiosyncratic influences unique to a given property determine the risk profile for that property.

The finance, commerce and economic literatures consideration of risk as a variation in returns is effectively a simple expression or measure of the outcome of the various contributory influences. The literature would suggest extensive commonality of influences with a significant proportion of those influences which contribute to risk also contributing to growth. Accordingly, it is arguably inappropriate

to consider the method of measurement as being a difference between the literatures conceptual approach to risk and to growth.

It is contended that the remaining conceptual difference is the most significant, being the relative emphasis placed by the literature on each of systematic, unsystematic and idiosyncratic influences for each of risk and growth respectively.

The finance, commerce and economic literature suggests that systematic influences have the greatest impact upon growth, unsystematic influences impact both growth and risk and idiosyncratic influences have the greatest impact upon risk.

It may, therefore, be contended that each source of investment return for a given asset at a given point in time may comprise either a systematic, unsystematic or idiosyncratic influence and that the relative distribution of such sources of return or influences will determine whether the ultimate effect of such influences upon a given asset manifests as either a risk or growth emphasis.

Further, within the groupings of those sources of return found within the property finance literature, many of the factors and the contributory elements of such factors, identified from the property theory literature review, were apparent.

Therefore, it is contended that the factors identified in the property theory literature review comprise the sources of investment return for prime, CBD office investment property and are capable of classification as systematic, unsystematic and idiosyncratic.

If, in a given situation, a greater emphasis on systematic and unsystematic influences occurs, this may contribute to an emphasis on growth for a given asset.

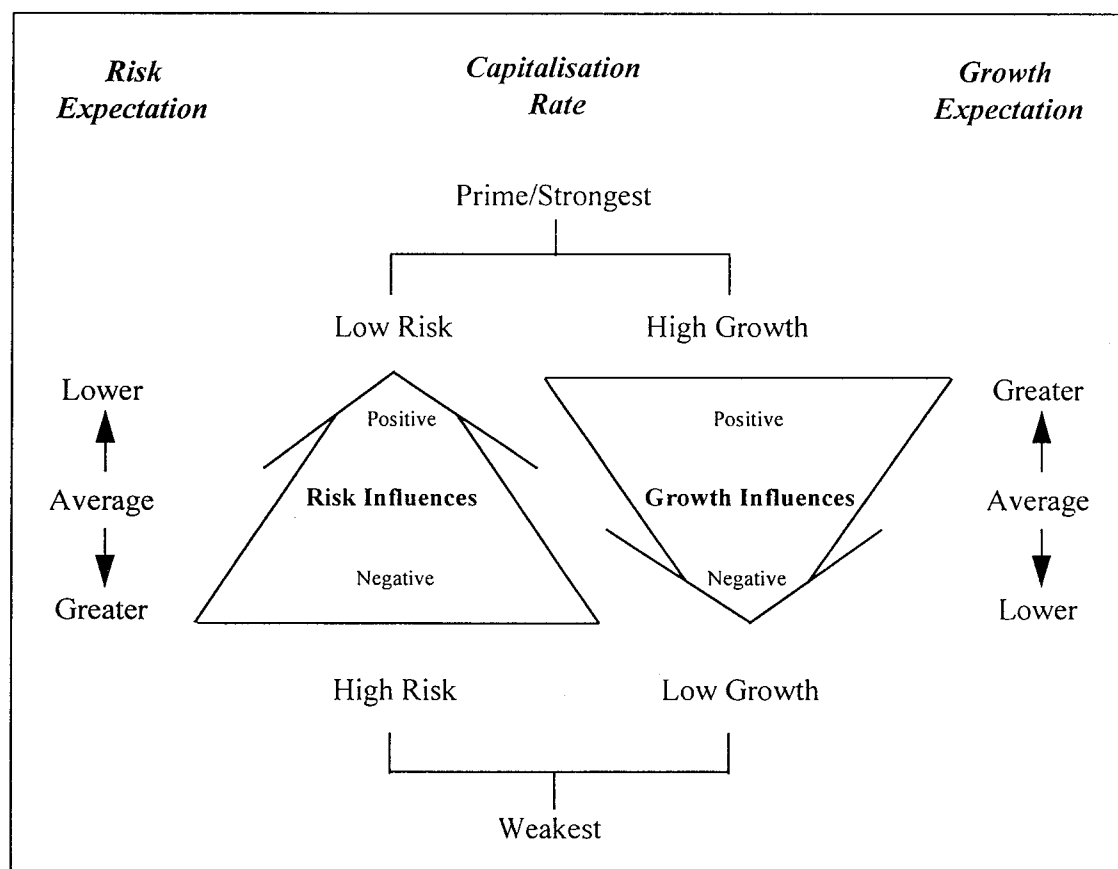
Conversely, in a given situation, if a greater emphasis on unsystematic and idiosyncratic influences occurs, this may contribute to an emphasis on risk for a given asset.

Further, contemporaneously, the positive or negative expectation for each source of return may also impact upon its relative contribution and may further determine, for unsystematic influences in a given situation, a risk or growth emphasis.

Accordingly, risk and growth may be contended to ultimately be manifest as positive or negative expectational influences upon each such source of investment return within the determination of the capitalisation rate.

This proposition is consistent with the findings of the literature review as expressed in Equations 2.14 and 2.24 which, as each are equal to y , suggests that each of the identified determinants of the capitalisation rate (being k_1 to k_{10} inclusive) may be capable of expression as either systematic, unsystematic or idiosyncratic sources of investment return with growth and risk emphases.

Such a proposition does not, however, consider the mutual exclusivity of expressions as either a growth or risk emphasis. Can a given determinant, such as location, have both a growth and risk emphasis? Similarly, Equations 2.14 and 2.24 do not address the relative significance of each determinant or source of investment return as an influence upon the capitalisation rate. It is, however, contended that both issues are related and can be considered together conceptually.



**Diagrammatic Representation Of the Risk-Growth Relationship
In The Property Theory Literature**

Figure 3.1

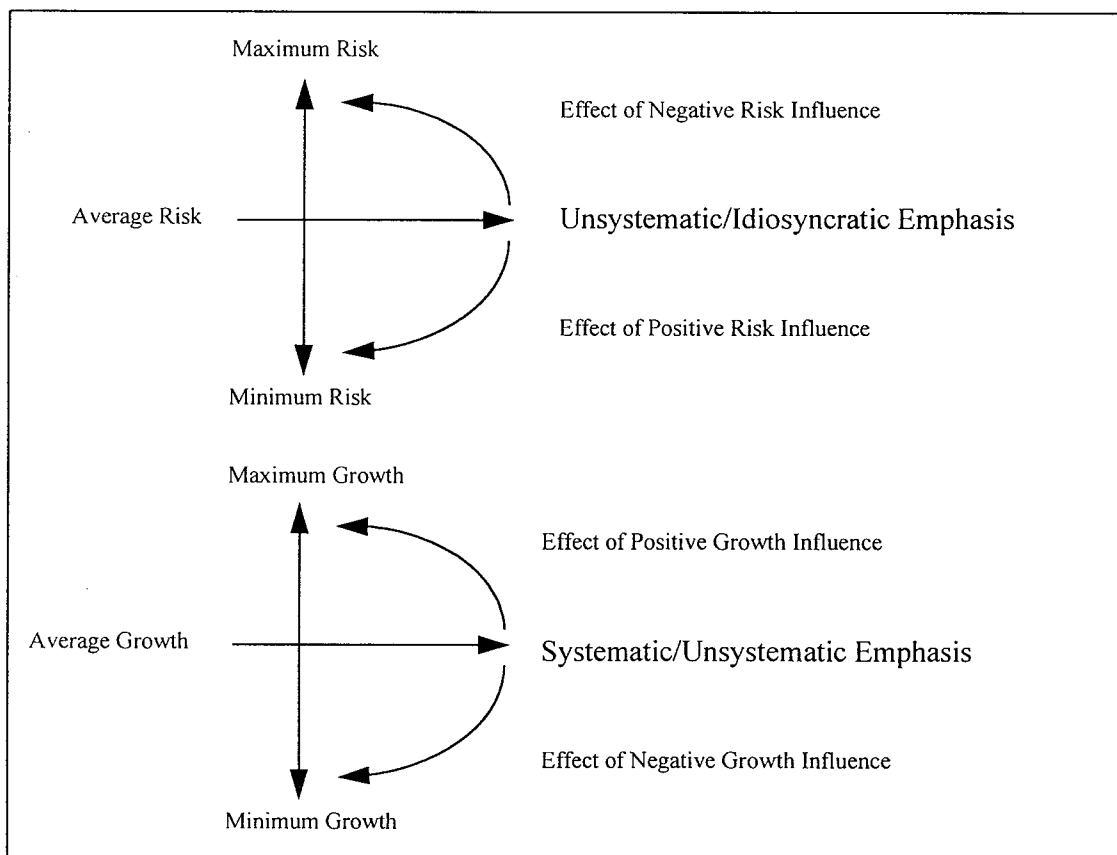
The property theory literature suggested that a low, prime or strong capitalisation rate for a given CBD office investment property implies low risk expectation and high growth expectation. Conversely, a

high, non-prime or weak capitalisation rate for a given CBD office investment property implies high risk expectation and low growth expectation¹. Such an approach is represented diagrammatically in Figure 3.1, which is original to this Thesis.

It is contended that Figure 3.1 suggests that:

- a strong capitalisation rate is an expression of positive growth influences being relatively more significant than positive risk influences; and
- a weak capitalisation rate is an expression of negative risk influences being relatively more significant than negative growth influences.

Such an approach would be consistent with the findings of the finance, commerce and economic theory literature review concerning risk, growth and the relationship between risk and growth, as summarised diagrammatically in Figure 3.2 which is also original to this Thesis.



Diagrammatic Representation Of Risk And Growth In The Finance, Commerce And Economic Theory Literature.

Figure 3.2

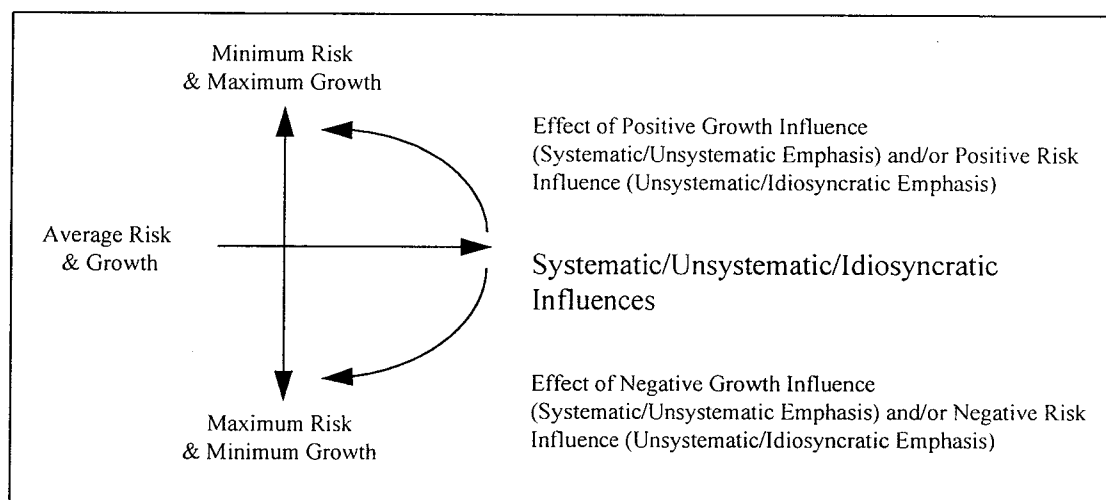
¹ See, for example, Britton et al (1980):

"In general, it may be said that if rental value is likely to increase, a higher YP will be applied; while if there is a doubt of the present level of rent being maintained, the YP will be reduced to cover the risk."

As Figure 3.2 shows, growth influences have a systematic or unsystematic emphasis with a positive growth influence maximising growth and a negative growth influence minimising growth.

Conversely, risk influences have an unsystematic or idiosyncratic emphasis with a negative risk influence maximising risk and a positive risk influence minimising risk.

Figures 3.1 and 3.2 may be combined, diagrammatically, as shown in Figure 3.3 (which is also original to this Thesis).

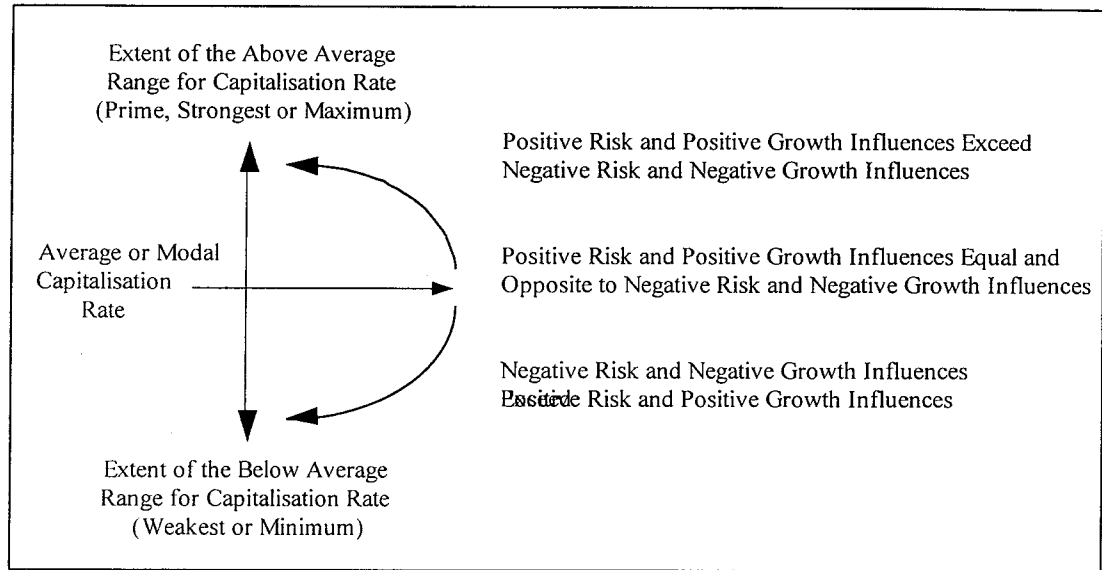


Diagrammatic Combination Of Figure 3.1 and Figure 3.2

Figure 3.3

Figure 3.3 shows that, at the opposite ends of the spectrum, a strong capitalisation rate would exhibit minimum risk and maximum growth whereas a weak capitalisation rate would exhibit maximum risk and minimum growth, with an average capitalisation rate exhibiting an equal and opposite expression of each.

Having regard to Figure 3.3 and to the discourse above and consistent with Figure 3.1, the respective findings concerning risk, growth and the capitalisation rate may be interpreted diagrammatically as shown in Figure 3.4 (which is also original to this Thesis).



Diagrammatic Interpretation of Risk, Growth And The Capitalisation Rate

Figure 3.4

The relationships suggested in Figure 3.4 may be combined with Equation 2.24 as follows:

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

which may be expressed as:

$$y - r_f = f(R_S, R_U, R_I) - f(G_S, G_U, G_I) \quad \text{Equation 3.1}$$

and if expressed in an expectational context at time t subject to the information available at that time, then:

$$E(y_{At}) - r_f = f(R_S, R_U, R_I)_A - f(G_S, G_U, G_I)_A | \emptyset_t \quad \text{Equation 3.2}$$

$$\text{and: } E(y_{Pt}) - r_f = f(R_S, R_U, R_I)_{<A} - f(G_S, G_U, G_I)_{>A} | \emptyset_t \quad \text{Equation 3.3}$$

$$\text{and: } E(y_{Wt}) - r_f = f(R_S, R_U, R_I)_{>A} - f(G_S, G_U, G_I)_{<A} | \emptyset_t \quad \text{Equation 3.4}$$

which may be alternatively expressed as:

$$y - r_f = f(R_S - G_S), (R_U - G_U), (R_I - G_I) \quad \text{Equation 3.5}$$

$$\text{or: } E(y_{At}) - r_f = f(R_{SA} - G_{SA}), (R_{UA} - G_{UA}), (R_{IA} - G_{IA}) | \emptyset_t \quad \text{Equation 3.6}$$

$$\text{and: } E(y_{Pt}) - r_f = f(R_{S<A} - G_{S>A}), (R_{U<A} - G_{U>A}), (R_{I<A} - G_{I>A}) | \emptyset_t \quad \text{Equation 3.7}$$

$$\text{and: } E(y_{Wt}) - r_f = f(R_{S>A} - G_{S<A}), (R_{U>A} - G_{U<A}), (R_{I>A} - G_{I<A}) | \emptyset_t \quad \text{Equation 3.8}$$

where: $E(y_{At})$ = expected average or modal capitalisation rate at time t
 $E(y_{Pt})$ = expected prime, strongest or maximum capitalisation rate at time t
 $E(y_{Wt})$ = expected weakest or minimum capitalisation rate at time t
 A = average or modal
 \emptyset_t = information subset available at time t
 y = capitalisation rate
 r_f = risk free rate
 R_S = systematic risk influence
 R_U = unsystematic risk influence
 R_I = idiosyncratic risk influence
 G_S = systematic growth influence
 G_U = unsystematic growth influence
 G_I = idiosyncratic growth influence

It is contended, therefore, that the capitalisation rate is a function of the net effect of risk and growth, manifest as positive and negative expectational influences upon each identified source of investment return, giving the asset the characteristic of a growth asset or a risk asset.

Such an approach to the capitalisation rate as a function of systematic, unsystematic and idiosyncratic influences, that may have risk or growth emphases, is equally applicable to each and all of the property asset class, individual property sectors and respective property sub-sectors.

In the context of the capitalisation rate, such emphasis is contended to be likely to be manifest as a net addition to or deduction from the average or modal capitalisation rate, reflecting the relative strength of the respective growth and risk emphases. If such emphases are of equal strength, an average or modal capitalisation rate may be likely to result.

Accordingly, it is contended that risk and growth should not be considered as separate concepts, as suggested in Equation 2.14, as each is merely an expression of the relative net strength or emphasis of each identified factor or source of return.

Interestingly, the inter-relationship between growth and risk receives relatively little attention in both the property theory literature and the finance, commerce and economic theory literature. However, though the various references by authors to the concepts of risk and growth often overlap, what little consideration there is may be argued to be broadly consistent with the above approach.

For example, Reilly (1989) notes that growth and risk directly affect each other in finance theory (pages 19-20), proffering (at pages 523-4) a definition of the capitalisation rate in capital market and finance terminology which combines risk and growth only. Baum and Mackmin (1979) refer to “... an overall or all risks capitalisation rate or growth rate ...”, with Brown (1984) noting:

“Many property investment decisions are based on a single yield figure representing investor’s beliefs concerning risk and the expectation of future growth.”

In summary, risk and growth may be considered as the net effect of the sum of positive and negative expectational influences upon each identified source of investment return for a given asset at a given point in time relative to an average expectation. It is contended, therefore, that the proposition that risk and growth may not be determinants of the capitalisation rate, as suggested by the review of literature, is supported and valid.

Accordingly, given that the factors identified in the property theory literature are contended to be sources of investment return for prime, CBD office investment property and given that Equation 2.14 and Equations 3.6, 3.7 and 3.8 are each expressions of the capitalisation rate (y), it is contended that Equation 2.14 may be combined with Equations 3.6, 3.7 and 3.8 as follows:

$$E(y_{At}) - r_f = f(k_1(RA - GA), k_2(RA - GA), k_3(RA - GA), k_4(RA - GA), k_5(RA - GA), k_6(RA - GA), k_7(RA - GA), k_8(RA - GA), k_9(RA - GA), k_{10}(RA - GA)) | \emptyset_t \quad \text{Equation 3.9}$$

$$\text{and: } E(y_{Pt}) - r_f = f(k_1(R < A - G > A), k_2(R < A - G > A), k_3(R < A - G > A), k_4(R < A - G > A), k_5(R < A - G > A), k_6(R < A - G > A), k_7(R < A - G > A), k_8(R < A - G > A), k_9(R < A - G > A), k_{10}(R < A - G > A)) | \emptyset_t \quad \text{Equation 3.10}$$

$$\text{and: } E(y_{Wt}) - r_f = f(k_1(R > A - G < A), k_2(R > A - G < A), k_3(R > A - G < A), k_4(R > A - G < A), k_5(R > A - G < A), k_6(R > A - G < A), k_7(R > A - G < A), k_8(R > A - G < A), k_9(R > A - G < A), k_{10}(R > A - G < A)) | \emptyset_t \quad \text{Equation 3.11}$$

where:

$E(Y_{At})$	= expected average or modal capitalisation rate at time t
$E(Y_{Pt})$	= expected prime, strongest or maximum capitalisation rate at time t
$E(Y_{Wt})$	= expected weakest or minimum capitalisation rate at time t
A	= average or modal
\emptyset_t	= information subset available at time t
r_f	= risk free rate
R	= risk
G	= growth
k_1	= alternative investments
k_2	= building
k_3	= economic situation
k_4	= legal environment
k_5	= location
k_6	= planning
k_7	= sentiment
k_8	= separable asset class characteristics
k_9	= state of the property market
k_{10}	= tenant

with each factor or source of investment return having either a systematic or unsystematic or idiosyncratic classification. Accordingly, each such expression is contended to be consistent with property, finance, commerce and economic theory as derived from the review of literature.

Given the emphasis within the property finance literature upon the greater significance of idiosyncratic influences than systematic or unsystematic influences on the risk and return aspects of property in general and a single property in particular, it is contended that it may be worthwhile to identify those sources of return which are idiosyncratic for consideration in the context of Equations 3.9, 3.10 and 3.11.

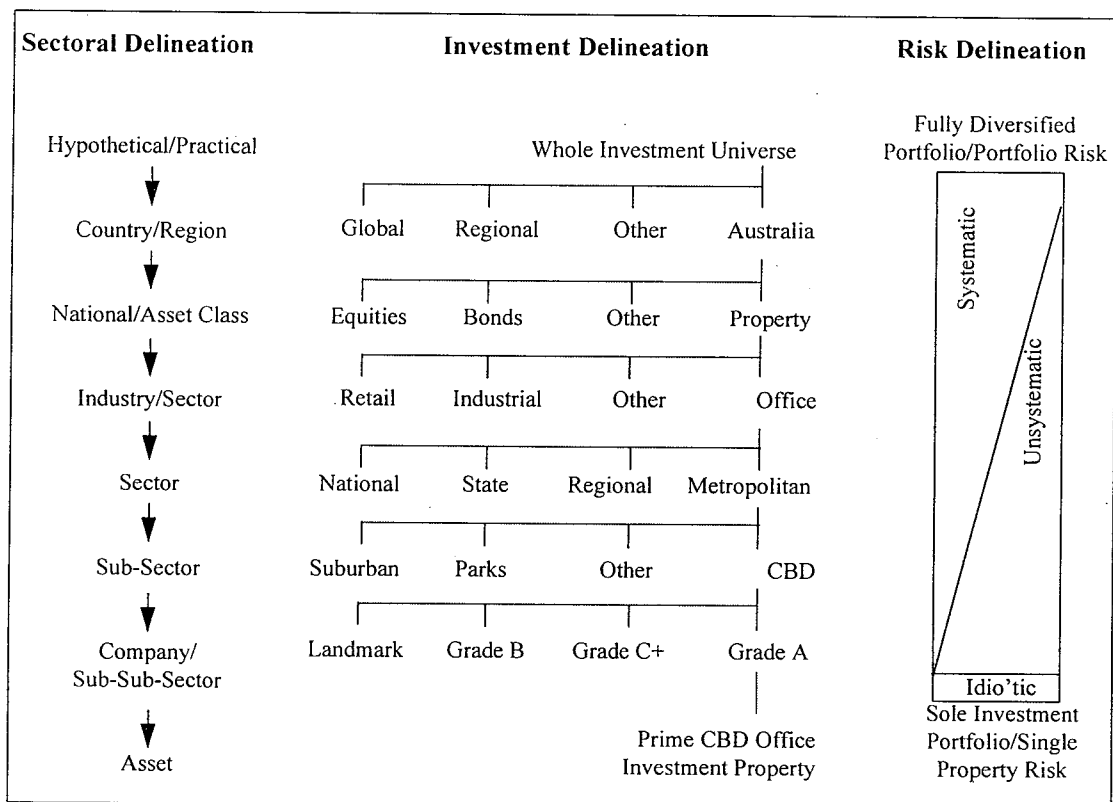
3.2.2 Identification of Idiosyncratic Sources of Return

Given the context of study for this Thesis, concerning prime, CBD office investment property, it is relevant to consider and seek to place such a small component of the investment universe within the context of the whole investment universe and to relate this to the sectoral and risk dimensions adopted in the finance, commerce and economic theory literature and within the property finance literature.

Based on the findings of the review of literature, the construction of capital markets may be considered in three principal dimensions, being:

- in terms of sectoral dimensions - from the hypothetical universe of investments to the individual asset;
- in terms of investment dimensions - from the whole investment universe to a given prime, CBD office investment property;
- in terms of risk dimensions - from totally systematic through progressively decreasing systematic/increasing unsystematic to totally idiosyncratic risk,

which is illustrated diagrammatically in Figure 3.5.



A Taxonomy Of The Three Dimensions Of The Capital Markets

Figure 3.5

The proposed framework for the investment universe, as expressed in Figure 3.5 (which is original to this Thesis), generally addresses the roles of the capital markets risk classifications of systematic,

unsystematic and idiosyncratic together with the broad concept of elimination of single asset risk through portfolio diversification which is central to capital market theory.

Such a taxonomy of the investment universe provides a proposed framework which accommodates the range of investments from the fully diversified portfolio, comprising every sector of the whole investment universe and which exhibits only portfolio risk, through to the single investment portfolio consisting of one particular asset or property, which exhibits idiosyncratic or single property risk only.

As such, the proposed framework places a single asset both clearly and relatively within the context of the whole investment universe. Similarly, the proposed framework places a given prime, CBD office investment property (being a single property asset) within the context of the Australian national property market.

Having classified a given prime, CBD office investment property as a single asset within the framework of the investment universe, it is now proposed to endeavour to apply capital markets risk classifications, identified from the review of literature, to the identified sources of investment return or determinants of the capitalisation rate for such a given property investment.

The taxonomy of the three dimensions of the capital markets or investment universe (Figure 3.5) is consistent with the property finance literature review which found that property has a higher level of idiosyncratic risk than other asset classes.

Accordingly, when seeking to compare property to property at a point in time, the literature suggests a closer focus on idiosyncratic sources of investment return to be appropriate and same are contended to be potentially of most relevance in the development of an econometric model. It is, therefore, proposed to endeavour to place the factors or sources of investment return identified in the property theory literature review within the context of a systematic, unsystematic and idiosyncratic classification in order to objectively identify those which are idiosyncratic.

Each of the identified factors will be reviewed to establish whether each may be attributed with either one or more of a systematic, unsystematic or idiosyncratic risk classification in the context of a single, prime, CBD office investment property.

Given the characteristics of property identified in the review of literature and to be consistent with the findings of the review of literature, it is proposed to adopt the test of pervasiveness as the decision rule in order to attribute a risk classification to each of those respective factors, identified in the property theory literature, in a manner by which the findings of both the property theory literature review and the finance, commerce and economic theory literature review may be reconciled.

As Figure 3.5 illustrates, if a particular influence pervades all or the majority of sectoral dimensions it is classified as systematic, whereas a particular influence which only pervades a minority of sectoral dimensions is classified as unsystematic and that which impacts a single asset only as idiosyncratic.

In order to place a given, prime, CBD office investment property in the context of the Australian property market and to be consistent with Figure 3.5, it is proposed to adopt the following levels at which to test the pervasiveness of each identified factor or source of investment return:

- Australia, Property Asset Class, Office Sector, Metropolitan Sector;
- CBD Sub-Sector;
- Grade A Sub-Sub-Sector; and
- a Given Prime CBD Office Investment Property.

Given the nature of capital markets risk classifications, as clearly exhibited through the pervasiveness decision rule, each of the identified categories is consumed by the next higher category (excepting, by definition, the highest category). Accordingly, the risk distinction between systematic and unsystematic is only relevant for a given investment dimension. However, having regard to the emphasis herein upon idiosyncratic risk, this may not necessarily be an issue.

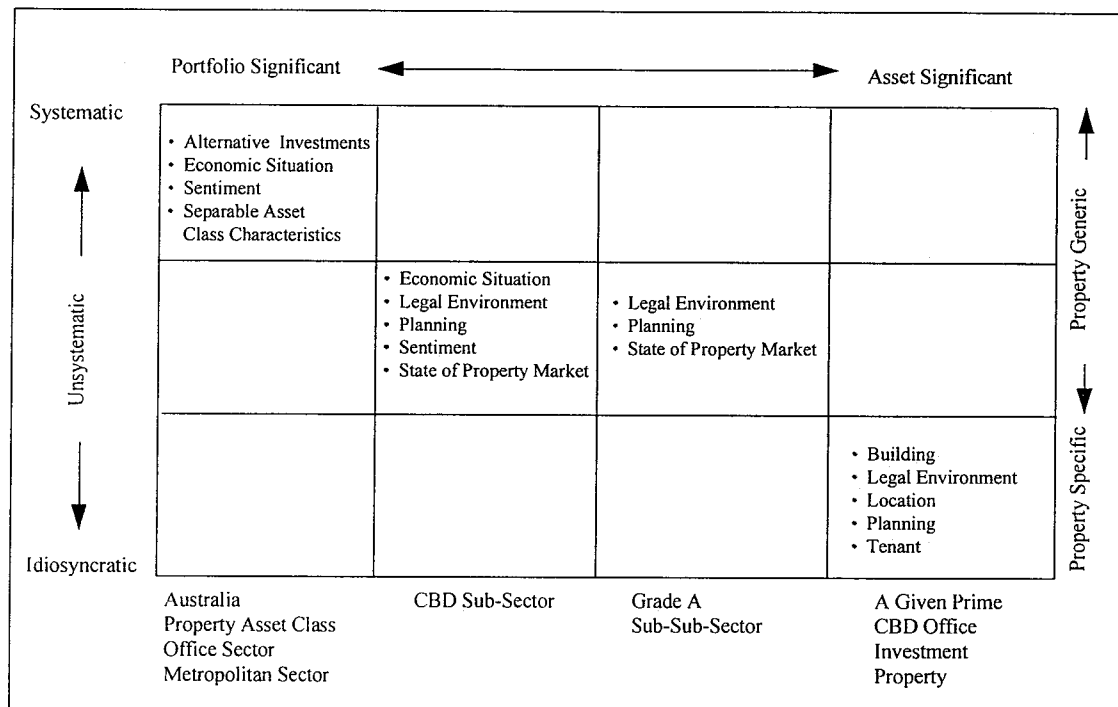
The review of property theory literature identified ten factors or sources of investment return, namely:

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

Therefore, starting at the idiosyncratic risk classification level, it is proposed to identify those factors or sources of investment return which are likely to be unique to a given property, then those which are likely to be common or pervasive to all properties in the Grade A sub-sub-sector, those which are likely to be common or pervasive to the entire CBD office market or sub-sector and then finally, for the purposes of this Thesis, the systematic level of those factors which are likely to be common or pervasive to the entire metropolitan office sector.

Based on this approach, a risk classification matrix was constructed (Figure 3.6) which is original to this Thesis. Given the characteristics of certain factors and the combination of pervasiveness with the consuming nature of ascending risk classifications, certain factors are listed several times. For example,

planning may be unique to a particular property, common to the Grade A sub-sub-sector and common to the CBD sub-sector.



Risk Classification Matrix

Figure 3.6

Consistent with the review of literature, Figure 3.6 clearly identifies certain factors as purely idiosyncratic (building, location, tenant) and as purely systematic (alternative investments, separable asset class characteristics) with the balance being either idiosyncratic, unsystematic or systematic depending on the investment dimension adopted.

Figure 3.6 is consistent with the findings of the review of literature in the application of the principles of diversification for risk reduction. Those factors identified as purely idiosyncratic are potentially capable of elimination through diversification within a given property portfolio. Conversely, those factors which are identified as purely systematic could not be eliminated within a property portfolio and could only be capable of elimination by diversification into other asset classes.

Accordingly, capital markets risk classifications would appear capable of application to the identified factors or sources of investment return, as suggested by the finding of the property finance literature review.

Having regard to the construction of an econometric model for the determination of the capitalisation rate for a prime, CBD office investment property which is consistent with property, finance, commerce and economic theory, it is contended that those factors or sources of return found to have an idiosyncratic character are most likely to be relevant. Accordingly, building (k_2), legal environment (k_4), location (k_5), planning (k_6) and tenant (k_{10}) are contended to be likely to be the most significant factors for such a model.

Thus, for a prime, CBD office investment property, it is contended that Equations 3.9, 3.10 and 3.11 may be restated as:

$$E(y_{At}) - r_f = f(k_2(RA - GA), k_4(RA - GA), k_5(RA - GA), k_6(RA - GA), k_{10}(RA - GA)) | \emptyset_t \quad \text{Equation 3.12}$$

$$\text{and: } E(y_{Pt}) - r_f = f(k_2(R < A - G > A), k_4(R < A - G > A), k_5(R < A - G > A), k_6(R < A - G > A), k_{10}(R < A - G > A)) | \emptyset_t \quad \text{Equation 3.13}$$

$$\text{and: } E(y_{Wt}) - r_f = f(k_2(R > A - G < A), k_4(R > A - G < A), k_5(R > A - G < A), k_6(R > A - G < A), k_{10}(R > A - G < A)) | \emptyset_t \quad \text{Equation 3.14}$$

- where: $E(y_{At})$ = expected average or modal capitalisation rate at time t
 $E(y_{Pt})$ = expected prime, strongest or maximum capitalisation rate at time t
 $E(y_{Wt})$ = expected weakest or minimum capitalisation rate at time t
 A = average or modal
 \emptyset_t = information subset available at time t
 r_f = risk free rate
 R = risk
 G = growth
 k_2 = building
 k_4 = legal environment
 k_5 = location
 k_6 = planning
 k_{10} = tenant

It is contended to be significant that those factors proposed as Property Generic in the review of pilot studies literature (see Section 2.3.3, above) are all confirmed not to be idiosyncratic within the Risk Classification Matrix in Figure 3.6.

As noted above, the review of literature suggested that systematic influences have the greatest impact upon growth, unsystematic influences impact both growth and risk and idiosyncratic influences have the greatest impact upon risk. As shown in Figure 3.6 above, whilst building, location and tenant are capable of classification solely as idiosyncratic influences, legal environment and planning may be idiosyncratic or unsystematic factors dependent upon the dimension of assessment. This is particularly interesting given the distinction between legal environment and planning suggested in the review of literature (see Section 2.3, above)

Accordingly, whilst the growth characteristic could arguably be deleted from each of Equations 3.12, 3.13 and 3.14 for k_2 , k_5 and k_{10} , the same could not be argued for k_4 and k_6 . Similarly, whilst there may be a greater risk or growth emphasis upon a given factor attributable to its systematic, unsystematic or idiosyncratic character, the literature is not conclusive that such emphasis as risk or growth is mutually exclusive.

Further, it is contended that the extent to which the growth and risk characteristic of each factor can be distinguished and so be separately measured is questionable, with the net effect of the risk-growth trade-off potentially the only manifestation at the factor level capable of expression and measurement.

Accordingly, it is not proposed to further attempt to refine the risk and growth attribution for each factor, individually, within the single, potentially explanatory equation at this stage.

It is, therefore, contended that the determinants of the capitalisation rate for a prime, CBD office investment property at a point in time may be described algebraically in a form which accords with property, finance, commerce and economic theory as follows:

$$E(y_{Pt}) - r_f = f(k_2(R < A - G > A), k_4(R < A - G > A), k_5(R < A - G > A), k_6(R < A - G > A), k_{10}(R < A - G > A)) | \emptyset_t$$

Equation 3.13

where: $E(y_{Pt})$ = expected prime, strongest or maximum capitalisation rate at time t

A = average or modal

\emptyset_t = information subset available at time t

r_f = risk free rate

R = risk

G = growth

k_2 = building

k_4 = legal environment

k_5 = location

k_6 = planning

k_{10} = tenant

However, the very low relative and proportionate importance of planning and legal environment, as assessed within the pilot studies in the review of literature, is contended to be particularly significant in the context of Equation 3.13. Planning is classified as a Tertiary determinant and legal environment as a Secondary determinant, scoring 3% and 4% respectively, as noted in Table 2.3 above. This compares with tenant which scored 23% and location and building which each scored 9%, several times greater than the scores for planning and legal environment respectively. Their contribution is, therefore, not only small in a nominal sense but tiny in a relative sense.

Thus, whilst planning and legal environment are acknowledged to be both unsystematic and idiosyncratic influences upon a given prime, CBD office investment property which may vary over time, it is contended that they are neither likely to add significantly to the predictive power of the single, potentially explanatory equation nor to be a significant consideration between such properties at a point in time. It is, therefore, contended that they may be discarded from the development of an econometric model for the determination of the capitalisation rate. The single, potentially explanatory equation may, therefore, be stated as follows:

$$E(y_{pt}) - r_f = f(k_2(R < A - G > A), k_5(R < A - G > A), k_{10}(R < A - G > A)) | \emptyset_t \quad \text{Equation 3.15}$$

where: $E(y_{pt})$ = expected prime, strongest or maximum capitalisation rate at time t

A = average or modal

\emptyset_t = information subset available at time t

r_f = risk free rate

R = risk

G = growth

k_2 = building

k_5 = location

k_{10} = tenant

Therefore, for a property where the growth emphasis for the majority of factors is stronger than the risk emphasis, a net negative effect would result which would cause the expected capitalisation rate to be reduced (capital value to rise).

Conversely, for a property where the risk emphasis for the majority of factors is stronger than the growth emphasis, a net positive effect would result which would cause the expected capitalisation rate to rise (capital value to fall).

Having, therefore, reconciled the two equations into a single, potentially explanatory equation which is based on and so accords with property, finance, commerce and economic theory and which may also be

reconciled with the role of the idiosyncratic risk classification at the single property asset level, it remains to specify those assumed theoretical principles underlying the single, potentially explanatory equation for further consideration.

3.2.3 Assumed Theoretical Principles Underlying The Single, Potentially Explanatory Equation

Whilst Equation 3.15 is based on the findings of the property, finance, commerce and economic theory literature review and therefore accords with theory, it is also reliant upon a series of assumed theoretical principles which may be summarised as follows:

- the pilot studies found state of the property market and economic situation to be both relatively and proportionately important Primary and Secondary determinants respectively, though both were omitted from the single, potentially explanatory equation developed in Section 3.2.2, above. Further, it is assumed that such factors vary over time and are systematic to the entire CBD office sub-sector and so may be omitted from a point in time, idiosyncratic focussed econometric model. Accordingly, it is contended that the validity of the omission of economic situation and state of the property market from the single, potentially explanatory equation should be verified;
- if the determinants of the capitalisation rate are capable of description as sources of investment return and of classification as systematic, unsystematic and idiosyncratic emphases and if risk and growth are manifestations of positive and negative expectational influences upon each of the identified sources of investment return, then, at a point in time:
 - risk should negatively correlate with growth;
 - risk and growth should correlate with the capitalisation rate;
 - risk and growth should correlate with the determinants and the determinants should correlate with the capitalisation rate;
 - risk and the capitalisation rate and unsystematic/idiosyncratic influences should correlate strongly and growth and the capitalisation rate and unsystematic/idiosyncratic influences should correlate weakly;
- that, as contended, the:
 - strongest capitalisation rate expectation embodies:

- a below average risk expectation (minimum risk);
- an above average growth expectation (maximum growth);
- weakest capitalisation rate expectation embodies:
 - an average or above average risk expectation (non-minimum risk);
 - an average or below average growth expectation (non-maximum growth);
- however, if, as contended, it may be unlikely that the risk and growth aspects of a given determinant can be distinguished, it may be expected that the relationship between the capitalisation rate and the determinants, risk and growth combined will not be significantly different to the relationship without each of risk or growth respectively.

To support the theoretical validity of the single, potentially explanatory equation for the determination of the capitalisation rate, each of the above underlying assumed theoretical principles require verification.

Should any of the underlying assumed theoretical principles be found to be invalid, the single, potentially explanatory equation will require respecification accordingly.

3.2.4 Summary - Derivation Of A Single, Potentially Explanatory Equation For Econometric Modelling

Having, therefore, derived a single, potentially explanatory equation for the determination of the capitalisation rate between properties at a point in time which is based on and accords with property, finance, commerce and economic theory through the findings of the property, finance, commerce and economic literature review and having specified those assumed theoretical principles supporting same, it is proposed to identify that data to be collected to facilitate quantification of the single, potentially explanatory equation for use in subsequent econometric modelling.

3.3 IDENTIFICATION OF DATA FOR COLLECTION

It is proposed to collect sufficient, appropriate data to quantify each of the components of the single, potentially explanatory equation (Equation 3.15), verify the validity of each of the assumed theoretical principles underlying such single, potentially explanatory equation as specified in Section 3.2.3 and to investigate the validity of the findings of the review of literature within Chapter 1 concerning the following aspects of current practise in the capitalisation rate selection and adjustment process:

- the identification of current methods of capitalisation rate selection;
- the identification of sources of the capitalisation rate;
- the identification of approaches to capitalisation rate adjustment;
- an assessment of whether the adjustment process is always to the nearest 0.25%; and
- confirmation of the extent of the determinants of the capitalisation rate.

Given the focus within the Thesis Problem on subjectivity, informality and heuristics, it is contended to be preferable to use as much measurable or hard data and objectively derived inputs as possible for the development of an econometric model to minimise the requirement for practitioner sourced inputs, as such inputs may introduce subjectivity and heuristics into the econometric model and so contribute to a reduction in consistency, formality and reliability.

Accordingly, it is proposed that a model is required which minimises the role of practitioner opinion, intuition and experience and which, further, contributes to a reduction in variability in capitalisation rate adjustment, preferably through the assessment of capitalisation rates in increments of less than 0.25%.

Having thus established the basic parameters within which the econometric model is to be developed, the following data requires collection to undertake each and all of the above:

- an expression of a risk free rate;
- an expression of an expected, average capitalisation rate for prime CBD office investment property;
- the current capitalisation rate for a hypothetically perfect, prime CBD office investment property in Sydney;
- the identification of a sample of properties;
- an expression of an expected capitalisation rate and of a variable for each of building, location, tenant, risk and growth for each of a sample of properties;
- to identify current methods of capitalisation rate selection;
- to identify sources of the capitalisation rate;

- to identify approaches to capitalisation rate adjustment;
- to identify whether the adjustment process is always to the nearest 0.25%;
- an expression of practitioners understanding of economic situation and state of the property market.

Having identified the wide range of data required, it was apparent that a combination of the collection of factual or hard data together with judgemental or soft data would be necessary. Further, it was apparent that some of the required data was of a refined nature and would only become available as a result of the analysis of preliminary data requiring prior collection.

For each set of data, alternative sources were considered individually in an endeavour to reduce the component of judgemental data and so ensure greater rigour within the econometric model to be developed and subsequent consistency in application. Accordingly, the range of data to be collected was divided as follows:

Judgemental Or Soft Data:

- identify current methods of capitalisation rate selection;
- identify sources of the capitalisation rate;
- identify approaches to capitalisation rate adjustment;
- identify whether the adjustment process is always to the nearest 0.25%;
- identification of the current capitalisation rate for a hypothetically perfect, prime CBD office investment property in Sydney;
- an expression of an expected capitalisation rate and of a variable for each of building, location, tenant, risk and growth for each of a sample of properties;
- confirmation of the determinants;
- expressions of practitioners understanding of economic situation and state of the property market; and

Factual Or Hard Data:

- expression of a risk free rate.

The above preliminary data may then be refined to provide the following:

- expression of an expected, average capitalisation rate for prime CBD office investment property;
- alternative expressions of a variable for building, location and tenant, as an average and relative to an average for a sample of properties,

which will be undertaken in Chapter 4, together with the analysis of the balance of the data collected.

The soft or judgemental data was collected through a Practitioner Survey, with the alternative approaches to each type of data considered, together with that adopted, being outlined in Section 3.4.2 followed by the factual or hard data collection which is summarised in Section 3.4.4, below.

3.4 DATA COLLECTION

The lack of factual or hard data available for the advanced analysis of property investment is particularly relevant for cross sectional multiple regression at a point in time, thus necessitating the use of a Practitioner Survey. Whilst the limitations of such an approach to data collection are acknowledged, it is contended that the absence of alternative sources of data renders its use unavoidable.

The Practitioner Survey forms a key element of this Thesis and so will be considered in detail through the following sub-sections:

- 3.4.1 Sample Identification And Selection;
- 3.4.2 Practitioner Survey Construction;
- 3.4.3 Conduct Of Practitioner Survey;
- 3.4.4 Summary - Practitioner Survey; and
- 3.4.5 Factual Or Hard Data,

respectively, below.

3.4.1 Sample Identification And Selection

Acknowledging the differing roles of valuers and investors (as summarised in Section 1.2.5), practising valuers were selected for use as the survey sample for reasons discussed and detailed in Parker (1994E). To summarise, valuers were preferred to investors as it was argued that valuers are greater in number in Sydney, are less likely to be influenced by disparate investment objectives and philosophies, are accustomed to adopting a standard definition of open market value and are more likely to be able to maintain a consistent focus on the capitalisation rate whilst adhering to a series of underlying assumptions.²

For the survey sample to be statistically significant, a group of at least thirty respondents was considered necessary. To maintain consistency with the pilot studies, the survey sample contained valuers from the major firms who had participated in the pilot studies of previous years, totalling 39 respondents. To increase the size of the survey sample, valuers from smaller firms and sole practitioners with extensive experience in the valuation of prime, CBD office investment property were also selected. The latter were identified from personal knowledge, contacts and referrals, suggestions of the Sydney office of the Australian Institute Of Valuers And Land Economists (AIVLE), the AIVLE Private Practitioners List and the Yellow Pages.

Given the size of the Sydney CBD office market and the limited number of valuers practising in the prime investment sub-sector, it was particularly challenging to locate a sample which was not only large but also appropriate for the purposes of this type of research and the sample identified is contended to be statistically significant. It is, therefore, expected that, whilst the pilot studies were based on fewer respondents, such respondents will probably be found to be more experienced in the prime, CBD office investment sub-sector than that sample finally assembled for the Practitioner Survey.

In addition to the identification of a respondent sample, the survey construction (see Section 3.4.2, below) required the identification of a sample of prime, CBD office investment properties to be used as the basis for data attribution.

In order to maintain objectivity and minimise bias in the selection of such a sample of prime, CBD office investment properties, the classifications attributed by Australia's principal property industry body, the Building Owners And Managers Association (BOMA), were adopted. BOMA is an independent association of property owners and managers which collates and disseminates data amongst both its members and property industry participants. Given its independence and the very wide range of industry participants who supply data, the classifications adopted by BOMA are generally held to be

² The rationale is further discussed in Parker (1992D), (1993A), (1993C) and (1994C).

both comprehensive and the industry standard. The basis of classification by BOMA of CBD office stock into five categories is summarised in Table 3.1.

Category	Indicative Size	Floor Plate	Age/Services/Finish
Premium	> 20,000 sqm	> 1,100 sqm largely column free	Top quality modern space which is generally a pace setter in establishing rents and includes: - the latest or recent generation of building services; - ample natural lighting; - good views/outlook; - prestige lobby/finish; and - quality access to/from an attractive street setting
Grade A	> 6,000 sqm	> 600 sqm largely column free	High quality modern space including: - good views/outlook; - quality lobby finish; and - quality access to/from an attractive street environment.
Grade B	Any size	Any size	Good quality modern space.
Grade C	Any size	Any size	Older style air conditioned space.
Grade D	Any size	Any size	Poor quality space.

BOMA CBD Office Classification

(Source: Building Owners And Managers Association Of Australia Limited)

Table 3.1

As it is contended that Premium office buildings would be most likely to be valued principally on a discounted cash flow basis, the Grade A sector was selected for analysis as the most prime stock likely to be valued principally by the capitalisation of income method. Interestingly, this approach is consistent with the terminology of the Lend Lease Group (one of Australia's largest property investors) who classify Premium buildings as "super prime" leaving BOMAs Grade A buildings to be the prime sector.

After some negotiation, BOMA kindly provided a schedule of all those buildings in the Sydney CBD which were classified as Grade A, together with their area, current direct vacancy (excluding sub-lease vacancy) and age. There were 46 such buildings listed as at July, 1994 and a map of Sydney showing the location of each is included in Appendix 3.1. All buildings so classified are included on the map and none were deleted from the list at this stage.

However, the BOMA data provided the date of original construction for each of the properties in the sample, some of which had been subject to subsequent major refurbishment. Accordingly, each building was inspected and those which had been subject to apparent major refurbishment identified. The respective building owners were then contacted to confirm if there had been such major refurbishment and to ascertain the date of completion of such refurbishment. In such cases, the date of completion of the last major refurbishment was adopted as the basis for expressing the relative age of the building.

Accordingly, therefore, it is contended that both the samples of respondents and of properties were objectively selected providing a solid foundation for data collection and subsequent rigorous analysis.

3.4.2 Practitioner Survey Construction

Three pilot surveys of increasing levels of refinement and sophistication were conducted in 1991, 1992 and 1993 with copies of each survey form included in Appendix 3.2. The findings of each survey are summarised in Excursus 3, annexed hereto, as referred to in Chapter 2 (Section 2.3.3, above).

Each year, the pilot study survey form was amended to address and resolve interpretative and other problems identified by respondents in the previous years survey as well as adding further questions. Accordingly, the 1994 Practitioner Survey was based on the pilot surveys and benefited from the extensive trialing undertaken in each previous year.

The 1994 Practitioner Survey form was based on the 1993 pilot survey form with the addition of questions to address:

- capitalisation rate selection and adjustment;
- optimal location, building and tenant attributes;
- the extent of the list of identified determinants of the capitalisation rate;
- the approach adopted by valuers to the assessment of the economic situation and state of the property market

and inclusion of the list of prime, CBD office investment properties comprising the sample, as identified in Section 3.4.1, for the attribution of capitalisation rates and risk and growth measures.

A copy of the 1994 Practitioner Survey form is included in Appendix 3.3 with the construction of the Practitioner Survey to be considered in two parts, namely:

- data to confirm the statistical validity of the sample, findings of the pilot studies and validity of the findings of the review of literature within Chapter 1 concerning aspects of current practise in the capitalisation rate selection and adjustment process (Section 3.4.2.1 - Confirmatory Data);
- and
- data for use in the development of an econometric model from the single, potentially explanatory equation including the quantification of each of the component variables and verification of the validity of the underlying assumed theoretical principles (Section 3.4.2.2 - Modelling Data),

respectively, below, after a brief review of the specific assumptions which respondents were requested to make when responding to questions in the Practitioner Survey.

To increase the consistency of responses and maintain the focus on the capitalisation rate, all respondents were asked to base their answers on a series of assumptions. These assumptions were intended to remove many of the problems from the capitalisation process by relating the survey questions to a hypothetically perfect property investment. Accordingly, the Introduction on the survey form stated:

Each question should be assumed to refer to a CBD office investment property in a prime location in Sydney, leased at market rents to several tenants with no shortfall in recoverable outgoings, on long, institutional leases in the current property market and subject to no unusual features or problems.

Thus, the capitalisation rate under consideration in the following questions would not require adjustment to accommodate a non-prime location, over or under-renting, single tenant issues, outgoings problems, unusual lease terms or a short lease. This was intended to increase the focus of respondents on the composition and characteristics of the capitalisation rate itself and the particular aspects being investigated by the respective questions.

The Introduction upon the survey form went on to define the type of capitalisation rate or yield under consideration:

For each question, the capitalisation rate should be considered as an equivalent yield and not as an initial, reversionary, equated or other expression of yield.

This assumption was intended to further focus respondents attention on the composition and characteristics of the capitalisation rate in its purest form without regard to the effects of differential reversionary income streams on its assessment or interpretation.

Having established the assumptions underlying the Practitioner Survey, the Confirmatory Data and Modelling Data were addressed as follows.

3.4.2.1 Confirmatory Data

It was proposed to collect data to confirm the following:

- the statistical validity of the sample (Section 3.4.2.1.1);
- the findings of the pilot studies (Section 3.4.2.1.2); and
- the validity of the findings of the review of literature concerning various aspects of current practise in the capitalisation rate selection and adjustment process (Section 3.4.2.1.3),

which will each be considered, sequentially, below.

3.4.2.1.1 Statistical Validity Of The Sample

The first question in the Practitioner Survey sought to establish:

- the statistical depth of the sample;
- respondents exposure to the valuation of prime CBD office investment property; and
- respondents experience and qualifications,

through the collection of data on the number of valuations undertaken each year, proportion which were CBD office, range of values and the respondents period of practical experience, professional qualifications and level of industry body involvement.

Optimally, the sample would be highly qualified and experienced and be regularly involved in the valuation of a large number of prime CBD office investment properties which would make them ideally situated to comment with authority on matters concerning the determination of the capitalisation rate for such property.

3.4.2.1.2 Findings Of The Pilot Studies

For completeness, it was proposed to use the 1994 large sample Practitioner Survey to confirm or refute the findings of the smaller sample pilot studies undertaken in 1991, 1992 and 1993 and a generally similar format was adopted³ for the questions concerning relative importance (Question 12) and proportionate importance (Question 13).

Given the findings of the pilot studies, slight movements in the order of relative and proportionate importance of determinants from the previous year might be anticipated, but the hierarchy of Primary, Secondary and Tertiary determinants is expected to be maintained. Confirmation of the findings of the pilot studies would further reinforce the theoretical validity of Equation 3.15.

Though Question 12, above, listed the twelve determinants of the capitalisation rate identified from the review of property theory literature, the review noted that it was not possible to ascertain from the literature whether the list was complete. Interestingly, the review of literature concerning the pilot studies noted that the small sample pilot studies conducted found that none of the respondents sought to add, delete or vary the list of determinants, despite being repeatedly encouraged to do so if they felt it appropriate.

Accordingly, for completeness, the large sample practitioner survey sought to ascertain if respondents considered the list to be complete and whether there were any other determinants generally viewed as relevant that should also be considered. (Questions 16 and 17) for addition to the list.

Given the findings of the pilot studies, it was not anticipated that further determinants of the capitalisation rate would be identified. However, having regard to the nature of the survey sample, any further determinants that may be identified would be likely to be of considerable interest

3.4.2.1.3 Aspects Of Current Practise In The Capitalisation Rate Selection And Adjustment Process

Given that the Thesis Problem arose from the approach to capitalisation rate selection and adjustment advocated within the literature reviewed in Chapter 1, the Practitioner Survey sought to confirm that such approaches were currently practised by practitioners in order to investigate the validity of and

³ For relative importance assessment, the approach to data collection and underlying rationale were the same as adopted in the 1993 survey though the scoring order was reversed. Respondents were asked to attribute a relative importance score between 1 (Vitaly Important) and 5 (Least Important) to each identified factor and concept, in order to overcome the common comment that all were important with the acknowledgment that some may be more important than others.

substantiate the Thesis Problem. Accordingly, questions were included to investigate the sources, decision basis, selection and adjustment of the capitalisation rate:

Sources Of The Capitalisation Rate (Question 2)

Based on the findings of the review of literature tempered by personal experience, a range of potential alternative sources of the capitalisation rate was listed in the 1993 pilot survey including directly comparable sales, all office sales, discussions with agents, personal feelings and asset class relativity.

The 1994 Practitioner Survey adopted the same classifications as the 1993 pilot survey but rearranged them in alphabetical order (to remove any potential for bias based on the order of listing) and included an additional line to allow respondents to add further sources of the capitalisation rate which they considered appropriate. The question adopted a simple numeric ranking in order of importance, rather than an assessment of proportionate or other type of importance.

The preamble to the question specifically stated that it referred to sources of the capitalisation rate in the "current market". It should be noted that the prime, CBD office sub-sector in Sydney in late 1994 was characterised by a rising level of sales activity.

In accordance with the literature, it might be expected that respondents would suggest directly comparable sales to be the most important source of capitalisation rates. However, given the lack of sales activity and resulting evidence during late 1993/early 1994, it is possible that other sources of the capitalisation rate may be found to be more significant, at the time of the Practitioner Survey, than directly comparable sales and that respondents may add further sources to the list.

Basis Of The Capitalisation Rate Decision (Question 3)

The analysis of comparable sales is, by definition, an historic or retrospective exercise but the adjustment process is a current time exercise and the adoption of a capitalisation rate for use within a valuation a prospective exercise. Hence, the literature suggests that valuers may be anticipated to have regard to the past and present in the adjustment process but does not provide an apparent insight into the role of the future or of expectations in the adjustment process.

Given the significance of the role of expectations in the pricing of other asset classes in the capital markets, Question 3 sought to investigate its role in the context of capitalisation rate selection by asking respondents to attribute a percentage to each of retrospective, current time

and prospective considerations when adjusting the capitalisation rate, which acknowledges that respondents may be considering more than one time frame simultaneously but that one may be more significant than the others.

Consistent with the review of property theory literature, it may be anticipated that the majority of respondents will have regard to either past events or concentrate on the present, with little regard to the future.

Selection Of The Capitalisation Rate (Question 4)

A further aspect of the capitalisation rate adjustment process which does not appear to be addressed in the literature concerns the level of rounding of the capitalisation rate when devalued from a comparable sale and for application in the valuation of a given property.

Anecdotal evidence and personal experience suggest that valuers have a tendency to adopt capitalisation rates in increments of 0.25%, with sensitivity analyses generally found to be calculated at 0.25% rests.

Such an approach is apparently inconsistent with the devaluation of comparable sales which rarely produces evidence of a capitalisation rate rounded to exactly 0.25%. Similarly, personal experience of the discounted cash flows included by professional valuers within valuation reports indicates that the discount rate that is often adopted is a whole percent which generates a net present value that does not devalue to a capitalisation rate rounded to exactly 0.25%.

Accordingly, there would appear to be little logical defence of the adoption of the nearest 0.25% increment for the assessment of the capitalisation rate, other than the valuers skills being unable to assess a capitalisation rate more accurately than the nearest 0.25%. There could, however, be a significant pricing impact arising from such rounding.

Given the dearth of literature on the topic, it is proposed to investigate which level of rounding is usually adopted by practising valuers when selecting a capitalisation rate. As the greatest rounding level, based on personal experience, was anticipated to be to the nearest 0.50% and the least to be to 0.05%, respondents were asked to simply nominate that level of rounding which they would be most likely to use with four alternatives of 0.05%, 0.10%, 0.25% and 0.50% arranged in an increasing order.

Anecdotal evidence and personal experience suggests that the majority of respondents would select 0.25%. It should be noted that the question presupposes that respondents will not only

round to the defined categories but also consistently round to the same degree. Accordingly, it will be interesting to observe if any respondents comment on alternative levels of rounding or suggest different levels of rounding for different valuations, sub-sub-sectors, points in the market cycle, etc.

Adjustment Of The Capitalisation Rate (Questions 5 And 6)

As with the previous sub-sections, the literature does not appear to focus on exactly how the valuer undertakes the process of adjustment from devalued comparables to the assessment of the capitalisation rate for application in the valuation of a given property.

Given the dearth of information on these aspects of the adjustment process, it is proposed to ascertain from the respondent practitioner sample exactly how the adjustment process is undertaken with the basis of adjustment and adjustment techniques considered in two separate, sequential questions.

Three principal bases for evidence adjustment were suggested in the literature (being subjective mental adjustment, additive approach and an adjustment based on the bond rate) and respondents were requested to simply nominate which of the three bases they would primarily use. Such an approach does not preclude the use of alternative bases but merely seeks to gauge the extent of the most regularly used basis. A fourth section for respondents to state the basis adopted, if none of the three listed, was also included in the question (Question 5).

Based on the literature, it is anticipated that the majority of respondents will nominate subjective, mental adjustment as the primarily used basis of adjustment. The literature suggests that other bases are unlikely such that, should any be nominated by respondents, they will be of considerable interest.

Two principal techniques for evidence adjustment were suggested in the literature (being sensitivity and probability analysis) and respondents were requested to simply tick the box if they applied such a technique when selecting the capitalisation rate for use in a given valuation or to nominate another technique if adopted (Question 6). Such an approach permitted respondents to tick both boxes, if both methods were used, or neither as appropriate.

It is, however, possible that, by nominating the alternative techniques and seeking respondents to register their use, a bias in responses may arise with respondents potentially ticking one or both boxes even though they do not use the technique.

Based on personal experience of perusing valuation reports, most valuers conduct at least a simple sensitivity analysis but may not realise that this is what they are doing. Accordingly, it will be interesting to observe how many respondents undertake (or are able to acknowledge that they undertake) sensitivity analysis, whether any also undertake probability analysis and how many do not undertake either. The literature suggests that other techniques are unlikely to be adopted such that, should any be nominated by respondents, they will be of considerable interest.

3.4.2.1.4 Summary - Confirmatory Data

Having reviewed those questions in the Practitioner Survey which sought to confirm the statistical validity of the sample, findings of the pilot studies and validity of the findings of the review of literature concerning various aspects of current practise in the capitalisation rate selection and adjustment process, the following Section reviews those questions in the Practitioner Survey which sought to collect data for use in the quantification of the component variables for the development of an econometric model from the single, potentially explanatory equation and the verification of the validity of the underlying assumed theoretical principles.

3.4.2.2 Modelling Data

It is proposed to consider the collection of Modelling Data in the following order:

- 3.4.2.2.1 Benchmark Capitalisation Rate;
- 3.4.2.2.2 Optimal Location;
- 3.4.2.2.3 Optimal Building;
- 3.4.2.2.4 Optimal Tenant;
- 3.4.2.2.5 Economic Situation And State Of The Property Market; and
- 3.4.2.2.6 Capitalisation Rate, Risk And Growth,

sequentially, below.

3.4.2.2.1 Benchmark Capitalisation Rate (Question 7)

In order to establish a measure of relativity for the analysis of responses to the balance of the Practitioner Survey, it is necessary to establish the respondents view of the appropriate capitalisation rate for a hypothetically perfect, prime, CBD office investment property in Sydney at the time of the survey.

Evidence from a recent sale could have been adopted as an alternative source of the Benchmark Capitalisation Rate, if such a sale could have been found, but this may not have possessed all the characteristics of a hypothetically perfect property. Similarly, as the characteristics of a hypothetically perfect property have yet to be calibrated, it is impossible to identify a particular property as such and so impractical to then seek respondents views on the appropriate capitalisation rate for that property.

Alternatively, the view of an agent or research house could have been adopted, if published at the time of the survey, as an alternative source of the Benchmark Capitalisation Rate. Whilst no such publication could be located, the respective agent or researcher could have been requested to provide an opinion of the hypothetically perfect capitalisation rate as an alternative but, it is contended, this may not have provided a superior assessment to that of the larger sample of Practitioner Survey respondents.

Although the Practitioner Survey was prefaced by a statement of the characteristics to be assumed, these were repeated in the introduction to the question in an endeavour to reinforce the perfect nature of the hypothetical property. Respondents were simply asked to nominate “the appropriate capitalisation rate for such a hypothetically perfect prime, CBD office investment property in Sydney today” and were not given any guidance as to how this should be stated.

It will be interesting to observe if the responses to this question illustrate a high level of consistency or a considerable range amongst respondents views of the hypothetically perfect prime capitalisation rate and the extent of decimal places and rounding apparent in responses. When combined with the various property characteristics to be considered below, it should be possible to build a profile of the hypothetically perfect property's location, building attributes and tenancy composition for use in model development.

3.4.2.2.2 Optimal Location (Question 8)

Location was contended to be an idiosyncratic or property specific source of return which is asset significant and potentially unique to a given, prime, CBD office investment property.

However, precisely where the hypothetically prime CBD office location in Sydney may be found was not identified in the literature reviewed. Anecdotal evidence suggests that the Central Station area formed the prime CBD location at the turn of the century, but by the Second World War this had shifted to Martin Place. The current size of the Sydney CBD and number of landmark office towers constructed during the 1980s suggest a significant number of hypothetically perfect, prime CBD office locations may be equally defensible.

Accordingly, the Practitioner Survey sought to identify respondents views as to the current, hypothetically prime, CBD office location in Sydney in order to provide a point from which to measure relative strengths of location for use in the development of an econometric model. It was considered that such a location may be a specific site or building, the junction of two streets or a certain city block.

Rather than create a possibility of bias in the data by suggesting alternative locations and asking respondents to select one (and because an objective basis upon which to establish such a range of alternatives was not identified), respondents were asked to nominate their view of the prime office location within the Sydney CBD by specifying the name or names of either a specific site/building, the corner of two streets or the streets bounding a particular block (Question 8).

Whilst considerable support might be expected for Martin Place as the traditionally held, prime, CBD office location in Sydney, the disparate locations of new landmark office towers such as Grosvenor Place, Gateway, Governor Phillip Tower and 1 O'Connell Street as well as the established landmark towers such as Australia Square and 20 Bond Street may result in support for an alternative prime location or a variety of equally supported alternative prime locations.

3.4.2.2.3 Optimal Building (Question 9)

Building was contended to be an idiosyncratic or property specific source of return which is asset significant and potentially unique to a given prime, CBD office investment property.

The property theory literature suggested a wide range of issues for consideration in respect of building. Baum (1989) found age to be inferior, as an indicator of depreciation, to other building quality factors such as flexibility in terms of configuration, internal specification and external appearance commenting:

“... building quality is superior to age as an explanation of capital value depreciation.”

Accordingly, age is one potential, objectively derived relative measure for the impact of building as a determinant of the capitalisation rate, but may not be expected to be as significant as a measure of building quality. It is also relevant to note that Baum (1989) found the major impact of depreciation on yield to strike at years 11 to 17 whilst the major impact on rental value occurs at years 17 to 26.

An objectively derived relative measure of building quality would be an ideal component for the quantification of the derived model. Such a measure as Rider Hunts BQA (Building Quality Assessment) would provide an independently assessed guide to relative building quality. However, a BQA when completed is both confidential and proprietary to the commissioning client and so

inaccessible for public research purposes, as well as being limited in number as Rider Hunt have only been commissioned to undertake a BQA for a small proportion of the buildings included within the sample below.

Accordingly, it is necessary to establish an alternative relative measure of building quality for use in the derived model. In order to establish such a measure, Baums identified building quality factors were amplified by reference to Micro Taxonomy 2 (Appendix 2.2 of Chapter 2), developed from the property theory literature review and a range of ten building attributes identified and arranged alphabetically (to minimise potential bias) for consideration by the respondents in the Practitioner Survey (including, for example, extent of windows, foyer, quality of services and flexibility).

As each of the identified building attributes were expected to be of some importance, the respondents were asked to provide a percentage assessment of the proportionate importance of each, in the context of a hypothetically perfect prime, CBD office building, in order to provide a measure of relativity for use in the construction of a building quality measure (Question 9). As such, a hypothetically perfect building would achieve a building quality rating of 100% with the Practitioner Survey providing an indication of the relative importance of the various contributory influences for assessment in the context of each of the various buildings within the sample below.

As all identified aspects are sub-sets of Baums building quality factors, it will be interesting to observe which are considered by the respondents to be the most proportionately important. Based on the property theory literature review finding that, when all else is equal, a superior building is one which offers “the more desirable and lasting accommodation” (Hughes (1952)), it is challenging to contemplate which of the attributes might be more proportionately important than the others.

3.4.2.2.4 Optimal Tenant (Questions 10 and 11)

Tenant was contended to be an idiosyncratic or property specific source of return which is asset significant and potentially unique to a given prime, CBD office investment property. The property theory literature reviewed suggested a wide range of issues for consideration in respect of tenant, fundamentally arising from the quality of the income stream as determined by the characteristics of the payer (covenant and default risk) and the terms for payment (lease document).

In constructing a tenant quality measure for use in the development of an econometric model, it is possible to isolate and so disregard the terms for payment by assuming that standard, institutional lease terms apply for the specified property. The tenant quality measure, therefore, becomes an expression of the characteristics of the payer in terms of covenant or default risk as considered under tenant quality and tenant default issues in Micro Taxonomy 12 (Appendix 2.13 of Chapter 2).

The literature suggests that a Government tenant would be superior to other types of tenant in this regard but that the process of judging between respective tenants covenant quality is relatively unsophisticated and so could result in crude comparative assessments.

Having regard to the likely occupiers of prime, CBD office investment property, respondents were requested (Question 10) to attribute a percentage measure of proportionate importance (to sum to 100%) to each of the following tenant types, grouped by broadly common levels of covenant quality:

Government/Public Company/National Partnership
Pty Ltd Company/NSW Partnership
Private Individuals/Others

assuming that partnerships carry partners personal guarantees.

It might be anticipated that Government, Public Companies and National Partnerships would be the principal tenant groups within prime, CBD office investment properties and the literature suggested that Government tenants may be preferable for such investments. Accordingly, respondents views on whether there should be a distinction between the proportionate importance of each of Government, Public Company and National Partnership respectively (by allocating a percentage score to each to sum to 100%) were sought for incorporation within the tenant quality variable for the development of the model (Question 11).

Whilst a distinct preference towards Government, Public Companies and National Partnerships as a group might be expected, the preference within the group is more challenging to determine. Whilst Government provides minimal default risk, various property management problems such as timely payment, ability to achieve payment for sundry charges, etc may be less significant by having Public Companies or National Partnerships as tenants. Whether the respondents perceive the relative importance of each of the three groups to be significantly different will be interesting to observe. Similarly, the relative importance of Pty Ltd Companies, NSW Partnerships, Private Individuals and Others will also provide interesting information for analysis in the development of a tenant quality variable.

In addition to a measure of tenant quality being the security of the cash flow being generated by a given property, it may also be worthwhile to consider the level of vacancy or occupancy with the collection of such hard data being considered in Section 3.4.4, below.

3.4.2.2.5 Economic Situation And State Of The Property Market (Questions 18 and 19)

Section 3.2.3 noted that the omission of state of the property market and economic situation from Equation 3.15 was inconsistent with the findings of the pilot studies, which suggested each to be relatively and proportionately important Primary and Secondary determinants respectively. Their omission was based upon each being sources of return which are systematic to the entire CBD office sub-sector and which vary over time but would be static at a point in time (the model being proposed to be a static model). It was, however, contended that the validity of their omission should be verified as this was an assumed theoretical principle underlying the single, potentially explanatory equation.

The review of property theory literature found a paucity of detailed analysis concerning the relationship between the capitalisation rate and the economy with a wide range of issues generally cited by different authors as relevant. It is not, therefore, possible from the property theory literature to accurately define which contributors to the economic situation influence capitalisation rates.

Further, from the findings of the property theory literature review, state of the property market was classified as an objectively measured statement of affairs which is either current or retrospective and it was noted that a range of measured indicators were produced in the Australian property market. However, whilst acknowledging the principle, it was found that the literature did not go on to consider in detail the nature of the relationship between the state of the property market and the capitalisation rate.

Accordingly, it was proposed to investigate those issues to which valuers have regard when considering each of economic situation and state of the property market within the capitalisation rate adjustment process. If such issues are predominantly point in time issues (such as regard to very regularly produced data including economic or property market indices or updates) their omission may be invalid. Conversely, if the issues are predominantly over time issues (such as regard to irregularly produced data including economic trend measures, infrequent property market reports or property sales) their omission may be valid.

Accordingly, the Practitioner Survey asked respondents to specify briefly those factors or indicators to which they had regard when considering each of the economic situation (Question 18) and state of the property market (Question 19) as a determinant of the capitalisation rate.

It will be interesting to observe the factors or indicators listed by respondents and the level of sophistication suggested thereby. Responses may, potentially, range from the popular indicators, which regularly appear in the national press and industry publications or a schedule of qualitative issues,

through to the identification of specific, key indicators or advanced, proprietorial analysis of published data to provide unique measures or indicators. Personal experience would suggest that the former is more likely than the latter.

3.4.2.2.6 Capitalisation Rate, Risk And Growth (Questions 22A, 22B and 22C)

Section 3.2.3 proposed that if the determinants of the capitalisation rate are capable of description as sources of return and of classification as systematic, unsystematic and idiosyncratic and if risk and growth are manifestations of positive and negative expectational influences upon each of the identified sources of investment return then, at a point in time, a series of relationships between risk, growth, the determinants and the capitalisation rate should be identifiable. It was further contended that the validity of such a proposition should be verified as it forms an assumed theoretical principle underlying the single, potentially explanatory equation.

To verify such a proposition, it was proposed to collect data in the Practitioner Survey concerning respondents views on risk, growth and the capitalisation rate for the sample of prime, CBD office investment properties specified in Section 3.4.1, above.

Though the sample of properties included all of those classified as Grade A by BOMA, there were some surprising inclusions such as 50 Bridge Street and Darling Park which are both very large and prestigious properties that may have been considered Premium (and so would be more likely to be principally valued by a discounted cash flow approach), whilst 160 Sussex Street and 130 Elizabeth Street may be considered Grade B rather than Grade A class stock. Accordingly, with several apparent outliers in the sample, it may be anticipated that the respondents may find some properties more difficult to assess than others.

To assist the respondents in attributing a capitalisation rate and a risk and growth measure to each property in the sample, an expression of tenant grade was also provided and a series of assumptions specified in the Practitioner Survey. The measure of tenant grade was based on a combination of vacancy level and type of majority occupier, adopting the vacancy data supplied by BOMA and the tenant classifications proposed in Section 3.4.2.2.4, above. The majority occupier was determined by an inspection of each building and analysis of the directory board coupled with personal knowledge of the respective tenancy profiles. The use of a full tenancy schedule for each property would have potentially provided a more objective and consistent basis of assessment but, given the number of different owners of the properties in the sample and the highly confidential nature of tenancy schedules, such an approach was practically precluded. The tenant grades created are summarised in Table 3.2, with a relevant grade then being attributed to each building in the sample.

Vacancy Level						Majority Occupier
Under 10%	11% - 25%	26% - 50%	51% - 75%	76% - 90%	91% +	
A	D	G	J	M		Government/Public Company/National Ptnship
B	E	H	K	N		Pty Ltd Company/NSW Partnership
C	F	I	L	O		Private Individuals/Other
					P	N/A

Basis Of Tenant Grades

Table 3.2

In an endeavour to avoid the potential problems referred to above, respondents were also reminded of the following specified, underlying assumptions for each building adopted for the survey, being that each :

- is leased to several tenants (such that no discount for bulk or single tenant risk is required);
- is let at rentals which do not require an adjustment to reflect market levels through the capitalisation rate and with no shortfall in the recovery of outgoings;
- is let on long, standard institutional leases with conventional review patterns;
- has no extraneous problems such as limited car parking, onerous outgoings, etc; and
- has no disadvantageous aspects or other problems requiring reflection through the capitalisation rate,

for reference when assessing the appropriate capitalisation rate for each property in the sample.

Consistent with the findings of the property theory literature review, the assessment and attribution of a measure of growth and risk was approached on the basis of the assessment of a tangible, individual expression. For simplicity, respondents were asked to select a whole number from a rising scale of 1 to 5 (from none to high) to quantify their qualitative view of the risk and growth characteristics of each property, respectively and to provide their assessment of "the appropriate capitalisation rate today, to the nearest two decimal places" (Question 22) with the full text of the question given in Appendix 3.3.

It should be noted that an expression for growth and risk as an annual rate was not sought. Respondents were simply asked to attribute a tangible, individual expression of the relative growth and risk characteristics of each property in the sample from the scale provided.

The sample contains a wide range of buildings, locations and tenant profiles such that a broad spread of risk and growth scores might be anticipated. It will, however, be interesting to observe the spread of attributed capitalisation rates given that all properties are defined as Grade A, such that they should fall within a narrow band, yet have such diverse characteristics that a wider band may be justifiable.

It will also be interesting to observe if the proposed correlation between risk, growth and the determinants, the expected negative correlation between risk and growth, anticipated positive correlation between risk and the capitalisation rate and anticipated negative correlation between growth and the capitalisation rate, respectively, are found to exist.

3.4.2.2.7 Summary - Modelling Data

The Practitioner Survey was designed to facilitate the collection of a wide range of data for use in the development of an econometric model. In addition to establishing a Benchmark Capitalisation Rate, the Practitioner Survey also sought to obtain respondents views on optimal location, building and tenant to provide a basis for quantification of the component variables to be used in the development of an econometric model. Further, the data to be collected concerning economic situation, state of the property market, capitalisation rate, risk and growth was designed to facilitate investigation of the validity of the assumed, theoretical principles underlying the single, potentially explanatory equation.

3.4.2.3 Summary - Practitioner Survey Construction

The Practitioner Survey was constructed to collect data on both the capitalisation rate adjustment process and the determinants of the capitalisation rate which, given the extent of information requiring collection, renders the Practitioner Survey relatively long and involved.

Accordingly, a series of steps were taken to ensure that a focused, optimal response to the Practitioner Survey was achieved and these are detailed further below.

Though lengthy, the Practitioner Survey should provide a significant portion of the base data for both subsequent refining and for use in confirming the statistical validity of the sample, the findings of the pilot studies, the validity of the findings of the review of literature within Chapter 1 concerning aspects of current practise in the capitalisation rate selection and adjustment process, for developing an econometric model from the single potentially explanatory equation, specifying the component

variables for use therein and verifying the validity of the underlying assumed theoretical principles thereof.

A copy of the full 1994 Practitioner Survey form is included in Appendix 3.3 with the conduct of the Practitioner Survey being outlined in the following Section.

3.4.3 Conduct Of Practitioner Survey

The conduct of the Practitioner Survey will be considered in four sections, namely:

- 3.4.3.1 Trial Basis;
- 3.4.3.2 Logistics;
- 3.4.3.3 Unexpected Problems; and
- 3.4.3.4 Anticipated Limitations.

3.4.3.1 Trial Basis

The Practitioner Survey was predominantly based on that used for the pilot studies undertaken in each of the three years previous. The majority of the survey form had, therefore, been progressively amended to address ambiguities and other problems identified by respondents in previous years.

The initial draft of the 1994 Practitioner Survey form was reviewed by the Thesis Supervisors and a range of helpful comments and suggested amendments received, which were incorporated into the revised draft used for trialing.

As there were new questions and revised formats in the 1994 Practitioner Survey form, these were trialed prior to the full sample survey being undertaken. A small sample of institutional in-house valuers, who were not included within the Practitioner Survey sample, was used to test the new questions and amendments were then made to accommodate the comments received.

Accordingly, by the time the 1994 Practitioner Survey form was used by the full 1994 respondent sample, it had been extensively reviewed and amended to remove possible ambiguities and to ensure that it was as clear and incapable of misinterpretation as possible.

3.4.3.2 Logistics

The survey was the first known large sample survey of practising valuers to be undertaken in Sydney and required considerable forward planning. The approach to identification of the survey sample of 39 practising valuers was outlined in Section 3.4.1 above. Given the relatively limited size of the sample, it was proposed to structure a data collection seminar format to maximise attendance, optimise independence of responses and ensure maximum consistency in responses at a given point in time.

By taking respondents out of their office environment and placing them in a controlled environment, it was anticipated that responses would not be adversely affected by either distractions or completion in stages over a period of time. Further, the identical explanation of the survey form to all respondents simultaneously would assist in reducing the risk of mis-interpretation.

A central city location was preferred for convenience of respondents, so endeavouring to minimise the number of respondents failing to attend. Jones Lang Wootton kindly donated their auction room (with a comprehensive range of audio-visual facilities) for use for the seminar. The seminar was held at 4.30 pm on Monday, 24th October, 1994. Both the day and time were selected to be convenient to the respondent practitioners and so further reduce the risk of non-attendance.

The data collection seminar was structured such that it would qualify for Continuing Professional Development (CPD) points within the AIVLE Programme. The AIVLE also kindly provided their National Education Manager to act as an assistant for the seminar. The availability of CPD points was a further benefit and encouragement for attendance which was also proposed to assist in minimising non-attendance.

At the seminar, each respondent was provided with a copy of the Practitioner Survey form for completion anonymously. The author chaired the seminar and lead respondents through the form progressively, completing one question at a time. Each question was placed on a screen by overhead projector and the reason for each question explained prior to its being completed by the respondents. The results from previous years for that question, where appropriate, were then briefly discussed after completion, so as to provide a CPD qualifying activity but not influence the outcome of the responses.

For Question 22, photographic slides of each building were shown on a screen to refresh practitioners memories of the respective buildings. A brief description of the major tenants was also provided to supplement that information given on the Practitioner Survey form. Otherwise, respondents had only that information given upon the Practitioner Survey form and their own personal knowledge and experience with which to answer each question. Discussion and the exchange of ideas and comments

between respondents during the seminar was actively discouraged in an attempt to ensure the independence of responses.

Despite the extensive planning of the Practitioner Seminar, several problems still arose which are considered briefly below.

3.4.3.3 Unexpected Problems

Although two reminder letters were forwarded to each respondent in the week immediately prior to the seminar, eleven respondents failed to attend. As this was 28% of the sample and given the limitations of the sample size, it was considered appropriate to pursue such respondents further. Accordingly, each was separately provided with a survey form after the data collection seminar, then personally followed up and their completed forms collected promptly.

The respondent practitioners raised two significant problem areas during the seminar, being:

- the identification of three properties in the sample which were not freehold, namely:

Quay West	Head-Leasehold
Piccadilly Tower	Head-Leasehold
51 Druitt Street	Strata Title

and these were removed from the sample accordingly, being marked with a green star on the map in Appendix 3.1. The sample therefore now comprised 43 properties for analysis; and

- the identification of several properties where significant leasing transactions had taken place over the period since the BOMA data was prepared, such that the vacant areas given on the survey form were overstated. The data was, therefore, amended accordingly prior to further analysis.

It was, however, pleasing that so few issues were raised by respondents regarding the quality of data within the Practitioner Survey form and that no areas of ambiguity or mis-interpretation concerning the Practitioner Survey form were raised by respondents.

3.4.3.4 Anticipated Limitations

As noted in Sections 1.4.2.4 and 3.4.1, above, the limited number of both valuers practising in the sub-sector and properties for analysis in the sub-sector render the achievement of a statistically significant sample size challenging.

Whilst the model has theoretical integrity and there is confidence that the samples contained both all appropriate respondents and properties, such that the results of the analysis will be relevant for the sub-sector at the time of the study, it is acknowledged that the relatively small sample sizes may limit the wider practical applicability of the findings beyond the sub-sector and point in time of the study.

3.4.3.5 Summary - Conduct Of Practitioner Survey

The Practitioner Survey form was, therefore, the result of extensive development and trialing which, having regard to the nature of this type of research, lead to surprisingly few unexpected problems. The logistics of the data collection seminar proved successful in achieving the objectives of optimising responses to the Practitioner Survey and so provided a rigorously founded data base for subsequent econometric analysis.

3.4.4 Summary - Practitioner Survey

The Practitioner Survey was a wide ranging questionnaire which sought information regarding a series of issues for which other, previous research had not been identified.

The results of the Practitioner Survey should not only confirm the findings of the pilot studies but also provide an original insight into the capitalisation rate adjustment process as well as sourcing the requisite data for the quantification of variables for use in the development of an econometric model.

As may be expected, the Practitioner Survey comprises original research per se with the findings, summarised in Chapter 4, being original to this Thesis.

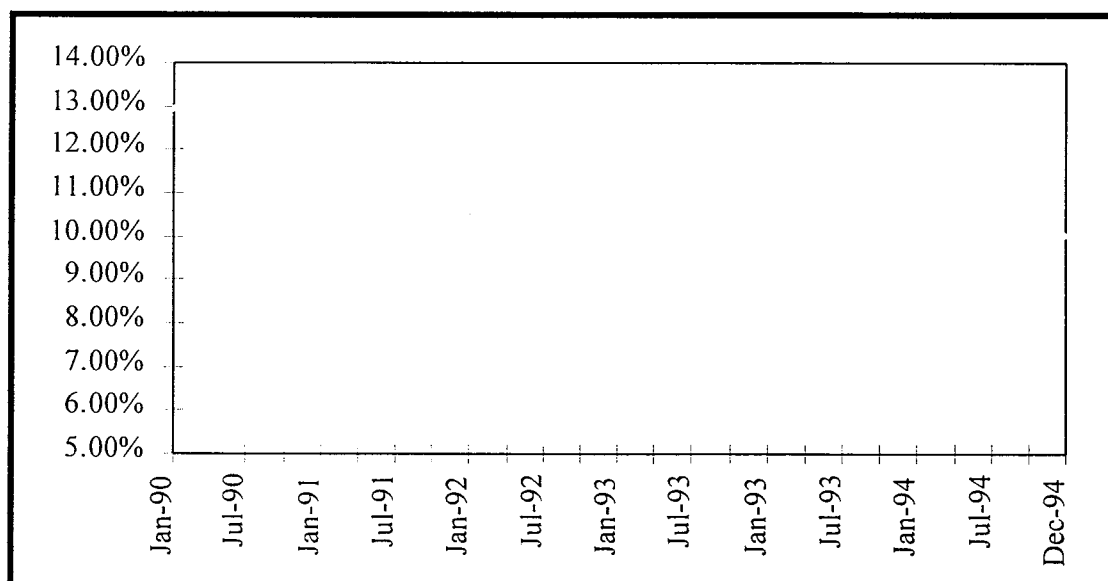
Prior to summarising this Chapter in its entirety, the collection of factual or hard data will be briefly reviewed with the results of the Practitioner Survey then being considered in Chapter 4.

3.4.5 Factual Or Hard Data

As noted in Section 3.3 above, the range of data to be collected was divided into judgemental or soft data and factual or hard data. Further, as referred to in Section 3.4.1 above, factual data concerning the area, direct vacancy and age of the properties in the sample was obtained from BOMA. Accordingly, the only factual or hard data remaining for collection was that of an expression for the risk free rate.

After discussion with the Fixed Interest Investment Team of a major Australian Funds Manager, the Federal Governments 10 Year Bond Rate was selected as an appropriate proxy for an Australian risk free rate.

Accordingly, Federal Government 10 Year Bond Rate data was sourced from Equinet and the rate at close of business on Friday 21st October, 1994 was 10.17%. This was the last close of business rate prior to the Practitioner Survey which was conducted on Monday 24th October, 1994 and so was that rate adopted for analysis.

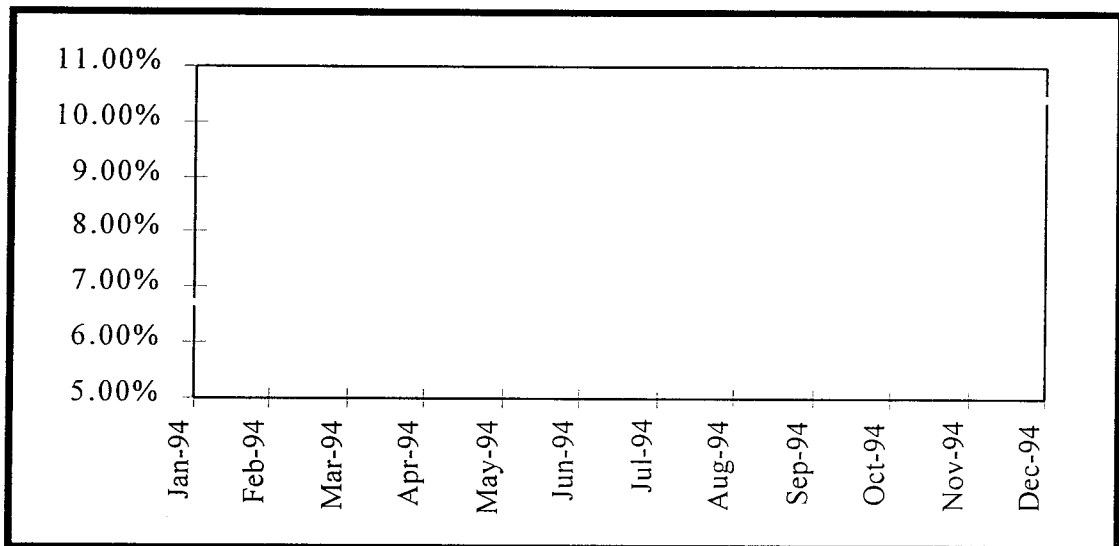


10 Year Bond Rate, 1990 - 1994

Figure 3.7

However, the timing of the Practitioner Survey was potentially unfortunate given the change in the bond rate over previous years, as shown in Figure 3.7. Having progressively fallen since 1990, the Federal

Government 10 Year Bond Rate rose sharply during 1994 from a low of 6.44% in January to a peak of 10.69% in November, 1994 as shown in Figure 3.8.



10 Year Bond Rate, 1994

Figure 3.8

Accordingly, it may be contended that respondents could have been progressively reflecting the rising bond rate in the valuation of prime, CBD office buildings during 1994 but without potentially knowing that it was close to peaking at the date of the Practitioner Survey. The respondents may, therefore, have been anticipating a sustained continuation of the rise in the bond rate as at the date of the Practitioner Survey.

Further, during September, 1994 the rate had risen by almost 1% from 9.44% to 10.33% prior to falling to 10.17% at the time of the Practitioner Survey in October and then rising again to its peak of 10.69% four weeks later. Thus, there had been considerable volatility and lack of clear direction in the rate during the month immediately prior to the Practitioner Survey and during the period immediately thereafter.

The interest rate scenario prevailing at the time of the Practitioner Survey was, therefore, that of a sharply rising 10 year bond rate over the past medium term but subject to considerable fluctuation during the immediate past short term, which could be expected to be likely to influence the respondents views on capitalisation rates. It will, therefore, be interesting to observe if there are any apparent effects of such an interest rate environment in the capitalisation rate and other data collected.

3.4.6 Summary Of Data Collection

Having clearly identified the data for collection, the Practitioner Survey was carefully designed to ensure that both data for direct use and data for use after analytical refinement were collected.

Together with hard or factual data for the risk free rate and that provided by BOMA, all the necessary data was collected which would be required for analysis in Chapter 4 to permit the development of an econometric model, from the single, potentially explanatory equation, in Chapter 5.

3.5 SUMMARY, AREAS FOR FURTHER RESEARCH AND CONCLUSIONS

3.5.1 Summary

The review of literature, undertaken in the previous Chapter, comprised the first step in the proposed sequential approach to addressing the Thesis Problem.

Having contended that the solution to the Thesis Problem was to investigate and identify a more consistent approach to capitalisation rate adjustment between two properties at a point in time which will contribute to a reduction in the variability between valuers in capitalisation rate selection, it was proposed that the use of an econometric model may achieve this by providing a deterministic, measured, objective, consistent and formal approach (based on rational and logical criteria which more closely simulate the approach adopted by investors to an appraisal of worth) if it accords with property, finance, commerce and economic theory, so contributing to a reduction in or elimination of the reliance upon the interpretation of comparables.

Accordingly, having derived and proposed two consistent but different potentially explanatory equations for the determination of the capitalisation rate from property, finance, commerce and economic theory which, therefore, accord with such theory, the next step in the proposed sequential approach to addressing the Thesis Problem comprises the second step, being the modeling step or process.

The first part of the tripartite modelling process was undertaken in this Chapter and comprised the reconciliation of the two explanatory equations into a single, potentially explanatory equation for subsequent, econometric modelling, the identification of data to be collected to facilitate quantification of the components of the single, potentially explanatory equation and the collection of such identified data.

Following further consideration of the roles of risk and growth and the classification of the sources of return in the context of a single property, to identify those that may be considered idiosyncratic, the following single, potentially explanatory equation for the determination of the capitalisation rate between prime, CBD office investment properties at a point in time was proposed:

$$E(y_{Pt}) - r_f = f(k_{2(R<A - G>A)}, k_{5(R<A - G>A)}, k_{10(R<A - G>A)}) | \emptyset_t \quad \text{Equation 3.15}$$

The approach adopted to such reconciliation is original to this Thesis, including considerable original research into the application of the principles of finance, commerce and economic theory to the determinants of the capitalisation rate for prime, CBD office investment property.

It was contended that, as Equation 3.15 was based on the findings of the property, commerce, finance and economic literature review, it therefore accords with theory. However, it was also noted to be reliant upon a series of assumed theoretical principles, which were specified and to be based upon the findings of the review of literature within Chapter 1 concerning aspects of current practise in the capitalisation rate selection and adjustment process, each of which required verification of validity to ensure the theoretical defensibility of the single, potentially explanatory equation.

Having then carefully identified that data required to quantify each of the components of the single, potentially explanatory equation, to verify the validity of each of the assumed, theoretical principles underlying same and to investigate the findings of the review of property theory literature in Chapter 1 concerning aspects of current practise in the capitalisation rate selection and adjustment process, the Practitioner Survey questionnaire used in the conduct of the pilot studies was revised to accommodate all judgemental data requiring collection.

Following trialing, the Practitioner Survey questionnaire was completed by 39 respondents, principally within a controlled seminar environment, carefully timed, located and structured to optimise attendance, with very few unexpected problems arising. Given the evolution of the Practitioner Survey, it was contended to be a relatively sophisticated and comprehensive, though lengthy, format structured to minimise the effect of extraneous influences on the quality of the data collected. The sample of Grade A office buildings selected was objectively based and the sample of respondent valuers selected to both maximise the size and optimise the quality of the sample and the seminar environment structured to

optimise the quality of responses in the Practitioner Survey. Having therefore collected the judgemental data, the relevant hard data was also then collected for analysis in the second part of the modelling step to be undertaken in the next Chapter.

3.5.2 Areas for Further Research

As the factors determining the capitalisation rate were found to be identifiable, it is contended that each may be quantifiable and that the determination of the capitalisation rate may, therefore, be modellable.

Accordingly, the judgemental and hard data collected in this Chapter will be analysed in Chapter 4, following, as the second part of the modelling step, to quantify each of the components of the single, potentially explanatory equation, to verify the validity of each of the assumed theoretical principles underlying same and to investigate the findings of the review of property theory literature in Chapter 1 concerning aspects of current practise in the capitalisation rate selection and adjustment process

An econometric model of the determination of the capitalisation rate between properties at a point in time, based on the single, potentially explanatory equation and data collected in this Chapter, through the application of cross sectional multiple regression analysis, will then be developed in Chapter 5 comprising the third and final part of the modelling step, which was the second of the proposed three step sequential approach to addressing the Thesis Problem.

Thus, having completed the second step, the third and final step in the proposed sequential approach to addressing the Thesis Problem will comprise the testing of the econometric model in order to assess the practical relevance or otherwise of the identified factors to the determination of the capitalisation rate, through the investigation of the Thesis Proposition and testing of the Thesis Hypothesis, followed by a summary of the approach adopted in, the identification of areas for further research beyond the scope of, the conclusions that may be drawn from and the policy recommendations arising out of this Thesis.

3.5.3 Conclusions

Having derived a single, potentially explanatory equation for the determination of the capitalisation rate between properties at a point in time, which is based on and therefore accords with property, finance, commerce and economic theory, the quantification of the components of the equation was carefully constructed in an endeavour to minimise the role of practitioner opinion, intuition and experience.

Further, the data collection process was designed to build on pilot studies and a trialed questionnaire, using an objectively and carefully selected sample of properties and respondents and being conducted in a controlled environment to optimise the quality of and to minimise potential ambiguity in the data collected, which may subsequently impact on the validity of the developed econometric model.

Accordingly, the data collected should be both objective and robust which, when combined with an equation which is theoretically defensible, should produce an econometric model which substantially limits subjectivity, informality and heuristics in the capitalisation rate determination process and so contributes to the solution of the Thesis Problem.

The development of such a framework for capitalisation rate determination should result in a more structured process which facilitates more consistent processing of information and so contributes to a reduction in the variability in capitalisation rate selection.

Finally, the questionnaire should produce statistical data concerning aspects of current practise in the capitalisation rate selection and adjustment process which will allow the approach advocated in the literature to be compared to that adopted in practice for the first time.

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