CHAPTER 6

SUMMARY, AREAS FOR FURTHER RESEARCH, CONCLUSIONS AND POLICY RECOMMENDATIONS

CHAPTER 6

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6.0 INTRODUCTION

This Thesis investigated aspects of the selection of the capitalisation rate for use in the valuation of prime, CBD office investment property, by the capitalisation of income method of valuation, focussing on the adjustment of capitalisation rates deduced from the analysis of comparable sales evidence.

Through original, rigorous research and analysis, an econometric model of the determination of the capitalisation rate was developed and applied in the test of the Thesis Hypothesis and investigation of the Thesis Proposition. The Thesis Hypothesis was found to be supported and the Thesis Proposition to be valid, thus solving the Thesis Problem.

It was found that the use of an econometric model achieved greater consistency in approach to capitalisation rate determination, adjusted between properties at a point in time, contributing to a reduction in the variability of capitalisation rate determination and hence capital value assessment, compared to that attributable to valuers adopting the current method of capitalisation rate determination.

The process leading from identification to solution of the Thesis Problem will be briefly summarised below, together with the suggestion of areas for further research beyond the scope of this Thesis, a statement of the conclusions that may be drawn and a series of policy recommendations arising from this Thesis.

6.1 SUMMARY

The first Chapter of this Thesis sought to investigate the capitalisation of income method of valuation, ascertain the current method of capitalisation rate determination, identify the general problem area and specify a defined problem for subsequent analysis.

Consistent with a conventional academic approach, a Thesis Proposition and Thesis Hypothesis were formulated to solve the Thesis Problem together with the specification of the Thesis Aim, Thesis Objectives and Thesis Principles. Having defined the Thesis Problem, a three step general approach to solution, consistent with the academic approach, was proposed and undertaken in Chapters 2 to 5, inclusive.

The identification and solution of the Thesis Problem, respectively, will be briefly summarised below.

6.1.1 Identification Of Thesis Problem

The investigation of the capitalisation of income method of valuation reviewed a range of issues concerning the method, provided an explanation of the methods construction and identified its principal elements and fundamental underlying assumptions. The method was contended to be an extremely simplistic model of a complex set of relationships, being dependent for its veracity upon the correct assessment of two variables, net income and the capitalisation rate. The range of underlying, simplifying assumptions and requisite conditions for operation were found to be of limited relevance to property valuation practise, which created a fundamental flaw in the theoretical basis of the method that was compounded by the characteristics of the property asset class.

Despite the capitalisation rate being identified as a key variable in the method, its selection was found to receive very limited attention in the literature. Appearing to have evolved through practise (as practitioners mutated the method in response to changes in the property market environment over the century) rather than through the application and development of theory, it has spawned a significant body of valuation lore, perpetuated by the methods of teaching valuation and heavily dependant upon the role of the practitioner. The capitalisation of income method of valuation was found to have lost its economic rationale, with the capitalisation rate having ceased to be a simple, explicit discount rate and to have become not only complex but also implicit.

The current method of capitalisation rate selection was found to be comparable based market pricing, comprising the adjustment of capitalisation rate evidence, derived from the analysis of identified comparable sales, to accord with the subject property being valued. Both analysis and adjustment were found to receive limited attention in the literature reviewed, with the informality of each process being compounded by the limiting characteristics of property as an asset class. Though the literature was found to almost automatically assume a requirement to adjust evidence (which may have been sub-optimally analysed), little guidance was provided as to how to adjust or that which such adjustment should reflect, further exacerbating the sub-optimality.

Though the literature was found to be predominantly qualitative, discursive, limited and lacking in analytical depth, the requirement to adjust for differences between properties and for the passage of time was contended to be evident from the literature reviewed. Such adjustment was found to be based on the valuers subjective judgement, reliant on heuristics and informally made, so creating the potential for considerable inconsistency in the capitalisation rate adjustment process. Accordingly, the process was

confirmed to be heavily dependent upon the skill, experience, qualification, expertise, knowledge and intuition of the valuer with the outcome potentially unique to a given valuer.

Significantly, a simple, step by step, composite guide to the process of selecting the capitalisation rate for use in the capitalisation of income method of valuation was not identified within the literature reviewed, with its teaching found to be provided more in practice than in academia.

Despite criticism of both the capitalisation method and rate, a range of qualitative and quantitative defences (based on valuation lore and applications of capital market theory, respectively) were identified which contributed to the continued use of the method and the apparent expectation and acceptability of permissible inconsistency, in the order of 10%, in the valuation of prime, CBD office investment property using the method.

Accordingly, the general problem area was found to be that the current method for the determination of the capitalisation rate between properties at a point in time was sub-optimal, being subjective, informal and heuristic, having evolved through practise and so being independent of and lacking an accord with theory, which contributed to the inconsistency or variability in capitalisation rate adjustment, being an issue of significance for which solution was contended to be worthy of pursuit.

The principal issue arising from the general problem area was found to be the potential for two valuers of equivalent standing to determine two equally valid capitalisation rates for the valuation of the same property at the same point in time using the current method of determination. Such a level of variability in capitalisation rates, arising from the use of the current method of selection, was attributed to the inconsistency arising from the subjective, informal and heuristic nature of the current method.

A wide range of subsidiary issues were identified as arising from the principal issue, which reinforced the validity of further investigating the general problem area. The rationale and potential benefits of addressing the issues were reviewed and the prospective continued use of the capitalisation of income method of valuation found to render attention to such issues both desirable and worthwhile.

Having regard to the general problem area, the principal issue identified for consideration and consistent with the subsidiary issues, the specific Thesis Problem for investigation was defined as:

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

A three step general approach to solution was proposed, being consistent with the academic context of a conventional Thesis approach, within which the Thesis Aim was stated to be:

> to model those issues which contribute to capitalisation rate determination

and the Thesis Objectives specified as:

> to identify, analyse and evaluate existing econometric models for the determination of the capitalisation rate;
>
> to identify, analyse the role and evaluate the significance of each of the issues that contribute to the current method of capitalisation rate determination;
>
> to review property, finance, commerce and economic theory relevant to capitalisation rate determination;
>
> to develop an econometric model for capitalisation rate determination which combines the current method and existing econometric models with property, finance, commerce and economic theory and the identified issues which contribute to capitalisation rate determination;
>
> to examine the variability in the current method of capitalisation rate determination for prime, CBD office investment property in Sydney; and
>
> to ascertain if such variability is reduced through the application of the developed econometric model.

Consistently, the Thesis Principles were enunciated to be:

> to make a distinct contribution to knowledge of the subject, based on original investigation, research, review and criticism, towards the study of property investment, the extension of the bounds of knowledge and addition to the body of knowledge;
>
> to demonstrate a capacity for independent research; and
>
> to maintain a practical application and industry relevance for the studys findings.

In order to solve the Thesis Problem, it was proposed that the replacement of a subjective, informal and heuristic approach to capitalisation rate determination by a deterministic, objective and measured approach (based on logical and rational criteria which more closely simulates that approach adopted by an investor to an appraisal of worth) would reduce or eliminate the reliance upon the interpretation of comparables and reduce the role of the valuer in such determination, so contributing to a reduction in the level of variability in adjustment between properties at a point in time. Accordingly, it was necessary to identify such an objective and measured approach to capitalisation rate determination which, in order to solve the Thesis Problem, must achieve consistency and formality and must also accord with property, finance, commerce and economic theory.

Consistent with a conventional academic approach, a Thesis Proposition was formulated for investigation:

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

and a Thesis Hypothesis stated for testing:

> 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 the current method of capitalisation rate determination

which were each consistent with the Thesis Aim, Thesis Objectives and Thesis Principles. Finally, the Thesis Scope was defined and a range of Thesis Limitations identified for subsequent verification of validity

6.1.2 Solution Of Thesis Problem

The three step general approach proposed to solve the Thesis Problem, which was consistent with the academic context of a conventional Thesis approach, was undertaken in Chapters 2 to 5, inclusive, comprising the following:

6.1.2.1 Step 1 -The Review Of Literature Step

This was undertaken in Chapter 2 and sought to identify existing econometric models for the determination of the capitalisation rate, between properties at a point in time, which accord with

property, finance, commerce and economic theory and to investigate and collate those issues relevant to such determination. Focussing on the adjustment of the capitalisation rate process, the review sought to identify that which is to be reflected within the adjustment and how the adjustment is to be undertaken.

The review of literature was approached as a central topic area (being that literature concerning existing econometric models for the determination of the capitalisation rate) and three peripheral topic areas, being the identification of those issues relevant to determination from the property theory literature, relevant aspects derived from finance, commerce and economic theory literature and the reconciliation of both found within the property finance literature, respectively. The relevant issues collated from the property, finance, commerce and economic theory literature were then combined to derive and propose a theoretically defensible, potentially explanatory equation for the determination of the capitalisation rate.

Within the central topic area, the review of literature identified a range of Additive Models and Quantitative Models which were analysed but none were found to both focus on the adjustment between properties at a point in time and to accord with each of the bodies of property, finance, commerce and economic theory. Accordingly, an existing solution to the Thesis Problem was not identified within the literature. The review of literature did, however, identify various economic, property market and individual building issues relevant to the determination of the capitalisation rate which indicated that the determination process, whilst apparently wide and complex, may be potentially modellable.

Given the absence of an existing econometric model for the determination of the capitalisation rate, it was proposed that such a model be developed for use in the solution of the Thesis Problem. To ensure that such a model is validly founded upon and so accords with theoretical principles, it was proposed to review the property, finance, commerce and economic theory bodies of literature, from which the components of the model may be specified accordingly.

The first peripheral topic area comprised a review of the limited, unstructured, discursive, descriptive and predominantly qualitative property theory literature, which was found to devote relatively little attention to the determination of the capitalisation rate in general and even less to that for prime, CBD office investment property.

From the literature reviewed, twelve groups of issues were found to influence the capitalisation rate which were classified as ten factors (clearly identifiable and capable of succinct definition) and two concepts (lacking clear delineation or definition but generally associated), being growth and risk, which were each found to be considered to be determinants of the capitalisation rate in their own rights and implicit within the capitalisation rate. Such classification was original to this Thesis as were the Micro Taxonomies proposed for each identified group of issues, with significant overlaps between each group

identified in a dodecagon (also original to this Thesis) suggesting some form of inter-relating structure. It is notable that no doctoral, higher degree theses or other significant research works were identified within the literature concerning the determination of the capitalisation rate.

A brief review of literature regarding the pilot studies undertaken suggested that the twelve groups of issues were a complete list and so likely to be determinants, with inter-relationships and an apparent hierarchy and orders of relative and proportionate importance discernible. Whilst acknowledged to be preliminary, it was considered to be significant that the pilot studies were found to support the findings of the property theory literature review.

From a review of the literature concerning the evolution of the capitalisation of income method of valuation, it was contended that the concept of risk and growth being implicit within, rather than implied by, the capitalisation rate was attributable to the development of the method over the century and fundamentally flawed. Such a flaw was, however, found to have been perpetuated by the circuitous dependence upon comparable evidence and the methods adopted for teaching valuation, where academia was found to provide the basic outline within which the profession filled in the details during practise. The capitalisation of income method of valuation was found to have lost its economic rationale, with that which started as an explicit discount rate having become not only complex but also implicit.

As the groups of issues influencing the capitalisation rate are identifiable from the literature, it was contended that they may be quantifiable and therefore potentially modellable. Based on the literature, the roles of legal environment and planning were contended to differ from those of other factors. Together with the roles of the concepts of growth and risk, each were contended to be worthy of further research within the finance, commerce and economic theory literature, to ensure that the proposed model accords with each of the bodies of theory.

Accordingly, the second peripheral topic area comprised a review of the finance, commerce and economic theory literature which was found to conceptually approach both growth and risk very differently from that approach found within the property theory literature. Both growth and risk were found to be explicitly addressed and clearly related to each other in theory with a common link to the capitalisation rate through the discount rate and through the approach to and emphasis on common sources on investment return, being based on a top down approach with the role of expectations found to be central.

The capitalisation rate was found to be a byproduct or outcome of an explicit consideration of the discount rate and the growth rate within the finance, commerce and economic theory literature. The

capitalisation rate was found to be simply but fundamentally the difference or spread between the two more significant variables.

Regarding the earnings multiplier, the literature focussed more on the income aspect than on the multiplier, with growth being attributable to sources of investment return, identified as economic factors, industry factors and company factors, with the latter being found to be of less significance. With no distinct concept of capital growth and with growth being explicit, top down and current time/prospective within the finance, commerce and economic theory literature, the contrast to the implicit, bottom up and retrospective/current time approach to growth in the property theory literature could not be greater.

Within the finance, commerce and economic theory literature, growth is clearly distinguishable as a concept which may be positive or negative with an expectation of quantum and direction that manifests in a pricing impact. Accordingly, it is contended that growth is unlikely to be a determinant of the capitalisation rate in its own right, but more likely to be a positive or negative expectational influence on the identified sources of investment return.

The concept of risk as a variation in returns was found to be central to the finance, commerce and economic theory literature reviewed, with such variation being potentially positive or negative and subject to the influence of expectations. The literature was found to approach the discount rate as the composite of the risk free rate plus the risk premium, with the latter differing between both asset classes and individual assets. The analysis of the risk premium within the literature was found to be overwhelmingly quantitative, but with the underlying concept of grouping influences on return by pervasiveness into systematic, unsystematic and idiosyncratic. Whilst some confusion was evident within the literature concerning the definition and application of such groupings, a familiarity with the sources of return for growth, identified within the literature, was apparent.

Within the finance, commerce and economic theory literature reviewed, risk was found to be a composite result, explicit and attributable to underlying influences upon return which may be contrasted to the independent and implicit concept of risk found in the property theory literature reviewed. Accordingly, it is contended that risk is unlikely to be a determinant of the capitalisation rate in its own right, but more likely to be a positive or negative expectational influence on the identified sources of investment return.

It was contended to be a highly significant finding of the finance, commerce and economic theory literature review that it may be one or more of the discount rate, growth rate, risk free rate and risk premium which may change and so result in a change in the capitalisation rate, not vice versa.

The findings of the finance, commerce and economic theory literature review concerning the capitalisation rate, discount rate, risk and growth were found to differ very significantly from those of the property theory literature review. Accordingly, the third and final peripheral topic area sought to reconcile the findings of each through a brief review of the property finance literature.

Significantly, the restatement of the capitalisation of income method of valuation as both a function of the discount rate and the growth rate and in terms of expectations was found early within the property finance literature reviewed. The literature also suggested a range of factors which contribute to growth in a property context, displaying a notable emphasis on individual property specific influences, but with the notion of capital growth lingering as a distinct concept.

A shift to viewing risk as the variation in returns was not clearly evident within the property finance literature reviewed, but a drift in that direction was apparent. Whilst a focus on the discount rate was found within the literature, the approaches to its derivation were more reminiscent of the property theory literature than of the finance, commerce and economic theory literature. The growing body of quantitative analysis found within the property finance literature establishes the general applicability of the principles of finance, commerce and economic theory to property, highlighting the significance of single property risk, idiosyncratic influences and the greater role of the individual asset in influencing returns than is found to occur in other asset classes.

Through the application of the pervasiveness test to the identified influences and their classification by asset class, sector, sub-sector and asset, a table of the descending hierarchical classification of systematic, unsystematic and idiosyncratic influences found in the literature was constructed, which is original to this Thesis and represents the first attempt to collate and classify such references in the context of property. The table clearly shows that the principles identified in the finance, commerce and economic theory literature are applicable to property and through the inclusion of those groups of influences found in the property theory literature review, reconciles with the findings of the finance, commerce and economic theory literature review.

Having thus reconciled the findings of the property theory literature review with those of the finance, commerce and economic theory literature review, the nature of the relationships identified were interpreted to define the capitalisation rate, respectively, as follows:

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

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

which, though different, are consistent and being based on the findings of the review of the bodies of theory literature, accord with theory and so are theoretically defensible models of the determination of the capitalisation rate.

Accordingly, Step 1 comprised the review of literature approached as a central and three peripheral topic areas, establishing an apparent absence of existing econometric models which solved the Thesis Problem, collating those issues from property, finance, commerce and economic theory relevant to prime, CBD office investment property and deriving and proposing two explanatory equations for the determination of the capitalisation rate.

The completion of Step 1 fulfilled three of the Thesis Objectives, being:

> to identify, analyse and evaluate existing econometric models for the determination of the capitalisation rate;
>
> to identify, analyse the role and evaluate the significance of each of the issues that contribute to the current method of capitalisation rate determination; and
>
> to review property, finance, commerce and economic theory relevant to capitalisation rate determination,

thus providing the theoretical foundations upon which the modelling process could be undertaken in Step 2, which will be briefly summarised below.

6.1.2.2 Step 2 -The Modelling Step

It was ascertained in Step 1 that the determination of the capitalisation rate, between properties at a point in time, had not previously been modelled, that the groups of issues influencing the capitalisation rate were identifiable and potentially quantifiable and that the nature of their relationship could be expressed as two consistent but different explanatory equations.

Accordingly, Step 2 sought to model the determination of the capitalisation rate between properties at a point in time, based on and consistent with the findings of the review of literature, with such a model then to be applied to the solution of the Thesis Problem.

Step 2 was undertaken in Chapters 3, 4 and 5 with the combination of the two explanatory equations into one equation being considered before a three part approach to modelling comprising:

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

prior to the application of such a model to the solution of the Thesis Problem.

Accordingly, before commencing the three parts of the modelling process, the two equations defining the capitalisation rate consistent with the findings of the property, finance, commerce and economic theory literature review were combined to derive and propose a theoretically defensible, potentially explanatory single equation for the determination of the capitalisation rate.

After summarising and analysing the conceptual similarities and differences between the approaches to risk and growth found in the literature, the relationships were expressed diagrammatically with risk and growth contended to be manifest as a net addition to or deduction from the average capitalisation rate, reflecting the relative strength of emphasis on the identified sources of return. A framework was then proposed to identify the idiosyncratic sources of return by placing a prime, CBD office investment property in the context of the investment universe with reference to sectoral, investment and risk dimensions.

Consistent with the emphasis on idiosyncratic influences found within the property finance literature and the logical likelihood that such influences would be of significance in a comparison between two properties at a point in time, the sources of return identified in the property theory literature were classified diagrammatically within a risk matrix, constructed upon the basis of a test of pervasiveness, in order to objectively identify those which are idiosyncratic. Such an approach is original to this Thesis and found building, location, tenant, legal environment and planning to be idiosyncratic determinants of the capitalisation rate, with the latter two of probable limited importance.

Having regard to the above, the two equations defining the capitalisation rate were resolved into a single potentially explanatory equation for prime, CBD office investment property for modelling, being:

$$E(y_{Pt}) - r_f = f\left(k_{2\,(R<A-G>A)}, k_{5\,(R<A-G>A)}, k_{10\,(R<A-G>A)}\right) \mid \varnothing_t \qquad \text{Equation 3.15}$$

such that if a growth emphasis is stronger, the capitalisation rate will be reduced (value will rise) whereas if a risk emphasis is stronger, the capitalisation rate will be increased (value will fall).

Equation 3.15 was noted to be dependent upon a series of underlying assumed theoretical principles including that the factors of economic situation and state of the property market are characterised by

varying over time but being static at a point in time and that a range of identified relationships between risk, growth and the determinants are found to exist.

Accordingly, a single theoretically defensible, potentially explanatory equation for the determination of the capitalisation rate was proposed which was derived from and therefore consistent with property, finance, commerce and economic theory and the principal findings of the review of literature. Having derived a single equation for practical application, each of the component factors require quantification prior to the equation being econometrically modellable and its practical relevance then being assessable.

The first part of the modelling process was undertaken in Chapter 3, comprising the establishment of that data requiring collection to quantify the single potentially explanatory equation and to confirm various aspects of the capitalisation rate adjustment process with the collection of same. A combination of factual or hard data and judgemental or soft data, for subsequent refinement, was found to be required with the aim of minimising the component of judgemental data in order to maximise the objectivity of the modelling process. A Practitioner Survey was used to collect two groups of data, being:

Confirmatory Data

To confirm the statistical validity of the sample, the findings of the pilot studies and the findings of the indicative literature review in Chapter 1 concerning the capitalisation rate adjustment process including current methods of capitalisation rate selection, sources of the capitalisation rate, approaches to capitalisation rate adjustment, determination of whether such adjustment is always in increments of 0.25% and the extent of the determinants of the capitalisation rate; and

Modelling Data

For use in the derivation of an econometric model from the quantification of the single potentially explanatory equations component factors, being the benchmark capitalisation rate, optimal location, tenant and building, capitalisation rate, risk and growth assessments and for use in the verification of the underlying assumed theoretical principles,

with the survey format being developed during the pilot studies undertaken in 1991, 1992 and 1993 and the 1994 version being trialed on a group of in-house institutional valuers. The Practitioner Survey questions were based on a series of specified assumptions to increase consistency in response and maintain the focus. The Practitioner Survey considered 46 buildings in the Sydney CBD which were classified as Grade A by an independent, industry body (BOMA) and involved 39 respondents in a controlled seminar environment that was timed, located and structured to maximise attendance by the sample, which was acknowledged to be relatively small for statistical purposes.

To supplement the judgemental data collected by Practitioner Survey, hard data concerning the bond rate was collected from Equinet and concerning the area, direct vacancy and age of each of the 46 buildings in the sample from BOMA.

Accordingly, the first part of the modelling process was undertaken in Chapter 3, comprising the establishment of the data requiring collection to quantify the single potentially explanatory equation, to objectively investigate, identify and confirm the method of capitalisation rate selection currently in use in practice and to investigate various aspects of the capitalisation rate adjustment process with the collection of both factual data and judgemental data through the use of a Practitioner Survey.

Having collected the requisite data, the second part of the three part modelling process was undertaken in Chapter 4 and comprised the analysis of the data collected which may be summarised as the analysis of the two groups of data referred to above, being:

Confirmatory Data Analysis

The sample was found to be regularly involved in the valuation of prime, CBD office investment property, highly qualified and experienced and therefore ideally placed to comment with authority on aspects of the valuation of such property, such that the sample was confirmed to be deep, optimal, statistically valid and the testing, therefore, defensible.

The data analysis generally confirmed the findings of the pilot studies concerning hierarchical issues, relative and proportionate importance and the completeness of the list, with some limited movement observed, as expected, so supporting the theoretical basis of the single explanatory equation.

The findings of the indicative literature review in Chapter 1 concerning current practise in capitalisation rate selection and adjustment were generally supported by the data analysis, with rounding in increments of 0.25% found to be generally adopted, directly comparable sales found to be by far the most important source of capitalisation rate evidence, 83% of respondents found to use sensitivity analysis and the list of determinants found to be essentially complete with only "environmental/geotechnical factors" added which was contended to be unlikely to be of significance in the context of existing CBD office properties.

Interestingly, greater regard to prospective conditions was found in the data analysis than suggested in the literature reviewed with only approximately half of the sample relying upon the subjective mental adjustment of determinants, which were significant findings of the data

analysis. Accordingly, in overview, the validity of the Thesis Problem was contended to be substantially verified.

Modelling Data Analysis

The data collected was analysed to derive three expressions for the expected capitalisation rate, three alternative measures for the determinant of building, one measure for the determinant of location and three alternative measures for the determinant of tenant. Accordingly, each of the components of the single potentially explanatory equation were quantified for use in subsequent modelling.

The data analysis confirmed that the factors of economic situation and state of the property market are characterised by varying over time but being static at a point in time and so may be omitted from a model of the adjustment of the capitalisation rate at a point in time. Furthermore, the range of identified relationships between risk, growth and the determinants were found to be as expected based on the review of theory literature.

Therefore, as the validity of each of the assumed theoretical principles underlying the single explanatory equation was found to be verified, it was confirmed that the equation is theoretically defensible and so does not require respecification.

To undertake the testing of the Thesis Hypothesis in Step 3, below, the modelling data analysis also identified those properties from the sample to be used for testing as follows:

Property x

A property currently within the sample, but to be excluded during the remainder of the modelling process, which had been subject to an independent valuation close to the date of the Practitioner Survey by a valuer not in the sample, therefore being totally independent of the modelling process and so ideal for rigorous testing; and

n Properties

Being approximately 10% of the current sample, being a large enough sub-sample to be statistically significant during testing but not so large as to adversely affect the size and integrity of the remaining sample when excluded during the remainder of the modelling process. Four properties were identified which were spread across the CBD, being selected on the basis of including the most frequent observations in each variable group and being typical Grade A office properties (that is, not being landmark or of a heritage character).

The deletion of those properties to be used for testing reduced the size of the building sample data set to 38 properties which included each Grade A office property in the Sydney CBD regardless of its vacancy rate, nett lettable area, location, age, building score or tenant score.

The data set, therefore, included properties with outlying observations in such respects and the data analysis continued to optimise the data set by identifying and removing those properties with such outlying observations, using cross sectional multiple regression analysis. Eight properties with outlying vacancy rate, nett lettable area and location observations were removed from the sample, with no properties deleted for outlying age, building score or tenant score observations. Prior to optimising the data set, an R^2 of 0.512 and Adjusted R^2 of 0.399 were found, rising to an R^2 of 0.594 and Adjusted R^2 of 0.465 after optimisation of the data set.

Optimisation of the data set was completed by the addition of a control property to provide parameters for the cross sectional multiple regression analysis and to improve the predictive power of the explanatory equation. Based on the quantification of variables adopted and the findings of the data analysis, above, an hypothetically perfect prime CBD office investment property was added to the sample resulting in a sample R^2 of 0.657 and Adjusted R^2 of 0.553, which was contended to be a significant improvement. The sample for modelling, therefore, comprised 31 buildings.

Through further data analysis, it was established that a distinction could not be sustained between risk and growth in Equation 3.15 such that the effect of each could not be specified separately. Only the net, cumulative effect of the risk and growth aspects on each determinant, when combined, were found to be manifest, with Equation 3.15 therefore, being restated as:

$$E(y_t) - r_f = f(k_{11}, k_{12}, k_{13}) \mid \varnothing_t \qquad \text{Equation 4.1}$$

for use in subsequent modelling.

Chapter 4, therefore, comprised the data analysis being the second part of the modelling process and confirmed:

- the statistical validity of the sample;
- the findings of the pilot studies;
- the validity of the series of underlying assumed theoretical principles, thus ensuring the theoretical defensibility of the single explanatory equation;
- that the findings of the indicative literature review in Chapter 1 concerning current methods of capitalisation rate selection and adjustment were supported;
- the quantification of each of the components of the single potentially explanatory equation;
- the isolation of that data for use in testing, being Property x and a sample of n properties; and
- the optimisation of the data set.

Accordingly, having completed the second part, the third and final part of the modelling process was undertaken in Chapter 5 and comprised the development of an econometric model for the determination of the capitalisation rate.

The quantified components and the optimised data set were used to derive an econometric model based on the single potentially explanatory equation, through cross sectional multiple regression analysis, to assess the practical relevance or otherwise of the factors to the determination of the capitalisation rate. The econometric model so derived was then applied to the investigation of the Thesis Proposition through testing of the Thesis Hypothesis to determine if the model solved the Thesis Problem.

Through multiple regression analysis, the three expressions of the expected capitalisation rate, less the risk free rate, were regressed as the dependent variables against the independent variables of the three alternative measures for the determinant of building, that for location and the three alternative measures for the determinant of tenant. The expected results and expected signs arising were considered, with this type of property data noted to often result in weak statistical results from multiple regression analysis.

To maintain a practical application and industry relevance through user friendliness, it was contended that the model should be simply constructed using easily assessable input variables, preferably factually based in order to minimise the role of practitioner opinion, intuition and experience in the practical application of the model.

Following the completion of a series of cross sectional multiple regression analyses, the following predictive model was derived for the determination of the capitalisation rate between properties at a point in time:

CAM - RFR = -0.938 - 0.0160 Building Score + 0.000918 Location Score - 0.0183 Covenant-Occupancy Score Equation 5.1

providing an unexpectedly strong R^2 of 64.8% and Adjusted R^2 of 60.9%. Furthermore, the model achieved a significant proportion of its aims to maintain a practical application and industry relevance through user friendliness, being simply constructed with only one expression for each determinant, being comprised of easily assessable inputs and comprising half factually based and half derived expressions, so limiting the role of the practitioner.

Thus, the third and final part of the modelling process, undertaken in Chapter 5, successfully comprised the derivation of an econometric model for the determination of the capitalisation rate through cross sectional multiple regression analysis, based on the single explanatory equation, the quantified components and the optimised data set. The econometric model so derived confirmed the practical relevance of the specified factors to the determination of the capitalisation rate.

Having successfully concluded the three parts of the modelling process, Step 2 of the general approach to the solution of the Thesis Problem was completed. Undertaken in Chapters 3, 4 and 5, Step 2 combined the two explanatory equations into one equation and comprised the three part approach to modelling being:

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

being undertaken prior to the application of such a model to the solution of the Thesis Problem in Step 3. Accordingly, Step 2 modelled the determination of the capitalisation rate between properties at a point in time, based on and consistent with the findings of the review of literature.

6.1.2.3 Step 3 -The Testing Step

Having completed The Modelling Step (Step 2) and derived a theoretically defensible, econometric model for the determination of the capitalisation rate between properties at a point in time, Step 3 was commenced in Chapter 5 and continued in this Chapter, comprising the use of the econometric model to investigate the Thesis Proposition through testing of the Thesis Hypothesis to determine if the model solves the Thesis Problem and to report the findings, areas for further research, conclusions and policy recommendations arising therefrom.

The Thesis Hypothesis may be restated as follows:

> 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 the current method of capitalisation rate determination

and the Thesis Proposition as follows:

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

The test of the Thesis Hypothesis formed the initial test of the validity of the Thesis Proposition and comprised a comparison of the standard deviation of those capitalisation rates produced by the econometric model for each of the sub-sample of n properties to that of those capitalisation rates selected by the respondents in the Practitioner Survey for the same properties. The test found the standard deviation of the sample of capitalisation rates produced by the econometric model for the sub-sample of n properties to be significantly below that of the sample of capitalisation rates selected by the respondents, with this principal test of the Thesis Hypothesis also found to be supported by the results of a t Test, such that the Thesis Hypothesis was found to be proven and the Thesis Proposition likely to be valid.

Two additional, complementary tests were undertaken to confirm the validity of the Thesis Proposition, being:

- a comparative standard deviation test, as used in the test of the Thesis Hypothesis above, but comprising the entire sample of N properties, which also found the standard deviation arising from the use of the model to be generally below that of the respondent sample but, as expected, less conclusively than was found for the sub-sample of n properties. The results of the test were also supported by a t Test; and

- a static, comparative test, using Property x, of that capitalisation rate produced by the econometric model compared to that selected by an independent valuer in a fee based valuation with the Thesis Proposition being valid if the two rates differ, as was found, prima facie, to be the case. Given the independence of the valuer and the exclusion of Property x from the sample used for modelling, the results of this test were contended to be rigorous.

Accordingly, the two additional complementary tests undertaken were both found to support the validity of the Thesis Proposition and to further support the finding that the Thesis Hypothesis was proven, so fulfilling the balance of the Thesis Objectives:

> to develop an econometric model for capitalisation rate determination which combines the current method and existing econometric models with property, finance, commerce and economic theory and the identified issues which contribute to capitalisation rate determination;
>
> to examine the variability in the current method of capitalisation rate determination for prime, CBD office investment property in Sydney; and
>
> to ascertain if such variability is reduced through the application of the developed econometric model.

Accordingly, the findings of The Testing Step (Step 3) proved the Thesis Hypothesis, validated the Thesis Proposition and so solved the Thesis Problem.

Further, by fulfilling the Thesis Objectives, the stated Thesis Aim:

> to model those issues which contribute to capitalisation rate determination

was achieved in accordance with achievement of each of the enunciated Thesis Principles:

> to make a distinct contribution to knowledge of the subject, based on original investigation, research, review and criticism, towards the study of property investment, the extension of the bounds of knowledge and addition to the body of knowledge;
>
> to demonstrate a capacity for independent research; and
>
> to maintain a practical application and industry relevance for the studys findings.

Having identified the development and application of an econometric model as a solution to the Thesis Problem, the three steps undertaken through the six Chapters of this Thesis comprised a logical and sequential approach to the investigation of the validity of such a proposed solution in a manner consistent with a conventional academic approach.

Both the defined Thesis Problem and the proposed solution were placed clearly within a rigorous academic context and set within a conventional, formal academic framework, including the review of literature to provide a sound theoretical foundation, the collection of original data, subsequent statistical analysis, econometric modelling and independent testing, comprising a rigorous approach which ensures the defensibility of the results.

Having completed that part of Step 3 comprising the use of the econometric model to investigate the Thesis Proposition, through testing of the Thesis Hypothesis, to determine if the model solves the Thesis Problem and to report the findings thereof, the summary of the process leading from identification to solution of the Thesis Problem is complete.

It therefore remains to undertake the balance of Step 3, being the suggestion of areas for further research beyond the scope of this Thesis and the statement of both the conclusions that may be drawn and the policy recommendations that may be made from the findings of this Thesis.

6.2 AREAS FOR FURTHER RESEARCH

Whilst the entire range of areas for further research arising out of but beyond the scope of this Thesis is acknowledged to be very wide, it is not proposed to seek to exhaustively and comprehensively list each below. Accordingly, five principal areas arising from the Thesis topic which are consistent with the Thesis Limitations considered in Section 1.4.2.4 and contended to be worthy of further research will be briefly considered, being:

6.2.1 Adjustment
6.2.2 Analysis
6.2.3 k and g
6.2.4 Capital Markets Issues
6.2.5 Subsidiary Issues

respectively, as follows.

6.2.1 Adjustment

Whilst this Thesis considered various aspects of capitalisation rate determination between prime, CBD office investment properties at a point in time, the investigation, by its nature, focussed upon one small area of the determination process resulting in numerous other aspects remaining for further research.

Of these, the principal area for further research is contended to be the capitalisation rate determination process over time. Having considered those issues relevant at a point in time, the role of such determinants as economic situation and the state of the property market, which were contended to be important but to change over time whilst static at a point in time, would be worthy of further investigation.

Similarly, the various determinants were found to have differing levels of importance over time (see Section 2.3.3) which may reflect different stages in the lettings and capital markets. Accordingly, it is stressed that the results of this Thesis and conclusions drawn herein are only relevant for and applicable to that state of the market prevailing in Sydney at the time the data was collected.

Whilst the general principles of the findings may be expected to remain relevant and applicable, the specific composition of the econometric model developed could be expected to differ for Sydney at different points in time and in different market states. It may also be expected to differ for other cities in both similar and different market states and over time. Accordingly, further research intc the level of relevance and applicability both over time and through different market states could be particularly worthwhile.

Furthermore, the extent to which each of the determinants, their relative and proportionate importance and their relationship with each other change over time also remains to be investigated.

Regarding the determination of the capitalisation rate at a point in time, various issues remain for consideration. Contextually, the roles of the assessment of gross and net income were found in the literature to be acknowledged as significant in the valuation process, but little research into the validity of alternative approaches to their assessment was identified. Similarly, the role of adjustments to the income stream and capital additions or deductions during the valuation process to reflect particular issues receives little attention in the literature or in contemporary research but has potentially significant effects upon the accuracy and validity of the capital value determined.

Further, whilst the relativity of capitalisation rates between prime, CBD office investment property was considered, such issues as the relativity of Grade A to Grade B, the relativity of CBD office to suburban and metropolitan office and the relativities between institutionally owned, non-institutionally owned,

owner occupied and so forth per se and within each office sub-sector remain to be considered. Similarly, landmark office properties were disregarded on the premis that they may be more likely to be valued using DCF methodologies, but a more sophisticated capitalisation methodology may render such a distinction worthy of reconsideration.

Also, the relativity of capitalisation rates between office, retail, industrial and the other property sectors and the relative pricing of the property asset class and the other asset classes remain to be investigated and may be linked to those capital markets areas noted as worthy of further research below.

The final, principal contextual area which remains to be investigated comprises the relativity of the valuation of a property to the estimation of its worth and the reconciliation of the respective capitalisation rates arising therefrom.

Concerning the econometric model itself, as developed in this Thesis, numerous areas arise which are contended to be worthy of further research. At the macro level, whether or not the model produces a valid capitalisation rate requires investigation and further relates to the fundamental, wider issue of whether investors and valuers are optimally pricing property. The role of the capitalisation of income method of valuation in the economically valid pricing of property to facilitate the identification of mis-priced property, from which abnormal returns may be consistently earned, remains to be pursued.

The statistical analysis within this Thesis was acknowledged to be based upon a relatively small sample of both properties and respondents. Accordingly, further investigation with a larger sample of properties and respondents may provide some interesting comparative results. However, given that the property sample contained every Grade A office property in Sydney, in order to achieve a larger sample of properties it would be necessary to combine Grade A and Grade B in Sydney, combine Grade A in several State capitals, combine Grade A in every capital across Australia or focus on a city with close but distinct sub-markets such as the City Of London or West End. Given the idiosyncratic characteristics of individual properties and the very distinct characteristics of each citys market, such combination may achieve greater statistical validity but at the expense of clarity in the observation of the very characteristics being investigated.

Similarly, the respondent sample included every valuer of CBD office property who could be identified in Sydney, such that seeking to increase the size of the respondent sample would face the same issues, in principle, as apply to increasing the size of the property sample.

Alternatively, rather than use valuers, it would be interesting to compare the results obtained from the use of transactional evidence, however the potential paucity of CBD office property sales occurring at the same time or close to each other may limit the practicality of such an approach. Whilst this could

potentially be overcome by using a proxy for price such as independent valuations or BOMA index returns, obtaining a larger sample at the same point in time may remain a significant challenge though one which may be worthy of an endeavour to overcome.

To enhance the quality of the econometric model, the specification and calibration of the models variables would be worth significant further research. Potentially, if the variables were more optimally specified, the R^2 and Adjusted R^2 may be increased and the greater use of factual data for each variable may raise the objectivity and consistency of outputs from the use of the model.

Whilst the Practitioner Survey investigated some of the perceptual nuances arising from the valuers approach to judging the quality of the building and the tenant when determining the capitalisation rate, it was contended that further refinement of the composition of each variable may improve the accuracy with which the model reflects the approach of the valuer when considering each such issue. Refinement of the location variable to address topographical issues, such as through the use of a grid or a quality of location scale, could potentially improve the quality of the econometric model. It is contended that the closer the model can become to matching the thought processes and finer aspects of each consideration of the valuer when determining the capitalisation rate, the more relevant would be its outputs.

Whilst building and tenant were relatively sophisticated variables in composition, research into the extent to which their composition may change over time in response to changes in market conditions, the economic environment, changes in building design and technology and so forth would be worthwhile. Similarly, whether the relativity between each of building, location and tenant changes over time, the factors which lead to such change and the time frames over which such change occurs could be worth investigating.

The property, finance, commerce and economic theory literature suggests that the idiosyncratic variables should be common for each of the property sectors, but research into the validity of such a suggestion would be of interest. It may be that whilst the three variables are common, their relative significance changes between property sectors with, for example, tenant being of a greater significance for retail or building of a greater significance for industrial.

Similarly, such investigation could be applied to markets with that variable which is most relevant in Sydney being potentially different to that in Canberra or Melbourne, given the different sizes of the markets, their respective composition, age of building stock, profile of tenants and so forth. Similarly, changes within each sector or in the markets over time, through booms and troughs, may contribute further differences, so providing an additional, complex aspect to the capitalisation rate adjustment process which would be worthy of further research.

Finally, the investigation of the Thesis Proposition through the analysis of Property x provided a range of interesting issues arising which would be worth further research. If the impact of each of timing, sub-optimal quantification of variables in the model, inconsistent information processing by the respondents and or the valuer and the subjective, informal and heuristic nature of the method could be distinguished, in their respective contributions to inconsistency, a clearer understanding of same may arise.

6.2.2 Analysis

Section 1.1.4 identified two principal steps in the capitalisation of income process, being analysis of comparable sales evidence and the subsequent adjustment of such evidence to match the subject property being valued.

Whilst various authors were found to have commented on the necessity for thorough and consistent analysis, as well as upon the need for comprehensive records and for being fully conversant with all aspects of the transaction, the literature did not focus upon the analysis process.

Accordingly, it is contended that further research into the analysis process would be worthwhile to investigate aspects such as how valuers undertake the analysis of comparable sales transactions, whether all valuers analyse in the same manner, how and from where the details of the transaction are sourced, how valuers determine this information to be correct, how the information collated is stored for retrieval and so forth.

Given the fundamental importance of the analysis of comparable evidence to the valuation process, research into the design and implementation of a system for the consistent and accurate reporting of transactional information by those participants in the transaction to the market at large and the development of a standard reporting format would, potentially, be of considerable merit and benefit.

Related to this aspect is the very topical issue of the valuation of prime, CBD office investment property during periods of limited or no transactional activity. The absence of comparable transactions may not necessarily mean that the value of property does not change until another sale occurs, but the valuer has been deprived of the principal basis upon which to determine the extent and direction of any such change in value. Accordingly, as would result from the breakdown of any of the underlying assumptions outlined in Section 1.1.2, the capitalisation of income method of valuation then potentially ceases to be a valid method of valuation, such that further research into ways of overcoming such limitations may render the method both applicable and defensible during such periods of limited transactional activity.

Contextually, the extent to which different valuers have different qualifications, skills and experience together with the alternative ways in which they might identify and analyse comparable sales transactions may each significantly impact upon the veracity of the capitalisation rate determination process, before any adjustment to match the subject property being valued is undertaken. An assessment of the extent to which such issues, together with any others that may arise, contribute to the inconsistency in capitalisation rate selection, in addition to that arising from the adjustment process, would be worthwhile in order to better appreciate the relative significance of the contributing factors to such inconsistency.

6.2.3 k And g

The review of literature and the econometric modelling clearly confirmed the relevance of k and g in the assessment of the capitalisation rate. However, in the context of prime, CBD office investment property, neither k nor g have been subject to extensive empirical research.

Accordingly, further research into the assessment of k for prime, CBD office investment property, its relativity to other property sectors and the potential differences geographically remain to be explored. Similarly, surprisingly little empirical research into the factors influencing the supply and demand for office accommodation and office investments and the manner in which this manifests as rental growth appears to have been undertaken but is highly relevant in the assessment of growth.

Through the explicit assessment of k and g in the valuation of a given property, the need to independently determine the capitalisation rate would be removed as it would result from such assessment. Whilst this, arguably, merely moves the decision from selecting a capitalisation rate to selecting a discount rate and growth rate, research into the explicit assessment of each may contribute to reducing the effects of the general problem area.

Such an investigation would be complementary to further research into the role of comparables in the valuation process, which would also contribute to an assessment of how the valuer might approach sustained periods of no transactional evidence, by moving the emphasis in the valuation process away from the reliance on comparable evidence towards the application of general capital markets principles which are not solely reliant upon the availability of transactions for their calibration.

The role of k and g in the valuation process is contended to be a particularly significant aspect of the application of capital market theory to property which is worthy of enunciation separately from the various, related capital market theory areas requiring further research considered below.

6.2.4 Capital Markets Issues

As noted in Section 2.5.4.1, above, the application of capital market theories to property is in its infancy. Though pioneering research has been undertaken by various authors, an emphasis on the portfolio rather than the individual property is apparent. Given that idiosyncratic influences are clearly found to be of significance for property as an asset class, a greater research emphasis on the risk and return aspects of the individual property itself and within the context of the portfolio would be worthwhile.

A wide range of capital market theory applications to property remain to be fully investigated, including the reconciliation of the principal assumptions underlying capital market theory with the characteristics of property as an asset class, the measurement of risk and return in a property context, the many aspects of diversification and the performance of beta between properties, between property sectors, between the respective asset classes and over time as well as the potential application of multiple and fundamental betas to property. Such areas are both enormous and challenging for further research given the range of issues associated with data availability and quality for property, but the results of such research in contributing to the integration of property into the capital markets and the debunking of the mystique attached to property investment are contended to be very desirable long term goals, rendering such research worthy of further attention.

Perhaps some of the most significant areas for further research concerning the application of capital market theory to property comprise the related issues of information processing and market efficiency in a property context and the role of expectations. Each are suggested in the literature to be distinguishable in the context of the property market and to be of considerable importance in attaining a better understanding of not only how the property market itself functions but also how it relates to those markets of the other asset classes. However, given the disparate, incomplete, restricted and often confidential nature of property information, as well as the significant issue of timeliness, this could be particularly challenging but does not diminish the importance of its pursuit.

Similarly, the role of expectations in the determination of price is particularly interesting in the context of property. The review of literature suggested that current time valuations were based on retrospective information and a fundamental inconsistency was observed. Conversely, the Practitioner Survey found that the role of expectations about the future / prospective issues was of significance to the valuer in undertaking a current time valuation. Accordingly, just how the valuer approaches and that to which the valuer has regard in such consideration would be worthy of further research.

By approaching the valuation process and model from a capital markets viewpoint and by considering each step as the impounding of information into price, the valuation process may become not only more

rational but also more logical which may lead to the adoption of more explicit, objective and formal valuation methods that can only be beneficial for the valuation profession and the property investment industry.

Having briefly considered those areas for further research arising from the application of capital market theory to property, the final area for consideration comprises the further investigation of those subsidiary issues identified in Section 1.3.2.

6.2.5 Subsidiary Issues

In addition to the principal issue arising from the general problem area, a range of subsidiary issues were suggested which would each also benefit from further research. Whilst there are a wide range of differing purposes for and bases upon which valuations may be prepared, to attain the goal of achieving greater consistency between valuers through further research into those ways by which such consistency may be achieved would be worthwhile.

This would contribute to not only optimising decisions concerning property but also to a more optimal allocation of resources including and related to property. Further research into information processing and market efficiency issues, as considered above, may contribute to achieving such a goal with investigation into their application to the many differing purposes for which and bases upon which valuations may be prepared being challenging but, potentially, very worthwhile.

6.2.6 Summary - Areas For Further Research

As noted above, this Section sought to briefly consider five principal areas for further research arising from the Thesis topic, but beyond the scope of the Thesis, which were consistent with the Thesis Limitations considered in Section 1.4.2.4. It was acknowledged that a wide range of areas arose for further research but that this Section did not seek to exhaustively and comprehensively list each.

Further research into both the adjustment and analysis steps as well as into the roles and application of each of k and g and the many aspects of capital market theory applicable to property were each considered worthwhile and likely to contribute to addressing the subsidiary issues arising from the general problem area identified in Chapter 1.

Significantly, though the Section was brief, a wide variety of issues for further research were identified with the consideration of each issue then leading to other, related issues which were also worthy of further research. Accordingly, the small aspect of valuation methodology considered within this Thesis appears likely to provide a fertile source of areas for further research well into the foreseeable future.

6.3 CONCLUSIONS

The principal conclusion that may be drawn from this Thesis is contended to be that the identified problem was solved through rigorous, academic research.

By empirical analysis, the Thesis Hypothesis was tested and found to be proven, the Thesis Proposition tested and found to be valid, the Thesis Aims achieved and the Thesis Objectives fulfilled, so solving the Thesis Problem whilst adhering to the Thesis Principles and verifying the validity of the Thesis Limitations.

It is, however, acknowledged that the Thesis was constructed upon a series of specified Thesis Limitations in order to identify a Thesis Hypothesis for testing. Accordingly, the findings of the Thesis are of the greatest relevance for addressing the adjustment of capitalisation rates at a point in time for current pricing of prime, CBD office property in Sydney which is institutionally owned. Whilst the principles of the findings may be of relevance to other property sub-sectors, any attempt at direct application must be tempered with cautious regard to the Thesis Limitations.

Significantly, an existing, robust and defensible econometric model for the determination of the capitalisation rate was not identified such that it may be concluded that the identified Thesis Problem had not been previously solved. Further, it may be concluded that the Thesis Problem was validly stated and its nature substantiated through the econometric modelling and testing.

Accordingly, as it is found that the standard deviation of a sample of capitalisation rates calculated by the econometric model developed is below that of a sample selected by property valuers using the current method of capitalisation rate determination, it may be concluded that the use of an econometric model reduces the variability in capitalisation rate determination.

It may be further concluded that existing econometric models for the determination of the capitalisation rate were identified, analysed and evaluated with the role of each of the issues that contribute to the

current method of capitalisation rate determination being identified and analysed and their significance evaluated. Founded upon a review of property, finance, commerce and economic theory literature relevant to capitalisation rate determination and therefore theoretically defensible, an econometric model for the determination of the capitalisation rate was developed which combines the current method and existing econometric models with property, finance, commerce and economic theory and those identified issues which contribute to the determination of the capitalisation rate.

Having examined and established the variability in the current method of capitalisation rate determination for prime, CBD office investment property in Sydney, it was ascertained that the application of an econometric model which is based on and therefore accords with property, finance, commerce and economic theory succeeds in reducing such variability. Accordingly, it may be concluded that those issues which contribute to capitalisation rate determination were modelled with the quantitative analysis supporting the interpretation of the property, finance, commerce and economic theory.

The problem of an unacceptably high level of variability in capitalisation rate adjustment between properties at a point in time arising from the current method of capitalisation rate determination being subjectively based, inconsistent, informal, heuristic and lacking a framework which accords with property, finance, commerce and economic theory was solved through rigorous, original, academic investigation, research, review and criticism. By so doing, a distinct contribution was made to the knowledge of the study of property investment, the extension of the bounds of knowledge and the addition to the body of knowledge, so demonstrating a capacity for independent research whilst maintaining a practical application and industry relevance for the studys findings.

The quantitative analysis undertaken may be concluded to be valid, being based upon a statistically significant and relevant sample of respondents, a statistically significant sample of properties and a rigorous, objective and formal data collection, analysis and modelling process which limited the contribution of subjectively, informally and heuristically derived components and the role of practitioner opinion, intuition and experience in order to optimise the integrity and defensibility of the application of the resulting model.

Accordingly, to establish through testing, based upon such a rigorous approach, that the potential mis-pricing of sample properties by sample respondents ranged from -34% to +18% in the given test may be concluded to be of significance, given that the acceptable range was contended to be +/- 10%. The econometric model developed, therefore, facilitates the replacement of a subjective, informal and heuristic process with an objectively based and theoretically defensible expression.

A significant conclusion of this Thesis is contended to be that the capitalisation of income method of valuation is flawed. The principle of a valuation model which may provide two equally valid answers to the same question is contended to be both unacceptable and illogical, being further compounded by the dependence upon the implicit, the role of the practitioner, the invalidity of the fundamental underlying assumptions and requisite conditions and the prevalent methods adopted for the education of the valuer.

Not only is the capitalisation of income method contended to be flawed in theory and in principle, but also in practice. Whilst this Thesis sought to provide the first rigorous attempt to investigate the adjustment step within the capitalisation of income method of valuation and to research that for which adjustment should be made and how such adjustment should be made, there remain many areas requiring further research (see, for example, Section 6.2, above), not least the various aspects of analysis, which are fundamental to the defensibility of the method in practice. Whilst the literature reviewed acknowledged the capitalisation rate to be a key variable, the attention to the capitalisation rate within the literature is contended to be inadequate given the significance of the variable.

It may be further concluded that the approach to the concepts of risk and growth found within the property theory literature is inconsistent with that found in the finance, commerce and economic theory literature. The proposition of risk and growth as positive or negative expectational influences on the identified sources of investment return, rather than as determinants of the capitalisation rate in their own rights, forms a major conclusion of this Thesis.

Furthermore, the applicability of the findings of the property theory literature review, concerning the influences upon the capitalisation rate, within the systematic, unsystematic and idiosyncratic classification structure found in the finance, commerce and economic theory literature review through the application of the test of pervasiveness at the asset class, sector, sub-sector and asset levels is concluded to also be of significance, being a distinct and original contribution of this Thesis towards the broader reconciliation of property theory to finance, commerce and economic theory.

A reconciliation of the application of capital market theory and approaches to accord with the theory and practise of property valuation is concluded to be of importance, with the replacement of valuation lore by finance, commerce and economic law comprising a potentially significant step in such a process. With the capitalisation rate having lost its economic rationale and the capitalisation of income method having lost its economic validity, the scope for further research and education in this area is vast with the principle of changes in the capitalisation rate being a result of changes in the discount rate, its components and the growth rate concluded to be of fundamental importance and a significant change in conceptual emphasis for both practitioners and educators, which is already overdue. Given the limitations in current methods and approaches, it may be concluded that valuers are potentially mis-

stating the value of prime, CBD office investment property but to what comparative degree remains to be investigated.

It may be concluded that such a change in emphasis has significant repercussions for the role and basis of the use of comparable sales evidence, the role of and explicit regard to expectations within the valuation process, the impounding of information into price and related issues of market efficiency in a property context, further advances in which would collectively contribute to the continued reconciliation of property theory with finance, commerce, economic and capital markets theory and of the property asset class with the other capital markets asset classes. Whilst the potential for full reconciliation is clearly evident, to achieve same requires considerable further research.

It may further be concluded that the use of such an econometric model by the valuer in practice may, in the future with the benefit of considerable further research, contribute to addressing a range of the subsidiary issues arising from the general problem area outlined in Section 1.3.2.

The econometric model developed within this Thesis is not only theoretically defensible but also practically effective and so may be concluded to be an advance in the theory and practise of property valuation. To find that current property valuation practise was not entirely consistent with finance, commerce and economic theory but that reconciliation was potentially achievable is a significant conclusion of this Thesis which comprised an investigation of the capitalisation rate selection and adjustment process through rigorous, original academic research which not only solved a valid problem and provided a distinct contribution to knowledge of relevance to the valuation profession, the property industry and the property market, but also gave rise to a wide range of fascinating areas for further research in the future.

6.4 POLICY RECOMMENDATIONS

Whilst a wide range of matters arise from this Thesis which would benefit from changes in policies and so may be considered as policy recommendations, it is not proposed to endeavour to review each herein. Accordingly, it is contended that the principal policy recommendations arising from this Thesis may be summarised as a need for:

6.4.1 A Change In The Perception Of Property As An Asset Class;

6.4.2 A Greater Focus On Research;

6.4.3 An Increase In Market Efficiency;

6.4.4 An Adoption of New Approaches;

6.4.5 A Change In Emphasis In Valuer Education;

6.4.6 A Change In Attitude By The Valuer; and

6.4.7 A Change In Focus For The Role Of Professional Bodies,

each of which will be considered, respectively, below.

6.4.1 A Change In The Perception Of Property As An Asset Class

It is contended that a concerted effort is required by all those involved in the property investment industry to overcome the perception of property as a special asset class, to which some form of mystique attaches, contributing to the insularity of property as an asset class. Negative perceptions of illiquidity, heterogeneity and so forth in property need to be overcome through the application of capital markets theory to facilitate a clearer appreciation of the comparative risk / return profile of property by capital markets participants.

The perception of property as a special asset class is counter-productive as it discourages investment in the asset class which, given the long term forecast growth in superannuation in Australia, would be to the serious disadvantage of those involved in the property investment industry.

The quicker and more effectively property can be integrated into the capital markets framework and considered in the same manner as the other asset classes by the professional investment community, the sooner the perceptual barriers to further investment in the property asset class by the professional investment community may be overcome to the benefit of the property investment industry.

6.4.2 A Greater Focus On Research

Consistent with the integration of property into the capital markets is the need for a greater focus on research into both the relative role and function of property as an asset class and the development of appropriate valuation methodologies that arise therefrom.

It is contended that scope exists for those universities with property valuation research capacities to focus more closely on such research, which would be consistent with the change to education emphasis considered below. By an increased interaction with both the property market and its participants,

including practising valuers, in association with existing links with the professional bodies, specific foci for research may be identified and priorities established.

Whilst the application of finance, commerce, economic and capital market theory to property is well underway, much remains to be done and further research by universities in such areas is required to contribute to effecting the integration of property into the capital markets. For example, the role of supply and demand in influencing growth, the role of expectations, the comparative risk / return profile of property at the asset level, sub-sector level, sector level and asset class level and issues relating to value as a proxy for price are just some of the inter-relating issues which require further research.

6.4.3 An Increase In Market Efficiency

It may be contended that one of the most significant issues prohibiting the smooth operation of the property market is market inefficiency through the sub-optimality of information processing and impounding of information into price.

The efficiency of the property market has to be improved if property is to function as a competitive asset class in the capital markets. Accuracy, timeliness, openness, completeness and width of availability of information are all presently inadequate and require significant improvement. These are key problem areas for all participants in the property investment industry to address.

At its most basic, the property industry could start by promoting the collation of accurate sales data, consistently reported and analysed, to provide the nucleus for a more efficient market. Such collation could ideally be co-ordinated by a network of universities in each of the capital cities, thus providing the source data for that research advocated in Section 6.4.2, above, or could be controlled by an independent property industry or professional group such as BOMA or the AIVLE. Given the potential value of access to accurate and timely information for the valuation profession, such a venture could be very worthwhile for the pioneering body.

Even such initial steps as the standardisation of definitions of terms for general acceptance and the design and specification of a format for sales analysis would potentially provide significant foundations for an improvement in information processing which would be relatively simple to implement.

Such steps towards improving the efficiency of the property market would assist in breaking down the barriers surrounding property as an asset class, thus eroding its insularity and significantly contributing to its integration into the capital markets and wider acceptance by the general investment community.

6.4.4 An Adoption Of New Approaches

It is apparent from this Thesis that the slavish adherence to comparable sales within the valuation process is an inadequate basis of valuation methodology. Accordingly, it may be contended that the valuation profession should reduce its dependence upon comparable sales as the basis of valuation and seek to adopt and develop more explicit valuation methodologies which are consistent with finance, commerce and economic theory.

The acknowledgment of the capitalisation rate as the outcome of the inter-relationship of more significant variables, rather than being the principal variable of significance itself, is contended to be a major shift in emphasis from that currently prevailing in the valuation profession. The adoption of such an approach by the valuation profession would be a significant step towards the adoption of finance, commerce and economic theory based valuation approaches but may be thwarted by both the currently limited extent of the body of knowledge concerning the discount rate, the risk premium and the growth rate for property and the limited awareness of same by the valuation profession.

It is contended that the goal of a vast improvement in the consistency between valuers valuing the same property on the same basis at the same time should be pursued and that the adoption of new valuation approaches would contribute to such achievement. Such valuation methodologies which are consistent with finance, commerce and economic theory would serve to place risk and growth in a theoretically defensible context and preclude their continued use as the panacea for many valuation differences.

Rendering the use of comparable sales as a check for a principal valuation method based on finance, commerce and economic theory may lead to more consistent and defensible valuations which have an economic validity. Such a move could be potentially significant for assessing the economic equilibrium value of property in order to identify over and under priced property and so earn abnormal returns.

Further, it may also facilitate the identification of those transactions which set new levels of economic equilibrium value from those which are merely out of line transactions, providing a significant advance on the present basis where the identification of out of line transactions from comparable sales evidence is potentially more challenging and the validity of the valuation based thereon accordingly diminished.

6.4.5 A Change In Emphasis In Valuer Education

The current method of capitalisation rate determination was contended to be heavily dependent upon the role of the practitioner with little guidance provided in the literature reviewed concerning those issues

for which adjustment should be made and the extent of such adjustment. It was further contended that prevailing methods of valuer education leave the implementation of the adjustment as a matter to be learnt in practice rather than in academia.

It is suggested that an increasing role for finance, commerce and economic theory and capital markets theory in the valuation process should also include an increase in the provision of education concerning the implementation of an adjustment on such a basis at the university level with a greater emphasis on the analytical, so reducing the potential effect of problems arising from the inadequate teaching of same in practice. Given the increasing complexity of property investment and the time poor profile of many practitioners, such a change in emphasis in valuer education could be of considerable benefit to both the profession and the graduate.

Furthermore, a trend towards the adoption of valuation methods which are more consistent with finance, commerce and economic theory may lead to existing practitioners requiring significant further education such that recent graduates may find a role to play in the education of their superiors, rather than vice-versa as has traditionally occurred.

Similarly, a clear role exists for the use of Continuing Professional Development to enhance the knowledge and skill base of practitioners on a regular basis, such that the review of such programmes by the various providing bodies would appear opportune. An increased role for Continuing Professional Development programmes would be entirely consistent with the aim of enhanced credibility for the valuer and confidence in the valuation process together with the aim of a progressive reduction in the level of professional indemnity claims, level of insurance premia and related litigation.

A closer focus on the return to the theoretical foundations of valuation consistent with finance, commerce and economic theory and a greater application of capital markets theory to property, rather than adherence to and perpetual adoption of the cook-book routines, together with greater interaction with the property market and its participants by academia would assist in the provision of graduates who are more suited to the demands of practise in Australia today.

The review of literature clearly showed that there were significant limitations in the depth and quality of valuation teaching texts with few providing detailed attention to the various aspects of the capitalisation of income method of valuation, despite the extent of its use in current practise.

Accordingly it is contended that scope exists for the development of specialist texts focussing on niche areas including not only the capitalisation of income method of valuation for office property but also for application to other types of property and for each of the other bases of valuation.

6.4.6 A Change In Attitude By The Valuer

There would appear to be significant potential for the valuer to endeavour to enhance his credibility for, although the valuer may be doing the best he can given his education, training and the quality of the valuation tools at his disposal, the literature suggests that his best may no longer be good enough in the face of more demanding clients and other professional groups keen to and capable of offering the same services as the valuer.

The valuer may be contended to have been lulled into a false sense of security by the comfort of the defensibility of judgemental techniques which, despite the challenge attributable to the Australian property market collapse of the late 1980s early 1990s, do not appear to have changed significantly. A lack off appreciation of the implications of the prevailing regulatory environment, the emergence of quality assurance, the increasing significance of compliance issues for the property investment industry and related issues suggest that the valuer may be ill prepared for the demands of accountability and defensibility that are emerging.

The transparency of the product of the equities analyst sets a level to which the valuer needs to aspire to match the requirements of the investment industry and so gain both its confidence and that of the community at large.

Accordingly, the valuer who fails to address the changing nature of the business environment and who fails to seek to amend his knowledge and skill base accordingly may be expected to progressively loose credibility and so be likely to face professional extinction.

6.4.7 A Change In Focus For The Role Of Professional Bodies

Given the range of policy recommendations which are of significance to the valuer and the valuation profession, an opportunity exists for the professional body to adopt an active role in their implementation and so make a major contribution to the rebuilding of confidence in the valuer and the valuation process by the users of valuation services, the investment community and the community at large.

As the arbiter of both education and practise standards for the valuer, the professional body is ideally placed to assume a focus on the implementation of the various aspects and to force an increase in standards through the requirements of its Continuing Professional Development programme, the

introduction of accreditation and other initiatives. The adoption of such a focus by the professional body would provide a significant contribution to such a rebuilding of confidence.

Such activity would be complementary to the steps that may be taken by valuers to rebuild their credibility, with the cumulative effect of both being an increase in confidence in the property asset class which would be consistent with various other policy recommendations considered above.

Through its unique position within the property investment industry and the range of means at its disposal, the professional body could adopt a new role as the preserver of the valuation profession.

6.4.8 Summary - Policy Recommendations

The various policy recommendations considered above are both complementary to and consistent with each other. Through a greater focus on research and a change in the emphasis in valuer education, the adoption of new approaches is attainable. Further, an increase in market efficiency coupled with an increase in the credibility of the valuer and greater confidence in the valuation profession arising from focussed activity by both the professional body and by the valuer, would all contribute to a change in the perception of property as an asset class, which would benefit not only each of the participants in the property investment industry but also the beneficiaries of investment in property who, ultimately, comprise the community at large.

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