The use of the Discounted Cash Flow (DCF) method as a method of valuation within the South African property industry: A critical review

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SOLI DEO GLORIA

DECLARATION

1. I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.
2. I have used the Harvard convention for citation and referencing. Each contribution to, and, quotation in, this research report from the works of other people have been attributed, and have been cited and referenced.
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ABBREVIATIONS

The following abbreviations have been used throughout this report

API	Australian Property Institute
BCom	Bachelor of Commerce
BSc	Bachelor of Science
BSc (Hons)	Honors in Bachelor of Science
CDA	Confirmatory Data Analysis
CPD	Continued Professional Development
CPUT	Cape Peninsula University of Technology
CV	Capital Value
DCF	Discounted Cash Flow
EDA	Exploratory Data Analysis
ERV	Estimated Revenue Value
IPD	Investment Property Databank
IRR	Internal Rate of Return
IVSC	International Valuation Standards Council
M.L.P.M.	Master of Land and Property Development Management
M.Prop.	Master of Property
MSc	Master of Science
NOI	Net Operating Income
NPV	Net Present Value
NQF	National Qualifications Framework
OPEX	Operational Expenses
PGI	Potential Gross Income

PV	Present Value
RICS	Royal Institute of Chartered Surveyors
SA	South Africa
SACPVP	South African Council for the Property Valuers Profession
SAPOA	South African Property Owners Association
STD DEV	Standard Deviation
TRR	Target Rate of Return
UCT	University of Cape Town
UFS	University of the Free State
UJ	University of Johannesburg
UK	United Kingdom
UNISA	University of South Africa
UP	University of Pretoria
USA	United States of America
WACC	Weighted-Average Cost of Capital
WITS	University of the Witwatersrand
WWI	World War One
WWII	World War Two

ABSTRACT

The Discounted Cash Flow method of property valuation is a fairly new method and research in other English speaking countries indicated a trend towards the use of the DCF method in preference to the Capitalization method despite an initial hesitance due to the perceived complexity of the method. The aim of this study was therefore to form an understanding if similar perception of complexity exists in South Africa and how these perception influence the perceptions and preference of use of the DCF method of valuation by valuation professionals within the South African context. The research was guided by three specific research questions which probed valuers' methodology preference, valuers' education, and difficulties experienced in accessing data needed for DCF valuation input variables. A mixed method research approach was adopted using questionnaire and document surveys to gather data from valuation professionals, lecturers of valuation education programs accredited with the SACPVP, and the curricula of these programs. The results indicate a general low preference for the use of the DCF method of valuation while the Capitalisation method is indicated as the most preferred method. This low preference was found to be the result of a high degree of difficulty experienced in accessing data needed for DCF valuation input variables. It was also found that the level of valuation education increases the acceptance and preference for the use of the DCF method.

CHAPTER 1 INTRODUCTION TO RESEARCH PROJECT

1.1 Introduction

Property is one of the basic factors of production (Palmquist, 1989) with land and buildings the most tangible forms of property. Striving towards an agreement on the worth or value of tangible property gave rise to a set of skills which developed into the vocation of property surveyor which was in turn organized into societies or professional bodies.

The ambiguity surrounding the word "value" was first observed by Adam Smith who noted that it can mean usefulness or value-in-use, in one sense, but also purchasing power or value-in-exchange, in another (Wyatt, 2007). The value-in-exchange, or the estimate of the most likely price to be concluded at a specific time between buyers and sellers of property which is assumed to be available for purchase, is the value which the property valuer is seeking to establish.

As asset market theories developed, property was recognized as an asset class to which the efficient market theory applies, however, as understanding of property markets developed the theories were adjusted to describe and to forecast movements in property markets. But history has shown that it was especially during trying times that established theories and practices were shown to be lacking. Currently, shortly after the *Great Recession* of 2008, there are already calls for the re-examination of the current efficient market theories and a shift of paradigm to include complex economics theories. Changes in paradigm and practice are however slow in the happening as observes throughout the history of the development of theory and practice (Wyman et al., 2011). The development of valuation methodology is no exception to this rule.

The valuation profession in England can be traced back to 1868 when a national association of property surveyors was formed (Morgan, 1998). Miller & Markosyan (2003) in tracing the academic roots and evolution of real estate appraisal in the United States of America proposed the year 1902 as the official birth year for the appraisal profession in that country. During the same periods valuation bodies were formed in other countries which experienced accelerated economic growth early in the 20th century.

Today the basic goal of property valuation is to provide a monetary measure of the utility derived through the access to and control of property. Despite this seemingly basic function, property valuation and associated services provided by property professionals have evolved into being critical in the functioning of property markets which again influence financial markets and even national economies. The property valuer, as a professional, has become an independent axis around whom property information flows, touching every aspect of property; from the feasibility study of a proposed development to the determination of value when an asset is to be taken by the government or to be destroyed to make way for new growth (Motta & Endsley, 2003).

With the rise of globalization, direct investment in property and property derivatives across international borders also accelerated. A natural outflow of globalization was the need for standardisation in property valuation approaches and reporting. This led to the formation of the International Valuation Standards Council (IVSC) which is tasked with the standardisation of valuation terminology, methodology, approaches to valuation, valuers conduct and reporting principals.

Three approaches to valuation are put forward by the IVSC (IVSC, 2013):

1. The Market Approach,
2. The Income Approach, and
3. The Cost Approach.

The Market approach provides an indication of value by comparing the subject property with identical or similar assets of which recent transaction information are available. This approach is most suitable for, but not limited to assets used for personal enjoyment, i.e. residential property and vacant land.

The Income approach provides an indication of value by converting future cash flows into a single current capital value. As the name indicates this approach is most suitable for property which generates a cash flow over the course of its useful life.

There are three methods which fall under this approach:

1. Income Capitalisation, where an overall capitalization rate is applied to a representative single period income,

2. Discounted Cash Flow, where a discount rate is applied to a series of future cash flows to discount them to a single current capital value,
3. Various option pricing models.

The Cost approach provides an indication of value using the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or by construction.

In the discussion of the theory and practice of valuations it is important to distinguish between value and worth as well as valuation and appraisal.

The distinction between value and worth can be summed up as the former being equivalent to the value-in-exchange and the latter being equivalent to the value-in-use. From this distinction flows the differentiation between valuation and appraisal. The former is an estimation of exchange value or market value that is based on an interpretation of comparable market evidence whereas an appraisal of worth, appraisal for short, is an estimation of value (worth) to a specific individual, investor or class of investors. An appraisal therefore involves an assessment of the specific circumstances of the specific individual, investor or class of investors together with the wider property, economical and market factors culminating in an investment value (Wyatt, 2007; Baum & Crosby, 2008).

The fundamental and historic approach to property valuation is an estimation of the likely selling price derived from comparable market evidence and was developed in England when property was let on long leases of up to 42 years with little or no rent review breaks during the lease. This approach can be summed up as the capitalization of the rental income at a rate termed the initial yield or the all-risk yield which includes implicit assumptions about future income growth, risk and depreciation. Initially the capitalization rate was taken as the conventional gilt (government long bond) rate plus a 1 – 2% premium for risk. However, as rent reviews became more frequent due to a more rapid rise in rental rates, the yields were determined from the yields of similar properties which recently transacted in the market and the explicit link to the capital markets was lost. This method is still in use today. Information regarding the transactions is collected and subjectively adjusted taking account of factors such as differences in lease terms,

duration of lease, location, the security of the tenants, property size and condition, and the date of the sale. Income of only one year is use, effectively fixing the income in perpetuity, while the capitalization rate is adjusted to allow for income growth. This fundamental approach disqualifies this method of valuation to be called an investment appraisal since such an appraisal requires explicit DCF techniques which link property to the other capital markets. Despite property's special characteristics it shows many similarities to other investment assets: it generates cash flow, there are uncertainties attached to these cash flows and there are imbedded options in property. An explicit DCF valuation, as opposed to an implicit one year income capitalized valuation, places a value on the expected cash flows from a property using techniques familiar to the investment industry (Adams et al., 1999).

This paper focuses on the investment value of property and the appraisal or valuation process and method to measure this value or worth known as the discounted cash flow approach.

1.2 Background to the study

The technique of discounted cash flow (DCF) has its roots in the fields of financing and economics where it was developed as a tool in the decision making process. Its primary functions were to assess the profitability of investment projects under certain sets of conditions or to compare projects with one another to ascertain which is the most profitable. With time a simple form of the DCF technique was started to be used as a valuation method in the valuation of investment property (Enever & Isaac, 2002).

A brief review of the history of the DCF method in English speaking countries around the world reveals that this method of property valuation is a relative "new" method to the industry and one that was shrouded in controversy before its final acceptance. The battle for acceptance was especially hard in Australia after a high court in that country ruled on the apparent unsuitability of DCF as a method of valuation (Parker & Robinson, 2000).

Martin (1993:391) reported on surveys conducted in the United States of America (USA) dating from 1972 and onwards which indicated the increased use of the DCF method by financial institutions to value real estate investments. However, he concluded that

although the investment industry was overwhelmingly using the DCF method, the Standards of Professional Appraisal Practice of the Appraisal Institute, Guide Note 4 published in 1990 still view the use of DCF by property valuers as "*a tool rather than a valuation method*".

Furthermore, following the global economic recession of the early 1990's Parker (1996) set out to determine the impact of the recession on valuation methodology. His study comprised a survey of valuers in certain cities in Great Britain, North America, Canada and Australia during late 1992 and indicated a global trend towards the use of DCF in preference to direct capitalization. What he noted, but not expanded on, was that valuers in Great Britain did not, at the time, embrace the use of DCF to the same extent as valuers in the other three English speaking countries.

Most of the researchers are in agreement that the slow uptake of the DCF method, despite its recognized benefits, can be ascribed to the perceived complexity of the method. Lin (2007:282) comments on the level of knowledge and understanding when valuing investment properties for securitization using the DCF approach saying that "*real estate appraisers should eventually turn into real estate financial analysts*", while Skolnik (1993) published a paper pointing out difficulties and criticizing "rule of thumb" approaches to DCF.

Turning from the international overview of the use of DCF, the question can be asked: Can a similar trend towards the preferred use of the DCF method be observed in South Africa and does the education of valuers address the issues of perceived complexity as experienced in the rest of the English speaking world? Unfortunately there is an overall paucity of research discussing the state of the South African valuation profession in terms of valuation approaches or research indicating the extent to which education have addressed the perceived complexity associated with the DCF method of valuation.

A search on Google Scholar returned some sources on real estate education in South Africa of which most notably are Mooya (2007) and Cloete (2002). The search returned however no indication of research done on valuation methods within the South African context, specifically the DCF method, or the link between education and its impact on valuation methods. This is in stark contrast with other African countries such as Nigeria

where the valuation profession has come under the scrutiny of the academia in an effort "to clean up" the industry, (Ajibola, 2010; Ayedun et al., 2012; Chichernea et al., 2008).

1.3 Problem statement

The problem to be examined in this study can be summarized as:

Research undertaken in Australia, the United States of America, Canada and England indicated a trend towards the use of the DCF method in preference to the Capitalization method although acknowledging a slowness in the trend due to the associated perceptions of complexity of the DCF method. No formal research to date has been done within the South African context to test the perceptions and / or preference in the use of the DCF method amongst professional valuers or whether the education and training of valuers have been successful in addressing the perceived complexities associated with the DCF method of valuation.

1.4 Research question

From the problem statement above a two-fold research question can be formulated:

The **general research question** in this study is:

> What is the general perception of the South African valuer towards the use of the Discounted Cash Flow method for the valuation of investment and income producing properties and can it be shown that the method has gained preference among the South African valuation community?

The **specific research questions** in this study are:

1. Which methods of valuation are available for the valuation of income producing properties in South Africa and why are some methods preferred to others?
2. Is there a sufficient focus in the education of valuation professionals so as to give them a clear understanding of the principles behind the use of the DCF method?

3. Do South African valuers, as part of the perceived complexity of the DCF method, experience difficulties in accessing data and information needed as input variables in concluding a valuation based on the DCF method?

1.5 Research proposition

The research proposition to be tested in this study is:

An existing perception of complexity has led to a limited preference for the use of the DCF method of valuation in the valuation of income property. This perception of complexity is due to insufficient training in the method as well as difficulties experienced in accessing data to be used as input variables.

1.6 Research aims

Perceptions are clarified and acceptance is gained through knowledge and access to information. This research project will therefore aim to form an understanding of how the education of valuers and the access to information needed for the completion of a valuation based on the Discounted Cash Flow method influence the perceptions and preference of use by valuation professionals within the South African context.

1.7 Research objectives

The research objectives to be achieved are:

1. To conduct an analysis of the perceptions of DCF method proficiency and preference among practicing valuation professionals;
2. To determine the curricula of the courses accredited by the South African Council for the Property Valuers Profession (SACPVP) and the emphasis of the courses on the use of the DCF method;
3. To determine which input variables are needed to conclude a valuation based on the DCF method and which sources of information are available to the South African valuer from which these variables can be obtained; and
4. To make recommendations to the valuation industry and educational institutions based on the outcome of this study.

1.8 Research method

The research objectives outlined above are realized by adopting the following research method:

1. A literature review of matters pertinent to this study,
2. A survey of valuation professionals by means of a questionnaire to establish their levels of perceptions and preference of the DCF method, their views on the accessibility to input variables and their perceptions on the adequacy of the current training in the use of the DCF method,
3. A survey of lecturers of the courses accredited by the South African Council for the Property Valuers Profession (SACPVP) to determine the emphasis on the teaching of the DCF method,
4. A review of the curricula of the courses accredited by the South African Council for the Property Valuers Profession (SACPVP) to determine their level of focus on the DCF method of valuation and at which level education in valuation methods are introduced,
5. Analysis and interpretation of data, and
6. Conclusions and recommendations.

1.9 Significance of study

It is only during the last 15 – 20 years that the valuation profession has started to undergo more academic scrutiny and attempts being made to place the profession in an academic setting (Baum & Crosby, 2008; Wyatt, 2007). However, Mooya (2007) laments the lack in contribution from South Africa to the growth of property knowledge in Africa. Although it is not the purpose of this minor dissertation to add to the body of knowledge, the intension is to highlight some aspects within the South African valuation industry which might lead to further research.

1.10 Structure of the research report

The research report is structured as five chapters.

In **Chapter 1**, a brief outline of the research topic is given together with the background to the research proposal, followed by succinct statements of the research problem, the

research questions and the research proposition. The aim and objectives of the research are defined and are followed by a short description of the research methods to be employed. Finally, the significance of the research project is commented upon.

Chapter 2 provides a critical review of the international literature relating to the use of the DCF method of valuation in general and the associated complexities in particular. This chapter largely addresses the history of the development and reasons for the resistance to the acceptance of the DCF method of valuation. This chapter also includes a review of the curricula of educational institutions accredited by the South African Council for the Property Valuers Profession (SACPVP) as well as the sources of information available to South African valuation professionals.

Chapter 3 draws together the principal issues raised in the previous chapters and proposes and justifies the research method to be adopted in addressing the research questions.

Chapter 4 comprises the presentation and analysis of the questionnaire survey data of valuation professionals and the curricula of educational institutions together with a discussion of the findings.

Chapter 5 concludes with an evaluation of the assumptions and propositions of the research in light of the findings. Resulting conclusions are drawn and recommendations and suggestions for further research and practice are made. This is followed by a full list of **References** for the research report and an **Appendix** containing supporting documentation.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

This chapter reviews the development of the discounted cash flow approach from an historical perspective before examining the method itself in terms of input variables and associated complexity from an academic perspective. A sense of the acceptance and use of the approach by valuation practitioners is formed by reviewing comments made by various authors. Finally, available literature on the education of valuation professionals in the use of the DCF method is investigated. Literature from South Africa is also reviewed.

In order to manage the various aspects this review is divided into five sections under which each particular issue is dealt with, being: **History**, **Complexity**, **Acceptance** and **DCF Education**.

In order to understand the DCF method as it is currently accepted and used throughout the international valuation community, it is necessary to understand the development of this method of valuation and the preceding methods which lead up to the DCF method as it is currently accepted. The Literature Review informing this study therefore starts out investigating both the current and historic body of knowledge relating to the development of the theory and practice of the valuation of investment properties.

The history of the evolution of valuation methods indicates a clear link between the changes in economic theory and practice as brought about by cataclysmic events throughout the course of history such as the great financial market crashes and the two world wars. These events had a profound effect on the financial markets' views on returns, risk and the effect of inflation which in turn affected the view on the value of the underlying fixed assets. The review of the literature endeavours to create a historical timeline through these events and the resulting changes in valuation theory, methodology and practice.

As valuation theory evolved so did the complexity of the resultant valuation methods and models. With the increased globalisation of economies, the focus on localised, micro-economic factors influencing property value shifted to a global view, thereby adding to the complexity of the input variables to the valuation process. The Literature Review

therefore also focuses on the complexity of the DCF method, the identification of the input variables and the available sources of data to inform the input variables.

Moving from the academic theorising and valuation modelling to the practicing of valuations, the Literature Review focuses on the acceptance of the DCF method of valuation by the valuation community.

In conclusion and turning the focus towards the South African valuation profession, a review of the curricula of the seven institutes of learning accredited by the South African Council for the Property Valuers Profession (SACPVP) is undertaken with a specific focus on the teaching of the theory and practice of the DCF method of valuation but also on any other methods for the valuation on income property.

2.2 History

It is impossible to understand the details of valuation methods without an understanding of how these methods evolved and a consideration of the context within which these changes took place (Baum & Crosby, 2008). Investors' perceptions change as financial conditions and markets change and therefore valuation models and practice should adapt accordingly to keep up with these changes.

Income producing properties are normally held as investment properties with the owner of the property passing right of occupation to a tenant by way of a lease agreement. The rent earned by the owner is determined by the supply and demand for that type of property in the market and represents the income return on the investment in the property. The income can be viewed as a cash flow earned by the investment and therefore the investment value of the property can be mathematically calculated as being the present value of this cash flow.

This method of calculating the value of an income generating property by means of capitalising or discounting the rental income was first expounded by Marshall (1920).

Historically, property was treated separately from other investment markets with its own distinct valuation or pricing techniques. Investment markets link discount and expected growth rates to other financial markets and to the wider economy. However, property as

an investment class is heterogeneous and thinly traded, so capitalisation rates and rental income are derived from comparable evidence.

The method of direct comparison is therefore held as the method of choice since if a comparable property exchanged at a certain price it follows that the property to be valued will exchange at the same price. This method is however subject to criticism as complex income producing properties are difficult to analyse due to the possible existence of special circumstances, i.e. tenant incentives, stock or plant and machinery which were included in the transaction, etc. (Wyatt, 2007).

Wyatt (2007) refers to the technique of deriving a capitalisation rate from comparable sales as being derived from the principles of financial mathematics, although he admits that the links are not obvious and that the comparison of property with other asset classes is problematic. He refers to this technique of valuation as the investment technique and confirms that there are two recognised approaches to valuing a property using the investment method: the income capitalisation approach using an All Risk Yield (ARY) and the discounted cash flow (DCF) approach using a target rate of return or a discount rate. Wyatt (2007:127) admits that the capitalisation method can be criticised for being backward-looking due to its reliance on historical market data, but argues that the method still involves forecasting, "*it is just that future expectations are encapsulated in the yield choice*". He concludes that the capitalisation approach is a more reliable investment valuation method since it is purely based on market-derived data. He puts forward that this approach is widely used to value properties with "*stable, fairly predictable income flows and with ample comparable evidence to hand*". This qualification is important since he admits that there is growing concern about the suitability of the method as lease structures becomes increasingly diverse, thereby decreasing the comparability between properties.

By tracing the development of the capitalisation and other derivatives of this method, the link with the financial discounted cash flow method can be observed.

Baum and Crosby (1988) set out to trace the development of investment valuation methodology in general. Their main focus was to show that valuation methodology started out as rational and logic by being linked to other investment markets, but then

regressed into irrationality devoid of logic by linking the value of property to that of other property through the process of comparable sales analysis.

They divide the development of valuation methodology into roughly three periods:

- 1884 – 1933
- 1943 – 1962
- 1962 to the current date

They furthermore showed how investor expectations influenced and changed valuation methodology during the periods prior to 1960 and post 1960. Baum & Crosby (2008) ascribed the stability in valuation models in England before the 1960's to the absence of inflation or inflation expectations, putting the 1960's forward as a watershed period in valuation approaches in England. They further showed that basic economic indicators suggested that there was little or no perception of the effect of inflation on investment returns. Inflation was viewed as being a cyclical event or triggered by "shock"events such as WWI, 1914 – 1918, when prices doubled, just to fall by a third during the 1920's to again rise by a third during WWII and was therefore not viewed as a risk factor to be incorporated in times of economic stability.

They concluded that it was the inability and unwillingness of the valuation profession to move with the changes in investor expectations which finally led to severe criticism of the profession and valuation methodology following the first large property crash of 1973 in England. This event triggered a renewed debate on valuation methodology, favouring yield construction (DCF approach) above yield analysis (sales comparison approach). Unfortunately the debate was more on the academic level than on the practicing level where some of the outdated methods are still applied to the valuation of income property.

In order to understand the evolution of valuation methodology the types of property ownership and their income levels need to be defined:

1. Freehold properties let at the current market rental rate, also called rack-rented freeholds,

2. Freehold properties let at below the current market rental rate, but which will revert to the current market rent at the time of the rental review. Such a property was known as a "reversionary freehold", and
3. Lease-holds.

Following is a brief discussion of the development of valuation methodology according to the time periods as put forward by Baum and Crosby (1988 & 2008).

2.2.1 Period: 1884 – 1933

A publication dating from 1884 entitled *The Appraiser, Auctioneer, Broker, House and Estate Agent, and Valuer's Pocket Assistant* by C Norris (Baum and Crosby, 1988) put a single rate calculation forward as the method of valuation for all three types of property occupation. It was reasoned that for every reversionary freehold there must be a leasehold which value corresponds to the difference between the rent paid and the rack rent, or simply, the difference between the value as if freehold and the value as if reversionary freehold.

Norris and other authors (Curtis, Smith & Davies) quoted by Baum and Crosby (1988) placed property on par with other investments and compared property with undated government bonds, bringing the capitalisation rate in line with the rate of consoles (undated gilts).

Baum and Crosby (2008) summarise and link the capitalisation approach of the early 1900's to the DCF method of the valuation of freehold property by mathematically equating a one year capitalisation valuation to a discounted cash flow valuation with an undefined time horizon.

A later textbook published in 1908 by Davies entitled *Curtis on the Valuation of Land and Houses* introduced a dual rate approach to the valuation of a reversionary freehold property, known as "term and reversion" (Baum and Crosby, 1988). The only justification offered for the change in approach being the perceived differences in risk between the two income streams. The contractual rent was assume to have lesser risk on account of the rent being below the market rent, while the market rent was an estimated amount and therefore uncertain. In order to accommodate the differences in risk, a lower

capitalisation rate was applied to the contractual rent than to the reversion rent (Baum & Crosby, 2008). Baum and Crosby (1988) however observed that although the dual rate approach was propagated in the textbooks, valuation reports from the time indicated a continual use of the single rate approach. By the seventh edition of the *Curtis on the Valuation of Land and Houses* textbook in 1933, the practice seemed to be established that the valuer should form his or her opinion on the capitalisation rate from the records of the property market (comparable transactions), yet in relation to the place of property within the investment market.

This view that the capitalisation rate / discount rate of the income should be in relation to the return in other asset markets are in line with investor's expectations of the period. Baum and Crosby (1988) gives an extensive overview of the economic conditions of the period between 1910 to 1940 and the property market of Nottingham in order to illustrate the ruling investor's expectations of that period. In the third edition (Baum & Crosby, 2008) this overview is summarized as follows:

The key identifier of the economic context was the absence of inflation and more importantly the absence of an expectation of inflation. The direct effects of this on property investments were:

- Low rental growth as supply and demand were the only drivers of growth, and
- Property was viewed as low risk, long term investments, comparable to long term government bonds.

This view on the property market remained virtually unchanged as long as the economic context remained static until the period from middle 1940 to middle 1960.

2.2.2 Period: 1943 – 1962

The changes to valuation models before the Second World War and after the Second World War are at first glance not that noticeable. The first change was on the practical level; it was only after the Second World War that valuation reports of the time started to indicate the use of the dual capitalisation rate / term and reversion model (Baum and Crosby 1988).

The second and more significant change noticed was coming from the text books on valuation practice at the time and involved the yield choice. Again, Baum and Crosby (1988) goes to some length in detailing the subtle changes which took place. It can be summarised as follows:

Even though the theoretical background to the derivation of the capitalisation rate was established, namely that investment in property is to be linked to returns on other investments with similar risk profiles, there was a noticeable change from yield construction to yield analysis. It was this change in the approach to yield choice which Baum and Crosby (1988) labelled as a move from a rational and logic approach to irrationality devoid of logic by linking the value of property to that of other property through the process of comparable sales analysis.

2.2.3 Period: 1962 to the current date

Despite the pre- and post-Second World War changes, the history of the development of valuation methods in England can be divided in a "before the 1960's" and an "after the 1960's" period (Baum & Crosby, 2008).

In England, up until the 1960's, commercial properties were typically leased over long periods of up to 42 years with no or only occasional rent reviews. Negotiations with new tenants were focused on securing an as long as possible occupation with no reviews. Prospective tenants offering good covenant were even offered renewal options at a constant rental rate. The possibility that rental income could come down or the effect of inflation were seemingly of little concern. Investments in commercial properties were viewed as low risk investments and consequently the rate of return was closely linked to similar low-risk investments such as government long-dated bonds, known as gilts. Property market risk was discounted by adding 1.5-2% to the redemption yield rate on long-dated gilts thereby establishing long-dated gilts as the benchmark for property returns and equating the capitalisation rate to the investor's target rate of return (TRR). This view on the yields is confirmed by the analysis of comparable sales during that period (Baum & Crosby, 2008).

Baum & Crosby (2008) ascribed the stability in valuation models in England before the 1960's to the absence of inflation or inflation expectations, putting the 1960's forward as a watershed period in valuation approaches in England. They further showed that basic economic indicators suggested that there was little or no perception of the effect of inflation on investment returns. Inflation was viewed as being a cyclical event or triggered by "shock"events such as WWI, 1914 – 1918, when prices doubled, just to fall by a third during the 1920's to again rise by a third during WWII and was therefore not viewed as a risk factor to be incorporated in times of economic stability.

However, during the latter part of the 1950's bond rates started to rise indicating that the effect of inflation was being factored in. As inflationary expectations began to take effect investors started to pay less for fixed interest investments and more for property and equities thereby pushing bond yields up and property yields down, creating the so-called "reverse yield gap". Also, after the 1960's a period of limited supply of commercial and industrial properties and changes in macro-economic policies caused a rapid increase in rental rates (Wyatt, 2007; Sayce et al., 2006).

Inflationary expectations also affected rental rates which saw a reduction in the rent review periods from 21 years to 14 years, then to 7 years and finally to 5 years in the early 1970's. Rental review periods for small, or so-called secondary tenants (as apposed to "blue chip"tenants), were set at three years and in some cases even annually (Enever & Isaac, 2002). Eventhough there was also a decrease in rental periods, UK leases are still some of the longest in the world (Baum & Crosby, 2008).

Since the 1960's property was increasingly viewed as a growth investment and valuation techniques had to adjust. Instead of forecasting rental growth, the capitalisation rate was lowered to below the TRR to imply future income and capital growth expectations and so doing the capitalisation rate was finally disconnected from its benchmark, the long bond (gilt) rate. The capitalisation rate was from now on to be determined by the comparable method only without some regard to its relation to other investment assets as was still the case in the pre-1960 era.

A new method, the so-called "Layer" method, also arose during the 1960's and 1970's in order to cope with the changing economy. Whereas the "Term and Reversion" method

made a vertical slice in the cash flow to separate the term income from the reversionary income, the Layer method slices the cash flow horizontally creating a "low risk" bottom-slice or core income into perpetuity and a "high risk" top-slice income for the duration of the term. Two events led to the use of the Layer method: In the 1960's a change in British capital gain tax legislation led valuers to seek a method which could identify the capital gain element of the reversion. Secondly, the rental freeze imposed in the UK during the early 1970's popularized the Layer method even further since it affords the valuer to differentiate between the fixed contractual rent "in hand" and the uncertain rental value at reversion. This method kept on being popular even after the relaxation of the rent freeze. Baum and Crosby (2008) reported that a survey conducted by Crosby in 1991 of valuation methods used among British valuers indicated a high level of popularity of the layer method among the group who entered the profession in the early 1970's.

Baum & Crosby (2008) argues that the adaptions to the existing pre-1960's valuation models disconnected the valuation of income property from other investment markets by changing the capitalisation rate from a rate of return to purely a unit of comparison.

The great divider between the pre-1960's and post-1960's period is inflation and the DCF method of valuation is found to be the most suitable to take the effect of inflation over the life of an investment in a property into account (Enever & Isaac, 2002).

Furthermore; the increase in multi-tenanted properties, the diversity in lease contract terms and sometimes scarcity of sales, renders the income capitalisation method inadequate. As a result there is a move to property valuation methods that focus more explicit on the TRR of the investor, the expected flow of income, expenditure and capital growth. The discounted cash flow (DCF) method of valuation uses an established financial modelling technique that allows comparison between property and other forms of investment thereby anchoring property as an asset class comparable to other asset classes.

It was perhaps the changing expectations of investors which accelerated the transformation in valuation approach the most. Investors relied on valuers to guide them in investment decisions and with the market crashes in the UK in 1973/1974 and again in 1990 when properties were sold below the values suggested by valuers, leading to losses

on the part of bankers and investors, valuers and their methods were blamed for the losses.

Some commentators on these market crashes did not mince their words in criticising the valuation profession:

In England, Plender (1982) criticised the British banking system for being too reliant on the opinion of property valuers.
In Australia, Boyd (1995:59) commented as follows*:* "*The inability of valuers to forecast future changes in the market and the lack of consistency in valuations have been strongly criticised by clients of valuers*"

In the United Kingdom the use of growth-explicit valuation modelling was only started to be considered by a small number of leading property valuation practitioners in the mid to late 1980's. Recessionary market conditions in the early 1990's convinced most leading investors and investment advisors to undertake DCF analysis in addition to market valuations which were based on the more traditional approaches to valuation. It was especially the publication of a book by Brown, *Property Investment and the Capital Market* in 1991 which encouraged property practitioners to consider alternative approaches to the valuation of investment property. The first edition of Baum and Crosby's book Property Investment Analyses in 1988 provided valuers with an analytical framework for using cash flow analyses in property valuation. A joint paper published by the Investment Property Forum and the Royal Institute of Cartered Surveyors in 1997 supplied further momentum to the use of alternative methods of valuation so that by 2000 the use of DCF methods of valuation were accepted at large by the commercial property industry. In the USA and Australia DCF is widely recognised and used as a valuation method with the Australian Institute of Valuers and Land Economists having even drawn up a standard for DCF appraisals (Sayce et al., 2006:). As early as 2001 Sweden and The Netherlands obtained more than 10% of valuations by means of the DCF method out of the seven European countries which submit data to the IPD (Gunnelin et al., 2004).

Boyd (2003:4) reflects on the use of DCF techniques of valuation during the 1960's and 1970's, recognising that the reason for the critisism leveled against the method was more

because of the "*unprofessional use by valuers who did not fully understand the process and did not effectively communicate the nature of the exercise to the client. The user was more to blame than the approach itself."* However, he identifies the 1990's as the period of the revival in the use of the DCF approach, calling it a "second generation" DCF approach, one which focuses on risk analysis by identifying the accuracy of the input variables. The new generation approach places the emphasis on simulating the most probable cash flow scenarios by using market evidence and a more thorough understanding of micro and macro-economic forces.

2.3 Complexity

One of the reasons why many valuers still hold on to the more traditional methods of valuation is the perceived simplicity of such methods.

The DCF approach can appear to be more cumbersome. Wyatt (2008) acknowledges that the DFC method is criticised for the apparent lack of market-supported evidence for the estimation of some of the key variables used in the construction of a cash flow analysis. Boyd (2003) emphasises a thorough risk analysis of input variables together with sensitivity and scenario analysis of discount and reversion rates. This approach of a more scientific analysis of data and data trends as well as sensitivity and scenario modelling can be a daunting challenge to especially older valuation professionals who were trained in the pre-1990 and even pre-2000 era.

Baum and Crosby (2008) recognise the complexity of the DCF approach with respect to the level and complexity of the information required and question whether the valuer is at all equipped to undertake an investment appraisal. They answer this question as follows "*It is difficult to see why not?*" supplying the following reasons:

- Forecast data on market and property cycles can be purchased from specialist analysts,
- The market valuation and the investment appraisal processes are very closely connected, and

- The DCF approach to valuation has been taught for a number of years with a more recently added focus on the mechanics of forecasting through econometrics modelling.

These comments are however made with relation to the UK and European valuation industry.

In order to identify the complexity issues and challenges in access to financial and market data, the DCF model will be discussed and key input variables identified for further discussion.

2.3.1 DCF Model and Key Variables

Discounted Cash Flow analysis includes a range of variables and input data which in essence is an unbundling of implicit yield and capitalisation rates used in traditional valuation methods while being able to deal with more complex structured rental contracts. Waytt (2007) asserts that in essence the DCF approach removes the growth element from the One Year Capitalisation approach and puts it into the cash flow, thereby re-establishing the relationship between the target rate of return from an investment in property in comparison with returns from other investments, as was the case during the pre-1960 era when rental growth was negligible. Furthermore, in unpacking the implicit assumptions of a traditional valuation, the DCF approach enables the valuer to consider whether they are in line with the investor's view of the market (Sayce et al., 2006).

Mathamatically the DCF method is represented as follows:

$$V = \sum_{t=1}^{n} \frac{(H - D - U - F - I)_t}{(1 + \mathrm{p})^{\mathrm{t}}} + \frac{\mathrm{NOI}_{\mathrm{n+1}}}{(1 + \mathrm{p})^{\mathrm{n}}}$$

Where:

V = Present value / Market Value	H = Rental income	D = Operating costs
U = Maintenance costs	F = Property tax	I = Capital expenditures
R = Residual value	t = Time variable	n = Analysis period
p = Discount rate		

Although many variables can be identified, there are a few key variables which have been identified as having a greater impact on the outcome of a DCF valuation (Wyatt, 2007). The other variables are all related to these key variables and are fairly straight-forward to quantify once these key variable have been identified. The key variables are as follows:

- Rental rates,
- Rental growth rates,
- Discount rate, or the target rate of return, and the
- Exit yield.

Foundational to a good DCF valuation is the pincipal of market-supported forecasting (Appraisal Institute, 2008). The following are typical forecast categories to be addressed in a DCF model:

- Current market rental rates, lease expiry dates and expected rental rate changes,
- Lease concessions and their influence on market rent,
- Renewal options,
- Existing and anticipated expense recovery provisions,
- Tenant turnover,
- Vacancy losses and collection allowance,
- Operating expenses,
- Net operating income,
- Capital items including leasing agents commisions and tenant improvement allowances,
- Reversion capitalisation rate, and
- Discount rate.

Sayce et al. (2006) suggest that the DCF calculation be broken down into three primary areas:

- **Holding Period**: Also known as the time horizon; all DCF's must be carried out over a specific time.
- **Cash Flows**: For the duration of the holding period all cash flows must be estimated. The cash inflows and outflows can be building and use specific and can include, but are not limited to the following:
    - Current contractual rental,
    - Contractual rental escalation rates,
    - Estimated future market rental rates,
    - Estimated future market escalation rates,
    - Vacancy losses,
    - Building expenses, such as repairs and maintenance, taxes and utilities,
    - Value of the cash flow at the end of the holding period, also known as the terminal value. This value is based on the assumption that the property will be sold at the end of the holding period. This value is based on the capitalisation of the income at the end of the holding period by using an exit yield.
- **Discount Rate**: This rate will represent an individual investor's requited rate of return for the property, including an allowance for specific (property) and systemic (market) risk.

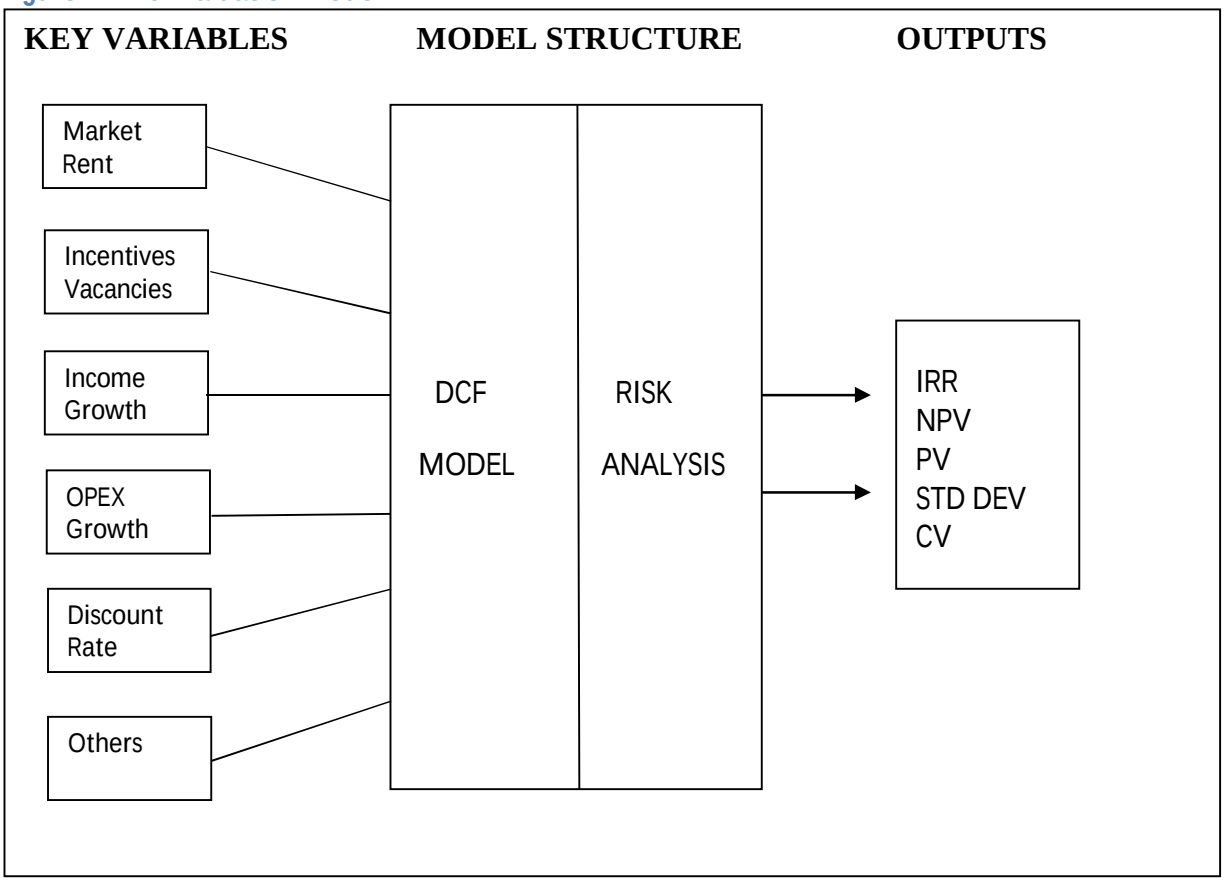
These primary areas can be further broken down into the DCF valuation model elements which can then be used to determine the key input variables:

- **Background Information:** relating to the property, for example, title deed information and local government information,
- **Known values:** as gathered from the rent roll, for example, rental areas, current rental rates, escalation rates, expense recoveries, etc.,
- **Variables:** for example market rental rates and escalation rates, market vacancy rates, the required rate of return, exit valuation capitalization rate, vacancy rates,
- **The analysis period:** the length of the holding period. The longer this period the greater the degree of uncertainty in the determination of future cash flows,

- **The cash flow periods:** under the use of traditional methods, the rent was assumed to be quarterly or yearly in arrears, in reality, rents are paid quarterly or monthly in advanced. The DCF model will have to be set up to reflect the reality of frequency and timing of the cash flows,
- **The net cash flows:** these represent the inflows minus the outflows and are also known as the net operating income (NOI).

Boyd (2003:6) proposes the following visual representation of the DCF valuation model:

Figure 2.1 DCF valuation model



Source: (Boyd, 2003)

In structuring a DCF model Boyd (2003) emphasizes the following three key elements: Firstly, the timing components on the cash flows. Secondly, the terminal or exit value calculation, and thirdly, the effective rates of return.

Boyd (2003) further concludes that the following key input variables, which correspond with the view held by Wyatt (2007), have the most profound effect on the accuracy of the DCF analysis: Firstly, the rental growth over time, secondly, the discount rate, and finally the terminal value.

Baum and Crosby (2008) categorize the inputs to a DCF analysis as the Income / Value Inputs as well as the Cost Inputs while categorizing the sources of the inputs as both Client Specific and Market Specific. The Market Specific data is further subdivided by them as being either Current or Forecast.

Baum and Crosby (2008) summarize the information required for a typical DCF analysis according the following matrix:

Table 2.1 DCF analysis matrix

Type of Information	Current Information	Forecast Information
Value	ERVs of both existing building and any prospective changes to the building in the future. Rent Passing	Rental value forecast. Rental depreciation rates Exit capitalization rate forecast for existing or replacement buildings.
Building	Size Cost of maintenance Nature of prospective redevelopment or refurbishment and costs.	Changes in building costs. Timing of redevelopment or refurbishment.
Current Leases	Number of tenants. Lease expiry or break dates. Rent revision dates and type. Renewal rights/options.	Incidences of future breaks and renewals. Voids and future lease incentives.
Holding Costs	Management Costs. Rent revision costs. Purchase and sales costs.	
Other information	Discount rate. Taxation Loans: Interest and Payments. Holding Period.	

Following is a review of the key input variables and cash flow components:

Timing components

The timing components in the structuring of a cash flow analysis comprise:

- The holding period or the duration of the study,
- The time intervals or the cash flow periods,
- The positioning of the cash flows within the cash flow periods.

Holding Period

The choice of holding period has a direct impact on the risk of fluctuations from predictions of future economic and property trends as well as an error in the selection of the exit variables. The choice of holding period is normally client specific and can range from three years to up to fifteen years. As a rule of thumb large institutional investors have longer holding periods than niche investors. Investor – developers are normally more interested in capital returns and will only hold on to a development untill it is fully occupied and the cash flows have stabilized. Other factors influencing holding periods are: the length of the lease contracts and the quality of tenants; physical nature of the property in terms of depreciation factors and redevelopment potential (Wyatt, 2007:361).

The choice of holding period will be influenced by the most advantageous disposition year. Since the net operating income of the year following the year of disposition is used to calculate the reversion value care should be taken that this year will represent a stabilised level of NOI. Sensitivity tests are helpful in this regard. Also impacting on the choice of holding period is the lease expiring profile of the tenants as this will influence the stability of the NOI in the year following the disposition year (Willison, 1999).

In the UK a holding period which coincide with the lease term or rent review periods are used. Although this can range from 5 to 20 years, the current norm is 10 to 15 years (Baum and Crosby 2008:66). In the USA 10 year holding periods are used (Appraisal Institute, 2008:541) and in the Netherlands 20 year holding periods are not uncommon (Sayce et al. 2006). In South Africa holding periods of between 5 and 10 years are commonly used.

Cash Flow Periods

These can be monthly or yearly periods, however, monthly intervals are considered to be more accurate since this reflects actual practice as rents are normally paid on a monthly basis. Although the majority of literature consulted indicate no preference, a study conducted in Australia concluded that monthly cash flow periods are more accurate than yearly cash flow periods (Boyd, 2003). Sayce et al. (2006) also supports cash flow periods which reflects the actual cash flows of the property under study.

Positioning of the cash flows within the cash flow periods

The position of the cash flow within the cash flow period can have a significant influence on the final value of the cash flow analysis especially when one year cash flow periods are used (Boyd, 2003). The traditional approach to the position of the cash flow is either the "in advance" or "in arrears" options. However, the "in arrears" option implies that for the first year after the purchase date of the property all the income and outgoings occurred only at the end of that year. To compensate for this anomaly some practitioners started to use the "mid-point" of the time interval which is a more realistic approach when using one year intervals where income is received on a monthly basis.

A case study using the in advance and in arrears approach for annual cash flow periods indicated a 9.1% difference in resultant values (Boyd 2003). Boyd (2003) concluded by stating that the use of the in arrears option together with one year cash flows intervals results in an inaccurate representation of market value.

Cash Flow Components – Finding Net Operating Income

The cash flow over the holding period comprises inflows and outflows, however these are not static and are subject to increases and decreases. For every cash flow item there are market factors influencing the rate of increase and decrease and the forecasting of these market factors and their influence on the rate of increase or decrease must be determined from available market evidence.

Cash Inflows

The most basic form of cash inflow from an income property is rent received from the tenant or tenants, in the case of a multi-tenanted property. Rents are typical received for the following:

- Floor area rental (Office, Commercial & Industrial), and
- Parking

In applying the rental income component to the cash flow model, the analyst is faced with the following challenges:

- Identifying market rent,
- Identifying the relationship between the contractual rent and the market rent,
- Forecasting future rental rates,
- Forecasting the growth in future rental rates, And
- Vacancies and collection losses.

Relationship between the contractual rent and the market rent

The supply of land can be considered to be fairly fixed over time. The supply of improvements with a given use and with certain specifications are however not fixed over time. This adds a dynamic of change to the principle of supply and demand and the interaction with rental levels. Improvements to property change over time not only as a result of replacement, but also of refurbishment. Replacement and refurbishment are again linked to amongst others the availability of finance and planning consent and the economy in general (Sayce et al., 2006). So, although the total stock of available floor space in a certain market seems to be static, there is movement in the short, medium and long term which will influence supply and demand and ultimately rental rates.

The practical outplay of a tenant's ability to pay, and market supply and demand forces in its influence on a cash flow, can be illustrated as follows:

At a time of high tenant demand a property owner may be able to set and achieves a rent that is in fact above the ability of the would-be tenant's economical ability to pay, for the short term at least. The actual market rent that the tenant will be able to afford is a

combined function of his / her ability to pay and the level of market supply in the rental market. The level of rental income received by the building owner is therefore viewed as more risky than the "normal" market rental rate. The inverse would be the case where there is an ample supply of space affording the would-be tenant to pay less than his / her economic ability. Under such circumstances there exists the potential for rental growth to the level of equilibrium between tenant's affordability and supply and demand.

Baum and Crosby (2008) quote two studies (Fisher and Lentz, 1990 and Crosby 2006c) which indicate that tenants, in order to secure continued occupation, are more willing or rather have no other option but to renew to above market rates when existing leases with no renewal options expire.

The valuation professional should be able to understand these concepts of economical rental value to be able to recognise any risk elements associated with rental rates reflected on rent rolls.

Identifying Market Rent

Sayce et al. (2006) put three methods forward for the assessment of market rent:

1. Comparable transactions,
2. Trading potential, and
3. Cost.

Comparable Transactions

The principle of comparison is underlying to the process of rent establishment (Sayce et al., 2006; Waytt, 2007). For the most accurate assessment the comparison is to be based on similar properties and transactions in the same sub-market (Baum and Crosby, 2008). The following attributes are therefore to be taken note of when investigating market rents:

- Size and configuration,
- Quality and type of accommodation,
- Condition,
- Location,

- Covenants of lease
- Date of commencement.

Since property is highly heterogenic the perfect comparable does not exist. This leads to the principle of adjustment whereby the valuation professional compares the market evidence to the subject property and by applying justifiable adjustments to the market evidence arrives at a reasonable rate for the subject property. Not all market evidence, however, is adjustable, not only as a result of the heterogeneity of property, but also because rental leases are individually negotiated, each with a unique set of options and caveats. For market evidence therefore to qualify for adjustment they must be:

- Recent,
- Relevant,
- Accurate (reflect the full position),
- Capable of analysis.

The establishment of market rent can be problematic in "thin" markets where there are limited rental properties. In such cases the valuer can revert to using "out of pocket" comparable properties or older data with the necessary adjustments.
However, there can be cases where there is a total lack in comparable data, especially in markets where the predominant use of the surrounding properties differ from the subject property. The rental data for the alternative use can then be used with the necessary adjustments.

Trading Potential

This method is useful for rental determination of trading properties such as hotels and other leisure properties. Since these types of properties are traditionally owner occupied there are limited rental data available. The rental rate can be calculated by applying a residual method whereby the net operating profit from the business is calculated and then split between a rental portion and an entrepreneurial portion.

Cost Approach

This approach is normally undertaken for management accounting purposes and is a pure accounting exercise. It is only applied to specialized properties which very seldom transact in the open market or where the business or enterprise is normally sold with the property.

Future Rental and Rental Growth Rates

The forecasting of future rental rates and rental growth rates are important both in the estimation of the cash flow and in the prediction of the resale value (Baum and Crosby 2008).

Baum and Crosby (2008) point out that an important element of rental forecasting is the effect of depreciation on the rental value with the passing of time. It is therefore important to keep in mind that data published on growth rates of market rental is net of depreciation but is also an average rate in perpetuity. This is because the rate of depreciation is property specific.

Due to the influence of depreciation Baum and Crosby (2008:70) suggest a two-tier approach in rental forecasting whereby the property is viewed as "frozen" in perpetuity, that is, depreciation is ignored at first and dealt with separately.

1. **The "frozen" view**: Baum and Crosby (2008) suggest three possible methods in forecasting future rental rates:

    a. **Extrapolation of time series data** whereby historical rates are analysed in order to identify long term trends in rental values. Cyclical patterns and non-recurring influences are to be identified and the trend line smoothed in order to create a straight line which can be extrapolated over the holding period under analysis.

    b. **Identifying casual relationships.** This approach is slightly more complicated. It involves the identification of a relationship between two variables, say between the vacancy rate and rental rates. A hypothesis is then formulated

which can state that a rise in vacancy rates is followed by a fall in rental rates. The magnitude of the movement in rental rates to a corresponding change in vacancy rate can also form part of the hypothesis. This relationship is then tested by using statistical tests of data to indicate the strength and relationship between the two variables. If the correlation is high and the corresponding rates in change are found to be true, a simple set of calculations can conclude future rental values and the rate of change in rental value.

c. **A combined approach.** This is the most common approach to rental forecasting whereby the valuer adjust the extrapolated values to reflect informally related influences. These related influences can include the number of similar properties under construction in the area which will influence the supply and demand equilibrium, rising or falling vacancy rates, and any other economic indicators. Forecasting reports by professional analysts on the national and regional economy can be of assistance to the valuer in this regard.

2. The effect of depreciation

The effect of depreciation is complex since the rental income is observed to steadily increase even as the building ages (Baum and Crosby, 2007). This can be because either the escalation in rental income is higher than the effect of depreciation or because the value of the site increases faster than the depreciation of the building.

The depreciation of a building can be divided into the following parts (Appraisal Institute, 2008):

- Physical deterioration,
- Functional obsolescence, and
- External obsolescence.

The physical deterioration of a building is normally a function of the maintenance and is curable under normal conditions. Functional obsolescence is more difficult and more costly to cure since it involves the design elements of the building such as size and lay-out of offices or open areas, material used for the finishes of the building which became outdated, etc. There are five types of functional obsolescence:

- Curable functional obsolescence caused by a deficiency requiring an addition (by means of the installation) of a new item,
- Curable functional obsolescence caused by a deficiency requiring the substitution (by means of replacement) of an existing item,
- Curable functional obsolescence caused by a super-adequacy that is economically feasible to cure,
- Incurable functional obsolescence caused by a deficiency, and
- Incurable functional obsolescence caused by a super-adequacy.

External obsolescence is normally not curable since it is caused by factors outside the property. They can however be either temporarily, such as market oversupply, or permanent, such as proximity to an environmental disaster (*ibid*).

The physical deterioration of a building can to some extent be forecast and the effect on the cash flow can be factored in through either an adjustment to the rental income or a large capital expense. Functional and external obsolescence can however not always be foreseen over the cash flow period. Unless there are already tell-tale signs of this type of obsolescence they are viewed as uncertainties and can therefore not be taken into consideration (*ibid*).

The rental income can be adjusted as follows to account for the effect of depreciation:

$$\text{Depreciation factor} = (1 + g)/(1 + d)$$

Where g = the annual rate of rental growth of new buildings

d = the annual rate of depreciation.

Studies of depreciation rates in London in the UK indicated an annual rate of 1% - 2% for office and industrial properties (Baum and Crosby, 2007).

There are however two methods available for estimating anticipated depreciation:

1. The first method is an empirical approach. The market rent for the subject property can be compared with the market rent for a similar, but newly constructed building. The difference in rent is an indication of the effect of depreciation. By annulising the difference in rent over the age of the subject property, the rate of depreciation can be determined.
2. The second method is a theoretical approach. The value of the building and the land is separately calculated upon which the building value is depreciated over the lifespan of the building. The resultant rate of depreciation can then be applied to the rental income.

Vacancies and Collection Losses

A distinction is to be made between the maximum potential income a property can earn when fully let and the actual income, or the gross effective income, a property can earn. The difference is a function of the vacancy rate and collection losses.

The following definition appears in the standard appraisal handbook used across the USA:

A deduction from potential gross income (PGI) made to reflect income reduction due to vacancies, tenant turnover, and nonpayment of rent; also called vacancy and credit loss or vacancy and contingency loss (Appraisal Institute, 2008:484).

Wincott, (1997) did excellent work in consolidating and structuring the theoretical and practical difficulties ascociated with vacancies and collection losses when constructing cash flows. The following discussion is largely based on his research.

Wincott (1997) differenciate the following elements of vacancy:

- Frictional vacancy,
- Structural vacancy,
- Absorption vacancy, and
- Credit loss.

Frictional vacancies refer to vacancies caused by tenant relocation when leases expire. Structural vacancies refer to vacancies caused by difficulties inherent to the property or a specific space which management leaves vacant in order to accommodate the expansion of existing tenants. Absorption vacancy is also known as the natuaral vacancy rate in South Africa and refers to property specific occupancy levels to achieve the stabilized/equilibrium vacancy rate, while credit loss is an allowance made for the nonpayment of rent due to default or even expense reimbursements as part of a negotiated lease agreement.

Underlying to the vacancy rate of properties in a specific market is the relationship of supply and demand of rental space in that market which is to a large extent driven by the property cycle and ultimately the economic cycle. A simple example is as follows: In markets with over supply, rental rates can drop to a level where occupiers of C-grade accommodation can afford A-grade accommodation with the result that movement will occure towards the A-grade accommodation. This can lead to a drop in the vacancy rates of A-grade accommodation and a simultaneous rise in the vacancy rate of C-grade accommodation. When supply and demand change again a reverse in the movement of A-grade to C-grade accommodation is noticed. (Wincott, 1997).

The stabilised/equilibrium vacancy rate or the natural vacancy rate is the long term vacancy rate as observed over a period of at least one property cycle. This rate can differ from the published long term rate for a specific area as each property within that area will have its own specific rate. The building specific rate should be available from the owner or building management company. This rate forms the basis in the use of the direct capitalisation method of valuation whereas in the DCF analysis the various elements are treated separately (Wincott, 1997).

When analysing the cash flow using the DCF approach the following should be addressed (Wincott, 1997):

- Current vacancy / occupancy rate,
- Tenant retention rate,
- Downtime between leases,
- Typical lease term,

- Average remaining lease term,
- Structural vacancy,
- Equilibrium vacancy rate to be applied in the reversion sale price.

Cash Outflows

The second component of the cash flow is the cash out flows, better known as the property expenses or operating expenses and includes all expenses incurred in owning a property. A large proportion of these expenses can be recovered from the tenants and are to be shown in the cash flow calculation as an inflow under the heading “Recoveries”.

Operating expenses can be divided into three categories (Appraisal Institute, 2008): Fixed expenses, variable expenses, and a replacement allowance. Fixed expenses comprise of municipal property rates and building insurance cost whereas variable expenses can include, but are not limited to management fees, utility costs such as water, electricity and sewerage, salaries and wages of building staff, cleaning, maintenance and repairs to building and property, leasing commissions, security, and waste removal. Replacement allowance can be dealt with in one of two ways, depending on the local practice. It can either be dealt with as an explicit or capital expense showed in the cash flow at the time when it is to take place, or it can be averaged and allowed for as a monthly or yearly expense. In order to receive market rentals a building or a certain rental area in a building needs to be re-fitted to suite a specific tenant. This type of expense is known as the tenant installation allowance and is incurred at the start of a new rental agreement.

2.3.2 Discount Rate

The correct valuation of a property depends on the ability to express the future economic benefits, typically in the form of a cash flow, in terms of its present value (Wyatt, 2007). Baum and Crosby (2008) asserts that the valuation or appraisal of all investments assumes that the current value is equal to the net present value (NPV) of the future benefits from the investments. The NPV is dependent on the determination of the most likely cash flow, discounted by the most likely discount rate. This discount rate can be equated to the return an investor will require in order to make an investment in property.

Hoesli & MacGregor (2000:11) combines the notions of the "time value of money"and the "present value"of a future income stream in order to develop the "required nominal return" for an investor to consider making an investment.

Time value of money holds that an amount of money received in the future is less valuable than the same amount received in the present. Hoesli & MacGregor (2000) propose three reasons for this as follows:

1. Money held in the present can now be spent and utility obtained, whereas this current utility is to be foregone when money in received in the future,
2. There is a risk that all or a part of the money can be lost in some way in the future, and
3. The presence of inflation can reduce the purchasing power of the money.

In order for the investor to invest an amount in the present in the expectation to receive a return in the future a rate of return is required which will compensate the investor for the above factors. This rate of return is therefore known as the required nominal rate of return or the hurdle rate and is mathematically expressed as follows (Hoesli & MacGregor, 2000:88):

$$R_N = RF_R + RP + i_e$$

Where: R_N is the required nominal return

RF_R is the real risk-free rate of return

RP is the risk premium (compensation for risk), and

i_e is the compensation for expected inflation.

The required rate of return or the discount rate incorporates both elements of minimum return and risk compensation.

The above statement equates the discount rate with the required rate of return which links the discounted cash flow method of valuation to the original purpose of that of a decision making tool (Baum & Crosby, 2008). The application of the required rate of return to a given cash flow will return the net present value which will represent the

maximum price at which an investor will acquire a property, thereby providing the investor with an indication of:

- The value of a property in order to make an offer,
- The value of a property in order to make a counter offer,
- The value of a property in order to determine the asking price.

It can therefore be seen that the determination of the correct discount rate is a key input variable in a discounted cash flow valuation.

The components of the required rate of return, or the discount rate, are shown above to be the real risk free rate of return (RF_R), the property risk premium (RP) and the expected inflation rate (i_e).

Most authors, i.e. Baum and Crosby (2008), Hoesli and MacGregor (2000), Sayce et al. (2006) and Brueggeman & Fisher (2008) agree that government long bonds, Gilts and U.S. Treasury Bills, are good proxies for the risk free rate (RF_R). The property risk premium (RP) is viewed by Sayce et al. (2006) as the amount by which the property returns should exceed the expected returns from the risk free rate. Hoesli and MacGregor (2000) uses the capital asset pricing model (CAPM) to determine the property risk, but qualify its limitations, while Baum and Crosby's (2008) biggest criticism against the use of CAPM is the general lack of data to calculate the beta for any given individual property. Baum and Crosby (2008) also give the use of the weighted-average cost of capital (WACC) as a possible method for calculating the property risk premium. They however criticise the use of this method on the basis that most investment companies owns several properties with different risk profiles which disqualifies the use of the WACC for a single property. Many investing institutions will also have difficulty in calculating their WACC as not many normally issue equity or borrow money. The method on which both Sayce et al. (2006) and Baum and Crosby (2008) agree, is what Baum and Crosby (2008:77) call "*an intuitive approach"*. This method employs the individual assessment of the risk factors pertaining to the property market, property location, tenant, lease, building and transaction cost. Sayce et al. (2006) go into much detail explaining the use of this method of risk premium assessment.

2.3.3 Reversion Capitalisation Rate or Exit Yield

Wyatt (2008) ranks the exit yield rate as one of the four most significant variables in the construction of a DCF model since a notional sale of the subject property is introduced at the end of the holding period. This sales value of the property is calculated by capitalising the estimated net rental income of the property at the end of the said holding period. Wyatt (2008) then gives some guidance as to how to determine the exit yield rate by stating that the yield should be higher than an initial yield rate. The difference should reflect the reduction in the remaining economical life of the subject property at the end of the holding period. If, however, an allowance for refurbishment has been made for in the cash flow during the holding period, this should be factored in when deciding on the exit yield.

Sayce et al. (2006:144) states that the forecasting of property yields is *"recognised to be an extremely difficult task*". They concur that the exit yield should be adjusted to reflect items such as the unexpired terms of leases, the increased age of the property and changes in market expectations as with regard to functionality. They caution however in the making of adjustments as this can lead to double counting of risks since the same factors are taken into account when deciding on the risk portion of the discount rate. As far back as 1993, Skolnik (1993) already questioned the practice of the American valuation community to adjust the exit yield rate to reflect future investment risk and aging of the subject property, reiterating that these factors are already included in the discount rate.

Baum and Crosby (2008:70) take a very pragmatic approach to the determination of the exit yield concluding that "*this may not be as large a task as it appears*". They firstly hypothesise that since property yields for the past century have been generally stable it can be expected that there will not be any drastic changes in property yields into the future. They therefore suggest that the current yield on similar properties of the age at which the subject property will be at reversion, can be used as the exit yield for the subject property.

2.3.4 Sources of data

Several of the input variables discussed above are collected by various roll players in the South African property industry and made available either in the public domain or to paid clients only. Although not every neighbourhood is covered by the existing publications general trends or parameters can be determined and further refined through "hands on" local research by valuation professionals.

The following publications can be used in conjunction with valuer's own empirical research:

- The *Rode's Report on the South African Property Market*, also known as the Rode Report. This publication by Rode & Associates (Pty) Ltd is a quarterly report and analysis on most sectors of the property market. It covers trends and levels of rentals and standard capitalisation rates by property type, grade, node/township, the listed real estate market, and building construction costs and building activity. It does not however cover the retail market. The panel method of surveying is used whereby individuals are asked to give their opinion on certain aspects of the property market.
- The Investment Property Databank (IPD) publish several reports on the South African investment property market:
    - IPD Property Investors' Digest,
    - IPD Retail Digest,
    - IPD Nodal Analysis, and
    - IPD Valuation Report.

  These reports are compiled from information supplied by property portfolio companies and are useful when valuing large buildings which might interest portfolio investors. These reports are however lesser helpful in the valuation of smaller properties with a more limited marketability.
- The South African Property Owners Association (SAPOA) publish the following reports which can also be of some help:
    - Office Vacancy Survey,
    - Industrial Vacancy Survey,

- Capitalisation and Discount Rate Survey,
- SA Property Market Trend Report,
- Retail Trends Survey,
- SA Property Index.

Apart from the data on the market in general, property specific information is obtainable from the rent roll and from the building owner and/or building manager. The operating expenses of a property can be found from previous financial statements prepared by the owner or building manager as well as building expense budget statements. Escalation rates of expenses are normally a function of the inflation rate and published information on foreseeable escalations such as utility budget statements. Replacement allowance is a function of the age and maintenance levels of the building. A new building will not need replacement of costly items such as air conditioning systems, painting, re-tiling, roof replacement, lift and escalator equipment in the foreseeable future. For an older building though provision must be made based on the remaining useful life and level of maintenance for these items.

South Africa does not have a central register of property rental transactions that valuers can access to obtain comparable rental information. The valuer therefore needs to rely on his / her detective skills. Sources for local information can include:

- Rental and sales agents operating in the area,
- Other valuers who also work in the area, and
- Interviews with tenants and landlords in the immediate vicinity of the subject property.

2.4 Acceptance and Preference

The DCF method of valuation can be considered a recently introduced method. Parker & Robinson (2000) sight an unpublished doctoral thesis presented in 1972 at the University of Reading entitled "*Investment method of property valuation*" as the catalist for the rise of the DCF method in the UK. This places the official age of the method at a mere 40 years.

Although there is a paucity in research on the acceptance of the method, side remarks by academic writers on valuation methodology are of note. Baum and Crosby (2008:297), in the conclusion to their book made the following remark "*The models we favour appear to replace a tried-and-tested conventional implicit-yield model with a dangerously subjective contemporary explicit cash-flow model, forcing the valuer into the hazardous science of forecasting. We hope we have demonstrated that this is not so".* Sayce et al. (2006:16) admits that "*Untill recently in the UK, however, DCF was considered to be an analytical tool and not a valuation tool*" and "*the variance in end results from those achieved through conventional methods has resulted in considerable resistance amongst some members of the valuer community*". They are however quick to point out that the move towards the adoption of the DCF method is gaining momentum.

Parker & Robinson (2000), when discussing the history of the Australian discounted cash flow practice standard, points to a decision by judge Jacobs in the High Court of Australia in 1976 as the single most important event in that country for preventing the acceptance of the DCF method. It was only during the early 1990's, following a collaps in the property market, that the use of the DCF method was again promoted as a viable method of valuation. It took however a while for the Australian Property Institute (API) to publish practice standards and guidance notes on the use of the method with a widely accepted draft standard finally appearing in 1999.

Some writers also alude to the link between the educational level of the property professional and the preference for the DCF method. Baum and Crosby (2008) for example site a survey done in 1991 by Crosby which found a corrolation between the preference of the use of the horizontal sliced layer technique, a crude form of the DCF method, which became popular in the 1970's and valuers who entered the profession during the 1970's. Boyd (1995) conducted a survey of valuers in the use of valuation methodology and found a strong correllation between the use of the cash flow method and the level of valuation education of the professional.

2.5 DCF Education

Property valuation professionals need to be educated and trained in the theory, methodology and techniques of property valuation. The question is however: who or what determine the contents of the curriculum and who control the quality of the education? Cullana and Iona (2003) in a report on the education of property professional at the Massey University in New Zeeland state that they make use of regular feedback from students and the industry. They name the three professional bodies associated with the property industry in New Zeeland as being major stakeholders in the university's property courses in determining the curricula content while feedback from students and the industry are used to evaluate the quality of the curriculum and teaching. Boyd (2005), commenting on the education of property professionals in Australia also confirm the involvement of various stakeholders in the determination of curricula. He goes further by proposing a broader focus than only on valuation methodology suggesting a focus on the following outcomes: a sound understanding of the property discipline body of knowledge, the ability to analyse property market behaviour and the ability to communicate the analyses and understanding in an appropriate manner. The literature also pointed out some short comings in the education of valuation professionals. Callanan & McCarthy (2003) surveyed valuation and property management employers in New Zealand and found that graduates lacked practical skills and knowledge and the ability to relate theory to practice, as well as a lack of knowledge of building construction and property development. Weinstein & Worzala (2008) investigated newer post-graduate programmes and identified 11 key skills that should be included in programmes to enhance real estate practice. In one of the more recent studies, Poon et al. (2011) undertook a broad survey based study in the UK in order to identify the discrepencies between what employers expect of real estate graduates and the perceptions that real estate graduates have of what they have achieved during their studies, as well as universities' views of the content of RICS accredited real estate courses. In the study graduates and employers were asked to comment on 72 characteristics. The highest level of agreement was obtained form the question whether the graduate has acquired knowledge of valuation with graduates agreeing that they acquired knowledge while

employers strongly agreed that graduates need to acquire knowledge of valuations as part of their course.

No research was however found which dealt directly with the subject content of real estate programs taught at institutions of higher education. Only Parker & Robinson (2000), in their history of the Australian DCF practice standard allude to the text books used during the 1980's in the teaching of valuation methodology in Australia and in the UK, mentioning that the Australian text book contained three pages on the DCF method, whereas the UK text book contained 16 pages on the subject, including worked examples.

Evidence from South Africa

A search on GoogleScholar® reveals a paucity of academic debate in South Africa in the field of property with only a few publications noted, i.e. Chikafalimani & Cloete (2010), Cloete (2002) and Mooya (2010).

As in the case of the international literature no research has been done on the actual contents of valuation modules as presented as part of a qualification in real estate studies.

Although no direct evidence of DCF education was found in the literature review, some conclusions can be formed: The literature indicates that curricula content are to a certain extent controled through the feedback and involvement from property industry stakeholders. In South Africa the South African Council for the Property Valuers Profession (SAPVP) is mandated to accredit courses and programs deemed to be acceptable for the preparation of valuation professionals. It was observed from Section 2.2 that the use of the DCF method gained more prominence after 1962 and it can therefore be assumed with some certainty that education in the theory and use of the DCF method is included in all curricula which focus on the education of valuation professionals in South Africa.

2.6 Findings of the Literature Review

This section of the study seek to connect the research questions and objectives with the literature already available on the field of property valuation and more specifically the literature on the theory and use of the DCF method of valuation.

The literature review started out with an overview of the history of the development of the DCF method of valuation and found that the DCF method of valuation is a fairly new approach which came to the fore during the latter parts of the 1960's and early 1970's due to the inability of the more traditional methods to supply satisfactory results during unstable financial periods. It was further seen that although property investors were the first to make use of the method as a tool for decision making, the valuation fraternity was more reluctant to use the method as an approach to establishing the market value of property. The main thrust of opposition to the use of the method is based on the perception of complexity and can be summarized as follows: The traditional approach to the valuation of income generating properties relies in the use of a capitalisation rate which is established through the analysis of sales of comparable properties. Factors such as market growth rate, risk and future expectations are implicit in this single rate. By using the DCF method these factors are individually addressed as inputs in the calculation. Some authors reported the opinion among valuers that the process of establishing the inputs which relate to future market expectations and movements equate to "crystal ball gazing" and that they therefore disregard the method on this basis. This issue is however addressed by other authors in suggesting the use of sensitivity and probability scenarios in choosing future rates. The literature revealed therefore that there is indeed a level of perceived complexity attached to the DCF method of valuation.

The literature review then addressed the perceptions of complexity by focussing on the theory of the DCF method in general and the input variables in particular. The input variables were identified and discussed together with comments from various authors on how to calculate or determine each input variable. Although the various authors differ in their approach in establishing the magnitude of some of the input variables, they are in general agreement on which input variables are to be considered. Methods grounded in established market cycle theory, accepted statistical modelling and common sense were discussed for establishing inputs which reflect future market conditions. As part of the discussion on input variables, the literature review also focussed on the sources of information from a South African perspective. This discussion on input variables and sources of information addressed in part the third objective of the study. However, the actual access to information sources and the availability of additional sources not covered

in the literature review will be determined by means of data collected and analysed as part of this study.

The review then continued to investigate the literature on the reluctance to the acceptance of the method as well as the preference of use. The literature showed that this reluctance can be ascribed to various factors, i.e. in Australia it can be directly linked to a ruling in a high court which was interpreted as being opposed to the use of the DCF method. The literature also indicated a correlation between the education of a property valuer and the acceptance and preference of use of the method. This study will therefore also collect data and analyse it in order to determine the perceptions and acceptance of the DCF method among South African property valuers. Since the literature indicated a correlation between education and the use of the DCF method this study will collect and analyse data in order to determine the perceptions of South African valuers on their education in the use of the DCF method.

Moving to the actual education of property professionals the literature indicated no research done on the actual content of valuation courses. It does however indicate that in some cases valuation courses are developed in close association with valuation stake holders such as valuation professional bodies and the users of valuation services. In South Africa the SAPVP is mandated to accredit courses and programs deemed to be acceptable for the preparation of valuation professional. This study will determine which courses, with their respective curricula content, are currently accredited and will collect and analyse data from the lectures on the education of the DCF method within the respective accredited courses.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the research design and strategy, the data collection method and analysis.

The purpose of the research design is to connect the research questions to the data of the study (Punch, 2005). The general research question is: What is the general perception of the South African valuer towards the use of the Discounted Cash Flow method for the valuation of investment and income producing properties and can it be shown that the method has gained preference among the South African valuation community?

And the specific research questions following from the general question are:

1. Which methods of valuation are available for the valuation of income producing properties in South Africa and why are some methods preferred to others?
2. Is there a sufficient focus in the education of valuation professionals so as to give them a clear understanding of the principles behind the use of the DCF method?
3. Do South African valuers, as part of the perceived complexity of the DCF method, experience difficulties in accessing data and information needed as input variables in concluding a valuation based on the DCF method?

According to Jackson (2009) research has three basic goals: to describe behaviour, to predict behaviour and to explain behaviour. Closely linked to these three goals of research are then the research methods used by scientists. Jackson (2009) put forward the following matrix linking research goals with research methods as well as a brief summary of the advantages / disadvantages of each method:

Table 3.1 Research goal and method matrix

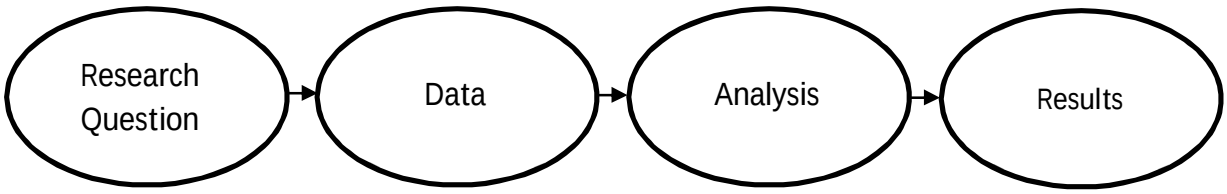
Goal	Method	Advantage / Disadvantage
Descriptive	Observational Method	Allow description of behaviour
	Case Study Method	Does not support reliable predictions
	Survey Method	Does not support cause-and-effect explanations
Prediction	Correlational Method	Allow description of behaviour
	Quasi-experimental Method	Supports reliable predictions from one variable to another Does not support cause-and-effect explanations
Explanation	Experimental Method	Allow description of behaviour Supports reliable predictions from one variable to another Support cause-and-effect explanations

Source: (Jackson, 2009:19)

This matrix will be used to inform the choice of research method for this study.

The conventional model of the research process represents the four principle research components in a linear way as follows (Bergman, 2009):

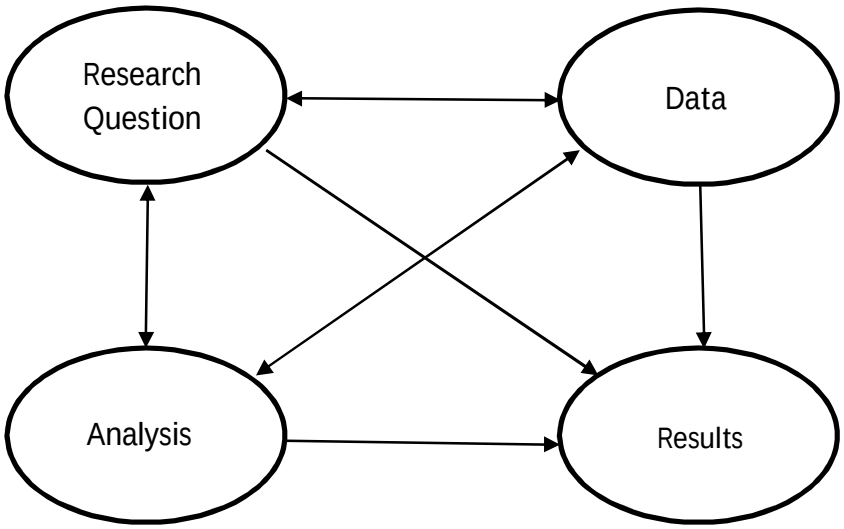
Figure 3.1 Linear research process model



Source: (Bergman, 2009:586)

But Bergman (2009) points out several fundamental problems with this view of the research process and put forward a more realistic representation of the process:

Figure 3.2 Feed-back research model



Source: (Bergman, 2009:586)

The author also started out with the conventional model in mind, but as the project unfolded the research questions, research design and strategy, data collection methods and analysis were continually adjusted until it reached a more integrated state.

Two research populations were included in this study. The research methodology will therefore be discussed accordingly. Data for the research of Population 1 was collected and analysed using both the quantitative and qualitative approaches by means of a structured questionnaire survey with both open- and closed-ended questions completed by property valuers registered with the SACPVP. However, with the unfolding of the project it became clear that there is a need to understand the current level of focus on the DCF method in valuation courses offered. It was therefore decided to add this dimension to research question 2 of the project by the introduction of a second research population. Data for the research of Population 2 was collected by means of a structured questionnaire completed by lecturers of property valuation courses accredited by the SACPVP and a document study of the current curricula of these courses or programs.

Since the primary research question and research proposition are answered by the data collected using the questionnaire survey approach for Population 1, the discussion of the design and strategy below is only relevant to this approach.

3.2 Research Design and Strategy

The research design provides a theoretical framework which will guide the research activities by informing on the approach to be adopted, research participants, data collection instruments and analysis of the data (Leacock et al., 2006). O'Leary (2010:88) offers a more formal definition, stating that methodology is the "*Overarching, macro-level framework that offers principles of reasoning associated with particular paradigmatic assumptions that legitimate various schools of research. Methodologies provide both the strategies and grounding for the conduct of a study*", while May (May, 2011:98) offers a more to the point definition, stating "*The research design provides the framework for the collection and analysis of data from a population.*"

The general and specific research questions were informed at first by exploratory research including a literature review and a few exploratory interviews and unstructured discussions. These were conducted with senior professional valuers and academics who are sufficiently involved in the valuation industry to be deemed "experts".

3.2.1 Qualitative versus Quantitative Considerations

A logical solution to the choice of approach is to move away from the position of the paradigm as starting point and to approach it from the research question/s. Punch (2005:19) offers the following comment to this effect: "*Different questions require different methods to answer them*". Loseke (2013:30) offers the following general principle "*Some questions are best answered by certain kinds of data and other questions require other kinds of data*". O'Leary (2010:128) calls this approach the "*question-driven perspective*" and describes it as putting the questions before the approach by asking which strategy will produce the most credible data needed to answer the research question.

The research proposition of this study states that valuation professionals in South Africa have a low preference for the Discounted Cash Flow method of valuation. It then proceeds to predict the existence of a correlation between this low preference and the training of property valuers in the application of the DCF method as well as difficulties experienced in accessing data to be analysed as input variables. Following from this

proposition are the research questions which address the issues of valuer's training and education, the data needed for inputs and limitations in accessing the data.

According to the "*question-driven perspective*", the centrality of correlation in the proposition and applied in the questions, this study will lean towards a more quantitative research approach (Punch 2005). However the qualitative analysis of open-ended questions in structured questionnaires and then being used to triangulate the quantitative data move the research approach to the left of the quantitative-qualitative continuum towards the mixed methodological position (O'Leary, 2010; Johnson & Onwuegbuzie, 2004).

The literature review indicates a bias towards the quantitative approach when studying the use of valuation methods among practitioners. Boyd (1995) made use of the quantitative approach when surveying Australian valuers in the principles and approaches to market value. Parker (1996), however, followed a mixed method approach making use of both a survey and interviews in determining the valuation methods adopted, capitalisation rate selection and importance attached to the determination of the capitalisation rate. The survey by Parker (1996) was conducted among selected valuation firms located in four different countries and constitute a limited representative sample of valuers in the four countries. Parker (1996) acknowledged that the small size of the survey sample is an inadequate base from which to draw substantive and definite conclusions and therefore used insights gained from the interviews to substantiate his conclusions. Öhman et al. (2012) used a strict quantitative approach when studying the accuracy of Swedish property appraisers' forecasts of net operating income in using the DCF method.

Punch (2005:240) identifies eleven ways in which the quantitative and qualitative approaches are combined. The method of combination which will best suite this study is one where "*qualitative research may facilitate the interpretation of relationships between variables"*. Punch (2005) describe the reason for taking this approach as that the qualitative research can help to explain the underlying reasons for the existence of relationships or correlations established through the quantitative research.

A mixed approach was thus adopted to be use in this study.

3.2.2 Research Strategy

Bless et al. (2013) and Saunders et al. (2009) starts the discussion of research design and strategy by focusing on the researcher's objective or aim in conducting the research. Four classifications of research purpose are suggested by Bless et al. (2013), being exploratory, descriptive, correlational and explanatory, whereas Saunders et al. (2009) and Jackson (2009) suggest only three of the four, being exploratory, descriptive and explanatory.

According to Bless et al. (2013) the **exploratory study** is useful where limited knowledge or information exists about a subject and where the outcome is to gain a broad understanding of a situation, phenomenon or a community. Saunders et al. (2009) single out exploratory studies as being flexible and adaptable to change. This type of research is often the antecedent of further research. **Descriptive studies** are described as presenting a clear picture of the phenomena on which ones research is based. Punch (2005:15) gives the following definition: "*To describe is to somehow draw a picture of what happened, or of how things are proceeding, or of what a situation or person or event is like*". A **correlational study** enables the researcher to make a statement or hypothesis in predicting the relationship between at least two variables (Bless et al., 2013). The correlational study is similar to the descriptive study in that it merely states or proves a phenomenon, in this case, the existence of a correlation. Explanatory studies in contrast to descriptive and correlational studies are aimed at probing the reasons for the existence of the phenomena being researched or the reason for the existence of correlations between variables (*Ibid*). The research conducted in this study is **descriptive correlational** in nature and the research design was chosen on this basis.

3.2.3 Research Design

Saunders et al. (2009) consider the following research designs: experiment, survey, case study, action research, grounded theory, ethnography and archival research.

The **experimental approach** was first made popular in natural sciences, but gained much popularity among social science researchers, especially in the field of psychology. The basic form of the experiment is to establish causal links between two variables (Saunders et al., 2009). Punch (2005) subdivides the experimental approach into three further

categories: classic experimental, quasi-experimental or non-experimental. These three are on a continuum defined by the following two aspects:

- The ability of the researcher to control exposure to the independent variable by the comparison groups, thereby indicating that the researcher has full control over the selection of the groups, and/or
- The ability of the researcher to control when to take measurements on the dependent variable in relation to exposure to the independent variable.

Under the experimental strategy the researcher has full control over both aspects while under the quasi-experimental strategy the control is limited in as far as treatment groups occur naturally and the researcher has control over when to take measurements on the dependent variable in relation to exposure to the independent variable. The problem of validity which arises in quasi-experimental design can be statistically controlled through the analysis of the instance of covariance. Under the non-experimental strategy the researcher has no control over the exposure of the independent variable, the composition of the treatment group or when to measure the dependent variable in relation to exposure to the independent variable. The researcher relies on statistical methods to identify relationships through control variable analysis in general and covariance analysis in particular Punch (2005).

The experimental approach was not considered on the basis of ethical issues and time limitations. It would be unethical to provide, say, inadequate education to a group of valuers in order to test their acceptance of the DCF method as against that of the control group who received proper education. Secondly, education and the gaining of experience in the use of a valuation method occur over a lengthy period of time which make it impractical for the time frame of this research.

The next research strategy suggested by Saunders et al. (2009) is that of the **survey approach**. Punch (2005) deals with the survey approach as being on the other end of the experimental approach continuum, calling it the non-experimental approach. Surveys are generally associated with the deductive approach and with the collection of quantitative data, analysed quantitatively using descriptive and inferential statistical methods. This approach is also well suited to explore particular relationships between variables and for the production of models to describe these relationships. Furthermore, through the use

of sampling it is possible to generate findings which are representative of the whole population (Saunders et al., 2009).

This strategy was found to be most suitable for to the research project by investigating the relationships between certain variables in the valuation community. The population of valuers are fairly small and all are contactable via electronic mail in order to administer the survey questionnaire. It is also noted from the literature review that survey as a research strategy was used in the studies of valuation methods among valuer populations in other countries (Boyd, 1995; Parker, 1996). The survey approach to be used in this study will test the attitudes and opinions of valuers in order to get a clear answer to questions 1 and 3. However, although question 2 will also be answered in part by this study by gathering the opinions of valuers on their individual experience with methodology training, a certain aspect of the question is forward looking by seeking to find what is the current state of valuers education with regard to the DFC method of valuation. A survey of university lecturers will focus on this issue by establishing the current level at which DCF training is introduced, the time spent on training and the examination of students. Two instruments were used in specific study of valuers education: A study of documentation published by each institute of learning on the courses presented; this formed part of the Literature Review; and a questionnaire survey directed to the lecturer of the said course at each of the institutions of learning. The data gathered by means of these two instruments was qualitatively examined and will be discussed in Chapters 4 and 5.

A further strategy available is that of the **case study**. The basic idea behind the case study is that one case (a particular contemporary phenomenon) will be studied in detail within its real life context in order to develop as full an understanding of that case as possible in order to find answers to the question "why" and is therefore most often used in explanatory and exploratory research. This strategy is very suitable to understand a single case, while multiple case studies can be used in order to make certain generalizations (Punch, 2005; Saunders et al., 2009). Punch (2005) put forward three reasons why a researcher would choose a case study: Firstly, to get a better understanding of a particular case, secondly, to gain insight into an issue or to refine a theory, and thirdly, to

learn about a particular phenomenon, population or general condition presented by a particular case. The purpose of this study is to test for the probability of correlations between some identified variables by studying a population of property valuers. This type of study excludes the use of the case study method.

Saunders et al. (2009) state that **action research** is characterised by an explicit focus on action within an organisation, particularly in promoting change within that organisation. Further to this, the researcher is typically involved in the action for change. This type of research is most suitable for addressing problems within structures such as businesses and for the production of guidelines for best practice. As such action research is undertaken over a period of time with the researcher actively participating in a change situation, often via an existing organization, whilst simultaneously conducting research. This study cannot employ such a research strategy as the focus is on individuals perceptions not necessarily connected to a specific organisation. Even though action research could be applied to change perceived opinions about the use of the DCF method of valuation, it will require quite a lengthy period of time.

The **grounded theory strategy** is generally associated with the inductive research approach and is useful to predict and explain behaviour (Saunders et al., 2009). The emphasis of the grounded theory approach is on theory building, and as such this strategy is not suitable for this research. This study presupposes an understanding of the existing theory by the research population and will seek to understand the level and limitations of applying the theory to the field of valuations.

Ethnography is rooted in the inductive approach and is committed to cultural interpretation (Saunders et al., 2009; Punch, 2005). The use of this strategy implies that the researcher must immerses himself or herself in the social world being investigated and as such research is time consuming. It was therefore not considered a suitable or practical strategy for this study.

Finally, the **archival research strategy** uses as a primary source administrative records and documents (Saunders et al., 2009). Since the focus of this research is on individuals outside the confines of the organisation, this strategy was therefore not a viable option for this study.

3.2.4 Time Based Considerations – Longitudinal vs. Cross Sectional Studies

This study employed the cross-sectional design, described by Saunders et al. (2009) as a study of a particular phenomenon at a particular moment in time. The research sought to define the current status of the preference of the DCF method of valuation among valuation professionals in South Africa. A longitudinal approach which examine features of people or other units at more than one time (Neuman, 1994), was clearly not appropriate given the limited timeframe of this particular study.

3.3 Organisation of the Study

The study was conducted by surveying two population groups and by means of a document survey. The methodology used in each incidence will be discussed separately.

Both **Populations 1 and 2** were researched by means of direct questionnaire survey instruments.

Data from **Population 1** (Section 3.4) were collected through an invitation sent out to all the valuers registered with the SACPVP to complete an online questionnaire.

The research on Population 1 focused on data from the valuers with regards to their perceptions, views and experience of valuation methodology, education and access to data, whereas research on **Population 2** (Section 3.5) represents a more focused probe into the current education of valuers in the DCF method. Lecturers of the seven institutes of learning which offers the nine courses/programs accredited by the SACPVP were invited to complete an online questionnaire and the contents of these nine courses/programs, as published on their respective websites, were studied using a document survey.

3.4 Population 1: Procedure for Data Collection, Research Instrument and Sampling

The study endeavours to answer three specific research questions:

1. Which methods of valuation are available for the valuation of income producing properties in South Africa and why are some methods preferred to others?
2. Is there a sufficient focus in the education of valuation professionals so as to give them a clear understanding of the principles behind the use of the DCF method?
3. Do South African valuers, as part of the perceived complexity of the DCF method, experience difficulties in accessing data and information needed as input variables in concluding a valuation based on the DCF method?

In order to answer these questions the primary focus group or research population comprised property valuers registered with the SACPVP.

3.4.1 Target Population

May (2011:98), describes the population as the "*universe*" to be sampled or the entire set of people about whom the researcher wants to determine some characteristics (Bless et al., 2013). The target population of this part of the study are the valuers registered with the SACPVP. Section 27 (3) of the Property Valuers Profession Act 47 of 2000 (Property Valuers Profession Act, No 47 of 2000) prohibits persons not registered with the SACPVP to work as independent property valuers. The population for the study is therefore well defined and comprised of 2 165 registered property valuers at the time. The details of every valuer registered with the SACPVP are available from their website which not only includes the name, but also the contact details and category of registration for every valuer.

3.4.2 Sample

May (2011:98) describes a sample as a subset or a portion of the population and defines a good sample of a population as being "*just like it, only smaller*". Samples are further subdivided into probability and non-probability samples with the main difference being the existence of a complete, or as complete as possible, "list" of the population. This "list" then forms the sampling frame from which the sample can be randomly selected. The reason for sampling is to compensate for the difficulty and associated cost involved in surveying every person which form part of a large population (Bless et al., 2013). These

considerations are however negated with the research instrument chosen being an internet based questionnaire whereby a whole population can be reached. An important principle pointed out by May (2011) is that each person in the research population must have an equal chance of being part of the sample. Of the 2 165 individuals listed with the SACPVP only 50 (2.31%) did not supply a contact e-mail address thereby indicating that 97.6% of the population has an equal chanch of being part of the sample. Of the 2 115 individuals, 283 or 13.07% responded to the invitation to participate in the questionnaire. Of the 283 questionnaires received 69 were rejected for incompleteness, resulting in a sample of 214 or 10.12% of the population. Since the logic behind sampling if for the researcher to make statements about a population from data collected from a sample (Punch 2005:101), the size of the sample to be used for this study is deemed to be of an adequate size.

3.4.3 Data Collection

Bless et al. (2013) defines data as measurements collected as a result of scientific observation, using measurements in the broad sense of the word. They further point out a relationship between the types of research conducted and the methods of data collection, differentiating between unobtrusive and reactive methods. The survey method of research as applied in the quantitative approach makes extensive use of questionnaires in order to measure the study variables (Nardi, 2006). Questionnaires can be designed to be used for self-administered surveys, face-to-face interviews, telephone interviews or computer-assisted and web-based surveys. Data in this part of the study were collected using a structured questionnaire with both open-ended questions which required an explanation or comment on a previous question and closed-ended questions with pre-determined answers to choose from.

3.4.4 Development of the Research Instrument

Bless et al. (2013) stresses the importance of constructing an appropriate and accurate instrument for measuring and collecting data. A literature review was conducted on questionnaire development in social research followed by the developed of a structured questionnaire which was administered through the on-line service of SurveyMonkey®. An

invitation with supporting cover letter was send to every e-mail address on the list of property valuers (Appendices 1 & 2).

In order to measure attitudes and opinions use was made of open-ended / closed-ended questions as well as filter and contingency questions. Intensity measures were also employed by making use of several Likert-type scales, sometimes in combination with a matrix format. The use of ranking was avoided (Nardi, 2006). A function of Surveymonkey® was employed whereby respondent are forced to answer each question by not allowing the proceeding to the next question unless the previous question is answered. This ensured a higher completion rate.

The questionnaire was tested for content validity by presenting it for completion and comments to a test group consisting of a candidate valuer, a professional associated valuer and a professional valuer after extensive briefing on the aims and objectives of the research project. The test for face and construct validity was done by presenting the questionnaire to a statistician and the supervisor of this study.

Finally the questionnaire was tested against a checklist proposed by Bless et al. (2013:212):

- *Are all questions relevant to the purpose of the research;*
- *Are there superfluous or trivial questions;*
- *Is the questionnaire well-structured to facilitate the flow of questions;*
- *Are the questions well formulated, clearly stated, unambiguous and do they use appropriated language and vocabulary;*
- *Are the questions formulated in a non-suggestive way, no leading questions;*
- *Are the questions precise and to the point;*
- *Are the multiple-choice answers relevant and exhaustive;*
- *Are the questions neither too intrusive nor embarrassing;*
- *Are neutral answers such as "I do not know" or "No opinion" given as choices; and*
- *Are the instructions clear and unambiguous?*

3.4.5 Questionnaire Content

The questionnaire was divided into three sections. Section One: **Demographic Information**, items 1 – 7, collected general information on age, number of years in the profession, professional status, province of residence, membership of professional bodies, sector of current employment and lastly academic qualification which gave entrance into the profession. Section two, **Scope of Valuation Work & Access to data**, items 1 – 10, not only extracted data on the frequency of valuation projects completed for income property, but also measured the individual's preference of valuation method, perceptions on proficiency with various methods of valuation and opinion on the relevance of various methods of valuation. This was followed by an open-ended question to first express an opinion on which is the better between the Capitalisation approach and the Discounted Cash Flow approach and then to supply reasons for the choice. This section also addressed issues of access to data for the determination of input variables into a DCF approach by asking respondents to indicate on a supplied scale the difficulty to obtain information on eight different input variables followed by a question on sources of information normally consulted. This section was then concluded with a question on the computer software used by the respondent to perform a DCF valuation. The last section, Section three, **Education and Further Education**, items 1 – 3, focused on the respondent's education in the use of the Discounted Cash Flow method of valuation. The first question was retrospective in testing the opinion of the respondent whether he/she has been sufficiently trained / exposed to the Discounted Cash Flow method of valuation. The second question addressed the current state of the respondent's knowledge of the Discounted Cash Flow method of valuation by asking which opportunities he/she have used to supplement their knowledge and the last question was forward looking by asking the respondent whether he/she would welcome the more readily availability of focused training opportunities in the methods of valuation of income producing properties.

3.4.6 Questionnaire Administration

After a secured account was created with SurveyMonkey®, the list of e-mail addresses were imported onto the program as well as the cover letter and sent out. For three weeks a weekly reminder was e-mail through SurveyMonkey® to the respondents and after the fourth week the survey was "closed".

3.4.7 Data Analysis

The data analysis consisted of examining the surveys for correctness and completeness. A total of 69 of the 283 responses were discarded for reason of incompleteness, leaving a total of 214 or 10.12% responses suitable for analysis. Data from the structured questionnaires were translated into numerical codes by the researcher and captured onto the statistical analysis software program SPSS (version 22). The analysis, presentation and discussion of the findings of the research will be presented in Chapter 4. The open-ended questions were analysed qualitatively and will also be presented in Chapter 4.

3.5 Population 2: Procedure for Data Collection, Research Instrument and Sampling

As indicated above, the primary focus group or research population comprise property valuers registered with the SACPVP. However, the opinion of the valuers on their education is retrospective whereas research question 2 can also be interpreted as probing the current state of the education of property valuers with respect to the use of the DCF method of valuation. In this respect the valuers community is not in the best position to comment but rather the institutions of education themselves. A survey was therefore undertaken of both the curricula of the nine course or programs accredited with the SACPVP as well as the lecturers who lecture on valuation methodology.

3.5.1 Target Population

The website of each of the institutions which offer the courses or programs was perused for the names and contact detail of the lectures who lecture on property valuation methodology. In cases where this information was not available the respective departments at the institution were contacted to provide the details. At this stage it was noted that the valuation course offered by UNISA have been discontinued, leaving only six accredited institutions.

Of the six lecturers identified, five took part in the survey.

3.5.2 Data Collection

Data in this approach to the study were collected using a structured questionnaire with only seven closed-ended questions with pre-determined answers to choose from.

3.5.3 Questionnaire Content

The first question ascertained at which level the respondent teaches valuation methodology. The second and third questions focused on the teaching of the DCF method of valuation by first asking the respondent to indicate the in-class time allocated to the teaching of the method and secondly how many assignments are the student expected to complete on the method. The fourth question focused on the testing of the student in the proficiency with the method by asking the respondent to indicate which percentage of the final examination paper is allocated to the DCF method of valuation. The fifth and sixth questions focused on the teaching of other methods for the valuation of income producing property by asking so select from a list which methods are also taught and also which of these methods are tested in the final examination. The seventh and last question asked the respondent to indicate whether a textbook or only course notes are used and to supply the details of the textbook used.

3.5.4 Data Analysis

The data analysis consisted of examining the surveys for correctness and completeness. Data from the structured questionnaires were translated into numerical codes by the researcher and captured onto the statistical analysis software program SPSS (version 22). This data was only analysed on the first level of statistical analysis using descriptive statistical techniques (May, 2011) whereafter qualitative inferences were made as presented as conclusionary comments in Chapter 5.

3.5.5 Conclusion

The research design, research populations and samples as well as the methodologies for data collection were discussed in this chapter. The quantitative data based on a structured questionnaire survey of Population 1, registered valuation professionals, will be analysed and discussed in Chapter 4 whereas the more qualitative data based on the literature review, the document survey and structured questionnaire survey of

Population 2, lectures at institutes of learning, will form part of the discussion and conclusions in Chapters four and five.

CHAPTER 4 RESEARCH ANALYSIS AND INTERPRETATION

4.1 Introduction

In Chapter 3 the methodology for the collection of the data which will form the subject of this chapter is discussed. This chapter will therefore focus on the analysis and interpretation of the data which was collected by means of the questionnaires attached as appendices at the end of this report.

Data analysis can broadly be divided into two type: exploratory data analysis and confirmatory data analysis (Robson, 2002). Exploratory data analysis (EDA) consist of describing the sample survey data by making use of tables, graphs and descriptive statistics describing not only individual variables, but also exploring the relationships between variables. Confirmatory data analysis (CDA) will seek to establish the validity of the proposition made at the beginning of this study.

In order to make use of some statistical method for the analysis of data it must be of a certain type (May 2009). Three levels of measurement are applicable to social science data, being: nominal, ordinal and scale. Nominal type data refers to discrete data, ordinal data refers to data of rank whereas scale data refers to data with a distinct interval or ratio. The data from the questionnaires of both the research population samples were coded and classified into the above categories before being captured into SPSS version 22 for further analysis.

The analysis and discussion of the data will be done by the guidance of the research questions in relation to the research objectives under the following headings:

- Demographics;
- Question 1: Which methods of valuation are available for the valuation of income producing properties in South Africa and why are some methods preferred to others?
- Question 2: Is there a sufficient focus in the education of valuation professionals so as to give them a clear understanding of the principles behind the use of the DCF method?

- Question 3: Do South African valuers experience difficulties in accessing data and information needed as input variables in concluding a valuation based on the DCF method?

Following these analyses the research proposition will be evaluated followed by a chapter summary.

4.1.1 Response Rates

Two populations were surveyed for this study.

- Population1: The sample for this study comprised 10.1% of the population of property valuers registered with the South African Council for the Property Valuers Profession (SACPVP). The sample was chosen based on the availability of an e-mail addres for each of the individuals registered with the SACPVP and it was found that only 50 out of the total of 2 165 individuals did not supply a contact e-mail address. 283 (13.07%) of those invited to participate in the reseach completed the online questionnaire. Of the 283 responses 69 were incomplete and could therefore not be used due to a technical fault with the website which was only later rectified. The remaining 214 responses will be discussed and analysed.
- Population 2: The population for this study comprises the lecturers at the seven institutions of learning which offer the nine accredited courses/programs. It was however found that the valuation course offered by UNISA have been discontinued, leaving only six institutions. These six institutions were contacted and the lecturers responsible for the valuation modules / courses were identified and invited to complete an online questionnaire. Of the six lecturers identified, five took part in the survey.

4.2 Demographics

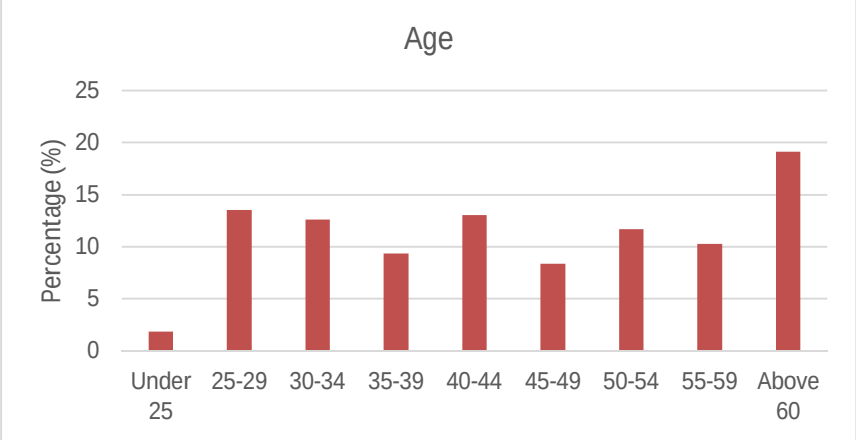
The following section provides an overview of the demographic profile of the sample of the valuers' survey as well as the lectures' survey by means of univariate analysis. Where appropriate and to gain a better understanding of the significance of the data, basic multivariate analysis in the form of cross-tabulation is employed. By making use of

frequency distribution tables and presenting them in graph form a familiarity with the sample population is created.

4.2.1 Age Bracket - Valuers

Figure 4.1 below indicates a good spread in the age of the respondents, however, the high response rate for the above 60 year old age group is indicating an aging profession. However, for the purposes of this study the number of years in the profession will be used as an independent variable rather than the age of the respondents.

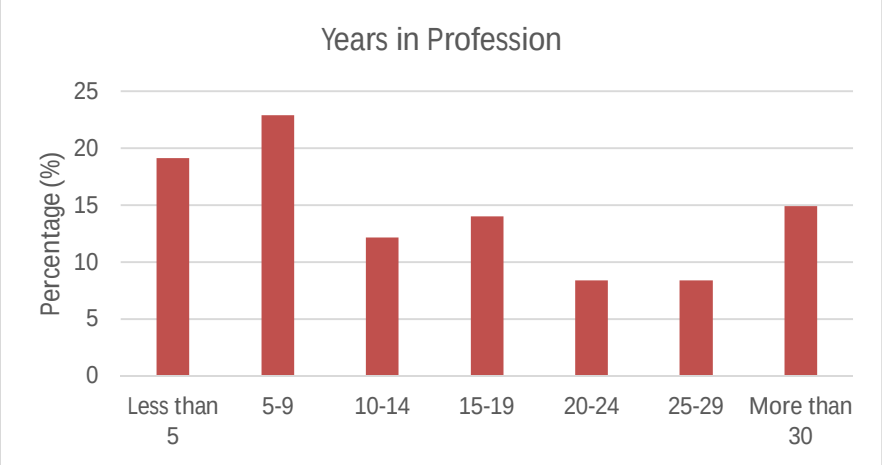
Figure 4.1 Age distribution of sample



4.2.2 Number of years in the profession - Valuers

Following the question of age, the respondents were ask to indicate the number of years as a member of the valuation profession.

Figure 4.2 Distribution of the number of years in the profession of sample

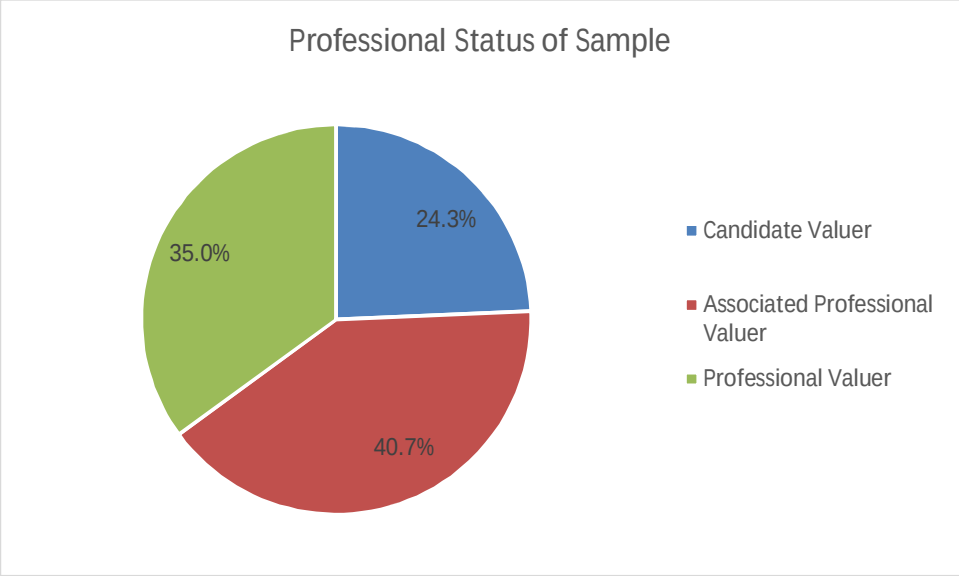


4.2.3 Professional Status - Valuers

In order to test the representation of all the registered categories, participants were asked to indicate their category of registration. Although the questionnaire asked those respondents who are registered in the category "Associated Professional Valuer with restrictions" to indicate the category of restriction, the results are reported only in the three main categories of registration, namely: Candidate Valuer, Associated Professional Valuer and Professional Valuer.

Figure 4.3 below indicates that 65% or 139 of the respondents are registered as either associated professional valuers or professional valuers. This high representation of the professional registered categories are of significance for this study since this group will be more likely to be involved in the valuation of income producing properties.

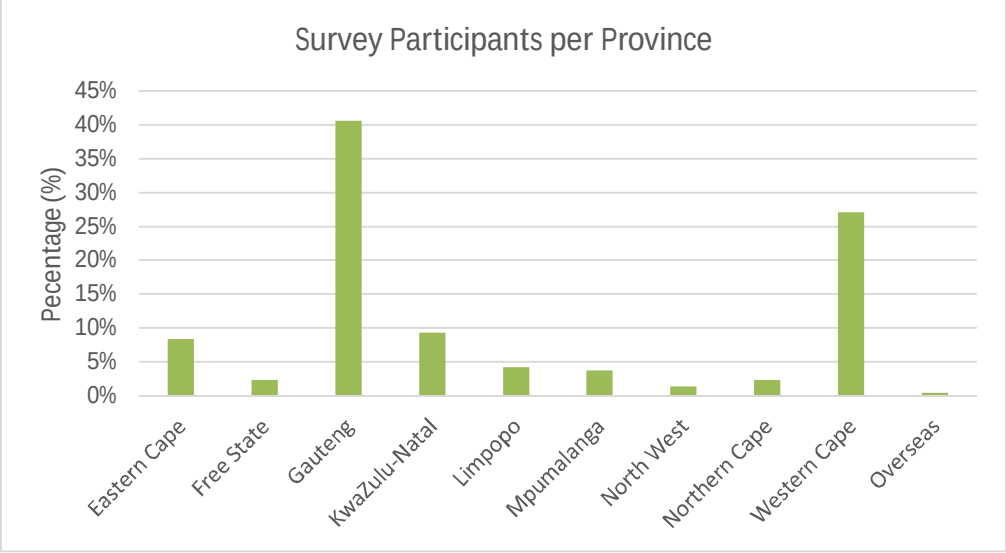
Figure 4.3 Professional status of sample



4.2.4 Province of Residence - Valuers

In order to test the representation of valuers across all the provinces of South Africa, participants were ask to indicate their province of residence as indicated in the graph below.

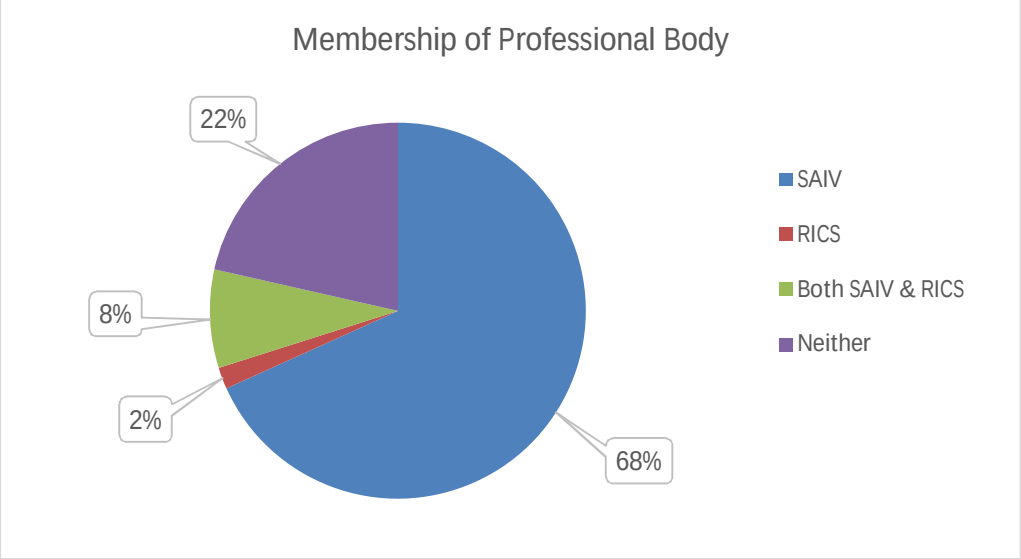
Figure 4.4 Survey participants per province



4.2.5 Membership of Voluntary Professional Bodies - Valuers

Apart from compulsory registration with the SACPVP there are several other voluntary valuers association of which the SA Institute of Valuers (SAIV) is the oldest and most well-known. The most well-known international association of property valuation professionals to which a South African valuer can belong to is the Royal Institute of Chartered Surveyors (RICS). This question asked the participant to indicate his/her membership with any of these two professional bodies. Figure 4.5 below indicates that 88% of the respondents belong to either the South African Institute of Valuers or the Royal Institute of Chartered Surveyors. This high percentage of association is of significance for this study as both of these professional bodies publish and present workshops and conferences on valuation methodology.

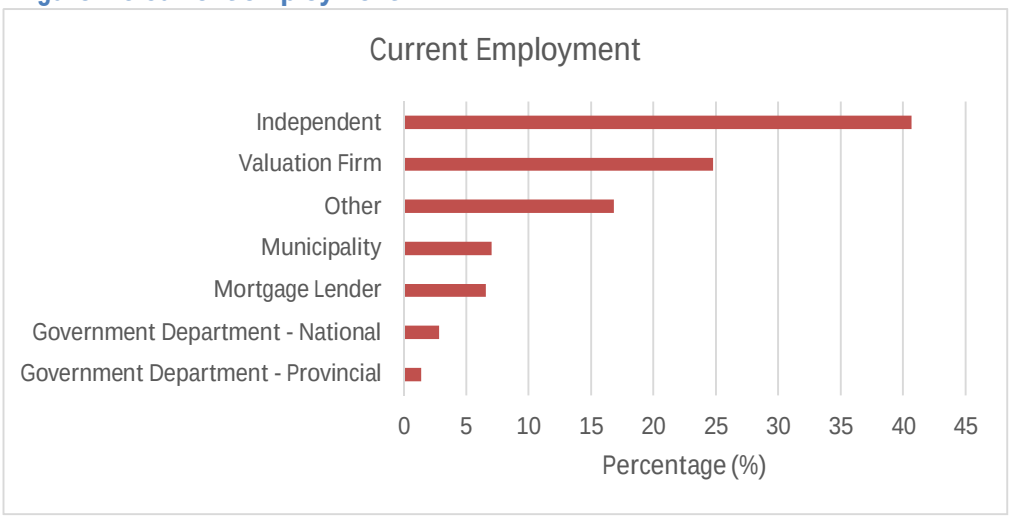
Figure 4.5 Membership of a professional valuation body



4.2.6 Current Employment - Valuers

This question tried to establish the category of current employment of every participant in order to ensure that most categories of employment are represented. Figure 4.6 below indicates that the majority of respondents, 147 or 65%, are either self-employed or employed by a valuation firm. This group is significant for the study since they are the more likely group to perform valuations of income producing properties.

Figure 4.6 Current employment



Respondents were asked to specify their current employment if “Other” was chosen. The table below shows a breakdown of responses.

Table 4.1 Description of "Other" employment

Description	Count
Academic	2
Asset Management / Listed Property / Property Development	9
Estate agency	5
Legal Sector	1
Not active in valuations	4
Parastatal	4
Quantity Surveyor	1
TOTAL	26

4.2.7 Teaching Level – Lecturers

This question asked the respondents to indicate at which level they teach valuation methodology. From the table below it can be seen that four of the five respondents lecture on the post graduate level, indicating that these respondents can be classified as senior lectures who should have a fair knowledge of valuation methodology.

Table 4.2 Level at which valuation methodology is taught

Lecturer	1st year	2nd year	3rd year	Post Graduate
1		X		
2				X
3			X	X
4				X
5		X	X	X

4.3 Question 1 Analysis

Which methods of valuation are available for the valuation of income producing properties in South Africa and why are some methods preferred to others?

The first part of the answer to this question was determined by the discussion on valuation methodology in Section 2.2 above. Based on the literature review on valuation methods the following methods were found to be available and are used for the valuation of income producing property:

- The One Year Direct Capitalised Income Approach;
- The Discounted Cash Flow Approach;
- The Direct Comparable Sales Approach;

- The Term and Reversion Approach; and
- The Hard Core / Top Slice Approach.

Of this list the One Year Direct Capitalised Income method and Discounted Cash Flow method are indicated by the literature to be the most relevant.

The questionnaire survey of lecturers at five institutions of educations sought to confirm that all these methods are included in the accredited curricula taught. It is noted from the results shown in Table 4.3 below that fewer lecturers are teaching the Hard Core / Top Slice method than those who teach the Term and Reversion method.

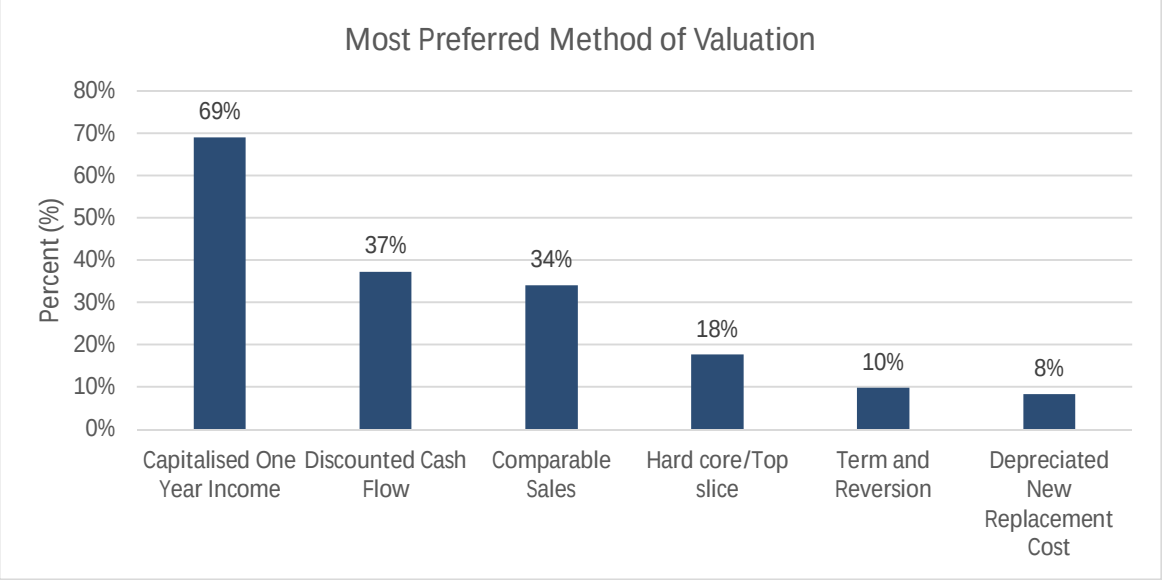
Table 4.3 Methods of valuation taught

Lecturer	Comparable Sales	DCF	Capitalisation	Term and Reversion	Hard core/Top slice
1	X	X	X	X	
2	X	X	X		X
3	X	X	X	X	X
4	X	X	X	X	X
5	X	X	X	X	

The Depreciated New Replacement Cost Approach is recognised in the valuation industry as the least applicable method for the valuation of an income producing property, but was added to this list of methods when used in the valuers survey questionnaire in order to complete the list of all possible methods available. Using this list respondents were asked to indicate their preferred method for the valuation of income property as well as their opinion on the relevance of each of the methods for the valuation of income property.

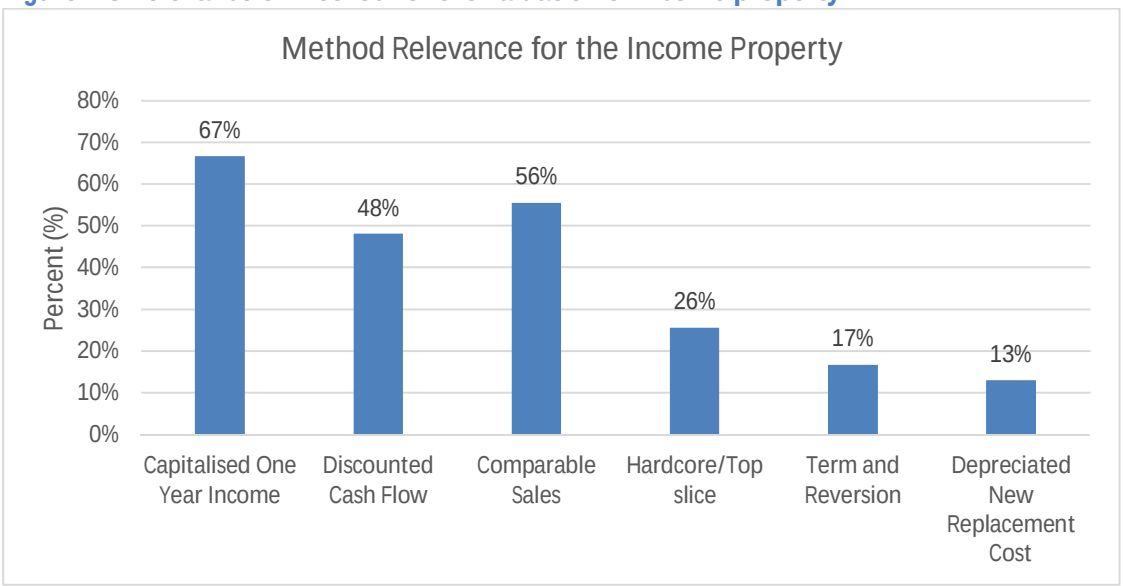
Participants were asked to rate the preference of each method according to a five point preference scale. Figure 4.7 below indicates that the majority of respondents, 69%, indicated the Capitalisation method as the most preferred method while only 37% of the respondents indicated the Discounted Cash Flow method as the most preferred method for the valuation of income property. A high degree of difference in preference between the two methods is noted. It is this difference in the degree of method preference which Question 1 seeks to understand.

Figure 4.7 Most preferred method of valuation



Parallel to method preference is method relevance. This means that a method that is preferred will also be a method deemed to be relevant for the valuation of income property. Participants were asked to rate the relevance of each method on a similar five point relevance scale. Figure 4.8 below reports the results of this question.

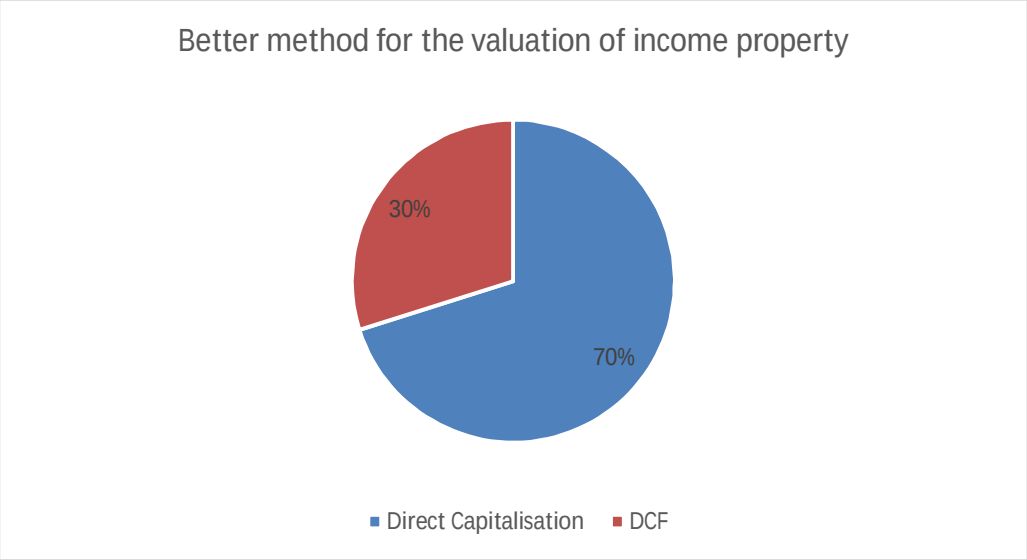
Figure 4.8 Relevance of method for the valuation of income property



By asking the respondents to choose between the Capitalisation method and the DCF method and then requiring them to provide reasons for their choice, the large difference noted in Figure 4.7 between the two methods was explored. Figure 4.9 below indicates

that 70% of respondents choose the direct capitalisation method when given the choice between only the two methods.

Figure 4.9 Better method – Direct Capitalisation or DCF



This large difference is however put into context when the reasons for the choice is explored by categorising them as followings:

- Positive attributes about the method was highlighted as to the reason for the choice;
- A method was chosen because it is deemed to be more suitable for a property with a single tenant or a property with multiple tenants;
- The shortcomings of the other method were highlighted as the reason for the choice of method;
- A method was chosen because the respondent is of the opinion that it is the method which the courts more readily accept;
- Limited access to information was highlighted as a reason for not choosing the other method. This included cases were comments referred to “too may estimates of variables”, “too many assumptions”, “too many arguable estimates”, “crystal ball gazing”, etc.;
- A method was chosen because in the opinion of the respondent it is the method best understood or preferred by the clients; and
- Other reasons were given which, in the view of the researcher, could not be otherwise categorised as a display of lack of understanding of valuation theory.

These included: "depends whether your lease or actual rental is market related", "DCF values the business", "depends on the lease profile", "only used when at least a 5-year lease in place with Blue-chip tenant", "I am more at *famalier* (sic) with the D C Method", etc.

Table 4.4 below summarises the results for each of the categories:

Table 4.4 Reasons for choice of each method

Reasons	DCF	Capitalisation
Positive attributes of method	71%	16%
Number of tenants	16%	14%
Short comings in the other method	3%	8%
Perceived preference by Courts	0%	3%
Access to info as reason for not choosing the other method	0%	35%
Perceived client preference	0%	11%
Other Reasons	11%	14%

The above reasons can now be used to understand why the Capitalisation method is preferred to the DCF method. It is seen from Table 4.4 that access to information as reason for not choosing the DCF method is the reason given with the highest frequency (35%).

4.4 Question 2 Analysis

Is there a sufficient focus in the education of valuation professionals so as to give them a clear understanding of the principles behind the use of the DCF method?

In answering this question data from the questionnaire survey of valuation professionals, the questionnaire survey of lecturers and the document survey of the curricula of the various institutions of learning will be analysed.

Several sets of data on education were collected from valuers who participated in the questionnaire survey. These included questions on:

- The qualification which gave entrance to the valuation profession;
- Their opinion whether they were sufficiently trained in the use of the DCF method of valuation; and

- The use of training opportunities to further their knowledge in valuation of income properties.

Furthermore, data were collected from lecturers as to:

- The percentage of the class contact time allocated to the teaching of the DCF method of valuation;
- The number of assignments on the DCF method which are required from the students per course / module lectured;
- The percentage of the final examination paper allocated to the testing the student's proficiency in the DCF method.

The document survey focused on the curricula of each of the accredited courses/programs offered by institutes of training as made available on the World Wide Web. The survey sought to determine the following:

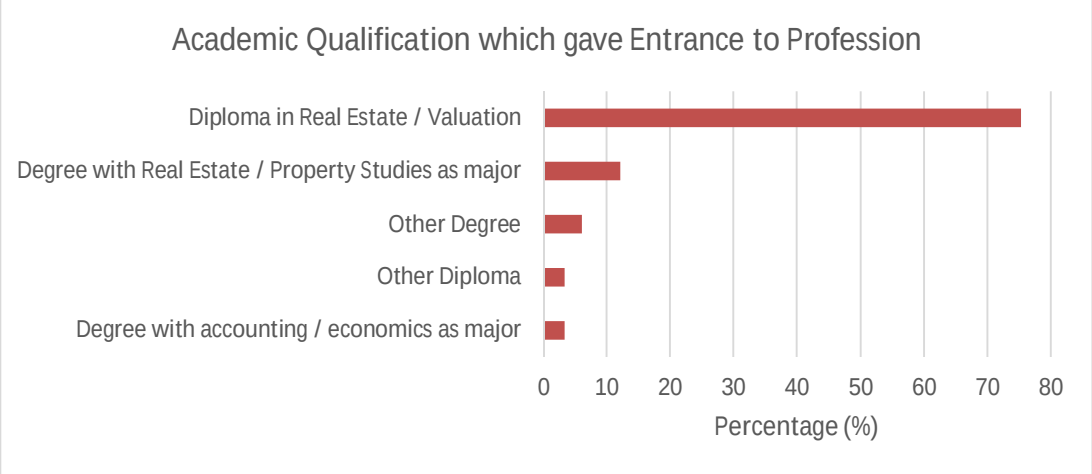
- The type and level of qualification offered; and
- The level within each of the qualifications at which the subject of property valuation is introduced.

The complete list of the curricula of each accredited course offered by each institute of learning is available under Appendix 5.

4.4.1 Questionnaire Survey of Valuation Professionals

Participants in the valuers' survey were asked to indicate which academic qualification obtained gave them entrance to the profession. Candidate valuers were asked to indicate which qualification they will obtain at the completion of their studies. Figure 4.10 below indicates the spread of academic qualifications and it is noted that the majority of respondents, 75%, obtained at least a diploma in real estate with property valuation as major while only 12% of the respondents obtained a degree with property valuation as major or included in the curriculum.

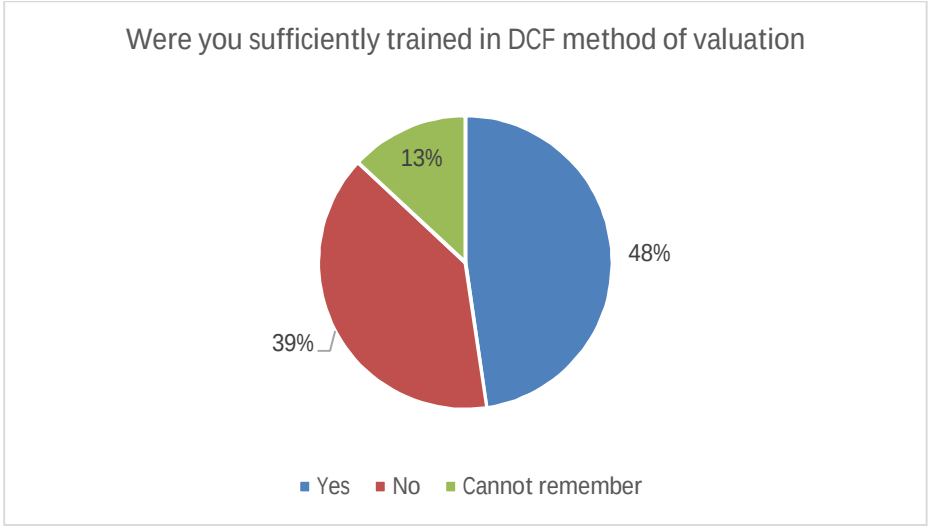
Figure 4.10 Academic qualification upon entering profession



It must be noted that a diploma course is usually skills orientated and subject centric whereas a degree course focusses on a broader field of study, exposing the student to the theory, philosophy and application of the subject matter. This differentiation is of importance to this study since for the completion of a DCF valuation the professional should be able to understand the interrelation between the property industry and the micro-, meso- and macro-economic environments and how the one affects the other.

Figure 4.11 below reports the response to the question whether sufficient training was received in the use of the DCF method of valuation. The biggest proportion, 48%, of respondents answered in the affirmative, 39% in the negative and 13% indicated that they cannot remember.

Figure 4.11 Response to sufficiency of training in the use of the DCF method



It is to be expected that the respondents who have been for the longest period in the profession, the more than 30 year group, would also be the group who would report the highest incidence of "cannot remember" and also be the group who would indicate that they were not sufficiently trained in the use of the DCF method. In contrast, it is also to be expected that the respondents who were for a shorter period in the profession would be the group who would indicate that they received sufficient training. In order to verify this these responses the results were cross-tabulated with the years of experience.

Figure 4.12 Cross-tabulation: Years in profession versus Sufficiently trained in use of DCF

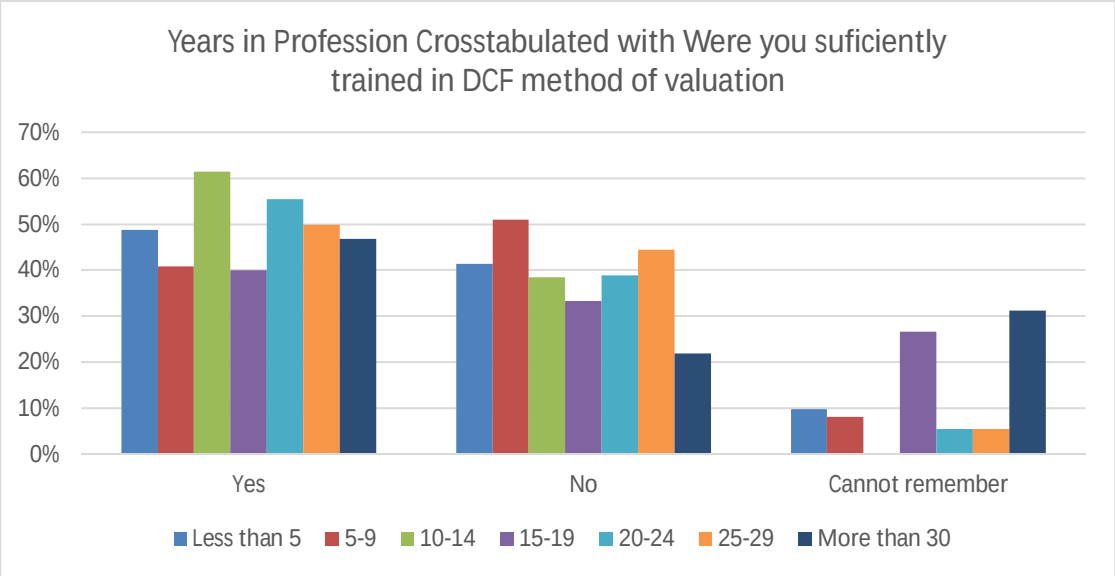
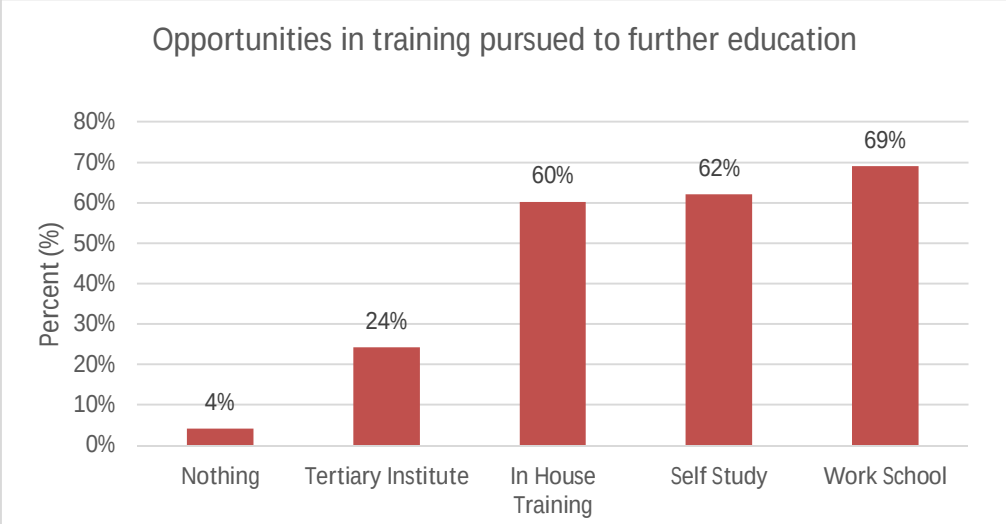


Table 4.12 above confirms that the group with more than 30 years of experience is also the group who reported the highest incidence of "cannot remember", but is also, against expectation the group with the lowest indication of having not been sufficiently trained. Surprising, however, is that the group of respondents who joined the profession more recently, the less than 10 year group, did not report the highest indication of sufficient training but reported instead that they are of the opinion that they were insufficiently trained.

Following on the above the respondents were asked to indicate which training opportunities were pursued in order to further his / her education in the field of income property. Five options were given from which the respondent could make multiple choices. Figure 4.13 below indicates the response. The highest percentage (69%) of respondents indicated that they attended a Work School. The Work School is an event

which is annually presented by the SAIV and attendance is compulsory for candidate valuers who wish to register with the SACPVP as professional associated valuers. Attendance is however also open to registered valuers who wish to gain continued professional development (CPD) credits. Education during the 3 to 4 day duration of the Work School is in the form of lectures delivered by invitees from the property industry and covers a wide range of property related subjects. Of the four training opportunities given, "Tertiary Institute" is the only training opportunity which is quantifiable, that is, which conforms to the guidelines of the National Qualifications Framework (NQF) and only 24% of the respondents indicated having followed this opportunity. It is disconcerting to note that 4% of respondents indicated that no training opportunities were pursued to further their education.

Figure 4.13 Training opportunities for further education in valuation methodology

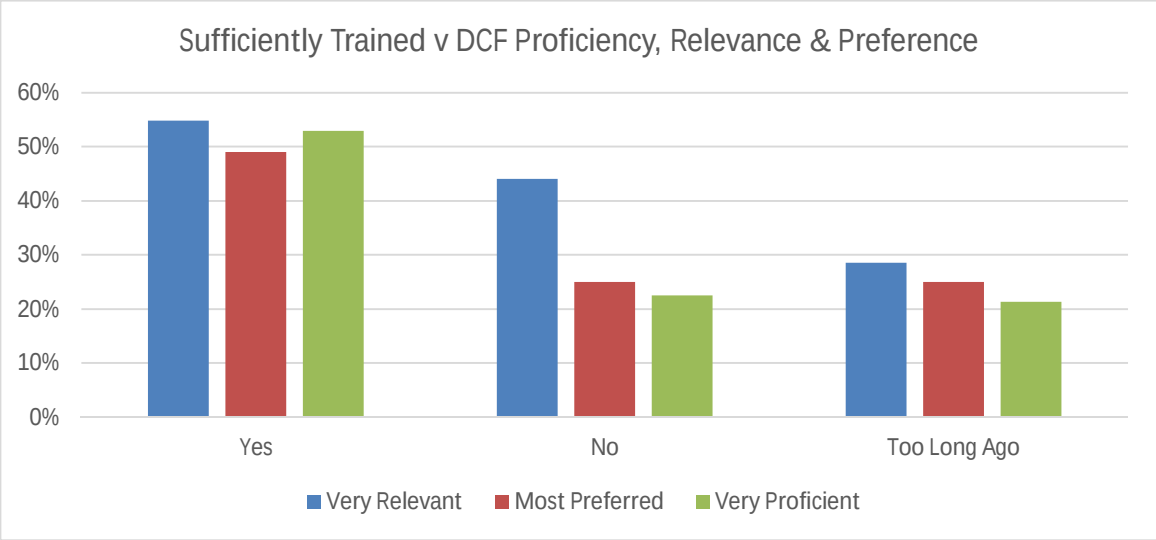


The following sets of data are analysed by means of cross tabulation:

- Questions bearing on:
    - Were you sufficiently trained in DCF method of valuation;
    - Academic qualification which gave entrance to profession; and
    - Opportunities in training pursued to further education
- With perception on
    - DCF as preferred method of valuation;
    - Proficiency in the DCF method; and
    - DCF as a relevant method of valuation.

Figure 4.14 below is a graphical representation of the question pertaining to the perception of sufficient training in the DCF method as related to the answers supplied on the perceptions of the DCF method of valuation being the most preferred method of valuation, the highest proficiency in this method and the most relevant method for the valuation of income property.

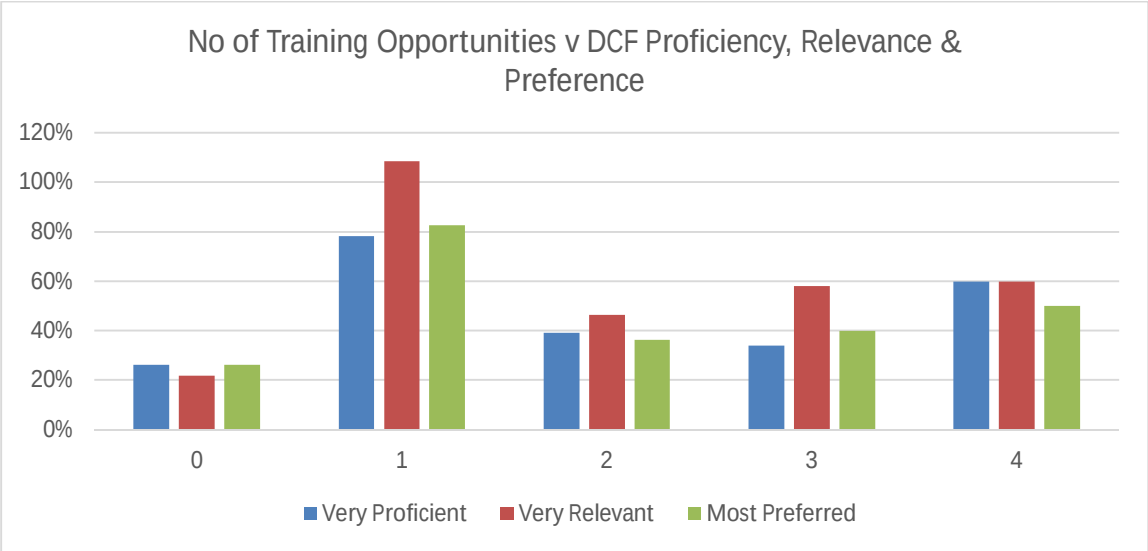
Figure 4.14 Cross Tabulation: Sufficient Training with DCF Proficiency, DCF Relevance & DCF Preference



It is noted from Table 4.14 above that those respondents, 48% of the population, who indicated that they are of the opinion that they were sufficiently trained in the use of the DCF method of valuation also indicated that they are the most proficient, 53%, in the use of the DCF method as opposed to the other methods, that they preferred the DCF method, 49%, for the valuation of income property, and that they are of the opinion that the DCF method of valuation is the most relevant method, 55%, for the valuation of income property.

Figure 4.15 below is a graphical representation of the question pertaining to the number of training opportunities pursued for the further education in the DCF method as related to the answers supplied on the perceptions of the DCF method of valuation being the most preferred method of valuation, the highest proficiency in this method and the most relevant method for the valuation of income property.

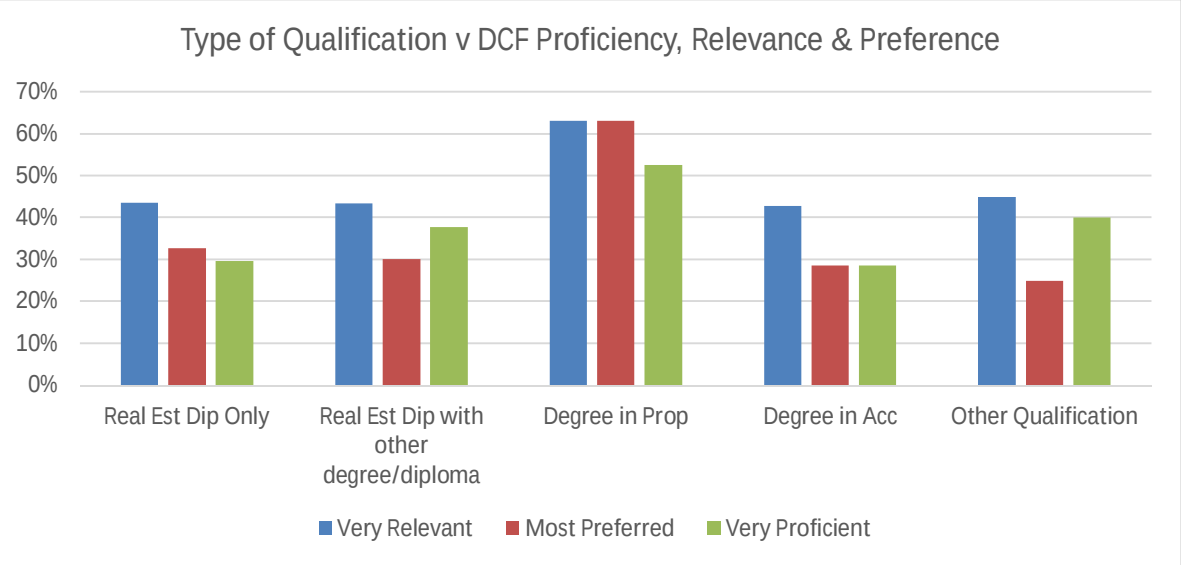
Figure 4.15 Cross Tabulation: Number of Training Opportunities with DCF Proficiency, DCF Relevance & DCF Preference



It is noted from Table 4.15 above that the responses of two groups of respondents stand out. These are the group who indicated that they have pursued only one type of opportunity, 26%, to further their education in the use of the DCF method and the group who indicated that they have pursued a total of four types of training opportunities, 9%.

Figure 4.16 below is a graphical representation of the question pertaining to the formal education received by the respondent which gave entrance to the valuation profession as related to the answers supplied on the perceptions of the DCF method of valuation being the most preferred method of valuation, the highest proficiency in this method and the most relevant method for the valuation of income property.

Figure 4.16 Cross Tabulation: Formal Qualification Received with DCF Proficiency, DCF Relevance & DCF Preference



It is noted from Table 4.16 above that those respondents, 17% of the population, who indicated that they hold a degree with studies in real Estate or Property as major also indicated that they are the most proficient, 53%, in the use of the DCF method as opposed to the other methods, that they preferred the DCF method, 63%, for the valuation of income property, and that they are of the opinion that the DCF method of valuation is the most relevant method, 63%, for the valuation of income property .

4.4.2 Questionnaire Survey of Lecturers

Participants in the lecturers' survey were asked to indicated what percentage of the class contact time is spend on the teaching of the DCF method of valuation. The table below shows that three of the respondents spend proportionally much less time on the teaching of DCF methodology than the other two.

Table 4.5 Contact time on the teaching of the DCF method of valuation

Percentage of Time Allocated	Frequency
More than 75%	
50% - 75%	
35% - 49%	
25% - 34%	2
20% - 24%	
15% - 19%	
10% - 14%	3
Less than 10%	

Following on class contact time, the respondents were asked to indicate the number of assignments on the DCF method which are required from the students per course / module lectured. The table below indicates that each lecturer requires at least one and some two assignments.

Table 4.6 number of assignments on the DCF method required

Lecturer	Number of Assignments
1	2
2	1
3	1
4	2
5	1

And finally the respondents were asked to indicate what percentage of the final examination paper is allocated to testing the student's proficiency in the DCF method. The table below indicates that four of the lecturers allocate less that 15% of the final examination paper to the testing of the student's proficiency in the DCF method whereas one lecturer allocates more than 25%.

Table 4.7 Percentage of the final examination paper allocated to testing DCF method

Lecturer	Percentage allocated
1	10% - 14%
2	Less than 10%
3	Less than 10%
4	10% - 14%
5	25% - 34%

The findings of the document survey are as follows:

The South African Council for the Property Valuers Profession (SACPVP) published the following list of accredited educational programs offered by the following educational institutions on their website (SACPVP, 2015):

- University of Cape Town (Department of Construction Economics & Management)
    - BSc (Hons) Property Studies together with BSc (4 year degree)- Full Accreditation,
    - Post Graduate Diploma Property Studies and
    - MSc Property Studies - Full Accreditation

- University of the Witwatersrand (Wits University)
  BSc Property Studies (4 year degree)- Not yet accredited, accreditation visit pending.

- University of Free State
  Master of Land and Property Development Management M.L.P.M. (M Prop): Property Valuation- Conditional Accreditation

- University of Pretoria (Department of Construction Economics)
    - MSc: Real Estate (Full Accreditation)
    - BSc (Hons) Property Studies together with BSc (4 year degree) Pending Accreditation

- University of Johannesburg
    - B Com (Hons) in Property Valuation & Management together with B Com Finance (4 year degree) or together with Advanced Diploma in Property Valuation & Management or bridging course. Full accreditation
    - National Diploma Real Estate (Property Valuation) - Qualification discontinued end 2012

- Cape Peninsula University of Technology
  National Diploma Real Estate (Property Valuation) - Full Accreditation

- University of South Africa- (UNISA)
  National Diploma Real Estate (Property Valuation)
  Qualification discontinued end 2011

Table 4.8 below summarises the qualifications offered by the various universities as well as the level on which they are presented.

Table 4.8 Description of qualification and level at which offered

University	Qualification	Level
University of Cape Town (UCT)	-Science degree in Property Studies -Diploma in Property Studies	-BSc (Honours), MSc -Post Graduate
University of the Witwatersrand (WITS)	Science degree in Property Studies	BSc
University of the Free State (UFS)	Degree in Land and Property Development Management	M.Prop.
University of Pretoria (UP)	-Science degree in Real Estate -Science degree in Property Studies	-MSc -BSc (Honours)
University of Johannesburg (UJ)	-Commerce degree in Property Valuation & Management -Advanced Diploma in Property Valuation & Management	-BCom Finance (Honours) -With BCom Finance
Cape Peninsula University of Technology (CPUT)	Diploma in Real Estate	National Diploma

Of relevance to this survey is the level at which property valuation is introduced as a subject. Table 4.9 below provides an overview of each of the curricula and it is noted that only two universities introduce the subject of property valuation in the second year of an under-graduate degree course. A complete list of the curricula for each of the accredited programs are available as Appendix 5.

Table 4.9 Level at which the subject of property valuation is introduced

University	Subject	Level Introduced
UCT	Valuation I	2nd Year BSc
WITS	Property Valuation	3rd Year BSc
UFS	Property Valuation and Management	M.Prop.
UP	Property Valuation	2nd Year BSc
UJ	Property Valuation Advanced Property Valuation and Management A & B	4th Year BCom Post Grad Dip
CPUT	Property valuation 1, 2 & 3	1st Year Diploma

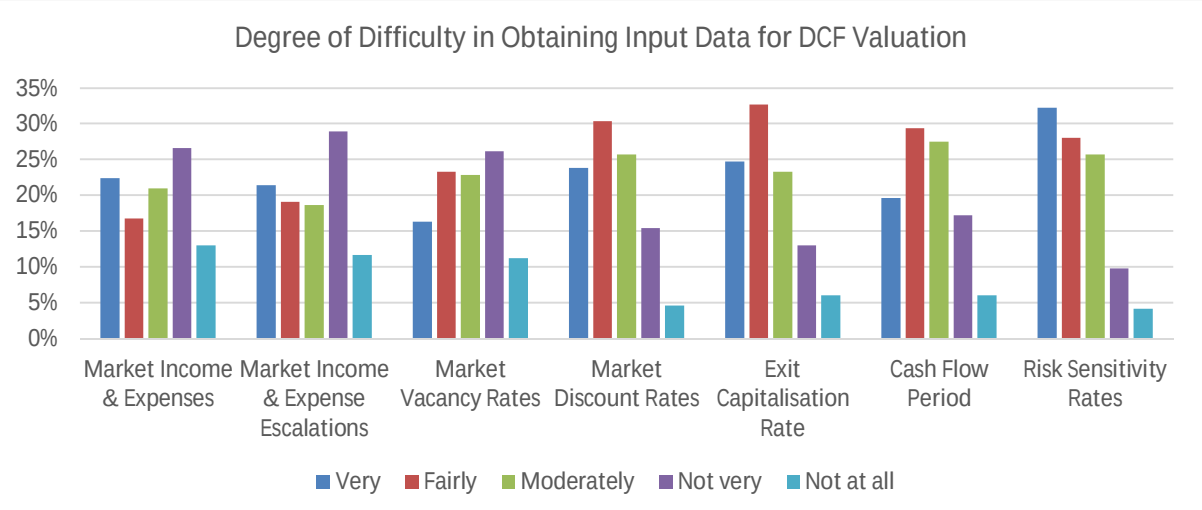
4.5 Question 3 Analysis

Do South African valuers, as part of the perceived complexity of the DCF method, experience difficulties in accessing data and information needed as input variables in concluding a valuation based on the DCF method?

The key input variables for a discounted cash flow calculation as well as data sources were identified and discussed in Section 2.3 of the literature review (Chapter 2) above. In order to answer this question two questions were included in the valuers' questionnaire:

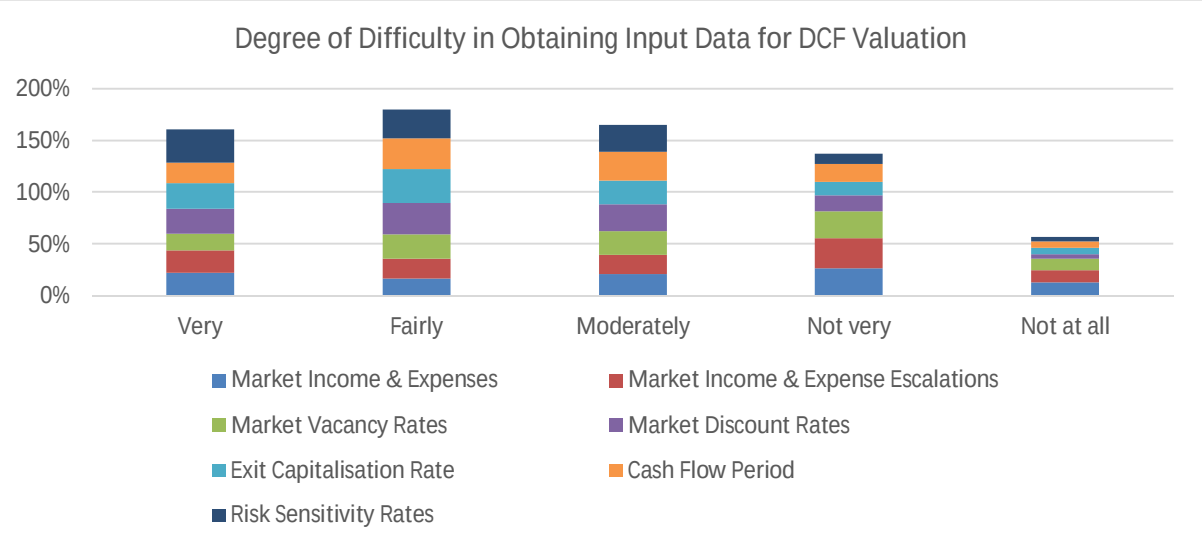
The first question asked the respondents to indicate the level of difficulty in obtaining the data required for seven input variables needed for the successful completion of a discounted cash flow valuation. Figure 4.14 below indicate the response to this question.

Figure 4.17 Degree of difficulty in obtaining input data for DCF valuation



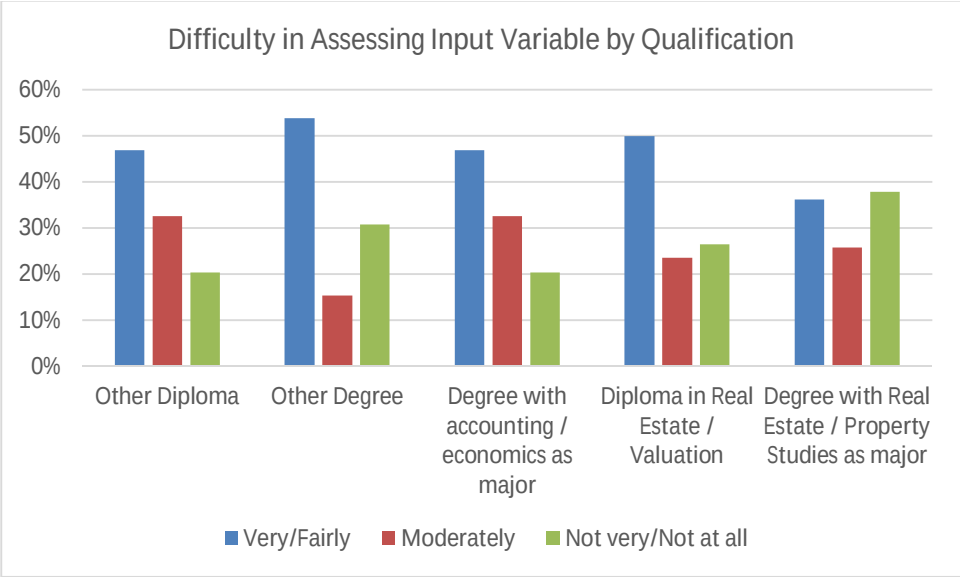
By changing the graph type the data can also be represented as follows, providing a better indication that there is a high incidence of difficulty experienced by valuation professionals in assessing data.

Figure 4.18 Degree of difficulty in obtaining input data for DCF valuation – Stacked Bar Graph



However, Table 4.19 below indicates that by cross tabulating the total degree of difficulty experienced in assessing data to be used as input variables with the level of qualification it is noted that the group who hold a degree with real estate or property studies as major experienced the least difficulty.

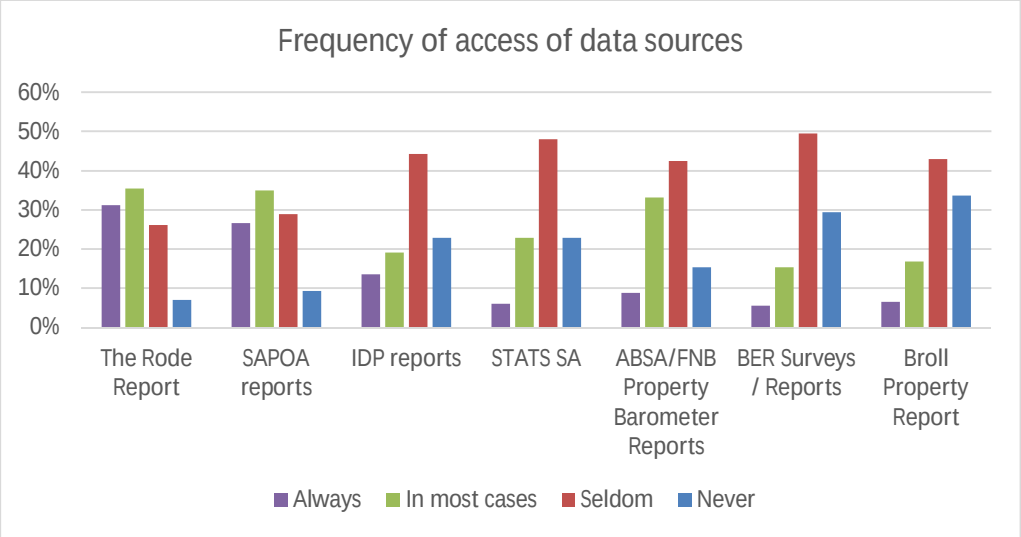
Figure 4.19: Difficulty in Assessing input Variables by Qualification



The second question in the valuer's survey relating to valuation input variables asked the respondents to indicate the frequency with which a list of data sources are accessed in

determining the variables. The list of data sources were identified and discussed in Section 2.3 of the literature review (Chapter 2) above. Some of these data sources are in the public domain, but most are only available on paid subscription. Figure 4.17 below indicates the frequency of access for each of the data sources.

Figure 4.20 Frequency of access of data sources



By combining the categories "Always" and "In most cases", the "popularity" of sources of information are indicated as follows:

Table 4.10 Rating of input variable data sources

Source	Access Frequency
SAPOA Reports	67%
The Rode Report	64%
IPD Reports	35%
ABSA/FNB Property Barometer Reports	26%
STATS SA	22%
Broll Property Report	20%
BER Surveys / Reports	16%

4.6 Evaluation of the research proposition

An existing perception of complexity has led to a limited preference for the use of the DCF method of valuation in the valuation of income property. This perception of complexity is due to insufficient training in the method as well as difficulties experienced in accessing data to be used as input variables.

The analysis of Question 1 indicated a marked preference for the use of the Capitalisation method (69%) above the use of the DCF method (37%) thereby confirming that South Africa valuers has a low preference for the use of the DCF method for the valuation of income property. This preference was indicated to be caused by difficulties valuation professional experience when trying to access data for the completion of valuations based on the DCF method of valuation. These difficulties were clearly illustrated with the analysis of Question 3, although it was found that professional who hold is degree in real estate or property studies reported a lesser degree of difficulty. The analysis of data for research Question 2 probed the perceptions of valuers with regards the education in the use of the DCF method as related to their preference, proficiency and perception of the relevance of the method. It was found that professional who hold is degree in real estate or property studies reported a higher level of preference, proficiency and perception of method relevance. The analysis of the lecturers' survey and the document survey indicated that the DCF method is lectured and examined as part of all the accredited educational programs.

The data therefore confirmed the proposition that limited access to data decrease the preference of use of the DCF method of valuation. The data, however, does not confirm the proposition that a perception of complexity which has led to a limited preference of the method can be shown to be linked to insufficient training, even though there are indications that a degree in real estate or property studies lessens the perception of complexity.

4.7 Summary

This chapter focussed on the analysis of the data collected by means of the three data collection instruments. After an analysis of the geographical information gathered by means of the two survey questionnaires and the document survey, the approach to the analysis was done following the specific order of the research questions.

Following is a summary discussion of each of the analysis as directed by the three research questions.

Question 1: Which methods of valuation are available for the valuation of income producing properties in South Africa and why are some methods preferred to others?

Based on the literature review in Chapter 2 above on valuation methods the following methods were found to be available and are used for the valuation of income producing property:

- The One Year Direct Capitalised Income Approach;
- The Discounted Cash Flow Approach;
- The Direct Comparable Sales Approach;
- The Term and Reversion Approach; and
- The Hard Core / Top Slice Approach.

The teaching of these methods were confirmed by the survey of lectures of five institutes of learning which offers learning programs accredited by the SACPVP. However, it is also noted that the "Term and Reversion" method and the "Hard core / Top Slice" method are not being taught at all five of the institutions of learning.

Data for the second part of the question was collected by means of a questionnaire survey among property valuers. In each question, 7 methods were provided from which to choose. The majority of the respondents (69%) indicated that they most prefer the Capitalisation method for the valuation of income property, whereas only 37% indicated the DCF method as their most preferred method of valuation. As to the relevance of each method for the valuation of income property, 67% indicated the Capitalisation Method as being the most relevant method and 48% indicated the DCF method as the most relevant. When asked to choose between the DCF method and the Capitalisation Method as the better method for the valuation of income property, 70% chose the Capitalisation method and 30% the DCF method. However, an analysis of the reasons provided for this choice indicated that the majority of the respondents who choose the Capitalisation method did not do so because of the superiority of the method, but because they find some reason for not choosing the DCF method. The predominant reason was pointed out to be difficulty in accessing data for the determination of the input variable needed for the completion of a DCF based valuation.

Question 2: Is there a sufficient focus in the education of valuation professionals so as to give them a clear understanding of the principles behind the use of the DCF method?

Information from all the data sources were incorporated in this analysis. It was found that the majority of the valuers (75%) obtained at least a diploma in real estate with property valuation as major while only 12% of the respondents obtained a degree with property valuation as major or included in the curriculum to give them entrance to the valuation profession. For the completion of a DCF valuation the professional should be able to understand the interrelation between the property industry and the micro-, meso- and macro-economic environments and how the one affects the other. It is reasoned that a diploma course is usually skills orientated and subject centric and will therefore not focus on a proper study of the field of property economics. The level of qualification was cross-tabulated with the perceptions of respondents with regards to their perceived proficiency in the use of the DCF method, the relevance of the DCF method as a method for the valuation of income property and their most preferred method for the valuation of income property. It was found that the group with a degree in real estate / property studies scored the highest in these three categories.

In a question on the opinion of the sufficiency of training in the use of the DCF method 48% of the respondents indicated that they are of the opinion that they received sufficient training and 39% of the respondents indicated that they were not sufficiently trained. However, the group of respondents who joined the profession more recently, the less than 10 year group, indicated a 50/50 split in opinion. This is of significance since this is the group of valuers who were more recently trained. The perception on the sufficiency of training was cross-tabulated with the perceptions of respondents with regards to their perceived proficiency in the use of the DCF method, the relevance of the DCF method as a method for the valuation of income property and their most preferred method for the valuation of income property. It was found that the group who indicated that they are of the opinion that they were sufficiently trained scored the highest in these three categories.

When asked which training opportunities were pursued in furthering their understanding of the valuation of income property only 24% of the respondents indicated “Tertiary

Institute". The majority (69%) indicated that they attended a Work School and 62% and 60% respectively that they did some self-study or underwent in-house training. None of these last three options are quantifiable in terms of conformity to the guidelines of the National Qualifications Framework (NQF) and will be in the majority of the cases most likely be in the form of transferring skill sets and the perpetuation of longstanding and perhaps outdated modes of valuation methodology and theory The number of training opportunities pursued were cross-tabulated with the perceptions of respondents with regards to their perceived proficiency in the use of the DCF method, the relevance of the DCF method as a method for the valuation of income property and their most preferred method for the valuation of income property. It was found that the group who indicated that they did not pursued any training opportunities scored the lowest in these three categories.

The analysis of the survey of lecturers indicated that of all the accredited education programs offered include modules on the DCF method of valuation. It was however noted that there are marked differences between lecturers in the lecturing contact time and examination content allocated. Two of the respondents spend more than 25% class contact time on the teaching of the DCF method whereas the other 3 respondents allocates less than 15% on DCF education. Only one lecturer indicated that more than 25% of the final examination paper is allocated to the testing of the proficiency of the student in the use of the DCF method.

The document survey indicated that the subjects on property valuation are only introduced towards the end of the courses.

Question 3: Do South African valuers, as part of the perceived complexity of the DCF method, experience difficulties in accessing data and information needed as input variables in concluding a valuation based on the DCF method?

This question was probed by analysing participants' responses to a survey question to indicate the degree of difficulty experienced in determining the magnitude of each of 7 input variables for the successful completion of a DCF valuation. Three of the variables are also needed for the completion of a valuation using the Capitalisation Method. These

three are: Market Income & Expenses, Market Income & Expense Escalation Rate, and Market Vacancy Rate.

It was noted that for each of these inputs around 40% of the respondents indicated that they experience difficulty and around 40% indicated that they do not experience any difficulty in obtaining data. The remainder 20% indicated that they experience moderate difficulty in obtaining data. However, for the other four input variables: Market Discount Rate, Exit Capitalisation Rate, Cash Flow Period, and Risk Sensitive Rate, there is a sharp increase in respondents indicating that they experience difficulty in obtaining data. Of note here is the 60% indication of difficulty in obtaining data for the Risk Sensitivity Rate. When this data was cross tabulated with the level of education of respondents it was found that the group who hold a degree in real estate or property studies experience a lesser degree of difficulty in determining the values of input variables.

Respondents were also asked to indicate the frequency with which certain sources of published information are accessed when completing a DCF valuation. It was found that 55% to 65% of respondents accessed at least two of the sources most of the times.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study set out to determine the general perception and to understand to which extent the discounted cash flow method of valuation is preferred by the South African valuation community. Studies done in other English speaking countries indicated a trend towards the use of the DCF method in preference to the Capitalization method despite an initial hesitance due to the perceived complexity of the method. Since post-apartheid South Africa's re-entrance into the global economy the property industry have experienced tremendous growth as evidenced by the growth in the listed property sector, however, very little evidence is found of research being done on the South African property industry and even less on the professional who must "confirm" the value of property – the South African valuation professional. This study is therefore intended "to break the ground" for further research into valuation methodology and perceptions within the South African property valuation profession.

In the following sections, the research proposition, questions, objectives and the research presented in this thesis will be summarised, the implications of the results will be considered, the limitations encountered discussed, and finally, some suggestions will be provided for future research.

5.2 Research proposition, questions and objectives

Based on initial literature studied a general research question is put forward, asking what is the general perception of the South African valuer towards the use of the Discounted Cash Flow method for the valuation of investment and income producing properties and whether it can be shown that the method has gained preference among the South African valuation community?

Following the general research question a proposition is put forward in this study stating that an existing perception of complexity has led to a limited preference for the use of the DCF method of valuation in the valuation of income property and that this perception of complexity is due to insufficient training in the method as well as difficulties experienced in accessing data to be used as input variables. The specific research

questions flowing from this proposition seek to understand which methods of valuation are available for the valuation of income producing properties in South Africa and why are some methods preferred to others. Furthermore, whether there is a sufficient focus in the education of valuation professionals so as to give them a clear understanding of the principles behind the use of the DCF method and finally to determine whether South African valuers experience difficulties in accessing data and information needed as input variables in concluding a valuation based on the DCF method. In answering these research questions this study proposes to fulfil the following objectives:

1. To conduct an analysis of the perceptions of DCF method proficiency and preference among practicing valuation professionals;
2. To determine the curricula of the courses accredited by the South African Council for the Property Valuers Profession (SACPVP) and the emphasis of the courses on the use of the DCF method;
3. To determine which input variables are needed to conclude a valuation based on the DCF method and which sources of information are available to the South African valuer from which these variables can be obtained; and
4. To make recommendations to the valuation industry and educational institutions based on the outcome of this study.

5.3 Findings

Below follows a discussion of the findings to each of the three specific research questions, the general research question and an evaluation of the research proposal.

5.3.1 Question 1

Which methods of valuation are available for the valuation of income producing properties in South Africa and why are some methods preferred to others?

Section 2.2 of the literature review (Chapter 2) above followed the history and the evolution of valuation methodology for the valuation of income producing property. The following methods were found to be currently used by the majority of valuation professionals in English speaking countries:

- Capitalised Income;
- Discounted Cash Flow;
- Hard core / Top slice; and
- Term and Reversion.

The literature review further revealed that the Hard core / Top slice method and Term and Reversion method are adaptations of the DCF method to deal with specific events in the British economy. They are however still popular. The questionnaire survey as discussed in Chapter 4 above confirmed the widespread use of these same methods in South Africa.

A survey of lecturers and curricula confirmed also that the Capitalisation and DCF methods are taught at all the universities surveyed, while not all of the universities teach the Hard core / Top slice and Term and Reversion method.

As to the method preference, it was found that the majority of valuers (69%) prefer the Capitalisation method of valuation with only 37% indicating a preference for the DCF method. This preference for the Capitalisation method was further confirmed by 67% of valuers indicating that the Capitalisation method is considered to be the most relevant method for the valuation of income property while only 48% of valuers indicated the DCF method as being the most relevant.

The reason for this preference was determined by asking participants in the valuers' survey to motivate their choice of method between the Capitalisation and DCF methods. It was found that the predominant reason for the high incidence of choice of the Capitalisation method (70%) is not directly related to the positive attributes of the method, but rather due to difficulties they experience in accessing input variables for use with the DCF method.

5.3.2 Question 2

Is there a sufficient focus in the education of valuation professionals so as to give them a clear understanding of the principles behind the use of the DCF method?

This question was posed in part to the valuers participating in the questionnaire survey by asking them to rate their proficiency in the DCF method. They were also asked several questions on their education as valuers as well as their preference for certain methods. The data from these answers were cross tabulated with each other in order to observe the existence of any relationships. It was observes that the majority of participants are of the opinion that they were sufficiently educated in the DCF method. This group also consistently scored high on their perception of being highly proficient in the use of the method and preference for the DCF method.

The survey of valuers found that the majority of respondents (75%) obtained a diploma in property valuation and only 12% a degree in the field of economics or property studies with property valuation as a major subject. It was noted that a diploma course is usually skills orientated and subject centric whereas a degree course focusses on the broader field of study exposing the student to the theory, philosophy and application of the subject matter. This differentiation is paramount for the completion of a DCF valuation since the professional should be able to understand the interrelation between the property industry and the micro-, meso- and macro-economic environments and how the one affects the other. It is therefore questionable whether a valuer who was only exposed to the DCF method through a diploma course will prefer the DCF method without having received an education which will deepen his / her understanding of the property industry and the micro-, meso- and macro-economic environments. When the data from the question on type the of education was cross tabulated with perceptions of own proficiency and preference of the DCF method, it was not surprising therefore to find that the group who hold a degree in real estate or property studies showed the greatest incidence of perception of high proficiency and preference for the use of the DCF method.

Lastly, respondents were asked to indicate how many training opportunities to improve their understanding and use of the DCF method were pursued. This data was also cross

tabulated with perceptions of own proficiency and preference of the DCF method, it was not surprising to find that the group who indicated that they have never pursued a training opportunity showed the lowest incidence of perception of high proficiency and preference for the use of the DCF method.

It can therefore be concluded that there is a link between perceptions of proficiency, preference of use and the education of valuation professionals. There is even an indication that more advanced education (degree programs) increases perception of high proficiency and preference for the use of the DCF method.

The document survey of accredited valuation education programs and the questionnaire survey of lecturers of valuation subjects was done in order to assess the current state of valuers education. It was found that all but one of the programs are offered as degree courses with some on post graduate level. The survey of lectures revealed that education of the DCF method are part of all the programs with fair portions of class contact time and the examination papers dedicated to DCF training.

5.3.3 Question 3

Do South African valuers experience difficulties in accessing data and information needed as input variables in concluding a valuation based on the DCF?

The key input variables for a discounted cash flow calculation were identified and discussed in Section 2.3 of the literature review (Chapter 2) above. Furthermore, several publications which are deemed good sources of information were also identified and discussed in the same section. These were put to participants in a questionnaire survey asking them to indicate the level of difficulty experienced in finding the data for each of the variables as well as how often are the given sources consulted. The data from the survey indicated that valuers experience high levels of difficulty in assessing data to be used for input variable despite indications that certain publications which are deemed to provide data are regularly consulted. It was however found that the level of property education, those who hold a degree in real estate or property studies, are experiencing a lesser degree of difficulty in assessing data.

5.3.4 General Research Question

What is the general perception of the South African valuer towards the use of the Discounted Cash Flow method for the valuation of investment and income producing properties and can it be shown that the method has gained preference among the South African valuation community?

From the discussion of the findings of the three specific research questions above and the empirical data collected it can be concluded that there exist a general perception of complexity with regard the use of the DCF method. This perception is largely the result of the perceived difficulty to access to the input variables needed. These perceptions were found to increase the preference of valuers to continue using the Capitalisation method. However, it was found that valuers who hold a degree as opposed to a diploma in real estate or property studies tend to have a more positive view on the DCF method with a higher level of preference for the use of the method. The large number, eight in total, of degree and post graduate property education course accredited by the SACPVP, opposed to only one diploma course, will cause an increase in the acceptance and preference in the use of the DCF method of valuation.

5.3.5 Research Proposition

An existing perception of complexity has led to a limited preference for the use of the DCF method of valuation in the valuation of income property. This perception of complexity is due to insufficient training in the method as well as difficulties experienced in accessing data to be used as input variables**.**

This study successfully indicated that there exists a limited preference for the use of the DCF method of valuation. This limited preference was however shown to be the result of perceived difficulties in assessing data for input variables. Even though a direct link between the perceptions of complexity and training could not be shown, it was found that valuers which hold a degree in real estate of property studies reported a lesser perception of complexity and a higher degree of preference for use of the method.

5.4 Limitations of the Study

There are several limitations of this study that merit attention:

- This study is limited to an analysis of valuers perceptions about the DCF method of valuation and it does not intent to perform formal empirical testing of their proficiency in the method;
- This study is limited to the current training of valuers and does not take into consideration the curricula of valuers who were trained in the past;
- Even though the response rate to the questionnaires is sufficiently representative of the population of valuation professional, a higher response rate resulting in a bigger data set could have provided an even clearer understanding of the research problem;

Despite these limitations, the data collected from both the valuers, lecturers and the document survey were sufficient to provide a valid insight into valuers' preferences and the state of valuers' education with regard to the discounted cash flow method of valuation.

5.5 Recommendations and further research

As indicated in the introduction to this chapter, this study is intended to "break the ground" for further research into valuation methodology, preferences and perceptions within the South African property valuation profession. The study revealed that although there exist perceptions of complexity and low preference for the use of the DCF method, it was found that valuers who hold a degree in real estate or property studies showed a greater preference towards the use of the DCF method than any of the other education groups. The following is therefore recommended for both further research and possible actions to be taken by the property valuation profession and other roll players:

- Education programs should align with industry expectation and universities should therefore work closer with industry stakeholder in setting up and reviewing valuation programs;

- Valuers profession associations should focus training programs more on the understanding of economic principles and the impact on property than on the practical aspects of valuation methods.

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APPENDIX 1
INVITATION TO VALUATION PROFESSIONALS TO PARTICIPATE IN SURVEY

Invitation to participate in research project and consent to participation

Participants: Valuation professionals registered with the South African Council for the Property Valuers Profession (SACPVP).

Data collection method: Invitations e-mailed to SACPVP members with hyperlink to SurveyMonkey®.

Research Project: The use of the Discounted Cash Flow (DCF) method as a method of valuation within the South African valuation industry: A critical review.

Good day

I am a student at the department of Construction Economics & Management at the University of Cape Town conducting research towards a MSc in Property Studies. I am researching the use of the Discounted Cash Flow (DCF) method as a method of valuation within the South African valuation industry and would like to invite you to participate in the project.

The survey is therefore structured in such a way as to measure the proficiency of valuers in the use of this method of valuation as well as to determine which difficulties valuers experience in accessing information to satisfy the input variables of a typical DCF project. Even though your current employment situation might not expose you to the valuation of income generating properties your participation would be appreciated as there are some questions pertaining to valuers education, training and perception.

Participation in the survey is voluntarily and since Sureymonkey® does not collect any personal information on participants, participation is totally anonymous.

By completing the online questionnaire you give consent to participate in the research and that the information you supply may be used in reaching certain conclusions to satisfy the research objectives.

The final results of the surveys will also be submitted to the SACPVP together with recommendations towards the improvement of the services rendered by valuers to the property investment and financial industries.

The final results of the survey will be available on request after the completion of the research project.

The questionnaire consists of only 18 questions which will take between 10 and 15 minutes to complete. The following link will take you to the online questionnaire:

Should you wish not to participate; the following link will return to me a statistical count of non-participants – also needed for the research:

Thank you for your participation.

PT Pienaar

APPENDIX 2
VALUERS SURVEY QUESTIONNAIRE

Survey Questions

An electronic survey (SurveyMonkey®) of property valuers registered with the South African Council for the Property Valuers Profession (SAPVP).

Section 1: Demographic Information

1.1 Age bracket.

Under 25

25-29

30-34

35-39

40-44

45-49

50-54

55-59

Above 60

1.2 Number of years in profession

Less than 5

5-9

10-14

15-19

20-24

25-29

More than 30

1.3 Professional Status

Candidate Valuer

Associated Professional Valuer with restriction:

- Assessment rates & Endowment for a Local Authority (Code: a)
- Mortgage Bonds (Code: b)
- Mortgage Bonds on Single Residential Properties (Code: c)
- Single Residential Properties (Code: f)
- Agricultural Properties (Code: j)
- Assessment Rates & Endowment for Local Authority & Mortgage Bonds (Code: ab)
- Mortgage Bonds & Single Residential (Code: bf)
- Local Authority & Single Residential (Code: af)
- Local Authority, Mortgage Bonds & Single Residential (Code: afb)
- Property Valuation under Supervision for purposes of Local Experience (Foreigners) (Code: n)
- Special Consult Registrar (Code: s)

Associated Professional Valuer without restriction

Professional Valuer

1.4 Province of residence

Western Cape

Eastern Cape

Northern Cape

Gauteng

KwaZulu-Natal

Mpumalanga

Free State

Limpopo

North-West

1.5 To which of the following professional bodies to you belong:

SAIV

RICS

Both SAIV & RICS

Neither

1.6 How are you currently employed?

Independent

Government Department - National

Government Department - Provincial

Municipality

Mortgage Lender

Valuation Firm

Other

1.7 Please state the academic qualification which gave you entrance into the profession as well as any other qualification. If you are a candidate valuer and still studying, indicate which qualification you are aiming to achieve and in which year you aim to graduate.

Diploma in Real Estate / Valuation – Please state institution

Degree with Real Estate / Property Studies as major – Please state institution

Degree with accounting / economics as major – Please state institution

Other Diploma – Please state

Other Degree - Please state

Section 2: Scope of Valuation Work & Access to data

2.1 Frequency of requests for the valuation of Income Properties (not specialized)

At lease than once a week

At least once every two weeks

At least once a month

At least once every two months

Less than once every two months

2.2 Preferred method of valuation for income properties (not specialized)

	Most Preferred	Only when no other option available	Least preferred	Only as control	Never
Comparable Sales					
Capitalised One Year Income					
Term and Reversion					
Hard core/Top slice/ Bottom Slice					
Discounted Cash Flow					
Depreciated New Replacement Cost					

2.3 How would you gauge your proficiency with the following methods?

	Not at all proficient	Not very proficient	Moderately proficient	Fairly proficient	Very proficient
Comparable Sales					
Capitalised One Year Income					
Term and Reversion					
Hard core/Top slice/ Bottom Slice					
Discounted Cash Flow					
Depreciated New Replacement Cost					

2.4 Notwithstanding your answers to 2.2 and 2.3 above, what is your opinion on the relevance (outdated or not suitable) of the following methods of valuation as a method for the valuation of income property (not specialized)?

	Not at all relevant	Not very relevant	Moderately relevant	Fairly relevant	Very relevant
Comparable Sales					
Capitalised One Year Income					
Term and Reversion					
Hard core/Top slice/ Bottom Slice					
Discounted Cash Flow					
Depreciated New Replacement Cost					

2.5 The International Valuations Standards (IVS) Framework document mentions the Discounted Cash Flow method of valuation as one of three methods which resort under the Income Approach. What, in your opinion and experience, is the degree of difficulty to ascertain the magnitude of each of the following input variables for the successful completion of a valuation based on the DCF method?

Input variable / Difficulty of obtaining	Not at all	Not very	Moderately	Fairly	Very
Market Income / Expenses					
Market Income / Expense Escalations					
Market Vacancy Rates					
Market Discount Rates					
Reversion / Exit Capitalisation Rate					
Holding Period / Cash Flow Period					
Risk Sensitivity Rates					

2.6 When preparing a valuation report for an income property, which of the following information sources do you consult?

	Always	In most cases	Seldom	Never
The Rode Report				
SAPOA reports				
IPD reports				
STATS SA				
ABSA/FNB Property Barometer Reports				
BER Surveys / Reports				
Broll Property Report				
Other				

2.7 If you have checked *Other*, please provide details.

2.8 From you experience and personal opinion which is the better method for the valuation of income property:

Direct Capitalisation

DCF

2.9 Using the space available expand on the reasons for your preference indicated above.

2.10 Which of the following do you use in the completion of a income valuation

Cougar

Argus

Spreadsheet

Other, please specify

Section 3: Education and Further Education

3.1 Referring to your education in question 1.8 above, in your opinion, were you sufficiently trained / exposed to the Discounted Cash Flow method of valuation?

- Yes
- No
- Too long ago, cannot remember

3.2 Over the past couple of years property have increasingly become an asset class in its own right with the establishment of REITS, PUTS and PLS's as well as investors buying income property as part of a balanced investment portfolio. Referring to your time as a valuer in section 1.2, which steps have you taken to educate yourself to provide a better service to your clients?

- Acquire valuation textbooks and peer reviewed journals for further self-education on the subject.
- Attend extra classes at the local university / technicon / polytech / college.
- Attend "in-house" training courses.
- Attend work schools presented by professional valuation bodies.
- Nothing, not my field of specialization.

3.3 Even though the valuation of income property might not be your field of specialization, would you welcome the more readily availability of focused training opportunities in the methods of valuation of income producing properties?

- Yes
- No
- Indifferent

APPENDIX 3
INVITATION TO LECTURERS TO PARTICIPATE IN SURVEY

Invitation to participate in research project and consent to participation

Participants: Lecturers of valuation courses at the seven institutions of learning accredited by the South African Council for the Valuation Profession (SACVP).

Data collection method: Invitation by e-mail with hyperlink to SurveyMonkey®.

Research Project: The use of the Discounted Cash Flow (DCF) method as a method of valuation within the South African property industry: A critical review.

Good day

I am a student at the department of Construction Economics & Management at the University of Cape Town conducting research towards a masters degree. I am researching the use of the Discounted Cash Flow (DCF) method as a method of valuation within the South African property industry and would like to invite you to participate in the project.

Primarily I am interested in finding out the degree to which this method of valuation has gained acceptance within the South African valuation industry as well as the proficiency of valuers in using the method. Therefore my main focus group is valuers registered with the South African Council for the Property Valuers Profession (SACPVP). However, research has shown that the methods of valuation have evolved over the past 20 to 30 years with the changes in the global economy and change in the status of property into that of an investment class. I am therefore interested in finding out to what degree institutions of learning are focusing on the teaching of the DCF method of valuation and whether there is a correlation between the education of valuers and their resistance or not to the use of this method of valuation.

I will be grateful if you choose to participate in the survey and participation is voluntarily. Sureymonkey® does not collect any personal information on participants in surveys so participation is totally anonymous.

By completing the online questionnaire you give consent to participate in the research and also that the information you supply may be used in reaching certain conclusions to satisfy the research objectives.

Should you wish to participate in the research and be interested in the outcome of the survey you can respond to this e-mail address with the word “Results” in the subject line.

Thank you for your participation.

PT Pienaar

APPENDIX 4
LECTURERS SURVEY QUESTIONNAIRE

Survey Questions

Introduction

The International Valuations Standards (IVS) Framework document puts forward three approaches to valuation:

1. **The Market Approach,**
2. **The Income Approach, and**
3. **The Cost Approach.**

Methods that fall under the Income Approach include:

- **Income capitalisation, where an all-risks or overall capitalisation rate is applied to a representative single period income,**
- **Discounted cash flow where a discount rate is applied to a series of cash flows for future periods to discount them to a present value,**
- **Various option pricing models.**

Questions

1 On which level do you teach valuation methodology?

1. 1st year
2. 2nd year
3. 3rd year
4. Post Graduate
5. All of the above

2 In the valuation courses you teach, what percentage of class contact time is allocated to lecturing on the DCF method?

More than 75%

50% - 75%

35% - 49%

25% - 34%

20% - 24%

15% - 19%

10% - 14%

Less than 10%

3 How many assignments are students required to complete on the DCF method in the course you lecture?

1

2

3

4

5

More than 5

4 What percentage of the final examination paper is allocated to testing the student's proficiency in the DCF method in the course you lecture?

More than 50%

35% - 49%

25% - 34%

20% - 24%

15% - 19%

10% - 14%

Less than 10%

5 Apart from the DCF method, which of the following methods are also taught?

Income Capitalisation

Term and Reversion

Hard core/Top slice/ Bottom Slice

Other, please provide details

6 Apart from the DCF method, which of the following methods are also tested in the final examination?

Income Capitalisation

Term and Reversion

Hard core/Top slice/ Bottom Slice

Other, please provide details

7 Is a text book prescribes for the course?

Yes, please provide details

No, only course notes

APPENDIX 5
CURRICULA OF COURSES ACCREDITED BY THE SACPVP

The South African Council for the Property Valuers Profession (SACPVP) published the following list of nine accredited courses / programs at the following educational institutions on their website (SACPVP, 2015):

- University of Cape Town (Department of Construction Economics & Management)
    - BSc (Hons) Property Studies together with BSc (4 year degree)- Full Accreditation,
    - Post Graduate Diploma Property Studies and
    - MSc Property Studies - Full Accreditation

- University of the Witwatersrand (Wits University)
  BSc Property Studies (4 year degree)- Not yet accredited, accreditation visit pending.

- University of Free State
  Master of Land and Property Development Management M.L.P.M. (M Prop): Property Valuation- Conditional Accreditation

- University of Pretoria (Department of Construction Economics)
    - MSc: Real Estate (Full Accreditation)
    - BSc (Hons) Property Studies together with BSc (4 year degree) Pending Accreditation

- University of Johannesburg
    - B Com (Hons) in Property Valuation & Management together with B Com Finance (4 year degree) or together with Advanced Diploma in Property Valuation & Management or bridging course. Full accreditation
    - National Diploma Real Estate (Property Valuation) - Qualification discontinued end 2012

- Cape Peninsula University of Technology
  National Diploma Real Estate (Property Valuation) - Full Accreditation

- University of South Africa- (UNISA)
  National Diploma Real Estate (Property Valuation)
  Qualification discontinued end 2011

Following is the breakdown of each curriculum as published on the website of each of the respective institutes of learning:

- University of Cape Town (Department of Construction Economics & Management)
    - o BSc (Hons) Property Studies together with BSc (4 year degree)- Full Accreditation

First Year	Evidence based Management
	Property Studies IA
	Property Studies IB
	Property Information Systems
	Property Investment Mathematics I
	Building Technology 1T
	Microeconomics
	Macroeconomics
	Statistics 10O1
	Statistics 1000
Second Year	Financial Accounting IA
	Business Finance
	Business Law I
	Property Studies IIA
	Real Property Law I
	Measurement
	Property Investment Mathematics II
	Property Studies IIB
	Electives
	Marketing I
	Labour Law
	Microeconomics II
	Macroeconomics II
	Business Statistics
	Approved Elective
Third Year	Business Law II
	Professional Communication Studies
	Property Studies IIIA
	Property Studies IIIB
	Property & Contract Law
	Property Studies IIIC
	Cost Engineering IT
	Electives
	Business Accounting
	Management Accounting I
	Marketing I
	Labour Law

	Company Law
	Globalisation & the Built Environment
	Microeconomics II
	Macroeconomics II
	Business Statistics
	Research & Survey Statistics
Honours	Advanced Property Studies A
	Advanced Property Studies B
	Applied Property Law
	Housing Development and Management IT
	Treatise
	Advanced Property Studies C
	Electives
	Business Accounting
	Management Accounting I
	Marketing I
	Labour Law I
	Company Law
	Microeconomics II
	Macroeconomics II
	Business Statistics
	Research and Survey Statistics

- Post Graduate Diploma Property Studies

Property Development
Property Law
Urban Land Economics
Property Finance
Property Portfolio Management
Property Valuation Theory & Practice
Advanced Property Valuation
Research Methodology
Further Applied Statistics
Minor Dissertation Property Studies
Introduction to Applied Statistics

- MSc Property Studies

Property Development
Property Law
Urban Land Economics
Property Finance
Property Portfolio Management
Property Valuation Theory & Practice
Advanced Property Valuation
Research Methodology
Further Applied Statistics
Minor Dissertation Property Studies
Introduction to Applied Statistics
Research Report

- University of the Witwatersrand (Wits University)
  - BSc Property Studies (4 year degree)- Not yet accredited, accreditation visit pending.

First year	Applied Mathematics
	Construction Planning and Design 1
	Theory and Practice of Quantity Surveying 1
	Mathematics
	Planning for Property Developers (half-course)
Second year	Business Accounting
	Construction Planning and Design II
	Theory and Practice of Quantity Surveying II
	Building Science I
	Civil Engineering in Relation to Planning
	Economics 1
	Commercial Law
Third year	Industrial Organisation and Management
	Construction Technology
	Theory and Practice of Quantity Surveying III
	Research Report (half course)
	Property Valuation
	Property Economics
	Commercial Law
Fourth year	Discourse
	Commercial Procedures including Relevant Legislation
	Introduction to Construction Project Management

	Estimating and Analysis of Prices
	Property Finance and Investment
	Cost Evaluation and Control
	Property Marketing and Management

- University of Free State
    - Master of Land and Property Development Management M.L.P.M. (M Prop) Property Valuation- Conditional Accreditation

First year	Property Development
	Building Economics
	Construction Contracts, Procedure and Procurement
	Land Evaluation
	Construction and Agricultural Engineering
	Introduction to Theory of Urban Planning
	Urban Planning Practice
	Environmental Economics
Second year	Property Development
	Property Valuation and Management
	Applied Game Farm Planning
	Construction and Agricultural Engineering
	Research Essay: Property Development
	Introduction to Studies in Regional Planning
	Land Valuation and Business Plans
Optional modules	Professional Practice
	Dispute Resolution
	Applied Project Management
	Housing
	Tourism and Development
	Transportation
	Planning Management
	Life Cycle Cost, Facility Evaluation and Management
	Advanced Urban Planning Practice

- University of Pretoria (Department of Construction Economics)
    - BSc (Hons) Property Studies together with BSc (4 year degree) Pending Accreditation

First Year - 1st Semester	Academic literacy for Construction Economics
	Building Drawings
	Building Science
	Academic Information Management
	Building Services
	Quantities
	Economics
	Real Estate
	Precalculus
2nd Semester	Building Organisation
	Building Drawings
	Building Science
	Economics
	Real Estate
	Building Services
	Quantities
	History of the Environment
Second Year - 1st Semester	
	Building Science
	Property Valuation
	Real Estate
	Financial Management
	Building Services
	History of the Environment
	Civil Engineering Services
	Statistics
2nd Semester	Building Science
	Property Valuation
	Real Estate
	Financial Management
	Building Services
	History of the Environment
	Civil Engineering Services
	Statistics
Third Year - 1st Semester	Business Law
	Building Science
	Property Valuation
	Real Estate
	Building Services
	Community-based Project
2nd Semester	Housing
	Building Science
	Property Valuation
	Introduction to Property Law

	Real Estate
	Community-based Project
	Property Financial Mathematics
	Research Methodology
	Sustainable Construction
Honours - 1st Semester	Building Cost Estimation
	Property Marketing
	Facilities Management
	Property Valuation
	Research Report
	Property Development
	Construction Management
	Practical Development Feasibility
2nd Semester	Building Cost Estimation
	Management Practice
	Market and Location Studies
	Property Valuation
	Feasibility Studies
	Research Report
	Law of Lease Contracts
	Property Investment
	Practical Development Feasibility

- MSc: Real Estate (Full Accreditation)

Property Management
Property Valuation 801
Property Valuation 802
mini-dissertation
Property Development 801
Property Development 822
Facilities Management
Research Methodology
Property Investment

- University of Johannesburg
  - B Com (Hons) in Property Valuation & Management together with B Com Finance (4 year degree) or together with Advanced Diploma in Property Valuation & Management or bridging course. Full accreditation

B Com (Hons) in Property Valuation & Management	Advanced Property Valuation and Management A
	Advanced Property Valuation and Management B
	Advanced Property Finance and Investment

	Applied Property Law A
	Applied Property Law B
	Property Portfolio Management
	Research Project: Property Valuation and Management

- Cape Peninsula University of Technology
    - National Diploma Real Estate (Property Valuation)

First Year	Law on property valuation
	Property economics and finance 1
	Principles of property law
	Property practice 1
	Property valuation 1
Second Year	Property economics and finance 2
	Principles of information systems
	Property marketing 1
	Property valuation 2
Third Year	Property economics and finance 3
	Property practice 2
	Property valuation 3

APPENDIX 6
ACCESS TO UCT STAFF FOR RESEARCH PURPOSES CONSENT FORM

HR194	**ACCESS TO UCT STAFF FOR RESEARCH PURPOSES**	UNIVERSITY OF CAPE TOWN

NOTES

- Forms must be downloaded from the UCT website: http://www.uct.ac.za/depts/sapweb/forms/forms.htm
- This form must be completed by applicants who are requesting to access UCT staff for the purpose of research.
- A copy of the research proposal as well as the Ethics Committee approval must be attached.
- It is the **responsibility of the researcher/s to apply for ethical clearance** from the relevant Faculty's Research in Ethics Committee (REC).
- If you are requesting staff information, you are required to complete the HR Information Request Form (HR190) and submit it together with all the required documentation.
- The turnaround time for a reply is **approximately 10 working days unless specified as urgent.**
- Return the completed application form and all the above documentation to Joy Henry via email: joy.henry@uct.ac.za; or deliver to: For the Attention: Executive Director, Human Resources Department, Bremner Building, Room 214, Lower Campus, UCT.

SECTION A: APPLICANT DETAILS

Title	Mr	Name	PT Pienaar
Telephone number	082 440 2740	Email address	ptpienaar@gmail.com
Student number	PNRPET005	Staff number	
Visiting researcher ID / passport number			
Faculty Officer contact details	Mareldia Fagodien		
	Mareldia.Fagodien@uct.ac.za		
University or institution at which employed or a registered student	UCT		
Faculty or department in which you are registered or work	Department of Construction Economics and Management		
Address (if not UCT)			

SECTION B: SUPERVISOR DETAILS

	Title and name	Telephone number	Email address
Supervisor	Manya Mooya	+27 21 650 3443	manya.mooya@uct.ac.za
Co-Supervisor			

SECTION C: APPLICANT'S FIELD OF STUDY (if applicable) / TITLE OF RESEARCH PROJECT / STUDY

Degree	M.Sc. in Property Studies	
Research project or title	The use of the Discounted Cash Flow (DCF) method as a method of valuation within the South African property industry: A critical review	
Research proposal attached	☒ Yes	☐ No
Target population (number of UCT staff)	1	
Amount of time required for an interview and/or questionnaire	30min	
Lead Researcher details	Manya Mooya, manya.mooya@uct.ac.za	
Proof of ethical clearance status attached	☒ Yes	☐ No

SECTION D: FOR OFFICE USE (Approval status to be completed by the Executive Director, Human Resources or Nominee)

Support or approval			Role	Signature	Date
Supported?	☑ Yes	☐ No	Joy Henry (Office Co-Ordinator)		26/09/14
Approved?	☑ Yes	☐ No	Miriam Hoosain (Executive Director: HR)		29/09/14

APPENDIX 7
ETHICS COMMITTEE APPROVAL FORM

EBE Faculty: Assessment of Ethics in Research Projects (Rev2)

Any person planning to undertake research in the Faculty of Engineering and the Built Environment at the University of Cape Town is required to complete this form before collecting or analysing data. When completed it should be submitted to the supervisor (where applicable) and from there to the Head of Department. If any of the questions below have been answered YES, and the applicant is NOT a fourth year student, the Head should forward this form for approval by the Faculty EIR committee: submit to Ms Zulpha Geyer (Zulpha.Geyer@uct.ac.za; Chem Eng Building, Ph 021 650 4791).
NB: A copy of this signed form must be included with the thesis/dissertation/report when it is submitted for examination

This form must only be completed once the most recent revision EBE EIR Handbook has been read.

Name of Principal Researcher/Student: PT Pienaar — Department: Construction Economics & Management

Preferred email address of the applicant: ptpienaar@gmail.com

If a Student: Degree: MSc Property Studies — Supervisor: MM Mooya

If a Research Contract indicate source of funding/sponsorship: NA

Research Project Title: The use of the Discounted Cash Flow (DCF) method as a method of valuation within the South African property industry: A critical review

Overview of ethics issues in your research project:

Question 1: Is there a possibility that your research could cause harm to a third party (i.e. a person not involved in your project)?		NO
Question 2: Is your research making use of human subjects as sources of data? If your answer is YES, please complete Addendum 2.	YES	
Question 3: Does your research involve the participation of or provision of services to communities? If your answer is YES, please complete Addendum 3.		NO
Question 4: If your research is sponsored, is there any potential for conflicts of interest? If your answer is YES, please complete Addendum 4.		NO

If you have answered YES to any of the above questions, please append a copy of your research proposal, as well as any interview schedules or questionnaires (Addendum 1) and please complete further addenda as appropriate. Ensure that you refer to the EIR Handbook to assist you in completing the documentation requirements for this form.

I hereby undertake to carry out my research in such a way that

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

Signed by:

	Full name and signature	Date
Principal Researcher/Student:		24/06/2013

This application is approved by:

Supervisor (if applicable):		24/06/2013
HOD (or delegated nominee): *Final authority for all assessments with NO to all questions and for all undergraduate research.*		
Chair : Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the above questions.		25/06/2013