

The Applicability of Discounted Cash Flow Model on Valuation Practice in Nigeria

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ABSTRACT

The Discounted Cash Flow Valuation model seems to have addressed the shortcomings identified with the conventional valuation and has over the years been applied effectively in the valuation of property investments in the western economies while in Nigeria we cannot state that Estate Surveyors and valuers embraced this model notwithstanding the difficulties encountered in predicting property investment risks. As such, this study examined the discounted cash flow Valuation model with a view to ascertaining its applicability to property valuation by Estate surveyors in Nigeria. To achieve this, the study investigated the relevance, understanding and usage of the model by Estate Surveyors and Valuers in Nigeria. Multistage and purposive sampling techniques were combined to select the study areas which consist of two cities from each of the six geopolitical zones in Nigeria, after which two cities were purposively selected from the two states. The selected cities are: Lagos, Akure, Onitsha, Enugu, Warri, Portharcourt, Kaduna, Kano, Abuja, Jos, Yola, and Maiduigiri. The population of the study was 4,190 being registered members as at November 2019 of Estate Surveyors and Valuers in Nigeria. The instruments used in the collection of data include; questionnaire, the interview and the internet- emails. Questionnaires were designed and administered to Estate Surveyors that were not below 18 years of age. The rating scale used in the survey was the summated rating scale also called the 'Likert type rating scale. Data collected were analyzed with descriptive and parametric statistics based on normality. The research hypothesis was postulated and tested. The result showed: that there is low level of understanding and usage of the Discounted Cash Flow Valuation model by Estate Surveyors and Valuers in Nigeria. This study, therefore, recommends that Estate Surveyors and Valuers must update their records with published monetary policy rates, inflation rates, yields on treasury bills and government bonds in order to ascertain the equated yield, implied growth rate and inflation risk free yield needed for the application of this Model.

Keywords: Investment, Valuation, Applicability, Conventional, Discounted cash flow model

INTRODUCTION

To achieve the set goals and objectives for an investment there must be an interplay and availability of capital, labour, land, entrepreneurship, technology, and as well as markets. It is for this reason that Investment analysis follows a consistent pattern regardless of the investment vehicle or investor entity.

That is, the streams of benefits from alternative proposals are forecast and are adjusted for timing and risk differences. Alternatives are then ranked according to their desirability, in terms of the trade-off between perceived risk and anticipated return. Rational investors seek financial returns as a reward for committing

resources and as compensation for bearing risk. This however depends on investor objectives and individual attitude towards risk.

Invariably, little or no attention has been accorded to property investment risk in Nigeria. "Property investment risk is a much under considered and under researched problem. Property investment analysts recognize the impact of risk on return and capital appreciation of property investment performance. Rather than conduct a thorough quantitative analysis adopt an intuitive approach to reflect its effect on value" [1]. Also, [2] argues that "these risks are important features of property performance measurement but the variability in returns of rent and capital appreciations are most crucial in their determination, and investors rarely call for analysis of the performance of their investments occasioned by their nature; no accountability requirement and no conscious consideration to establish basis for future action. Traditionally, most Nigerians, abhor alienation of property, most would prefer a private and unadvertised sale of their property. It is never viewed as an investment which can be alienated or divested to invest in another medium although its income yielding characteristic is well appreciated. It is not viewed as other investment such as equities or even bank deposit" [3] [4] [5]. In spite of its perceived complexity, real property investment analysis is not fundamentally different from other investments in terms of investment decision, because the benefit stream is estimated with the assumption that investors purchase investments with the ability to produce returns within the investment period. In conventional valuation the practice in discounting is that yield is adjusted for risk, that is, the discount rate used reflects its riskiness, with higher risk cash flow having higher discount rate. Due to these adjustments, Contemporary valuation models were developed to address the shortcomings in

the conventional valuation models concerning the selection of capitalization rate, all-risk yield, and compensating errors of undervaluation and overvaluation. The Contemporary valuation models, namely; Real Value Model [6]; Equated yield Analysis [7] and Real Value/Equated Yield Hybrid [8] have been commended and also subjected to criticisms as regards to their effective application in Nigeria. The Royal Institution of Chartered Surveyors sponsored a research programme into property valuation methods which led to the publication of interim report in 1980 [9]. The report also concluded that: equated yield analysis is a practical and simple method of making explicit assumptions as to the likely pattern of future value changes and, it's use in the determination of value to particular purchaser should be encouraged. Also, the advocates of Discounted Cash Flow Model (DCF) make the point that most investors are unlikely to purchase property in isolation from a consideration of the other investment opportunities available to them and that they will have regard to their own expectation of future rental growth...when deciding whether or not to buy a property investment at the ruling market price [10] [11]. It is on this premise that this study seeks to ascertain the relevance of the Discounted Cash Flow valuation Model (DCF) model in Nigeria.

Statement of Problem

The rate of return in the valuation practice has been branded all risk yield. "It is a repository into which all factors affecting performance is heaped" [12]. This all risk yield is implicit in nature and is adjusted intuitively to reflect the understanding that the term rent is more secure than the reversionary which is market based. However, this resulted in the use of two rates of valuation. [13] shows that the use of two rates in the valuation of property is hopelessly inconsistent, in his analysis and concluded that "the use of more than one remunerative rate of interest in a

conventional investment valuation is unsatisfactory and should be discouraged". "Some British authors' document empirical initial yield for various types of property, such as tenement and offices expressed in a range of 4% to 6%, 14% to 20% respectively" [14]. This may be reliable for British economy but not for developing Nigerian economy characterized by exchange rate fluctuations, inconsistent fiscal policy, inflation and dearth of reliable market data. Also, in conventional valuation approach, properties throwing up higher values have low initial yield, whereas generally, the higher the yield the better the attractiveness of an investment. "The apparent paradox exhibited here merely depict the gearing nature of initial income of property investments and the need to consider the overall return of property investment which is better expressed as equated yield" [15] [16]. The Discounted Cash Flow Valuation model therefore

Multistage and purposive sampling techniques were combined to select the study areas which consist of two cities from each of the six geopolitical zones and other investment outlets in Nigeria. All sample units were given the same weight; as such every element in the population had equal probability of selection. The combination of simple random sampling and purposive selection was adopted to enable the researcher divide the population into distinct, independent strata and to draw inferences about specific subgroups [17] [18]. For the study, the geopolitical zones are six and with a simple random sampling two states were selected from each of the geopolitical zones, after which two cities were purposively selected from the two states to assist the researcher to obtain in detail the data needed. Some of the geopolitical zones have seven states such as North West and North Central whilst others have six states and South East five States. As such, their probabilities vary being that the sum of their probabilities

seems to have addressed the shortcomings identified with the conventional valuation and has been in use over the years but proved to be effective and reliable in the valuation of property investments in the western economies (e.g. United Kingdom and Canada etc) but what of an unstable economy like Nigeria, have the practitioners embraced the model notwithstanding the difficulties encountered in predicting property investment risks.

Aim and Objective of the Study

The aim of this study is to examine the Discounted Cash Flow Valuation model with a view to ascertaining its applicability to property valuation by Estate surveyors in Nigeria. To achieve this, the study investigates the relevance, understanding and usage of the Discounted Cash Flow Valuation model by Estate Surveyors and Valuers in Nigeria.

METHODOLOGY

must be equal to one. The selected cities are: Lagos, Akure, Onitsha, Enugu, Warri, Portharcourt, Kaduna, Kano, Abuja, Jos, Yola, and Maiduigiri. The population of the study was 4,190 being registered members as at November 2019 of Estate Surveyors and Valuers in Nigeria. The choice of the sample survey was necessitated by the need to collect substantial data from the twelve cities. The survey instrument was designed over six months period. In the course of the survey, a mixed mode of data collection procedure was employed. The interviewer administration was used for general topics, and self-administration for sensitive topics. The instruments used in the collection of data include; questionnaire, the interview and the internet- emails. Questionnaires were designed and administered to Estate Surveyors that were not below 18 years of age [19]. The survey consists of 10 multiple response questions and 10 satisfaction questions measured on five point scale. The rating scale used in the

survey was the summated rating scale also called the 'Likert type rating scale. The instruments (questionnaires) were given to relevant professional colleagues; statisticians, and lecturers in Real Estate Management for corrections and guidance in line with the objective of study. Moreso, it was not too difficult to obtain reliable data from the respondents, although it was observed that some of the respondents were sensitive to personal questions. Other limits identified were finance due to the volume of the field work required and other necessary

LITERATURE REVIEW

Essentially, investment is the foregoing of immediate or today's consumption for an enhanced later or future benefit. This benefit however need not be financial but in the case of financial benefit, it could come in the form of income or capital appreciation. How does an investment 'generate later benefit'? It can be achieved in three ways: By income; by generating a return of capital; and by a psychic income. "Investment return is therefore a function of income, capital return, and psychic income." [20]. Real estate investors make an immediate and certain sacrifice of current purchasing power in expectation of future economic benefit., [21] posits that the primary purpose of an investment is the future income or profit which he summed thus: "The critical issue in appreciating the quantum or quality of returns or profit realized from an investment lies in the real value rather than nominal value of the return. In effect, the return from an investment, must as a matter of course be projected on a plane of time in order to give credibility to the quantum of the return." As such, investment proposals are evaluated by comparing the magnitude of the sacrifice with the quantity and timing of expected benefits and by considering the level of certainty with which expectations are held. Investment property valuation examines the local property investment market, in terms of size, activity, and main property types,

logistics, however, adequate financial arrangement was made by the researcher to ensure that every aspect of the study was covered within the study time. Analysis of the data collected involved the use of descriptive and inferential statistics. The statistics include; measures of central tendency; measures of dispersion, and measures of relationship. These statistics were used to analyze and present data in a simple and acceptable form while inferential statistics were used to test for relationships between variables.

crucial pricing rates such as capitalization rates and discount rates, and key players with a focus on the particular property type under consideration. Moving from the market and overall property type level to the specific property level, investment property valuation needs to examine and evaluate carefully all the attributes of the property, physical, environmental, legal, location, financial and any aspect that may have bearing on its income earning capacity and value prospects. Once carefully analyzed, the impact of all these factors on property gross and net income earning capacity and prospects must be assessed and quantified [22]. The most commonly used technique for investment property valuation is the discounted cash flow model.

History of Property Valuation

Property Valuation dates back to over three hundred years from the Persian, Asian, and Roman Empires. However, the first book on property valuation, titled Book of Surveying was published in 1523 in England by [24]. The first professional body of surveyors was formed in 1834 in London as a precursor of the Royal Institution of Chartered Surveyors which was founded in 1868. In the United Kingdom in the early 1970's the effects of inflationary growth on both valuation theory and practice prompted the development of the basic 'real value' valuation models as a more realistic investment model. Real value models

were first heralded by Ernest Wood in the 1960s with his Inflation-Risk-Free-Yield (IRFY) model defined as a 'yield excluding inflation and real value change'. This was followed by [25] real value hybrid model. The principal argument for using the real value model over the traditional UK (ARY) all risk yield model is that the latter over-values the term (as it capitalizes the rental cash flows at the initial capitalization rate); and under-values the reversion (as it capitalizes the current rental value at the capitalization rate). However, the real value approach founded in the 1980s was considered too complex and esoteric especially in its first formulation - its theoretical soundness was rubbished by the complicated formulary and calculation required [26]. A friendlier nominal 'equated yield' (EY), a variant of the Discounted Cash Flow (DCF) model, was recommended [27]; and has remained the most popular valuation model in use in UK since the end of the 1970s. The debate on the need to expressly reflect risks and uncertainty in valuation started in 1994 with the publication of the Mallinson Report that outlined a number of initiatives which should undertake to improve the quality of valuations and the standing of the valuation profession in the business world (RICS, 1995). Term and reversion methods using the split rate, equivalent rates, or layer methods are standard universal format which split the basic components into contractual rent and unknown future reversion. This is applied without regard to growth implications, more especially when applied to over and under rented property. However, this model is poor for analysis. Various criticisms have been adduced to conventional investment methods of valuation worldwide among which include errors of logic and arithmetic, and the implicit nature of yield used [28], [29]; [30]. The Discounted Cash Flow (DCF) techniques are being extensively used as a check on the traditional equated yield (EY) valuations

and for properties that have unusual cash flows. Studies conducted by [4], [9], [23] reveal that the Nigerian valuation practitioners believed that the investment method currently provides capital value estimates that are lower than market prices and in order to use this method, adjustment of constituents variables would be required to produce accurate capital values. This is true as the use of two capitalization rates undervalues the term rent and is mathematically inconsistent. Up to the present time, valuation have been expressed as a single unchallenged, single point, non-risk adjusted figure. The need to identify and express for risks and uncertainty within the scope of property valuation is currently one of the key concerns in contemporary UK valuation literature [12]. The Discounted Cash Flow (DCF) techniques gained widespread use in the UK especially in the last two decades, and particularly in the valuation for individual property investments in relation to companies and institutions meeting their target returns [25]. Advising on the purchase of a property or mortgage value based on non-risk adjusted past market trends increasingly becoming inadequate advice to sophisticated clients because such deterministic (unadjusted) calculations ignore the other possible capital values, which could be derived if changes occur in rental income, growth rate and yield forecasts. Among the internal forces that have impacted significantly on valuation theory and practice standards are the damaging criticisms from other professions and investors regarding the accuracy of valuer's estimates and reliability of his advice. Today's real estate valuation profession in Nigeria stands at a crossroads necessitating a revisit in order to reposition it to perform its expected roles more effectively. Presently, not only are clients beginning to question Nigerian valuers' approach and cast doubts on the reliability of their advices, other professionals, notably engineers and

accountants, are not only encroaching into areas which are the traditional purview of the valuers/appraisers (officially referred to in Nigeria as Estate Surveyors and Valuers), but are claiming to be more competent [14]. Sophisticated clients are therefore increasingly advocating downside risk quantification, measurement, and adjustments from valuers similar to what is obtainable in other markets like the capital market. [3]. [4] observed that financial institutions, the main clients of Real Estate Valuers in Nigeria, are getting weary of mortgage valuations prepared by valuers. Financial institutions now advance a very low percentage of values recommended by valuers, while insisting on additional collateral. Invariably, the problems were that conventional model uses all risk yield, relying on calculating investment value by applying a year's purchase to a static net rental allowed improperly for the effects of rising inflation. However, this was being met by the promotion of discounted cash flow techniques using a redemption yield [11]. Afterwards, there came a more competitive yield originated by Philip Marshall [23]. The malisons report (RICS, 1994) following the boom/bust of the United Kingdom

property market in the early 1990's made a number of far reaching recommendation affecting how valuation should be undertaken. Malisons recommendation 24 and 25 related to the development of modified All risk yield (ARY) and Discounted cash flow technique reducing dependence on ARY. A working party undertook a survey of practitioners in the market as to the then adoption of conventional/ traditional or contemporary/DCF methodologies in undertaken valuations (French, 1996) and this showed few (5%) of respondents using real value model for reversionary freehold and over-rented properties only against the majority that favoured equated yield model. This however led to the publication of an RICS information paper on commercial property valuation method [9] with recommendation on using equated yield analysis and Short cut DCF. This invariably favours discounted cash flow model in valuing property using an investment method or income capitalization method that make use of target rate and discount rate [17]. These two methods are best suited and are widely in use due to acceptance and their explicit nature as compared to more complex real value model.

DATA PRESENTATION

Table 1: The Factors Inhibiting The Use of the Discounted Cash Flow Valuation Models in Nigeria. Survey of 320, Estate Surveyors and Valuers in Nigeria.

S/N	Discounted Cash Flow valuation models	Disagreed	Somewhat Agreed	Average y Agreed	Agreed	Highly Agreed	Total %
1	Real Value Model	31(9.7)	25(7.8)	126(39.4)	73(22.8)	65(20.3)	320(100)
2	Equated yield Analysis	29(9.1)	38(11.9)	68(21.3)	64(20.0)	121(37.8)	320(100)
3	Real Value/Equated Yield Hybrid	45(14.1)	29(9.1)	81(25.3)	71(22.2)	94(29.4)	320(100)
4	Rational Model	148(46.3)	32(10)	41(12.8)	48(15)	51(15.9)	320(100)
5	Dialectic Model	148(46.3)	48(15)	28(8.8)	44(13.8)	49(15.3)	320(100)

Source: Field survey 2019

In Table 1 31(9.7%) respondents disagreed that the real value models addressed the shortcomings of conventional valuation whilst 126(39.4%) averagely agreed that the real value model addressed the shortcomings of conventional valuation. 29(9.1%) disagreed that the Equated yield Analysis addressed the shortcomings of conventional valuation while 121(37.8%) highly agreed that the Equated yield Analysis addressed the shortcomings of conventional valuation. 45(14.1%) the respondents disagreed that Real Value/Equated Yield Hybrid addressed the shortcomings of conventional valuation. Also, 148(46.3%) and 148(46.3%) respondents disagreed that Rational Model and Dialectic Model addressed the shortcomings of conventional valuation respectively.

Hypothesis

Null Hypothesis (H₀): There is no significant difference in the level of understanding and usage of the Discounted Cash Flow Valuation model by the Estate Surveyors and Valuers in Nigeria.

Alternative Hypothesis (H₁): There is significant difference in the level of understanding and usage of the Discounted Cash Flow Valuation model by the Estate Surveyors and Valuers in Nigeria.

The majority (at least 51%) of the Estate Surveyors and Valuers have poor understanding and usage of the Discounted Cash Flow Valuation models in Nigeria. The above deals with the tests of hypotheses concerning proportion.

$$n = 320; p = .51; q = 1 - .51 = 0.49 \quad \hat{p} = 220 / 320 = .6875 \quad pq = 0.2499$$

Using the normal approximation, the Z value for testing P = P₀ is given by Therefore,

$$\text{When } H_0: P = 0.51 \quad H_1: P < 0.51$$

α = 0.05, Critical region Z < -1.645. Reject H₀ if z ≤ -z_α otherwise, accept H₀.

$$Z = \frac{\hat{p} - P}{\sqrt{\frac{P_0 Q_0}{n}}}$$

$$Z = \sqrt{6.3556} ; P(6.3556 \geq -1.645)$$

CONCLUSION

We accept H_0 and conclude that there is low level of understanding and usage of the Discounted Cash Flow Valuation

model by Estate Surveyors and Valuers in Nigeria.

RECOMMENDATIONS

The study recommends the following:

1. That for property investments valuation, the way out of the dearth of market data is the use of the Discounted Cash Flow model for valuation analysis. For effective application of this model, Estate Surveyors and Valuers must update their records with published monetary policy rates, inflation rates, yields on treasury bills and government bonds.
2. To improve on the availability of reliable market data, property should be seen mainly as investment, and in that vein, market data would easily be

accessible whilst secrecy in property transactions should be discouraged. The Continuous Professional Development (CPD) Programme of the Nigerian institution of Estate Surveyors and Valuers should be refocused to address this area of deficiency.

3. This model however is capable of synchronizing valuers opinion of value as it derives valuation inputs from regulatory bodies (Central Bank of Nigeria and National Bureau of Statistics) periodic data on financial publications.

REFERENCES

1. Ajayi, C. A. (1998). *Property investment valuation and analysis*. Ibadan: De-Ayo publications.
2. Ajayi, C.A. (2006). Towards new directions for property valuation paradigm, paper presented at the international conference on the built environment: Innovation, policy, and sustainable development, Ota :Covenant university.
3. Babawale, G.K (2007). Valuers' liability for negligence. *The Estate surveyor and valuer*, 30(1): 49-56.
4. Babawale, G. K. (2008) . An evaluation of factors influencing inaccuracy in residential property valuation in Lagos metropolis. Unpublished doctoral dissertation. University of Lagos.
5. Babawale, G. K. (2009). Towards a standardized approach to real estate valuation practice in Nigeria. *The Estate Surveyor and Valuer*, 32(1).18-28.
6. Babawale, G.K. & Omirin, M.M. (2011). Valuers' and valuation firms' characteristics as causes of inaccuracy in valuation in Nigeria. *Mediterranean journal of social sciences* Vol.2 (3), September 2011, pp. 11-22
7. Babawale, G.K. & Oyalowo B.A. (2011). Incorporating sustainability into real estate valuation: The perception of Nigerian valuers. *Journal of sustainable development* Vol.4 (4); August 2011, pp.236-248.
8. Babawale, G.K.(2012). An assessment of the current standard of real estate valuation practice Nigeria. *Elixir social science*, 47 (2012), pp. 9094-9102.
9. Baum, A and Crosby, N (1988). *Property investment appraisal*, London :Routledge.
10. Baum, A.E. Crosby, N. (1989). *Property investment Analysis*, London: Routledge.
11. Baum, A. E.& Mackmin, D. (1996). *The income approach to property valuation*. (4th Edition), London: Routledge.
12. Baum, A. E.(2002), *Commercial real estate investment*, London: Estate gazette.
13. Baum, A. E. (1987). Risk-explicit appraisal: A sliced income

- approach. *Journal of Valuation*, 5:250-270. London: Routledge.
14. Baum, A. (1988). A critical examination of measurement of property investment risk. *Working paper* No.22, University of Cambridge.
15. Baum, A and Macgregor, B (1992). The Initial yield revealed: Explicit valuations and the future of property Investments. *Journal of property valuation and investment*. 10 (4):709-726.
16. Baum, A., Mackmin, D and Nunnington (1997). *The income approach to property valuation*, (4th Edition), London: International thompson business press.
17. Bretten, J. and Wyatt, P. (2002). Variance in property valuations for commercial lending, *Research Papers* : (4): 9.
18. Bowcock, P. (1983). The valuation of varying incomes, *Journal of valuation* 1:366-371.
19. Carsberg Report (2002). *Property valuation*, London: Royal institution of chartered surveyors.
20. Crosby, N. (1983). The investment method of valuation: A real value approach. *Journal of valuation*, 1: 341-350 and 2: 48-59.
21. Crosby, N. (2000). Valuation accuracy, variation and bias in the context of standards, *Journal of property investment and finance*: Vol. 18, 10-15.
22. Ibiyemi, A.O (2007). Application of property valuation and analysis to green buildings, Lagos: *Journal of environmental studies*, 6 (1):47-54.
23. Ibiyemi, A.O (2009). Rational property investment valuation practice in Lagos, *The Estate Surveyor & Valuer*, 29-38.
24. Jefferies, L. J. (2009). A Short history of income property valuation models. (The 17th To 21st Century). Stockholm: A Paper presented for presentation at the European real estate conference.
25. Jefferies, L. J (2009). A Brief history and development of real value model the last four decades, Sydney: A Paper Presented at the Pacific rim real estate society conference.
26. Kalu, I.U (2007), *Property Valuation and Appraisal*, Bon Computers, Owerri.
27. Kalu, I.U (2010). "Prospects of Real Estate Investment in Niger Delta". Professional Development (M.C.P.D) Seminar of the Nigerian Institution of Estate Surveyors and Valuers Enugu Branch.P 10-15.
28. Ogbuefi; J.U (2004), *Aspects of Feasibility and Viability Studies*, Institute of Development Studies, University of Nigeria, Enugu Campus.
29. RICS, (2003). *Appraisal and Valuation Standard*, Royal institution of chartered surveyors, London.
30. Mba W.O (2017). A critical examination of discounted cash flow model as it relates to investment in Nigeria. PhD Thesis, University of Nigeria Nsukka.