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## An Examination of Discounted Cash Flow Valuation Model as it relates to Property Investments in Nigeria.

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### ABSTRACT

The discounted cash flow valuation model proved to be effective and reliable in the valuation of property investments in stable economies. Whereas, there are difficulties in predicting property investment risks in unstable economy owing to the dearth of reliable property market data. This study examined the Discounted Cash Flow Valuation model with a view to proffering a suitable and reliable model as it relates to property investments in Nigeria. It compared the average total returns on property investments with other investment outlets and formulated a suitable Discounted Cash Flow Valuation model for property investments in Nigeria. Multistage and purposive sampling techniques were combined to select the study areas consisting of two cities from each of the six geopolitical zones in Nigeria, and also data were collected on other investment outlets in Nigeria. The study covered the period of 2005 to 2019. The total population used in the study comprised of 4,190 registered Estate Surveyors and Valuers as at November 2019. All the respondents were above eighteen years and were practicing in Nigeria. Sample sizes were determined and 350 Estate Surveyors and valuers were estimated. The instrument used for the primary data collection was structured questionnaires which contained two sections with a five point likert scale. The questionnaire was face-validated by experts in real estate management, and statistics. The secondary data were obtained from, unpublished literatures, conferences of scholars, Journals, Central Bank of Nigeria annual reports and National Bureau of statistics reports, stock exchange market reports and Valuers Journal of appraisals and management. Data collected were analyzed with descriptive and parametric statistics based on normality. This recommends that Estate Surveyors and Valuers in Nigeria should carry out a comparative yield analysis of property, as it relates to investments, with due regard to the bonds, treasury bills and prevailing rediscounting rates at the time of valuation in order to ascertain the equated yield, implied rental growth rate, and inflation risk free yield needed for the application of the Model.

Keywords: Examination, Valuation, Conventional, Traditional, discounted cash flow model

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### INTRODUCTION

The goal of most investors when the motive is financial is to maximize benefits and minimize costs, hence the need to wisely allocate and utilize the limited resources to achieve set goals and objectives. 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. 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.

When comparing investment alternatives with comparable risks associated with the return on and of capital, the rational investor is motivated by two basic preferences. These can be summarized as “more is better than less and sooner is better than later” [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”. 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.

Conventionally, 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 [3]; Equated yield Analysis [4] and Real Value/Equated Yield Hybrid [5] have been commended and also subjected to criticisms as regards to their effective application in Nigeria. The contemporary valuation model has three major inputs. These are; future growth in rental value; Future changes in contractual income flow, timing of these changes, and the yield required for the investment. The Royal Institution of

Chartered Surveyors sponsored a research programme into property valuation methods which led to the publication of interim report in 1980 [6]. 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. However the subjective assumptions made in the method (e.g. as to the opportunity cost of capital and growth rate) mean that valuations will not necessarily reflect the judgment of the market. The implication is that techniques that rely on a subjective assumption regarding the future cannot be used for valuation but may be appropriate for analysis. But the advocates of Discounted Cash Flow Model (DCF) made 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 [7].

Invariably, the valuation practice in Nigeria raises serious challenges due to the nature of the property market which casts doubts as to the validity of the techniques employed. These factors which inhibit the use of these models range from the dearth of market evidence and intuitive adjustment of capitalization rate. “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” [8]. It is on this premise that this study seeks to critically examine the Discounted Cash Flow valuation Model (DCF) as it relates to

the prevalent economic circumstances in Nigeria.

### **Statement of Problem**

The valuation practice in Nigeria no doubt was inherited from the United Kingdom, as such; the practices were bound to suffer the same problem encountered by the United Kingdom in the conventional property valuation. Conventionally, this yield is adjusted intuitively to reflect the understanding that the term rent is more secure than the reversionary which is market based. This, however, resulted in the use of two rates of valuation. [9] 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”. In conventional valuation the major problem is the choice of capitalization rate. “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” [10]. This may be reliable for British economy but not for developing economy characterized by exchange rate fluctuations, inconsistent fiscal policy, inflation and dearth of reliable market data. As such, in Nigeria, the real estate investor is expected to shoulder risks which conform to the prevalent economic and political circumstances. The Discounted Cash Flow Valuation model

therefore addressed these shortcomings identified with the conventional valuation model concerning the selection of capitalization rate, all-risk yield, and compensating errors of undervaluation and overvaluation. This model has been in use over the years and has proved to be effective and reliable in the valuation of property investments in stable economies (e.g. United Kingdom and Canada etc) with predetermined property investment risks because of the availability of reliable market data, whereas in Nigeria, there are difficulties in predicting property investment risks.

### **Aim and Objectives**

Investors are interested, not merely on the amount of money they are to get as returns on their investment but also the real value of the returns. This presupposes that the returns on their investments ought to be such as to equally cover the depreciating effect of inflation on future incomes, hence the need to determine the real return suitable for the valuation of property investments in Nigeria. This study examines the Discounted Cash Flow Valuation model with a view to proffering a suitable and reliable model as it relates to property investments in Nigeria. To achieve this, the objectives are; to compare the average total returns on property investments with other investment outlets and, formulate a suitable Discounted Cash Flow Valuation model for valuation of property investments in Nigeria.

### **METHODOLOGY**

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. 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 must be equal to one. The selected cities are: Lagos, Akure, Onitsha, Enugu, Warri, Port Harcourt, Kaduna, Kano, Abuja, Jos, Yola, and Maiduigiri whilst six financial investment outlets: Government Bonds, Treasury Bills, Stocks and Shares, Monetary policy Rate, and prime lending rate were purposively selected out of other investment outlets. This study covered the period of Fifteen years, from 2005 to 2019. For the property investment, data were collected from prime property such as banking halls, standard offices, and residential buildings on the central business districts and prime layouts of twelve states in Nigeria respectively. 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 month's period. In the course of the survey, a mixed mode of data collection procedure was employed. The interviewer administration was used for general

#### LITERATURE REVIEW

The essence of valuation is to determine value. In determining value one must take into account the related economic, social, and political factors which influence the thought of men, and also the judges and jurors who rule on what constitutes value. This dates back to over three hundred years from the biblical times, the Persian, Asian, and Roman Empires. However, the first book on property valuation, titled Book of Surveying was published in 1523 in England by John Fitzherbert [11]. 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. As a former British colony and a member of the Commonwealth, Nigeria's academic and professional training is rooted and patterned after the British. The effects of

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. The survey consists of 20 multiple response questions and 20 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.

#### Data Analysis Procedures

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.

(EY), a variant of the Discounted Cash Flow (DCF) model, was recommended [13]. 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 [14]. According to the International Valuation Standards Committee (IVSC), "real property represents a considerable portion of the world's wealth, and its valuation is fundamental to the viability of global property and financial markets. The quickening pace in the globalization of investments market further underscores the need for valuations that are consistent, transparent and that are readily understood, applicable and accepted internationally [15]. In the emerging globalized world, valuations that would be relied upon internationally can therefore be produced only by a valuation profession that conforms to international standards of professional education, competence and practice. 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; and the growing awareness of academics and practitioners of the need to increase the transparency of valuation process and to adopt procedures that systematically assess and report property risks as well as to account for the uncertainties associated with valuers' opinion [16]. More so, rental growth is not adequately taken care of in the conventional model. Recent studies have espoused the need for change from an approach based on an intuitive adjustment of the yield to an approach based on an explicit analysis of the relevant variables [17]. The need to identify and express risks and uncertainty within the scope of property valuation is currently one of the key concerns in contemporary UK valuation literature [18].

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 [19]. Up to the present time, valuation have been expressed as a single unchallenged, single point, non-risk adjusted figure. 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. 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. [20].

Today's real estate valuation profession in Nigeria stands at a crossroad 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. Financial institutions now advance a very low percentage of values recommended by valuers, while insisting on additional collateral in order to mitigate the imminent credit risk accentuated by uncertainty in valuations [21]; [22]. As such, the financial institutions, the main clients of Real Estate Valuers in Nigeria, are getting weary of mortgage valuations prepared by valuers [23]. Hence, the need to comparatively evaluate the total

returns and inflation growth rates in property and other investment outlets to assist in the determination of acceptable

risk free rates for the valuation of property investments in Nigeria [24].

DATA PRESENTATION

**Table 1: The Average Annual Inflation Rates in Nigeria, from 2005 to 2019.**

YEAR	JAN N %	FEB N %	MAR N %	APR N %	MAY N %	JUNE N %	JLY N %	AUG N %	SPT N %	OCT N %	NOV N %	DEC-N %	MEAN N %
2005	9.80	10.90	16.30	17.90	16.80	18.60	26.10	28.20	24.30	18.60	18.20	18.10	18.65
2006	10.70	10.80	12.00	12.60	10.50	8.50	3.00	3.70	6.30	6.10	7.40	8.30	8.33
2007	8.00	7.10	5.20	4.20	4.60	6.40	4.80	4.20	4.10	4.60	5.52	5.82	5.38
2008	8.60	8.00	7.80	8.20	9.70	12.00	14.00	12.40	13.00	14.70	12.15	12.70	11.11
2009	14.00	14.60	14.40	13.30	13.20	11.20	11.10	11.00	10.40	11.60	12.22	12.85	12.49
2010	14.40	15.60	14.80	15.00	12.90	14.10	13.00	13.70	13.60	13.40	13.37	12.70	13.88
2011	12.10	11.10	12.80	11.30	12.40	10.20	9.40	9.30	10.90	10.50	11.20	11.70	11.08
2012	12.60	11.90	12.10	12.90	12.70	12.90	12.80	11.70	11.30	11.70	12.35	12.22	12.26
2013	9.00	9.50	8.60	9.10	9.00	8.40	8.70	8.20	8.00	7.80	8.62	8.64	8.63
2014	8.04	7.69	7.78	7.87	7.96	8.19	8.34	8.52	8.33	8.07	7.97	7.97	8.06
2015	8.15	8.38	8.50	8.64	9.02	9.21	9.22	9.34	9.39	9.30	9.18	9.33	8.97
2016	9.62	11.38	12.78	13.71	15.57	16.48	17.12	17.62	17.85	18.33	16.38	16.67	15.29
2017	15.60	16.45	17.25	16.00	16.00	17.40	15.10	15.60	17.40	17.63	17.30	16.50	16.5
2018	12.00	11.90	12.16	11.90	12.70	12.90	12.15	11.76	11.35	11.70	12.35	12.12	12.1
2019	11.37	11.31	11.25	11.37	11.4	11.22	11.08	11.02	11.24	11.61	11.85	11.98	11.32

Source: National Bureau of Statistics, Nigeria 2019.

**Table 2: Average Annual Total Returns on Real Estate Composite in Nigeria, from 2005 to 2019**

Year	South West	South East	South	North West	North Central	North East	Estate Composite average Total annual returns in Nigeria
2005	0.2073	0.2065	0.1427	0.0973	0.2565	0.2027	0.1855
2006	0.1815	0.1978	0.1331	0.0915	0.1978	0.1931	0.1658
2007	0.1717	0.1925	0.1493	0.1517	0.2525	0.1793	0.1829
2008	0.1762	0.1807	0.1508	0.1462	0.2607	0.1708	0.1809
2009	0.1840	0.1834	0.1655	0.1740	0.3034	0.1855	0.1993
2010	0.1968	0.1868	0.1623	0.1768	0.3268	0.1023	0.1920
2011	0.2267	0.1834	0.2088	0.1767	0.3774	0.0888	0.2103
2012	0.2313	0.2071	0.2088	0.1913	0.3881	0.0788	0.2176
2013	0.2021	0.1958	0.1973	0.1721	0.3758	0.0573	0.2001
2014	0.2250	0.1981	0.2235	0.1785	0.3785	0.0982	0.2170
2015	0.2210	0.2044	0.2321	0.1890	0.3850	0.1055	0.2228
2016	0.2650	0.2195	0.2485	0.1945	0.3885	0.1284	0.2407
2017	0.2710	0.2245	0.2575	0.1980	0.3945	0.1375	0.2490
2018	0.2810	0.2345	0.2675	0.1990	0.3645	0.1575	0.2590
2019	0.2710	0.2365	0.2575	0.1090	0.3745	0.1675	0.2990

Source: Field survey 2019



These are the average annual total returns on the prime property selected from the twelve cities in Nigeria. These returns were from the rental values of the 5Nos prime commercial and 5Nos prime residential property in each of the selected cities in Nigeria.

**Table 3: Average Annual Total Returns on other Investment Outlets in Nigeria, from 2005 to 2019.**

Year	Investment Bonds annual returns	Primary Bills annual returns	Government and Shares total annual returns	Prime lending rate	Primary Rate (Mpr)	Policy rate	Composite average annual returns of other investments in Nigeria ₦
2005	0.1371	0.1650	0.1448	0.1650	0.1500		0.1523
2006	0.1345	0.1850	0.1587	0.1780	0.1300		0.1572
2007	0.1905	0.1700	0.3449	0.1646	0.1317		0.2003
2008	0.1650	0.0858	0.2227	0.1544	0.0950		0.1451
2009	0.1860	0.0280	0.0765	0.1829	0.0975		0.1142
2010	0.1582	0.0236	0.0585	0.1886	0.0600		0.0978
2011	0.1265	0.0761	0.0576	0.1575	0.0683		0.0972
2012	0.1375	0.1470	0.0468	0.1710	0.1201		0.1245
2013	0.1495	0.1041	0.0467	0.1658	0.1203		0.1173
2014	0.1012	0.1151	0.0506	0.1685	0.1200		0.1110
2015	0.1224	0.1095	0.0485	0.1684	0.1300		0.1158
2016	0.0750	0.0485	0.0505	0.1669	0.1133		0.0908
2017	0.1878	0.1309	0.0510	0.1778	0.1400		0.1375
2018	0.1418	0.1092	0.0615	0.1645	0.1400		0.1234
2019	0.1161	0.1067	0.0655	0.1525	0.1350		0.1152

Source: Central Bank of Nigeria Money Market Indicators 2005 to 2019.

These are the average total annual returns on other investments in Nigeria as published Monthly by Data and statistics of the Central Bank of Nigeria. See the appendix. The composite returns are the averages of the investment outlets for the year under study.

**The Modified Discounted Cash Flow Model**

Nigerian property market is unstable characterized by low market sales and the unwillingness bedeviled by the inability to see property as an investment. As such [25] posited that for the Nigerian property market with its peculiarities [26], that the Discounted Cash flow approach satisfies the requirement for accurate and flexible model. This is due mainly to its ability to cope with the discounting of irregular

income flow pattern as well as non overwhelming reliance on property market evidence [27]. As the input data are explicit, rental growth rate and discounting rate at the opportunity cost of capital, it is possible to use an adjusted rate of inflation or retail price index as the rental growth rate, and the yield on long-dated gilts suitably adjusted for Discounted Cash flow appraisals. One significant departure from the conventional method is the separation of the yield into two: a discount rate which is comparable with other investment outlets and another which explains the growth inherent in the income and review patterns [28].

Yield is an indicator of both riskiness and profitability. It is a basis for comparing

investments; as such investments should be valued at its total yield. That is, the yield which reflects all the risks including inflation risk [29]. As an alternative to dearth of true comparables there are enough data on yields of long-dated and undated stock. Interest rate changes are controlled by the Government through the Central Bank of Nigeria. With the availability of market data the following inputs are needed for the Discounted Flow Valuation Model;

1. Equated Yield (e)
2. Market capitalization rate (k)
3. Income review term(t)
4. The implied growth rate (g)

When the above variables are known, either of the above can be calculated by rearranging the growth formulae [30]. But in the absence of true comparables and the market capitalization (k) growth could be ascertain by recourse to annual consumer pricing index, annual inflation rate and minimum rediscounting rate at the time of valuation [31] [32]. As such, a more reliable approach will be the adjustment of data derived from these sources and adjusted for the purposes of property valuation.

Problem: 1

Value a freehold interest in a commercial property let on a 15 year lease, on a 3 year review period and the current net rental value is N8,400,000 per annum , and a holding period of 15 years there is

no evidence of a reliable market data. But there are data on Treasury bills, government Bond, Prime Lending rate, Monetary Policy Rate, inflation rates. (For the year 2016).

Analysis of the Model:

$tr = e = \frac{\Sigma(gbr + tb + sssr + plr + mpr)}{n} + \text{risk premium,}$

Where: tr = total returns; e = equated yield; gbr = government Bond Total annual Return

tb = Treasury bills Total annual average return; sssr = Stocks and Shares total annual returns

plr = Prime Lending rate Total annual average return; mpr = Monetary policy rate,

n= number of independent variables.

e = Composite total annual average return = 0.1245= 12.5%

Add 1.5 % risk premium for property investment= 2% + 12.5% = 14.5%

Equated yield = 15% for;

$gt = \frac{\Sigma(carpi + mrr)}{n}$

where: gt = implied rental growth within review period(t); carpi = current annual retail price index, gt = Average annual inflation rate 12.26%; Minimum rediscounting rate 7.6%,  $(12.26\% + 7.6\%)/2 = 9.93$  say 10%. Having Known e and g; K can be calculated ; If

By rearranging  $e = k + (SF \times P)$ ;  $K = e - (SF \times P)$ ; e= 15%; g = 10%

$K = .15 -$

$K = .15 - 0.09532 = 0.05468$  ;  $K = 5.47$

**Table 4: The Modified Discounted Cash Flow Valuation 1.**

Years	Current Net Rental Value	A ₦1 at $g_t = 10\%$	Projected Income(₦)	YP 3years at e = 15%	PV at =15%	e =	Present Value
1-3	8,400,000	1.0000	8,400,000	2.2833	1.0000		19,179,720
4-6	8,400,000	1.3310	11,180,400	2.2833	0.6407		16,355,922
7-9	8,400,000	1.7716	14,881,440	2.2833	0.4323		14,689,032
10-12	8,400,000	2.3579	19,806,360	2.2833	0.2843		12,857,144
13-15	8,400,000	3.1384	26,362,560	2.2833	0.1869		11,250,190
15	8,400,000	4.1772	35,088,885	18.2815*	0.1229		78,837,578
							₦153,169,586

Source: Analysis from Survey 2019.



Conventionally, the outcome of the valuation is same with the outcome of the above model.

Net rental value per annum  
 N8, 400,000.00  
 YP in perpetuity @ (k) 5.47%  
 N18.2815

Capital value  
 N153, 564,600

Note; At the 15th year the income was capitalized in perpetuity at 5.47% due to the implicit nature of all risk yields which incorporates risks and growth.

The Value N153,169,586 fell short of the conventional value by N 395,014 error due to rounding.

Valuation using Real value model;  
 i= Inflation risk free yield; e= 15% g= 10%

For a 3 year review period:

$$i = 1.1 = 1.15 - 1 = 1.046 - 1 = 0.046 = 4.6\%$$

Net rental value per annum  
 N8, 400,000.00

$$YP = YP_t @ e = YP_{3yrs} @ 15\% = 2.2833 \times$$

$$= 2.2833 \times 7.9256 = 18.0966$$

Capital value  
 152,011,440  
 Note;

The Capital Value N152, 011,440 fell short of the Modified Discounted Cash Flow Valuation value by N 1,158,146 error due to rounding.

Problem: 2

Value a freehold interest in a commercial property let on a 15 year lease, on a 5 year review period and the current net rental value is N8,400,000 per annum , and a holding period of 15 years and on the same market condition as in problem 1, (For the year 2016)..

Composite total annual average return  
 $0.4066 / 3 = 0.13553 = 13.55\%$

Add 1.5 % risk premium for property investment= 1.5% + 13.55% = 15.05%

Equated yield = 15% for;  $gt = \Sigma(carpi + mrr)/n$ ;  $g_t =$  inflation rate 13.5%; Minimum rediscounting rate 6.5%,  $(13.5\% + 6.5\%)/2 = 10\%$ . Having Known e and g; K can be calculated,

By rearranging  $e = k + (SF \times P)$ ;  $K = e - (SF \times P)$   $e = 15\%$ ;  $g = 10\%$ ;

$$K = .15 - 0.0905481 = 0.0594 ; K = 5.94\%$$

Solution 2

**Table 5: The Modified Discounted Cash Flow Valuation 2.**

Years	Current Net Rental Value	A ₦1 at $g_t = 10\%$	Projected Income(₦)	YP 5years at $e = 15\%$	PV at $e = 15\%$	Present Value
1-5	8,400,000	1.0000	8,400,000	3.3522	1.0000	28,158,480
6-10	8,400,000	1.6105	13,528,200	3.3522	0.4972	22,547,638
11-15	8,400,000	2.5937	21,787,080	3.3522	0.2472	18,054,165
15	8,400,000	4.1772	35,088,480	16.8350*	0.1229	72,598,820
						141,359,103

Source: Analysis from Survey 2019.

Conventionally, the outcome of the valuation is same with the outcome of the above model.

Net rental value per annum  
 N8, 400,000.00  
 YP in perpetuity @ (k) 5.94%  
 N16.8350

Capital value

₦141,414,141

Note;

- At the 15<sup>th</sup> year the income was capitalized in perpetuity at 5.94% due to the implicit nature of all risk yields which incorporates risks and growth.

- The Value ₦141, 359,242 fell short of the conventional value by N 54,899 error due to rounding.

Valuation using **Real Value Model**,

i= Inflation risk free yield; e= 15% g= 10%

For a 5 year review period:

$$i = 0.046 = 4.6\%$$

Net rental value per annum

₦8, 400,000.00

**Table 7: Comparative Analysis of problem 1 and 2 of the Reversionary Freehold Valuations of a Commercial Property Let 2016 on 15 Years Lease, on 3 Years and 5 Years Review Periods, Respectively.**

Income review pattern	Direct Capitalization with K (all risk yield) N	Modified Discounted Cash Flow N	Real Value Valuation Method N	Mean Value
3yearly review period.	153, 564,600.00	153,169,586.00	152,011,440.00	152,915,209.00
5yearly review period.	141,414,141.00	141,359,103.00	139,620,600.00	140,797,948.00
Value difference.	12,150,459.00	11,810,483.00	12,390,840.00	12,117,261.00

Source: Analysis 2019.

For the two valuations their capitalizations differ due to their differences in reviews [33]. A commercial property let on a three yearly review pattern is more secure due to the short period before reverting to the current market rental value than for property let on a 5yearly review. For the table above the capitalization (K) for three yearly

The above analysis threw out the real return rates covering mean range of equated yield, all risk yield and implied rental growth that could be employed in

$$YP = YP t @ e$$

$$= YP 5yrs @ 15\%$$

$$= 3.3522 x$$

$$= 3.3522 \times 4.9285596 = 16.6215$$

Capital value 139,620,600

**Note;**

- The Value ₦139,620,600 fell short of the Modified Discounted Cash Flow Valuation value by N 1,738,503 difference due to rounding.

#### RESULTS

review pattern was 5.47% whilst the capitalization (K) for five yearly review pattern was 5.94%. The differences on the three valuations were due to rounding [34]. All risk yield K was derived by working back with due regard to the review pattern, whilst the real return was derived with the knowledge of equated yield (e) and implied rental growth rate (g).

the valuation of property investment in Nigeria irrespective of the review clause. These were clearly stated hereunder;

**Table 8: The Capitalization Rates on 3 Years Review, where e = 11-20% ; g= 10%**

Equated yield %	All Risk Yield(k )%	Implied Rental Growth (g) %	Real Return(i) %
11	1.1	10	.9
12	2.2	10	1.8
13	3.3	10	2.7
14	4.4	10	3.6
15	5.5	10	4.6
16	6.6	10	5.5
17	7.6	10	6.4
18	8.7	10	7.3
19	9.8	10	8.2
20	10.9	10	9.1
Mean	5.73	10	5.01
Range	9.8	0	8.2

Source: Analysis from Survey 2019

The table illustrates the equated yield, the implied rental growth rates and the All Risk Yield (k ) and real return derived from equated yields of between 11% and 20% and implied rental growth of 10% on 3 year review pattern. But for equated yield at 18% where growth is 10%; k Can be calculate with the formula:

$$K = e - (SF \times P) = 8.7 \% \text{ while the real return } (i) = \frac{1 + e}{1 + g} - 1 = 7.3\%.$$

Note:

- That the real return 7.3% is same irrespective of the review arrangement.
- Implied rental growth is constant.
- The derivation of all risk yield K makes the valuation of property investments simple and very easy to calculate.

**Table 9: The Capitalization Rates on 5 Years Review, where e = 11-20% ; g= 10%**

Equated yield %	All Risk Yield(k )%	Implied Rental Growth (g) %	Real Return(i) %
11	1.2	10	.9
12	2.4	10	1.8
13	3.6	10	2.7
14	4.8	10	3.6
15	5.9	10	4.6
16	7.1	10	5.5
17	8.3	10	6.4
18	9.5	10	7.3
19	10.6	10	8.2
20	11.8	10	9.1
Mean	6.52	10	5.01
Range	10.6	0	8.2

Source: Analysis from Survey 2019

The table illustrates the equated yield, the implied rental growth rates and the All Risk Yield (k ) and real return derived from equated yields of between 11% and

20% and implied rental growth of 10% on 5 year review pattern. But for equated yield at 18% where growth is 10%; k Can be calculate with the formula:

$K = e - (SF \times P) = 9.5\%$  while the real return  $(i) = \frac{1 + e}{1 + g} - 1 = 7.3\%$ .

Note:

- That the real return 7.3% is same irrespective of the review arrangement.

- Implied rental growth is constant.
- The derivation of all risk yield K makes the valuation of property investments simple and very easy to calculate.

#### RECOMMENDATIONS

The study recommends the following:

1. That Valuers in the course of valuation analysis of investment property should always carry out comparative yield analysis of property as it relates to investments with due regard to the prevailing interest rates at the time of valuation. The rate of interest required by prospective purchasers of the various classes of landed property will therefore be governed by the general level of interest rates prevailing at the time of Valuation, particularly with the ideal security and Government stock.
2. That for property investments valuation, the way out of the dearth of market data is the use of Modified 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.

3. 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 institution should be refocused to address this area of deficiency.
4. 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.

#### CONCLUSION

The Modified Discounted Cash Flow (MDCF) Model no doubt provided the way out of the long controversy, of valuers resorting to cost approach to valuation in the absence of true comparables and the resultant overvaluation. There is a significant relationship between the average total returns on property investments and the average total returns on other investment outlets in Nigeria. In the course of valuation analysis of

property investments in Nigeria, Estate Surveyors and Valuers should always carry out a comparative yield analysis of property as it relates to investments generally with due regard to the prevailing interest rates at the time of valuation in order to ascertain the equated yield, implied growth rate and inflation risk free yield needed for the application of this Model.

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