



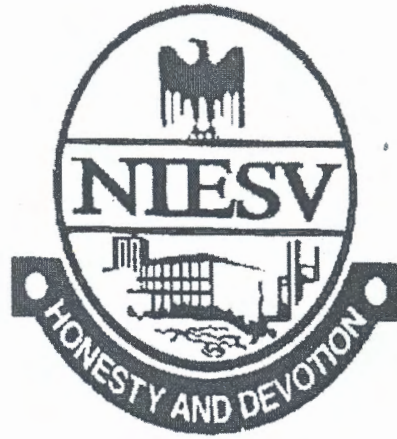
THE NIGERIAN INSTITUTION OF ESTATE SURVEYORS AND VALUERS

PROFESSIONAL QUALIFYING EXAMINATION LECTURE NOTES

ADULT ROUTE TO MEMBERSHIP OF NIESV, 2015



Designed and Produced by:
**Nightingale Publications & Research
International**
Centre for African Development Studies,
Federal Ministry of Education,
Abuja FCT, Nigeria +2348020764823
Website: www.nightingalepub.com



DR. IRHAM
COPY

THE NIGERIAN INSTITUTION OF ESTATE SURVEYORS AND VALUERS

PROFESSIONAL QUALIFYING EXAMINATION

LECTURE NOTES

ADULT ROUTE TO MEMBERSHIP OF NIESV, 2015

Copyright Reserved
NIESV, 2015

Dr. Ajayi-Patuola, FNIVS RSV
*Plot 759, Independent Avenue (BASSAN PLAZA)
CBD. P.M.B. 5175, Wuse, Abuja.*
Tel: 09-4604710, 4604711, 08023469157
E-mail: info@niesv.org.ng, natsec@niesv.org.ng
Website: www.niesv.org.com



Designed and Produced by:
**Nightingale Publications & Research
International**
*Centre for African Development Studies,
Federal Ministry of Education,
Abuja FCT, Nigeria +2348020764823*
Website: www.nightingalepub.com



Copyright © 2015 by NIESV

*Published by Nigeria Institution of Estate Surveyors and Valuers
Nigerian*

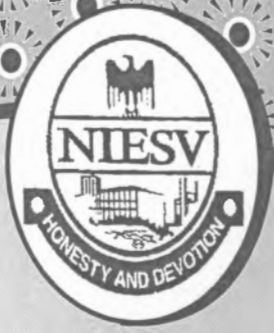
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Publisher.

Designed by: NIGHTINGALE PUBLICATIONS & RESEARCH INTERNATIONAL

ISBN 978-1-159823-590-7



**Designed and Produced by:
Nightingale Publications & Research
International**



National Secretariat

Plot 759, Independence Avenue (Bassan Plaza), Central Business District, Abuja
P.M.B. 5175, Wuse, Abuja. Tel: 08078193014, 08078193015

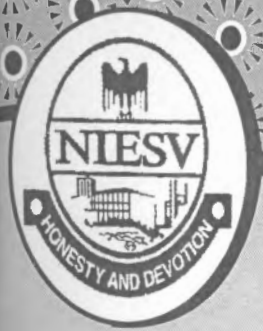
Lagos Liaison Office:

Plot A, Block 12, Elephant Cement Way,
(Opposite Lagos State Secretariat Mosque) CBD, Alausa, Ikeja
P.O. Box 2325, Lagos. Tel: 08078193027

Enugu Liaison Office:

Block A, Akalaka House,
127/129, Chime Avenue,
New Heaven, Enugu
Tel: 080781193029

Website: www.niesv.org.ng



Preface

The idea to commence a Adult route to membership of NIESV was considered by the Council in 2013 at Uyo-Akwa-Ibom State Council Meeting. A committee was formed to look into modalities for recruiting mature Estate Surveyors into the profession. The outcome of this Committee is the manifestation of this Lectures Notes. The Membership Committee ensures that candidates with a Degree or HND in Estate Management and Valuation, who have attained the age of at least 50 years and been in practice for over two decades should be allowed to apply for this special route.

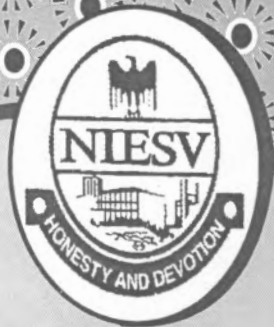
Scholars and practitioners are engaged to prepare lecture notes for the task tailored in line with our Professional Examination syllabuses. I am particularly grateful to this group of researchers who not only educative and teaching materials on relevant areas of our practice, but did it with a dispatch. Thank you for this wonderful job.

The President of NIESV, Olorogun James Omeru has been very supportive in ensuring that success of this lofty aim is achieved. He particularly chaired a meeting with group of these land administrators in Benin City in 2013 and promised to put an end to non-professionals heading our State and National Ministries of Lands in Nigeria.

The programme is intended to bring mature members of profession into our membership cadre through a well formulated and rigours training over a specified period.

This particular edition covers Principles of Valuation, Building Construction Professional Practice, Advanced Valuation I and II, and Professional Report Writing.

Dr. B.J. Patunola Ajayi
Chairman, NIESV Membership Committee,
Abuja, FCT-Nigeria



Forward

The World is changing and process of doing business in the world is equally changing that is the reason why it is paramount to adapt to the changes in order for us to be relevant as a leader in real estate business arena. it is patetic to note that majority of our ministries of land are being directed by personnels who are not versed in the profession of Estate Surveying and Valuatqñ. To make the,needed impact that the contemporary change demands, we must device a way to bring them under our umbrella the reason for Adult Route to Membership.

The idea to train and absorb our mature members into the member fold of the profession through a special raute was first considered in 2013 and a Committee was established to give modalities in order to achieve this purpose.

I congratulate the First Vice President and Chairman, NIESV Membership Committee for working tirelessly in ensuring that this Lecture Notes is prepared and published in a book format.

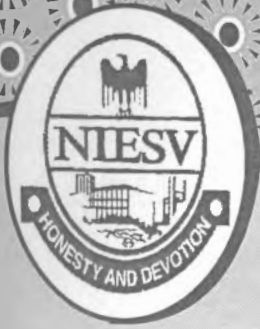
Also, I appreciate the efforts of the contributors-ESV Adedayo Adebayo, ESV Iroham C.O, ESV Olurotimi Kemiki and ESV Salau L. Tunde for forwarding their write-ups for publication without any pecuniary attachment whatsoever. Thank you for this selfless service to humanity.

It is my firm believe that, this book shall not only be beneficial to the candidate on Adult Route but also, other probationers aspiring to sit for our Professional Qualifying Examination (PQE). I hereby recommend this book to the general community of Professional Estate Surveyors and Valuers, Probationers, Students and General Public who intend to improve their knowledge in Real Estate Profession through a selfstudy.

Thankyou all

Oloorogun James Omeru (FNISV)

*President, The Nigerian Institution of Estate Surveyors and Valuers
Abuja, F.C.T-Nigeria.*



List of Contributors

The Nigerian Institution of Estate Surveyors and Valuers (NIESV) is grateful to the following scholars for contributing to the writing of chapters of this book. Their efforts shall be recognised for providing a selfless service to the Institution. Thankyou.

*1. **ESV. Adedayo Adebayo (PhD).** A lecturer at, the department of Estate Management and Valuation, Federal University of Technology, Akure, Ondo State - Nigeria.*

*2. **ESV. Iroham C.O. (PhD)** - Lectures at the Department of Estate Management, College of Science and Technology, Covenant University, Ota, Ogun State - Nigeria.*

*3. **ESV Olurotimi Kemiki (PhD):** A Lecturer at the Department of Estate Management and Valuation, Federal University of Technology, Minna Niger State - Nigeria. Chairman, NIESV, Niger State Branch.*

*4. **ESV, Salau Liadi Tunde:** Head of Department, Department of Estate Management and Valuation, Federal Polytechnic, Bauchi and Chairman, NIESV, Bauchi/Gombe States Branch.*

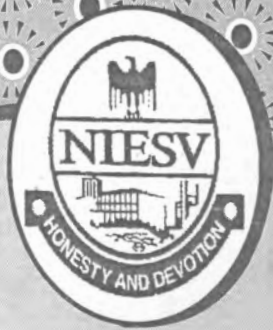
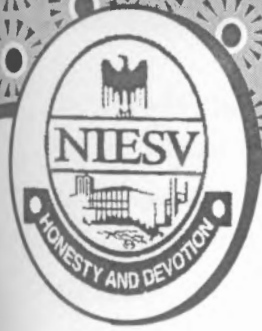


Table of Contents

<u>CONTENT</u>	<u>PAGE</u>
<i>Preface</i> _____	
<i>Forward</i> _____	
<i>List of Contributors</i> _____	
<i>Table of Contents</i> _____	
<i>Chapter 1</i> _____	<i>01-15</i>
<i>Chapter 2</i> _____	<i>15-31</i>
<i>Chapter 3</i> _____	<i>32-51</i>
<i>Chapter 4</i> _____	<i>52-73</i>
<i>Chapter 5</i> _____	<i>74-71</i>
<i>Chapter 6</i> _____	<i>80-91</i>
<i>Chapter 7</i> _____	<i>92-105</i>
<i>Chapter 8</i> _____	<i>106-114</i>
<i>Chapter 9</i> _____	<i>115-118</i>
<i>Chapter 10</i> _____	<i>119-128</i>
<i>Chapter 11</i> _____	<i>129-138</i>
<i>Chapter 12</i> _____	<i>139-147</i>



MEANING AND CONCEPT OF VALUATION

Valuation is the art and science of determining the monetary worth of an asset for a particular purpose and at a particular point in time. No matter the way this term germane to the study of estate management “valuation” is defined the underlying terms must be stated as that gives credence to the definition. There might not be a clear cut definition to the term valuation but as mentioned above the following terms considered very important must be present.

It has been argued on various platforms that valuation is either an art or a science. The art aspect of valuation has given various valuers the leeway to see properties from various lights resulting from experience and individual hunch. The science aspect of valuation cannot also be de-emphasized as certain criterias such as location, state of the asset and level of construction are always constant factors that are obvious. Hence, valuation can best be described as both an art and a science as both features do play vital role in the process. However, the major question to ask now is which of these features is preponderate in the process?

The valuation process must be geared towards deriving a monetary worth which is usually in the local currency where such task is undertaken. The mere derivation of a figure without a unit of representation in a currency flaws the process. This explains why valuation, a derivate of value, is synonymous to monetary issues.

Asset, no matter how small, crude and primitive it appears projects a huge capital outlay, little wonder it has been associated with the rich. In this part of the world the unit of representation of the valuation exercise is Naira (N) and this runs into millions or at least hundred of thousands with very few in the tens of thousands, an unwritten standard that even informs all approximations.

The crux of this exercise is asset. Hither to, valuation has been focused more on real property which is differentiated from any other kind of property (Subsequent lectures will elucidate on the various terms attributed to the instrument of trade in the process). Hence, apart from land and buildings which valuation has transcended, the professional exercise has also been carried out on fixtures, fittings, furniture, plant and machinery and even tradable stocks. There are even special valuations carried out in bizarre environment such as shrines, graveyards and in more contemporary valuations, billboards, amongst others. In a nutshell, valuation is carried out on “wealth container that has a sence of value to the owner”.

Another important aspect to the definition outlined is the issue of being carried out for a particular purpose. It is rightly said that the purpose of valuation determines the basis and the basis determines the method to adopt. Needless to say that valuation figures varies from various purposes. Amongst the most common purposes of valuation include mortgage, insurance, rental, sales, compulsory purchase and acquisition, and rating.

Finally, the period of time valuation is carried out must be spelt out vividly. Most asset have exponential growth rate and so to prevent the dynamic changes that these assets may command in value, there is need to state the particular date the exercise wss carried out. More so as a way of defense as all documents have legal interpretations, the specified date will rule out all complexities in value variations.

PURPOSE, BASIS AND METHODS OF VALUATION

Purpose of valuation

In a simple term, purpose can be referred as the reason why valuation is carried out. As spelt out in the previous lecture, valuation can be carried out for various reasons. Some of these reasons include: mortgage, balance sheet, performance measurement, insurance, rental, purchase, sales, compulsory purchase and acquisition, rating and taxation, business merger, liquidation and takeovers amongst others. The purpose of valuation informs the valuer (term referred to professionals given the statutory preserve to carry out the valuation exercise in this part of the world) that clients require knowledge of bundle of wealth inherent in assets being owned. For this reason a valuer can be approached to determine worth of various assets for particular cause. This now predisposes the valuer to ask in various capabilities at various points in time. Hence, at sometime the valuer is acting on behalf of the purchaser at another time the valuer is acting on behalf of the vendor. Some other time the client of the valuer is the government while the valuer also represents the citizenry at other occasions. Other parties being represented by the valuer are financial institutions other corporate bodies and various forms of statutory tribunals. Although, in the business world, the client is king, the valuer should not loose touch with the fact that the valuation exercise will in the long run trigger happenings in the property market at large and as such it must be handled to a large extent void of prejudice.

Basis of valuation

The basis of valuation is regarded as the ground on which valuation stands. It can be better described as the rationale for carrying out valuation. Every valuation is geared towards representing outcomes in the property market, however not all do such directly. Apart from the "open market value" and its variant "force sale value" during mortgage valuation that has direct influence on the larger market; other bases of

valuation include "indemnity and "reinstatement" synonymous with insurance valuation. Some other bases of valuation are "existing use" particularly when owner/user intends to retain possession of the asset; "liquidation" which happens when there is a statutory deposition of right to assets. However for plant and machinery valuation, the bases of valuation are principally on the basis of "going concern" and "gone concern" while "indemnity and "reinstatement" are also confined to insurance valuation for this specialized type of valuation.

Methods of valuation

Once the reason and rationale for carrying out valuation has been established, the actual task of valuation is undertaken. However, this task has to be in line with laid down approaches of undertaking the task. Hence the approach involved in carrying out valuation defines its method. There are various methods involved in carrying out valuation of assets. They are investment method, cost method, residual method, comparative method, and profit method. These are the major methods of valuation, however other methods that exist are variants of these or combination of these. For instance in plant and machinery valuation the known methods for handling valuation of plant and machinery are market data approach, cost-summation approach and the profit approach. The best form of approach has been the cause of some intellectual debate in time past without a worldwide consensus arrived at. Notwithstanding, the approach adopted, the larger market should be put in consideration in determining values.

BASIC DEFINITIONS OF CERTAIN TERMS

The business of valuation stems on land. Since the very essence and definition of land goes beyond the physical hard crust of the earth surface, it is pertinent to state and define the various variant of which land appears. For instance land entails the entirety of the environment which includes the atmosphere, lithosphere, and hydrosphere. Moreso all appurtenances permanently affixed to the hard crust of the earth surface also qualifies to be regarded as land. Hence, this awareness has resulted to multifaceted dimation of the professional task of valuation. Apart from the concept of land other terms need to be highlighted in order to bring out the professionalism in handling this task of valuation. These concepts are:

Real property/Estate

This is the bundle of rights inherent in the physical structure. Infact this is the major aspect of the environment being studied. The tradeable instruments are these rights that come in various forms of supremacy, ranging from the freehold, leasehold, subleasehold, licences and various rights that come as encumbrances to the holdings of others.

Property/Real Estate

This is the physical structure in which rights are being held. As earlier stated these have transcended the mere hard core layer of the earth surface to buildings, bridges, roads, telecommunication mast amongst others. Hence, it is pertinent to state here that while land is the hard core surface of the earth together with all natural appurtenances associated with it, property/real estate is the hard core surface of the earth together with all man-made appurtenances permanently attached to it.

Freehold

Freehold is the highest right contained in any real estate. This gives superiority of ownership. In Nigeria, this term is becoming inundated as the current document governing land tenure in the country "Land Use Act" has placed every holder of land right on occupancy capacity eroding the concept of ownership. However, doubtably the concept of ownership can still be claimed as a term of ninety-nine years which the Certificate of Occupancy awards is ample enough to sometimes outlive the holders.

Leasehold

This interest subsists in property that has been let or leased out. The interest is termed unsecured compared to the freehold and can only be valued when a profit rent is being enjoyed. This interest enjoyed by the lessee is for a determinable period of time below the period attributed to the freeholder.

Subleasehold

Leasehold that has some or all of its interest given out for a lesser contractual arrangement having conditions submerged in the head lease is known as a sublease. This interest is unsecured compared to the leasehold and therefore reflects in higher yield used in valuation.

License

Permits required in utilizing properties particularly for a short determinable period of time. This permit comes with various forms of restrictions. They could be created by statutes but usually with the consent of the freeholder. They include erection of mast, advertisement sign boards etc. A written agreement provides a period of notice to be given either party to disengage the contract.

In valuation particularly while carrying out asset valuation; there are terms that are treated with consubstantial manner. They are furniture, fittings and fixtures.

Assignment

Students should learn more on Estates/interests/rights as it relates to the variants of freehold and leasehold interests.

Furniture

Furniture is a moveable item in the property that enhances decorative and functional characteristics of the property.

Fittings

This is a detachable part of the building that enhances the decorative and functional characteristics of the property. Fittings can be removed from the property is easily without causing any structural damage to the edifice.

Fixtures

This is a fixed part of the property that enhances the decorative and functional characteristics of the property. Fixtures make the property complete as a whole as trying to remove them will cause a structural damage the property.

Assignment

Students are required to give examples of furniture, fittings and fixtures.

MATHEMATICS OF VALUATION (AMOUNT OF ONE NAIRA TABLE)

The science aspect of valuation requires that certain calculations are made based on parameters given. These parameters are somewhat constant depending on the method of valuation to use. Some of such parameters include rent passing, outgoings, cost of construction, appropriate yield to adopt, cost of land, etc. even though certain assumptions have to be made, but the mere fact that a universal acceptance of these variables projects the scientific aspect of the task while the art aspect brings a perspective of what the parameters should represent.

The use of the valuation table such as the "Parry Valuation Table" gives the science aspect of the task though cannot be a substitute for experience which forms the art part of the valuation task. However, in order to get a broad spectrum of the process involved a combination of both is apt. "Parry Valuation Table" and any other variant of it sprang from foundational formula. These formulars form the crux on which other models would build on. A discuss on the various models are presented. The Valuation models to be studied can be considered broadly under Single Rate and Dual Rate Table

SINGLE RATE TABLES

AMOUNT OF N1 TABLE

$$A = (1+i)^n$$

Q: To what amount will N 1 invested at 6% compound interest accumulate in 4 years (Assumption that the compound interest would be added annually) A: 1.261

When interest is payable at intervals less than a year such as half-yearly, quarterly

and monthly

(i) Divide I by the number of interest accumulations in the year

(ii) Multiply n by the number of accumulations in the year

If interest is accumulating half-yearly

$$A = (1+i)^{2n}$$

Q: To what amount will N 1 invested at 6% compound interest accumulate in 4 years if interest is payable half-yearly?

A: 1.2667

If interest is accumulating quarterly

$$A = (1+i)^{4n}$$

Q: To what amount will N 1 invested at 6% compound interest accumulate in 4 years if interest is payable quarterly

Note: No matter the intervals of interest accumulation the above principle is a guide.

A: 1.2689

Q: Alhaji Tunde purchased a detached house for N9,000,000. A sum of N320,000 was spent at once on roads and other costs of development. During the first period of five years no return was received from the property as it was undergoing repairs/refurbishment. Calculate the total cost of the property to Alhaji Tunde at the end of the five years assuming interest rate is put at 8 percent

A: Capital sum invested = 9,000,000 + 320,000 = 9,320,000

Amount of N1 in 5yrs @ 8 = 1.4693

Cost to Alhaji Tunde 13,693,876

Q5: To what amount will N650,000 invested at 18% of interest accumulate in 8 years if interest is payable weekly

A: 650,000 × 4.2110 = 2,737,150

FACTS ABOUT THE AMOUNT OF N1 TABLE

- Forms the basis for other valuation tables
- Based on compound interest calculation
- AMT figures are usually greater than one
- Excess over unity represent total interest earned
- AMT formula is $(1+i)^n$ where "i" is interest earned by N1 in 1 year and "n" is the number of years
- AMT is usually represented by just "A". Hence $A = (1+i)^n$

PRESENT VALUE OF ONE NAIRA TABLE

This is the amount that must be invested now to accumulate to N1 at I compound interest in n years. Alternatively it can be defined as "The Present Value of the right to receive the sum of N1 at a given time in the future discounted at a given rate of

interest Operationally, $PV = 1 A = 1 (1+i)^n$

Q6: What sum invested now will at 6 percent compound interest accumulate to N1 in 7 years time?

A: 1

$$(1+i)^n = 1 / (1.06)^7 = 0.667 = 67K$$

Q7: What amount must be invested at 9% to accumulate to N1 in 8 years A: 0.502 = 51K

Q8: A man has a right to receive N250, 000 in 14 years time. What is the present value of this right assuming that capital is invested at 83/4% compound interest?

$$A: 0.3090 \times 250,000 = N77,250$$

Q9: A property owner anticipates that he will need to make a major renovation in his property at an estimated cost of N125, 000 in 5 years time. Assuming Capital is invested at 91%

2

$$A: 0.6352 \times 125,000 = N79,400$$

Q: What can you make of this?

A: PV decreases with date and rate of interest (This underlines the importance of "NOW" in valuation as made evidence from the principle of "Rebuc Sic Stantibus")

Q: An Investor has the right to receive N400, 000 in 10 years. What sum would he be prepared to accept today in order to forfeit the future sum? Market evidence reveals that money invested today can earn interest at the rate of 8% over the next 10 yrs

A: Sum receivable in 10yrs time N400, 000

PV of N1 in 10yrs @ 8% 0.4632

PV of N400, 000 in 10 yrs @ 8% 185, 280

FACTS ABOUT THE PV TABLE

- The Table is based on Compound Interest Calculation
- The Present Value is usually less than unity
- PV is the reciprocal of Amount of N1 Table
- The formula for calculating PV of N1 is $PV = 1 / (1+i)^n$
- The difference between any given present value of N1 and unity represents the interest that could be earned by that present value of N1 if it were invested for that period at the given rate of interest

AMOUNT OF ONE NAIRA PER ANNUM TABLE

Remember the sum of series in Geometric progression

$$S_n = a(r^n - 1)$$

r - 1 Substituting a = 1; r = (1+i). Amount of N1 per Annum formula

$$= 1 / ((1+i)^n - 1)$$

$$(1+i)^n - 1 = (1+i)^n - 1 \text{ or } A - 1i$$

Q: N20, 000 is invested at the end of each year in a building society giving 8 1/2% compound interest. To what amount will this accumulate after 25 years?

A: Sum invested at the end of each year = N20, 000

Amt of N1 per annum @ 8.5% in 25yrs = 78.6678

Sum accumulation = 20, 000 × 78.6678 = N1, 573, 356

FACTS ABOUT THE AMOUNT OF N1 PER ANNUM TABLE

- The Table involves series of annual payments of N1
- Each payment is made at the end of the year, the first payment being at the end of the first year
- The Table is based on compound interest calculation
- The last payment earns no interest
- The formula is $A-1$ or $(1+i)^n - 1$

ANNUAL SINKING FUND

ASF is an accounting technique use in finance houses which entails the creation of a fund for the purpose of redeeming debentures; extinguishing debt or providing for the expiry of lease.

In property valuation, there is a slight variation in the study of ASF. ASF is a saving fund in which a series of equal annual payments are made with the aim of saving up to a specified amount at a given future date.

At the specified future date the fund will comprise all annual payments made into it plus compound interest earned by each annual payment right from inception ASF is therefore the annual sum s required to be invested at the end of each year to accumulate to N1 in n years at i compound interest

The formula for ASF is the reciprocal of Amount of N1 per annum Table = i

$$(A-1) = i$$

$$(1+i)^n - 1$$

Note: the above formula is of the assumption that savings are made at the end of the year and the savings are not subject to taxation ASF can be useful in calculating annual sum to set aside in meeting future liabilities or expenses such as possible claims for dilapidation on the termination of a lease or sum required for rebuilding or reconstruction of premises.

Q: Assuming that Mr. Kunle anticipates making an alteration for extra toilet in his house which is likely to cost N80, 000 in 5 years time. If capital is to be invested at 7%, what amount should be set aside annually to meet the future responsibility?

A: Future sum required = N 80, 000

ASF @ 7% in 5 yrs = 0.1739

Annual Savings required = N13, 912

Q: An investor purchased a freehold property for N20, 000 which is envisaged to

yield a net income of N1, 000 for the next 30 years. At the end of the period it will be necessary to rebuild at a cost of N16, 000 in order to maintain the property.

How should the investor provide for this and what will be the result on the percentage yield of his investments?

A: The owner may provide for the cost of rebuilding by means of ASF accumulating at say 2.5% over the next 30 yrs as follows:

Cost of rebuilding N16, 000 ASF to produce N1 in 30 years at 2.5% 0.023 ASF required N368 PA (The owners true income for the next 30 yrs will therefore be (N1, 000 - N368) = N632. This represents about 3.2% on the purchase price instead of the 5% which the investment might appear to be yielding.

Criticism of the Sinking Fund Theory

A) Sinking Fund Theory on valuation of terminable interest is criticized on the grounds that it is unrealistic and that no one will invest money to earn interest at say a paltry 2%

Criticism rebutted: Basic requirement of an Investor for lower yield so as to guarantee receipt of the future sum.

B) It is unwise to base the recoupment of investment on historic cost and that provision should be made for the recoupment of a larger sum to make provision for inflation. If calculations were made for the recoupment of higher sum, investors would be allowing for part of the risk of his investment in the sinking fund

Criticism rebutted : If by creating a larger sinking fund he eliminated the risk to his capital caused by inflationary trends, he would be presumably prepared to accept a lower remunerative rate of interest as some of the risk normally reflected in this rate would have been removed

FACTS ABOUT THE ANNUAL SINKING FUND (ASF) TABLE

The Table involves series of annual savings each less than N1

The sum eventually saved is N1

The N1 saved is made up of all the annual capital savings plus accumulated interest

The last years' savings earns no interest being put into the fund on the last day of the last year

ASF Formula = $1 + i \left[\frac{A - 1}{i} \right]$ or $(1+i)^n - 1$

PRESENT VALUE OF N1 PER ANNUM OR YEARS PURCHASE (YP)

The Table shows the present value of the right to receive N1 at the end of each year for "n" years at "i" compound interest. This formula is derived from the addition of the present value of N1 received PV of N1 due in 1 year = $\frac{1}{1+i}$

PV of N1 due in 2 year = $\frac{1}{(1+i)^2}$

YP of N1 due in 2 years = $\frac{1}{1+i} + \frac{1}{(1+i)^2}$

Rearranging for convenience:

YP of N1 due in n years = $1 - PV_i$

Q: What is the present value of the right to receive an annual income of N750 at the end of each of the next 6yrs discounted at 8%

A: Annual Income = N750

PV of the right to receive N1 in 6yrs @8% 4.6229

PV of the right to receive N750 in 6yrs @8% (**Capital VALUE**) N3,467.175

Q: A Landlord will receive N2000 per annum from his tenant for the next 20 years.

Assuming 8% compound interest; What is the capital value of his income

A: Annual Income = N2000

PV of the right to receive N1 in 20yrs @8% 9.818

PV of the right to receive N2000 in 20yrs @8% (**Capital VALUE**) N1,9636

Q: What is the value of an income of N68.75 for the next 27 years discounted at 7%

A: Annual Income = N68.75

PV of the right to receive N1 in 27yrs @7% 11.9867

PV of the right to receive N2000 in 20yrs @8% (**Capital VALUE**) N824.0856

FACTS ABOUT THE PRESENT VALUE OF N1 PER ANNUM OR YEARS PURCHASE (YP)

The Table concerns a series of annual receipt of N1 each

Each N1 is receivable at the end of the year

- The receipt of each future N1 is discounted at an appropriate compound interest
- The formula for the YP for a limited period is $1 - PV_i$
- The function of the YP is to show the relationship between income and capital and to convert income-flow into capital values.

YEARS PURCHASE IN PERPETUITY (YP)

If n = infinity then 1

$(1+i)^n = 0$

Hence, YP in perpetuity = $\frac{1}{i}$

Q: Chief Balogun is the owner of a freehold interest in a shop yielding a net income of N2000 per annum. Assuming 7% compound interest calculate the capital value of A's interest

A: Net income per annum: =N2000

YP in perp @ 7% =14.286

Capital value =N28,571

YEARS PURCHASE OF A REVERSION TO PERPETUITY

This is the present value of the right to receive N1 at the end of each year in perpetuity at i compound interest but receivable after the expiration of n years. It is established

that if N1 is receivable at the end of each year in perpetuity, then its capital value (YP) = $1/i$

However, this YP would not be paid for a stream of income that was not receivable until n years had expired. The present value of that income would be the amount that could be invested now at i to produce $1/i$ in n years; this is the PV of $1/i$

The YP of a reversion to perpetuity is given by $PV \text{ of } N1 \times 1/i = 1/i(1+i)^n$

Q: What is the right to receive N1 per annum in perpetuity commencing in 7 years times (Assume 7% compound interest)

A: $1/i(1+i)^n = 1$

$(0.07)(1.07)^7 = 1$

$(0.07)(1.6058) = 1$

$(0.1124) = 8.8967$

This can be expressed like this:

Net income per annum = N1

YP in perp @ 7% = 14.2857

PV of N1 in 7yrs @ 7% = 0.6227

YP in perp deferred 7 yrs @ 7% = 0.8959

Capital Value = N8, 959

YP(INTEREST AT INTERVALS OF LESS THAN ONE YEAR)

- Divide i by the number of interest accumulation in the year
- Multiply n by the number of interest accumulation in the year
- Divide the amount receivable per annum by the number of interest accumulation in the year

Q: Find the capital value of an income of N800 per annum for 12 years @ 8% compound interest

(i) if interest accumulates annually

(ii) if interest accumulates half yearly

(i) Income per annum = N800

YP for 12 yrs @ 8% $1 - 1/(1+i)^n$

$= 1 - 1/(1.08)^{12}$

$0.08 = 7.54$

Capital Value = N6, 032

(ii) If the interest were credited half yearly, there will be 24 separate incomes of N400 each at 4% compound interest for each half-yearly.

The amended calculation would be:

Income per annum = N400

YP for 24 periods @ 4% per period

$1 - 1/(1+i)^n$

$= 1 - 1/(1.04)^{24}$

$$0.04 = 15.25$$

$$\text{Capital Value} = \text{N}6,100$$

(YP) INCOME TO BE RECEIVED AT INTERVALS OF MORE THAN ONE YEAR

There are instances where income is received not at the end of each year but a greater interval. The Capital Value may be calculated by using the formula:

$$\text{CV} = \text{Amount of each payment} \times$$

$$\text{YP for the Total Sum} \times \text{PV N1 for Payment b4 1st payment}$$

$$\text{YP for Periods between Payments}$$

Q: What is the capital value of the right to receive 5 payment each of N300 these being received at 5 years intervals at an assumed compound interest of 8%?

$$\text{Each payment} = \text{N}300$$

$$\text{YP 25yrs @ 8\%} \times \text{PV N1 for 5yrs @ 8\%}$$

$$\text{YP 5yrs @ 8\%}$$

$$10.67 \times 0.681$$

$$3.991.821$$

$$\text{Capital Value} = \text{N}546.34$$

DUAL RATE TABLES

This is the Capital Value of the right to receive N1 at the end of each year for n years at i compound interest but allowing for a sinking fund to recoup N1 after n years

If an interest has an income that is receivable for a limited period only, the purchaser could not afford to pay the same amount as for the purchasing of a perpetual stream of income. When the term expires, the income stops flowing and the purchase price is lost.

Dual Rate Tables are therefore based on the assumption that the investor will annually set aside a sum of the income received. This would be invested as a sinking fund to recoup the original capital at the end of the term

Dual Rate YP has two rates of interest:

i = Remunerative rate of interest (the yield the investor requires or rate by which he expects to be remunerated by his investment)

s = Accumulative rate of interest (earning power of sinking fund in recouping the original capital at the end of the term)

- Assume that the net interest on N1 to be "i" and the Annual Sinking Fund to recoup N1 at the end of the limited term to be "s". Then the total income from property worth a capital value of $\text{N}1 = 1(i + s)$
- But Capital Value = Net Income per annum \times Years Purchase (YP)
- $\text{YP} = \text{Capital Value}$
- Annual Income per annum
- $\text{YP} = \text{P}$

$$P(i + s) = 1$$

$$(i + s)$$

Q: What is the Capital value of an income of N2000 receivable in 12 yrs by Okoro at an 8% rate on return. Assuming Okoro has to provide for recoupment of his investment.

A: Net Income per annum N2000

YP for 12 years @8% and 21

2%

1

$$i + s = 1$$

$$0.08 + 0.025$$

$$(1.025)^{12} - 1 = 6.553$$

CAPITAL VALUE N13,106

DUAL RATE AND THE TAX FACTOR

The accumulated rate of interest which is required to work with is the net rate of interest. In case a gross rate of interest is given it should be adjusted as net by multiplying by the net adjustment factor (T_n)

$$T_n = 1 - x \text{ where } x = \text{rate of tax}$$

100

The dual rate formula being affected by the tax factor becomes

$$YP = 1$$

$$i + s(1 - 1/x)$$

For example if gross rate of interest = 41/2 percent and tax liability = 30 Kobo in the Naira then net rate of interest = Gross rate of interest $\times (1 - 30/100) = 41/2 \times 70/100 = 3.15\%$

The sinking fund element must be increased by multiplying by the gross adjustment factor TG Where $TG = 1/1 - x$

So the sinking fund element becomes $S(1/1 - X)$.

So the formula for YP Dual Rate affected by Tax factor is

$$YP = 1$$

$$i + s(1/1 - x)$$

Q: What is the capital value of an income of N1500 per annum receivable by Alhaji Kibiya for 12 years only. Alhaji Kibiya will require a 8% percent return and a sinking fund could be invested at 41/2 % gross affected by a tax element of 33K in the Naira

A: Net interest for $s = \text{Gross interest} \times (1 - x)$

$$= 41/2 \times (1 - 33/100)$$

$$= 41/2 \times (67/100)$$

$$= 3.015\% \text{ (Say } 3\%)$$

So Capital Value:

Net Income per annum = N1500

YP 12 Yrs @ 8% and 3% net (Tax 33%)

$$1i + s(1/1-x) = 1$$

$$0.08 + 0.03 \times 1/0.67$$

$$((1.03)^{12} - 1) = 5.379$$

CAPITAL VALUE = N8069

VALUATION FORMULA AND THEIR INTERRELATIONSHIP

Q: Given that the PV of N1 in 20 yrs @ 5% = 0.377, Calculate the YP Single Rate for 20 yrs @ 5%

A: YP Single Rate = $1 - PV/i$

Since PV of N1 in 20 yrs @ 5% = 0.377, then substituting we deduce as follows:

$$1 - 0.377$$

$$0.05 = 12.46$$

Q: Given that the Annual Sinking Fund to replace N1 in 21 years at 21/2% is 0.037, Calculate the Present Value of N1 in 21 years at 21/2%

A:

$S = i/A - 1$ and $PV = 1/A$. Since A is the common factor in both formula, deductions can be made as follows:

Given that S to replace N1 in 21 years at 21/2% is 0.037, then $0.037 = i/A - 1$

$$0.037 = 0.025$$

$$A - 1$$

$$A = 0.025 + 1 = 1.68$$

$$0.037$$

$$PV = 1/A = 1/1.68 = 0.596$$

Q: Given that the PV of N1 for 10 years at 5% = 0.614, calculate the Amount of N1 per annum for 8 years at 5%

A:

$PV = 1/A$ while Amount of N1 per Annum = $A - 1$

The common factor between the two formula is A

PV of N1 for 10 yrs @ 5% = 0.614 then A for 10 yrs @ 5% = $1/0.614 = 1.63$

However, A for 8 yrs @ 5% = A for 10 yrs @ 5% = $1.63 = 1.63 = 1.48$

A for 2 yrs @ 5% $(1.05)^2 = 1.1025$

Amount of N1 per Annum for 8 yrs @ 5%

$$= A - 1/i = 1.48 - 1/0.05 = 9.6$$

Q: Calculate the PV of N1 in 3 years at 8% given that the PV of N1 in 1 year @ 8% is 0.926 and the Single Rate YP for 2 years @ 8% is 1.783

A:

Single Rate YP = $1 - PV/i$

$$1.783 = 1 - PV \text{ 2 yrs @ 8\%}$$

$$0.08$$

$$= 1.783 \times 0.08 = 1 - PV \text{ 2yrs @ 8\%}$$

$$PV \text{ 2yrs @ 8\%} = 1 - (1.783 \times 0.08) = 1 - 0.14264 = 0.8574$$

$$PV \text{ of N1 for 3yrs @ 8\%} = PV \text{ for N1 for 2yrs @ 8\%} \times PV \text{ for N1 for 1yr @ 8\%}$$

$$= 0.8574 \times 0.926 = 0.7939$$

Q: Calculate the YP for 16 years @ 10% and 3% given that the YP Single rate at 3% for 16 years is 12.56

A:

$$YP \text{ Single Rate} = 1 - PV/i \text{ But } PV = 1/A$$

$$YP \text{ Dual Rate} = 1/i + S \text{ But } S = i/A - 1$$

We can derive A from the first formula and substitute this in S which is to be used in the second formula $12.561 = 1 - PV$

$$0.03$$

$$PV = 1 - 0.37683 = 0.62317$$

$$\text{So } A \text{ for 16yrs @ 3\%} = 1.605$$

$$S = i/(A-1) \text{ for 16yrs @ 3\%} =$$

$$S = 0.03/1.605 - 1 = 0.049$$

$$\text{Substituting in the YP Formula} = 1/i + s$$

$$YP \text{ 16yrs @ 10\% and 3\%} = 1/0.1 + 0.049 = 6.711$$

Q: Value an income of N2000 per annum for 10 years @ 10% and 21/2% net adjusted for tax at 40 kobo in N1 given that the annual sinking fund to replace N1 in 10 years at 21/2% is 0.08925

A:

$$S \text{ for 10 yrs @ 21/2\%} = 0.08925$$

$$\text{Net Income per annum} = N2000$$

$$YP \text{ 10yrs @ 10\% and 21/2\% (tax 40 kobo in N)}$$

$$= 1/i + s(1/1-x)$$

$$= 1/(0.1 + ((0.08925) \times 1/0.6)) = 4.02$$

$$\text{CAPITAL VALUE} = N8040$$