

Financial Instruments & Documentation

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Section 1

Valuation of Financial Instruments

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Financial Instruments - Introduction

- **Definition:** A financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability/ equity of another entity
- **Requirement for valuation:** Transactional pricing (buy/ sell), financial reporting purposes, business combinations, share based payments, off-market transactions, tax allocation, liquidation, etc.

Financial Instruments - Classification

Derivative instruments

- Vanilla derivatives (exchange traded / over the counter) e.g. FX forwards, commodity futures, FX & equity options, interest rate and cross currency swaps
- Complex derivatives e.g. equity linked notes, preference shares, debentures, corporate guarantees
- Embedded derivatives e.g. call/ put options found in shareholder agreements/ loan agreements, liquidation rights, participation rights

Non derivative instruments

- Equity
- Fixed income securities e.g. fixed/ float loans, bonds, debentures

Selection of Appropriate Valuation Approach & Methods

Due consideration should be given by the valuer to:

- Valuation base and **terms and conditions** of the instrument being valued
 - Complexity of instrument being valued
- **Purpose** of valuation
- Other factors such as **available information** and **control environment** under which entity and instrument operate

Market Approach

- A valuation approach that **uses prices and other relevant information** generated by **market transactions** involving **identical or comparable instruments**
- Examples:
 - Traded price of the financial instrument in the active market
 - Traded price of an identical/ comparable financial instrument in the active market
 - In absence of an active market benchmark price, one may consider comparable pricing or private transaction pricing

Market Approach

- The selection of appropriate comparable and its benchmark price require **close evaluation of comparability, consideration of qualitative and quantitative factors** specific to the measurement of the financial instrument and valuer's judgement
- In case, the financial instrument being valued is characterized by **certain different terms** than the identical quoted instrument, the Valuer shall **adjust the comparable price to reflect the different terms and characteristics.**

Income Approach

- Valuation approach that converts **future cash flows to a single present valued amount**. The cash flows are based on current market expectations for the future.
- The value of a financial instrument is determined based on the **expected economic benefits by way of income, cash flows or cost savings** generated by such financial instrument and **level of risk associated** with such financial instrument. It generally involves discounting future amounts to a single present value after adjusting inherent risks.
- In situations where a financial instrument does not give rise to committed contractual cash flows, an estimation of future cash flow basis of various available estimates would aid the income approach.

Income Approach

- Apart from the cash flows that the entity expects to realize, the terms of a financial instrument, amongst other matters, also typically cover:



the **timing** when the entity expects to realize the cash flows related to the instrument;

the **basis of calculation** of the cash flows, e.g., the interest rate, underlying index or indices, etc.; and

the terms and timing for any **special terms/restrictions** in the contract, e.g., put or call, lock-in, prepayment, extension, conversion options, residuary right.

Income Approach

Black-Scholes option pricing model for European option pricing

Inputs to Black Scholes Model

1. Stock price

2. Strike Price

3. Risk free rate

4. Dividend yield

5. Expected volatility

6. Time to maturity

Call option

$$c = S * e^{-qT} * N(d_1) - K * e^{-rT} * N(d_2)$$

$$d_1 = \frac{\ln\left(\frac{S}{K}\right) + \left(r - q + \frac{1}{2} * \sigma^2\right) * T}{\sigma * \sqrt{T}}$$

$$d_2 = d_1 - \sigma * \sqrt{T}$$

Put option

$$p = K * e^{-rT} * N(-d_2) - S * e^{-qT} * N(-d_1)$$

$$d_1 = \frac{\ln\left(\frac{S}{K}\right) + \left(r - q + \frac{1}{2} * \sigma^2\right) * T}{\sigma * \sqrt{T}}$$

$$d_2 = d_1 - \sigma * \sqrt{T}$$

Income Approach

Binomial option pricing model for European/ Bermudan/ American option

<div style="background-color: #800000; color: white; padding: 2px;">S(0)</div> <div style="background-color: #ffff00; padding: 2px;">P(0) = S(0)-K</div> <div style="background-color: #f4a460; padding: 2px;">C(0) = max(P(0),PV(p*C(1)+(1-p)*C(2)))</div>	<div style="background-color: #800000; color: white; padding: 2px;">S(1) = u*S(0)</div> <div style="background-color: #ffff00; padding: 2px;">P(1) = S(1)-K</div> <div style="background-color: #f4a460; padding: 2px;">C(1) = max(P(1),PV(p*C(3)+(1-p)*C(4)))</div>	<div style="background-color: #800000; color: white; padding: 2px;">S(2) = d*S(0)</div> <div style="background-color: #ffff00; padding: 2px;">P(2) = S(2)-K</div> <div style="background-color: #f4a460; padding: 2px;">C(2) = max(P(2),PV(p*C(4)+(1-p)*C(5)))</div>	<div style="background-color: #800000; color: white; padding: 2px;">S(3) = u*S(1)</div> <div style="background-color: #ffff00; padding: 2px;">P(3) = S(3)-K</div> <div style="background-color: #f4a460; padding: 2px;">C(3) = max(P(3),0)</div>	<div style="background-color: #800000; color: white; padding: 2px;">S(4) = d*S(1) = u*S(2)</div> <div style="background-color: #ffff00; padding: 2px;">P(4) = S(4)-K</div> <div style="background-color: #f4a460; padding: 2px;">C(4) = max(P(4),0)</div>	<div style="background-color: #800000; color: white; padding: 2px;">S(5) = d*S(2)</div> <div style="background-color: #ffff00; padding: 2px;">P(5) = S(5)-K</div> <div style="background-color: #f4a460; padding: 2px;">C(5) = max(P(5),0)</div>	<p>Key formulas</p> <p>u: $\exp(\text{Volatility} * \text{sqrt}(t))$</p> <p>d: $\exp(-\text{Volatility} * \text{sqrt}(t))$</p> <p>p: $\frac{\exp((\text{rf}-q)*t)-u}{u-d}$</p>
<p>Legends</p> <div style="background-color: #800000; color: white; padding: 2px;">Stock price tree</div> <div style="background-color: #ffff00; padding: 2px;">Payoff tree</div> <div style="background-color: #f4a460; padding: 2px;">Option value</div>						

Case Study 1

Compute Value of the ESOP having following terms:

Key Terms

Stock Price (INR)	25.0
Strike Price (INR)	22.0
Risk free rate	7.0%
Dividend yield	0.5%
Expected volatility	40.0%
Time to maturity (years)	4

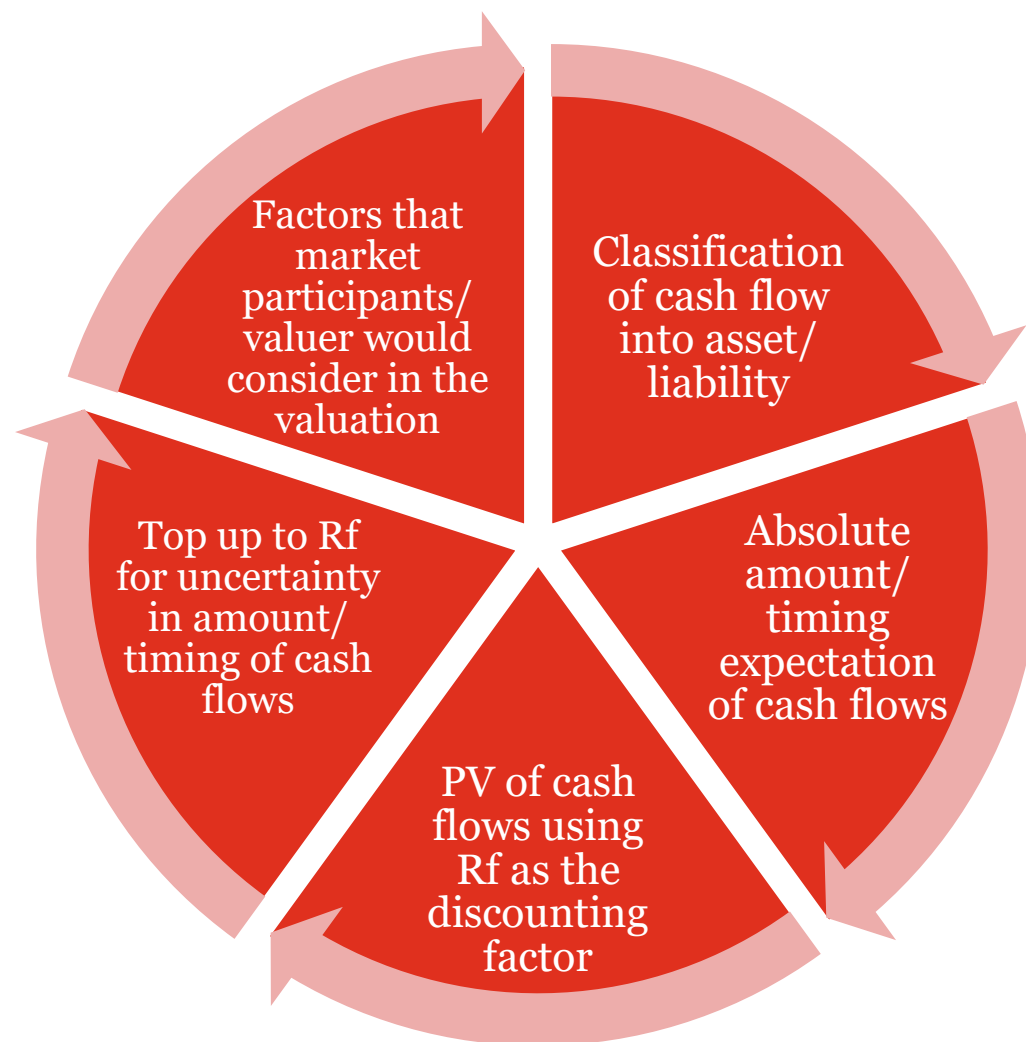
Case Study 2

Compute Value of the Bond having following terms:

Key terms

Face value	100,000
Issue date	1-Apr-17
Interest payment dates	31-Mar every year
Coupon rate	10%
Maturity date	31-Mar-22
Valuation date	31-Dec-17
Market yield for residual maturity (4.25 years)	11.0%

Income Approach - Major considerations



Cost Approach

- Valuation approach that reflects the amount that would be required **currently to replace the service capacity of an asset** (often referred to as current replacement cost).
- From the perspective of a market participant seller, the price that would be received for the asset is based on the cost to a market participant buyer to acquire or construct a substitute asset of comparable utility.
- This approach is **rarely used** in valuation of financial instruments and is better suited for non-financial assets

Adjustments for Credit Risk – Instrument and Issuer

Counterparty credit risk

- Check for historical, present and future financial performance plan of the counterparty
- Check the performance/ prospects of the macro industry sector in which the counterparty operates

Capital leveraging

- Check amount of borrowing in the underlying asset
- Check leverage ratio of the issuer of the financial instrument

Security hierarchy

- Level of security charge that the financial instrument gives. Lower charge would increase the credit risk

Collateral and default protection

- Collateral coverage and
- Assess liquidity of collateral
- Seniority in case of liquidation

History of default

- Information on defaults that have occurred in past liabilities in the counterparty helps in assessing the level of financial stress

Offsetting

- Is underlying asset is held by counterparty?

Control environment

- **Unobservable inputs** and **calculation models** prepared by issuer of financial instruments – consideration for control environment.
- **Control environment** consists of governance and control procedures set in place by an entity with the objective of increasing reliance on valuation process and conclusions.
- Value placing reliance on internally performed valuation shall consider reliance on control environment, its adequacy and independence.

Section 2

Documentation and Reporting

2

Reporting

- The form and content of the valuation report depends on the:
 - **nature** of the engagement; and
 - **purpose** of the valuation.
- Contents of the Valuation Report are selected by the valuer, based on the specifics of the engagement, in particular, the nature of the engagement, and the purpose of valuation.

Report

- Valuer shall at a **minimum** include the following in the valuation report:
 - background information of the asset being valued;
 - purpose of the valuation and appointing authority;
 - identity of the valuer and any other experts involved in the valuation;
 - disclosure of the valuer's interest or conflict, if any;
 - date of appointment, valuation date and date of the valuation report;
 - analysis and procedures undertaken;
 - nature and sources of the information used or relied upon;
 - procedures adopted in carrying out valuation and valuation standards followed;

Report

- valuation methodology used;
 - restrictions on use of the valuation report, if any;
 - major factors that were taken into account during the valuation;
 - conclusion; and
 - caveats, limitation and disclaimers to the extent they explain or elucidate the limitations faced by valuer, which shall not be for the purpose of limiting his responsibility for the valuation report.
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- Where a valuer uses the work of an expert during the process of valuation, he shall disclose the identity of such expert and the reliance placed on the valuation report of such expert.

 - A valuer may decide to include the valuation report issued by such expert as an annexure to his valuation report.

Management Representations

- A valuer may obtain written representations from the management regarding information for performing the valuation, which is a matter of professional judgement.
- Where valuer has relied on information represented by the management, he shall mention the fact of such representation and his reliance on the same.
- **The existence of the management representation letter shall not preclude the valuer from exercising reasonable skill and care with respect to the information obtained regarding the valuation.**

Documentation

- A Valuer shall document matters which are important in providing evidence that the valuation assignment was carried out in **accordance with the ICAI Valuation Standards** and support his assessment or the valuation report submitted by him.
- Documentation includes the record of valuation procedures performed, relevant evidence obtained and conclusions that the Valuer has reached.
- Shall document the valuation evidence obtained on a **timely basis**.
- Shall be prepared **at the time the valuation assignment** is performed.
- Extent of documentation is a matter of professional judgement.

Documentation

- Shall retain the information obtained, as well as his analyses, assumptions, and workings to arrive at the valuation for a period of time sufficient to meet the needs of applicable legal, regulatory or other professional requirements for records retention.
- Retention period for valuation documentation is ordinarily **not shorter than three years from the date of the valuation report.** The valuer may maintain documentation in either physical or electronic format.
- A valuer shall ensure that the documentation is maintained in a form that is sufficient to enable another professional having no connection with the engagement or a reviewer appointed by any relevant professional body, to review the valuation process and conclusions.

Documentation

Following documents/information/analyses shall, **at the minimum**, be documented:

- Engagement or appointment letter;
- tabulation of data obtained during the course of valuation;
- workings undertaken to arrive at the value;
- copies of relevant circulars, extracts of legal provisions;
- Valuation Basis, approach/es, and method/s, or a combination thereof, used to arrive at the value;
- assumptions, a change in which, may materially affect the value;
- a copy of the signed valuation report issued; and
- Management/client representation letter or such communication received, if any.

Thank You