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THE VALUATION PROFESSIONAL

YOUR INSIGHT JOURNAL

ICMAI REGISTERED VALUERS ORGANISATION

About ICMAI Registered Valuers Organisation

The Companies Act, 2013 brought into the light the concept of 'Registered Valuers' to regulate the practice of Valuation in India and to standardize the valuation in line with International Valuation Standards. Consequentially,

The Ministry of Corporate Affairs (MCA) notified the provisions governing valuation by registered Valuers [section 247 of the Companies Act, 2013] and the Companies (Registered Valuers and Valuation) Rules, 2017, both came into effect from 18 October, 2017.

In view of the above, the Institute of Cost Accountants of India (Statutory body under an Act of Parliament) has promoted ICMAI Registered Valuers Organisation (ICMAI RVO), a section 8 company under Companies Act, 2013 on 23rd February 2018, which is recognised under Insolvency and Bankruptcy Board of India (IBBI) to conduct educational courses on Valuation for three different asset classes - Land & Building, Plant & Machinery and Securities or Financial Assets and to act as frontline regulator as Registered Valuers Organisation. ICMAI Registered Valuers Organisation is an Academic Member of International Valuation Standards Council.

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FROM THE CHAIRMAN's DESK

CS (Dr.) Shyam Agarwal
Chairman
ICMAI Registered Valuers Organisation

The value of a business is the combined value of the debt plus the value of the equity. In trying to understand a valuation, the investor is trying to determine the value of one or the other of these two things.

Debt is set up with a known return and as such the value of debt is much easier to determine. It is the principal plus the interest on the principle until the claim is paid. Equity on the other hand, is an uncertain return. Investors cannot guarantee the return on their investment and so determining the value of equity is a little harder. Equity should provide a return to the investor commensurate with the risk of holding that equity. a business is not worth the same to different parties. Different prospective buyers are likely to assign different values to the same company, depending on how the company fits into their scheme of things. One may argue that just the way beauty lies in the eyes of the beholder, value lies in the pocket of the buyer.

Valuations for business can vary widely depending upon the basis used. The net asset method purely based on the balance sheet generally tends to give the lowest overall valuation but once an element of return is added to the balance sheet asset value as in the super profit method of calculation the valuation increases slightly and then again in the earn out which is based on a more even mix of assets and future earnings. The highest valuations generally arise based purely on earnings with the P/E, dividend and DCF methods. The higher valuations that take account of future potential of the business appear more appropriate as the net asset basis takes no account of the value that those assets can generate or the effort that has gone into building a valuable brand or customer base. ESG (Environmental, Social, and Governance) factors are becoming increasingly important in the start-ups ecosystem. Investors are now looking for start-up's that are committed to sustainability, social responsibility, and good governance practices. ESG factors can affect a start-ups' funding and valuation, as well as its long-term growth prospects.

FROM THE PRESIDENT's DESK

CMA Vijender Sharma
Nominee Director
ICMAI Registered Valuers Organisation

President
The Institute of Cost Accountant of India

Valuation helps businesses, investors, and financial professionals determine the value of a business, asset, or investment. Over the years, valuation has undergone significant changes and developments, and it continues to evolve.

As the world continues to emerge from the multi-year impact of the pandemic, there are new challenges ahead that are affecting consumer confidence — and in turn, may affect business and its valuation. At the same time, there are also crosscurrents in play. For example, despite increased inflation and rapidly increasing interest rates, consumer spending levels currently remain high, but are showing some signs of strain.

Valuation is a prophecy of future business expectations. To accurately reflect those expectations, it is critically important for a business owner to identify and understand what drives value? What factors increase cash flows and reduce risk? Ongoing assessment of a company's value drivers is integral to its success. The valuation process involves both a quantitative and a qualitative assessment of a company that should be part of any business owner's standard operating procedure as a useful and important business management exercise. A valuation assessment can provide the business owner with meaningful and oftentimes actionable information that highlights the real intrinsic value of the firm and ultimately maximize returns.

Overall, it is important to remember that income-based valuations are based on the future expected earnings/cash flow of the operating entity. Even though we as valuators often rely on historical earnings to determine future earnings, it is important to factor market and operational changes into our analysis. The ongoing impacts of the COVID-19 pandemic, along with the corresponding government response, have created significant changes in operations and markets for many companies. Given that these impacts persist today, it is important to closely examine changes in operating results over the last two years and adjust accordingly.

FROM THE MD's DESK

Dr. S.K. Gupta
Managing Director
ICMAI Registered Valuers Organisation

Business valuation is a process and a set of procedures used to estimate the economic value of an owner's interest in a business.

Valuation is used by financial market participants to determine the price they are willing to pay or receive to effect a sale of a business. The purpose of corporate valuation is basically to estimate a fair market value of a company. So, at the outset, we must clarify what is meant by "fair market value" and what is meant by "a company". The most widely accepted definition of fair market value is the price at which the property would change hands between a willing buyer and a willing seller when the former is not under any compulsion to buy and the latter is not under any compulsion to sell, both parties having reasonable knowledge of relevant facts.

Valuation activities refer to the process of determining the value of an asset. Valuation is determining of the current market value of economic assets as money. In other words, it can be defined as the appreciation and estimation of the value of a firm's total assets such as current assets (like inventory), fixed assets/non-current assets (like lands, buildings, properties, machinery, plant, equipments and vehicles) and intangible assets (like goodwill and other intangible assets). Valuation is to investigate to what extent a fixed asset, intangible asset or a service provides the expected benefit from them and to give an opinion about their properties in order to determine their value (Chambers, 2009: 5-7). Since the valuation of the firm is a function of the future of the firm, the "expression of art rather than science" is used for firm valuation process.

There are three main valuation approaches are used. Asset based approach, which deals with the establishment of assets and liabilities recorded in the company's records and represents actual rather than estimates. It does not relate to a particular unit but depends on market prices and deals mutual recurrence. The income approach is based on the expected future cash flows of the company. The present value of a company is determined by the present value of the cash flows of that company generated in the future. Lastly, the value of the business is obtained by the comparison of the business with similar-class businesses and securities sold in the market. From all of the above we can reach a final conclusion that the valuation is an integrated process, which we have all referred to in the previous conclusions parts of it and we cannot neglect any part.

PROFESSIONAL DEVELOPMENT

ICMAI REGISTERED VALUERS' ORGANISATION

Registered Office
The Institute of Cost Accountants
of India 4th Floor, CMA Bhawan
3, Institutional Area Lodhi Road,
New Delhi – 110003

www.rvoicmai.in

PROFESSIONAL DEVELOPMENT PROGRAMS

April'2023 to June'2023	
Date	**PD Programs**
1st March 2023	Seminar on Journey and Success Stories of Women
03rd - 04th March 2023	Master Class
05th March 2023	Achieving Excellence in Valuation
06th March 2023	International Women's Day
09th -10th March 2023	Master class on Valuation
13th -14th March 2023	Workshop on Valuation
15th March 2023	Interactive Meet of Registered Valuers
16th -17th March 2023	Learning Session on Valuation
18th -19th March 2023	Certificate Course in Valuation Standards
20th -21st March 2023	Master Class on Valuation
22nd March 2023	Valuation boot Camp
23rd - 24th March 2023	Learning Session on Valuation
25th -26th March 2023	Master Class on Valuation
25th -26th March 2023	Crash Course Preparation for Valuation Examination
27th -28th March 2023	Learning Session on Valuation
29th March 2023	Competency Building Program in Valuation
30th - 31st March 2023	Valuation Roundup
05th -06th April 2023	Achieving Excellence in Valuation
08th - 09th April 2023	Workshop on Valuation
13th -14th April 2023	Master Class on Valuation
15th -16th April 2023	Valuation Bootcamp
15th -16th April 2023	Crash Course Preparation for Valuation Examination
20th -21st April 2023	Learning Session on Valuation
25th-26th April 2023	Master Class on Valuation
29th -30th April 2023	Learning Session on Valuation
2nd May 2023	ICMAI RVO in association with IBBI organises Valuation Boot camp
6th -7th May 2023	2 Days Focused Learning Program of Case Studies (Securities or Financial Assets)
7th May 2023	Learning Session on Valuation
11th -12th May 2023	Master Class on Valuation
17th -18th May 2023	Learning Session on Valuation
20th -21st May 2023	Bootcamp on Valuation
24th -25th26th May 2023	Online Management Development program on Valuation
27th – 28th May 2023	Workshop on Valuation
31st May 2023 – 1st June 2023	Certificate Course on the Valuation of Intangible Assets

3rd – 4th June 2023	Certificate Course on International Valuation Standards
10th – 11th June 2023	Master Class on Valuation
17th – 18th June 2023	Crash Course Preparation for Valuation Examination
17th -18th & 24th -25th June 2023	Summer Boot camp & Online Certificate Course on Valuation
20th -21st June 2023	Case Studies in Valuation
28th -29th June 2023	Certificate Course in Valuation Standards

Hours Training Programs

March'2023 to June'2023	
Date	**Programs**
17th March to 19th March & 23rd March to 26th March 2023 (Seven Days Program)	50 Hrs Educational Course on Valuation in Securities or Financial Assets
7th April to 9th April and 13th April to 16th April 2023 (Seven Days Program)	50 Hrs Educational Course on Valuation in Securities or Financial Assets
21st April to 23rd April & 27th Apr to 30th April 2023 {Seven Days Program}	50 Hrs. Educational Course on Valuation (Plant & Machinery, Land & Building
02nd June to 04th June & 08th June to 11th June 2023 {Seven Days Program)	50 Hrs. Educational Course on Valuation (Plant & Machinery, Land & Building
15th June- 25th June 2023	50 Hrs Educational Course on Valuation in Securities or Financial Assets

Upcoming 50 Hours Training Programs

Date	**PD Programs**
07th -09th& 20th-23rd July 2023	50Hrs Educational Course on Valuation in Securities or Financial Assets


Articles

ARTICLE

Valuation of Financial Service Firms

Dr. S K Gupta
Managing Director
ICMAI Registered Valuers Organization

The Perspective

The role that banks play in an economy is undeniably important. Banks promote economic wealth, and signify strength of a country's financial system, apart from its responsibility of keeping public trust and confidence. The traditional functions of deposit and loan have evolved into complex practices that banks use to provide financial backbones for an economy.

A country's stability is largely dependent on banks because of its: a) ability to maintain resiliency through diversified sources of revenues, assets, and liabilities; b) ability to achieve higher profitability from revenue and cost synergies; c) has greater transparency that helps lower counterparty risks; d) can early detect accumulating systemic risks; and e) can better deal with mismatches in loan-deposits

Bank valuation is an estimation of its market value in terms of money on a certain date, taking into account the factors of aggregate risk, time and income expectations. Banks and other financial services firms can be particularly challenging to value. Their financial statements are unlike those found in other industries, and once familiar concepts like working capital and operating income become confusing and difficult to define let alone calculate. The consequence is that to value a bank requires a wholly different approach which carries its own set of potential pitfalls.

Overview on possible issues in valuation of financial service firms

Financial service firms have much in common with industrial firms but, we need to understand whichare the features that make them different from the other firms and which are the implications in a valuation perspective.

Debt, "raw material" or source of capital?

When we talk about capital for non-financial service firms, we tend to talk about both debt and equity. A firm raises funds from both equity investor and bondholders (and banks) and uses these funds to make its investments. When we value the firm, we value the value of the assets owned by the firm, rather than just the value of its equity. With a financial service firm, debt seems to take on a different connotation. Rather than viewing debt as a source of capital, most financial service firms seem to view it as a raw material.

The regulatory framework

Due to the risks taken on by banks, their specific role in the economic system, and their dependency on economic cycles, banks are subject to various bank-specific rules and regulations, and the effect of regulatory requirements on value have to be considered. In their role as financial intermediaries, banks absorb imbalances in the savings and investment behaviour of their customers, leading to high volatility in the profit contributions of different bank products before and after risk .Apart from specific rules concerning the accounting of various balance sheet items, banks are subject to specific capital adequacy rules given their role as macroeconomic institutions, including the capital standards put forward by the Basle Committee on Banking Regulations and Supervisory Practices. In addition, rules on the maintenance of minimum reserves and systems for the protection of deposits regulate capital management within banks.

Differences in Accounting Rules

The accounting rules used to measure earnings and record book value are different for financial service firms than the rest of the market, for two reasons. The first is that the assets of financial service firms tend to be financial instruments (bonds, securitized obligations) that often have an active market place. Not surprisingly, marking assets to market value has been an established practice in financial service firms. The second is that the nature of operations for a financial service firm is such that long periods of profitability are interspersed with short periods of large losses;

Reinvestments

Banks are often constrained by regulation in both where they invest their funds and how much they invest. If we define reinvestment as necessary for future growth, there are other problems associated with measuring reinvestment with financial service firms. Usually we consider two items in reinvestment – net capital expenditures and working capital. Unfortunately, measuring either of these items for a financial service firm can be problematic.

Approaches to valuation of financial service firms

Market approach

The market (or relative valuation) approach is probably the simplest way to value a bank. The most sufficient multiples for bank valuation are the price- earning ratio (P/E) and the price-to-book value ratio (P/BV). P/E ratio, as a function of three variables – the expected growth rates in earnings, the pay-out ratio, and the cost of equity,

Asset-based approach

The asset-based valuation of a bank requires valuing the loan portfolio of the bank (which comprises its assets) and subtracting the outstanding debt to estimate the value of equity. It is frequently used to establish the liquidation value of a bank for possible legal proceedings. However, the value-based approach is difficult to apply when the bank enters multiple businesses (commercial banking, investment banking, etc.) or regions (countries)

Income approach

The income approach focuses on the conversion of expected future economic benefits into their present value. The free cash flow on equity (FCEE) method is highly valid for bank valuation, also because it reflects the fact that banks can create value from the liability side of the balance sheet. The alternative representation of FCFE is the summation of dividends paid, potential dividends, and equity repurchases and issues.

The dividend discount model (DDM) is another discounted cash flow models, which applies to banks since they are publicly traded companies. To value a stock, using the dividend discount model, the estimates of the cost of equity, the expected pay-out ratios, and the expected growth rate in earnings per share over times are needed. The expected dividend per share in a future period can be considered as a product of the expected earnings per share in that period and the expected pay-out ratio. It allows us to focus on the expected growth in earnings (more accessible and reasonable data) and change the pay-out ratio over time (to reflect changes in growth and investment opportunities).

The major discussion on the income approach concerns the possibilities of estimating the cost of equity. The cost of equity for a bank has to reflect the portion of the risk in the equity that cannot be diversified away by marginal investment in the stock. Several methods are available to calculate the expected return on equity or discount rate for banks: - Gordon Growth Model - An average profitability - The cost of foreign funds - Capital Asset Pricing Model (and its extensions)

Contingent claim valuation

Option pricing models based on advanced mathematics could be used for bank valuation as well. The Black-Scholes model is appropriate usage in bank valuation, since operations on both assets and liabilities are significant for the banking business structure. The model might be adopted for bank valuation by the following procedures:

1. The risk-free rate is accepted at the same level as in the income approach.

2. The price volatility is calculated from the annual bank statistics. The usage of relatively stable market indexes is also appropriate

3. Instead of Macalay duration, use the weighted average debt turnover as debt duration.

4. S and X variables are determined by the asset-based approach

Methods of valuation of financial service firms

1. **Net Asset Based Valuation**: Asset based valuation approach establishes the liquidation value of a bank for possible legal proceedings but this value-based approach is difficult to apply when the bank enters multiple businesses (commercial banking, investment banking, etc.) or regions (countries). Net asset valuation is not useful for the valuation of banks as whole; it is useful to assess the valuation of individual financial investment.

2. **Discounted cash flow valuation**: DCF focuses on overall growth and stability of bank and not only on profit growth therefore has it emphasizes on factors such as capital growth & renewal, income generated and risk. DCF valuation helps to know about the underlying characteristics of the firm, understand its business and its future risk income & growth.

3. **Free Cash Flow to Equity** : Banks are required to maintain minimum capital to sustain their operations, and there are two measures of capital: Tier 1 capital is the narrower measure and is composed primarily of common equity but also includes noncumulative preferred stock, while Tier 2 capital is a broader measure of capital that includes subordinated debt and cumulative preferred stock. To implement this FCFE model, we need two ingredients. The first is the expected net income over time. The second is the investment in regulatory capital, which will be a function of both the degree to which the financial services firm is under or over-capitalized to begin the process

and the expected growth rate in its risk-adjusted assets.

4. **Relative valuation :** Another way to think of the value of any asset is as a multiple of the earnings it generates. The most sufficient multiples for bank valuation are the price-earning ratio (P/E) and the price-to-book value ratio (P/BV). P/E ratio, as a function of three variables – the expected growth rates in earnings, the pay-out ratio, and the cost of equity, depicts some specific characteristics for bank valuation. The price earnings ratio for a bank is measured much the same as it is for any other firm. The most important issue about the multiple is that "earnings represent the bottom line of the income statement, they can also be affected by different accounting policies. The second multiple we are using is the P/B value. It represents the ratio between the market capitalization of the firm and the book value of equity. The measure is suitable for financial institutions because of the regulatory stress on solvency, capital requirements, and equity maintenance

5. **Residual Income approach** : In this model the equity value of a bank is the sum of the PV of expected excess return and the capital currently invested in the bank. The difference between a DDM and a RIM is that, in a Dividend Discount Model, we use the present value of Dividends and the present value of the Terminal Value of Dividends to value a bank, but in a Residual Income Model you use the difference between ROE and Cost of Equity plus the current Book Value to value the bank. Hence, the excess equity return needs to be calculated.

$$Excess\ Equity = (ROE - COE) * Book\ Value\ of\ Equity$$

The beginning book value (BV) of equity for the following year is simply the BV of equity of the following year plus the expected retained earnings of the year.

Book value $of\ Equity$n= $BV\ of\ Equity$n-1 + ($Net\ Income$n-1*$Retention\ Ratio$).

A logical starting point is to look at a long history of the bank's actual returns on equity, and then making adjustments for the future. This is the stage where we should take into account the bank's strengths and weaknesses relative to its competitors, as well as expected changes to the macroeconomic environment .The excess equity is then discounted by the cumulated COE and added to the initial BV of equity. Afterwards, the terminal value is added to result in current value of equity, before dividing by the diluted number of shares in order to obtain the result of the model:

6 **Excess Return Model :** It arrives at the value of equity as the sum of the current equity capital and the present value of expected excess returns to equity. Finding the current equity capital is as easy as looking at the balance sheet. Finding the present value of excess returns is more challenging. Here is the equation:

Excess Return = (Projected Return on Equity – Cost of Equity) * (Beginning Equity Capital)

Projecting a bank's future return on equity can be challenging. A logical starting point is to look at a long history of the bank's actual returns on equity, and then making adjustments for the future. This approach grounds the analysis in real returns that have been attained in the past (rather than committing the classic business school mistake of starting from zero and building up to returns by layering assumptions upon assumptions, resulting in projections that are orders of magnitude off of the best or worst performance ever achieved by the company, or even any company in the industry!), and then makes allowance for projected changes in the operating environment. This is the stage where the investor takes into account the bank's strengths and weaknesses relative to its competitors, as well as expected changes to the macroeconomic environment.

If a bank is earning extremely high excess returns now, it is important to do a multi-period valuation whereby these returns decline to a long-term sustainable level over time. Once the firm reaches its long-term sustainable operating level, you calculate a terminal value that incorporates this long-run moderate growth. The objective is to arrive at expected excess returns for each year in the future, either through a period of higher than normal growth with a terminal value, or modeling normal growth beginning now (for a relatively established bank).

Specifics of banks' valuation:

- Debt seems to take on a different connotation in Banks. Rather than view debt as a source of capital, most financial service firms seem to view it as a raw material. In other words, debt is to a bank what steel is to General Motors, something to be moulded into other financial products which can then be sold at a higher price and yield a profit. Consequently, capital at financial service firms seems to be more narrowly defined as including only equity capital.
- Due to the risks taken on by banks, their specific role in the economic system, and their dependency on economic cycles, banks are subject to various bank-specific rules and regulations, and the effect of regulatory requirements on value have to be considered. Due to banks' specific dependency on macroeconomic factors, legislators give them specific rights to build up reserves.
- Banks are required to maintain capital ratios to ensure that they do not expand beyond their means and put their claimholders or depositors at risk. Second, financial service firms are often constrained in terms of how they can invest their funds.
- Entry of new firms into the business is often restricted by the regulatory authorities, as are mergers between existing firms. From a valuation perspective, assumptions about growth are linked to assumptions about reinvestment. With financial service firms, these assumptions have to be scrutinized to ensure that they pass regulatory constraints.
- Provisions for losses are also an issue for valuation. These provisions reduce net income in the current period but are used to meet expected losses in future periods. In general, while the actual bad debts that occur in any year will not match the provision set aside for that year exactly, the cumulative provisions over time should be equal to the cumulated bad debts over the same period.
- If we define reinvestment as necessary for future growth, there are other problems associated with measuring reinvestment with financial service firms. Usually we consider two items in reinvestment – net capital expenditures and working capital. Unfortunately, measuring either of these items for a financial service firm can be problematic. Consider net capital expenditures first. Unlike manufacturing firms that invest in plant, equipment and other fixed assets, financial service firms invest in intangible assets such as brand name and human capital. With working capital, we run into a different problem. If we define working capital as the difference between current assets and current liabilities, a large portion of a bank's balance sheet would fall into one or the other of these categories. Changes in this number can be both large and volatile and may have no relationship to reinvestment for future growth.

Conclusion

Bank valuation remains to be an intricate process that was made even more complex by the attempt to be risk averse stemming from lessons learned in the global financial crisis. Although most banks were resilient, these institutions have become careful in its risk taking initiatives, taking measures to be transparent and conservative in all its transactions. This is to protect mainly the depositors and depositors, and largely the stakeholders. The basic loan and deposit functions are now disaggregated on specific characteristics of products and services, so that practices will be focused on reducing risk and increasing returns on these offerings

The basic principles of valuation apply just as much for financial service firms as they do for other firms. There are, however, a few aspects relating to financial service firms that can affect how they are valued. There are, however, a few aspects relating to financial service firms that can affect how they are valued. The first is that debt, for a financial service firm, is difficult to define and measure, making it difficult to estimate firm value or costs of capital. Consequently, it is far easier to value the equity directly in a financial service firm, by discounting cash flows to equity at the cost of equity. The second is that capital expenditures and working capital, which are required inputs to estimating cash flows, are often not easily estimated at financial service firms. In fact, much of the reinvestment that occurs at these firms is categorized under operating expenses. To estimate cash flows to equity, therefore, we either have to use dividends (and assume that what is not paid out as dividend is the reinvestment) or modify our definition of reinvestment. Even if we choose to use multiples, we run into many of the same issues. The difficulties associated with defining debt make equity multiples such as price earnings or price to book value ratios better suited for comparing financial service firms than value multiples. In making these comparisons, we have to control differences in fundamentals – risk, growth, cash flows, loan quality – that affect value. Finally, regulatory considerations and constraints overlay financial firm valuations. Bank valuation is a continuously evolving process and as long as banks play significant roles in economic systems, new methods and theories of valuation need to arise to keep up with the highly dynamic global world.

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ARTICLE

Property Valuation In Post Covid Period In India: Can We Rely On Trend / Market Analysis?

CMA Prof Jayanta Mitra

Backdrop:

Trend Analysis (also termed Market Analysis) is an important tool in the hands of Valuers and Appraisers for valuing Real Estate Properties. However,in the current post covid period in India,where majority of Real Estate Properties are not being sold/rented/owned,we need to take a fresh look at the Trend Analysis,for valuing Real Estate Properties in India.

What Role Does Trend Analysis Play In Determining Property Value:

Trend Analysis is a Quantitative Technique,normally used by Valuers and Appraisers to identify and measure trends in the market.

Basically, the following characteristic features attract potential buyers/ tenants to a Property in India and add to its value:

• Proximity to Public Transportation

• Nearness to Educational Institutions/ Banks/ Hospitals/Clubs/Markets etc

• The side of the Street a Property is located

• Posh Locality etc

In the post covid period, Realtors are trying to lure prospective buyers through features like ---In house Health Club Amenities, Free Wi-Fi, Green Building Certifications and other Smart Technologies.

How Trend Analysis For A Property Is Done ?

To identify and measure trends,Valuers and Appraisers use Spreadsheets & Software Tools to sort out large sets of comparable data. The main objective is to ascertain the relationship between Selling Price and Market Conditions and also between Selling Price and Characteristic Features of Property ,that attach and drive value. The results obtained can be used to predict Future Performance or Support Value Adjustments for Market Conditions.

Will The Elephant Dance ?

All predictions made previously in the Pre Covid Period relating to Valuation of Real Estate Properties, have failed drastically in the Current Post Covid Period in India. The Financial Sector has dried up and experts are of the opinion that the Liquidity Crunch may take another 4-5 years to return back to normalcy.

Capital Based Factors like Monetary Policy, Government Spending, Taxation,Interest Rates,Non Availability of Investment Capital in the present economic scenario has aggravated the poor Real Estate Valuation picture.

User Based Factors like migration pattern of labourers,Population Shifts,Economic Shocks,Recent Natural Disasters, Over Building of Properties, Changes in Affluence and Income Distribution etc have rubbed salt to the fresh Economic Wounds.

Trend Analysis of Property Valuation has thus become "A Note of Interrogation" in the Current Property Appraisal Process in India, particularly when it comes to the highest and best use of the property.

Is There A Solution To The Problems Faced ?

Experts are of the opinion that Valuers and Appraisers need to carefully distinguish between Factors that Cause Change and Symptoms of Changes.

As mentioned earlier,Symptoms of Changes include Changes in Vacancy Rates,Falling Property Prices etc.

Regardless of the Analysis of the Factors, Valuers need to segment the Market and Highlight the subject "Property".

Trends for a specific neighbourhood are likely to be more helpful than broad market ttrends.

Trends, like any other factors, affect Value,and can change Future Property Value subsequent to the Valuation date.

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ENVIRONMENTAL DEGRADATION IN CONSTRUCTION SITES

Er. M. Ulaganathan1
Dr. S. N. Sugumar2

Abstract: Food, Dress, and Shelter are all basic amenities of mankind, we know well. The first residence is the caves of the forest. Civilisation made modern techniques and methods a new form of construction activity. The challenges faced more use of natural resources and causing the outcome of pollution emissions. Depletion of natural minerals spoils another side effect such as declined groundwater level. Recent developments in construction methodologies yielded contamination of water, landfill, made-up grounds, harmful carbon emissions, etc. Inundation, submergence, low lying area are the results of these infrastructure developments. Energy conservation, Energy consumption, Industrial Development, polluting atmosphere, and health impairment, are to be looked at.

Objectives of the Study: The Authors analyse the impact of environmental pollution on real estate–infrastructure growth and subsequent impairment (can influence the property value) caused by the following situations

1. Landfillll (Building Debris etc) created by Municipal Corporations releases bad odor
2. Marshy site condition due to long-time stagnation of surface runoff and rainwater
3. Low lying areas resulted from new layout road formations
4. Untreated thermal polluted sludge discharged by nearby industrial estates
5. Unpleasant odor caused by nearby running industries
6. Unaffordablele noisy environment created by adjacent industrial estates
7. Vibrations continuously due to nearby Aerodromes
8. Contaminated groundwater – unfit for domestic consumption
9. Storage godowns of industrial managements causing epidemic – mosquito breedings, etc
10. Unexpected landslides, animal intrusions, subsidence, inundations, excess rainfall, no rainfall

Literature review:

- Infrastructure development is the barometer country's growth and 400 million tons of construction materials are every year
- Infrastructure developments in the real estate sector are approximately 40 % of the global energy level, US Green Building Council (USGBG)
- UN report 2015 and Kevin Muldoon - Smith, 2019, stipulate world's carbon emissions in the real estate sector are around 20% now and expected 56%, in 2030

- World Bank, 2018 reported the real estate field consumes 12% and emits 30% of waste sullage
- The World Health Organization estimates that outdoor air pollution caused 3.7 million premature deaths globally in 2012.
- In 2012 some 7 million people died as a result of air pollution exposure, making it the world's biggest killer (WHO, 2013).
- Recent study revealed that real estate polluted 23% of air pollution,

40% of drinking water pollution,
50% of climate change, and
50% of landfill waste. (Bimhow)

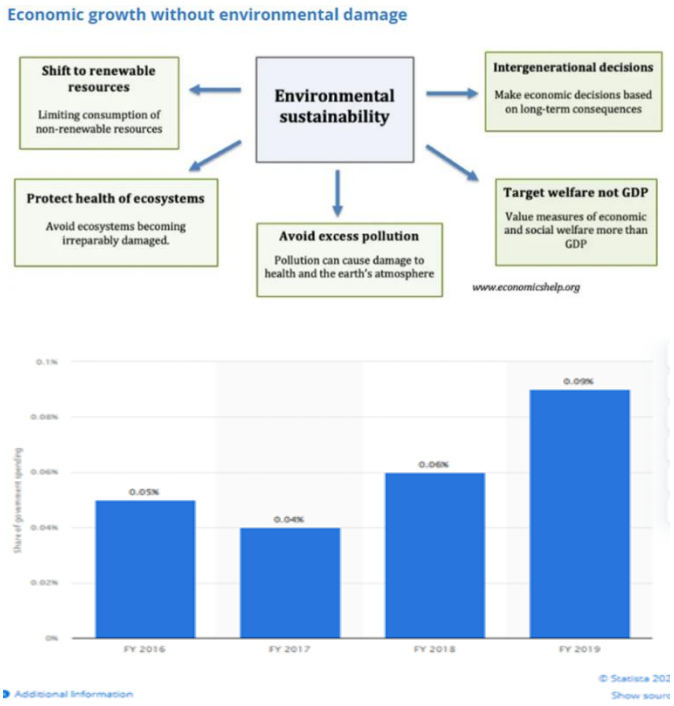
- USGBC, 2021, states that the Green buildings in commercial establishments are 40 - 48% compared to only 2 percent in 2005

Green Building concept was enacted in India, in 2000, the CII Sohrabji Godrej Green Business Centre (GBC) was launched in March 2000 during the visit of then - U.S. President Bill Clinton to India aims to promote ecologically sustainable business models in the green economy and was inaugurated by His Excellency Dr. A. P. J. Abdul Kalam, the then President of India on 14 July 2004

Introduction: Principles for Environmental Sustainability/ Sustainable Buildings:

- Sustainability refers construction of infrastructures without impacting the ecosystem which exists in the area. i.e the ability of the property to exist without disturbing the wildlife around
- Green building concept is widely accepted to curb emissions and create sustainable standards
- Both State and Central Governments also initiated motivations to build sustainable developments along with planners, engineers, key personnel, citizens, stakeholders, dwellers, al
- CPCB and other state level Institutions engaged to set out standards to control pollution at affordable costs and procedures
- Separate wings are looking at Construction and labor welfare, specifically, Tamilnadu government Directorate of Industrial Safety and Health by engaging their officers

- RERA, also insists such measures to adopt in the construction of residential and commercial sectors
- Similarly Carbon Emission in industries have been also regulated and monitored by state pollution control boards
- Carbon Taxes are levied
- Energy auditing is done periodically - 3 R policies adopted
- Social awareness programs are conducted among villagers, staff, workers, and stakeholders discussing Emission-free or controlled climate, energy conservations, alternate technologies, like solar panels, etc



Environment pollution due to construction activities in infrastructure developments:

1. **Landfillsllll (Building Debris etc) created by Municipal Corporations release bad odor**:

    - Constructions and renovations or demolitions of buildings generate more waste materials like debris, brickbats, concrete lumps, glass pieces, wooden pieces, asphalt sheets, asphalts, lime contents, and so on
    - These wastes are either dumped in landfill or disposed of in incinerators according to the situation
    - The so-called waste dumps prevent rain and other surface runoff from penetrating underground
    - 3 R policy, i.e, reuse, repair, and recycling of this waste are thought alternatively
    - Wooden bats or reapers and metals can be recycled for other uses.
    - Brickbatsts are crushed into the jelly size and can be used for weathering course

2. **Marshy site due to long-time stagnation of surface runoff and rainwater**:

- The stagnation of water by any cause creates a bad odor and forms slushy mud which does not allow water to penetrate below
- Soil lost its fertile capability and no vegetation growth or trees
- Soils are also less capable of supporting the beneficial microflora necessary for mineral cycling.
- Loosened soil becomes “quicksand” spots and endangers the locality
- Soil and stagnated water become a spot of continuous bad odor and ill health for the residents nearby as a spot for mosquito breeder
- Damage to Flora and fauna: Debris dumped in the rivers causes a river or stagnated water to become deep black color and foul smelling prevent oxygen accumulation in water and flora and fauna i.e aquatic cultures such as fishes, plants, animals, bacterial biological conservation. The water contains many chemicals that can damage the survival of flora and fauna
- In addition to the plant wastewater pollution to the river the other thing that can undermine the survival of flora and fauna is the construction of REAL ESTATE located in an area that should be their habitat such as in mountainous areas.
- One of the factors that led to the development of real estate in the area because the area is a beautiful area, cool, calm, and peaceful, but instead it's what makes the flora and fauna not peaceful because of the animals they had resided there must displace because of development is not to mention the plants that should be in with a cruel slash kalupun there are probably not as much plant and any formerly in use as a decoration or beauty alone.
- For instance, real estate in the area north of Bandung which was once a haven for flora and fauna has now turned into a comfortable bed wrought for the haves.

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- For instance, real estate in the area north of Bandung which was once a haven for flora and fauna has now turned into a comfortable bed wrought for the haves.
- Fishes in the local lakes will disappear, which is accountable based on monetary losses.
- Trees saplings will become dead due to stagnated polluted water and become fuel wood, damage so caused will be assessed in cost analysis

05. **Low-lying areas resulted from new layout road formations**

- Global warming due to the emission of abundant Carbon dioxide and carbon monoxide imbalances temperature variations and rains in certain regions
- As a consequence, heavy rainfall fills Valleys and dams and inundation by surplus floodwater in some regions followed by drought in other regions
- The Government and Private sectors taking up developmental activities for the public cause by all means by creating new avenues, projects, dam structures, irrigation canals, industrial zones, etc
- The so-called industrial zone may take a new form of upgrading the entire surrounding by filling the existing ground surface or water retaining structures to cater to their needs
- Such improvements will become a headache to adjacent surroundings in various forms

- The nearby low-lying areas or valleys get inundation either by rainwater or water squeezing from nearby irrigation dams
- Similarly, the execution of Industrial constructions carried at an elevated level leaves the nearby area as a downtrodden
- The infrastructures already built in these areas getting submerged and intend to raise the basement level to safeguard from dampness
- Alternatively, the structures can also be either demolished and reconstructed

06. **Untreated thermally polluted sludge discharged by nearby industrial estates**:

- Construction materials such as aluminum, concrete, and steel are responsible for large amounts of greenhouse gas emissions.
- The GHG emissions contribute to global warming, thus leading to climate change.
- Urban housing construction increases the number of particulates in the air, which causes many respiratory problems. In countries such as India, where there has been a surge or urban development, the cities are covered in thick layers of dust, partly caused by construction activity

0.7 Unpleasant odor caused by nearby running industries:

- Expansion of existing projects, new projects, and other such infrastructure developments by fuel burnings emits an appreciable quantity of gas causing pollution in the air and other provinces
- Speedy executions exceed emissions at the regulated level and are monitored by agencies
- Harmful discharges in water bodies to be controllable within the tolerable limit either by treating to neutralise the pH value
- The contaminants containing toxic chemicals, arsenic, and lead soaking into the groundwater causing cancer, physical ill health, fluoride deficiency, etc
- Wastewater from the construction sites creates severity to the environment as it can harm or disrupt the entire ecosystem.

08. Unaffordablele noisy environment created by adjacent industrial estates:

- The usage of Plants and Machinery in the construction site produces more noise than the permitted level
- This situation happens normally in the demolition stage of any project and landscaping.
- This abnormally noisy environment irritates nearby residents and school students
- Vibration accompanied by airplanes nearby aerodromes damages structures and human beings
- The underlying cause for those vibrations may also indicate a problem, such as misaligned gears or malfunctioning equipment.
- Not only can these issues create noise pollution (which can impact local wildlife), but they may also be leaking harmful chemicals into the environment.
- These floating fine particles such as Carbon particles/dust and other suspensions created by debris from construction activities may be inhaled by the occupants surrounding the premises and leads to lung disorder like cough, Asthma, deposition in the Lungs, Cancer growth, etc. Hypertension

09. Contaminated groundwater – unfit for domestic consumption:

- Waste water emerged from the concrete wash or mixing, oil, solvent, temperature buffer, metabolite, living environment, lubricants, and other compounds
- Rain & Stormwater harvesting by proper methods and draining to nearby drains
- The sediments clog the drain pipes
- Particulates suspensions and dust in the air cause respiratory and other lung disorders particularly in the urban sector also polluting when trashing our oceans, rivers, and lakes.
- Before the discharge of wastewater, it should be disinfected to kill the disease-causing organisms like bacteria.
- Proper chlorination should be done to prevent the formation of chlorinated hydrocarbons or disinfection should be done by ozone or ultraviolet radiations.

10. Storage godowns of industrial managements causing epidemic – mosquito breedings, etc:

- Disappearance of biodiversity depletes aquatic ecologies and triggers the unbridled proliferation of phytoplankton in lakes, which in a balanced ecosystem, provides food for a wide range of sea creatures including shrimp, snails, and jellyfish.
- The result of this is eutrophic “dead zones”, caused by the promotion of algae growth, where aquatic life cannot survive because of a lack of oxygen.
- Plants being stationary are subjected to drastic changes caused by developmental activities.
- A large area of the land surface is cleared of natural vegetation the remaining flora is subjected to adverse conditions. The susceptible species disappear.
- The changed conditions of the environment may be detrimental to rare and endangered species present in the system.

- Species that happen to be endemic may be lost completely. Animals migrate away. All this may result in the disappearance of the traditional resource base for the local population

11. Unexpected landslides, animal intrusions, subsidence, inundations, excess rainfall, no rainfall:

- Landslide means mass ground movements, rock falls, deep-seated slope failures, mudflows, and debris flows
- Landslides occur in a variety of environments, characterized by either steep or gentle slope gradients, from mountain ranges to coastal cliffs or even underwater, in which case they are called submarine landslides.
- Shift of gravitational force makes landslide failure due to heavy rainfall, an earthquake, a slope cut to build a road, and many others, although this is not always identifiable.
- Construction of new dams raises the water level of the particular region and causes the inundation and subsequent submerging of structures
- Developmental projects for housing, industry, road, rail, and air transport are using up agricultural or forestlands increasing pressure on the available land resource.
- Gas emissions becoming a reason for no rainfall or excess rainfall

Monitoring and control of Pollutions created in construction sites:

1. Fuel: Poor maintenance of tools and plants consumes more fuel. Machines require regular maintenance. Idle run to be avoided or minimized. Replace old worn out spare parts with quality. To limit fossil fuel pollution, construction projects should try to minimize the impact of construction on the environment by reducing haul distances, reducing vehicle idling, using green, alternative fuels, and using hybrid equipment. By decreasing fossil fuel use gas emissions also can be decreased thus leading to better air quality.

2. **Green Building Concepts**: refers to modern and developed thinking of utilization of natural resources aiming to meet the requirements of infrastructures such as solar power for electrical energy, natural ventilation, and sunstrokes to brighten or to provide lighting for safe and comfortable living of incumbents or industrial running in order conserve energy, water, and material resources

- A ‘green’ building is a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings preserve precious natural resources and improve our quality of life includes.

  - Efficient use of energy, water, and other resources
  - Use of renewable energy, such as solar energy
  - Pollution and waste reduction measures, and the enabling of re-use and recycling
  - Good indoor environmental air quality
  - Use of materials that are non-toxic, ethical, and sustainable

- Green practices in Plants and equipment aim to minimize noise and vibrations, avail maximum productivity, minimum waste, conservation of energy efficiency functioning, minimal fuel consumption, etc
- 3 R policy, i.e. Reduce waste, Reuse, and recycling concept will be followed while designing and implementing constructions, and no ecological changes, quality of materials, construction, durability, and strength
- The GBC headquarters at Hyderabad is India’s first platinum-rated green building which has been awarded by the United States Green Building Council (USGBC), under the Leadership in Energy and Environmental Design (LEED) rating system.
- In 2011, the Centre launched the GreenCo Rating system which evaluates how green a company is and suggests the way forward on resource conservation and energy & environmental management.
- Residential and commercial lighting: The main factors influencing energy are a type of Construction, Materials required, Shape & orientation of the building, internal climate characteristics, and internal activities consumes about 80 % of all energy for water heating, space cooling/heating
- **Design aspects**: Orient the house to reduce solar gain in summer and capture the sun’s light and warmth in winter.
- Carefully sized overhangs or awnings will protect windows from the summer sun while admitting the sun’s warming rays in winter when it is at a lower angle
- Maximize natural light to reduce the need for electrical usage during the day
- Compact fluorescent lights (CFLs) are big energy savers.
- Choose CFLs with warm color temperatures (around 2, 7000 to 3,000° Kelvin) which are indistinguishable from incandescent lights.
- Cut energy consumption further with clean, renewable energy from photovoltaic panels.
- In some locales, wind-generated electricity is also an option
- Reduce vehicle speed limits by 10 kilometers per hour.

3. Noise Pollution: The unpleasant, discomfort-causing sound from any source is called noise. The sustained presence of harmful, unwanted, or annoying noise in the environment is called noise pollution which encompasses roadway noise, aircraft noise, industrial noise as well as high-intensity sonar.

Sources of Noise generation:

- Surface Transport motor vehicles, Trains movements
- Aircrafts & Aerodromes
- Industrial machines – Boilers, Air Conditioning units, Motors, Compressors
- Loudspeakers - Religious, Loud music during festival seasons
- Fire Crackers – Religious & Festival seasons
- Electric home appliances, such as televisions, transistors, radios, Vaccum Cleaners, AC
- Heavy Sky - scrapper constructions – pneumatic hammers, air compressors, Bulldozers, Loaders, Pavement breakers
- The newly formed industries must compensate or take preventive measures to control the emission of pollution according to international standards
- The noise generation not only affects living things, but it also contributes considerable damage to nonliving things like residential buildings
- The roofing of ACC sheets of nearby dwelling units broken into pieces due to continuous vibration

Permissible levels of Noise Pollution:

Area Code	Category of Area/Zone	Limits in dB(A) Leq *	
		Day Time	NightTime
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note:
1. Daytime shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is defined as an area comprising not less than 100 meters around hospitals, educational institutions, and courts. The silence zones are zones that are declared as such by the competent authority.
4. Mixed categories of areas may be declared as one of the four above-mentioned categories by the competent authority.
*dB(A) Leq denotes the time-weighted average of the level of sound in decibels on scale A which is relatable to human hearing.
A "decibel" is a unit in which noise is measured.
"A", in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.
Leq: It is an energy mean of the noise level, over a specified period.

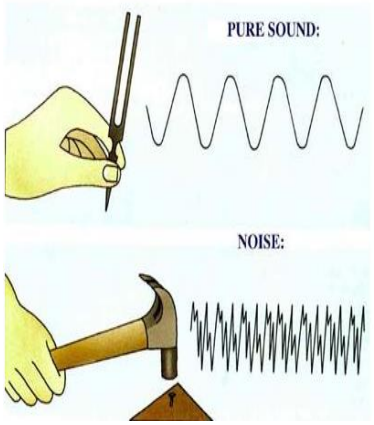
City	Noise level (dB)
Nanjing (China)	105
Rome	90
New York	88
Calcutta	85
Mumbai	82
Delhi: 80	80
Kathmandu	75

Effects of noise pollution:

- The noise generated by construction is considerable and is maximum during the preparation of the site, demolition as well as landscaping.
- The noise arising from construction can be an irritant to residences and schools nearby hampering the quality of life and work within.
- The metal-on-metal impact can be reduced by using rubber panels or covers and barriers erected around noisier sites to help reduce their impact. Some tools can also be fitted with silencers.
- To avoid noise becoming a problem, construction activities should begin and end at regulated times.
- Construction firms could send letters to people and institutions in the neighborhood, informing them about the times of work, and the duration of the project, as a goodwill gesture.
- "*Noise that exceeds the ambient sound level by more than 10 decibels (dB) as measured from 15 feet from the source as measured from inside any property or on a public street is prohibited*."Auditory sensitivity is reduced with a noise level of over 90 dB in the mid-high frequency for more than a few minutes.
- Noise can cause temporary or permanent hearing loss. It depends on the intensity and duration of the sound level.
- Interferes with man's communication: In a noisy area, communication is severely affected.
- Continuous exposure to noise affects the functioning of various systems of the body. It may result in hypertension, insomnia (sleeplessness), gastrointestinal and digestive disorders, peptic ulcers, blood pressure changes, behavioral changes, emotional changes, etc. Dementia & High noise levels can contribute to cardiovascular effects in humans and an increased incidence of coronary artery disease
- Soar produced and the mood of workers spoiled
- Accidents due to sudden acceleration of noise level
- Intense noise levels affect non-living things too.
- The noise booms cause cracks in national and archeological monuments, as well as very high levels of noise, which are the cause of cracks in hills.
- Noise can be transmitted through the air (also known as airborne sound/noise) or through solid structures/materials (structural sound/noise or impulse sound).
- The impact caused by continuous high-frequency sound waves and premature failure of reduction in the service life of Building Structures
- High-intensity explosions can break glass panels and vibrations in the buildings
- In Chennai Airport, the Glass panels fitted in the roof level often break and falls due to heavy vibratory noise created by Airplanes
- The vibrations caused by noise waves will not allow the suspending particles blown at the time of construction/demolition to settle down the ground.
- Many times it can be seen that some properties, though in good physical condition do not get any prospective buyers in the market because most of the prospective buyers have a stigma or dislike for the said property for certain reasons like a marsh, odor, noisy zones, etc

Measure to protect the effects of Noise pollution on the Real Estate Sector:
Infrastructures/Buildings

Horizontal clearance: Normally spanning away from the source of noise may have a lesser effect far away to dissipation of sound waves



Vertical Clearance: Restrict the number of stories, i.e, the height of the building is maintained well below the source of the noise.

- For example, tower-mounted sirens/mobile/ Mobile/ Elec communication fitted in nearby industries or blowers of such kind emitting continuous noise. But the drawback here is the permitted FAR of the property could not be achieved due to height restriction. Therefore a loss in the utilization of living space in the plot area

- **Crack Propagation**: Sound waves are of a high-frequency vibratory nature which vibrates continuously the target object. Specifically, Concrete components face the waves and hence the bondage between reinforcement bars and surrounding aggregates starts loosening. The weakened ingredients allow air to enter and corrosion of steel reinforcement proceeds. Lastly, the life of the structure goes down. A loss in the form of an under-service life span of infrastructures.

- **Existing Cracks width widening**: corrosion starts in the existing cracks. But the cracks are further expanded and acceleration of corrosion took place. The rate of corrosion is fast as before.The brittle of heterogeneous components starts at a random rate than expected

- **Sound Proof Insulation**: Sound dampeners are a type of acoustic insulation that dissipates vibrational energy before it can radiate as sound. By stopping an object from vibrating, sound-dampening products reduce noise, or unwanted sounds, that travel through the air as waves.

- **Cladding with insulation material**: prevents sound waves not to pass through the components like RCC Beams, RCC Columns, and similar

- **Noise absorption materials**: The metal-on-metal impact can be reduced by using rubber panels or covers and barriers erected around noisier sites to help reduce their impact. Some tools can also be fitted with silencers. Hollow Celcrete Blocks are used as Steining wall bricks, of their hollow space inside the sound waves reverberate within that interstice and dampen. The hollow air-filled space does not allow sound waves to travel further.In Cinematorium Halls, Sports & Public Audition Halls, some kind of interior works will be furnished using inert sound absorbing/insulation material to subsidize the reverberation effect of noise due to audio systems installed inside. Dampers are also used

Building Orientation: The Town planning parameters were studied carefully, in such a way as to orient the building configuration by orienting the wind-blowing direction to enter the main entry gate and exit in the rear gate, to be in a straight line in consonance with the airflow direction to minimize the hitting sound waves the building inside and it will pass over. This will reduce the harmful effects of noise on the incumbents also. This is similar to swimming along the direction of water flow in a river

Barrier Walls:

Trees & Plantations: Trees can produce white noise to help muffle the effects of unwanted noises. Dense foliage can also form a bit of a sound barrier. We know that plantations absorb noise, dampen airborne dust-suspended particulates, and are air flow absorbersTrees & Plantations: Trees can produce white noise to help muffle the effects of unwanted heat radiations. Dense foliage can also form a bit of a temporary barrier. We know that plantations absorb heat to some extent, dampening airborne dust-suspended particulates, air flow absorbers, and artificial sprinkler systems as required in the appropriate zones. Bushes, Flower pots,

Buffeting:

- Local wind effects combined with noise due to adjacent structures can significantly impact the loading experienced by a building in a developed environment.
- Phenomena such as buffeting, channeling, and sheltering can have unique, and occasionally unpredictable, effects on the loading and response for a particular building.
- The buffeting excitation is connected with shelter effects and both effects have to be taken into account for the resulting peak wind load of a downstream building.
- In an unfavorable position the increase of this peak load may be up to 50%. From wind tunnel tests "buffeting factors BF" which are based on the stochastic wind load concept have been developed for different situations of adjacent buildings.
- The conducted analysis shows that the characteristics of pressure fluctuations generating buffeting loads on bridge decks vary along the structural surface.
- Areas where pressure fluctuations generated by either longitudinal turbulence, vertical turbulence, or a flow/structure interaction are dominant, all requiring different stochastic buffeting load descriptions.

Noise Pollution (Regulation & Control) Rules, 2000:

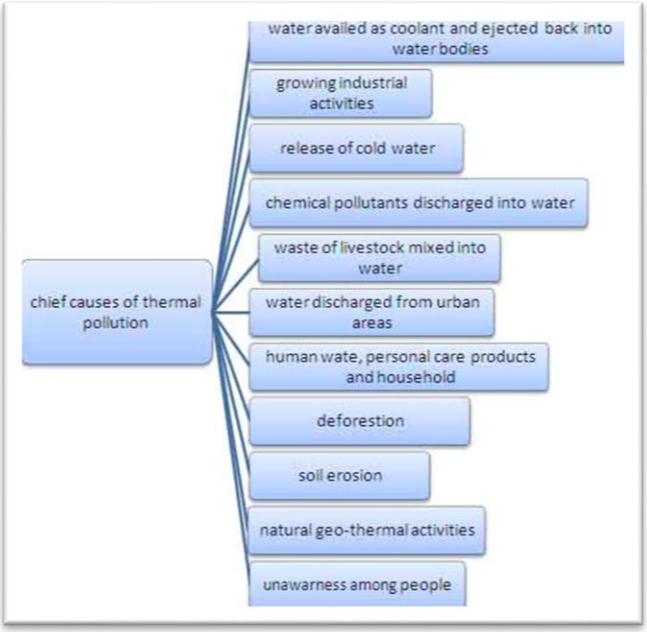
- Aiming to regulate and control noise from sources like industrial activity, construction activity, generator sets, loudspeakers, public address systems, music systems, vehicular horns, and other mechanical devices, such that the prescribed Ambient Noise Levels are complied with.
- A loudspeaker should not be used except after obtaining written permission from the authority
- If the noise level exceeds the ambient standards by 10 d(B), A complaint can be lodged to the authority
- However, noise with an intensity of 85 dB or higher will lead to physiological and psychological adverse effects on the nervous system, sleep, emotions, and performance.

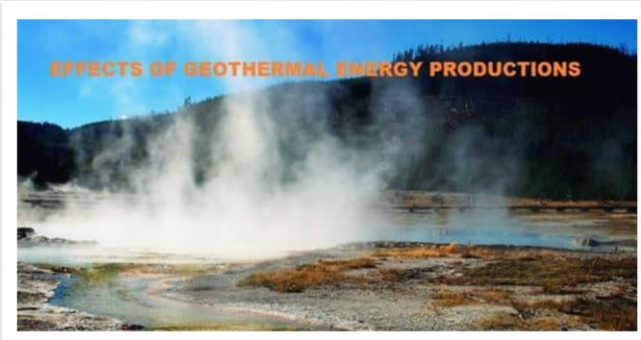
Noise standards recommended by CPCB committee

Category of area	Noise level in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	40	40

4. No untreated thermal discharges directly into the ground surfaces or ponds:

- The undissipated heat contained chemicals mixed sullages either by infrastructure constructions or industrial units discharge into the natural water bodies such as ponds, lakes, rivers, and coastal seas, ground penetration causes severe damage to aquatic life and human consumption
- Usually, Industrial units draw water for manufacturing activities, from nearby water bodies with permission from the authority
- On the completed cycle, the untreated product of water containing undissipated heat (10 -16 degree centigrade) mingled with a heavy dose of chemicals with high pH values directly discharged into the same water retaining bodies that causes a heavy impact on natural ecosystem such as the killing of living organisms, fishes, plants, animals, humans, etc
- Oxygen levels in the water get reduced due to heat presence leading to fish migrations
- The composition of flora and fauna changes because the species sensitive to increased temperature due to thermal shock will be replaced by temperature-tolerant species.
- The heat gain from air-conditioning units, vehicles on the road and other combustion processes will increase the rate of depletion of the ozone layer, increasing climate temperature.


chief causes of thermal pollution
water avalled as coolant and ejected back into water bodies
growing industrial activities
release of cold water
chemical pollutants discharged into water
waste of livestock mixed into water
water discharged from urban areas
human wate, personal care products and household
deforestion
soil erosion
natural geo-thermal activities
unawarness among people


EFFECTS OF GEOTHERMAL ENERGY PRODUCTIONS

Preventive and Control Measures for Thermal Pollution

Use less electricity– The low heat emitting fixtures and fastenings such as tube lights, pendent bulbs, wall mounted, ceiling, and table fans must be energy efficient and built based on green power consumption significant contribution to controlling thermal pollution by consuming less electricity, The use of less electricity will lead to less workload on power plants and these plants will not have to use their machines too much,

Plantation of more trees upon the banks of rivers, seas & other water bodies – This is also a good way to control thermal pollution. The trees around sources of water help in absorbing the harsh sun rays and prevent them from falling directly upon the water.

Artificial Lakes – Industries, factories, or plants that are serious about storing and reusing the heated water, used as a coolant, can work out on artificial lakes. These are artificial lakes where the heated water can be stored easily. These lakes are very helpful for normalizing the temperature of hot water. This way, the hot water will not be disposed back into the lakes, rivers, etc., and will be used for other suitable tasks. Artificial lakes or ponds use evaporation or convection techniques for cooling down the water. These artificial lakes or ponds generally contain two ends. From one end, the hot water is transferred into the lake; it is processed through evaporation or other technique and finally, when it cools down, it is taken out from the other end. The evaporated heat dissolves in the air.

Recycling used water – Smart people always find intelligent solutions for even the most difficult of problems. If people start working on the idea of recycling the used water in plants and factories, the problem of thermal pollution will be lessened to a significant extent. Every plant or industry should make it a rule that water used as coolant will not be spilled back into water bodies. Rather, it will be recycled for further tasks. In today's era, we often hear news about the shortage of water and thousands of people dying because of the same.

5. Natural Ventilation system: The heat dissipation happens along the current of the airflow direction.

- **Airflow direction**: the overall airflow direction in a building, which should be from clean zones to dirty zones; and air distribution or airflow pattern — the external air should be delivered to each part of the space efficiently and the airborne pollutants generated in each part of the space should also be removed efficiently.
- Ventilation moves outdoor air into a building or a room and distributes the air within the building or room.
- The general purpose of ventilation in buildings is to provide healthy air for breathing by both diluting the pollutants originating in the building and removing the pollutants from it (Etheridge & Sandberg, 1996; Awbi, 2003).
- Natural ventilation can generally provide a high ventilation rate more economically, due to the use of natural forces and **large openings**.
- Natural ventilation can be more energy efficient, particularly if **heating i**s not required.
- Well-designed natural ventilation could be used to access higher levels of **daylight**.

Building ventilation has three basic elements: Ventilation rate: the amount of outdoor air that is provided into the space, and the quality of the outdoor air ;

Natural ventilation: Natural forces (e.g. winds and thermal buoyancy force due to indoor and outdoor air density differences) drive outdoor air through purpose-built, building envelope openings. Purpose-built openings include windows, doors, solar chimneys, wind towers, and trickle ventilators. This natural ventilation of buildings depends on the climate, building design, and human behavior.

From a **technological point of view**, natural ventilation may be classified into simple natural ventilation systems and high-tech natural ventilation systems. The latter are computer-controlled and may be assisted by mechanical ventilation systems (i.e. hybrid or mixed-mode systems). High-tech natural ventilation may have the same limitations as mechanical ventilation systems; however, it also has the benefits of both mechanical and natural ventilation systems.

Mechanical ventilation: Mechanical fans drive mechanical ventilation. Fans can either be installed directly in windows or walls, or installed in air ducts for supplying air into, or exhausting air from, a room. The type of mechanical ventilation used depends on climate. For example, in warm and humid climates, infiltration may need to be minimized or prevented to reduce interstitial condensation (which occurs when warm, moist air from inside a building penetrates a wall, roof, or floor and meets a cold surface). In these cases, a positive-pressure mechanical ventilation system is often used. Conversely, in cold climates, exfiltration needs to be prevented to reduce interstitial condensation, and negative pressure ventilation is used. For a room with locally generated pollutants, such as a bathroom, toilet, or

kitchen, the negative pressure system is often used.

In a positive pressure system, the room is under positive pressure and the room air is leaked out through envelope leakages or other openings. In a negative pressure system, the room is under negative pressure, and the room air is compensated by "sucking" air from outside. A balanced mechanical ventilation system refers to a system where air supplies and exhausts have been tested and adjusted to meet design specifications. The room pressure may be maintained at either slightly positive or negative pressure, which is achieved by using slightly unequal supply or exhaust ventilation rates. For example, a slight negative room pressure is achieved by exhausting 10% more air than the supply in a cold climate to minimize the possibility of interstitial condensation. In an airborne precaution room for infection control, a minimum negative pressure of 2.5 Pa is often maintained relative to the corridor (CDC, 2003).

Hybrid or mixed-mode ventilation: Hybrid (mixed-mode) ventilation relies on natural driving forces to provide the desired (design) flow rate. It uses mechanical ventilation when the natural ventilation flow rate is too low (Heidelberg &Bjørn, 2002).

When natural ventilation alone is not suitable, exhaust fans (with adequate pre-testing and planning) can be installed to increase ventilation rates in rooms housing patients with airborne infection. However, this simple type of hybrid (mixed-mode) ventilation needs to be used with care. The fans should be installed where room air can be exhausted directly to the outdoor environment through either a wall or the roof. The size and number of exhaust fans depend on the targeted ventilation rate and must be measured and tested before use.

Problems associated with the use of exhaust fans include installation difficulties (especially for large fans), noise (particularly from high-power fans), increased or decreased temperature in the room, and the requirement for a non-stop electricity supply. If the environment in the room causes thermal discomfort spot cooling or heating systems and ceiling fans may be added.

Another possibility is the installation of whirlybirds (whirligigs or wind turbines) that do not require electricity and provide a roof-exhaust system increasing airflow in a building.

Discussions:

- **Real Estate aspects:**Massive constructions susceptible to discharge of large quantum of slag and brickbats, cement particles, wastewater, curing water, dust, and similar products. But construction activity even though prone to the emission of pollution-causing materials is a continuous process for expansion or developmental process. In construction sites, the use of heavy machines & equipment raises louder noises, which along with airborne particles enter the lungs of laborers employed by inhaling
  - To nullify this pollution based occupational deceases, it is a normal practice that sprinkles water or sprays water on the heaped raw materials before use in construction activity
  - These raw materials include Bricks, Granite Jelly, Sand, and other such products
  - Flying particles sticking on these materials earthed by moisturizing suspended dust
  - The Main Entrance of the Building may face the direction of the wind if adoptable and vice versa, so that the sound waves traveling in the Air might be collided and be avoided.
  - In Vasthu, that is why the main and back entrances of residential dwellings being situated in a straight path, enter and leave the noise vibrations considerably following the current of airflow or blowing
- **Contamination of water** – caused by penetration of industrial wastes below the ground and contaminates water and unfit for human consumption, the same when used for construction activities makes harmful effects on structures like crack propagation, faster deterioration, etc
- **Building Component Surface Peeling**: The deposited chemical mixed substances react with surface coatings and make peeling of coatings and leaving the surface which leads to severe corrosion. Also, The underlying cement or concrete mortar starts deteriorating and reduces property value
- **Brittleness of ingredients**: During concreting process, the water mixed with the concrete mixture quickly evaporated due to uncontrollable heat surrounding the building component's castings. This evaporation of water particles reduces the concrete to attain the optimum strength over time. In ACC sheeted roofings, due to extra heat crumbles in pieces due to exposure to thermal pollution radiation.
- **Rate of Corrosion**: The design parameters were originally adopted under normal procedure. Normally, the Reinforced Concrete Structures' service life is shown as 60 years as per BIS standards and the National Building Code. Pollution in the form of excess heat surrounding the building deteriorates and reduces the physical life. Steel reinforcement's accelerated corrosion or rusting takes more than that in the normal course. Excessive heat also creates metallurgical modifications in the material and depends according to heat variations. Rusting or corrosion of steel rods becomes Structural failures and finally leads to failure or collapse. Accelerated corrosion
-

takes place due to heat-induced variations frequently.

- **Thermo – Electrolite cell**: Thermo coupled electrolyte cell formed between adjacent reinforcement rods in the presence rain water droplets or acid rain chemical compositions blend mixture, in addition to heat present in the atmosphere, one cathode acting as anode generates the electric flow of current in addition to heat present in the atmosphere & other rods as cathode produce localized stress among the steel rods, therefore corrosion and consequences breaks the lumps and into pieces in future courses. Susceptibility is there, because of moisture present, attracts lightning energy, and conducts through longitudinal re-bars down to earth.
- **Environmental Stigma** refers to properties having been situated/ purchased in a contaminated/polluted prone environment, which leads to several complications called stigma. Stigma represents a loss in value apart from the cost of curing the contamination itself, and it can be based upon actual or perceived risks or fear, such as "possible public liability," "fear of additional health hazards" and "simple fear of the unknown." Additionally, stigma is based upon perceptions about risks and liabilities associated with owning or holding property interests in, contaminated property.

Economic Factors:

- **Selling price**: 100% of the participants of the survey stated that the selling price was important to them. Buyers want to get the most 'bang for their buck, especially in the current sluggish global economy. Additionally, buyers want to invest in a house that has the potential to appreciate over the next 5-10 years, resulting in an exit profit.
- **Location:** 95% of the participants of the survey mentioned the importance of location. Because the location is such a broad topic, surveyors were asked to explain what about the location was so important to them. The majority of responses mentioned the school district, tax rates, and crime rates in the community where the house was located at.
- **Entertainment:** 80% of participants from the survey mentioned entertainment. People want a home that entertains in the form of a basement, a pool, an exercise room, a big backyard, and a movie room.
- "**Green taxes**" (also called "environmental taxes" "pollution taxes" or "eco-taxes") are excise taxes on environmental pollutants or on goods whose use produces such pollutants. Carbon taxes are a kind of Environmental Tax on pollution that provides clear incentives to polluters to reduce emissions and seek out cleaner and sustainable alternatives.

Cost incurred due to non-disposal of waste, and unsafe disposal of municipal. The industrial and clinical waste costs incurred due to natural resource degradation, loss of recreation, tourism, fishing, and ecology have to be estimated.

- Noise & other Pollution continues to increase with the consequences affecting growing numbers of people and ultimately the global environment.
- From an economic perspective, the forces behind pollution are related to the inability of markets to properly "price" the goods and services whose production and consumption processes cause pollution, as well as the ecosystems which serve to absorb the residuals of these processes.
- Then, regulatory and economic instruments can be used in an attempt to alter prices as well as societal and industrial behavior to reduce pollution
- Cost for procurement of noise control devices and installations is the actual expenditure likely to incur
- Observation shows about 2 – 4 % of the Building or Project Cost of Infrastructure may be the approximate cost of preservation against noise pollution combined with heavy air blow

Valuation Criteria:

- Elevation is also a crucial determinant of environmental attractiveness, but its low impact on land prices can be explained by the fact that high differences in elevation are not a desirable feature in housing construction and recreational areas.
- Clean ground water can raise the value of a nearby home by up to 25 percent.
- Water front property values can decline because of the unpleasant sight and odor of algal blooms.
- Marshy sites bear a lesser value compared to similar adjacent land having good potable ground water.
- Insufficient Demand & supply or Scarcity of Environmental free Lands: low degree of urbanization affected, urban sprawl
- **Loss of Productivity**: Productivity reduces due to excessive temperature difference which induces fatigue in workmen. Only restricted hours are being used in construction activities. Particularly, rest is offered at the noon period to avoid health problems. The air-conditioned space inside a building or other infrastructures maintains a controlled temperature at extra expense than that in a similar situation without such thermal pollution. The difference in hotness keeps the humans and animals to be reluctant to work outside the building. Critical productive hours become minimized. This finally improves project cost.

- **Unpleasant heat waves lower property rates**: Both inside and outside temperatures of a building structure create an imbalance that propagates numerous cracks throughout the building making the value getting reduced. One point to note is that pollution cannot be prevented or minimized here. The aim is to sustain the atmosphere by building or infrastructure.
- **Suitable discount** to be made in the valuation appraisal to account for the cost involved in heat dissipation of liquid/gaseous waste by-products before discharging into the ground surface in Industrial Effluents which may, the actual expenditure to neutralize the hot liquid wastes to dissipate the hotness and then pH value to the admissible range maybe 2.00 – 2.50 percent of total project budget and may safely be assumed as fair provision and reasonable

According to a realtor.com study, *sellers of homes within a 2-mile radius of an airport will discount prices 13.2% from the going rate of other homes in the same ZIP code; sellers will also offer discounts for proximity to railway tracks (12.3%) and highways (11.3%).*

- "The presence of an airport could cause properties near to sell up to 20% lower than the average of homes in the next concentric circle," says Davies.
- Millennials and other property buyers are putting a significant emphasis on investing only in sustainable homes. Sustainable homes fetch a premium when you sell them. Moreover, it is easy to gain a decent appreciation when it comes to sustainable homes.
- It is especially true for homes that are in semi-urban and rural areas. This may cause comparatively lower impact or otherwise
- Even Electricity can also be produced by this localized continuous noise
- Where in the city itself demand exceeds supply in housing, green belt homes compete directly with much city housing wherever such green belt homes are well-connected to the city.
- Further, they in all cases attract a future-guaranteed premium for the protection of their views and, recreational space and for the preservation/conservation value itself.
- Most also benefit from higher rates of urban gardening and farming, particularly when done in a community setting, which has positive effects on nutrition, fitness, self-esteem, and happiness, providing a benefit for both physical and mental health, in all cases easily provided or accessed in a green belt.
- Government planners also seek to protect the green belt as its local farmers are engaged in peri-urban agriculture which augments carbon sequestration,
- reduces the urban heat island effect, and provides a habitat for organisms.
- Peri-urban agriculture may also help recycle urban greywater and other products of wastewater, helping to conserve water and reduce waste.
- Green Belt homes have by definition nearby protected landscapes.
- In a protracted housing shortage, the reduction of the Green Belt is one of the possible solutions.
- All such solutions may be resisted however by private landlords who profit from a scarcity of housing, for example by lobbying to restrain new housing across the city.
- The stated motivation and benefits of the green belt might be well-intentioned (public health, social gardens, agriculture, environment), but inadequately realised relative to other solutions.
- Stigma, in the environmental context, may be broadly defined as the negative perceptions associated with property that is contaminated, that was once contaminated or that lies in proximity to contaminated or previously contaminated property.

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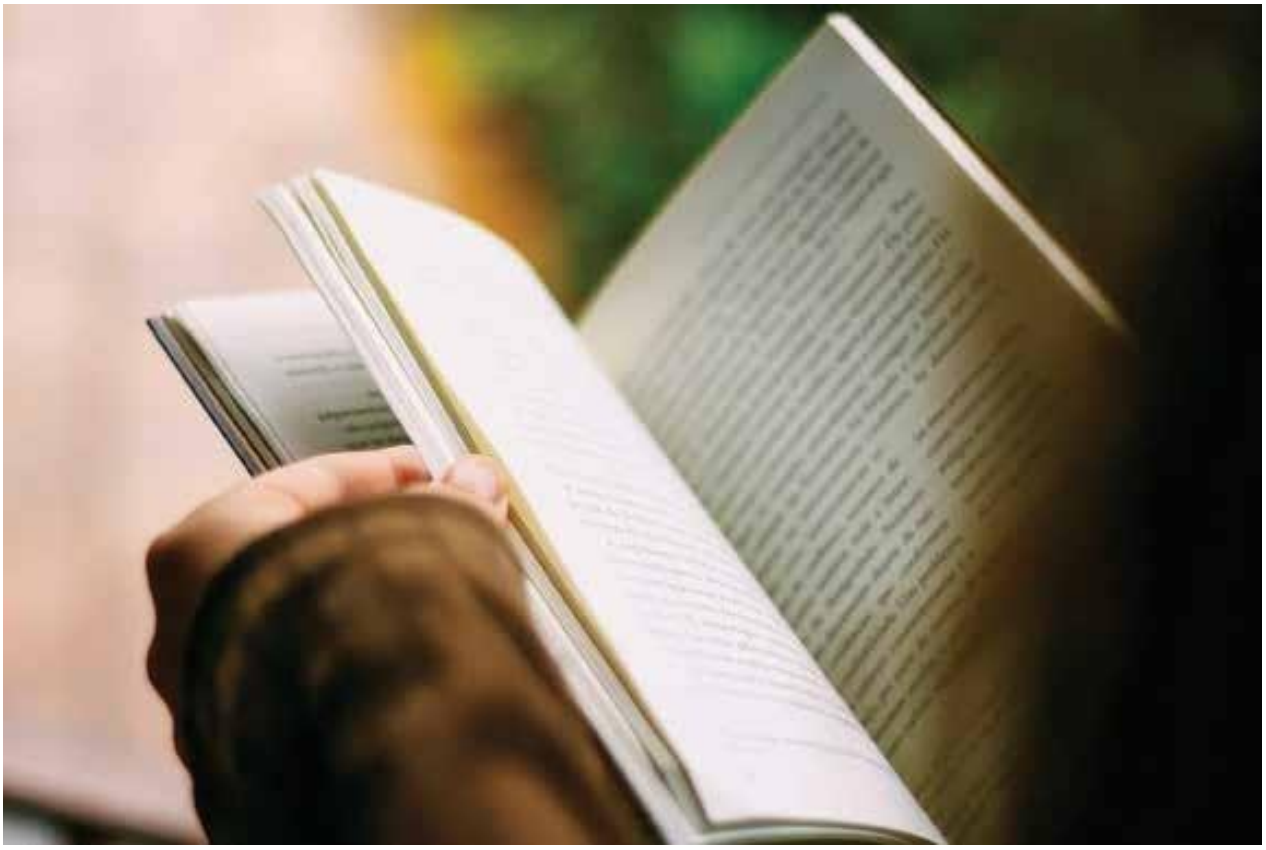


ICMAI REGISTERED VALUERS' ORGANISATION

Registered Office

The Institute of Cost Accountants
of India 4th Floor, CMA Bhawan
3, Institutional Area Lodhi Road,
New Delhi-110003


IVSC
Opportunities for Enhancing the Goodwill Impairment Framework
Article 3 of 3

Opportunities for Enhancing the Goodwill Impairment Framework

The IVSC issues Perspectives Papers from time to time, which focus on pertinent valuation topics and emerging issues. Perspectives Papers serve a number of purposes: they initiate and foster debate on valuation topics as they relate to the International Valuation Standards (IVS); they provide contextual information on a topic from the perspective of the standard setter; and they support the valuation community in their application of IVS through guidance and case studies.

Perspectives Papers are complementary to the IVS and do not replace or supersede the standards. Valuers have a responsibility to read and follow the standards when carrying out valuations

By: Kevin Prall, Business Valuation Technical Director, in consultation with the IVSC Business Valuation Board

Amortisation of Goodwill Revisited

Accounting standard setters have begun projects to consider potential changes to goodwill accounting. In the context of these projects, the IVSC received a number of questions from constituents and stakeholders asking whether the principles underlying business valuations are compatible with certain concepts being considered, principally the amortisation of goodwill. The IVSC Boards concluded that the best way to aid public discussion was to publish a three part article series to explore the fundamental issues with the goal of aiding capital markets by informing financial statement preparers, reviewers, and users. In the first article, Is Goodwill a Wasting Asset?, the IVSC examined whether goodwill is economically a wasting asset, and if so, if the life and implicit decline in value can be reasonably estimated and supported. The IVSC examined this question through (1) a functional

assessment of the nature of goodwill, and (2) an analysis of the assumptions underlying deal models and the implicit assumptions regarding goodwill. The evidence indicated that goodwill is clearly not a wasting asset. This conclusion is supported by both the functional analysis of the components of goodwill and consideration of how businesses are valued and priced for transactions.

In the second article, Information Value of the Current Impairment Test: Leading or Lagging Indicator?, the IVSC explored the information content of the goodwill impairment test and highlighted reasons for its perceived limitations as a leading indicator. For this purpose, the IVSC analysed the accounting framework to better understand why goodwill impairments in certain situations fail to be a leading indicator. In doing so, we identified four primary reasons for why goodwill impairments may lag market sentiment.

The identification of the shortcomings provides a clear roadmap to explore how the current goodwill framework could be improved to provide investors with more timely and relevant information. As the previous article demonstrated, the current goodwill impairment framework provides inconsistent results as a leading indicator. This is of course not the sole measure of the usefulness of the impairment exercise. Nonetheless, it is an important shortcoming, thus, many of our suggestions focus on solutions to enable the timelier identification of potential impairments to goodwill. However, we also more broadly explore ways in which the current framework can provide investors with more decision useful information.

We previously examined the primary reasons for the potential timing lag in the disclosure of goodwill impairments. To identify opportunities for improvements to the current model, we explore potential options to mitigate or eliminate each limitation:

1. **Impairment Shielding** – Internally generated headroom
2. **Artificial Headroom** – Amortisation of acquired intangible assets
3. **Impairment Triggers** – Overly broad and outward looking
4. **Behavioural Considerations** – A reluctance to take impairment

We believe the following suggestions represent viable options that not only significantly improve the information content of the goodwill impairment framework, but also simultaneously reduce cost and complexity as compared to the current framework. Such options also do not require significant changes to the current framework, and as such represent practicable options that deserve further examination by stakeholders.

Potential Solutions for Impairment Shielding

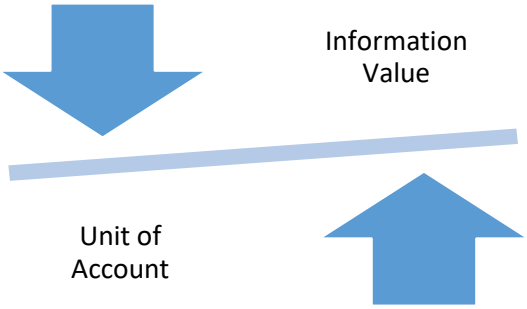
The current accounting model attempts to balance the desire of investors to understand the performance of acquisitions subsequent to the transaction, with the reality for preparers of tracking the acquired operations separately from its normal course of business. The result is the Tested Unit 1 concept, which allows for the combination of an acquired business with legacy operations.

As the impairment framework relies on the comparison of Value2 to a Tested Unit's carrying amount3 , acquired goodwill can be shielded from impairment by unrecognised headroom of the legacy business that becomes part of the Tested Unit post acquisition. Internally generated headroom primarily consists of self-generated and unrecognised intangible assets and goodwill of the legacy business of the Tested Unit. As a result of the internally generated headroom, the purchased goodwill will only be impaired once the decline in Tested Unit Value exceeds the internally created goodwill and intangibles

A comprehensive solution to eliminate the effect of internally generated headroom would be for the recognition of internally developed intangible assets and goodwill. The current accounting models do not account for internally generated intangible assets, which has ramifications well beyond goodwill impairment testing. The effect to the goodwill impairment framework is just one of multiple consequences that results from the absence of a more systematic approach

to costs and asset generation related to intangible assets. However, fundamental changes to intangible asset accounting is beyond the scope of this current discussion.

Another option to mitigate, or eliminate, the impact of internally generated headroom is to test at a lower level.



To completely eliminate the effect, it would require that each acquisition becomes its own Tested Unit and be tracked and tested on a like for like basis to the operations acquired. However, doing such would be cumbersome to administer and impractical in the longer term, as most often acquired businesses are merged with legacy operations after acquisition in an attempt to materialise aspired synergies and separate financial results are often only tracked for a certain period of time after the acquisition. Alternatively, there may exist a lower unit of account, than the current Tested Unit criteria, that provides an attractive cost benefit proposition. While reassessment of the current Tested Unit regime is also beyond the scope of the current discussion, investors have expressed confusion regarding how Tested Units are defined for impairment testing purposes. As such, later in this article we conside how additional insights could be conveyed to investors through more detailed disclosures.

Instead of expanding the scope to assess the cost benefit of the additional recognition of some or all internally generated intangible assets or considering how any changes to reduce the unit of account for the Tested Unit may benefit investors, we explore more direct solutions to account for the internally generated headroom

Step-Up Approach

The calculation of internally generated headroom at the time of acquisition, and its inclusion in the carrying value of the Tested Unit in subsequent testing periods, would more appropriately account for the internally generated intangibles and goodwill. This would enable a more direct test of acquired goodwill in subsequent periods and negate much of the problems resulting from internally generated headroom. This concept is far from being new or innovative. FRS 11 Impairment of Fixed Assets and Goodwill, was issued in July 1998 by the

UK Accounting Standards Board. Paragraph 50 from FRS 11 stated that “Where an acquired business is merged with an existing business and results in an income-generating unit that contains both purchased and (unrecognised) internally generated goodwill: (a) the value of the internally generated goodwill of the existing business at the date of merging the businesses should be estimated and added to the carrying amount of the income-generating unit for the purposes of performing impairment reviews;”

Additionally, a 2017 IASB Staff Paper outlined what was termed the “headroom approach” as a proposed methodology to negate the unit of account impact without adding significant cost to the impairment process.4 The approach captures the internally generated headroom at the time of acquisition. At subsequent dates, the internal headroom amount is netted against the Value of the CGU (or equivalently added to the carrying amount) so as to mitigate the impact of aggregation within a Tested Unit and its propensity to shield impairment from an underperforming acquired business. However, as noted below, the headroom approach suggested additional complicating procedures not contained in FRS 11.

In practice, calculating the amount of internally generated headroom of the Tested Unit legacy business at the time of acquisition could be done by (1) determining the Value of the Tested Unit legacy business and subtracting its carrying amount, or (2) determining the entire Tested Unit Value, then subtracting off the legacy operations carrying amount and the purchase price. The determination of the Value of the Tested Unit in aggregate, or the Value of the legacy business, would be an incremental requirement at the time of acquisition as compared to the current framework. However, the additional effort would be minimal considering the pre-deal efforts of the acquirer when determining the relevant price of the target company and the role of synergies, and likely more than offset by additional benefits. For instance, the various exercises already done to price the transaction would create significant synergies for determining the Value of the entire Tested Unit (e.g., reliance on discount rate assumptions, market multiples, PFI assumptions, etc.). Additionally, often the legacy business of the Tested Unit is the subject of significant analysis during the transaction as companies assess synergies, benchmark the target to current operations, and plan for future integration. Determination of the entire Tested Unit Value would also simplify synergy allocation determinations. And finally, the Value of the Tested Unit would provide the baseline for any necessary

analysis in subsequent periods (i.e. the incremental effort to value the entire Tested Unit is brought forward to the transaction date, rather than be incurred in the first testing period after the transaction). 5

Table 1 below displays the first of thes headroom is calculated as the difference between the legacy business of the Tested Unit's Value and its carrying amount as of the transaction date. This amount is then added to the carrying amount and the transaction amount for the acquired business to derive the stepped-up Tested Unit carrying amount. 6 At acquisition, this approach would result in zero headroom, equivalent to if the acquisition became a standalone Tested Unit. In this example, an impairment is taken in year 3, in the amount equivalent to the value reduction of the acquired business.7 However, without the step-up, the table below shows that no impairment would be taken under the status quo.

Table 1		With Step-Up Approach			Without Step-Up Approach		
Ref		2019	2020	2021	2019	2020	2021
[A]	Legacy Business of Tested Unit Value	100	100	100	100	100	100
[B]	Legacy Business of Tested Unit Carrying Amount	60			60		
[C]	Internally Generated Headroom *[A] less [B]*	40			0		
[D]	Value of Acquired Business	100	100	80	100	100	80
[E]	Tested Unit Value *[A] + [D]*	200	200	180	200	200	180
[F]	Stepped-up Tested Unit Carrying Amount *[B] + [C] + Purchase Price of 100*	200	200	200	160	160	160
[G]	Net Tested Unit Headroom for Impairment Test *[E] - [F]*	0	0	-20	40	40	20
	Financial Reporting Impairment	No	No	Yes	No	No	No

There are multiple advantages of the step-up approach as compared to the current framework. Most significantly is that the step-up approach more appropriately accounts for the internally generated intangibles and goodwill, thus enabling a more direct test of acquired goodwill which would lead to more timelygoodwill impairments.

Potential Solutions for Impairment Shielding and Artificial Headroom

While the Step-Up approach accounts for intangibles created before the acquisitiondate when performing the impairment test, it does not account for intangibles created after the acquisition date when performing the impairment test. As newly developed intangible assets are not recognised on the balance sheet, the amortisation of acquired intangibles creates artificial headroom as time passes. Artificial headroom is created regardless of whether an acquired company is combined with legacy business operations within the Tested Unit or set up as a stand-alone Tested Unit.

The impact of amortising intangibles is shown in Table 2 below. In the Step-Up approach, the amount of the impairment is now distorted by the amortisation of acquired intangible assets and the lack of recognition of new intangibles. In the without Step-Up approach, the amortisation creates even more cushion to shield a greater downturn.

Table 2		With Step-Up Approach			Without Step-Up Approach		
Ref		2019	2020	2021	2019	2020	2021
[A]	Legacy Business of Tested Unit Value	100	100	100	100	100	100
[B]	Legacy Business of Tested Unit Carrying Amount	60			60		
[C]	Internally Generated Headroom *[A] less [B]*	40			0		
[D]	Value of Acquired Business	100	100	80	100	100	80
[E]	Carrying Amount of the Acquired Business	100	95	90	100	95	90
[F]	Tested Unit Value *[A] + [D]*	200	200	180	200	200	180
[G]	Tested Unit Carrying Amount *[B] + [C] + [E]*	200	195	190	160	155	150
[H]	Net Tested Unit Headroom for Impairment Test *[F] - [G]*	0	5	-10	40	45	30
	Financial Reporting Impairment	No	No	Yes	No	No	No

Similar to the Step-Up approach which accounts for internally generated goodwill of the legacy business prior to the acquisition, a possible solution could include an adjustment to the carrying amount, or value, that considers the cumulative amortisation of the acquired assets subsequent to the acquisition as well as impacts to related accounts such as deferred taxes.

We note that combining an add-back of the amortised intangible assets, with an approach that accounts for internally generated headroom from legacy operations, effectively results in a calculation of Value at the time of acquisition. While a combination of both adjustments does remedy the impacts of internal headroom and the amortisation without replenishment of intangibles, it would be more intuitive and less costly to apply a direct Value comparison approach.

Direct Value Comparison

A direct comparison of the Value of the Tested Unit at acquisition to the Value of the Tested Unit as of subsequent test dates provides an intuitive and direct test of the value creation ability of the business, while also eliminating the need for many elements of the current framework that increase confusion and cost.

Table 3 below shows the simple derivation of the total Tested Unit Value at acquisition, and the direct comparison of the Tested Unit Value at subsequent testing periods to this initial amount.9

As with the step-up approach, a direct Value comparison more appropriately accounts for the internally generated intangibles and goodwill and enables a more direct test of acquired goodwill, leading to timely goodwill impairments.

Unlike the headroom approach, a direct Value comparison approach would circumvent the impact of amortisation of acquired intangible assets. The Value of the Tested Unit at each test date would be compared to the static Value of the Tested Unit at acquisition, rather than to an adjusted carrying amount distorted by the amortisation of intangible assets without the offsetting recognition of new intangibles.10

While a direct Value comparison approach recognises an impairment upon diminution in value of the Tested Unit, it does not require any (value) growth in the acquired business. Some investors note that Management (of the acquirer) should be assessed on its ability to grow the value of the business consistent with the premise for the acquisition, not simply be tested on its ability to not lose value.11 While we appreciate the sentiment, we do not believe such a threshold is consistent with the impairment principle as it is currently referenced throughout accounting standards. Value creation would allow Management to create extra headroom going forward

Ancillary Benefits of a Direct Value Comparison Approach:

While providing a better comparison of goodwill, which would facilitate timely impairments, the **direct Value comparison approach would also provide an opportunity to reduce overall cost and complexity**. A direct Value comparison approach would eliminate the need to derive carrying amounts for the Tested Units at each testing date. Depending on a company's complexity, procedures, and systems, the derivation of carrying amounts typically requires significant internal company effort as well as many judgements. For example, judgements must often be made about how to appropriately allocate certain assets between multiple Tested Units, such as a manufacturing facility that is utilised in the production of product lines from different Tested Units. The same complexities arise in the allocation of liabilities. As just one example, the allocation of debt to Tested Units often requires numerous assumptions. Finally, judgement is also required not only to determine which Tested Unit assets and liabilities should be allocated to, but if certain assets and liabilities should be allocated to Tested Units at all or if they should be maintained at a de facto corporate unit. For this item in particular, the existing guidance is lacking and often results in wide divergence in practice. While the complex derivation and subjective judgments result in significant efforts by management, they in turn also can necessitate significant audit procedures. As with management, any opportunity to shift audit time and resources to more value-added areas, should be welcomed.

Additionally, under current US GAAP, a Step-0 qualitative analysis typically still requires the derivation of carrying values for the reporting units. Under a direct Value comparison approach, this arduous process would be avoided all together.

Similarly, as both the IASB and FASB consider trigger-based tests, a direct Value comparison approach may reduce the effort associated with compliance in such instances.

Further, as noted in our second article, under the current framework there is not a direct correlation to the amount of impairment and overall diminution in value of the Tested Unit. The current framework can even indicate an increasing rate of decline for the Tested Unit, when actual performance has improved as compared to a prior year in which impairment was taken. By comparing Value over time, any goodwill impairment would be equal to the reduction in Value of the Tested Unit.

Finally, a direct Value comparison approach would help simplify other complex aspects of the goodwill framework. For instance, this approach would help in the initial allocation of goodwill when there are multiple Tested Units, as the Value determination of each of the Tested Units will help understand and reconcile where synergies are expected to be realised. Similarly, the approach would also facilitate exercises required for the restructuring of Tested Units and any

dispositions from Tested Units.

Potential Solutions for Impairment Triggers

A review of the example triggers cited in accounting standards, and those noted by companies upon an impairment disclosure, shows them to be overly broad and strongly focused on external market and industry conditions. Additional examination finds the same to be true for acquisition disclosures of the recognition and valuation of goodwill and intangible assets. The CFA Institute has noted that such disclosures, and subsequent disclosures for impairment tests, are "generally sparse, qualitative and boilerplate". 12 CFA Institute goes on to say that financial statement users have consistently and clearly articulated that "Investors want more, not less, information regarding intangibles and long-term value creating activities of the business"13 and "Improved disclosures on value creation."14

Such comments indicate that initial recognition and valuation of goodwill and intangible assets disclosures should be enhanced, and Impairment triggers should be more directly tied to those same KPIs, criteria, and disclosures made at the acquisition regarding the expected performance of the acquisition. The below discussion:

- Explores the information and data produced in normal course of the acquisition process;
- Assesses the relevance of such information and data to investors;and
- Considers how the disclosure of such information may aid in the subsequent goodwill impairment process.

Acquisition Disclosures

The current acquisition accounting requirements generate an abundance of decision useful information, yet public disclosures related to transactions are but a small fraction of that relied on by the preparers and reviewers of the financial statements. Below represents some of such information:

- Financial Metrics – Financial metrics are pervasive within the M&A process.The below highlights some of such metrics at various levels of detail: (1) Deal Metrics (transaction level), (2) PFI (forecast outputs), (3) KPIs (forecastinputs):
    - Deal Metrics – Deal models are used to help price transactions as well as throughout the business combination process. The price paid and the assumed cash flows, result in an expected internal rate of return (IRR). The IRR can be compared to the company's cost of capital to determine if the transaction is expected to be accretive to overall value. Inaddition to the IRR, deal metrics are often assessed through implied multiples of a subject metric(s), such as EBITDA. Similar to the IRR, the implied multiples from the transaction can be compared to that of the acquirer, and in this case also to multiples of public companies that operate in the same industry. The systematic disclosure of such deal economics would provide invaluable information to investors to assess the relative valuation creation prospects ofthe transaction.
    - Projected Financial Information (PFI) – Deal models rely on keyassumptions on revenue growth, expected margin expansion, capital expenditures, synergies and long-term growth and margin assumptions. Preparers and reviewers spend significant time developing and reviewing the PFI, which is ultimately used to derive fair value measurements for tangible and intangible assets. However, few if any of the PFI assumptions are communicated to investors.While full disclosure of the PFI would reveal proprietary competitive information, the consistent disclosure of certainkey assumptions of the PFI would also provide invaluable information to investors to assess the relative valuation creation prospects of the transaction.
    - Key Performance Indicators (KPIs) – With all acquisitions, management relies on certain metrics that they use internally to justify the purchase and later to assess whether a transaction is successful. Such KPIs will include certain deal economics or PFI considerations as referenced above but may also include more target or industry specific metrics such as customer retention rates. More disclosure of these KPIs that were used to assess the deal would provide investors with key insights with which to independently prepare financial

models to assess intrinsic value. Additionally, as discussed below, they also provide an objective framework for the assessment of future performance, impairment triggers, and possible impairment charges.

- Tested Unit Structure – The current Tested Unit structure is not always that informative to investors. There is no information provided on whether the acquisition will be combined with an existing Tested Unit or will be standalone. If combined with legacy operations, there are no disclosures on what other assets and operations are included in the Tested Unit, the relative size or value of the existing Tested Unit, the amount of internal headroom contained in the tested Unit, and whether the Tested Unit contains other prior acquisitions. All such information is reviewed by the preparers and reviewers as part of acquisition accounting requirements. Required disclosures of key Tested Unit insights would provide decision useful information to assess various aspects of the transaction, such as claims on the level of expected synergies that will be generated through combination with legacy operations.
- Goodwill Disclosures – While the amount of goodwill is disclosed and recorded on the balance sheet, little additional information is conveyed to investors. For example, the first article in this series discussed the various components of goodwill, including: reputation, future intangible value, workforce, synergies, and assemblage value. These categories of goodwill may provide a framework for the disclosure of meaningful information to investors on how a company plans to create and maintain its value creation advantages beyond the life of the identified tangible and intangible assets. For example, although not separately recognised, the value of the acquired assembled workforce is valued as part of the acquisition accounting fair value process. While the other components of goodwill are not computed, synergies and assemblage value could be reasonably estimated at a high level for directional disclosure. Finally, the remaining portions of goodwill could appropriately be addressed through management disclosures and analysis as value emanating from the maintenance of corporate reputation, or value to be realised by future technology that will be dependent on successful completion of future research activities.

Goodwill Test Triggers

At subsequent goodwill test dates, those KPIs identified and disclosed by management at acquisition, should form the basis for effective trigger-based test criteria. For example, in the periods immediately following the acquisition, actual performance should be compared to the PFI at the time of the acquisition to see if expectations have been met. Additionally, deal metrics such as relevant discount rates and implied multiples should also be calibrated from the acquisition. For the IRR, market inputs to discount rate derivation can easily be compared to those at the acquisition to determine if there have been significant changes in the required rate of return since the acquisition. Whereas, implied multiples of comparable public companies can be compared to those at acquisition to determine if there has been a deterioration in the prospects of the broader industry. Finally, objective KPIs as identified at acquisition can also be measured and compared to the assumptions made at the time of the acquisition.

Impairment Disclosures

While the above acquisition disclosures and related impairment triggers provide a more transparent and objective framework with which to assess for impairment triggers, attention should also be given to the disclosures made when an impairment charge is taken.

As referenced in the second article of this series, the study "*Trigger Warnings: When is Goodwill Impairment Disclosure Informative?*" examines the information content of financial statement disclosures related to goodwill impairment testing. The paper contends that impairment reasons can be grouped into three categories: firm, industry, or economy related. The study finds significant price and volume market reactions to a firm's decision to impair goodwill, but only if a firm discloses firm-specific triggering events. The author concludes that these results indicate that financial statement users require more detailed firm-specific disclosures related to goodwill impairment testing. In addition to categorising the cause of the impairment, it would be helpful to disclose the KPI(s) that triggered the test and specifics on how the KPI(s) missed expectations.

Potential Solutions for Behavioural Considerations

The current goodwill framework seems too opaque, creates confusion for companies and investors alike, and ultimately may incentivise behaviours that lead to delayed impairments. This section examines how ideas set forth in this article may help to change certain behavioural circumstances that can lead to delayed impairments.

Direct Value Comparison Approach

The current framework's utilisation of carrying amount is somewhat of a black box for investors.15 As shown throughout the article series, the carrying amount of a Tested Unit may have little relation to the Value of the Tested Unit. While the derivation of such carrying amounts is completely hidden from investor view, providing details on its derivation would do little to enhance relevance or clarity. Alternatively, investors would fully appreciate a like for like comparison of the Tested Unit at the measurement date back to the Value of the Tested Unit at the acquisition date, as it would create a mutually agreed definition of what constitutes impairment. A clear understanding what impairment means, will foster a more transparent and objective process for preparers and reviewers.

Additionally, as discussed in the second article of this series, the current mechanics of the goodwill framework creates artificial headroom through the amortisation of intangible assets. This may have an impact on management's reluctance to take goodwill impairments. For example, rather than recognise an impairment, management may desire to delay the impairment charge in hope that the additional cushion created by intangible amortisation in the following year will take pressure off the calculation. The introduction of goodwill amortisation would further exacerbate the reluctance to take goodwill impairment charges, if and when needed. Alternatively, a direct Value comparison test would not encourage management to delayimpairments in hope of generating sufficient artificial headroom in subsequent periods. Finally, standard setters and regulators have noted how the current framework encourages management to allocate goodwill to Tested Units with the most internally generated headroom, both at the time of acquisition and at subsequent internal restructurings. A direct Value comparison test eliminates the effect of internally generated headroom, and thus eliminates any motivation to allocate acquisition goodwill to particular Tested Units. Additionally, as such procedures would also be necessary upon a reorganisation of the Tested Unit structure that involves any Tested Units that contain goodwill, there would be no opportunity to restructure Tested Units at subsequent dates to move goodwill to Tested Units with relatively more headroom.

Enhanced Disclosures and Objective Triggers

Enhanced KPIs and disclosures at acquisition would help set the guidelines for future impairment testing. The criteria for acquisition success, and alternatively impairment, should be defined and articulated to investors at the time of acquisition to the greatest extent possible.By defining the criteria for success and failure at the time of the acquisition, it willfoster an impairment process that is more objective and transparent. As a result, impairment testing would require less judgment, and thus reduce the potential moral hazard.

CONCLUSIONS

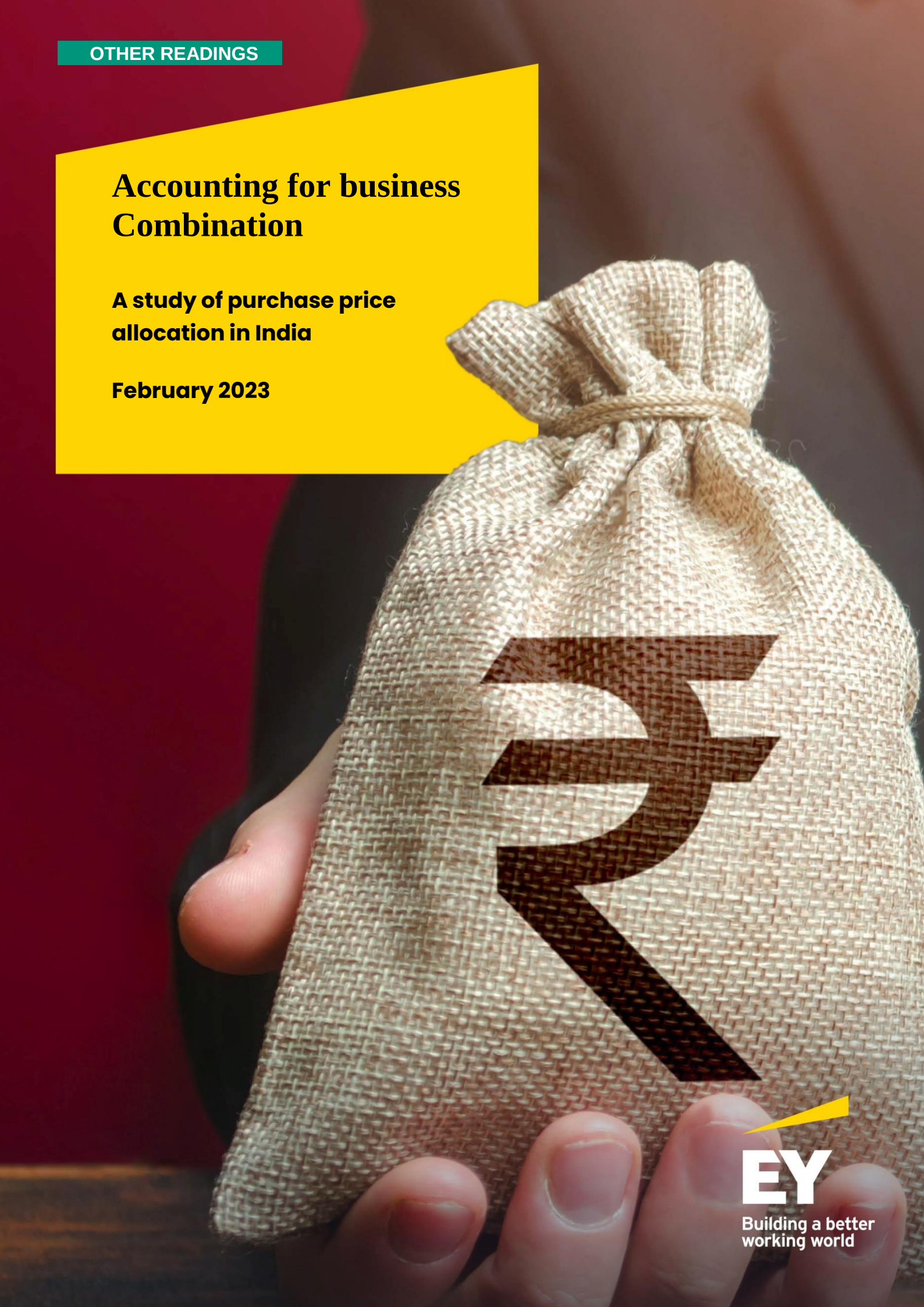
We believe the above suggestions represent viable options that not only significantly improve the information content of the goodwill impairment framework, but also simultaneously reduce cost and complexity as compared to the current framework. In particular, the direct Value comparison approachfixes a key criticism of the current goodwillframework of being a lagging indicator, while simultaneously providing an opportunity for simplification and cost reduction. Additionally, while the above does not make recommendations on exactly what information should be disclosed at acquisition, more decision useful information for investors is readily available. Whatever is disclosed, it should form the basis for the future impairment triggers and assessments. Finally, we believe that such changes will have a significant positive affect on the inherent behavioural elements that exist within thisand other impairment processes.

OTHER READINGS

Accounting for business Combination

A study of purchase price allocation in India

February 2023



Building a better working world

Foreword

We are proud to present the fourth edition of our Purchase Price Allocation (PPA) study.

Post COVID-19, the number of Mergers & Acquisitions increased during the year ended 31 March 2022, particularly in the backdrop of declined M&A activity during the previous year which was impacted due to the pandemic.

Ind AS 103 Business Combinations ("Ind AS 103") transforms the way companies plan and execute their acquisition strategies. The standard applies to most of the business combinations, including amalgamations and acquisitions. The change in accounting for business combinations calls for assets/liabilities (including intangible assets and contingent liabilities which did not exist on the balance sheet of target entities/ businesses) acquired in a deal to be measured at fair value applying appropriate valuation methods and residual value allocated to goodwill/capital reserve.

Understanding the implications of Ind AS 103 is important since they not only affect the future earnings and balance sheet of a company but may also have tax implications, questions from shareholders, etc. Further, in the era of intense auditor and regulatory scrutiny, this matter warrants careful attention. Depending on the transaction structure, PPA will also have relevance from an income-tax perspective, as tax treatment for different intangibles and goodwill could be different.

Ernst & Young Merchant Banking Services LLP's Valuation, Modelling & Economics Services department has undertaken a study of business combination accounting for transactions that were disclosed in annual reports of the top 500+ listed companies in India (covering over 500+ transactions) by market capitalization since implementation of Ind AS till 31 March 2022. The study presents the results of assets (primarily intangible assets) that are typically recognized and reported by a company during an acquisition. However, the results of this study cannot be viewed in isolation

Why benchmarking? Ind AS has consistently emphasized the importance of precise business combination accounting. While valuation guidelines may be prescribed in detail, assumptions and workings are still highly subjective in nature. An independent reasonable test is very important. A thorough PPA study will help in keeping a check with other transactions in a similar space. The study will help the management, auditors, tax officers and other advisors to assess the reasonableness of an individual PPA and predict the M&A impact on amortization expense.

Should you have any questions, our Valuation, Modelling & Economics Services' professionals are available to provide further insights on this study or on any other valuation topic

Parag Mehta

Partner, Strategy and Transactions (SaT)
Valuation, Modelling & Economics

Ernst & Young Merchant Banking Services LLP

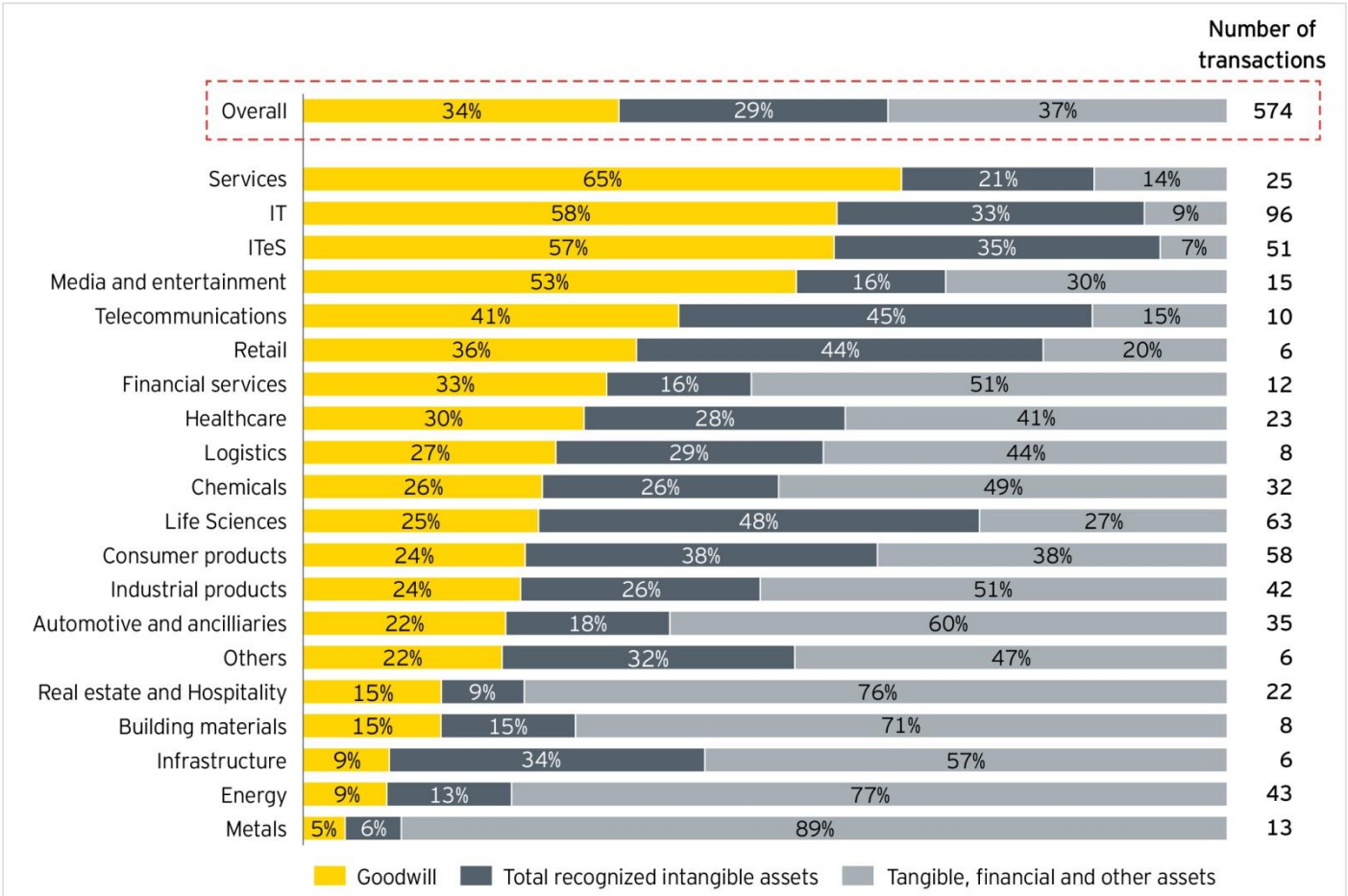
Fair value accounting of business combination and its manifold implications

Goodwill: an important element

Key findings

Based on the study, 29% of the enterprise value of acquired companies was allocated to identified intangible assets and 34% was attributable to goodwill, with the allocation varying considerably from industry to industry.

The allocation to goodwill in India is largely in line with the proportion allocated in global deals (e.g., in the US).



**Tangible, financial, and other assets for financial services are higher due to higher composition of financial assets (i.e., loans and advances)*

***Note 1:** The above numbers are average and should not be considered as a benchmark for the sector, as allocation of assets and goodwill may vary significantly based on transaction-specific facts.*

***Note 2:** Sectors with less than five transactions are categorized under "Others".*

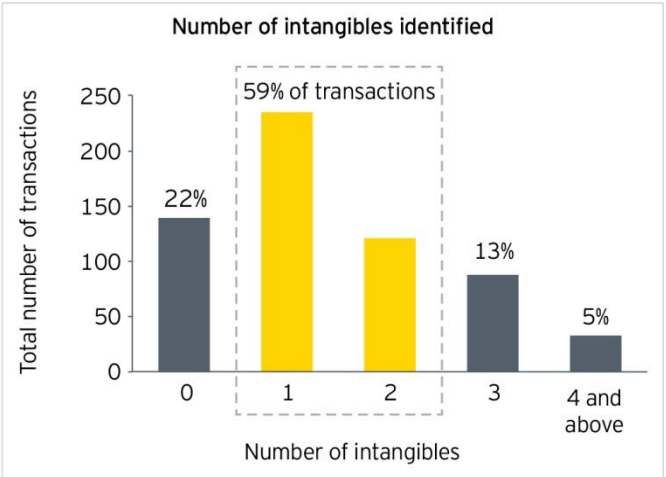
***Note 3:** Average goodwill is after considering adjustment for capital reserves.*

In sectors like telecommunications, life sciences, retail and consumer products, a relatively higher proportion of deal value is allocated to intangible assets. This is reflected by the underlying products, brands, intellectual property, license and rights and customer relationships.

Capital-intensive sectors, such as real estate and hospitality, energy, metals and building materials, allocate more than two-third of their enterprise value to tangible assets.

In 22% of the transactions analyzed, no intangible asset was recognized. These transactions majorly pertained to asset heavy sectors, such as real estate and hospitality, energy, industrial products, automotive and ancillaries, etc.

Transactions where more than two intangible assets were identified pertained majorly to sectors like IT, ITeS, consumer products, chemicals and life sciences.



Frequency of intangible assets recognized by sector

Sector	Number of transactions	Brand/ Trademark/ IPR	Software/ Technology/ platform/design/ know-how	Customer contract/ relationship	Dealer network	Non-compete agreement	License and rights	Other intangibles
Automotive and ancillaries	35	26%	34%	20%	3%	3%		26%
Building materials	8	38%	50%	13%		13%	25%	38%
Chemicals	32	38%	28%	22%	6%	19%	3%	34%
Consumer products	58	48%	22%	19%	10%	12%	5%	19%
Energy	43	5%	14%	19%			9%	19%
Financial services	12	25%	42%	33%	8%		17%	17%
Healthcare	23	30%	13%	26%		17%	4%	35%
Industrial products	42	17%	24%	26%		19%	10%	21%
Infrastructure	6		33%				50%	50%
IT	96	32%	32%	74%	2%	24%	3%	21%
ITeS	51	41%	33%	76%	2%	18%	2%	29%
Life sciences	63	73%	22%	13%		3%	10%	16%
Logistics	8	25%	38%	38%	13%	25%	25%	50%
Media and entertainment	15	20%	27%	20%		7%	13%	33%
Metals	13		8%	8%				46%
Retail	6	50%	33%		17%		17%	
Real estate and hospitality	22	5%	5%	5%			5%	18%
Services	25	24%	20%	40%		16%		56%
Tele-communications	10	30%	30%	20%			30%	30%
Total	**568**	**33%**	**26%**	**34%**	**3%**	**12%**	**7%**	**26%**

0% <15% Between 15% to 30% Between 30% to 45% Above 45%

Note: Sectors classified as "Others" are not considered in the analysis.

** Other intangibles in services, infrastructure, logistics and metals sector appear higher as the break-up of intangibles was not adequately disclosed.*

Marketing-related intangibles were the key acquisition driver in the consumer products, life sciences and retail sector.

Customer-related intangibles seem to be the acquisition driver in IT/ITeS sector.

Allocation within intangible assets

The average allocation of an intangible asset's value within different types of intangible assets (excluding goodwill), recognized among sectors, is tabulated below:

Sector wise	Brand/ Trademark/ Product/ANDA	Technology/ platform/design/ know-how	Customer contract/ relationship	Dealer network	Non-compete agreement	License and rights	Other intangibles
Automotive and ancillaries	22%	30%	23%		1%		25%
Building materials	13%	2%	7%		5%	35%	38%
Chemicals	34%	12%	13%	5%	4%	1%	31%
Consumer products	50%	8%	12%	3%	2%	7%	18%
Energy	2%	11%	33%			19%	35%
Financial services	2%	38%	37%	5%		13%	5%
Healthcare	35%	7%	17%		1%	2%	38%
Industrial products	15%	16%	28%		11%	10%	19%
Infrastructure		20%				60%	20%
IT	8%	14%	60%		3%	3%	12%
ITeS	10%	11%	58%	1%	2%	2%	15%
Life sciences	65%	12%	7%			4%	11%
Logistics	10%	2%	26%	9%	13%	18%	23%
Media and entertainment	10%	18%	23%		4%	7%	38%
Metals		2%	14%				84%
Retail	50%	18%		17%		16%	
Real estate and hospitality	8%	14%	7%			14%	57%
Services	20%	5%	31%		3%		41%
Tele-communications	14%	21%	23%			37%	5%
Total	**19%**	**12%**	**22%**	**4%**	**4%**	**14%**	**25%**

0% <15% Between 15% to 30% Between 30% to 45% Above 45%

Note: Sectors classified as "Others" are not considered in the analysis.

Dealer network is an important intangible in Retail and Logistics sector.

Generally, a non-compete agreement is a part of most acquisitions as a safeguard to the buyer. However, allocation of value to non-compete agreement is on the lower side - possibly indicating either a shorter life or probability/impact of competition is/are perceived to be minimal.

Methodology

This study is based only on annual reports of the top 500+ listed companies in India by market capitalization for FY17 to FY22. Transactions with enterprise value less than INR100 million were ignored. A total of 574 transactions were found where adequate information about PPA was disclosed. Appropriate assumptions were considered with regard to classification of intangibles where full information was not disclosed.

For certain transactions, only the total value was disclosed for all intangible assets recognized. For such transactions, the value of intangible assets was classified under other intangible assets.

Results are presented as percentages of enterprise value. If cash and cash equivalent are not disclosed, gross debt is assumed as net debt.

Our offices

Ahmedabad
22nd Floor, B Wing, Privilon,
Ambli BRT Road, Behind Iskcon
Temple, Off SG Highway,
Ahmedabad - 380 015
Tel: + 91 79 6608 3800

Bengaluru
12th & 13th floor
"UB City", Canberra Block
No.24 Vittal Mallya Road
Bengaluru - 560 001
Tel: + 91 80 6727 5000

Ground Floor, 'A' wing
Divyasree Chambers
11, O'Shaughnessy Road
Langford Gardens
Bengaluru - 560 025
Tel: + 91 80 6727 5000

Chandigarh
Elante offices, Unit
No. B-613 & 614
6th Floor, Plot No - 178-178A,
Industrial & Business
Park, Phase-I,
Chandigarh - 160002
Tel +91 172 6717800

Chennai
Tidel Park, 6th & 7th Floor
A Block, No.4, Rajiv Gandhi Salai
Taramani, Chennai - 600 113
Tel: + 91 44 6654 8100

Delhi NCR
Golf View Corporate Tower B
Sector 42, Sector Road
Gurgaon - 122 002
Tel: + 91 124 443 4000

3rd & 6th Floor, Worldmark-1
IGI Airport Hospitality District
Aerocity, New Delhi - 110 037
Tel: + 91 11 4731 8000

4th & 5th Floor, Plot No 2B
Tower 2, Sector 126
Noida - 201 304
Gautam Budh Nagar, U.P.
Tel: + 91 120 671 7000

Hyderabad
THE SKYVIEW 10
18th Floor, "Zone A"
Survey No 83/1, Raidurgam
Hyderabad - 500032
Tel: + 91 40 6736 2000

Jamshedpur
1st Floor, Shantiniketan Building
Holding No. 1, SB Shop Area
Bistupur, Jamshedpur - 831 001
Tel: + 91 657 663 1000

Kochi
9th Floor, ABAD Nucleus
NH-49, Maradu PO
Kochi - 682 304
Tel: + 91 484 433 4000

Kolkata
22 Camac Street
3rd Floor, Block 'C'
Kolkata - 700 016
Tel: + 91 33 6615 3400

Mumbai
14th Floor, The Ruby
29 Senapati Bapat Marg
Dadar (W), Mumbai - 400 028
Tel: + 91 22 6192 0000

5th Floor, Block B-2
Nirlon Knowledge Park
Off. Western Express Highway
Goregaon (E)
Mumbai - 400 063
Tel: + 91 22 6192 0000

Pune
C-401, 4th floor
Panchshil Tech Park
Yerwada
(Near Don Bosco School)
Pune - 411 006
Tel: + 91 20 4912 6000

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IVSC

DECIPHERING TECHNOLOGY

TIME TO GET TANGIBLE ABOUT INTANGIBLE ASSETS – PART 4

DECIPHERING TECHNOLOGY

TIME TO GET TANGIBLE ABOUT INTANGIBLE ASSETS – PART 4

By Nicolas Konialidis CFA, IVSC Asia Director

The IVSC issues Perspectives Papers from time to time, which focus on pertinent valuation topics and emerging issues. Perspectives Papers serve a number of purposes: they initiate and foster debate on valuation topics as they relate to the International Valuation Standards (IVS); they provide contextual information on a topic from the perspective of the standard setter; and they support the valuation community in their application of IVS through guidance and case studies.

Perspectives Papers are complementary to the IVS and do not replace or supersede the standards. Valuers have a responsibility to read and follow the standards when carrying out valuations.

Background

The introduction of new technology often marks the beginning of a new era: railroads, electrification, and combustion engines produced momentous changes even before the advent of the "digital revolution". The current wave of innovation is one of the factors behind the rise of intangible assets, which now account for a larger proportion of corporate assets than tangible ones.

This transformation towards more intangible assets has had profound effects on the valuation of assets and businesses. It is the object of the current series of Perspective Papers the IVSC has published. In Parts 1 and 2 of our series, we examined the "Case for Realigning Reporting Standards with Modern Value Creation" and focused on human capital. In Part 3, we examined brands and reputation. In this paper, the fourth of our series, we address the topic of technology valuation.

In this paper we will:

- Define technology as it pertains to valuation;
- Examine the lifecycle of technology and the difficulty of realising certain benefits as commercial profits;
- List the salient features of technology that are critical in a valuation;
- Use Apple's launch of the iPhone to contrast firm value and value of technology;
- Gauge investor reactions to these developments in the valuation of technology;
- Outline the ways in which IVS can be deployed to better manage technology valuation risk.

Defining technology

In the context of this paper, we define technology as "the application of knowledge for achieving practical goals in a reproducible way." The word also encompasses the "products resulting from such efforts, including both tangible tools such as utensils or machines, and intangible ones such as software." The result of a technological advance is to push out the frontier of the possible.

Technology encompasses several intangible assets that evolve over time. These range from fundamental R&D in the initial stages to mature production processes. The deployment of a technology requires investment to finalise an initial production run (e.g., automobiles), to build infrastructure (e.g., mobile telephony) and to commercialise a finished product

The lifecycle of technology

Innovation is often less the result of grand plans than of gradual tinkering, and its final application can vary greatly from its original conceptualisation. For instance, algorithms used to interpret sonar data in oil exploration became the basis for the Autotunes software. More recently, Virtual Reality (VR) hardware and software have been adapted for use in operating theatres and military applications.

New technology eventually diffuses into the economy as products become available for purchase, improving the features of other products. Today, no one gives the electronics in an entry-level car or the GPS in their phone much thought.

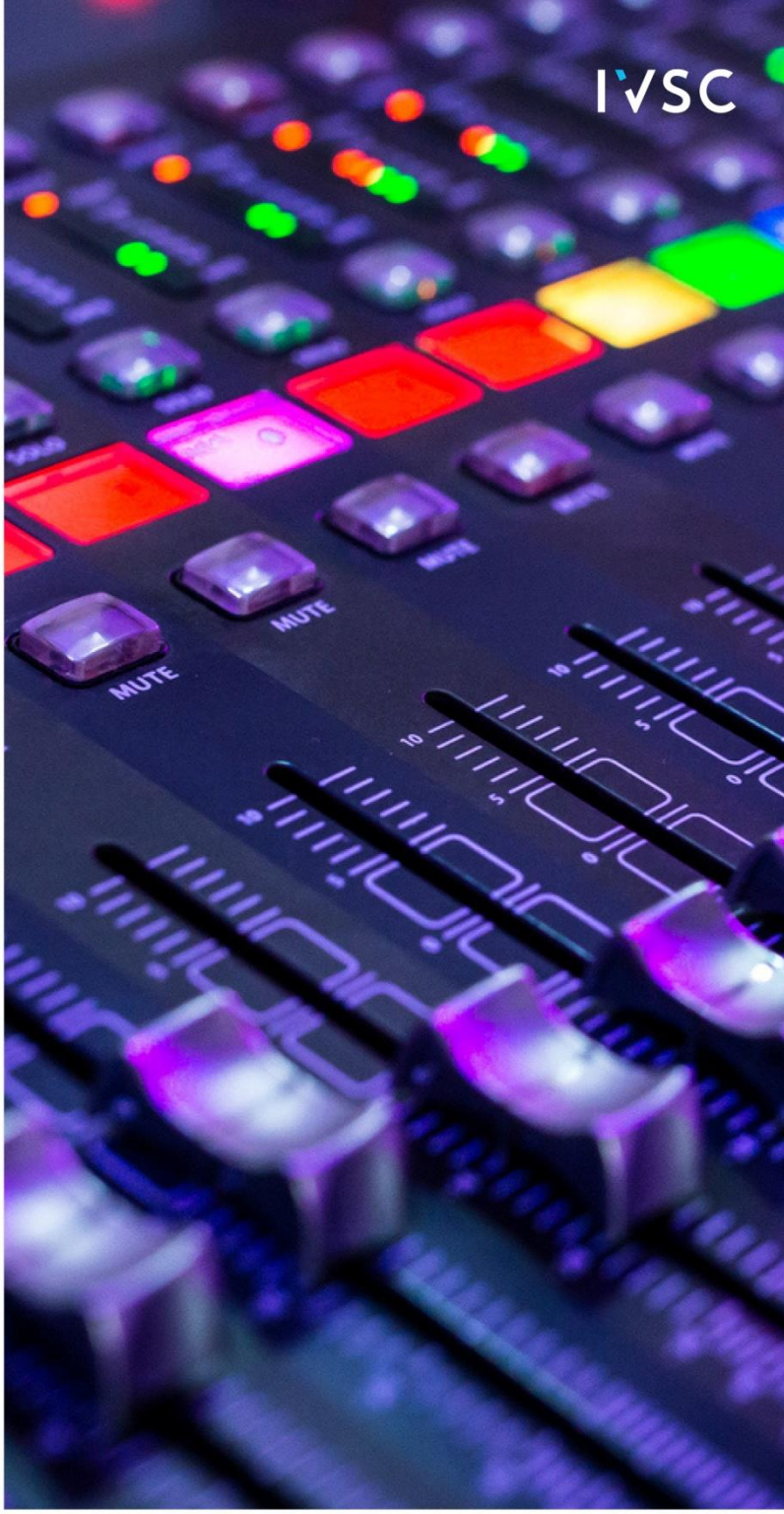
Perspectives Paper: Deciphering Technology

Technology also becomes cheaper with time: older semi-conductors remain useful but the product becomes structurally cheaper as newer generations are launched. In fact, a technology will eventually become commoditised, or even free, as it is replaced by something new.

Not all value can be realised commercially

Nobel prize-winner William Nordhaus has estimated that innovators, and their investors, only capture a sliver of the value their innovation creates for society. In fact, one interpretation of this analysis is that investors overestimate how much of the value they can "appropriate" for themselves

Nonetheless, given the absolute amount of the potential rewards, it is rational for entrepreneurs and their backers to try to capitalise on an innovation, even if they know that most of the benefits accrue to others. This phenomenon was captured by Scott McNealy's (the CEO of Sun Microsystems) "what were you thinking?" diatribe as he reflected, after the fact, on his company's stock valuation during the bubble.



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8. Nesvisky, M. (2004, October 10). Who gains from innovation? NBER Digest https://www.nber.org/digest/oct04/who-gainsinnovation

9. "At 10 times revenues, to give you a 10-year payback, I have to pay you 100% of revenues for 10 straight years in dividends. That assumes I can get that by my shareholders. That assumes I have zero cost of goods sold, which is very hard for a computer company. That assumes zero expenses, which is really hard with 39,000 employees. That assumes I pay no taxes, which is very hard. And that assumes you pay no taxes on your dividends, which is kind of illegal. And that assumes with zero R&D for the next 10 years, I can maintain the current revenue run rate. Now, having done that, would any of you like to buy my stock at $64? Do you realize how ridiculous those basic assumptions are? You don't need any transparency. You don't need any footnotes. What were you thinking?" https://www.bloomberg.com/news/articles/2002-03-31/a-talk-with-scott-mcnealy

Narrowing down to valuation

The large-scale economic and social transformations brought about by technology percolate down to the process of valuation that professionals conduct, whether in the context of a business valuation (eg, for M&A) or a narrower asset valuation (eg, Purchase Price Allocation).

Investment in technology has two salient characteristics:

- First, the investment itself influences the path of the technology's development and, to some extent, its success. Without enough investment, the technology might not reach the "tipping point" where it sustains a viable business.
- Second, an investment into technology generates highly dispersed returns. These range from a high probability of failure to extraordinary returns reflecting the "winner takes all (or most)" characteristics of successful innovations. Quantitatively, this is partly captured through the high degree of dispersion that technology investing entails, whereby the spread between the top and bottom quartile of stocks in the technology-heavy sectors is much larger than the same spread in other sectors.

Both these traits are captured, as part of the valuation of a technology asset, in various adjustments to forecasts and discount rates. Uncertainty is especially high for technology in its initial phases, where changes in inputs can result in large shifts in expected value.

A technology that has achieved commercial success has already avoided failure at launch. However, its valuation is still contingent on several key variables, including:

- What remaining useful life (RUL) or rate of attrition does the technology have?
- What outlays, whether as ongoing capital expenditures or expenses, are required?
- What premium or differential pricing or cost savings will the technology allow? And how long might these persist?
- How does the technology integrate with and separate from other assets?

Overall, improved disclosure about unit economics and enhanced financial reporting, both matters that are important to investors, can help make technology valuations more reliable. This remains true even when the resulting values remain volatile.

The technological continuum

The valuation of a specific technology is framed by two broad factors.

First, the delineation between and among the technology to be valued, its predecessors, and future iterations. A specific technology should be viewed as a discrete point on a continuum. New technology is seldom one dramatic discovery. Rather, it is built on earlier advances and is often a gateway to further changes, most of which cannot be foreseen. Therefore, one of the challenges of valuing a given technology is to separate it from the earlier technology it was built upon. An analysis of intellectual property may be required, allowing valuers to mark the contours of the technology.

Another, related, challenge is more subtle: a specific technology necessarily contains the seeds of its own evolution. Certain new applications and derivations might be foreseen. However, there are many examples where a new technology creates value by creating optionality and germinating future products that are yet to be invented, like the sonar algorithms that developed into Autotunes.

The second factor is the relationship between the technology and other intangible assets. Just as a specific technology should not be conflated with its predecessors, neither should it be confused with other intangible assets. In a business, technology works closely with other intangible assets such as brands or customer relationships. For example, the distinctive brands of large consumer technology companies routinely support the launch of new technologies. The trajectories of the new technology will depend on the strength of the other assets the firm can deploy.

The valuation community has progressed in developing techniques to evaluate and apportion value creation from various intangible assets. These techniques delve into the operations of companies' activities. However, executives are understandably hesitant to disclose competitive information for fear of losing competitive advantage.

This intermingling of technology with other assets leaves the valuer to identify the principal driver of value creation for the business, a task that requires in-depth analysis.

Firm value vs technology value: Apple's launch of the iPhone

Apple's unveiling of the iPhone on 9 January 2007 illustrates how the value of specific technologies relates to the value of a firm. The "technology" was, in fact, a bundle of assets. These assets included:

- Rights that Apple had acquired from various standard setters and national and international organisations;
- Data that Apple had acquired or collected from its customers' use of its software suite (iTunes, iPhoto etc) and iPod devices;
- Technology, including software, that Apple had licensed in from other firms such as chip manufacturers; and
- Proprietary technology, including software, that Apple created to run or integrate the various functionalities of the device. As Steve Jobs said of the "Multitouch" technology he revealed: "Boy, have we patented it!"

Until the commercial launch of the device six months later, analysts and investors had little hard data upon which to calibrate their expectations. A consensus eventually emerged about the size of the market, the trajectory of the iPhone's penetration, the level of sustainable margins, and likely competitors' responses.

These analysts and investors were also free to assign "future value" to opportunities and applications that required a significant leap of faith: health monitoring, video streaming, and others. This narrative, however, concerns the value of the firm. A valuer tasked with valuing Apple's technology necessarily had a narrower subject asset to tackle.

Part of the technology, as noted above, was not Apple's and could be licensed in. The integration of these available technologies and standards accrued to other intangible assets such as human capital.

Even if valuers used the emerging projections for the sales and financial performance of the iPhone, they would have had to assume a rate of decay for the specific technologies that were introduced on that day. They would have suspected that first version of "Multitouch" would be improved and eventually replaced, even if the touch screen remained the main interface of future iPhones. That replacement could be - and was - captured in the valuation of the firm but could not be ascribed to the current array of technologies in Apple's portfolio.

The other limitation in valuing the technology itself came from the influence of complementary intangible assets. Steve Jobs described the device as "an iPod, a phone and [an] internet communicator".

By 2007, the iPod already had a cult following and accounted for close to half of Apple's revenue. Jobs' choice of words is revealing, since he was presenting the new device as a derivation of Apple's most popular product, relying on the latter's aura and on the company's brand.

In retrospect, the launch of the iPhone presented a strong technological continuity with the iPod. Additionally, it relied on the Apple brand's "umbrella". Considering these elements, did the iPhone-specific technologies deserve to have the residual cash flows ascribed to them, thus giving them the leveraged upside of any significant success?

Investor insight on technological innovation

Technology often provides an irresistible lure to investors, underpinning good investment "stories". The tension between "stories" and "numbers" in the investment process has been well documented.

The expectation of a profitable investment in technology, and therefore the valuation of that technology, habitually rests on several features. An in-depth understanding and disclosure of these features is crucial in making the valuation of technology "more tangible".

- Conferring a strategic advantage in a potentially large market. This is especially true in the case of network effects and holds even if the technology is a non-rival good and market share "leaks" to competitors. The emergence of competitors precipitates adoption and accelerates the growth of the market.
- Creating a lasting cost advantage in an existing and/or growing market. This is typically captured through the estimated remaining useful life (RUL) or an estimate of the attrition rate of the technology.
- Imposing switching costs for customers.
- Requiring little reinvestment, regardless of whether the outlays are expensed or capitalised.

The evaluation of these important variables is complicated by the fact that technology can be contained in a registered right (eg, a patent), be unregistered (eg, a trade secret), or straddle both.

At one end of this spectrum, a patent has a very visible and predictable "cliff"; at the other end, the technology may be kept as a trade secret. Sometimes, the existence of the technology itself is a secret. Part of the technology, as noted above, was not Apple's and could be licensed in. The integration of these available technologies and standards accrued to other intangible assets such as human capital.

Using IVS for value measurement

The International Valuation Standards (IVS) provide a framework for the valuation of technology, regardless of the purpose of the valuation. Application of the IVS and the valuation of technology assets is complex and requires substantial professional judgment, expertise, and analysis. A valuer may pick from three approaches, selecting the one(s) that is(are) most appropriate in the circumstances.

Market approach

Under the market approach, the value of an intangible asset is determined by reference to market activity. The specificity and the opacity of technology make relevant comparisons difficult. For this reason, the application of the market approach for valuing single technological assets (as opposed to technology businesses) is quite rare.

Cost approach

The cost approach can be used when the technology is commoditised and does not confer a differentiated advantage. In that case, two main methods are applied: replacement cost method or reproduction method.

In their more advanced forms, these methods require the determination of an opportunity cost and/or of an "appropriate" profit mark-up. In effect, the cost method allows an analysis of the efficiency of the historical outlays incurred, and of the extent of entrepreneurial profit commensurate with risk.

Income approach

While the cost approach is mostly retrospective, the income approach is forward-looking and requires financial projections capturing the earnings power of the technology being valued.

The Apple example shows that several intangible assets and technologies can be entwined together in a product. The valuation professional should therefore determine whether the technology being valued is the main value driver or a secondary input

When technology is not the main (or "Principal Income Generating") asset, the relief from royalty method (RFR) is often appropriate. The RFR method discounts hypothetical royalty payments corresponding to the use of the technology. The royalty percentage is a function of the nature of the technology being licensed, but also considers specific contractual terms such as exclusivity, geographical reach, and duration. Since the royalty rate is a fixed percentage (e.g., 5% of sales), the value of the technology is a linear function of the revenues generated.

While the principle of the RFR method is quite simple, the determination of an appropriate royalty rate can prove challenging in practice. Databases containing royalty rate data from prior transactions present their own challenges and often fail to include important terms of licence deals. The alternative to using data from previous transactions is to derive a "fundamental" royalty rate. Such rates attempt to apportion the risks and rewards for both the licensor and the licensee from the economics rents to be extracted from the transaction.

Conversely, when the technology is the main value driver of a bundle of assets, the excess earnings method is often appropriate.

The excess earnings method subtracts contributory asset charges (CACs) for all the other assets necessary to generate the firm's earnings stream

By construction, the excess earnings method will yield more volatile results than those of the RFR. By imputing residual cash flows to the technology, the method's result is more leveraged to any marginal change.

We note that certain professional organisations are exploring an increasingly nuanced framework for the delineation of principal assets and therefore the allocation of value through the choice of the valuation method.

Valuation of technology for Transfer Pricing

The increasing complexity of technology has also been reflected in the valuation for the purposes of Transfer Pricing (TP). Both the US and the OECD have recently updated their rules and guidelines in these matters.

In this context, the valuation of technology is done on an "arm's-length" pricing basis, considering "realistic alternatives" rather than a fair market value/fair value basis.

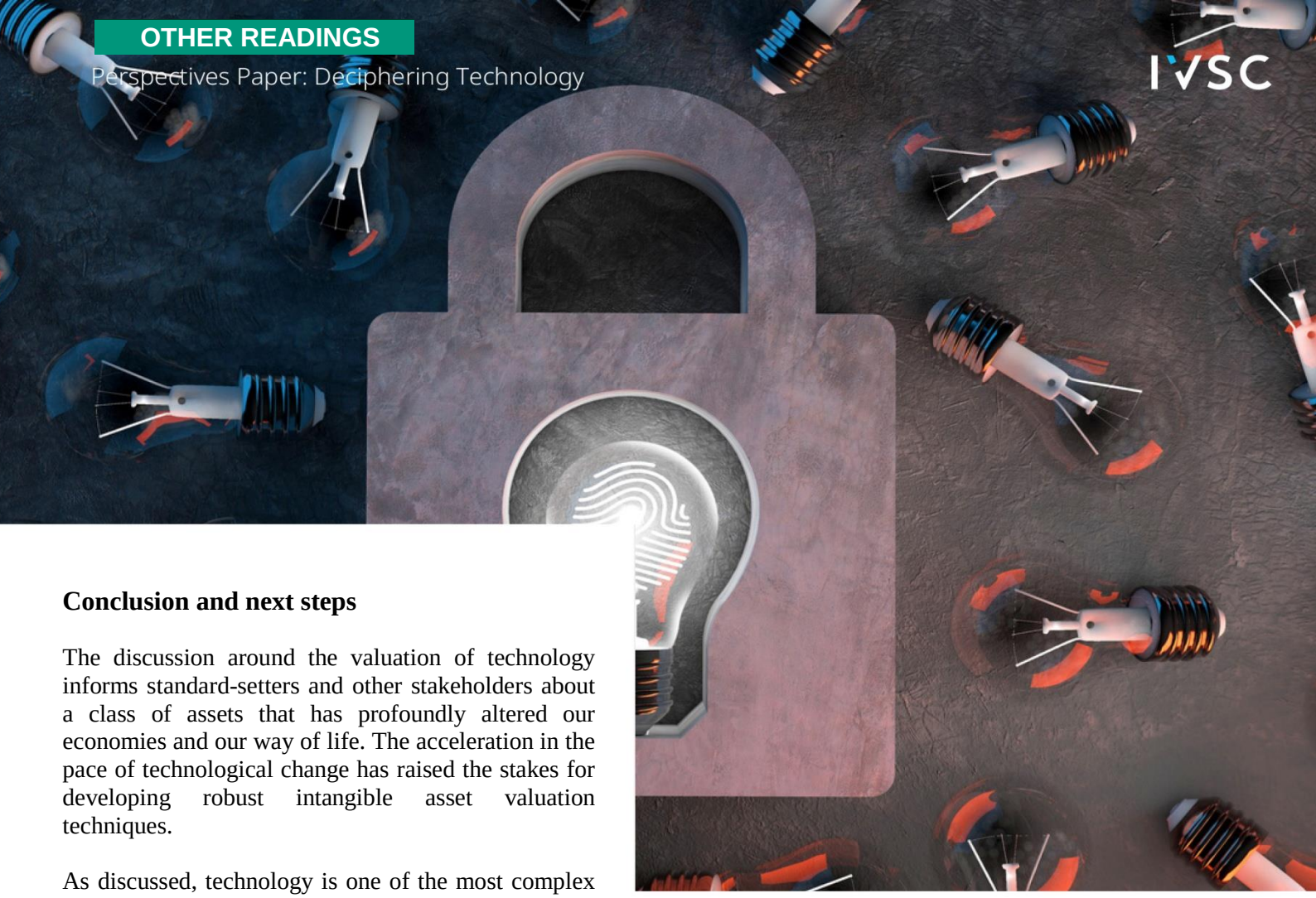
The RFR method for financial valuation is broadly equivalent to the comparable uncontrolled transaction (CUT) method in transfer pricing.

However, some significant differences remain:

- Transfer pricing valuations are less concerned with the identification of specific assets than the bundling of intangible assets into portfolios for the apportionment of earnings.
- Routine returns for other assets are derived from returns earned by comparable companies, rather than contributory asset charges.

- Cash flows are generally calculated on a pre-tax basis in the US, while financial reporting valuations deduct taxes before discounting cash flows.

The differences in these methodologies create the possibility of either unanticipated tax frictions or differences that will remain the object of scrutiny.



Conclusion and next steps

The discussion around the valuation of technology informs standard-setters and other stakeholders about a class of assets that has profoundly altered our economies and our way of life. The acceleration in the pace of technological change has raised the stakes for developing robust intangible asset valuation techniques.

As discussed, technology is one of the most complex intangible assets to value. Nonetheless, some clear trends emerge:

- The investment in technology allows for a high dispersion in possible outcomes for its creators and investors. These outcomes include failure.
- Any specific technology lies on a technological continuum between its predecessors and yet-to-be-invented future iterations.
- Capturing the unit economics underpinning the valuation of the technology requires overcoming the natural opacity in its characteristics.
- The deployment of technology generally interacts with other intangible assets: it relies on human capital, brand and customer relationships, and simultaneously adds to those assets.

The complex characteristics of technology suggest that best practices for its valuation will continue to evolve.

These characteristics also emphasise the need for robust professional competence in the conduct of such valuations. These requirements are in line with the IVSC's stated objectives of producing high-quality standards and promoting competency amongst valuation professionals.

Throughout this series of papers, we have visited the challenges and opportunities posed by the valuation of the principal categories of intangible asset classes. Forthcoming papers will continue the review of specific intangible assets and examine how these assets interact together.

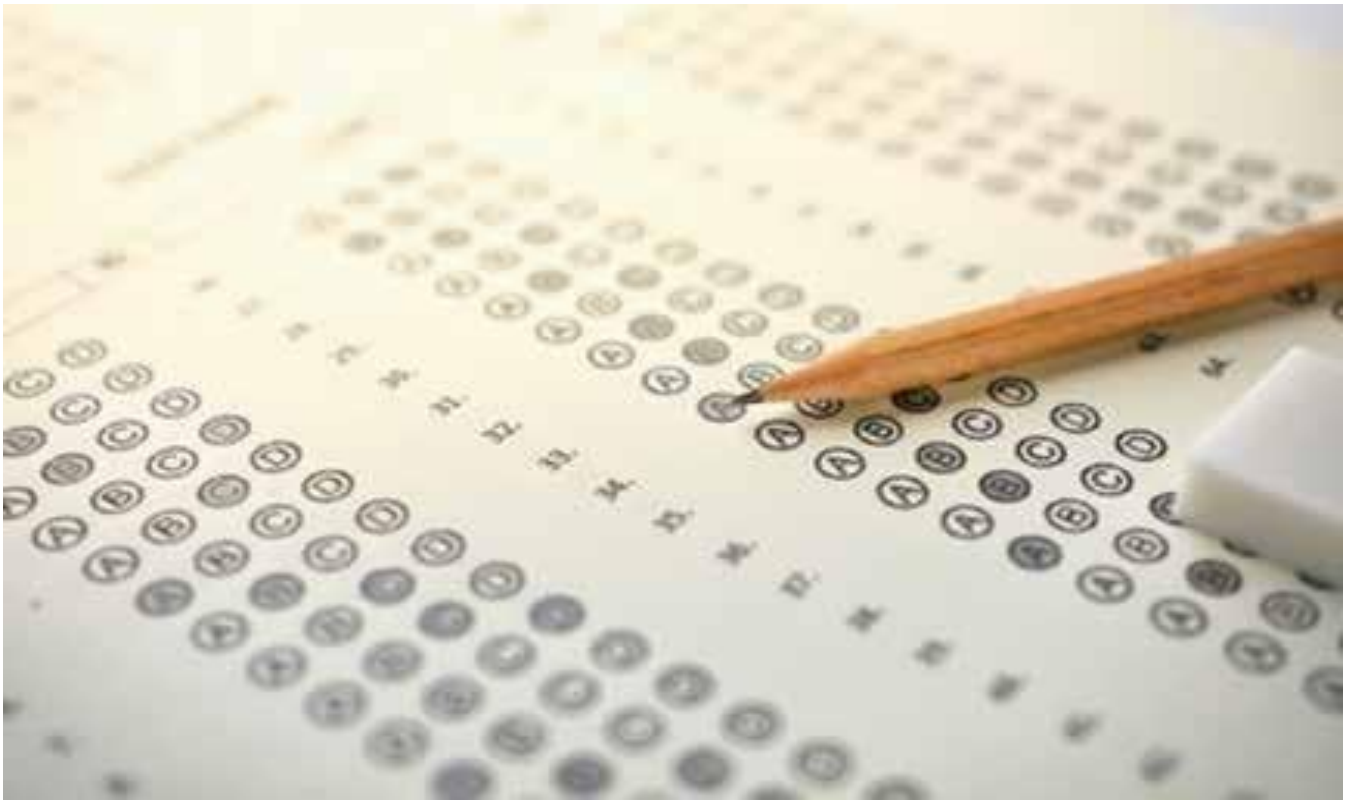
OTHER READINGS

IVSC

INTERNATIONAL VALUATION STANDARDS COUNCIL

WWW.IVSC.ORG

MULTIPLE CHOICE QUESTIONS



ICMAI REGISTERED VALUERS' ORGANISATION

Registered Office
The Institute of Cost Accountants of India 4th Floor,
CMA Bhawan 3, Institutional Area Lodhi Road, New
Delhi – 110003

www.rvoicmai.in

MULTIPALE CHOICE QUESTION

1. **The national income estimation is the responsibility of**
a) NSSO
b) CSO
c) Finance Ministry
d) National Income Committee

Ans) CSO

2. **The most appropriate measure of a country's economic growth is**
a) GDP
b) NDP
c) Per capita real income
d) GNP

Ans) Per capita real income

3. **To avoid double counting when GDP is estimated, economists**
a) Use GDP deflator
b) Calculate value added at each stage of production
c) Use retail prices
d) Use price of only intermediategoods

Ans) Calculate value added at each stage of production

4. **Capital Budgeting Decisions are based on:**
a) Incremental Profit
b) Incremental Cash Flows
c) Incremental Assets,
d) Incremental Capital

Ans) Incremental Cash Flows

5. **Operating leverage helps in analysis of:**
a) Business Risk,
b) Financing Risk
c) Production Risk
d) Credit Risk

Ans) Business Risk,

6. **Which of the following cost of capital require tax adjustment?**
a) Cost of Equity Shares
b) Cost of Preference Shares
c) Cost of Debentures
d) Cost of Retained Earnings.

Ans) Cost of Debentures

7. **Financial Leverage arises because of:**
a) Fixed cost of production
b) Variable Cost,
c) Interest Cost
d) manufacturing cost

Ans) Interest Cost

8. **Dividend Payout Ratio is**
a) PAT÷ Capital
b) DPS ÷ EPS
c) Pref. Dividend ÷ PAT
d) Pref. Dividend÷ Equity Dividend

Ans) DPS ÷ EPS

9. **Dividend Distribution Tax is payable by**
a) Shareholders to Government
b) Shareholders to Company
c) Company to Government,
d) Holding to Subsidiary Company

Ans) Company to Government,

10. **Stock split is a form of:**
a) Financial Restructing
b) Bonus Issue
c) Dividend Payment
d) Dividend in kind

Ans) Financial Restructing

11. **Retained earnings are:**
a) Not important when determining dividends
b) The same as cash in the bank
c) An indication of a company's liquidity
d) The cumulative earnings of the company after dividends

Ans) The cumulative earnings of the company after dividends

12. **Financial Analysis includes:**
a) External
b) Internal
c) Horizontal
d) All of the above

Ans) All of the above

13. **In Inventory Turnover calculation, what is taken in the numerator?**
a) Sales
b) Cost of Goods Sold
c) Opening Stock
d) Closing Stock

Ans) Cost of Goods Sold

14. **Who has the authority to certify that any instrument is not chargeable with duty?**
a) Magistrate
b) Collector
c) Bank Official
d) None of the above

Ans) Collector

15. **What is the maximum amount of penalty prescribed under section 62 of the Indian Stamp Act 1899 for executing instrument not duly stamped?**
a) One hundred rupees
b) Two hundred rupees
c) Five hundred rupees
d) One thousand rupees

Ans) Five hundred rupees

16. **What is the maximum amount of penalty prescribed under section 63 of the Indian Stamp Act, 1899, for failure to cancel adhesive stamp?**
a) One hundred rupees
b) Two hundred rupees
c) Five hundred rupees
d) One thousand rupees

Ans) One hundred rupees

17. **What is the maximum amount of penalty prescribed under section 65 of the Indian Stamp Act, 1899, for refusal to give receipt, and for devices to evade duty on receipts?**
a) One hundred rupees
b) Five hundred rupees
c) One thousand rupees
d) Five thousand rupees

Ans) One hundred rupees

18. **What is the maximum amount of penalty prescribed under section 66 of the Indian Stamp Act 1899 for not making out policy within one month after receiving, or taking credit for, premium or consideration for any contract of insurance or making one not duly**
a) One hundred rupees
b) Two hundred rupees
c) Five hundred rupees
d) One thousand rupees

Ans) Two hundred rupees

19. **Who has the power to make the rules relating to sale of stamps?**
a) Central Government
b) State Government
c) Collector
d) Chief Controlling Revenue Authority

Ans) State Government

20. **Where an instrument is chargeable with ..... in respect of any money expressed in any currency other than that of India, such duty shall be calculated on the value of such money in the currency of India according to the current rate of exchange on the**
a) Fixed amount duty
b) Ad valorem duty
c) Duty of Rs 1000
d) None of the above

Ans) Ad valorem duty

21. **A owes B Rs 1000. A sells a property to B, the consideration being Rs 500 and the release of the previous debt of Rs 1000. Stamp-duty is payable on ..... :**
a) Rs 500
b) Rs 1000
c) Rs 1500
d) None of the above

Ans) Rs 1500

22. A sells a property to B for Rs 500 which is subject to a mortgage to C for Rs 1000 and unpaid interest Rs 200. Stamp-duty is payable on ..... :
a) Rs 500
b) Rs 1000
c) Rs 1500
d) Rs 1700

Ans) Rs 1700

23. **A mortgages a house of the value of Rs 10,000 to B for Rs 5000. B afterwards buys the house from A. Stamp-duty is payable on ..... :**
a) Rs 5000
b) Rs 10,000
c) Rs 10,000 less the amount of stamp-duty already paid for the mortgage
d) None of the above

Ans) Rs 10,000 less the amount of stamp-duty already paid for the mortgage

24. **How is stamp duty paid in transactions where more than one instrument is required?**
a) Stamp duty is paid on all the instruments equally
b) Stamp duty is paid on any one of the instruments

c) Stamp duty is paid only on one of the principal instruments and on the balance documents only minimum duty is payable
d) Stamp duty is paid on ad valorem basis

Ans) Stamp duty is paid only on one of the principal instruments and on the balance documents only minimum duty is payable

25. **Rates of Stamp Duty payable for different types of documents are as per:**
a) Schedule I
b) Schedule II
c) Schedule III
d) Schedule IV

Ans) Schedule I

26. **Income by way of rent of agricultural land is:**
a) Business Income
b) Income from other sources
c) Agricultural Income
d) Casual Income

Ans) Agricultural Income

27. **As per section 2(31), the following is not included in the definition of 'person' :**
a) An individual
b) A Hindu undivided family
c) A company
d) A minor

Ans) A minor

28. **In which of the following cases, income of previous year is assessable in the previous year itself?**
a) Assessment of persons leaving India
b) A person who is into illegal business
c) A person in employment in India
d) A person who is running a charitable institution

Ans) Assessment of persons leaving India

29.**According to section 2(24), definition of 'income' is:**
a) Inclusive
b) Exclusive
c) Exhaustive
d) Descriptive

Ans) Inclusive

30. **CBDT in controlled by:**
a) Central Government
b) State Government
c) Both (a) and (b)
d) None of the above

Ans) Central Government

31. **Who is an Ordinarily Resident?**
a) Followed both basic and additional
b) Only basic
c) Only additional
d) Not basic and additional conditions

Ans) Followed both basic and additional

32. **Fair value measurement assumes that the transaction to sell the asset or transfer the liability takes place in the principal market for the asset or liability. What is the definition of the principal market used in Ind AS 113?**
a) The one with the greatest volume and level of activity for the asset or liability that can be accessed by the entity
b) The one with the highest and best price for the asset or liability that can be accessed by the entity
c) The one with the highest value activity for the asset or liability that can be accessed by the entity
d) The most advantageous market for the asset or liability

Ans) The one with the greatest volume and level of activity for the asset or liability that can be accessed by the entity

33. **Fair value measurements are categorised into a three-level hierarchy, based on the type of inputs to the valuation techniques used. What inputs are required for a fair value measurement to be classified as level 1 inputs?**
a) Unadjusted quoted prices in active markets for items identical to the asset or liability being measured
b) Inputs based on the highest and best use of the asset as determined by a market participant
c) Inputs other than quoted prices that are directly or indirectly observable for that asset or liability
d) Inputs which must be developed to reflect the assumptions that market participants would use when determining an appropriate price for the asset or liability

Ans) Unadjusted quoted prices in active markets for items identical to the asset or liability being measured

34. **Which of the following is NOT a valuation technique prescribed by Ind AS113?**
a) the fair value approach
b) the income approach
c) the cost approach
d) the market approach

Ans) the fair value approach

35. **Which of the following is NOT an example of a level 2 input?**
a) a financial forecast of cash flow or earnings

b) quoted prices for identical or similar assets or liabilities in markets that are not active
c) inputs other than quoted prices that are observable for the asset or liability, such as interest rates and yield curves, volatilities, prepayment speeds, and credit risks
d) inputs that are derived from or corroborated by observable market data by correlation or other means.

Ans) a financial forecast of cash flow or earnings

36. **Fixed assets which are subsequently measured in accordance with the revaluation model in Ind AS 16 Property, Plant and Equipment are not within the scope of Ind AS 113 in terms of both measurement and disclosure.**
a) TRUE
b) FALSE
c) Sometimes true
d) Need more information

Ans) FALSE

37. **Which of the following is considered standards of value?**
a) Liquidation of Value
b) Actual value
c) Going concern value
d) Investment value

Ans) Investment value

38. **While valuing 'synergy' which of the following is to be looked at!**
a) Operating synergy
b) Financial synergy
c) marketing synergy
d) Operating synergy orFinancial synergy

Ans) Operating synergy & Financial synergy

39. **When valuation process is under multiple scenarios, you take into consideration,**
a) Scenarios
b) Ranges of value
c) Ranges of value or Scenarios
d) none of the above

Ans) Ranges of value & Scenarios

40. **Which of the following is the "as of" date for valuation?**
a) Anytime within one year
b) Date that the report is signed
c) "As of" a single point in time or six months later
d) "As of" a single point in time

Ans) "As of" a single point in time

41. **As the amount of _____ increases the present value of _____.**
a) debt; net tax-shield benefits of debt increases
b) common equity; bankruptcy and agency costs increase
c) debt; net tax-shield benefits of debt decrease
d) common equity; net tax-shield benefits of debt decrease.

Ans) debt; net tax-shield benefits of debt increases

42. **Assume that the market imperfection of taxes exists. If thecorporate tax rate were increased under new legislation, the use of debt would _____.**
a) rise
b) fall
c) not be impacted
d) There is not sufficient information provided to determine the impact.

Ans) rise

43. **What are the specific inputs that you would consider while preparing a Valuation Report?**
a) Key Financials,Valuation methodologies considered,Valuation Workings,Fair Value Recommendation
b) Key Financials,Valuation methodologies considered,Valuation Workings,negative assurance
c) Valuation methodologies considered,Key Financials,postive assurance,disclaimer opinion
d) Key Financials,postive assurance,disclaimer opinion Industry overview

Ans) Key Financials,Valuation methodologies considered,Valuation Workings,Fair Value Recommendation

44. **If a bond sells above its par value, it is called ..... bond:**
a) Premium
b) Callable
c) Convertible
d) Discount

Ans) Premium

45. **Leverage is:**
a) The ability to easily raise needed fund
b) A notion from probability
c) The compounding of risk
d) A measure of investment performance

Ans) The compounding of risk

46. **American option is an option which:**
a) Cannot be exercised prior to its expiration date
b) Can be exercised only on the expiration date
c) Can be exercised prior to its expiration date

d) None of the above

Ans) Can be exercised prior to its expiration date

47. **..... is a notion relating to fixed income instrument:**
a) Rate of return
b) Par
c) Face value
d) Beta

Ans) Par

48. **..... is a value of security shown on certificate:**
a) Market value
b) Face value
c) Maturity value
d) All of the above

Ans) Face value

49. **Collar is:**
a) An option to purchase an asset
b) A type of derivative position
c) A notion from probability
d) A condition where spot prices exceed forward prices

Ans) A type of derivative position

50 **..... bond has its interest payment contingent on sufficient earnings of the firm:**
a) Subordinated debenture
b) Debenture
c) Junk bond
d) Income bond

Ans) Income bond

51. **The spread between Treasury securities and non-Treasury securities that are identical in all respects except for quality rating are called:**
a) Credit spread
b) Interest spread
c) Rate spread
d) None of the above

Ans) Credit spread

52. **First rating agency of India:**
a) SME Rating Agencies of India Limited (SMERA)
b) Investment Information and Credit Rating Agency of India Limited (ICRA)
c) Credit Rating Information Services of India Limited (CRISIL)
d) Credit and Research Limited (CARE)

Ans) Credit Rating Information Services of India Limited (CRISIL)

53. **Credit rating AAA denotes for:**
a) Extremely unlikely to default
b) Unlikely to default
c) Likely to default
d) Currently in default

Ans) Extremely unlikely to default

54. **A credit rating of bonds affects:**
a) Interest rate
b) Investment appetite
c) Bond pricing
d) All of the above

Ans) All of the above

55. **A credit rating once given to an corporate or government bond is:**
a) Cannot be upgraded in future
b) Cannot be downgraded in future
c) Can be upgraded or downgraded in future
d) Stable over the maturity period of the bond

Ans) Can be upgraded or downgraded in future

56. **An embedded option is:**
a) An option that is embedded into the stock, bond, etc
b) There may be more than one embedded option in a security
c) Generally, cannot be separated from the securities to which they are attached
d) All of the above

Ans) All of the above

57. **Which of the following is true about the callable bond?**
a) Callable bonds always trade at a discount to non-callable bonds
b) Callable bonds expose issuers to the risk of reduced re-investment return
c) Callable bonds are actually variable tenor bonds
d) Callable bonds are not as liquid as non-callable bonds

Ans) Callable bonds are actually variable tenor bonds

58. **Bonds with embedded put options are called:**
a) Putable bonds
b) Bondholders puts
c) Callable bonds
d) None of the above

Ans) Putable bonds

59. **A callable bond is worth ..... to an investor than non-callable bond because the company issuing the bond has the power to redeem it and**

deprive the bondholder of the additional interest payments he would be entitled to if the bond was held to matur
a) Less
b) More
c) Equal
d) None of the above

Ans) Less

60. **As per the valuation of investment circular issued by the FIMMDA, security receipts will be valued at:**
a) Carrying cost
b) Maturity cost
c) Net present value given by the issuing reconstruction company
d) None of the above

Ans) Net present value given by the issuing reconstruction company

61. **Which of the following is the correct one?**
a) Clean price = dirty price - accrued interest
b) Clean price = dirty price + accrued interest
c) Clean price = dirty price/accrued interest
d) Clean price = dirty price * accrued interest

Ans) Clean price = dirty price - accrued interest

62. **Securities issued by companies are traded in ..... :**
a) Derivatives market
b) Tertiary market
c) Primary market
d) Secondary market

Ans) Secondary market

63. **Does either the NPV or free cash flow model add the value of nonoperating net assets in its calculations_**
a) Only the NPV model does
b) Only the free cash flow model does.
c) Neither the NPV nor the free cash flow models do
d) Both the NPV and free cash flow models do

Ans) Both the NPV and free cash flow models do

64. **Does either the NPV or free cash flow model discount the firm's free cash flow at the unlevered cost of equity in its calculations?**
a) Both the NPV and free cash flow models do
b) Only the NPV model does
c) Neither the NPV nor free cash flow models do
d) Only the free cash flow model does

Ans) Only the NPV model does

65. **Does either the NPV or free cash flow model subtract the value of debt in its calculations?**
a) Only the free cash flow model does
b) Both the NPV and free cash flow models do
c) Only the NPV model does
d) Neither the NPV nor free cash flow models do

Ans) Both the NPV and free cash flow models do

66. **The adjusted present value (NPV) and free cash flow models give equivalent results. An analyst may prefer to use the NPV model because the :**
a) NPV uses the historical cost flow statement, which the free cash flow model does not
b) NPV highlights the extent to which the value of the firm is enhanced by the use of leverage in its capital structure
c) NPV focuses on the value of core operations whereas the free cash flow model does not
d) free cash flow model focuses of the effect of leverage,which NPV does not

Ans) NPV highlights the extent to which the value of the firm is enhanced by the use of leverage in its capital structure

67. **In internal rate of returns, discount rate which forces net present values to become zero is classified as_**
a) positive rate of return
b) negative rate of return
c) external rate of return
d) internal rate of return

Ans) internal rate of return

68. **In calculation of internal rate of return, an assumption states that received cash flow from project must_**
a) be reinvested
b) not be reinvested
c) be earned
d) not be earned

Ans) be reinvested

69. **In which of the following basic categories can business environment be divided?**
a) Local and Regional
b) Regional and National.
c) Internal and External.
d) Financial and Nonfinancial.

Ans) Internal and External.

70. **Economic environment refers to all forces which have a _____.**
a) political.
b) natural
c) economic.

d) social.

Ans) economic.

71. **_____environment is with in the control of the business.**
a) Internal.
b) External.
c) Micro.
d) Macro.

Ans) Internal.

72. **____ environment is beyond the control of the business.**
a) Internal.
b) External.
c) Micro.
d) Macro.

Ans) External.

73. **Micro environment is also called as _____.**
a) general environment.
b) operating environment.
c) economics environment.
d) political environment.

Ans) operating environment.

74. **Internal factors affecting a business environment also are referred to ____factors.**
a) controllable.
b) uncontrollable factors.
c) relevant.
d) global.

Ans) controllable.

75. **A systematic application of scientific knowledge to practical task is known as_____.**
a) technology.
b) culture.
c) demograpic.
d) legal.

Ans) technology.

76. **Buying in a cheaper market and selling higher in another market is known as**
a) Hedging
b) Speculation
c) Arbitrage
d) Gambling

Ans) Arbitrage

77. **In arbitrage pricing theory, required returns are functioned of two factors which have_**
a) dividend policy & market risk
b) market risk & historical policy
c) historical policy & dividend policy
d) dividend policy & earning policy

Ans) dividend policy & market risk

78. **Complex statistical and mathematical theory is an approach, which is classified as_**
a) arbitrage pricing theory
b) arbitrage risk theory
c) arbitrage dividend theory
d) arbitrage market theory

Ans) arbitrage pricing theory

79. **Which of the following method of fair exchange ratio is acceptable to court in view of Supreme Court decision in Miheer H. Mafatlal vs. Mafatlal Industries Ltd (1997) 1 SCC 579:**
a) Manageable Profit Method
b) Net worth Method
c) Market Value Method
d) All of the above

Ans) All of the above

80. In the matter of Dinesh Vrajlal Lakhani vs Parke Davis (India) Ltd, the Division Bench of the Bombay High Court also held that:

a) The Court is neither a valuer nor an appellate forum to re-appreciate the merits of the valuation. What the court has to ensure is that the determination should be contrary to law or unfair to the shareholders of the company which has been merged
b) The Court is neither a valuer nor an appellate forum to re-appreciate the merits of the valuation. What the court has to ensure is that the determination should not be contrary to law or unfair to the shareholders of the company which has been merged.
c) The Court is neither a valuer nor an appellate forum to appreciate the merits of the valuation. What the court has to ensure is that the determination should not be contrary to law or unfair to the shareholders of the company which has been merged.
d) None of the above

Ans) The Court is neither a valuer nor an appellate forum to re-appreciate the merits of the valuation. What the court has to ensure is that the determination should not be contrary to law or unfair to the shareholders of the company which has been merged.

Use the following information to answer Questions 81-84

Lois Fischer, Valuer, believes that the retail industry will perform well over the next several quarters and is interested in selecting a retail stock on the basis of its price-to-book multiple. Fischer's research has resulted in a list of five stocks from which she will make her final selection: Wally's, Home Decor, Redrug, Lester's, and Harmon's. The following table contains the information upon which Fischer will base her decision.

P/B Comparables for Retail Firms

	2013	2014	2015	3-Year Average	Current	2-year ROE Forecast	Beta
Wally's*	9.85	8.01	6.93	8.26	6.53	20.00%	0.98
Harmon's*	6.35	4.60	4.16	5.04	3.29	19.95%	1.02
Redrug**	14.93	11.08	13.32	13.11	5.78	18.20%	0.58
Home Decor***	9.75	7.24	8.88	8.62	3.31	19.29%	1.36
Lester's***	7.65	6.25	6.66	6.85	4.32	18.90%	1.22

*Retail industry (department & discount)	5.75	19.98%
**Retail industry (drugs)	4.69	15.27%
***Retail industry (home improvement)	3.62	19.29%

Annabelle Clementi, is Fischer's supervisor and has more than 15 years of experience analyzing firms in the retail industry. Clementi typically uses the P/B ratio when comparing retail stocks with the industry and among peers. However, Clementi has concluded that firms in the home improvement segment of the retail industry utilize their assets so efficiently that P/B valuation is not appropriate. Since these firms are typically characterized as having relatively strong cash flows, Clementi has decided to assess them using valuation measures that are based on cash flows and cash flow-related concepts. With this in mind, Clementi has obtained the following financial statements for Lester's, Inc., a major player in the home improvement segment of the retail industry. Other relevant information that will assist her with the valuation of Lester's includes the following:

- Lester's financial statements are prepared using U.S. GAAP.
- Actual interest paid for the year was $240 million. The reported cash flow from operating activities includes this effect, net of tax savings.
- The marginal tax rate is 37%.
- Lester's is currently trading at $42.10 per share.

Lester's, Inc. Income Statement

Period Ending December 31, 2015	
Total Revenue	22,111,108,000
Cost of Revenue	(15,743,267,000
Gross Profit	6,367,841,000
Operating Expenses	
Depreciation	**534,102,000**
Selling General and Administrative Expenses	**3,379,253,000**
Nonrecurring	**139,870,000**
Other Operating Expenses	**516,828,000**
Total Operating Expenses	**4,570,053,000**
Operating Income	**1,797,788,000**
Total Other Income and Expenses, Net	**58,431,000**
Earnings Before Interest and Taxes	**1,856,219,000**
Interest Expense	**(231,968,000)**

Income Before Tax	**1,624,251,000**
Income Tax Expense	**600,989,000**
Equity Earnings or Loss Unconsolidated Subsidiary	**N/A**
Minority Interest	**N/A**
Net Income from Continuing Operations	**1,023,262,000**
Nonrecurring Events	**N/A**
Discontinued Operations	
Extraordinary Items	**N/A**
Effect of Accounting Changes	**N/A**
Other Items	**N/A**
Net Income	**1,023,262,000**
Preferred Stock and Other Adjustments	**N/A**
Net Income Applicable to Common Shares	**1,023,262,000**
Earnings per Common Share	
Basic	**$1.62**
Weighted Average Shares Outstanding	
Basic	**631,643,000**

Lester's, Inc. Statement of Cash Flows

Period Ending December 31, 2015	$
Net Income	1,023,262,000
Cash Flow Operating Activities	
Depreciation	534,102,000
Changes in Operating Activities	
Changes in Accounts Receivables	(4,593,000)
Changes in Liabilities	306,869,000
Changes in Inventories	(325,406,000)
Changes in Other Operating Activities	(36,792,000)
Cash Flow from Operating Activities	1,497,442,000
Cash Flow Investing Activities	
Capital Expenditures	**(2,199,334,000)**
Cash Flows From Investing Activities	**(2,199,334,000)**
Cash Flow Financing Activities	
Dividends Paid	**(59,884,000)**
Sale (Purchase) of Stock	**115,870,000**
Net Borrowings	**873,480,000**
Other Cash Flows From Financing Activities	**N/A**
Cash Flows From Financing Activities	**929,466,000**
Effect of Exchange Rate	**N/A**
Change in Cash and Cash Equivalents	**227,574,000**
Cash and Cash Equivalents at Beginning of Period	**455,658,000**
Cash and Cash Equivalents at End of Period	**683,232,000**

81.**Based on the information in the first figure, which of the following statements least likely supports Fischer's recommendation of Home Decor over Lester's?**
a)Home Decor's P/B ratio relative to the industry.
b)Home Decor's P/B ratio relative to Lester's P/B ratio.
c)Home Decor's historical P/B ratios.
d)None of the above

Ans) Home Decor's historical P/B ratios.

82.**Which of the following statements is least likely a justification of Fischer's selection of Harmon's over Wally's on the basis of the information in the first figure?**
a)Harmon's level of systematic risk relative to Wally's.
b)Harmon's P/B ratio relative to the industry.
c)Wally's P/B ratio relative to the industry.
d)None of the above

Ans) Harmon's level of systematic risk relative to Wally's.

83.**Clementi requests that Fischer calculate several ratios using the previous information. The P/CF for Lester's using earnings-plus-noncash-charges for cash flow is closest to:**
a)15.89.
b)17.08.
c)25.99.
d)None of the above

Ans) 17.08.

84.**Clementi requests that Fischer calculate the P/CFO for Lester's, using adjusted cash flow from operations for cash flow for comparison with other companies. The adjusted P/CFO for Lester's is closest to:**
a)15.
b)17.
c)19.
d)None of the above

Ans) 17.

Use the following information to answer Questions 85-87

A bond named Galaxy has 4 years remaining till its maturity and is currently trading at US $102. Interest on the bond is paid on a semiannual basis based on a coupon rate of 5%. The bond is first callable in 2 years and on coupon dates after that date in accordance to the given table below:

End of Year	Call Price
2	101.5
3	101
4	100

85.**Which of the following is most likely to be the bond's annual yield to maturity?**

a)2.22%.
b)4.44%.
c)6.66%.
d)None of the above

Ans) 4.44%.

86.**Which of the following is most likely to be the bond's annual yield to first call?**

a)4.42%.
b)4.66%.
c)4.78%.
d)None of the above

Ans) 4.66%.

87.**Which of the following is most likely to be the bond's annual yield to second call?**

a)4.26%.
b)4.38%.
c)4.59%.
d)None of the above

Ans) 4.59%.

Use the following information to answer Questions 88-90

A 6% corporate bond is priced for settlement on 15 September 2015. The bond matures on 30 June 2018 and makes semiannual coupon payments on 30th June and 31st December. The bond is currently trading at 7.0% yield to maturity.

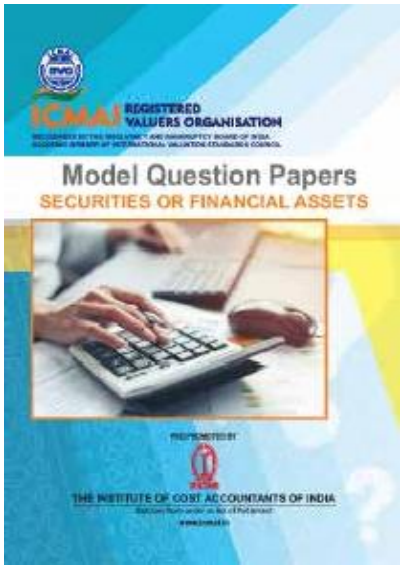
88.**Based on the above information, the full price of the bond on the settlement date is closest to:**
a)973.36.
b)987.47.
c)975.52.
d)None of the above

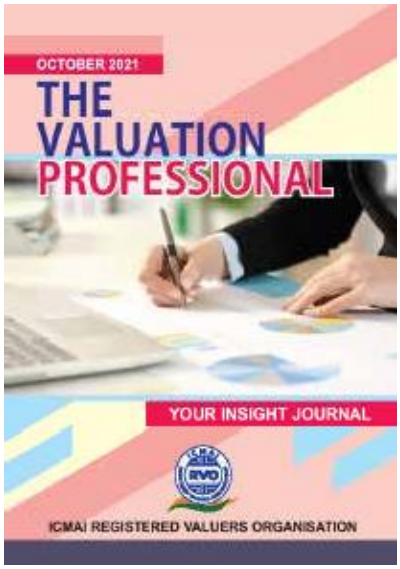
Ans) 987.47.
89.**Based on above information, the accrued interest on the settlement date is closest to:**
a)12.55.
b)22.55.
c)15.55.
d)None of the above

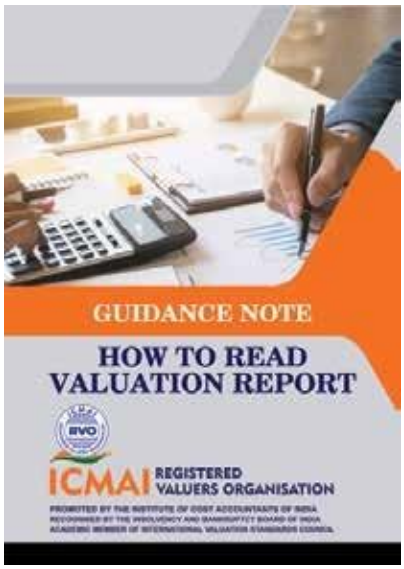
Ans) 12.55.
90.**Based on the above information, the flat price of the bond on settlement date is closest to:**
a)973.36.
b)974.92.
c)972.52.
d)None of the above

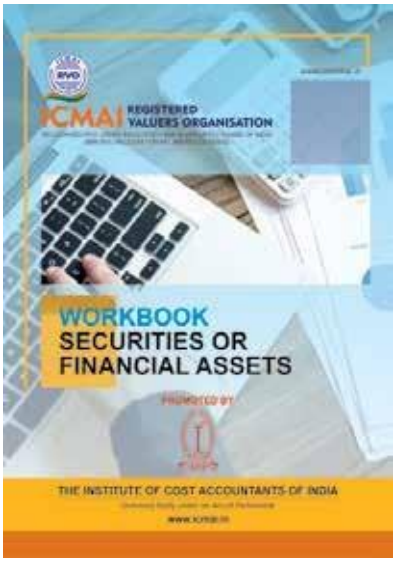
Ans) 974.92

International Yoga Day









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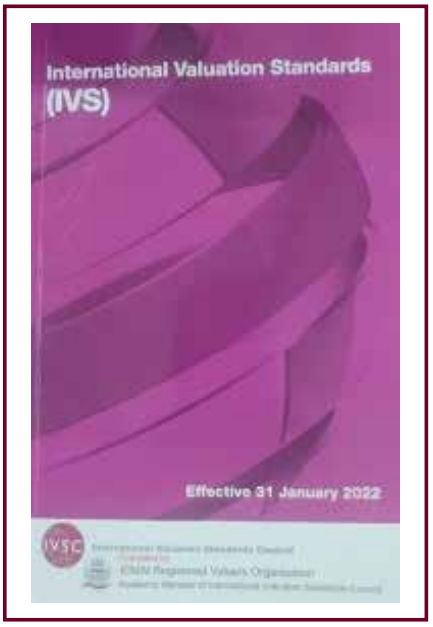

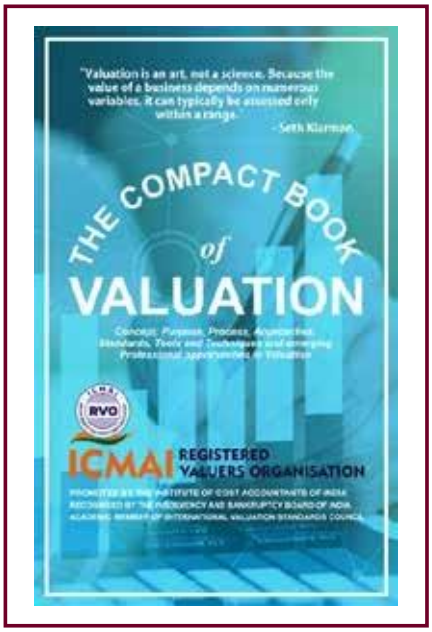

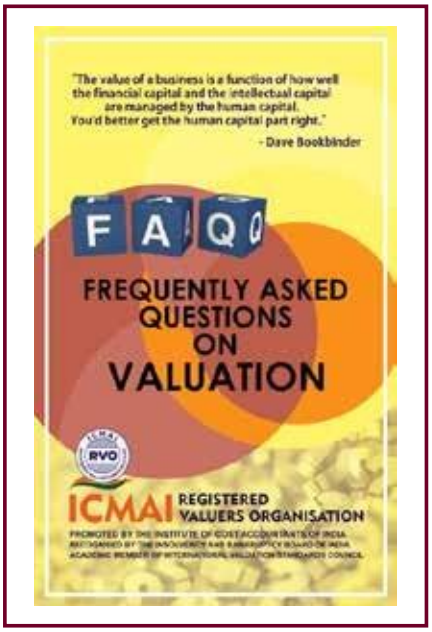

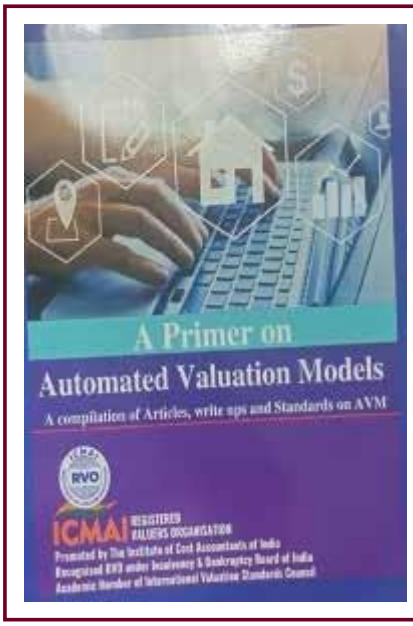

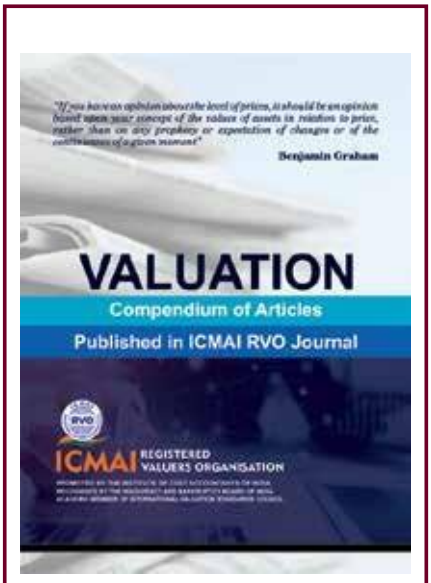

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GLOSSARY IN TERMS OF VALUATION

F

Fair Market Value—the price, expressed in terms of cash equivalents, at which property would change hands between a hypothetical willing and able buyer and a hypothetical willing and able seller, acting at arm's length in an open and unrestricted market, when neither is under compulsion to buy or sell and when both have reasonable

Fairness Opinion—an opinion as to whether or not the consideration in a transaction is fair from a financial point of view.

Financial Risk—the degree of uncertainty of realizing expected future returns of the business resulting from financial leverage.

Business Risk.

Forced Liquidation Value—liquidation value, at which the asset or assets are sold as quickly as possible, such as at an auction.

G

Going Concern—an ongoing operating business enterprise.Going Concern Value—the value of a business enterprise that is expected to continue to operate into the future. The intangible elements of Going Concern Value result from factors such as having a trained work force, an operational plant, and the necessary licenses,systems, and procedures in place.

Goodwill—that intangible asset arising as a result of name, reputation, customer loyalty, location, products, and similar factors not separately identified.

Goodwill Value—the value attributable to goodwill.

Guideline Public Company Method—a method within the market approach whereby market multiples are derived from market prices of stocks of companies that are engaged in the same or similar lines of business and that are actively traded on a free and open market.

I

Intangible Assets—nonphysical assets such as franchises, trademarks, patents, copyrights, goodwill, equities, mineral rights, securities, and contracts (as distinguished from physical assets) that grant rights and privileges and have value for the owner.

Internal Rate of Return—a discount rate at which the present value of the future cash flows of the investment equals the cost of the investment.

Intrinsic Value—the value that an investor considers, on the basis of an evaluation or available facts, to be the "true" or "real" value that will become the market value when other investors reach the same

conclusion. When the term applies to options, it is the difference between the exercise price and strike price of an option and the market value of the underlying security.

Invested Capital—the sum of equity and debt in a business enterprise. Debt is typically (a) all interest-bearing debt or (b) long-term, interest-bearing debt. When the term is used, it should be supplemented by a specific definition in the given valuation context

Invested Capital Net Cash Flows—those cash flows available to pay out to equity holders (in the form of dividends) and debt investors (in the form of principal and interest) after funding operations of the business enterprise and making necessary capital investments.

Investment Risk—the degree of uncertainty as to the realization of expected returns.

Investment Value—the value to a particular investor based on individual investment requirements and expectations. {NOTE: in Canada, the term used is "Value to the Owner".}

K

Key Person Discount—an amount or percentage deducted from the value of an ownership interest to reflect the reduction in value resulting from the actual or potential loss of a key person in a business enterprise.

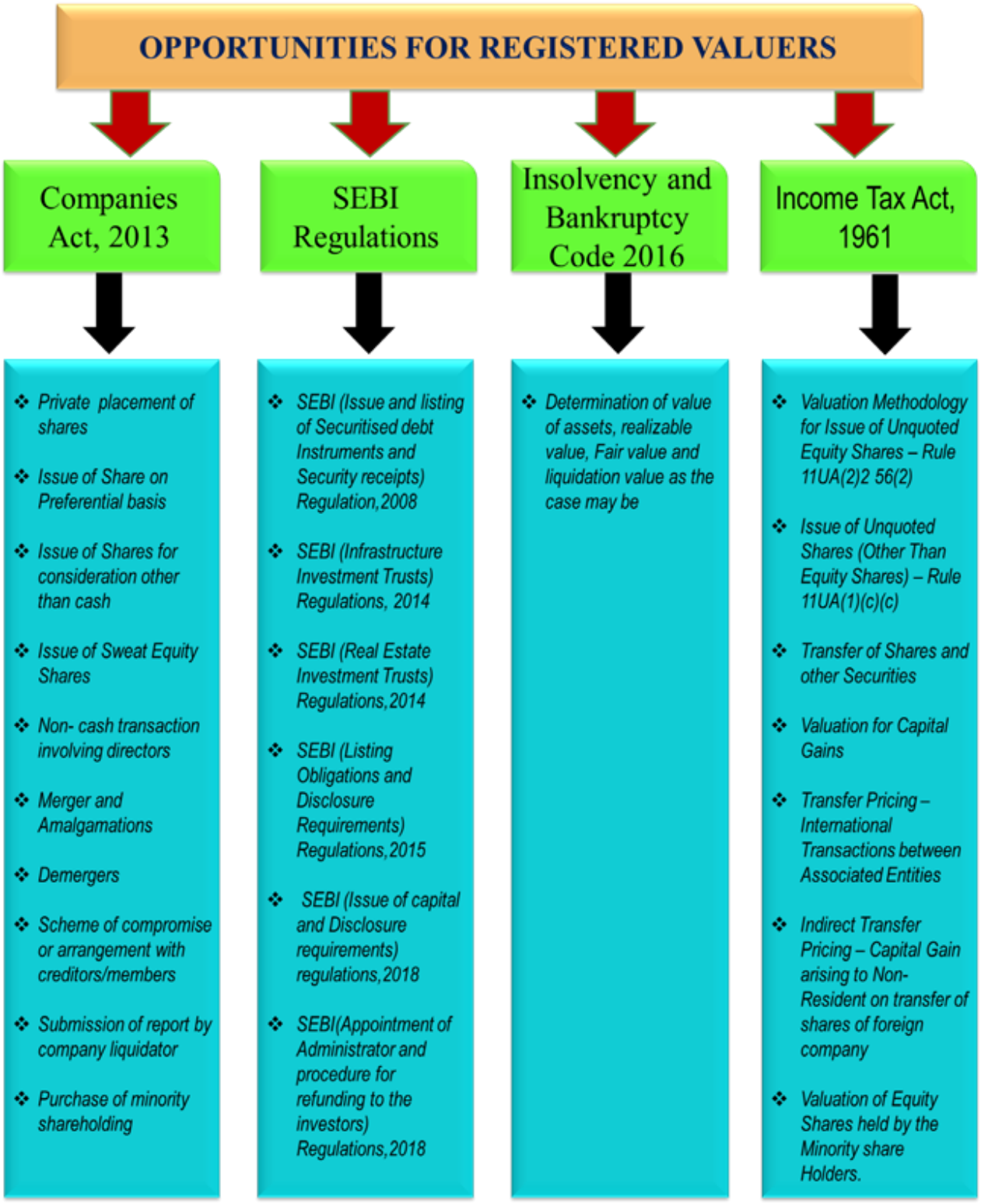
L

Levered Beta—the beta reflecting a capital structure that includes debt.

Limited Appraisal—the act or process of determining the value of a business, business ownership interest, security, or intangible asset with limitations in analyses, procedures, or scope.

Liquidity—the ability to quickly convert property to cash or pay a liability.

Liquidation Value—the net amount that would be realized if the business is terminated and the assets are sold piecemeal. Liquidation can be either "orderly" or "forced."



PROCESS FOR BECOMING REGISTERED VALUER

1. Meet eligibility requirements, qualification and experience prescribed under Rule 4 of the Companies (Registered Valuers and valuation) Rules, 2017
2. Seek enrolment as a valuer member of ICMAIRVO
3. Complete 50 Hours Educational Course
4. Register and pass computer based Examination conductedby IBBI
5. Submit required Form along with fee in favourof IBBI and supporting documents to ICMAI RVO
6. ICMAI RVO shall verify Form& other Requirements and forward the same along with its recommendation to IBBI
7. On receipt of Form along with recommendation of ICMAI RVO, fee and other documents,IBBI shall Process the application for registration
8. After registration with IBBI, take up COP training with ICMAI RVO
9. On completion of training ICMAI RVO shall issue a Certificate of Practice to the Registered Valuer
10. Valuation certificate can be issued only after obtaining Certificate of Practice

ICMAI REGISTERED VALUERS ORGANISATION
RECOGNISED RVO UNDER INSOLVENCY AND BANKRUPTCY BOARD OF INDIA

GUIDELINES FOR ARTICLES

INSOLVENCY AND BANKRUPTCY BOARD OF INDIA

New Delhi, the 30th September, 2022

THE INSOLVENCY AND BANKRUPTCY BOARD OF INDIA (ONLINE DELIVERY OF EDUCATIONAL COURSE AND CONTINUING PROFESSIONAL EDUCATION BY INSOLVENCY PROFESSIONAL AGENCIES AND REGISTERED VALUERS ORGANISATIONS) (AMENDMENT) GUIDELINES, 2022

In exercise of powers conferred by section 196(1)(aa) of the Insolvency and Bankruptcy Code read with regulation 5(b) and clause (ba) of sub-regulation (2) of regulation 7 of the IBBI (Insolvency Professionals) Regulations, 2016 and clauses (a) and (e) of sub-rule (2) of rule 12 of the Companies (Registered Valuers and Valuation) Rules, 2017, the Insolvency and Bankruptcy Board of India hereby makes the following amendments to the Insolvency and Bankruptcy Board of India (Online Delivery of Educational Course and Continuing Professional Education by Insolvency Professional Agencies and Registered Valuers Organisations) Guidelines, 2020, namely:-

1. (1) These amendments may be called the Insolvency and Bankruptcy Board of India (Online Delivery of Educational Course and Continuing Professional Education by Insolvency Professional Agencies and Registered Valuers Organisations) (Amendment) Guidelines, 2022.

(2) It shall come into force with immediate effect.

2. In the Insolvency and Bankruptcy Board of India (Online Delivery of Educational Course and Continuing Professional Education by Insolvency Professional Agencies and Registered Valuers Organisations) Guidelines, 2020 (hereinafter referred to as the principal guidelines), in Clause 9, in sub-clause (d), for the digit '100', the digit '200' shall be substituted.

3. In the principal guidelines, for Clause 11, the following shall be substituted, namely:-

"11. Validity
The Guidelines shall remain in force till further orders."