CHAPTER – IV

THEORY OF PRICING METHODS

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In a market economy, the existence of kaleidoscopic, uncertain and stochastic economic environment, accompanied by innovative price discovery processes, among others, the determination of ological and optimal pricing of any security, asset, commodity, etc., evinces a paramount importance, may it be for the holistic process of investment or disinvestment or mix of it, so that the avowed objectives and purposes of stake-holder/s are achieved

4.00 PROCESS OF VALUE, VALUATION AND PRICING

Valuation is evolving, pro-active, forwarding-looking, strategic, kaleidoscopic, reflexive stochastic and market-oriented concept in the modern economics, characterized by digitalization, robotization, tele-communicating, artificial intelligence, virtual reality and other technological advances. The staple purpose of valuation, *inter alia* involves **winning investors/customers** and **outperforming competitors**. In a typical market place, the seller has to act as marketer who is seeking a response from another party called the prospect (investor).

Therefore, it is now desideratum to define the concept of value and valuation.

$$\text{Value}^{1} = \frac{\text{Benefits}}{\text{Costs}} = \frac{\text{Functional benefits + emotional benefits}}{\text{Monetary costs + time costs + energy cost + psychic costs}}$$

The marketer can augment the value in the following five ways:

- Raise benefits (numerator)
- Reduce costs (denominator)
- Raise benefits and reduce costs
- Raise benefits by more than the rise in costs (concept of relativity)
- Reduction in benefits by less than the reduction in costs

The prospects, which are choosing between two-value offering V_1 and V_2, will examine the value ratio of V_1/V_2. He will favour V_1, if the ratio is larger than one and will favour V_2, if the ratio is smaller than one and will be indifferent, if the ratio equal one. The purpose of marketing-oriented concept in the "information age" is to deliver and ensure "**long-term superior value creation**". This was also measured by Value-Price Ratio (VPR). For a typical investment transaction,

$$VPR = \frac{\text{Total value to investor}}{\text{Total cost to investor}}$$

To illustrate, a hypothetical example, if the total value to investor is Rs.2,00,000/- and total cost is Rs.1,60,000/- the VPR is 1.25· 1.00. One can price a product as per the objectives and purposes for which the transactions are practiced.

From the above discussion, it is clear that in the process of valuation, there are 3 concepts viz value, costs, and the resultant price Valuation is therefore central to the process of buying and selling the business, securities, assets, etc.

(A) DEFINITIONS OF VALUE AND VALUATION

To understand the real and plausible meaning of valuation, it is useful to examine and analyze the definition of value and valuation, though to define valuation is a *herculean task* as value is a word of many meanings

(a) Hadley defined the word value as :

"A price is a fact and a value is an estimate of what the price ought to be"[2]

(b) ***"Valuation is the process of determining value of capital as artistic methods based on scientific tenets". Valuation is more of an art than a science".***[3]

(c) Christopher Gasson and Bertoli Mitchell defined 'Value" as :

"There is only one way to value a company accurately: sell it, all other methods involve a degree of subjectivity"[4]

(d) The researcher defines Strategic valuation as :

"The proactive and purposive process of developing and determining the economic value fit in the market life cycle of a business, inter alia by analyzing macro environmental factors to discern new economic opportunities and threats and strengths and weaknesses of net hard assets and soft assets of esoteric business/assets/equities by focusing on target customer's expectations through integrated marketing"

(B) CHARACTERISTICS OF VALUATION PROCESS

From the above mentioned definitions, the valuation process has following characteristics:

1. Valuation is a proactive process of discerning future cash flows of a business/asset/equity It is related to future expectation of the investor.
2. The process of valuation involves determining economic value based on future cash flow.
3. It takes in to account the macro and micro-factors of general environmental and idiosyncratic business environment.
4. The process also considers in to account both the ***hard assets*** reflected on the balancesheet and the ***soft assets***, many a times not reflected on the balancesheet, commonly known as off-balancesheet assets.
5. It involves the process of integrated marketing, inter alia developing a culture of both internal marketing and external marketing by the internal stakeholders
6. Above all, the concept focuses on the target customer's expectations and the purpose of valuation both at a time, inter alia, to ologically optimize the values and wealth for all the stakeholders.
7. Valuation is an appropriate combination of intelligence, exposure, experience and intuition. It is also an appropriate combination of present value of future cash flow stream and present value of windows of opportunities i e. options offered by the current set up.
8. Value of business is not aggregation of values of its individual assets but capitalized value of income it generates

9. Asset has a character of "plasticity" in the sense that the resources are considered plastic and stretchable for its discretionary uses to be employed by the owner/user.

(C) VALUE and PRICE

Value connotes value between well-informed but not enthusiastic buyer and seller, whereas for price it need not necessarily be the value estimated by the buyer There is difference between value and price, *inter alia*, due to:

(i) Information asymmetry and different level of quality of due diligence between buyer and seller for the process of price discovery.
(ii) Emotional / Ego value and liquidity of stocks/assets and control in the form of stake acquisition.
(iii)Strategic value related to pre-empting competitors, entry sops, logistics advantages, distribution network, quality of network of human resources, knowledge capital, brand value, quality of industrial relations, etc.

(D) COMPONENTS OF CORPORATE VALUE

(I) Stand alone valuation,
(II) Valuation when new/modified strategies are applied viz. applying new operating / financial / marketing / business strategies.
(III) *Synergistic and anergistic* sops *inter alia*, due to combination &/or unbundling
(IV) Restructured value

(E) PURPOSES OF VALUATION

All over the globe, the purposes of valuation can be broadly classified as under

1. Purchase for investment or for occupation.
2. Sale/divestment other than shares.
3. For loan/security for borrowing.

4. Rent fixation/ratable value
5. Land acquisition/evaluation of varying rights in property.
6. Betterment charges.
7. Auction bids.
8. Probate/partition.
9. Speculation.
10. Taxation.
11. Insurance / arbitration.
12. Court fees and stamps duty.
13. Share valuation.

(F) SHARE VALUATION

Modern share valuation theory and practice have its origins in United Kingdom[5] in the statutory requirement of the old Estate duty legislation of 1894. In UK, is interpreted in the courts and is reincarnated in the Capital Transferred Tax (CTT) and Capital Gain Tax (CGT) rules, embodied in the Finance Act, 1975 et.seq. and Capital Gain Tax 1979 (UK) This grafted a mandatory and statutory hypothesis of notional open market value on the often complicated restrictive structures and constitutions granted to private companies by Victorian Statues from the Joint Stock Companies Act of 1856 and the Companies Act of 1862 (UK). Commercial values since then have been based on a similar willing buyer and a willing seller in free negotiation concepts but of course, involve no statutory hypothesis to take full amount of actual circumstances of the parties to the transaction.

(G) PRINCIPLES OF SHARE VALUATION

Besides the purpose for which valuation is being carried out, the following fundamentals are basic tenets of valuation.

a. The purpose of valuation itself is of paramount and prime importance, as the same size of holdings may command vastly different values, perfectly legitimately and meaningfully – for different purposes Both marketer and prospect may pitch

different prices in different situations and ultimately this affect the concluded price.

b. The different legal rights and powers may create different share valuations. Information asymmetry and new methods of price discovery may also change the value and price
c. Before valuation can sensibly proceeds, the basic governing documents of the company such as Article of Association and Memorandum of Associations and other contractual documents must be interpreted for a given purpose.
d. Environmental factors such as global economic scenario, characteristics of national economy, industry, markets, customers, etc. must be taken into consideration.
e. Stochastic and esoteric conditions prevailing at the time of valuation must be examined and made known to the valuer.
f. Macro level changes alongwith micro level changes must be considered at the time of valuation
g. The valuation must take into consideration 'soft factors' such as quality of corporate governance, expectations and relationship with internal stakeholders, marketing niches, brand and intangible assets, knowledge capital, customer relationship cum delightment, etc., in addition to hard factors.
h. Mathematical exactitude in valuation is an impossible objective. Therefore, a range of acceptable values should always be established as negotiating tool.
i. Valuation is above all, a dynamic process – reflecting the real world of the market place – but unquoted/untraded shares will tend to fluctuate less than their stock market counterparts. This is due to the greatest speculator elements in quoted equity demand combined with the underlying stability of demand prevalent for private company shares.
j. It is desideratum to employ several variations to cash flow and profits to broaden the growth flow concept to attempt/to enhance its usefulness as a valuation tool For instance, instead of taking one of the parameters as earning per share, one has justifications to use Earning Before Interest and Taxes (EBIT) or Earning Before Interest, Depreciation and Taxes (EBIDT), *inter alia* to reckon growth factor, as

many new economy stocks have not reported positive earnings but have some level of cash flow.

k. Last but not the least, valuation is both "an art and a science". Accordingly it contains elements of both objective analysis and subjective judgement. Nevertheless, the valuer's main task is to arrive at a reasonably accurate and plausible value for the purpose in the hand and not to plead a special case.

4.01 PRICING METHODS OF A SHARE

I. *NET TANGIBLE ASSET METHOD (NAV)*

This method is also known as Book Value Method The value of a share is computed by determining net tangible asset value with the help of the latest audited balance-sheet. The formula is as under:

$$NAV^{6} = \frac{\text{Net tangible assets}}{\text{Number of equity shares}}$$

Net tangible assets is calculated by making total of tangible assets on the asset side of balance-sheet less current and non-current liabilities (i.e. long term liabilities) and also intangible/fictitious assets and unamortised miscellaneous expenses. Thereafter, the assets are revalued and any increase/decrease on account of this incidence has to be affected These exercise work out the value of Net Tangible Assets (NTA). Total number of equity shares duly adjusted by bonus issues and fresh issue of equity shares divides the resultant NTA. Further, any reserve created not out of debiting genuine profit and loss account should not be taken in the computation of NTA. Moreover, the provision for any other terminal benefits to the employees should be deducted as liabilities. Further any contingent liability impairing the value of net worth, is also to be deducted. Alternatively, this method of computation equates the value of the corporate firms to the tangible net worth of the firm.

STRENGTHS

1. It is facile to calculate and easy to understand.

2 This is the benchmark for minimum value for bricks and mortals economic entities.

WEAKNESSES

1. This method has not considered earnings/cash flows derived from the use of assets but has simply considered the figures of book value of assets.
2. Time value of money, effects of inflation and replacement costs are not reflected in the balance sheet and many a times therefore, are not considered in the computation.
3. It ignores the off-balance-sheet **soft assets**, in determining the value per share. Moreover this method also ignores the opportunity value of the assets and its various uses based on strategy followed by the business.
4. The value is not truly reflected, inter alia, due to pursing different accounting standards and practices such as, depreciation policy, inventory valuation method, deferred taxes, forex transactions, etc.

II *PROFIT EARNING CAPACITY VALUE (PECV)*

This method, inter alia value the share/company by capitalizing average of Profit after Tax (PAT) As per the guidelines of the then Controller of Capital Issues (CCI) of India, the following formula is used to calculate the PECV[7]

$$PECV = \frac{X_1}{X_2}$$

Where, X_1 = Average PAT + $\frac{\text{Fresh Capital Issue}}{\text{Existing net worth}}$ x existing PAT/capitalization rate (%)

X_2 = Number of equity shares, including the fresh capital issue.

In arriving at the average PAT, in the above expression, the following aspects are to be taken into consideration·

- Provision for taxation should be made at the current statutory rate under the Income Tax Act

- The profit shown in the audited account is adjusted so as to exclude non-recurring miscellaneous income of an abnormal nature and write back of provision.
- For 'averaging, normally the latest 3 years profits are taken into account. However, in industries subject to cyclical ups and downs it is advisable to consider the profits of the latest 5 years.
- If profit valuation in the last 3 years is regarded as normal, a simple arithmetic average is calculated. If profit shows a tendency to increase, a weighted arithmetic average is calculated in which the latest year is assigned a weightage of 3, the middle year a weightage of 2 and the last year a weightage of 1. If profits show a tendency to decline then profit of the last year only is to be considered.
- The capitalization rate[8] in the above expression is chosen as follows:

    a. 15% in case of manufacturing companies
    b. 20% in case of trading companies.
    c. 17.5% in case of intermediate companies.

STRENGTHS

1. This method is easy to calculate and facile to understand by the accountant.
2. It considers profits after tax, which is well accepted as one of the performance determinants of the business

WEAKNESSES

1. The method considers the profit figure of yester years and not of the future years.
2. It does not consider time value of money, cost of owners capital/opportunity value of tangible asset and also future ***free cash flows*** of the firm.
3. It considers subjective rate of capitalization and not the rate objectively expected by the investor based on criterion of risk free rate, compensation for Business risk and compensation for Financial risk.
4. This method is normally suited for businesses which are in the maturity stage of Product life cycle and not in the growth mode.
5. Indian companies mostly used this method in the 1990s, when the guidelines issued by the then CCI were mandatory.

III *FAIR VALUE METHOD (FV)*

The fair value of a share is determined by taking a simple average of NAV and PECV, based on a 15% capitalization rate If this average is less than the market value by about 20% only, it is regarded the fair value. If, however, the average of the NAV and PECV is less than the market value by a margin of over 20%, the PECV may be reworked out by lowering the capitalization rate. In no case however, can it be lower than 8% The Fair Value is then determined as the average of NAV and PECV based on a lower capitalization rate The formula[9] for computing fair value is as under

$$\textit{FV per share} = (\text{NAV} + \text{PECV}) / 2$$

STRENGTHS

1. It is well understood by the accountant, as it is calculated based on financial statement only.
2. It considers both the parameters of earning capacity and net asset value, for determining the fair value.

WEAKNESSES

1. This method does not consider into account the economists concept of profit, time value of money, soft assets and free cash flow (future), risk element, opportunity value of the business, etc. in computation of the Fair Value.
2. This is not suitable method for the new economy stocks.
3. This method is more suitable for the company having stable profitability ratios and is not in the growth mode.

IV *DISCOUNTED CASH FLOW METHOD (DCF)*

This method of valuation is the mother of all the valuation techniques. It takes into consideration not only the estimated future cash flows, but also take into consideration the time value of money, risk of the projected cash flows/returns, and estimated growth rates in the process of wealth creation. This method is also known as Dividend Discounted Method, Net Present Value method / Free Cash Flow method, with varying cash flows for different stakeholders, for whom the valuation is being done. The strengths, weaknesses and variants of this method are discussed hereinbelow.

STRENGTHS

1. Profit is an opinion but cash is reality of real commercial business in the market. Therefore, a sale is vanity, profit is sanity and cash is reality. Therefore, DCF method is known as the mother of valuation techniques as it takes into account "cash" and not the book profits / earnings
2. It is based on fundamentals of time value of money and future prospects of the business rather than historical performance, mostly ignored by assets/earning based valuation models.
3. This method allows considering variants of different cash flows and risk considerations, which are the staple elements of modern financial theory.

WEAKNESSES

1. Discounted cash flow method does not differentiate between investment and spending, thereby penalizing the early years of an investment.
2. Discounted Cash Flow method normally imparts one stand-alone valuation and maximum it can be changed either by the numerator or the denominator. It does not impart separately what is the value of add-ons. Moreover it does not consider the volatility of stock prices vis-à-vis the value of share price/present value of offer price/exercise price.

3. DCF rejects the proposal of projects having NPV = 0 or NPV = -ve, though it has *windows of opportunity value*. This weakness is partly taken care, by the model of Adjusted Present Value (APV) and Option Pricing Model (OPM).
4. DCF was originally invented for valuing stable and less uncertain cash flows with efficiency in the information as to risk and return. However, in the era of information age, the new processes of **Price Discovery** and **Information Asymmetry** in the velocity of complex commercial world, it is extremely difficult to reckon with reasonable accuracy the numerator and the denominator. It is like pure body shopping.
5. A typical business has "real option" availability as one of the opportunities and threats from the environment. It does not allow how to reckon such options in the process of stand-alone valuation. Other weaknesses are being discussed in its respective variants. Despite all the limitations, DCF method is still the mother of all the valuation techniques in view of its strengths and forte. Limitations can be overcome by making plausible assumptions.

REPERTOIRE OF DCF METHOD:

A. *DIVIDEND DISCOUNTED MODEL (DDM)*

Dividend Discounted Model[10] of valuation is conceptually a sound approach for determination of share value. As per this method the value of share (P_O) is equal to present value (PV) of dividend expected from its ownership plus present value of the sale price expected when the equity is sold. The following assumptions are required for this approach:

a. Dividends are paid annually.
b. The first dividend is received after the equity share is bought.

SINGLE PERIOD VALUATION MODEL

$$P_O = \frac{D_1}{(1+Ks)} + \frac{P_1}{(1+Ks)}$$

Where P_O = current price of the equity share.
D_1 = dividend expected a year hence.

P_1 = expected price of a share a year hence.
Ks = r = rate of return required on the equity shares The return required is equal to = $I + B_r + F_r$,
Where I = 12% per annum (bank term deposit rate)

$$\mathbf{B_r} = \text{compensation for Business risks} = 3 \times \frac{\text{Range of Return on Investment}}{\text{Mean of Return on Investment}}$$

$$\mathbf{F_r} = \text{Compensation for Financial risks} = 2 \times \frac{\text{Total debts}}{\text{Total equity}}$$

'Ks' or 'r' can also be calculated by the formula, **Ks** = $D_1 / P_o + g$

Where, D_1 = expected dividend a year hence
P_O = current price of equity share
g = average retention ratio X average return on equity

(a) Valuation with constant dividend

If we assume that Dividend Per Share (DPS) remains constant year after year at a value of D, then **P = D/Ks**

(b) Valuation with constant growth in dividend

If we assume that dividend tend to increase over-time at a constant compounded rate, then the value of share

$$\mathbf{P_O} = \frac{D_1}{Ks - g}$$

(c) Valuation with variable growth in dividend

If we assume that dividend is to grow at different varying rate, followed by normal rate of growth, then the value of the equity share is

$$P_O = \frac{D_1}{(1+Ks)} + \frac{D_2}{(1+Ks)^2} + \frac{D_3}{(1+Ks)^3} \ldots\ldots\ldots \frac{Dn}{Ks-g} \times \frac{1}{(1+Ks)^n}$$

(d) H model of equity valuation

Assumptions:

a) If the current dividend growth (Ga) is greater than the normal long run growth rate (Gn), the growth rate begins to decline.

b) After 2H years the growth rate becomes Gn

c) At H years the growth rate is exactly half way between Ga and Gn.

The valuation equation for the **H model** is as under:

$$P_O = \frac{Do\,(1+Gn) + H\,(Ga-Gn)}{R-Gn}$$

Where, P_O = Intrinsic value of the share
Do = Current dividend per share
R = Rate of return expected by Investors
Gn = Normal long run growth rate
Ga = Current growth rate
H = ½ of the period during which Ga will level off to Gn.

STRENGTHS

1. This model takes into account time value of money, growth rate and required return by equity shareholders as discounting factors.
2. This method is scientific and based on the principle that dividend does matters
3 This method is a part of Discounted Cash Flow (DCF) method. It takes into consideration not only the time value of money but also risk of the project/returns in the process of wealth creation.

WEAKNESSES

1 It does not consider free cash flow to equity shareholders as a measure of what a firm can afford to pay as dividends There are few firms that follow the policy of

paying out their entire free cash flow to equity as dividend. Many pay less and some pay more, much pay nil like Microsoft of USA. Therefore, the more logical and rational numerator in the discounted cash flow method is free cash flow to equity/free cash flow to firm / free net operating cash flows and undoubtedly not the dividend, in its holistic view.

2. Since many companies which are not paying / have not paid dividends and have re-invested for the growth, valuation on the basis of this method does not truly reflect the economic value of a share.
3. It is difficult to estimate correctly the growth rate and return required by the equity investors.

CAVEATS IN USING THIS MODEL

a) This method of valuation is most suited to companies who have paid sumptuous dividend in the past and also expect to pay splendidly in ensuing future.
b) However, this method of valuation is not suited for Indian PSUs because

- Out of 240 only 87 PSUs have declared dividend in the year 1997-98.
- Based on analysis of track records of dividend paid by 39 PSUs in which the disinvestment has been made so far, from FY 1986–87 through 1997–98, it has been found that in 153 cases no dividend have been paid and in most of the 39 PSUs from 1% to 10% dividend was paid. Therefore, this model is not the true reflection of economic value of share
- This method was also not rated as one of the methods adopted for acquisition and divestment decisions (as concluded by the survey undertaken by Cooper & Lybrand) by international investors Therefore, no working based on DDM is made and compared in this study. However, the improved version of DCF viz NPV method is considered for the purpose of this study.

B. *FREE CASH FLOW TO EQUITY METHOD (FCFe)*

In the discounted cash flow method of valuation, the focus is on ***cash flow against net income*** in the accounting terms The free cash flow to equity[11] is different and it could be more or less than the amount of dividend, as also could be different from the amount of net income, in view of the following.

- All the non-cash charges are added back to net income to arrive at the cash flow from operations Thus, the earnings reported by firms that takes significant non-cash charges against current income might be lower than cash flows.
- Free cash flow to equity is residual cash flow after meeting all capital expenditure and working capital needs whereas the net income does not include either Thus, higher growth firms that have significant capital expenditure and working capital needs might report positive and growing earnings while facing negative cash flow to equity. This peculiar situation was also found for Indian PSUs, as all the significant capital expenditure have had been not financed from the internal cash generation, but substantially finance from long term capitals / liabilities / capital reserves. Therefore, the true cash flow for the Indian PSUs is the net operating cash flow, which considers investment in net working capital, like in the capital budgeting decision.
- Method of charging depreciation, amortization of deferred revenue expenditure / un-amortized/miscellaneous expenditure, etc. also affect free cash flow to equity Kaplan and Roll (1972)[12] study concluded that financial market react negatively to firm that increases earnings at the expense of cash flow and positively to firm that increase cash flow at the expense of earnings, *inter alia* by resorting to switch depreciation method from accelerated (WDV) to SLM depreciation method and vice-versa.
- In the similar vein, the firm that switch inventory valuation method can affect reported earnings and cash flow especially in inflationary period. Firms that switch from using FIFO to LIFO accounting will report higher cost of goods sold and lower net income, while lowering that tax liability and augmenting cash flows. Sunder (1973, 1975)[13] examine 110 firms that switched from FIFO to LIFO between 1946 and 1966 and concluded that stock prices did not react negatively to the lower earnings reported by these firms.
- Net income is also affected by extraordinary gains and losses as also due to adoption of difference in accounting standards across the country Choi and Levich (1990)[14] in a survey of accounting standards across developed market note that most countries subscribe to basic accounting notions of consistency, realization and historical cost principles in preparing accounting statements

However, in two areas, US-GAAP differs from rest of the world viz. creation of general provisions into which they can transfer income and allowing claims of excess depreciation by companies in USA.

❖ **Practical difficulties**

Many firms, which are in the rapid expansion growth phase, faced negative free cash flow to equity as a sequel to the fact that the required investment outstrips earnings and free cash flows turns positive when growth slows down. This means that the firm is paying negative dividend by way of negative free cash flow Is that a bad sign? Not really.[15] The business is running a cash deficit not because it is unprofitable, but because it is galloping and growing so fast Rapid growth is good news not bad so long as the business is earning more than opportunity cost of capital. Therefore, it seems illogical and unjustified if the effect of growth and its long term effects are not considered in the valuation process, *mutatis mutandis*, *inter alia* by taking either free-cash flow / operating cash flow to firm or equity. Therefore, the real benchmark free cash flow should be free net operating cash flow, which is taken in the computation of NPV.[16]

The valuation format based on free cash flow to equity is exhibited herein below

$$\textit{Value of a share} = \frac{\text{Present value (PV) of cash flows}}{\text{No of equity shares}}$$

Where,

$$PV = \frac{CF_1}{(1+r)} + \frac{CF_2}{(1+r)^2} + \ldots \frac{CFn}{(1+r)^n} + \frac{CFn}{(r-g)} \times \frac{1}{(1+r)^n}$$

CF = Free cash flow to equity = Net income + depreciation
(-) Capital spending
(-) Change in working capital
(-) Principal repayments
(+) New debt issues

r = Cost of equity

g = Normal growth rate

The Base Line Value is the value of the business assuming no further value creation. NOPAT is generally a good approximation for company's baseline cashflows i.e. its operating cash flow before new investment. The base line value can be estimated with the standard perpetuity formula, which divides the base line cash flow, by the cost of capital. Marketable securities are added and debts are subtracted to arrive at the base- line shareholder value.[17]

Like Dividend Discount Model with varying growth, the free cash flow is also used at varying growth rate, *mutatis mutandis* as under.

(a) CONSTANT GROWTH FREE CASH FLOW TO EQUITY MODEL[18]

$$P_0 = \frac{FCFe^1}{r - g}$$

Where, P_0 = Value of stock today,
$FCFe^1$ = Expected free cash flow to equity over the next year

CAVEATS IN USING THIS MODEL

1) In this method growth rate used has to be reasonable relative to the nominal growth rate in the economy in which the firm operates.
2) The firm is in a steady state in the sense that capital expenditures are not 'disproportionately' large relative to depreciation and is of average risk class
3) As regard risk, the beta of equity is not significantly different from one.
4) The firms growing at a rate comparable to or lower than the nominal growth in the economy best use this model. In other words this method is not suitable for high growth companies having a negative cash flows not due to operational inefficiency, but due to huge capital expenditure required for the growth. ***Therefore, in all the probabilities it is desirable to leave for the analyst some leeway on both counts including assumptions as to cash flow and discount rate.*** *A fortiori*, disinvested PSUs are also categorized as high growth companies. Therefore, this pure method is not suited to Indian PSUs, *inter alia* due to compelling assumptions made for application of this model.

(b) THE TWO STAGE FCFe MODEL[19]

$$\textbf{Share value} = \text{PV of FCFe} + \text{PV of terminal value}$$

$$= \sum_{t=1}^{n} FCFe_t / (1+r)^t + Pn\,(1+r)^n$$

Where, $FCFe_t$ = Free cash flow to equity in year t,

Pn = Price at the end of extraordinary growth period (Pn = FCFe (n+1)/(r-gn)

r = required rate of return by equity investors

CAVEATS IN USING THIS MODEL

This model makes same assumptions about growth, as the two-stage dividend discount model. However, this model provides better results than the DDM, when value in firms that either have dividend that are unsustainable because they are higher than the FCFe or that pay less in dividend than they can afford to. The limitation of this model is that it applies to only stable firms, where capital expenditure is offset by depreciation and has average rate of risk for all its stocks. Other limitations are the same as discussed in the original model hereinabove

(c) THE E-MODEL – A THREE STAGE FCFe MODEL[20]

This model calculates the PV of expected FCFe over all three stages of growth as under:

$$P_O = \sum_{t=1}^{n1} FCFe_{(t)} / (1+r)^t + \sum_{t=n+1}^{n_n} FCFe_{(t)} / (1+r)^t + Pn_2 / (1+r)^n$$

→ *High growth* ← + → *Transition* ← + → *Stable growth period* ←

Where, P_O = Value of stock today,

$FCFe_{(t)}$ = FCFe in the year t,

r = Cost of equity

Pn_2 = Terminal price at the end of transition period i.e. FCFe n_2 + 1/ ($r-g_n$)

CAVEATS IN USING THIS MODEL

1. In the high growth, phase, the capital spending is likely to be much larger than depreciation and in the transition phase the difference is likely to be narrow and capital spending and depreciation should be in a rough parity in the stable

growth. These assumptions were not valid for the PSUs, under reference taken for the study.

2. This model is normally applied to average risk rate firm.
3 This model holds all the assumptions of H model of DDM, but is most suited to value firm whose dividends are significantly higher or lower than the FCFe.
4. The FCFe model are suited to transactions of large take-over or in valuing firms in which there is a reasonable chances of changing corporate controls.

In the study under reference, in none of the PSUs the requirement of a stable firm, average risk rate class, change of control, target take over, etc. have been met with Therefore, these pure models are difficult to apply as defined.

C. *FREE CASH FLOW TO FIRM (FCF_f) METHOD*

A firm is composed of all its claim holders and includes in addition to the equity investor, bondholders, and preferred stock holders Therefore, FCF_f [21] is calculated from the cash flows to all these claim holders as under:

FCF_f = FCFe + Interest (1-Tax rate)
+ Principal repayment – new debts issue
+ Preferred dividends

OR

$FCF_{f(t)}$ = EBIT (1-Tax rate) + depreciation
(-) Normal capital expenditure
(-) Change in net working capital

$$\text{Therefore, the value of firm} = \sum_{T=1}^{n} \frac{FCF_{f(t)}}{(1+WACC)^t}$$

STRENGTHS

1. This model has all the similarities of the FCFe Model, except the denominator and the numerator. *Ceteris paribus*, this model gives the same value as the value given by the FCFe Model; if the value determined hereinabove is further deducted by the amount of debts and added by market value of security/investment. This is nothing but the determination of 'corporate value'.

2 In this model the denominator is taken as weighted average cost of capital as against cost of equity taken in the FCFe Model As regards the numerator, cash flow available to all the claim holders of the firm is taken into consideration, as against the cash flow available to equity holders in the FCFe model.

WEAKNESSES

1. This model is sensitive to assumption made about normal capital expenditure relative to the depreciation amount. In other words, this model is appropriate for firms, which are stable, and capital expenditure is normally offset by depreciation.
2. This model is suited to business positioned in the maturity stage of product life cycle or "cash cows" in the Boston Consultancy Group (BCG) matrix. This model is not suited to firm, which are in the growth stage or "stars" in the BC metrics.
3. In view of the peculiarities of Indian PSUs, vis-à-vis assumptions made for application of this model, the same is adjusted, *mutatis mutandis,* as in the computation of NPV.

D. *NET PRESENT VALUE MODEL OF EQUITY VALUATION (NPV)*

As per the survey of Cooper and Lybrand,[22] of 199 companies drawn from the large countries in Belgium, France, Germany, Italy, Spain, Sweden, Switzerland, United Kingdom, and the USA, it was, *inter alia,* concluded that NPV method of valuation was rated as the first in both the decisions, for ***acquisitions and divestments***

In NPV, wealth maximization implies maximization of NPV of a course of action The net wealth of a course of action is difference between the total of present value of its expected benefits and the present value of its expected cost Wealth maximization goal correlate the present worth of a firm and its value over the long run, *inter alia* considering profitability, growth of the firm, amount of risk, price of stocks and pay out ratio. This implies that if a firm is highly valuable for the foreseeable future, it will have high current value and vice-versa. Therefore, the value of equity share is equal to

$$= \frac{\sum_{t=1}^{n} \text{PV of expected cash flows} + \text{PV of terminal value of expected cash flows}}{\text{Number of equity shares}}$$

NPV of cash flow is calculated by deducting initial outlays from the total PV of cash flows. However, for computation of NPV for the study under reference, since the capital outlay at the time of disinvestment by the divestor is nil, the corporate value is derived accordingly, *mutatis mutandis*

a) Corporate value = Total sum of PV of expected cash flows + PV of terminal value of expected Cash flow.
(+) Market value of securities
(-) Market value of debts

b) Weighted average cost of capital (WACC)[23] = Kd *Wd + Ke * We.

$$Kd = \frac{\text{Interest (1-t)}}{\text{Average interest-bearing debts}}$$

$$Ke = Rf + (Rm - Rf)\,\beta i$$

Where, Rf = risk free rate
Rm = Return from market (BSE)
βi = Beta of security

METHODOLOGY USED FOR THE STUDY

For determination of value of a share of PSU, the following assumptions are made as under·

1. Present value of cashflows: The numerator (PV of cash flows) is taken as actual operating cash flows following the financial year in which disinvestment have been made through FY 1997–98, instead of projected cash flows as envisaged in the Model This is more plausible and logical in view of the fact that in this study, the actual data of post – disinvestment periods are available upto FY 1997 – 98. Therefore, to derive NPV of a share available actual data are considered.

2. Terminal value : Terminal value of cash flow[24] is computed based on the actual cash Flow derived for financial year 1997 – 98, alongwith the derived growth rate and the WACC. Therefore, the formula for PV of terminal value of expected cash flow is

$$= CF\ (1+g)/(WACC - g) \times 1 / (1+WACC).$$

With a view to smooth out the effect of abnormality of cash flow in the last year, in normal circumstances the average of last 3 years cash flow is taken into consideration for computing terminal value However, in the cases of astronomically high/low cash flow (like, BPCL, NLCL) 5 years average of cash flows or the average of all the years' cash flow is taken with a purpose to smooth out the very high terminal value and the resultant high PV of terminal value. This **normalization process** for determining eventual plausible terminal value has been considered just to have a conservative approach to determine the share price as fair as possible, *de hors* of abnormality of high terminal value at the year-end.

3. Growth rate : For determining the growth rate, after verifying the literature[25] available for the same and plausible practices followed by the consultants, the latest statistical technique of estimating historical growth rate in the cash flow is applied. The growth rate is computed, first by working out wealth ratio of cash flows and then the geometric mean of the same has been computed, inter alia with a view to smooth out extreme abnormality in the formula approach. This has also in turn, smoothing effect on the determination of terminal value and accordingly the same is arrived at on normal basis To be more explicit, the growth rate of over all period of FY 1986-87 through 1997–98 of 12 years is calculated, *mutatis mutandis* five times upto financial year of disinvestment. Accordingly growth rates for FY 1986–87 through 1991–92, 1992–93, 1994–95, 1995-96 and upto 1997–98 are calculated. Moreover, the comparison is made with over all geometric mean of growth rate in cash flow for the period under consideration, and the broken period of disinvestment as mentioned hereinabove Thereafter, **the lowest** of all the five growth rates have been taken as a conservative growth rate, for determining the value. In cases where the growth rate is greater than WACC, growth rate is ignored to smooth out the abnomalities and accordingly the conservative low terminal value is derived which is

in turn taken for the computaion of the share value under reference. In the cases of negative growth rate, it is deducted from one (i.e. 1 – g) and correspondingly is also added back to WACC, known as adjusted WACC. Thus, to smooth out the abnormalities in deriving the fair rate of growth, plausible and appropriate treatment of growth factor in the computation of share value is made by the researcher In nutshell, the following formula is used.

$$= CF(1 \pm g) / (WACC \pm g) \times 1/(1 + \text{adjusted WACC})$$

4. Weighted average cost of capital : The WACC is determined as under:

$$WACC = Kd \times Wd + Ke \times We$$

Where, Kd = as defined earlier
Ke = Cost of equity.

For determining the cost of equity of PSUs, the CAPM Model is followed, as it is widely used all over the globe Therefore, $Ke = R_f + (R_m - R_f)\beta i$

COMPUTATION OF R_f

R_f, the historical risk free rate for the purpose of CAPM is computed by way of deriving geometric average of yield on Govt. of India securities With a view to smooth out and normalize the abnormalities, the period for the purpose is taken from 1980–81 through 1990-91, 1992-93, 1994-95 and 1995-96 upto the years of disinvestment. Accordingly, the geometric mean of yield on government security is computed for 1990-91 at 6 65% per annum, for financial year 1992-93 at 6% p a. for 1994-95 at 6 20% p.a and 5 85% p a for 1995-96 respectively. The data is taken for the period 1980-81 through 1997-98, from RBI bulletin [26]

COMPUTATION OF R_m

R_m, the historical Return on Market is computed by taking the index values of sensex of BSE (Mumbai). The data for sensex is taken from indexes published in the RBI bulletin and data published by the Stock Exchange Official Directory (Mumbai),

taking the base year as 1980-81 = 100 through 1990-91, 1992-93, 1994-95 and 1995-96 upto the years of disinvestment. In this case also to smooth out and normalize the abnormalities, the geometric average of all the period under reference have been derived and accordingly, the same has been taken into consideration for computation of cost of equity.

COMPUTATION OF βi

βi, the beta of each equity security of PSUs is derived by applying the latest scientific method . Since most of the PSUs were not listed on the stock exchange prior to the period of disinvestment, on long term basis, historical betas are not possible to compute. Further extensive literature on beta computation based on alternative non-market methods has also been examined and accordingly the formula prescribed has been tried for Rosenberg and Marathe[27] suggested that fundamental information about a firm could be used in conjunction with historical beta estimate to provide superior predictors of future betas. The updated version of regression relating to the betas of NYSE and AMEX stocks in 1991 to five variables is adopted. This is defined as follows:

Beta = 0.9832 + 0.08 CV in Operating Income - 0.126 Dividend Yield + 0 15 D/E ratio + 0 034 growth in EPS – 0.00001 total assets.

For computing the historical betas of Indian PSUs, this model was also tried out but no satisfactory results were achieved, such as deriving positive betas, *inter alia* due to high asset base of PSUs and absence of data on dividend yield prior to the year of disinvestments. Therefore, the only alternative available to the researcher was to use proxy company's beta in the same or nearby industry sector In India for the first time betas of 600 companies under the title corporate data base were published in the Chartered Financial Analyst[28] Accordingly, historical betas of proxy companies falling in the industrial sector or near industrial sector in which disinvested PSUs were classified by the Public Sector Enterprise Survey have been taken into account Since, the historical beta of proxy companies were affected by leverage in their capital structure, the technique[29] of **de-levering** and **re-levering** the **un-levered** beta is followed with the mix of capital structure of respective PSUs, with a view to

smooth out the abnormalities and to incorporate the effect of leverage on the risk. The details of which is discussed herein below:

(a) **De-levering** : The levered beta of proxy-companies in the industry group have been un-levered (assuming that the debt is risk free) by the following formula:

$$\mathbf{Ba} = Be \times E / E+D(1-tc)$$

Where, Ba = Beta of asset
Be = Beta of equity of proxy companies
E = Total equity / networth
D = Total liabilities
t_c = Corporate tax rate prevalent in the respective years

Simple average of **un-levered** betas of proxy-companies so derived in the respective sector/s has been computed.

(b) **Re-levering** : The average un-levered beta computed herein above (a) (supra) have been re-levered as per the actual debt equity ratio of respective PSUs (39 PSUs) by the following formulas.

$$\mathbf{Be} = Ba \times E + D(1-t_c) / E$$

The adjusted beta for each PSUs is accordingly calculated and thus used for the computation of cost of equity in the CAPM model.

Based on the above mentioned 3 parameters viz. Rf, Rm, Beta, and using the CAPM, cost of equity (Ke) is derived For the purpose of computation, the base of post – tax cost of Kd and Ke, is taken into consideration and accordingly after giving book value weightage the cost of capital of each PSUs is computed. While calculating the PV of cash flows per equity share, necessary adjustment for bonus issue and increase in capital has been made, *mutatis mutandis*

STRENGTHS

1. This model is more scientific and widely used all over the globe by the acquirer and the divestor. This method was also rated as number one method used by

decision makers for acquisition and divestment all over the world as per the survey of Coopers and Lybrand [30]

2. It takes into consideration, parameters of modern financial theory viz. time value of money, reckoning of risk through CAPM, growth and wealth generation mechanism.

3. *Ceteris paribus*, there is also a direct nexus amongst Net Present Value (NPV) and Economic Value Added (EVA) and Market Value Added (MVA). Therefore, accepting positive NPV projects should result in a positive EVA for the company and to a positive MVA. Therefore, it ensures whether adding value and generating of wealth, for the business take place or not.

WEAKNESSES

1. It is difficult to estimate with accuracy the cash flow, discount rate etc It requires complicated calculation but this limitation is not acceptable now in view of the availability of computers and use of artificial intelligence

2. This model imparts a stand-alone valuation model In other words, it does not consider the opportunity value of cash outflow and volatility of the market share price.

3. It ignores the impact of size, scale and strength of the capital outlay. Cash flow figures are more suitable, but can be easy to manipulate and cash flow target can be met by cutting back on the areas that create real value, such as marketing.

E *INTERNAL RATE OF RETURN METHOD (IRR)*

While NPV is computed in absolute rupee terms, Internal Rate of Return is computed in percentage (%) terms *Ceteris Paribus*, Internal Rate of Return is equal to a point where NPV is equal to zero. This method has its improved version in terms of overcoming its limitations, known as Modified Internal Rate of Return (MIRR) Since in this research study, comparison of share prices of disinvested PSUs are made in absolute rupee terms per equity share of Rs.10/-, economic value as per NPV method is calculated and compared, thereby excluding the computation of IRR.

V SHAREHOLDER'S VALUE ADDED (SVA) VALUATION METHOD

The merchant of Venice, EVA ® [31] and DCF are well known as 'A pound of flesh No more, no less'. All required a detailed understanding of balance-sheet (like Swimsuits) meaning thereby what is seen on it, is interesting but what is hidden (makes one go up to the wall) items and lines in the P&L account which are invented mainly for Tax-abatement purposes. Apparent and pivotal importance is to understand a firm's value is derived from cash from operations discounted over the life of a company The two well-known intellectuals father of the 'value approach' [32] viz G.Bennett Stewert III *The quest for value* and Mckinsey & Co *'Valuation'*, have gone one step further of the value approach and the concept of cash flow and its present value method namely, Prof. Merton Miller and Franco Modigliani.

Bennett Stewert shows the corporate world a method of measuring economic value added. Typically, EVA is difference between operating profit and the cost of capital employed. In any year that a company is in business and generating more operating profit than its capital charge, it is adding and creating economic value and wealth By discounting the spread at a cost of capital one gets cumulative PV of all future economic value additions Add this to the current capital and one gets the value of company.

Alfred Rappaport carried out the original thinking, as catalyst. This got started a major change in the way both management and share holders acted upon Thereafter, in the Value Based Management (VBM) process, the strategic management has received much attention, to promise the value of a business in terms of returns to share holders, known[33] as SVA in Mills and Print , VBM in Smith and EVA by Stern Stewart & Co. In each case the strategic goal is to augment shareholder's value, *inter alia* by focussing on share price. Thus, if growth is the stated goal of the firm, but the emphasis on size and market shares causes the return on capital to be inadequate to compensate shareholders for the risk they are taking, then the share price will fall Shareholder value analysis attempts to reorient goals so that the interests of Managers

and Shareholders are aligned. The origin of SVA also related to the weakness of income statement and limitations of free cash flow method of valuation.

- **Limitation of income statement:**

1. It does not consider the quality of earnings – merely the quantity
2. It does not distinguish between earning derived from true operating activities and assets and those from non-operating assets/activities.
3. It only considers the debt costs of financing. By ignoring the cost of equity it places a penalty for choosing a mix of debt/equity in the capital structure.

- **Limitations of free cash flow:**

Free cash flow is only a useful measure over the life of business but a company can have a large negative cash flow for several years and be perfectly a profitable, such as Witness Intel, because company with attractive growth prospects, often spend more cash than they generate Conversely, cash flow can be large and positive if companies under spend on maintenance and new capital investment – a popular measure to boost short-term result, but at what long-term cost?

The answer lies in the concept of Economic Value Based Management, the route to shareholder's value as a means of evaluating underlying business performances and when effectively applied and implemented it provides an excellent tool for **strategic valuation**, investment appraisal, and planning and strategic pricing decision.

The shareholder value added per equity share,[34] is measured as under:

$$SVA = \frac{\text{Strategic value of Enterprise}}{\text{Number of equity shares}}$$

Where, ***STRATEGIC VALUE*** of an Enterprise is computed as under:

Cumulative present value of economic profits.
Add · Opening Invested Capital (OIC)
= ***Business value (BV)***

Add : marketable securities

= ***Corporate value (CV)***

Less: Market value of debts
= ***Strategic value (SV)***

i) Σ PV of economic profit :
= Economic profit x PVIF (WACC, n) plus
PV of terminal value of economic profit.

ii) WACC = weighted average cost of capital.

iii) n = Years in time horizon

iv) NOPAT = EBDIT (-) Depreciation – Cash tax.

v) EP = NOPAT – (Opening Invested Capital x WACC)

vi) Opening Invested Capital = fixed assets plus net working capital less long-term liability.

vii) Value = Invested capital + EP / (1+WACC) . .....Epn / $(1+r)^n$

STRENGTHS

1. The traditional accounting perspective can be tracked back to the 1300 A D and focuses on Stewardship reporting and is principally backward looking Against this backdrop, EP type measure of valuation is more concerned with the future economic profit that are likely to be generated over the life of business and the risk associated with them with the focus that opportunity cost of capital is achieved. All stakeholders can ensure that opportunity cost of providers of all the capital is recovered/charged Accounting numbers and traditional financial ratios will be affected by the movement from industrial companies to Knowledge companies Shareholder's value calculations will not.
2. In the case of high asset base Enterprises, in measuring value of economic performance, the Opening Invested Capital plays paramount, ological, important and pivotal role. From a business valuation perspective the value of a business appears to be independent of Opening Invested Capital. This has to be accompanied by a word of caution in that the component that make up the value of the business are very different By comparing the beginning value of a business

with its ending value plus free cash flow over the period, the Total Business Return (TBR) effectively replicates total shareholders return.

3. Cash flow is estimated based on five drivers of value viz., sales growth, operating profit margin, cash tax rate, fixed capital needs and working capital needs. The other two drivers used are cost of capital and planning horizon.
4 The beauty of SVA is that it is more than calculating the value of an enterprise in the sense that it incorporates a thinking about financial structures that also facilitates a better understanding of the mechanism in a balance-sheet and P&L account. Pure cash flow analysis will miss crucial opportunities by disregarding the companies with negative cash flow (like Indian PSUs) in their early life Therefore, SVA imparts a very handy set of tools to understand and question the actions of management and value its progress year by year.
5. SVA is based on idea that profitability is as important as valuation in selecting individual shares, its intrinsic value but more importantly an increased market value, which as shareholders would very much appreciate. SVA value reflects the risk of investment The study undertaken by Ross Paul Bruner (1998)[35] for 12 years period inter alia concluded that the high EVA value quintile at 0.7 x EVA value (i.e market value/EVA valuation) = 0.7X) and outperformed significantly on an equal and capitalization weighted basis (+ 46 P.P. and + 68 P.P. respectively). The forth quintile trades at 0.9 x EVA value and out perform significantly on an equal and capitalization weighted basis (+ 34 P.P. and + 42 P.P. respectively). The third quintile trades at 1 x EVA value and outperform on an equal and capitalization weighted basis (+ 13 P.P. and + 14 P.P.) respectively, illustrating the concept of "SWEET SPOT". The second quintile trades at 1 3 x EVA and outperform on an equal and capitalization weighted basis (- 7 P P and – 28 P.P. respectively) The low EVA value quintile trades at 8 x EVA value and under perform on an equal and capitalization weighted basis (- 26 P.P. and – 41 P.P respectively). In short avoid only the most highly valued share relative to quality and search for value within the "SWEET SPOT".
6. SVA will give more information than DCF, in that management will see a clear connection between **operating and strategic investment decision**. Economic Value based Management (EVM) connects forward looking valuation

procedure with the subsequent evaluation of performances. Coca-Cola was the first to use EVM. Trend of EVA makes the concept as long term measures of capital market and product market in a Value.Based Management (VBM).

WEAKNESSES

1. It is very difficult to estimate perpetual value of business. However, when selling, rather than buying a share / business, as such in the disinvestment decision, the perpetuity approach has greater appeal
2. This approach to valuation does not consider the value of various opportunities and options available to the strategic management and as a result in the era of uncertainty, many a time the decision makers may mislead himself, if due weightage to ***option value*** is not given.
3. It also affected by different accounting policies and standards. However, the adjustments to reported financial statements may overcome these limitations
4. It does not consider "soft assets" in the value of Opening Invested Capital taken for determination of cost of invested capital.

VI *MARKET VALUE METHODS*

(A) PRICE/ EARNING MULTIPLE (PEM) METHOD

This method of valuation is a part of every day vocabulary of investors in the stock market and is widely used but misread of all multiples. The value of a share based on P/E multiple is as under

Value of a share = P/E multiple (times) X EPS_1

Where, P = Market price of a share
E = Earning per share for the period `0'
EPS_1 = Expected EPS for the year hence.

Alternatively, fundamentally P/E multiple[36] can also be calculated as under·

P/E_1 = Payout ratio / (r – Gn)

Where, r = rate of return required by the share investors.
Gn = normal growth rate.

STRENGTHS

1. This method of valuation is easy to calculate and facile to understand by an amateur investor.
2. If the P/E multiple of the candidate company is not available, many a times P/E multiple of proxy-companies / Industry / Market can be taken as a base for estimating the value. This shows the convenience of a P/E multiple as a tool of valuation.
3. This method of valuation is an intuitively appealing statistic that relates to the price paid for the current earnings.
4. P/E multiple are proxies for a number of other characteristic of the firm, including the risk, growth rate, etc
5. Comparisons are often made between P/E multiple in different countries with the intention of findings under-valued and over-valued markets. However, care should be taken to eschew misleading decisions due to differences in the underlying variables.

WEAKNESSES

1. P/E multiple eliminates the need to make assumptions about risks, growth, pay out ratio, all of which have to be estimated for DCF valuation. This is not comprehensible and seems disingenious because P/E multiple is ultimately determined by the very same parameters that determine value in DCF models.
2. Market many times makes "systematic errors" in valuing entire sectors To illustrate, say investor has over valued retail stock on average using the average P/E multiple of these stocks will build in that error into valuation.
3. Many a times it is very difficult to find a matching comparable.
4. P/E multiple is not meaningful especially when the EPS is negative. However, this limitation can be overcome by taking the normalized EPS, wherever it is possible. Likewise, for cyclical firms, P/E multiple of extreme high and a low may cause a problem for valuation.

METHODOLOGY USED FOR THIS STUDY

In all the 39 PSUs disinvested in India, market prices of only two PSUs were available on the stock exchange at the time of first round of disinvestment (and not for the others). Hence in the absence of P/E multiple of each PSUs, as an alternative, P/E multiple of proxy-comparable companies,[37] like the base taken in selection of betas, have been taken for the consideration Moreover, with a view to eschew over valuation and to smooth out abnormalities into normalization process , industry average P/E multiple is also calculated and compared Wherever no specific industry averages P/E multiple is available; near industry P/E multiple is calculated and compared with the comparable proxy-companies In all after making the objective comparison of various P/E multiples, a lower of P/E multiple, either of a proxy-comparable company or Industry average is taken as a base for computing share value based on this method of valuation

VARIANTS OF P/E MULTIPLE

Business practicenors and investors over a period of time have developed several other multiple with their esoteric purposes, which includes as under.

(B) PRICE TO BOOK VALUE MULTIPLE (P/B)

Ceteris Paribus, stock selling for well below the book value of equity, have generally been considered good candidate for under valued portfolios, while those selling for more than book value have been target for over valued portfolios The P/B multiple is calculated by the following formula.

$$\textit{P/B Multiple} = \frac{\text{Market price of equity}}{\text{Book value of equity}}$$

Fundamentally, the P/B multiple is also calculated as under:

$$\textit{P/B Multiple} = \frac{\text{ROE x POR}}{(r - g)}$$

Where, ROE = Expected return on equity
POR = Dividend Pay Out Ratio

STRENGTHS

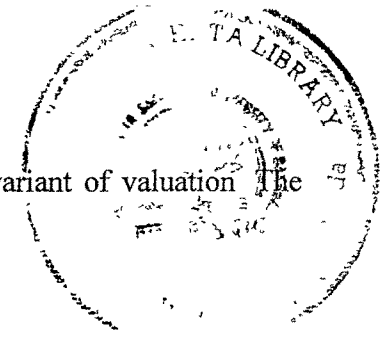
1 This multiple or ratio is used by Investors for screening under-valued and over-valued stocks Ben Graham[38] used, for instant, listed price being less than 2/3 of Book Value, as one of the criteria to be used to pick stocks.
2. It provides relatively stable, intuitive measure of value that can be compared to the market price. The Investor who mistrusts DCF estimate of value often uses this method.
3. For identification of undervaluation or overvaluation over similar firms having similar accounting standards this ratio is used Firm having negative earnings can also use P/B multiple for investment evaluation.
4. The gap between market value and book value can be used to measure the quantum of 'soft assets', which are not recorded on the balance sheet. This ratio is most widely known as indicator of existence of intellectual capital, as one of the method of measuring value of soft assets.[39]

WEAKNESSES

1. This multiple is affected by idiosyncrasies of different accounting standards and decision on depreciation, inventory valuation practices, deferred taxes, etc.
2. For service firms, new economic stocks where book value may not carry much meaning, as they do not have many tangible assets on their balance-sheet, but have much off-balance-sheet hidden assets.
3. In case of huge negative earnings and accumulated losses, resultant negative P/B multiple is of no use to the investor as one of the benchmark of valuation

(C) PRICE TO SALES MULTIPLE (P/S)

The P/E multiple and Price to Book value ratio remained the most widely used of the ratios in valuation. However, in recent years, analysts have increasingly turned to value as a multiple of revenue in the form of sales, *inter alia* to overcome limitations of positive cashflows and net earnings in the early years of the business. Recently,



new economy stocks are also being valued based on this variant of valuation. The captioned ratio[40] is calculated as under:

P/S = Price / Sales.

STRENGTHS

1. This ratio is simple to calculate and easy to understand, especially the firms having negative free cash flow in the initial period of investment.
2. This ratio is useful especially when P/E multiple and P/B multiple are negative and not meaningful for the purpose of Investment. This ratio is useful for trouble firms, as well.
3. Unlike dividend/earning/cash flow, this ratio is much less affected by creative accounting practices. Recently, all the new economy shares have attempted to compare this ratio as a multiple for making Investment.[41]
4. P/S ratio is less volatile and is stable It provides a convenient handle for examining the effect of changes in product pricing policy and other corporate strategic decisions.

WEAKNESSES

1. The forte of stability can become a disadvantage when the firm's problem lies in cost control. In such cases, revenue may not decline, even though the earnings and value dropped precipitously.
2. Failure to control cost and profit may mislead the valuations, especially, in a divisional and multi-product firms.
3. Since sales is vanity, profit is sanity and cash is reality, this model has no much value for the purpose of analyzing under-valuation and over-valuation

(D) MARKET CAPITALIZATION (MC) METHOD

This method of valuation is a further resemblance of P/E multiple with number of shares the firm has in its capital structure Typically, market capitalization[42] of a firm can be calculated by multiplying the numerator of P/E multiple with number of equity shares. The formula is as under:

MC = Market value of a share **x** number of equity shares.

STRENGTHS

1. This method is used as the maximum amount of payment the divestor can expect from the acquirer if the investor is willing to pay. Therefore, this value can act as a cap for the divestor and a negotiating tool for the acquirer. The value derived based on PEM is per share while market capitalization is the aggregate value of all the shares.
2. This method is rough and ready benchmark for determining the synergy Vs the anergy.

WEAKNESSES

1. Analyst has to use his/her wisdom in estimating the total market capitalization *inter alia* by smoothing out the abnormalities of fluctuations in the stock market prices. This limitation makes this method subjective and involves an element of hunch especially as to reckoning of time period and hence is less objective.
2. This method is almost a duplication of P/E multiple method of valuation and accordingly all the limitations of P/E multiples applied to this method as well, *mutatis mutandis*.
3. It is very difficult to find out a comparable cases and transactions in case of unlisted and/or closely held companies.

   Since in case of Indian PSUs as well, shares were not actively traded on the stock exchanges and also no 1.1 comparable cases are available in India, the PEM value per share is computed and compared for each PSUs based on assumptions made. In light of the above and with a view to eschew duplication MC is not computed and compared as a separate method.

VII. *FAIR VALUE PLUS INTEREST METHOD (FI)*

This is not the standard method of valuation of equity shares as per the standard literature available on corporate valuation, however, the same is suggested by

Mishra[43],et al as one of the valuation method for valuation of shares of Indian PSUs. According to this method, valuation is done by taking into account the total investment at the time of acquisition and by adding to the same an equivalent of 15% rate of interest every year on compounded basis. From the total sum so computed, the total amount of dividend paid to shareholders and stock re-purchases from the date of acquisition stretching to the date of valuation has to be deducted. Total number of equity shares to arrive at the value per share of the company divides the reminder. This method of valuation is suitable for companies having non-volatile assured income stream and for companies, which make capital addition only now and then. It is not useful in cases of corporate having negative networth. The formula given by the author is as under

Value = Principal + Interest / number of equity shares
= $P (1+r)^n$ / number of equity shares

Where, P = The total paid up capital in the year of acquisition
r = 15% rate of interest
n = number of years
Number of equity shares duly adjusted with fresh, bonus and right issues

STRENGTHS

1. Though this method is not widely used by consultants in the global field of corporate valuation, it has its own strength in the sense that it attempts to compare the minimum expectation of investor to have cash flow at a rate of 15% interest per annum.
2 The seller as a benchmark, which under the normal circumstances one cannot go below can use this method as a floor value.

WEAKNESSES

1 This method is not widely used by corporate consultants in practice in view of the in-built limitations such as it does not consider, actual free cash flow available to equity / firms, risk of the investment, option, opportunity cost, etc. in the determination share value per share
2. The benchmark rate of 15% per annum compounded is taken *sans* ascribing any objective justification, inter alia keeping in view the price discovery process and efficiency of use of assets acquired by making investment

3. *During the course of discussions by the researcher with renowned corporate valuers at Mumbai,* especially for taking any benchmark rate of interest in the disinvestment process, they all vehemently argued that for valuation, how any benchmark rate of interest can be taken as a compounding base to investment especially, when your assets are not used effectively and consequently not earning the required return as expected by the investor.[44] This may be the expectation of seller, which undoubtedly and unwittingly differs, with the expectation of buyers
4. The compounding effect has live linkage with time horizon from the date of acquisition to the date of valuation and not with other factors effecting the valuation process such as cash flow, discount rate, risk element, opportunity value, etc.
5. In the typical Indian PSUs irrespective of economic efficiency, based on this method the CONCOR incorporated in 1988 has much less value than the FACT incorporated in 1943.

Keeping in view the in-built limitations, this method is not considered as one of the methods of valuation for the purpose of this study.

VIII *MARKET VALUE OF ALL ASSETS (MVAA)[45]METHOD*

In the concept of relative valuation method, the independent professional valuers determine market value of assets. The measurement of market value of assets varied as per the subjective judgement of the valuer, in addition to other idiosyncratic factors and non-idiosyncratic factors prevailing at the time of valuation. This method is more useful where a proportion of hard assets required to be sold is more as compared to the soft assets. This method is more useful in determining the liquidation value for closer of units In India so far disinvestment in 39 PSUs are concerned, in none of the PSUs the asset has been sold.

However, with a view to give objectivity and scientific shape to the study and to offer guiding valuation and pricing strategy to the Sovereign divestor for the future, the researcher has attempted to derive the Market Value of All Assets, including Soft Assets of PSUs, *inter alia,* by considering the effect of inflation factor. The Market

Value of All Assets comprises of Market Value of Hard Assets and Soft Assets of an undertaking. While detailed computation of Market Value of Hard Assets and Soft Assets of all the 39 PSUs are exhibited in the Chapter No. 6 (*infra*), the assumptions and methodology used for deriving the Market Value of All Assets are as follows.

METHODOLOGY USED FOR DERIVATION OF HARD ASSETS

Out of 39 PSUs wherein disinvestment had been made, only 3 PSUs were incorporated prior to the 1950s and the rests were incorporated after 1950s. With a view to find out the 'replacement cost/market value of fixed assets' since their acquisition, the gross fixed assets have been inflated / deflated as per the inflation index published by the RBI.[46] In India, based on the perusal of authenticate literature, the oldest inflation index data are available from financial year 1952–53 with a base of 100 Therefore, "index numbers of Whole Sale Price – By groups and subgroups with base 1952–53 = 100, average of months / average of weeks ended Saturday", are used for the purpose of the study Index numbers of Wholesale prices – Industry-wise is taken as base, wherever it is available for a particular industry. In other cases, near industry sub-group and/or overall index of manufacturing is taken as surrogate. Moreover, the index numbers are "re-based" to original base of 1952–53 = 100, wherever found necessary The methodology to compute replacement cost of fixed assets is used, as developed by Shri S R Hashim and M M.Dadi.[47] The suitable inflator adjustment factor from the year of incorporation of each PSUs to the financial year 1986 – 87 was arrived at by the process of computing Geometric mean of the Index and thereafter, by applying the same to the opening balance, the gross fixed assets were inflated / deflated. Thereafter, the incremental fixed assets (after FY 1986 – 87 onwards, through 1997-98) are also inflated / deflated accordingly based on inflation index of respective years. In the study undertaken by Shri.S.R.Hashim and M.M.Dadi (*supra*), they had used simple average for the purpose. Here, the researcher has used geometric average of inflation index, as it is more scientific and rational method recognized by strategic investor in the valuation process

The inflated / deflated gross fixed assets, are then depreciated based on the ratio of net fixed assets to gross fixed assets Other assets such as net current assets, etc have

been taken at book value for the reasons that they are recorded at the current cost in the financial statement. For Market value of investments and securities, the book value of the same reflected on the audited balancesheet is taken as the value for the purpose of the study. Thus, net replacement/market value of Hard Assets is computed as discussed hereinabove for the purpose of the study.

METHODOLOGY USED FOR DERIVATION OF VALUE OF SOFT ASSETS

Excess earning method of valuation

This method of valuation is also known as Calculated Intangible Value (CIV) or Comprehensive Value (CV) by Lev Baruch or Treasury method [48]. This method is used mainly for determining the value of soft assets and is accordingly added to the value of hard assets to arrive at comprehensive value of an Enterprise. The origin of this method dates back to Revenue Ruling 68 – 609 of the US in 1920 (Internal Revenue Service) This method help calculate the excess return on hard assets reflected on the balance-sheet then uses this figure as a basis for determining the proportion of return attributable to soft assets In addition, Lev Baruch,[49] Stewart T.A., uses this method for computing intellectual capital – The new wealth of nations by taking average of 3 years

Financially the intellectual capital addresses the most fundamental features of a market economy. The sum of the cost of the company does not necessarily equal its price This is so because over the past decades a large part of global population has moved from using a cost base command economy, (in which the concept of consumer demand and the effect on price was never addressed) to a market economy The scale of the difference can be illustrated in the table, which compares the market value to book and replacement cost [50]

TABLE : 4.01

MARKET VALUE TO BOOK AND REPLACEMENT COSTS - A COMPARISON

($ In billions)

Companies	*Market value*	*Net asset*	*Replacement Estimate*	*Hidden value**
Coca cola	148	6	15	90%
Microsoft	119	7	18	85%
Intel	113	17	43	62%
General Electrical	169	31	77	54%
Exxon	125	43	107	14%

*Hidden Value is = (Replacement value / Market value) - 1

Source: Rupert Booth, "The Measurement of Intellectual capital", Management Accounting, CIMA, London, Vol. 76, No. 10, November 1998, p. 27.

From the above table, it is crystal clear that the quantum of soft assets or in other words the quantum of hidden value not reflected on the balance sheet is ranging from 14% to 90%. Therefore, it is (in all probabilities) desideratum in the process of valuation to reckon the quantum of soft assets, including for Indian PSUs, by whatever method one can determine. Typically, the measurement of comprehensive value of hard and soft assets may also be determined as under:

(1) Estimate the net tangible asset value for the subject business entity.

(2) Estimate normalized level of earnings

(3) Estimate an appropriate or fair percentage of rates of return or capitalization rate on the net tangible asset value. This may also be taken as WACC.

(4) Accordingly, excess earning is computed and it is divided by the capitalization rate. The capitalization rate may be the required returns by the equity shareholders Alternatively, one way of determining the capitalization rate is a reciprocal of pay back period. This process arrives at the value of soft assets In this study, the required rate of return is computed as Ks = r = I + Br +Fr (supra), which is more scientific and ological.

(5) Value of soft assets derived as above is added to the value of hard assets Thus, the comprehensive value of business computed.

(6) Applying the analogy of growth model the Normalized Earnings (NE) are adjusted for growth rate. As discussed in the NPV model, *mutatis mutandis* the formula is as under:

$$NE = \frac{\text{Average Earnings } (1 + g)}{(r - g)}$$

STRENGTHS

This is the most widely used method to determine value of soft assets and then adding the same to hard assets to arrive at comprehensive value of any business. However, different authors in view of various factors may make some refinement. Some have used the discounting rate as WACC or some use fix percentage such as 7.5% for fixed operating assets and 4.5% for financial assets. This is the easy method not only adopted by courts but also suggested by Lev Baruch.

WEAKNESSES

1. When the hard assets base is astronomically large then the soft assets and when earning is not a commercial objective of a business, though the business is in a growth stage, it has negative goodwill But actually this is not so in the real commercial world.
2. In practical life it is very difficult to determine with accuracy the three parameters such as normalized earnings, growth rate, WACC (the capitalization rate)

METHODOLOGY USED FOR DERIVING MARKET VALUE OF ALL ASSETS (MVAA)

(a) For Hard Assets, inflation adjusted value of fixed assets as discussed hereinabove is derived. The adjusted fixed assets are further added to net current assets plus book value of investment. This sum is reduced by the long-term liability, *inter alia* to arrive at the total net assets available to equity shareholders

(b) For Soft Assets, the treasury method recommended by several authors including Mr Lev Baruch is used for deriving the value of Soft Assets of PSUs.

(c) The Hard Assets and the Soft Assets are added to arrive at total Market Value of All Assets. The same is divided by number of equity shares to arrive at per share value

❖ MODIFIED TOBIN'S Q RATIO

This technique was originally developed by Nobel prize winner economist, James Tobin, as a method of predicting investment behavior in an economy. Tobin's Q ratio provides an alternative to the P/B multiple or ratio, *inter alia* by relating the market value of the firm to the replacement value of the assets in place This measure is more important especially for the firms having high quantum of hard assets in their balance sheet where inflation has pushed up prices of the assets or technology has abated the prices of assets This measure may provide a better measure of undervaluation. Typically the Q ratio[51] is calculated as under:

$$\textit{Q Ratio} = \frac{\text{Totals market value of equity + Total market value of debts}}{\text{Total replacement cost of assets.}}$$

This ratio is refinement over P/B multiple in the sense that the numerator includes market value of equity and debts and not only market value of equity, unlike P/B multiple. Likewise, denominator includes current replacement cost of all the assets and not only the book value of assets (i.e. net worth). Therefore, historical cost needs to be adjusted to the effect of inflation.

Ceteris Paribus, when the Q ratio is greater than one the firm have an incentive to invest as it is getting monopoly rents or higher than normal returns on investment, and when Q is less than 1, it is cheaper to acquire assets through merger than buying it. In other words, Q ratio of less than one suggest that there is undervaluation of market value of equity and/or debts and in all probabilities the market has not properly recognized the real net wealth of the company.

P/B multiple ratio and Tobin's Q ratio, both methods are best suited for making comparisons of the value of intangible assets of firms within the same industry, serving the same market and that have similar types of hard assets. A modified version of the Lewellen and Badrinath measure of Tobin's Q by Darell E. Lee & James G. Tompkins[52] is also studied while making study under reference.

METHODOLOGY FOR THE PURPOSE OF STUDY

Tobin's Q ratio is also computed for the study based on the following assumptions for all the PSUs, under reference For deriving the value of replacement cost of fixed assets and net current assets, the methodology used for determination of Market Value of Hard Assets, as discussed hereinabove is taken as the value of replacement cost of assets. Thus, the value of the denominator is taken as value derived in the computation of Market Value of Hard Assets for the purpose of computation of the Q ratio, under reference.

For the numerator, to compute market value of equity[53], average (high-low) market price of equity share of PSUs listed on BSE as on last day of financial year is taken for the purpose of study. Where the stock is not listed on BSE, the market price prevailed in the respective stock exchange is taken for computing the market value of equity. As regards, debt book value of debt is taken as market value of the debts, *inter alia* in view of the existence of contractual and non-trading nature of debts in India.

Accordingly, based on the above, the Tobin's Q ratio for all the PSUs for the last 3 years including 1997 – 98 have been calculated and compared, as in most of the cases listed market prices of equity shares were not available for earlier years on the recognized Stock Exchanges. To smooth out the fluctuations in Tobin's Q ratio for respective 3 years, simple average of last 3 years or for the available short period is computed and compared for 38 Indian PSUs. In case of one PSU viz. MMTC Ltd , since no listing is made till 31.3.98, it is not possible to correctly compute the Tobin's Q ratio. The detailed PSU-wise computation of Tobin's Q ratio is exhibited in Chapter -VI (*infra*).

IX *OPTION PRICING MODEL (OPM)*

DCF Method of valuation is rather like a **loaded gun** – able to hit the target in the hands of marketman, but have general hazards in the hand of amateur. It is fact of the life that money is worth different amount at different times and the Investor has the option to spend money now in expectation of receiving a large amount in a later day

A typical DCF method only gives a stand alone valuation amount. It does not take into consideration the analysis of contingent claim each pay-off has in it. *Ceteris Paribus*, DCF methods rejects the projects having negative NPV or zero NPV, though the project has opportunity value in it.

Options are basically derivative securities. The option-pricing model can also be applied to value any asset that has the characteristics of an option with some Caveats In the equity share valuation option pricing theory can be applied to value equity as a call option on the firm, a patent will be valued as an option on a product and natural resources/wasting assets as option.

In the equity valuation based on option pricing model, it assumes that

1. Equity can be viewed as a call option on the firm where exercising the option requires that the firm can be liquidated and face value of the debts which corresponds to the exercise price paid off. On liquidation, the pay off to equity investors can be written as V-D, if V > D or as Zero if V < D, where V = value of firm and D is the face value of the outstanding debt and other external claims.
2. The model for computing option value is the model described by Black and Schole, which is widely used by the entire community of practitioner. The model[54] is as under:

$$\text{Value of call} = SN(d_1) - Ke^{-rt} N(d_2)$$

$$\text{Where, } d_1 = In(S/K) + (r + \sigma^2/2)t \,/\, \sigma\sqrt{t}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

N (x) = Area under standardized normal distribution ($Z \leqslant X$)

S = Current value of underlying assets

K = Strike price of the option

t = Life of expiration of the option

r = Riskless interest rate corresponding to the life of option

σ = Variance in the *In* (value) of the underlying assets.

CAVEATS IN USING THIS MODEL

1 Troubled firm appropriately uses this model and the firm that has the following peculiarities.

a. There are only two claim holders in the firm: Debt & Equity.
b There is only one issue of debt outstanding and it can be retired at face value.
c. The debt has a Zero coupon and no special features like convertibility, put clauses, etc.
d. The value of the firm and its variance in that value can be estimated reasonably.

2. This model has wide applicability in valuation, especially in context where traditional DCF valuation model and multiple does not work Keeping in view the assumptions required to be adhered to for application of this model and in view of the peculiarities of Indian PSUs, the pure model is difficult to apply in view of the followings:

a Fulfillment of all the assumptions required for the model is not met with the idiosyncratic characteristics of Indian PSUs.
b. It is not possible to work out variance of underlying assets and variance in log (stock prices), especially when no normal listed market prices were available at the time of disinvestment, the period for which various methods of pricing are compared. Moreover, working of dividend yields is also not possible in the year of disinvestment, *inter alia,* due to peculiarities of Indian PSUs.

4.02 SELECTION OF NETWORK OF PRICING METHODS- *A PHENAKISTOSCOPE*

Financial Engineers and Analysts are well aware of the following changes already occurred and are occurring in the 21st century. They are.

1. Every business is adopting the concept of Value Based Management (VBM) VBM is a framework for measuring and more importantly managing business to create "Superior Long Term Value", for shareholders that satisfy both the capital and product market[55]
2. As a financial analyst, it is desideratum to know what are the new concepts for the cyber age Investor. They are[56] .

TABLE : 4.02

COMPARISON OF OLD AND NEW ECONOMIC PRINCIPLES OF MODERN FINANCIAL THEORY

20th CENTURY	**21ST CENTURY**
Economics	Bionomics
Zero sum	Positive sum
Physical capital	Human / Intellectual capital
Diminishing returns	Increasing returns
Comparative static	Non-Linear Dynamics
Command and Control	Neural Net works and Webs
Efficient Market Hypothesis	New Market inefficiency
Information symmetry	Information asymmetry

In view of the above, it is observed that our traditional mind set has always somehow perceived business as "**Buying cheap and Selling Dear**". The new approach defines a business as the organization that **"Adds value and Creates wealth".**

Keeping in view the above the strategic Analyst should have in his kitty, new appropriate tools and techniques to gauge valuation in the cyber age economy against, the machine age. As a strategic marketing concept, it is desideratum to delight our investor and how he perceives value investing simultaneously ensuring delightment of majority if stakeholders.

Despite the proliferation of valuation tools and techniques over the past 100 years, many active Managers apparently are still struggling to justify their *raison d'être It is more dangerous to act with today's tools with yesterday's thinking in this cyber age* Therefore, today investor has new concepts and new thinking for the economy, markets, business, processes, products, margins, returns, and values.

Therefore, in a typical decision for disinvestment transactions, it is *sine qua non* to analyze how the acquirer and the divestor perceive the transactions and how they value these transactions all over the world. Many studies have shown that acquirer

achieve significantly poor returns after the take over of the company, although this evidence is not entirely conclusive. Aggrawal[57] showed that the shareholders of an acquiring company suffer a statically significant wealth loss of 10% over the 5 years of the following the merger completion. Higson & Elliot[58] found negative returns to UK bidders around 10% over the two years post take oversee that bidders shareholders suffer negative returns in the announcement period unless they are hostile bidders and target shareholders gain in the announcement period. These results found contrary to the Efficient Market Hypothesis, which would suggest that the market correctly value shares, and will give normal return.

Coopers and Lybrand[59] found that with the notable exception of the USA, companies in all other countries under study by their own assessment over paid for their acquisition in over 20% of the case studies. This survey concluded the fact that companies over pay was not the major concern, rather that over paying is not considered to be a major fear.

To quote from the report:

"It is worrying that acquisition were considered successful even when it was acknowledged that with hindsight that the price paid was too high. It is critical that the accurate pricing and receiving value for money should be considered as acquisition objective".

This survey also found a number of valuation techniques commonly used by the acquirer and the divestor. Table 4.03 shows the most important valuation methods used for acquisition and divestment by the global players in the field.

TABLE : 4.03

MOST IMPORTANT VALUATION METHOD USED FOR ACQUISITION AND DIVESTMENT

Valuation methods	Number of responses
NPV	39
IRR	18
SVA	17
P/Emultiple	9
Market capitalization	7
Market Value of assets	5
Book value of assets	3
Market to Book ratio	3

Source: Mills Roger, "Shareholder Value Analysis in Acquisitions and Divestments by large U.K. Companies, Management Accounting, CIMA, LONDON, Vol. 76, No.2, February 1998, p.39.

Table no. 4.04 exhibits overall ranking of valuation methods used by the acquirer and the divestor in the major countries in the globe.

TABLE NO.- 4.04

OVERALL RANKING OF VALUATION METHODS USED

Valuation method	Ranking for acquisition	Ranking for divestment
NPV	1	1
IRR	3	4
SVA	5	4
P/E Multiple	2	2
Market Capitalization	7	7
Market value of assets	4	3
Book value of assets	6	6
Market to Book ratio	8	8

Source : Mills Roger, "Shareholder Value Analysis in Acquisitions and Divestments by large U K. Companies, Management Accounting, CIMA, LONDON, Vol 76, No 2, February 1998, p.39.

Table No. 4.05 exhibits the statistics of number of valuation methods used by the acquirer and the divestor as found in the survey carried out by Cooper and Lybrand.

TABLE : 4.05

NUMBER OF VALUATION METHODS USED

NUMBER OF VALUATION METHODS USED	NUMBER OF COMPANIES
1	1
2	2
3	3
4	8
5	5
6	8
7	28
8	47
Total	101

Source. Mills Roger, "Shareholder Value Analysis in Acquisitions and Divestments by large U.K. Companies, Management Accounting, CIMA, LONDON, Vol 76, No.2, February 1998, p.39.

Based on the international survey as discussed hereinabove and in view of the of investor in India and abroad, as also keeping in view the methods of pricing prevalent in India at the time of disinvestment and in view of suitability of each method of pricing based on its strength and weaknesses to idiosyncrasies of discussed hereinabove, the researcher has selected the widely accepted Network of Pricing Methods for this study under reference, they are :

I Net Tangible Assets Method (NAV)

II Price Earning Capacity Value Method (PECV)

III Fair Value Method (FV)

IV Net Present Value Method (NPV)

V Shareholders Value Added Method (SVA)

VI P/E Multiple Method (PEM)

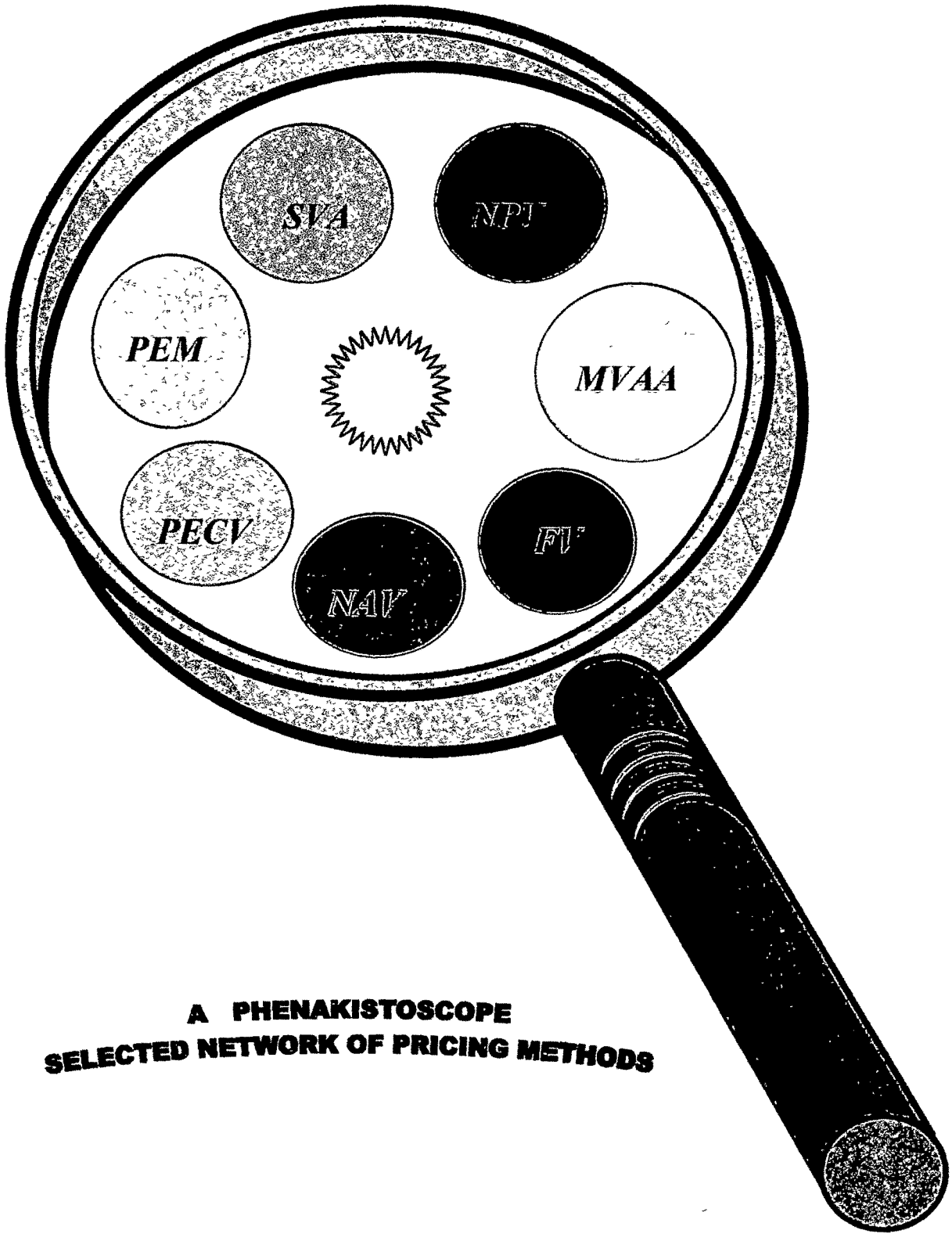
VII Market Value of All Assets Method (MVAA)

VIII Modified Tobin's Q ratio

Keeping in view the above and based on the scientific, ological and plausible analysis of the global scenario of modern finance and new processes of '**price discovery**', the researcher has endeavored to present the Selected Network of Pricing Methods in a pictorial form as under. With a view to help endoscope the ological and objective art of valuation and pricing aspects of management of disinvestment, the researcher has tried to discover the instrument of **"A PHENAKISTOSCOPE"** in which the sovereign divestor can view the different range of economic values derived from Selected Network of Pricing Methods A Phenakistoscope is defined[60] as an optic object resembling the 'zoetrope' – a disk in which figures on the inside of a revolving cylinder are arranged about the central and are viewed through slits in its circumference and paper like a single animated figure.

In the similar lines, in the process of determination of valuation and pricing of disinvestments, the derived economic value based on Network of seven methods of pricing which are widely practiced both by the acquirer and the divestors all over the globe, are exhibited in a disk. The animated view of developing negotiating capabilities for disinvestment and acquisition decision can be sharply taken by endoscopic analysis of 'phenakistoscope' by the both, *inter alia*, to add value and create wealth and total cash flow returns of disinvestment for all the stake-holders The researcher therefore, christens the Selected Network of Seven Methods of Pricing as a useful instrument of 'phenakistoscope' for management of strategy of determination of ological and optimal valuation and pricing of disinvestment The picture view of an instrument of **A PHENAKISTOSCOPE** in which, these methods of pricing are presented is depicted in the Picture 4.0a, as under:

PICTURE : 4.0A A PHENAKISTOSCOPE



A PHENAKISTOSCOPE
SELECTED NETWORK OF PRICING METHODS

4.03 VALUATION SYNTHESIS AND CONCLUSION

As there are no scientfic rules for discretion with the selection as to which method of valuation to use, there are no specific rules with regards to the weighting of the results of two or more methods of valuation. It is the quality, business and professional acumen of the negotiating team, integrated marketing capabilities of each party, etc., will influence the determination of value vs. price Moreover, different approaches of valuation are not discrete but have considerable overlap, viz. market multiple with economic profit/cash flow, economic earning and use of assets, etc. Therefore, instead of determing proportion of weightage, it must be left to the discretion of negotiating team, to determine it based on the existing facts and prevailing circumstances of the decision and purpose of the valuation However, for objectivity the following are to be observed scrupulously:-

(a) A range value

Instead of point value, a range of economic values based on Selected Network of Pricing Methods may be catered in the form of a PHENAKISTOSCOPE , letting the discretion with the decision maker, *interalia* to use either mean or median or any other appropriate factor of weightage within the derived range of a minimum to a maximum value. This will undoubtedly facilitate the leverage for better marketing and negotiating capabilities in a due diligence.

(b) **A relation value**

As the range has its forte in the decision making process, business or share valuation estimate may be expressed as a relationship to a given values, such as not less than rupee *x* or not more than rupee *x*, as the case may be.

To wit, based on the various assumptions made herein above, the share price of each PSU selected for the purpose of study is calculated as per **S**elected **N**etwork of **P**ricing **M**ethods discussed herein above. The derived share prices based on above-mentioned methods have been extensively and intensively compared and collated,

alongwith objective and ological strategic, economic, statistical and market comparison of disinvestment prices of portfolio of PSUs of the Sovereign divestor. The same is presented in the next chapters.

REFERENCES

1. Kotler Philip, Marketing Management – The Millennium Edition, Prentice Hall of India Pvt. Ltd., New Delhi, 1999, pp 35-37.
2. Namavati Roshan, Theory and Practice of Valuation, 1998, Lakhani Book Depot, Mumbai.
3. Adopted from the article of Palande Pravin, "Valuing Corporate Gray Matter", Trends, Think Tank, The Financial Express, February 22, 2000, p. III.
4. Gasson Christopher and Jolly Adam Corporate Finance Handbook, Kogen Page, British Library cataloging in Publication Data, London. (kpinto@kogean-Page.co.uk.)
5. Gurney Roland, Share Valuation Manuel, Gower (1987).
6. Mishra R.K., "Hyderabad Allwyn-An exercise in Valuation", The Chartered Accountant, Feb-00, pp 12-20, as also from Mishra R.K , Nandagopal, A lateef Syed Mohamed , "Sale of Public Enterprise Shares – Frittering Away Nation's Wealth", Economic and Political Weekly, November 27, 1993, pp. M 163-M168
7. *Ibid.*, pp. 12-20.
8. These capitalisation rates have been prescribed by the then CCI, Which are adopted from the study Materials provided for preliminary stage of students of CFA, by the Institute of Chartered financial Analyst if India, Hyderabad, India.
9. *Ibid*
10. Chandra Prasanna, Financial Management· Theory and Practice, 1997, Tata McGraw Hill Publishing Co. Ltd New Delhi, pp 112-120 and for deriving rate of return required by the equity investors viz Ks = r from Chandra Prasanna, "Pricing of Public Issues", Chartered Financial Analysts, Hyderabad, India, July-Aug-89, pp.3-7
11. Damodaran Aswath, (i) Damodaran on Valuation –Security Analysis for Investment and corporate Finance, 1994, John Wiley & Sons Inc., New York, pp.43-53 and (ii) Corporate Finance, Theory and Practice, 2000, John Wiley & Sons Inc., New York, pp.617-674.
12. Ibid. (i), p 51
13. *Ibid* (i), pp 51-52
14. *Ibid* (i), pp. 53.
15. The observations are based on the article of Priyadarshi Atul, Team Analyst, "Valuation–Solving the Tech-riddle", (Valuation of Amazon com under Damodaran's Model), Chartered Financial Analyst, July –2000, pp 47-50 and

Desmet Driek, Francis Tracy, Hu Alice, Koller Timothy M & Riedel George A, "Valuing dot-coms", www.Mckinseyquarterly com.

16. Gurusamy S., " How to compute NPV: "A Primer" The Management Accountant, ICWAI, Calcutta, India, Vol 33, No 6, June 98, pp. 464-469.

17. Rappaport Alfred, Creating Shareholder Value- A Guide for Mangers and Investors, 1998, The Free Press, New York, pp.100-111 and 193.

18 Damodaran Aswath, Damodaran on Valuation –Security Analysis for Investment and corporate Finance, John Wiley & Sons Inc., New York, pp.127-131

19. *Ibid*, pp.131-136.

20. *Ibid*, pp.137-140.

21. *Ibid*, pp.144-166.

22. Mills Roger W, "Shareholder Value analysis in acquisition and divestment decisions by large UK Companies", Management Accounting, CIMA, London, Vol.76, No 2, February 1998, pp 38-40.

23 Brealey Richard A. and Myers Stewart C , Principle of Corporate Finance, 1997, Mcgraw-Hill, inc , New York. pp.457-458.

24. Mills Roger, Rowbotham Sean and Robertson John, "Using Economic Profit in Assessing Business Performance" (Strategic Valuation), Management Accounting, CIMA, London, Vol.76, No 10, November 1998, pp.34-38.

25. Sridhar S , "The Analyst top 10 India's Most Investor Rewarding Companies-Corporate Catwalk", Chartered Financial Analyst, ICFAI, pp.23-34.

26. Reserve Bank of India, "Reserve Bank of India Bulletin", Monthly Publication of Reserve Bank of India, Mumbai, India, years 1980-81 through,1996-97

27. Rosenberg B, and Marathe M, " Test of Capital Asset Pricing Hypothesis, Research in Finance 1, pp. 115-124, adopted from Damodaran Aswath, Damodaran on Valuation –Security Analysis for Investment and corporate Finance, John Wiley and Sons Inc., New York, pp. 33

28. The ICFAI, "Corporate Data Base", Chartered Financial Analysts, India, June 1993 through December 1995

29 The derivation of beta for PSUs are based on the computation given by Parkinson C. and Ogilvie J., Strategic financial Management- Guidance and revision, 1999, Stage *4*, CIMA, LONDON, U.K., Published by Viva Books Pvt. Ltd., New Delhi, pp. 265-267 and Mc Cosker Philip, Method used to evaluate Investments in Capital Projects, CIMA Student, CIMA, London, U.K., No. 16, Feb –1997, PP 48-49.

30. Mills Roger W, "Shareholder Value analysis in Acquisition and Divestment decisions by Large UK Companies", Management Accounting, CIMA, London, Vol.76, No. 2, February 1998, pp. 38-40.

31. EVA is the registered trademark of Stern Stewart & Co.

32. Bruner Ross Paul, Global Equity Selection Strategies, 1998, GPCO, Chicago, Illinois, p.44 and Rappaport Alfred, Creating Shareholder Value- A guide for Mangers and Investors, 1998, The Free Press, New York, pp. 56.

33. All these references are reproduced from the article of Smith Malcolm, "Shareholder value. where the theory and practice converge", The Management Accounting, Vol.75, No 10, November 1997, pp. 34-35.

34. The formula for computation of SVA is processed from definitions and detailed computation give by Mills Roger, Rowbotham Sean & Robertson John, "Using Economic Profit in Assessing Business Performance" (Strategic Valuation), Management Accounting, CIMA, London, Vol. 76, No. 10, November 1998, pp 34-38

35. Bruner Ross Paul, Global Equity Selection Strategies, 1998, GPCO , Chicago, Illinois, pp. 53-91

36 Chandra Prasanna, " Understanding the P/E multiple", Charter Financial Analyst, Hyderabad, India, Vol. 8, No 9, Sep-93, pp. 1-6.

37. The base of Proxy/ Comparable companies P/E ratio is Taken from the discussion made for beta by Van Horne James C., Financial Management and Policy, 1996, Prentice Hall of India Pvt. Ltd., New Delhi, p.215 and p.776.

38 Damodaran Aswath, Damodaran on Valuation –Security Analysis for Investment and corporate Finance, 1994, John Wiley & Sons Inc., New York, p.240

39. Dzinkowski Ramona, "The Measurement and Management of Intellectual Capital . An Introduction", International Management Accounting Study, Management Accounting, CIMA, London, U K , Vol. 78, No 2, February 2000, pp 32-36

40. Damodaran Aswath, Damodaran on Valuation –Security Analysis for Investment and Corporate Finance, 1994, John Wiley & Sons Inc., New York, p 240.

41. This observation is processed from Desmet Driek, Francis Tracy, Hu Alice, Koller Timothy M & Riedel George A, "Valuing dot-coms", www.Mckinseyquarterly com.

42. This method of valuation as one of the method of valuation is based on the article of Mills Roger W., "Shareholder Value analysis in acquisition and divestment decisions by large UK Companies", Management Accounting, CIMA, London, Vol.76, No 2, February 1998, PP. 38-40

43. Mishra R.K , "Hyderabad Allwyn-An exercise in Valuation", The Chartered Accountant, Feb-2000, pp.12-20.

44 This observation is based on the discussions had at the UTI INSTITUTE OF CAPITAL MARKETS, Professional Development Programme on "Corporate Valuation", 27July-29 July 2000, Which was attended by the researcher

45. This is a new method of valuation of an equity share devised by the researcher based on the determination of Market Value of All Assets.

46. Reserve Bank of India, "Reserve Bank of India Bulletin", Monthly Publication of Reserve Bank of India, Mumbai, India, years 1952-53 through,1996-97.

47. Market value / replacement cost of fixed assets are derived based on the methodology developed by Hashim S.R. and Dadi M.M., Capital Output Relation in Indian Manufacturing (1946-1964), The Maharaja Sayajirao University, Economic Series NO 2 (1973). For rest of the hard assets and liabilities plausible assumptions prevalent in the real life business environment are enumerated.

48 Value of Soft Assets are derived by using the Treasury method as discussed by Shannon P. Pratt, Robert F Reilly, Robert P. Schweihs, Valuing a Business – The Analysis and Appraisal of closely held companies, (1996), *IRWIN.*, Professional Publishing, Chicago, Chapter 13, pp.285-297 and also by Lev Baruch of USA as per The Financial Express – Think Tank, "Intellectual Capital" – Valuation, Feb 22, 2000 PP.-VIII However, for determining the rate of return expected by the investor the methodology used by Chandra Prasanna, in the article "Pricing of Public Issues", Chartered Financial Analysts, India, July- Aug-89, PP. 3-7, is used.

49 The Financial Express – Think Tank, "Intellectual Capital" – Valuation, Feb 22, 2000, pp.VIII.

50 Adopted from Booth Rupert, "The Measurement of Intellectual Capital", Management Accounting, CIMA, London, U K , Vol. 76, No.10, November 1998, Pp 26.

51. Brealey Richard A. & Myers Stewart C., Principle of Corporate Finance, 1997, Mcgraw-Hill, inc., New York, pp. 244-262.

52. Lee Darrell E. and Tompkins James G., "A Modified version of the Lewellen and Badrinath Measure of Tobin's Q", Financial Management (AIMR), Vol 28, NO 1, spring 1999, pp. 20-31.

53. The average of high and low of market prices of equity shares of PSUs are taken from the data published Capital Market, The Stock Exchange(Mumbai) Official Directory and average equity share price quotations published by Taxman.

54. Damodaran Aswath, Damodaran on Valuation –Security Analysis for Investment and corporate Finance , 1994 John Wiley & Sons Inc., New York, pp 319-365

55 Booth Rupert, "The Measurement of Intellectual Capital", Management Accounting, CIMA, London, U K., Vol. 76, No. 10, November 1998, Pp. 26-28

56. These new principles are processed from Bruner Ross Paul, Global Equity Selection Strategies, 1998, GPCO, Chicago, Illinois, pp 27-42

57. Mills Roger W., "Shareholder Value analysis in acquisition and divestment decisions by large UK Companies", Management Accounting, CIMA, London, Vol. 76, No. 2, February 1998, P-38.

58 *Ibid.*, pp. 38-40

59. *Ibid* , pp.38-40.

60 The definition of the word 'Phenakistoscope' is taken from Webster's Third New International Dictionary unabridged, Konnmann, p. 1695.

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