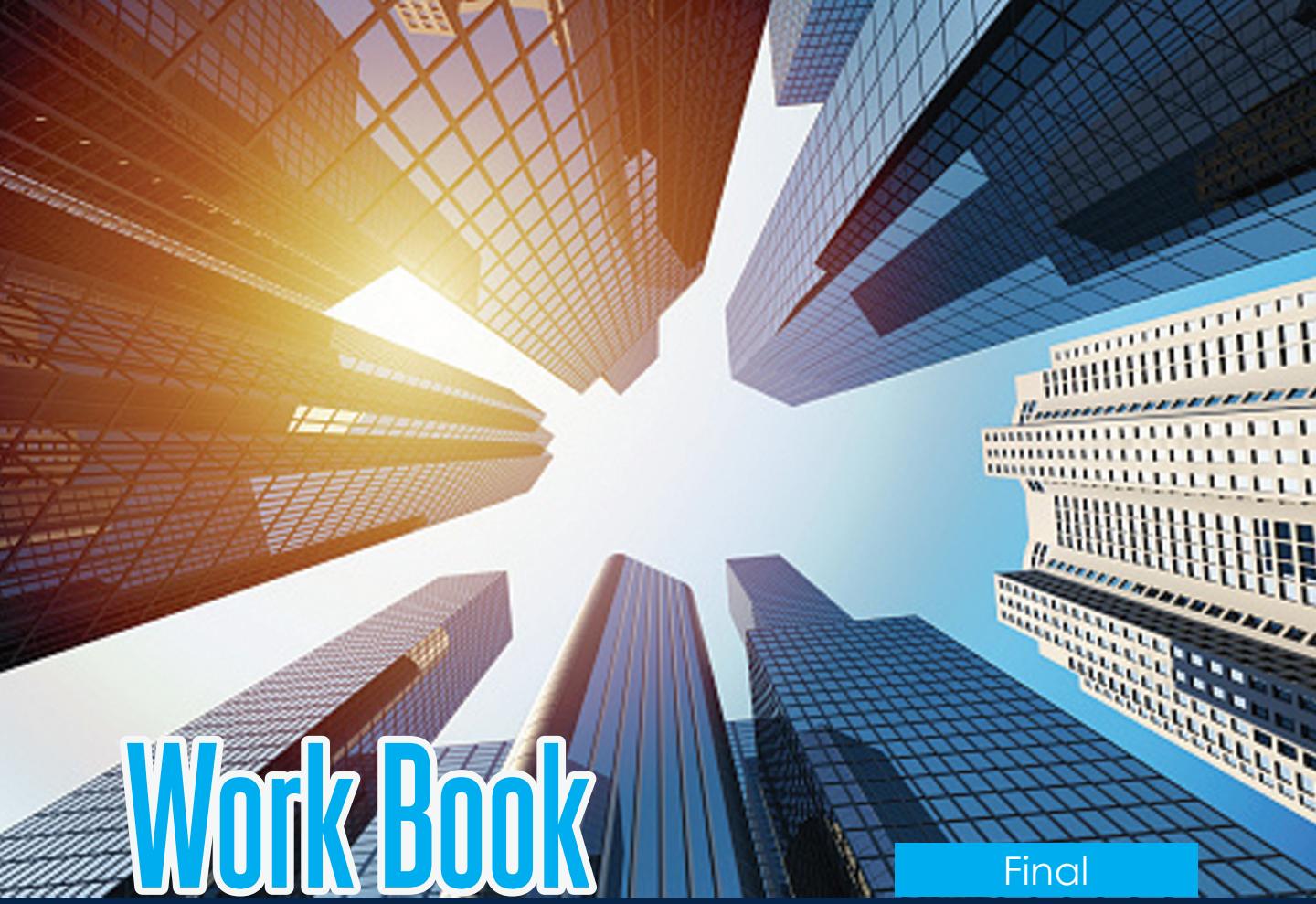

Work Book

Final

Strategic Performance Management and Business Valuation

Elective - Paper

20 A

The Institute of Cost Accountants of India

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WORKBOOK

Strategic Performance Management and Business Valuation

FINAL

Paper 20A

SYLLABUS 2022

The Institute of Cost Accountants of India

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Preface

The landscape of professional education is undergoing a profound transformation, driven by the evolving demands of a globally integrated economy. In this dynamic environment, it is imperative to equip students not only with technical knowledge but also with the analytical skills and professional acumen essential for success.

Effective learning extends beyond theoretical understanding—it necessitates the development of strong conceptual foundations, critical thinking abilities, and disciplined study habits. These attributes are cultivated through continuous practice and engagement with thought-provoking academic material. To facilitate this process, the curriculum, instructional methods, and assessments must be designed to provide comprehensive, structured, and intellectually stimulating learning experiences.

Building on the success of the previous editions, we are pleased to present the new edition of our 'Workbook' in an e-distributed format. This edition has been meticulously developed to enhance students' comprehension and application of key concepts. Each chapter is structured to offer a seamless learning experience and integrating practical illustrations in a phased manner to align with the evolving regulatory framework.

We are confident that this new edition will continue to serve as a valuable academic resource, empowering students to achieve their professional aspirations with confidence and competence.
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INDEX

1 Strategic Performance Management [Study Material - Section A (Module 1-4)]

ILLUATRATION 1

Beneish's M-score analysis for The Finshore Co., (TFC) is shown in the following:

Variable	Value
DSRI	1.19
GMI	0.88
AQI	0.90
SGI	1.12
DEPI	1.19
SGAI	0.78
Accruals	0.12
LEVI	0.55
M-score	-1.53
Probability	9.58%

1. Using a cutoff value of -1.78 for the M-score, what would you conclude about the probability of earnings manipulation for TFC?
2. What are the implications of the DSRI and DEPI variables for TFC?

Solution:

1. The M-score for TFC is given as -1.53 which is higher than -1.78, indicating a higher-than-acceptable probability of earnings manipulation. The estimated probability of earnings manipulation is 9.58%.
2. Both DSRI and DEPI (as well as SGI) have a value greater than 1. A DSRI value greater than 1 may indicate that the firm is accelerating revenue recognition. A DEPI value greater than 1 indicates that the depreciation rate was lower than the previous year. TFC may have used aggressive estimates for estimated useful lives or estimated salvage values or may be adopting more income friendly methods of depreciation.

ILLUSTRATION 2

Nidhi, CMA, gathers the following economic reports for India in the most recent two months:

Particulars	Latest Month	Prior Month
Building permits	1.80%	0.70%
Commercial and industrial loans	-0.90%	-1.60%
Consumer price index	-0.10%	-0.20%
Index of industrial production	0.20%	0.00%
New orders for consumer goods	2.20%	1.60%
Real personal income	0.00%	-0.40%

Based on these indicators, what should Nidhi conclude about the phase of the business cycle?

Solution:

Commercial and industrial loans and the consumer price index are lagging indicators. Industrial production and real personal income are coincident indicators. These indicators suggest the business cycle has been in the contraction phase.

Building permits and orders for consumer goods are leading indicators. Increases in both of these in the latest two months suggest an economic expansion may be emerging.

Taken together, these data indicate that the business cycle may be at or just past its trough.

ILLUSTRATION 3

King Indus Co., (KIC) produces heavy-duty automotive components. Financial results for KIC, as well as industry comparables, are shown the following:

KIC selected financial data (Amount in INR 000s):

Particulars	20 × 1	20 × 2	20 × 3
Sales	12,117	13,112	14,766
Accounts Receivables	1,272	1,573	2,363

Industry Average:

Particulars	20 × 1	20 × 2	20 × 3
DSO	22.6	22.8	22.4
Receivables turnover	16.2	16	16.3

1. Compute KIC's increase in revenue and receivables from 20×1 to 20×2 and from 20×2 to 20×3. Compare the change in revenues to the change in receivables.
2. Using end-of-year accounts receivables, comment on the trend in days' sales outstanding (DSO) and receivables turnover for KIC and compare it to the industry average.
3. Comment on possible revenue recognition issues at KIC.

Solution:

1. KIC's revenues increased at a slower rate compared to the growth rate in receivables indicating potential problems with collections and low quality of receivables.

Particulars	20 × 1	20 × 2	20 × 3
Change in sales	-	8.21%	12.61%
Change in receivables	-	23.66%	50.22%

2. DSI's days' sales outstanding is increasing over time and is significantly higher than the industry average. The receivables turnover ratio for KIC is declining over time and is lower than the industry average. Finally, the change in receivables as a proportion of revenues is positive and is increasing over time.

Particulars	20 × 1	20 × 2	20 × 3
Receivables/revenue	10.50%	12.00%	16.00%
Change in rec/rev	-	14.30%	33.30%
DSO	38.3	43.8	58.4
Receivables turnover	9.5	8.3	6.3

20×3 receivables turnover ratio

= net annual sales/average receivables = 14,766/2363 = 6.249

20×3 days of sales outstanding (DSO)

= 365/ receivables turnover ratio = 365/6.25 = 58.41

3. Based on all indicators, it appears that revenues at KIC are potentially of inferior quality. Analysts should be extremely skeptical about the earnings quality of KIC.

ILLUSTRATION 4

Coffee Brewers Limited's Statement of P & L for years just concluded shows the following figures:

Revenue - 500 lakhs

Cost of Goods Sold - 375 lakhs

Administration Cost - 64 lakhs

Relevant extracts from Balance Sheets at the end of the year just concluded and previous years are as follows-

INR in Lakhs

Particulars	End of year just concluded	End of Previous year
Total Assets	325	310
Total Liabilities	57	42

You are supposed to:

- Calculate Gross Profit Ratio and ROCE for Coffee Brewers Limited (CBL).
- Furniture industry earns GP at an average rate of 23%, while ROCE is 12%. Comment on the performance of CBL for the year just concluded.
- Advise after evaluating the performance of CBL if the furniture industry's ROCE is 16%.

Solution:

Calculation of Gross Profit Ratio

Gross Profit = Revenue - Cost of Goods Sold = 500 - 375 = INR 125 lakhs

Gross Profit Ratio = Gross Profit / Sale × 100 = 125 / 500 × 100 = 25%

Calculation of Return of Capital Employed (ROCE)

PBIT = Gross Profit - Administration Cost = 125 – 64 = INR 61 Lakhs

Average Capital Employed = [(325-57) + (310-42)] /2 = INR 268 Lakhs

ROCE = PBIT / Average Capital Employed × 100 = 61 / 268 × 100 = 23%

Since CBL's GP ratio and ROCE are better than the industry average, performance is acceptable.

If industry average ROCE is 16%, which is more than that of CBL (15%), the CBL needs to investigate the reasons for poor ROCE. Is it low profitability (due to high cost or low revenue) or are there unused assets? Depending upon the findings, the efforts shall be made to either rationalise the cost, revenue streams, or asset base.

ILLUSTRATION 5

GXP Limited has three divisions. Its desired rate of return is 14%.

The operating assets and income for each division are as follows:

Divisions	Operating Assets (₹)	Operating Income (₹)
G	19,20,000	3,45,600
X	10,50,000	1,73,250
P	12,30,000	1,67,280
Total	42,00,000	6,86,130

GXB Limited has ₹8,00,000 of additional cash to invest in one of its divisions.

The divisional managers have identified investment opportunities that are expected to yield the following ROIs -

Divisions	Expected ROIs for additional investment
G	16%
X	12%
P	15%

Required:

i. Calculate the ROIs at present for each division and state which division manager is currently providing the highest ROI.

ii. Based on ROI, identify the division manager who would be the most eager to accept the additional investment funds.

iii. Based on ROI, identify the division manager who would be least eager to accept the additional investment funds.

iv. State the division that offers the best investment opportunity for GXP limited.

v. Discuss the conflict between requirements (ii) and (iv) above.

vi. Advise how the residual income performance measure could be used to motivate the managers to act in the best interest of the company.

Solution:

i. Present ROI of each division

Divisions	Operating Assets (₹)	Operating Income (₹)	ROI
G	19,20,000	3,45,600	18%
X	10,50,000	1,73,250	16.5%
P	1230000	1,67,280	13.6%

The division manager of the G division is currently providing the highest ROI of 18% among the three divisions.

ii. The manager of division P would be most eager to accept the additional fund of ₹ 8,00,000 because the ROI of the proposed investment is more than the present ROI of 13.6%, and the acceptance of the proposal would increase the division's ROI.

iii. The managers of divisions G and X, both would be reluctant to invest the additional fund of ₹ 8,00,000. Because the return on the proposed project is 16% for L and 12% for X against their existing ROI of 18% and 16.5%, respectively.

However, the manager of division X would be least likely to accept the additional investment because the proposed ROI of the project is 4.5% less than the present ROI.

iv. Division G offers the best investment opportunity at 16% for GXP Limited.

v. Lack of goal congruence between divisions and the organisation as a whole is the reason. The divisional managers are forced to choose between the best interests of their division (because their individual performance is linked to divisional performance) and the best interests of the company as a whole.

In requirement (ii), the decision of the managers of division P is in the best interest of the division but at the expense of their company, resulting sub optimisation; whereas in requirement (iv), decision is taken from the perspective of GXP Limited as a whole.

vi. To avoid sub optimisation, the divisional performance can be measured using Residual Income (RI). Since under RI, divisional managers don't reject the proposed projects with lower returns than the existing rate of return of the division, hence in the interest of the organisation as a whole, the division is ready to accept the investment projects with returns equal to or greater than the predetermined required rate of return (i.e., 14%). RI, being an absolute measure, has the shortcoming that the performance of divisions with different sizes can't be compared.

ILLUSTRATION 6

Open Telecom Ltd. is a leading cellular service provider with a global presence. It aims to be the most innovative and trusted telecom company in the world. To achieve this aim, it is constantly working on its overall functioning. It is trying to adopt the best management practices in the world. The following is some information related to the company's performance for a particular period:

Particulars	Current Year	Base Year	Target
Operating Ratio	60%	54%	Reduce it to 50%
Average Revenue per user	225	210	Increase it to '250
Unresolved Consumer Complaints	27,500	25,000	Reduce it by 20%
Customer Relationship Centres	280	200	Take the total to 250
Employee Coverage under Training Programme	10%	8%	At least 15%

Required: Analyse the performance of the company using the Balanced Scorecard approach.

Solution:

The balanced scorecard is a method which displays an organisation's performance in four dimensions namely: financial, customer, internal, and innovation. The four dimensions acknowledge the interest of shareholders, customers, and employees; taking into account both long-term and short-term goals. The detailed analysis of the performance of the company using Balanced Scorecard approach is as follows:

i. **Financial Perspective:** Operating ratio and average revenue will be covered in this prospective.

   The company is unable to achieve its target of reducing the operating ratio to 50%; instead, it has increased to 60%. The company is required to take appropriate steps to control and manage its operating expenses.

   The average revenue per user has increased from INR 210 to INR 225 but remains short of the targeted INR 250. This is also one of the reasons for the swelled operating ratio. The company can boost its average revenue per user by providing more paid value-added services because the increasing price is not a fine choice considering the cutthroat competition in the telecom sector.

ii. **Customer Perspective:** Service complaints will be covered under this perspective.

   The company had set a target of reducing unresolved complaints by 20%, but unresolved complaints have risen by 10% [(27,500-25,000)/ (25,000) × 100]. It shows dissatisfaction is increasing among consumers, which would adversely impact the consumer's general perception of the company, and the company may lose its consumers in the long run.

iii. **Internal Business Perspective:** Establishing customer relationship centres will be covered under this perspective.

The company has established 80 relationship centres in the current period, exceeding its target of 50 (250-200) to cater to the needs of existing consumers as well as solicit new ones. This shows the seriousness of the company towards consumer satisfaction and would help them in the long run.

iv. **Learning and Growth Perspective:** Employee training program is covered under this perspective.

The company had set a target to cover at least 15% of its employee under its training program, but it covered only 10%. This could hurt the capabilities of the employees, which are needed for the long-term growth of the organisation necessary to achieve the objectives set in the previous three perspectives. People or the human resources of the company, is one of the three principal sources from which organisational learning and growth come.

ILLUSTRATION 7

Sukh Sadan community operates Shelter Services (SS) on a not-for-profit basis as a local solution to local housing needs. The primary objective is to meet the accommodation needs of persons within its locality targeting those living in the low/middle income groups and senior citizens. Accommodation is basically furnished; it consists of a small house, with kitchen, bathroom, bedroom/(s), and a sitting room. SS manages 450 such houses across various localities. Prestige Living (PL) is a profit-seeking organisation which provides rented accommodation to the public. PL manages 200 such houses across localities similar to SS' operations.

Income and Expenditure accounts for the year ended 31st March 2024 were as follows:

	SS	PL
Rent Received	1,02,98,600	1,09,98,000
Less:		
Employee Costs	24,00,000	38,00,000
Planned Maintenance and Substantial Repairs	34,19,500	10,41,000
Running Repairs	23,91,600	6,38,000
Miscellaneous Operating Costs	15,27,500	11,75,000
Insurance, Property Taxes, and Interest etc.	13,15,500	18,75,000
Operating (Deficit)/ Surplus	-7,55,500	24,69,000

Operating Information in respect of the year ended 31st March 2024 was as follows: House and rental information:

Size of House	Number of Houses		Rent per Week (in INR)	
	SS	PL	SS	PL
1 Bedroom +	40	20	400	750
2 Bedrooms +	80	40	450	800
3 Bedrooms +	250	140	500	1,175
4 Bedrooms +	80	Nil	700	N.A.

SS had certain houses that were unoccupied during part of the year. The rents lost as a consequence of unoccupied properties amounted to INR 18,17,400. PL did not have any unoccupied houses at any time during the year.

Employees were paid as follows:

Number of Staff		Salary per Staff Member (in INR) per annum	
SS	PL	SS	PL
1	2	3,00,000	5,00,000
2	2	2,50,000	3,00,000
4	11	2,00,000	2,00,000
8	-	1,00,000	-

Planned maintenance and substantial repairs undertaken:

Nature of Work	Number of Houses		Cost per House (in INR)	
	SS	PL	SS	PL
Miscellaneous Building Work	10	-	12,500	-
Sanitary Fittings (Kitchen + Bathroom) [all are the same size]	45	5	26,100	52,200
AC Upgrades/ Replacements	8	-	15,000	-
Replacement of Wooden Structure for 3-Bedroomed Houses	50	13	40,000	60,000

Running Repairs Information:

Classification of Repair	Number of Repair Undertaken		Total Cost (in INR)
	SS	PL	SS
Emergency	480	160	6,72,000
Urgent	990	376	11,28,000
Non-urgent	560	102	5,91,600

Each repair undertaken by PL costs the same irrespective of the classification of repair.

Required

i. Critically EVALUATE how the management of Shelter Services could measure the 'Value for Money' of its service provision during the year ended 31 March 2024.

ii. IDENTIFY, 2 performance measures in relation to Flexibility and Service Quality (dimensions of performance measurement).

iii. ANALYSE, 3 performance measures relating to 'Cost and Efficiency' that could be utilised by the management of Shelter Services when comparing its operating performance against that achieved by Prestige Living.

Solution:

(i) For commercial enterprises, generating profits is a very important objective. Likewise, not for-profit enterprises have certain cultural, social or educational objectives for which they are created. Regardless of the type of organization, it is important to know whether the internal operations meet certain performance benchmarks, that will ensure that the organization achieves its objectives in a better manner. Moreover, even if the organization does not operate for profits, it is important for it to be "cost effective". Resources (including money) should be used optimally to achieve intended outcomes. For example, SS can use this benchmarking tool to look into the following questions:

(a) Does the organization function in an efficient and cost-effective manner?

(b) Does the estate management make best use of the buildings to achieve the objectives of the organization?

(c) Does the estate management function manage upkeep of buildings in terms of repairs and improvements in an effective manner?

(d) Are the tenants satisfied with the service provided by the estate management and the suitability of the accommodation for their needs?

"**Value for Money (VFM)**" is an assessment made based on the criteria of economy, efficiency and effectiveness.

Economy involves minimising resource consumption while meeting specified requirements of quality and quantity. Minimize the cost of resources / required inputs (implies to spend less) while ensuring that the desired quality of service is achieved. For SS, inputs could be purchases made for maintenance and repair work like sanitary fittings, AC, wooden structure for the houses etc., while resources could be the labour employed to carry out these services. SS should aim at purchasing required quality of inputs at the least possible price. Skilled labour needed for this job should be procured at the lowest pay scale possible. Procuring these at lower cost leads to savings for SS. At the same time, SS should ensure that cost cutting / saving does not come at the cost of quality. Lower quality implies inferior service levels, which ultimately will compromise SS' social commitment to provide quality housing to needy members of its community.

Efficiency involves maximising the ratio between resources (input) and the output of goods, services or other results.

The focus of efficiency is on the process of rendering service. The objective of efficient operations is to maximize output using minimum resources. Improved productivity means that resources procured are used in an optimal way (implies spending well).

In the case of SS, one of the resources is the labour employed for repair and maintenance work. Efficiency (productivity) measured would be the relationship between the employees available and the repair work performed by them. If the pool of employees does more repair work than the benchmark set, productivity is higher. This also closely ties up with economy (cost) of operations. If the given pool of employees (resources), who are paid optimum salary (cost), cater to more repair and maintenance work, economy of operations is achieved due to higher productivity of operations. In case these activities are outsourced, efficiency and economy can be achieved by calling for tenders. Select the tender that provides maximum work for least cost.

In addition, SS may explore options for efficiencies from business process improvements, shared services as well as further efficiencies within assets management.

Effectiveness involves ensuring that the outcome achieves the desired policy aims and objectives. Have the objectives been achieved, how does the impact of the actual output / service compare with its intended impact? (Implies to spend money wisely to achieve desired objectives). In the case of SS, effectiveness could be assessed based on the following questions.

(a) Are the housing needs of the targeted community members met?

(b) Are the tenants satisfied with the accommodation?

(c) Given its social cause, are the staff friendly, courteous and hospitable to the customers?

(d) Do the housing accommodations comply with safety standards and other legal requirements?

Each measure is inter linked with the other. For example, SS has replaced sanitary fittings in

the kitchen and bathroom in 45 houses for INR 26,100 each, costing a total of INR 11,74,500. Compared to PL that has spent INR 52,200 on each house for sanitary fitting replacement. For the cost of INR 11,74,500 PL could have replaced fittings in only 22 houses (INR 11,74,500 / 52,000) as compared to SS' ability to replace fittings in 45 houses. Therefore, SS' decision has been economical, getting more work done for same cost. At the same time, this does not indicate whether the fittings replaced by SS are of similar or better quality as compared to PL. PL could have used better quality fittings that last longer, enhance customer experience, safety etc. The spending by PL could have been more effective than SS because it helps achieve the desired objective of customer satisfaction, safety and less running cost for maintenance. Therefore, to achieve economy, SS may have compromised on effectiveness.

Benchmarking is a good method of measuring performance it enables a comparison of the process, costs etc. with those of a close competitor. Services will be expected to use benchmarking information to learn from best practice, change procedures and processes to achieve enhanced methods of working, and reduce unnecessary expenditure.

However, benchmarking of performance against PL is not ideal. The performance of SS can be better measured by adopting benchmarking against similar charities whose primary objective is the provision of accommodation to the communities in which they operate.

Thus, SS must have permanent membership of the House Benchmarking Organisations, which helps social housing property-owners to compare the costs of service delivery, resources, and key performance indicators across all areas of the business. For example, the management of SS can enquire about a norm in respect of the repair charges, sanitary charges or wood structure replacement charges etc. of similar non-profit seeking organisations.

Further, benchmarking should be conducted annually to analyse all areas of the business and is used to identify high performing, low cost services. Using the annual benchmarking exercise results, the SS can plan to target those areas that are low performing and high cost.

Overall, SS should have strong commitment to value for money, which needs to be reflected in the business plan and in service-delivery plans. By applying these principles SS would be able to achieve the optimum utilisation of resources, which will in turn lead to extra capacity and allow SS to provide better services.

(ii) The Building Block Model proposed by Fitzgerald and Moon, gives six dimensions of performance measurement including service quality and flexibility.

Service Quality - Service quality is the measurement of how well a delivered service conforms to the customer's expectations. As a not for profit organization, SS provides housing services to cater to the needs of lower and middle income groups as well as senior citizens in the local community. Although service is provided at a concessional rate compared to its commercial peer ES, quality of SS' service needs to be judged based on certain parameters that were promised by the organization to its tenants. These could be used as parameters to assess service quality. Some of them could be:

- Behaviour, attitude, proactivity of staff employed by SS.
- Quality of basic amenities provided.
- Availability of on-site service for the residents
- Safety within and around the residential unit

Data for assessment of quality can be collected from feedback of tenants, analysing the number and nature of complaints made by tenants, tenant retention rate/loyalty etc. Feedback form tenants can be taken on specific issues or could be general in nature.

Flexibility - Flexibility is the ability of the organization to adapt to customers' requirements. This can be measured through service delivery time, promptness in responding to customer requests, ability of employees to perform different kinds of work etc. In the case of SS, the following performance measures can be used to assess the flexibility:

- The average waiting time for a tenant for a house to become available. Lower the wait time better the flexibility as it indicates that there are sufficient housing units available for rental accommodation.
- Following change in requirements, ability to meet the tenant's request for another house of a different size. This indicates whether the range of housing units offered is sufficient (flexible) to cater to the tenants' changing demand.
- Waiting time for undertaking repairs of an emergency nature, once notified by a tenant. Lower the waiting time during emergencies indicates the availability of appropriate personnel to carry of the repairs on short notice.

*(**Note**: Students are only required to provide two performance measures. These others have been given for completeness.)*

(iii) The management of SS could use the following performance measures –

An organization should aim at achieving results with maximum efficiency at the least possible cost. Efficiency measures the relationship between the input resources utilized and the output service achieved. Few of the measures that SS could use to compare performance with PL are:

The Average Employee Cost per week per house

Here, the resource (input) are the employees, which is 15 in case of both SS and PL.

The employees at SS cater to 450 houses as compared to 200 houses catered by PL. Therefore, SS is more efficient as compared to PL.

Likewise, cost of resources to SS is the employee cost, for which the pay structure and remuneration policies are different in both the organizations. SS has the ability to hire most of its resources at an annual salary of INR 1,00,000, which is the least level in the pay structure. Comparatively, PL also hires cheaper labour but at a slightly higher pay level of INR 2,00,000 annual salary. Therefore, the total cost of labour is higher by INR 14,00,000 (58%) for PL as compared to SS.

To compare the figures on a common factor, the employee cost can be calculated per week per house.

	SS	PL
The Average Employee Cost per week per house [INR 24,00,000^/ (450@ × 52)] and [INR 38,00,000^/ (200@ × 52)] ^ Employee cost from the income and expenditure table @ Number of houses (given): SS = 450; PL = 200	INR 102.56	INR 365.38

The average employee cost per week per house of PL is INR 365.38 (2.46 times) more than of SS. It can be concluded that SS is both efficient, in terms of being able to cater more houses with same number of employees, as well as cost effective due to the use of cheaper labour.

The Average Day to Day Repair Cost per week per house

Here, the resource (input) is measured in terms of the cost spent on repairs to maintain the rental houses. Running repairs are generally do not add much value to the rental houses. Therefore, lesser the repairs, higher the efficiency. From the income and expenditure table, it can be seen that SS has spent INR 23,91,600 as running repair cost for 450 houses versus PL that has spent INR 6,38,000 for 200 houses. To compare them on a common factor, the average repair cost per week per house has been calculated.

	SS	PL
The Average Day-to-Day Repair Cost per week per house [INR 23,91,600*/ (450@ × 52)] and [INR 6,38,000*/ (200@ × 52)] * Running repair cost from the income and expenditure table @ Number of houses (given): SS = 450; PL = 200	INR 102.21	INR 61.35

The average day to day repair cost per week per house for PL is INR 40.86 less than that of SS (-40%). This may be due to the fewer repairs required and the fact that there is no extra cost required for emergency and urgent repairs. The cost of repairs whether emergency, urgent or non-urgent to PL is the same, INR 1,000 [INR 6,38,000/ (160 + 376 + 102)] whereas the cost of emergency repairs to SS is INR 1,400 (INR 6,72,000/480), urgent INR 1,139 (INR 11,28,000/990) and for non-urgent repairs it is INR 1,056 (INR 5,91,600/560).

PL's low cost of repairs (which is identical for all types of repairs – emergency, urgent and non-urgent) may have been achieved through entering into a contractual agreement for repairs. SS should also think of entering into such contracts in order to save money.

Percentage of Rent Lost

Occupancy of rental houses indicate whether the capacity (in terms of houses rented) is being optimally utilized. Lesser the vacancy better the efficiency in terms of capacity utilization. This represents opportunity cost of not letting out the property.

	SS	PL
Percentage of Rent Lost = (Rent Lost / Gross Rent) [(INR 18,17,400/ INR 1,21,16,000)] Gross Rent = Rent Earned + Rent Lost = INR 1,02,98,600 + INR 18,17,400 = INR 1,21,16,000	15%	---

PL did not have any unoccupied properties at any time during the year; it has 100% occupancy. This shows that PL's properties are in high demand. On the other hand, SS has lost rent worth INR 18,17,400 through unoccupied properties; this is about 15% of the gross rent receivable.

The management of SS should identify the reasons why the houses remained unoccupied when the occupancy rate is 100% for an organisation like PL, a peer organisation should be used to benchmark the performance.

ILLUSTRATION 8

Flamingo Airline Limited (FAL), an international carrier took series of loans to finance the M&A deals, but now observing the working capital crisis. CEO of FAL in response to a question at recent press - conference, reported the Z-score of 1.6 and assure the investors as well as stakeholders that thing are under control. In which zone do you place FAL.

Solution:

Flamingo Airline Limited (FAL) will be placed in the Grey zone.

The classification criteria (into zones of discrimination) applicable to non-manufacturing entities, as per Z-score are-

Z-Score	Zone of discrimination	Prediction regarding corporate failure (due to bankruptcy)
Less than 1.1	Distress	Companies with a Z score of below 1.1 are in danger and possibly heading towards bankruptcy.
1.1 - 2.6	Grey	Companies with scores 1.1 to 2.6 need further investigation.
2.6 above	Safe	Companies with a score of 2.6 above are financially sound.

Mind-it, Skyway Airline Limited (SAL) is an international carrier, a non-manufacturing entity.

ILLUSTRATION 9

Following are the scores of six firms as per Argenti's A score model. You are required to identify healthy firms-

Firm	Defects	Mistake	Symptoms of trouble
1	10	0	4
2	2	15	0
3	10	15	0
4	15	0	0
5	0	30	0

Solution:

The maximum score allotted is 100 (being 43 from Defects, 45 from Mistake and 12 from Symptoms of trouble). For a firm to be cleared as healthy, its overall score must be less than the maximum acceptable score of 25 (with 10 and 15 being the maximum acceptable scores in defects and mistakes respectively). If a firm scores anything in Symptoms of trouble this is immediately seen as an indicator that the firm is at risk.

A firm that scores more than 25 overall, even if it scores below the individual thresholds in either of Defects (10) or Mistake (15), would still be considered at risk.

In case of 1st firm Symptoms of trouble score is 4, while in case 4th firm Defects score is more than 10 whereas in case of 5th firm Mistake scores are 30, which more than acceptable limit of 15, hence Firm 1, 4 and 5 are at risk. On contrary firm 2 and 3 are healthy.

ILLUSTRATION 1

Easy Shine is a startup company that uses a brushless machine to wash cars. Suppose Easy Shine makes an initial investment in equipment of INR 6,00,000. The equipment is depreciated on a straight-line basis over four years to a zero-book value. At the end of four years, the equipment will have a salvage value of INR 15,000. Easy Shine's marginal tax rate is 30%. The company is financed with 50% debt and 50% equity. The debt carries an interest rate of 6%, and the cost of equity is 19.8%.

Sales, Expenses, and Cash Flows as per market sentiments

	Year 1	Year 2	Year 3	Year 4
Sales	4,00,000	5,20,000	6,76,000	8,78,800
COGS	1,00,000	1,30,000	2,02,800	2,63,640
Gross Profit	3,00,000	3,90,000	4,73,200	6,15,160
Depreciation	1,50,000	1,50,000	1,50,000	1,50,000
Marketing Expense	80,000	1,04,000	1,35,200	1,75,760
Operating Income (EBIT)	70,000	1,36,000	1,88,000	2,89,400
Taxes at 30%	21,000	40,800	56,400	86,820
Operating income after taxes	49,000	95,200	1,31,600	2,02,580
Add back depreciation	1,50,000	1,50,000	1,50,000	1,50,000
After tax operating cash flow	1,99,000	2,45,200	2,81,600	3,52,580
Salvage value				15,000
Tax on salvage value				4,500
After tax salvage value				10,500
Total after tax cash flow	**1,99,000**	**2,45,200**	**2,81,600**	**3,63,080**

Easy Shine expects that it will have a year-on-year sales growth of 50%. Assume that cost growth rates remain the same as per market predictions.

i. Calculate WACC

ii. Based on 50% probability of both market sentiments and Easy Shine's expectation combined, calculate the NPV considering both the situations.

Solution

WACC = (0.198)(0.5) + (0.06)(1-0.3)(0.5) = 0.12

NPV based on market sentiments

Year	Cashflow	PVIFA,12%	PV of Cashflow
0	(6,00,000)	1	(6,00,000)
1	1,99,000	0.8929	1,77,679
2	2,45,200	0.7972	1,95,472
3	2,81,600	0.7118	2,00,437
4	3,63,080	0.6355	2,30,744
			2,04,332

Year	**0**	**1**	**2**	**3**	**4**
Sales growth			50%	50%	50%
COGS%		25%	25%	30%	30%
Marketing Expense		20%	20%	20%	20%
Sales		4,00,000	6,00,000	9,00,000	13,50,000
Less: COGS		1,00,000	1,50,000	2,70,000	4,05,000
Gross Profit		3,00,000	4,50,000	6,30,000	9,45,000
Less: Depreciation		1,50,000	1,50,000	1,50,000	1,50,000
Less: Marketing Expense		80,000	1,20,000	1,80,000	2,70,000
Operating Income (EBIT)		70,000	1,80,000	3,00,000	5,25,000
Less: Taxes at 30%		21,000	54,000	90,000	1,57,500
Operating income after taxes		49,000	1,26,000	2,10,000	3,67,500
Add back depreciation		1,50,000	1,50,000	1,50,000	1,50,000

Year	0	1	2	3	4
After tax operating cash flow		1,99,000	2,76,000	3,60,000	517500
Salvage value					15,000
Tax on salvage value					(4,500)
After tax salvage value					10,500
Total after tax cash flow		**1,99,000**	**2,76,000**	**3,60,000**	**5,28,000**
PVIFA		**0.893**	**0.797**	**0.712**	**0.636**
PV of cash flow		1,77,679	2,20,026	2,56,241	3,35,554
Sum of PV of cash flow	9,89,499				
Cash Outflow	(6,00,000)				
NPV	3,89,499				

NPV based on probability of both the situations

= (NPV as per market sentiments × 50%) + (NPV as per company's expectation × 50%)

= (2,04,332 × 0.5) + (3,89,499 × 0.5)

= INR 2,96,915.5

ILLUSTRATION 2

Arpan is researching the relative valuation of two companies in the steel industry, Long Products and National corporation. He has gathered relevant information on the companies in the following table.

	Long Corporation (in lakhs)	National Corporation (in lakhs)
Price per share	150	100
No. of shares outstanding	10	2
Market value of debt	50	100
Book value of debt	52	112
Cash and investments	5	2
Net Income	40.5	15
Net Income from continued operations	50	10

	Long Corporation (in lakhs)	National Corporation (in lakhs)
Interest Expense	3	5
Depreciation and Amortisation	8	4
Taxes	2	3

Calculate:

i. Price per share/EBITDA for both the companies

ii. EV/EBITDA for both companies

Solution:

i. Long Corporation:

EBITDA = Net Income from continued operations + Interest Expense + Depreciation and amortization + Taxes = 50 + 3 + 8 + 2 = 63 lakhs

EBITDA per share = 63/10 = 6.3

Price per share/EBITDA = 150/6.3 = 23.81

National Corporation:

EBITDA = Net Income from continued operations + Interest Expense + Depreciation and amortization + Taxes. = 10 + 5 + 4 + 3 = 22 lakhs

EBITDA per share = 22/2 = 11

Price per share/EBITDA = 100/11 = 9.09

ii. Long Corporation:

Market Value of Equity = Shares Outstanding × Price per share = 10 × 150 = 1,500 lakhs

Enterprise Value = Market Value of Equity + Market Value of Debt – Cash = 1,500 + 50 - 5 = 1,545 lakhs

EV/EBITDA = 1545/63 = 24.52

National Corporation:

Market Value of Equity = Shares Outstanding × Price per share = 2 × 100 = 200 lakhs

EV = 200 + 100 - 2 = 298 lakhs

EV/EBITDA = 298/22 = 13.55

ILLUSTRATION 3

Market SD = 3.50%, Security SD = 4%,

Coefficient of correlation for security with market = 0.80

Return from the market portfolio = 8.69%, Risk free rate of return = 3.55%

Find the required return from the security.

Solution:

$$\text{Coefficient of correlation} = \frac{\text{Covariance}}{\text{Sd Market + Sd Security}}$$

Thus, Covariance = 0.80 × 3.5 × 4 = 11.2

Market Variance = Market SD^2 = 12.25

Beta = Covariance/ Market Variance = 11.2 / 12.25 = 0.91

Required Return from the security= Rf + Beta (Rm - Rf) = 3.55 + 0.91 × (8.69 - 3.55) = 8.25%

ILLUSTRATION 4

Regal Financial recently paid a dividend of INR 18. An analyst has examined the financial statements and historical dividend policy of Regal and expects that the firm's dividend rate will grow at a constant rate of 3.5% indefinitely. The analyst also determines Regal's beta is 1.5, the risk-free rate is 4%, and the expected return on the market portfolio is 8%. Calculate the current value of Regal's shares.

Solution

First use the capital asset pricing model (CAPM) to estimate Regal's required return:

r = 4% + [1.5 × (8% − 4%)] = 10%

Then use the Gordon growth model to estimate share value:

$$V_0 = \text{INR } \frac{18 \times 1.035}{0.10 - 0.035} = \text{INR 287 per share}$$

ILLUSTRATION 5

Estimating terminal value

Unity Partners is expected to have earnings in ten years of INR 12 per share, a dividend payout ratio of 50%, and a required return of 11%. At that time, the dividend growth rate is expected to fall to 4% in perpetuity, and the trailing P/E ratio is forecasted to be eight times earnings. Estimate the terminal value at the end of ten years using:

i. Gordon growth model

ii. P/E multiple.

Solution:

The dividend at the end of ten years is expected to be INR 6 (INR 12 multiplied by 50%).

The dividend in Year 11 is then INR 6.00 × 1.04 = INR 6.24.

i. The terminal value using the Gordon growth model is therefore:

Terminal value in Year 10 = $D_{10} \times (1+g) / r-g = D_{11} / r-g$

= INR 6.24 / 0.11 − 0.04 = INR 89

ii. The terminal value given forecasted earnings of INR 12 and a P/E ratio of 8 is:

Terminal value in Year 10 (trailing P/E multiple) = INR 12.00 × 8 = INR 96

ILLUSTRATTION 6

Arena Distributors is a new company and currently pays no dividends. The company recently reported earnings of INR 150 per share and is expected to grow at a 15% rate for the next four years. Beginning in Year 5, Arena is expected to distribute 20% of its earnings in the form of dividends and to have a constant growth rate of 5%. The required rate of return is 12%. Calculate the value of Arena shares today.

Solution:

Let us first forecast the earnings in Year 5. Then calculate the dividends in Year 5 as 20% of Year 5 earnings. Applying the Gordon growth model to the Year 5 dividend gives us an estimate of the terminal value in Year 4. The terminal value discounted back four years is the current value of the stock.

E_4 = INR 150 × $(1.15)^4$ = INR 262

E_5 = INR 262 × 1.05 = INR 275

D_5 = INR 275 × 0.20 = INR 55

$V_4 = \frac{\text{INR } 55}{0.12 - 0.05}$ = INR 787

$V_o = \frac{\text{INR } 787}{1.12^4}$ = INR 500

ILLUSTRATION 7

East Railroad has a book value of INR 230 per share. The company's return on equity (ROE) is 14%, and its required return on is 12%. The dividend payout ratio is 60%. Calculate the value of the shares and the present value of expected economic profits.

Solution:

Calculation of growth rate(g):

g = retention ratio × ROE = (1 − 0.6) × 0.14 = 0.056 = 5.6%

Then, calculating intrinsic value:

$$V0 = \text{INR } 230 + \frac{(0.14 - 0.12) \times 230}{0.12 — 0.056} = \text{INR } (230 + 72) = \text{INR } 302$$

The present value of the firm's expected economic profits is INR 72.

3 Business Valuation Methods and Approaches [Study Material - Module 7]

ILLUSTRATION 1

Croma Plus has a revenue of INR 7500 lakhs. The sales growth and net profit margin forecast are as follows:

Year	1	2	3	4	5	Terminal
Sales growth	25%	25%	20%	16%	12%	8%
Net Profit Margin	20%	19%	18%	17%	16%	15%

Net Capital Investment is expected to be 60% of incremental sales. Working Capital Investment is expected to be 30% of incremental sales. Debt Financing will be used to fund 40% of investment in net capital items and working capital.

Beta = 0.85

Risk free rate = 7.5%

Risk Premium = 5.5%

No. of shares outstanding = 60 crores

Find – Required rate of return, Terminal Value, Value of Equity, and Value per share.

Solution

Required Rate of Return (Re) = Rf + (Rm – Rf) × Beta

= 7.5% + 5.5% × 0.85

= 12.18%

Computation of Free Cash Flow to Equity: (Amount in INR Lakhs)

Year	0	1	2	3	4	5	Terminal
Sales	7,500	9,375	11,719	14,063	16,313	18,270	19,732
Net Profit		1,875	2,227	2,531	2,773	2,923	2,960
Net FCI	60%	1,125	1,406	1,406	1,350	1,175	877

Year	0	1	2	3	4	5	Terminal
WCI	30%	563	703	703	675	587	438
Debt Financing	40%	675	844	844	810	705	526
FCFE		863	961	1,266	1,558	1,866	2,170
Terminal Value							51,925
PV Factor		0.8914	0.7946	0.7084	0.6314	0.5629	0.5629
PV of FCFE		769	764	897	984	1,050	29,229
Value of Equity	33,692						
No. of shares	6,000						
Value per share	**5.62**						

ILLUSTRATION 2

Technixia is a multinational distributor of semiconductor chips and related products to businesses. Its leading competitor around the world is Aramzo Electronics. Technixia shares have a current market price of INR 10.00, with 30 lakh shares outstanding, annual sales of INR 500 lakh, and an 8% profit margin. Aramzo shares have a market price of INR 15.00, with 40 lakh shares outstanding, annual sales of INR 650 lakh, and a profit margin of 6.9%. Based on the information given, answer the following questions:

(i) Which of the two companies has a more attractive valuation based on P/S?

(ii) Identify and explain one advantage of P/S over P/E as a valuation tool.

Solution:

(i) Technixia: P/S = (10 price per share)/ [(500 lakh sales) / (30 lakh shares)]
= INR 10 / (5,00,00,000 / 30,00,000) = 0.60

Aramzo: P/S = (15 price per share) / [(650 lakh sales) / (40 lakh shares)]
= INR 15 / (6,50,00,000 / 40,00,000) = 0.92

Technixia has a more attractive valuation than Aramzo based on its lower P/S and a better profit margin.

ii) One advantage of P/S over P/E is that companies' accounting decisions typically have a much greater impact on reported earnings than they are likely to have on reported sales. Although companies are able to make a number of legitimate business and accounting decisions that affect earnings, their discretion over reported sales (revenue recognition) is limited. Another advantage is that sales are almost always positive, so using P/S eliminates issues that arise when EPS is zero or negative.

ILLUSTRATION 3

Lifestyle Ltd (LL) provides a variety of household products. The below table presents the company's consolidated balance sheet as of 31 December 20X0.

Lifestyle Ltd Condensed Consolidated Balance Sheet

Assets	**INR in lakhs**
Current assets:	
Cash and cash equivalents	674
Accounts receivable, net	1,631
Inventories	1,322
Other current assets	755
Total current assets	4,382
Non-Current Assets:	
Property, plant and equipment, net	4,935
Goodwill and other intangible assets, net	5,188
Other non-current assets	945
TOTAL ASSETS	**15,450**
Liabilities and Shareholders Fund	
Current liabilities:	
Accounts payable	1,233
Accrued income taxes	684
Outstanding expenses	2,096
Convertible Notes and loans payable	57
Total current liabilities	**4,070**
Non-Current Liabilities:	
Long-term debt	8,022
Other non-current liabilities	2,516
Total liabilities	**14,608**

Shareholders fund:	
Preference shares	-
Equity shares — 863 lakh shares	2,544
Additional paid-in capital	4,919
Accumulated income (loss)	(7,216)
Retained earnings	32,155
Shares buy back	(31,560)
Total shareholders fund	**842**
Total liabilities and shareholders fund	**15,450**

From LL's financial statements, the income statement and statement of cash flows for the year ended 31 December 20X0 provided the following items (in lakhs):

Item	Source	Year Ended 31 December 20X0
Net income	Income statement	4,200
Interest expense (net of interest income)	Income statement	523
Income tax provision	Income statement	1,230
Depreciation and amortization	Statement of cash flows	856

The company's share price as of 15 February 20X1 was INR 74.52. Based on the above information, calculate EV/EBITDA.

Solution

For EV, we first calculate the total value of LL's equity = 863 lakh shares × INR 74.52 price per share

= INR 64,310.76 lakh market capitalization.

LL has only one class of equity shares, no preference shares, and no minority interest. For companies that have multiple classes of equity shares, market capitalization includes the total value of all classes of shares. Similarly, for companies that have preference shares and/or minority interest, the market value of preference shares and the amount of minority interest are added to market capitalization.

Hence, LL's Enterprise Value is

Value of Equity	64,310.76
Long-term debt	8,022
Convertible Notes and loans payable	57
Less: Cash and cash equivalents	(674)
Enterprise Value	INR 71,715.76 lakhs

For EBITDA, we use the trailing twelve-month (TTM) data, which are shown in the table above for the year ending 31 December 20X0.

The EBITDA calculation is

EBITDA = Net income + Interest + Income taxes + Depreciation and amortization.

EBITDA = INR 4200 + 523 + 1230 + 856

= INR 6,809 lakh.

For LL, we conclude that EV/EBITDA = (INR 71,715.76 lakh) / (INR 6,809 lakh) = 10.53

ILLUSTRATION 4

Exhibit Ltd. agrees to buy over the business of Extract Ltd. effective 1st April, 20X4. The summarized Balance Sheets of Exhibit Ltd. and Extract Ltd. as on 31st March 20X4 are as follows:

Balance sheet as at 31st March, 20X4

Particulars (INR Crores)	Exhibit Ltd.	Extract Ltd.
Liabilities:		
Paid up Share Capital		
-Equity Shares of INR 100 each	450	--
-Equity Shares of INR 10 each	--	25
Reserve & Surplus	1,750	120
Total	**2,200**	**145**
Assets:		
Net Fixed Assets	960	5.50
Net Current Assets	1,120	131
Deferred Tax Assets	120	8.50
Total	**2,200**	**145**

Exhibit Ltd. proposes to buy out Extract Ltd. and the following information is provided to you as part of the scheme of buying:

(1) The weighted average post tax maintainable profits of Exhibit Ltd. and Extract Ltd. for the last 4 years are INR 400 crores and INR 20 crores respectively.

(2) Both the companies envisage a capitalization rate of 6.5%.

(3) Exhibit Ltd. has a contingent liability of INR 420 crores as on 31st March, 20X4.

(4) Exhibit Ltd. to issue shares of INR 100 each to the shareholders of Extract Ltd. in terms of the exchange ratio as arrived on a Fair Value basis. (Please consider weights of 1 and 3 for the value of shares arrived on Net Asset basis and Earnings capitalization method respectively for both Exhibit Ltd. and Extract Ltd.)

You are required to arrive at the value of the shares of both Exhibit Ltd. and Extract Ltd. under:

(i) Net Asset Value Method

(ii) Earnings Capitalisation Method

(iii) Exchange ratio of shares of Exhibit Ltd. to be issued to the shareholders of Extract Ltd. on a Fair value basis (taking into consideration the assumption mentioned in point 4 above.)

Solution:

(i) Net Asset Value (NAV) Method

$$\text{NAV per share} = \frac{\text{Net Assets}}{\text{No. of Equity shares}}$$

	Total Assets	Total Liabilities	Net Assets	No. of shares	Net Asset Value / No. of share
	(a)	(l)	(a - l)	(n)	(a - l) / n
Exhibit Ltd.	2200 crores	420 crores	1780 crores	4.5 crores	395.56
Extract Ltd.	145 crores	-	145 crores	2.5 crores	58

(ii) Earnings Capitalisation Method

$$\text{Value of Firm} = \frac{\text{Maintable Profit}}{\text{Capitalisation Rate}}$$

	Maintainable Profit	Capitalization Rate	Value of Firm
Exhibit Ltd.	400 crores	0.065	6153.85 crores
Extract Ltd.	20 crores	0.065	307.69 crores

Earnings Capitalisation Value per share = $\frac{\text{Value of Firm}}{\text{No. of Equity Shares}}$

	Value of Firm	No. of shares	Earnings Capitalization Value Per Share
Exhibit Ltd.	6153.85 crores	4.5 crores	1367.52
Extract Ltd.	307.69 crores	2.5 crores	123.08

(iii) Fair Value and Exchange Ratio:

		Fair Value of share
Exhibit Ltd.	$\frac{395.56 \times 1 + 1367.52 \times 3}{4}$	1124.53
Extract Ltd.	$\frac{58 \times 1 + 123.08 \times 3}{4}$	106.81

Exchange Ratio = $\frac{\text{Fair Value of Extract Ltd.}}{\text{Fair Value of Exhibit Ltd.}} = \frac{106.81}{1124.53} = 0.095$

Exhibit Ltd should issue its 0.095 share for each share of Extract Ltd.

Note: In above solution it has been assumed that the contingent liability will materialize at its full amount.

ILLUSTRATION 5.

Free Cash flow for the Firm of Akash Constructions is INR 2,09,86,100 and is expected to grow at 5% annually. Calculate the value of Equity using Capitalized cash flow method and a WACC of 14.20%, when debt is 20,00,000.

Solution:

Value of Firm = $\frac{\text{FCF} \times (1 + g)}{\text{WACC} - g}$

Free cash flow for the firm	2,09,86,100
WACC	14.20%
Long term Growth Rate (g)	5%
Expected FCF next year [FCF × (1+g)]	2,20,35,405
Capitalisation Rate (WACC – g)	(14.20% - 5%) = 9.20%
Value of Firm	**23,95,15,271**
Less: Debt Capital	20,00,000
Value of Equity	**23,75,15,271**

ILLUSTRATION 6

Balance Sheet of L&D advisors is represented as follows as on 31st March 2024:

Liability	Amount (INR)	Asset	Amount (INR)
Equity Share Capital (1,00,000 shares of INR 10 each)	10,00,000	Land (FMV=40,00,000)	20,00,000
General Reserve	6,00,000	Building (FMV=50,00,000)	20,00,000
Foreign Exchange Reserve	2,00,000	Gold Bar (FMV=30,00,000)	15,00,000
Profit and Loss A/c	5,00,000	Investment (Quoted FMV=35,00,000)	7,00,000
Bank Loan	25,00,000	Current Assets	13,00,000
Unsecured Loan	10,00,000		
Current Liability	17,00,000		
	75,00,000		**75,00,000**

Use the given information and calculate the value of equity using a cost approach.

Solution:

We adjust the assets to their Fair Market Value (FMV) as given:

Asset	Book Value (INR)	Fair Market Value (INR)
Land	20,00,000	40,00,000
Building	20,00,000	50,00,000
Gold Bar	15,00,000	30,00,000
Investment (Quoted)	7,00,000	35,00,000
Current Assets	13,00,000	13,00,000
Total Assets	**75,00,000**	**1,68,00,000**

The liabilities remain at their book value:

Liability	Amount (INR)
Bank Loan	25,00,000
Unsecured Loan	10,00,000
Current Liability	17,00,000
Book value of Liability	52,00,000

Calculation of Adjusted Fair Value of Equity:

Book Value of Assets	75,00,000
Book value of Liability	52,00,000
Book Value of Equity	23,00,000
Less: Book value of Gold bar and Investments	(22,00,000)
Less: Book Value of Land and Building	(40,00,000)
Add: Fair Value of Gold bar and Investments	65,00,000
Add: Fair value of Land and Building	90,00,000
Adjusted Fair Value of Equity (a)	**1,16,00,000**
No of shares (b)	**1,00,000**
Value per share (a/b)	**116**

ILLUSTRATION 7

Mr. Jain is analysing the financial statements of Sterling Ltd. He has the 20X7 income statement and balance sheet, as well as the forecasted 20X8 income statement, balance sheet, and cash flow from operations (as shown in the following tables). Calculate forecasted free cash flow to the firm (FCFF) and free cash flow to equity (FCFE) for 20X8. All figures are in INR Lakhs.

Income Statement of Sterling Ltd.

Income Statement	**(Actual)**	**(Projected)**
	20X7 (in Lakhs)	**20X8 (in Lakhs)**
Sales	250	300
Cost of goods sold	100	120
Gross profit	150	180
Selling Expense	30	35
Depreciation	40	50
EBIT	**80**	**95**
Interest expense	10	15
Pre-tax earnings	**70**	**80**
Taxes at 30%	21	24
Net income (NI)	**49**	**56**

Balance Sheet of Sterling Ltd.

Balance Sheet	(Actual)	(Projected)
	20X7 (in Lakhs)	20X8 (in Lakhs)
Cash	5	10
Accounts Receivable	15	30
Inventory	30	40
Current Assets	**50**	**80**
Gross property, plant and equipment	300	400
Accumulated depreciation	-140	-190
Total Assets	**210**	**290**
Accounts Payable	20	20
Short-term debt	10	20
Current Liabilities	**30**	**40**
Long-term debt	100	114
Equity	50	50
Retained earnings	30	86
Total liabilities and owners' equity	**210**	**290**

Cash Flow from Operations Forecast of Sterling Ltd (in Lakhs).

Cash Flow from Operations	Forecast for 20X7
Net income	56
Add: Depreciation	50
Less: Working Capital Investment	25
Cash flow from operations	81

Solution:

Fixed capital investment is equal to capital expenditures (because there are no asset sales), which is equal to the change in net PPE plus depreciation:

Net PPE 20X7 = (Gross PPE) – (Accumulated Depreciation)

= 300 – 140 = 160 lakhs

Fixed Capital Investment = (Closing Net PPE – Opening Net PPE) + Depreciation

= (210 – 160) + 50 = 100 lakhs

Working capital investment is the change in the working capital accounts, excluding cash and short-term borrowings:

Working Capital Investment = (Accounts Receivables 20X8 + Inventory 20X8 – Accounts Payable 20X8) – (Accounts Receivables 20X7 + Inventory 20X7 – Accounts Payable 20X7)

Working Capital Investment = (30 + 40 – 20) – (15 + 30 – 20) = 50 – 25 = 25 lakhs

Given that depreciation is the only noncash charge, we can calculate FCFF from net income:

FCFF = NI + Depreciation + [Int × (1 – tax rate)] – Fixed Capital Investment – Working Capital Investment

= 56 + 50 + [15 × (1 – 0.3)] –100 –25

= 56 + 50 + 10.5 – 100 – 25 = –8.5 lakhs

Net borrowing is the difference between the new debt issues, and debt repayments:

Net Borrowing = (Long- and Short-Term New Debt Issues) – (Long- and Short-Term Debt Repayments) = (114 + 20) – (100 + 10) = 24 lakhs

FCFE = FCFF – [Int (1 – tax rate)] + Net Borrowing = – 8.5 – 10.5 + 24 = 5 lakhs

ILLUSTRATION 8

Suppose Momentum Co. has revenues of INR 2000 lakhs this year. However, we assume that its future performance will be tracked relative to sales as follows:

Sales growth and the net profit margin are projected as shown in the following table:

Sales and Net Margin Forecasts

Year	1	2	3	4	5	6
Sales Growth	30%	25%	20%	15%	10%	5%
Net profit margin	8.00%	7.50%	7.00%	7.00%	5.50%	5.00%

- Fixed capital investment net of depreciation is projected to be 30% of the sales increase in each year.
- Working capital requirements are 7% of the projected increased sales in each year. Debt will finance 40% of the investments in net fixed capital and working capital.
- The company has a 12% required rate of return on equity.

- The firm has 10 lakh shares of equity outstanding.

Calculate the value of the equity of Momentum Co. using FCFE model.

Solution:

Recognize that the target debt-to-asset ratio (D/E) is 0.40. The following table shows the FCFE for years 1-6.

Calculating FCFE for Years 1 Through 6 (Amount in INR lakhs)

Year		0	1	2	3	4	5	Terminal
Sales		2000	2,600	3,250	3,900	4,485	4,934	5,180
Net Profit			208	244	273	314	271	259
Net Fixed Capital Investment	30%		180	195	195	176	135	74
Working Capital Investment	7%		42	46	46	41	31	17
Net Borrowing	40%		89	96	96	87	66	37
FCFE			75	99	129	184	172	204
Terminal Value								2,918
PV Factor, 12%			0.8929	0.7972	0.7118	0.6355	0.5674	0.5674
PV of Cash Flows			67	79	92	117	97	1,656
Value of Equity		2,108						
*Debt will finance 40% of the investment in net capital and working capital.								
Debt financing = (debt-to-asset ratio) × [(Fixed Capital Investment – Dep) + Working Capital Investment]								
So, for year 1:								
Debt financing = (0.4) × [(1.95) + 0.455] = 0.962								

Let's demonstrate the calculation of the cash flow components in Year 1:

Sales = INR 2000 × 1.30 = INR 2600 lakhs

Net Income = INR 2600 × 0.08 = INR 208 lakhs

Net Fixed Capital Investment = (INR 2600 – INR 2000) × 0.30 = INR 180 lakhs

Working Capital Investment = (INR 2600 – INR 2000) × 0.07 = INR 42 lakhs

FCFE = Net Profit – Net Fixed Capital Investment – Working Capital Investment + Net Borrowing

= INR 208 – 180 – 42 + 89 = INR 75 lakhs

ILLUSTRATION 9

An analyst gathered the following data for Apex Industries [all amounts in INR lakhs]:

Recent share price	22.5
Shares outstanding	40 Lakhs
Market value of debt	137 Lakhs
Cash and marketable securities	62.3 Lakhs
Investments	327 Lakhs
Net income	137.5 Lakhs
Interest expense	6.9 Lakhs
Depreciation and amortization	10.4 Lakhs
Taxes	95.9 Lakhs

Based on this information, calculate the EV/EBITDA ratio for Apex Industries:

Solution:

EBITDA = 137.5 + 6.9 + 95.9 + 10.4 = INR 250.7 Lakhs

EV = (22.50 × 40) + 137 – 62.3 – 327 = INR 647.7 Lakhs

$$\text{EV/EBITDA} = \frac{647.7}{250.7} = 2.58 \text{ times}$$

ILLUSTRATION 10

Mr. Nath is responsible for valuing the shares of Pyramid Research Laboratories (PRL). The shares are currently trading at INR 8.75, and Nath gathers the following financial information about the company:

- Expected return on equity (ROE) = 16% annually for each of the next four years.
- Current book value (BV) of equity = 43,50,00,000.
- Shares outstanding: 6 Crores
- Required rate of return (Re) = 12%.

- No dividends are paid
- All earnings are reinvested
- Continuing residual income = 0 after four years.

The intrinsic value and the most likely recommendation Nath would issue for the stock of PRL are:

	Intrinsic Value	Recommendation
A.	1.1	Sell
B.	8.34	Buy
C.	8.34	Sell

Solution:

B_0 = Book value of equity/ Shares outstanding = INR 43,50,00,000 / 6 Crores = 7.25 per share

Year	E_t	B_t	ROE*	Equity Charge ($r \times B_{t-1}$)	Residual Income (RI) $E_t - (r \times B_{t-1})$
0		7.25			
1	1.16	8.41	0.16	0.87	0.29
2	1.35	9.76	0.16	1.01	0.34
3	1.56	11.32	0.16	1.17	0.39
4	1.81	13.13	0.16	1.36	0.45
*Earnings per share (EPS) is equal to beginning book value multiplied by ROE					

In this case, $\omega = 0$. The present value of continuing residual income in Year 3 =

$$\frac{\text{RI of 4th year}}{1 + r - \omega} = \frac{0.45}{1 + 0.12 - 0} = \frac{0.45}{1.12} = 0.40$$

$$\text{Value per share, } V_0 = 7.25 + \left[\frac{0.29}{1.12} + \frac{0.34}{1.12^2} + \frac{0.39 + 0.40}{1.12^3}\right] = 8.34$$

Since the shares are valued at INR 8.34 each and the current market price per share is INR 8.75, the shares are overpriced, and the analyst should consider issuing a sell recommendation.

ILLUSTRATION 11

An analyst is examining a private firm under consideration as an acquisition and determines the following:

- The current capital structure is non-optimal because the owner avoids the use of debt.
- A small stock premium and company-specific risk premium are determined because the private firm is much smaller and much less diversified than the public firms that beta is estimated from.
- The industry risk premium reflects the additional risk in this industry compared to the broad market.

The relevant figures are listed below:

Risk-free rate	3.6%
Equity risk premium	6%
Beta	1.3
Small stock premium	3%
Company-specific risk premium	2%
Industry risk-premium	1%
Pre-tax cost of debt	9%
Debt/total capital for public firms in industry	30%
Optimal debt/total capital	12%
Current debt/total capital	3%
Tax rate	30%

a. Calculate the required return on equity using the CAPM, the expanded CAPM, and the build-up method.

b. Calculate the WACC using the current capital structure and the optimal capital structure, assuming a cost of equity of 16%.

c. Comment on the appropriate capital structure weights

Solution:

a. The required return on equity using the CAPM is:

Risk-free rate + (β × Equity risk premium) 3.6% + 1.3(6%) = 11.4%

Using the expanded CAPM, a small stock premium and company-specific risk premium are added:

11.4% + 3% + 2% = 16.4%

Using the build-up method, beta is omitted, but an industry risk premium is added to the risk-free rate, the equity risk premium, the small stock premium, and a company-specific risk premium: 3.6% + 6% + 3% + 2% + 1% = 15.6%

b. The WACC, using the current capital structure, factors in the debt to total capitalization, the cost of debt, the tax rate, and the given cost of equity:

- W_D = Current debt/total capital = 3% = 0.03
- W_E = 1 - WD = 1 - 0.03 = 0.97
- R_E = Cost of equity = 16% (given)
- R_D = Cost of debt = 9% (pretax cost of debt)
- Tax rate = 30% = 0.3

$$\text{WACC} = (W_E \times R_E) + [W_D \times R_D \times (1 - \text{Tax rate})]$$
$$= (0.97 \times 16\%) + [0.03 \times 9\% \times (1 - 0.3)]$$
$$= 15.7\%$$

The WACC, using the optimal capital structure, is:

- W_D = Optimal debt/total capital = 12% = 0.12
- W_E = 1 - WD = 1 - 0.12 = 0.88
- R_E = Cost of equity = 16% (given)
- R_D = Cost of debt = 9% (pretax cost of debt)
- Tax rate = 30% = 0.3

$$\text{WACC} = (WE \times RE) + [WD \times RD \times (1 - \text{Tax rate})]$$
$$= (0.88 \times 16\%) + [0.12 \times 9\% \times (1 - 30\%)]$$
$$= 14.8\%$$

c. The current capital structure reflects the current owner's conservative use of debt. The optimal capital structure can be determined through discussions with financiers. The optimal capital structure should be used to calculate the (lower) WACC for the acquisition, given that the firm can support this level of debt. The capital structure for public firms in the same industry should not be used because public firms are likely to have better access to debt financing. A public firm could likely take on more (less expensive compared to equity) debt than a private company. For this reason, a private firm will likely have a greater WACC than a public firm in the same industry would have.

ILLUSTRATION 12

Calculate the FCFF for the next year from the following figures. Assume that the earnings and expenses are normalized and that capital expenditures will equal depreciation plus 4% of the firm's incremental revenues.

Current revenues	1,00,00,000
Revenue growth	5%
Gross profit margin	20%
Depreciation expense as a percentage of sales	1%
Working capital as a percentage of sales	12%
Selling expenses	16,00,000
Tax rate	40%

Solution:

Component	Formula / Calculation	Amount
Revenues	Current Revenue × (1 + Revenue Growth)	1,05,00,000
Cost of Goods Sold (COGS)	Revenue × (1 - Gross Profit Margin) = 1,05,00,000 × (1 -0.20)	84,00,000
Gross Profit	Revenue × Gross Profit Margin = 1,05,00,000 × 0.20	21,00,000
Selling Expenses	Given value: 16,00,000	16,00,000
EBITDA	Gross Profit - Selling Expenses = 21,00,000 - 16,00,000	5,00,000
Depreciation and Amortization	Revenue × Depreciation Percentage = 1,05,00,000 × 0.01	1,05,000
EBIT	EBITDA - Depreciation and Amortization = 5,00,000 - 1,05,000	3,95,000
Taxes on EBIT	EBIT × Tax Rate = 3,95,000 × 0.40	1,58,000
Operating Income After Tax	EBIT - Taxes on EBIT = 3,95,000 - 1,58,000	2,37,000
Add: Depreciation and Amortization	Given value: 1,05,000	1,05,000

Component	Formula / Calculation	Amount
Less: Capital Expenditures	Depreciation and Amortization + 4% of Incremental Revenue = 1,05,000 + 0.04 × 5,00,000 = 1,05,000 + 20,000	1,25,000
Less: Increase in Working Capital	Incremental Revenue × Working Capital Percentage = 5,00,000 × 0.12	60,000
FCFF	Operating Income After Tax + Depreciation and Amortization - Capital Expenditures - Increase in Working Capital = 2,37,000 + 1,05,000 - 1,25,000 - 60,000	1,57,000

ILLUSTRATION 13

Phoenix Ltd. reported a profit of INR 87 lakhs after 30% tax for the financial year 20X4-X5. An analysis of the accounts revealed that the income included extraordinary income of INR 10 lakhs and an extraordinary loss of INR 14 lakhs. The existing operations, except for the extraordinary items, are expected to continue in the future. In addition, the results of the launch of a new product are expected to be as follows:

Particulars	INR In Lakhs
Sales	80
Material Costs	22
Fixed Costs	12
Labour Costs	12

You are required to:

(i) Calculate the value of the business, given that the capitalization rate is 14%.

(ii) Determine the market price per equity share, with Phoenix Ltd's share capital being comprised of 1,00,000 13% preference shares of 100 each and 50,00,000 equity shares of 10 each and the P/E ratio being 10 times.

Solution:

(i) Computation of Business Value: (INR In Lakhs)

Profit before tax (87/1-0.30)			124
Less: Extraordinary income			-10
Add: Extraordinary losses			14
			128
Profit from new product			

Sales		80	
Less: Material costs	22		
Labour costs	12		
Fixed costs	12	(46)	34
			162
Less: Taxes @30%			(49)
Future Maintainable Profit after taxes			113
Relevant Capitalisation Factor			14%
Value of Business (113/0.14)			807

(ii) Determination of Market Price of Equity Share

Future maintainable profits (After Tax)	1,13,00,000
Less: Preference share dividends 1,00,000 shares of 100 @ 13%	(13,00,000)
Earnings available for Equity Shareholders	1,00,00,000
No. of Equity Shares	50,00,000
Earnings per share = 1,00,00,000/50,00,000	INR 2
PE ratio	10
Market price per share	INR 20

ILLUSTRATION 14

The valuation of Rohit Limited has been done by an investment analyst. Based on an expected free cash flow of 108 lakhs for the following year and an expected growth rate of 9 percent, the analyst has estimated the value of Rohit Limited to be 3600 lakhs. However, he committed a mistake of using the book values of debt and equity.

The book value weights employed by the analyst are not known, but you know that Rohit Limited has a cost of equity of 20 percent and post-tax cost of debt of 10 percent. The market value of equity is thrice its book value, whereas the market value of its debt is nine-tenths of its book value. What is the correct value of Rohit Ltd?

Solution:

Cost of capital by applying Free Cash Flow to Firm (FCFF) Model is as follows: -

$$\text{Value of Firm} = V_0 = \frac{FCFF_1}{K_c - g_n}$$

Where:

$FCFF_1$ = Expected FCFF in the year 1

K_C = Cost of capital

g_n = Terminal growth rate

Thus, INR 3600 lakhs = INR $\frac{108 \text{ Lakhs}}{K_c - g_n}$

Since g = 9%, then KC = 12%

Now, let X be the weight of debt and given cost of equity = 20% and cost of debt = 10%, then

20% (1 – X) + 10% X = 12%

Hence, X = 0.80, so book value weight for debt was 80%

∴ Correct weight should be 60 of equity and 72 of debt since the value of equity is thrice its book value, whereas the market value of its debt is nine-tenths of its book value

∴ Cost of capital = K_c = 20% (60/132) + 10% (72/132) = 14.54% and

∴ Correct firm's value = 108 lakhs / (0.1454 – 0.09) = INR 1949 lakhs.

ILLUSTRATION 15

Bhawna Ltd is assessing the impairment for its assets. The Assets were purchased for INR 7000 lakh and the accumulated Depreciation till date is INR 1800 lakh. It has hired a Registered Valuer and they have assessed the Fair Value of the assets at INR 4550 lakh and the expected cost of selling would be further INR 70 lakh. The Valuers have also assessed the Value in Use using the Discounted Cash Flow Methodology and the same is INR 4500 lakh. Calculate the Revised Value of Assets.

Solution:

The valuation of the assets would be assessed as follows: (INR Lakh)

Particulars	Amount	Amount
Purchase Cost		7000
Accumulated Depreciation		1800
Carrying Value or Book Value		**5200**
Fair Value	4550	
Cost of Disposal	70	
Fair Value less Cost of Disposal	**4480**	
Value in Use	**4500**	
Recoverable Amount		**4500**
(Higher of Value in Use and Fair Value less cost of disposal)		
Impairment Loss (Carrying Amount - Recoverable Amount)		**700**
Revised Value of assets in the books		**4500**

Thus, the firm will charge an Impairment Loss in its books and the Carrying value would be updated to INR 4500 lakh.

ILLUSTRATION 16

Piyush Ltd. provides you with the following financial information as at 31st March 2024.

(Amount in INR Lakhs)

Share Capital	981.46
Reserves and Surplus	1,313.62
Long Term Debt	144.44
Trade Payables	20.38

Additional information provided is as follows:

Profit before interest and tax is INR 2,202.84 lakhs

Interest paid is INR 13.48 lakhs.

Tax rate is 30%

Cost of equity = 12.42%, and Cost of debt = 6.53%

Required: Calculate economic value added of QZY ltd.

Solution:

EVA = NOPAT – WACC × Capital Employed

Capital Employed = INR 981.46 + 1313.62 + 144.44 = INR 2,439.52 lakhs

$$\text{WACC} = \left(\frac{981.46 + 1{,}313.62}{2{,}439.52} \times 12.42\%\right) + \left(\frac{144.44}{2{,}439.52} \times 6.53\%\right) = 12.07\%$$

NOPAT = (PBIT – Interest – Tax) + Interest (net of Tax)

(Amount in INR Lakhs)

PBIT	2,202.84
Less: Interest	-13.48
PBT	2,189.36
Less: Tax @30%	-656.81
PAT	1,532.55
Add: Interest (net of tax) [13.48 × (1-0.30)]	9.44
NOPAT	1,541.99

EVA = NOPAT – WACC × Capital Employed

= 1,541.99 – 12.07% × 2,439.52 = INR 1,247.54 Lakhs

4 Valuation of Assets and Liabilities [Study Material - Module 8]

ILLUSTRATION 1

Bloomsbury India, the current publisher of the book, Handbook on Valuation of Securities and Financial Assets by Vikash Goel, is willing to sell the copyrights of this book to another publisher who is keen to buy the copyrights. The following assumptions may be relevant.

The current price of the book is INR 3,000 and the publisher currently sells 6,500 copies of the book annually. The cost of production, distribution and author royalties amount to 70 percent of Sales. The book is becoming popular and the publisher estimates that the sales of the book may increase by 5 percent every year for the next 5 years. This is including the newer editions of the same book.

However, after 5 years, given the introduction of other books on the same subject, dilution of exclusivity, violation of copyrights and plagiarism, there may not be any increase in sales but the sales may be stable at the same level as at year 5.

Assuming a discount rate of 10 percent, we can assess the value of the copyrights as follows.

Solution:

The copyrights valuation can be done using the Market or Income or even cost approach. Let's say we apply the Income approach to value the copyrights.

Year	0	1	2	3	4	5	Terminal
Book Price	3,000						
Units Sales per Year	6,500						
Sales	1,95,00,000	2,04,75,000	2,14,98,750	2,25,73,688	2,37,02,372	2,48,87,490	2,48,87,490

Year	0	1	2	3	4	5	Terminal
Less: Costs	1,36,50,000	1,43,32,500	1,50,49,125	1,58,01,581	1,65,91,660	1,74,21,243	1,74,21,243
FCFE	58,50,000	61,42,500	64,49,625	67,72,106	71,10,712	74,66,247	74,66,247
Terminal Value							7,46,62,471
PV Factor		0.9091	0.8264	0.7513	0.683	0.6209	0.6209
PV of Cash Flows		55,84,147	53,29,970	50,87,883	48,56,616	46,35,793	4,63,57,928
Value of Equity	**7,18,52,338**						

ILLUSTRATION 2

You have been asked to value Agarwal Corporation, India, using an excess earnings method with the following information:

Working capital balance = INR 25,00,000

Fair value of fixed assets = INR 85,00,000

Book value of fixed assets = INR 60,00,000

Normalized earnings of firm = INR 13,00,000

Required return on working capital = 6.0%

Required return on fixed assets = 9.0%

Required return on intangible assets = 20.0%

Weighted average cost of capital = 8.0%

Long-term growth rate of residual income = 10.0%

Based on this information:

a. What is the value of Agarwal's intangible assets?

b. What is the market value of invested capital?

Solution:

a. Residual Income = Normalized Earnings – (Return on Working Capital + Return on Fixed Assets)

= 13,00,000 – (1,50,000 + 7,65,000) = 3,85,000

Projected Residual Income = Current Excess Earnings × (1 + Growth Rate)

= 3,85,000 × (1.10) = 4,23,500

$$\text{Value of Intangible Assets} = \frac{\text{Projected Residual Income}}{\text{Required return on intangible assets – Long Term Growth rate}}$$

$$= \frac{4,23,500}{0.20 - 0.10} = 42,35,000$$

b. Market value of invested capital = Working capital + Fixed assets + Intangible assets.

= INR 25,00,000 + INR 85,00,000 + INR 42,35,000

= INR 1,52,35,000

ILLUSTRATION 3

The net operating income for an office building is expected to be INR 225,000, and an appropriate capitalisation rate is 7.5%. Estimate the market value of the property using the direct capitalization method.

Solution:

The Direct Capitalization Method estimates the market value of a property using the formula:

$$\text{Market value} = \frac{\text{NOI}}{\text{Captalisation Rate}} = \frac{2,25,000}{7.5\%} = \text{INR } 30,00,000$$

ILLUSTRATION 4

A corporation issues an INR 1000 par value bond (Semi Annual) bearing a coupon rate of 10% matures after 15 years, with an expected rate of return of 12%. Find the value of the bond.

Solution

$$\text{Value of the Bond} = \frac{100}{2}\left[1 - \frac{\left(1+\frac{\text{YTM}}{2}\right)^{-2(15)}}{\frac{\text{YTM}}{2}} + \frac{1000}{\left(1+\frac{\text{YTM}}{2}\right)\wedge 2(15)}\right]$$

= 862.35

ILLUSTRATION 5

The following data is available for a bond.

Face value = INR 1,000

Coupon (Interest Rate) = 15% payable annually

Years to maturity= 5 Years

Redemption value= INR 1,000

Current Market Price= INR 964.07

Calculate:

a. Yield to maturity

b. Duration

c. Volatility of this bond

Solution:

a. YTM = (Coupon + (Maturity-Price) ÷ Years to maturity) ÷ (0.4 Maturity + 0.6 Price)

= (150 + (1000 - 964.07) ÷ 5) ÷ (0.4 × 1000 + 0.6 × 964.07)

= 16%

b.

Time	Payment	PVIFA, 16%	PV of cash Flows	Proportion of PV	Time × PV
1	150	0.8621	129.31	0.13	0.13
2	150	0.7432	111.47	0.12	0.23
3	150	0.6407	96.10	0.10	0.30
4	150	0.5523	82.84	0.09	0.34
5	1150	0.4761	547.53	0.57	2.83
			967.26	1.00	3.84

The duration is 3.84

c. Volatility = $\frac{\text{Duration}}{1 + \text{YTM}} = \frac{3.84}{1.16} = 3.31$

ILLUSTRATION 6

Compute EVA of JPCL Ltd. for 3 years from the information given – (in INR Lakhs)

Year	1	2	3
Average Capital Employed	4,000	5,000	6,000
Operating Profit before Interest	1,000	1,500	1,800
Corporate Income Taxes	120	150	200
Average Debt / Total Capital Employed (in%)	50%	25%	20%
Beta variant	1.4	1.2	1.7
Risk Free Rate (%)	10	10	10
Equity Risk Premium (%)	3	3	3
Cost of Debt (Post Tax) (%)	17%	17%	16%

Solution:

Year	1	2	3
Proportion of Debt	0.5	0.25	0.2
Cost of Debt	0.17	0.17	0.16
(a)	**0.085**	**0.0425**	**0.032**
Proportion of Equity	0.5	0.75	0.8
Cost of Equity (Working Note 1)	0.142	0.136	0.151
(b)	**0.071**	**0.102**	**0.1208**
WACC (a + b)	0.156	0.1445	0.1528

EVA = NOPAT – (WACC × Capital Employed)	**1**	**2**	**3**
NOPAT	880	1350	1600
WACC	0.156	0.1445	0.1528
Capital Employed	4,000	5,000	6,000
EVA (in INR lakhs)	**256**	**627.5**	**683.2**

Working Note 1:

K_E (Year 1) = $R_f + \beta (R_m - R_f)$

= 10 + 1.4 (3)

= 10 + 4.2

= 14.2

K_E (Year 2) = $R_f + \beta (R_m - R_f)$

= 10 + 1.20 (3)

= 10 + 3.6

= 13.6

K_E (Year 3) = $R_f + \beta (R_m - R_f)$

= 10 + 1.7 (3)

= 15.1

ILLUSTRATION 7

The Income Statement and Balance Sheet of **Radeon Company Ltd.** is given below:

INCOME STATEMENT

Particulars	INR in Lakhs	INR in Lakhs
Sales	6,250	
Total Income		6,250
Less:		
Manufacturing cost	1,500	
Administration cost	800	
Selling and distribution cost	350	
Depreciation	200	
		2,850
EBIT		3,400
Less: Interest		150

Particulars	INR in Lakhs	INR in Lakhs
EBT		3,250
Less: Tax (30%)		975
PAT		2,275
EPS		45.5
P/E ratio		3

BALANCE SHEET

LIABILITIES	INR in Lakhs	ASSETS	INR in Lakhs
Equity Capital (₹10 share)	500	Buildings	900
Reserve Surplus	350	Machinery	500
Term loan	650	Stock	150
Payables	300	Debtors	250
Provisions	130	Bank	130
TOTAL	**1,930**	**TOTAL**	**1,930**

The cost of equity and cost of debt is 14% and 8% respectively. The company pays 30% corporate tax.

From the information given you are required to calculate the EVA. Also, calculate Market Value Added (MVA) on the basis of Market value of equity capital.

Solution:

EVA = NOPAT – (WACC × CE)

= 2,380 – (10.36% × 1,500)

= 2,224.6

Calculation of NOPAT	INR in Lakhs
Sales	6,250
(-) Operating Expenses	2,650
(-) Depreciation	200
EBIT	3,400
(-) Tax @ 30%	1,020
NOPAT	2,380

Calculation of WACC

Sources	Amount in INR lakhs	Proportion	Cost	WACC
Equity Cap.	500	33.33	14%	4.67%
Retained	350	23.33	14%	3.27%
Term Loan	650	43.33	5.60%	2.43%
	1,500	100		10.36%

Cost of Debt (KD) = I (1 – tax)

= 8 (1 – 0.3)

= 5.6

MVA = Market Capitalisation – Book value of Net Worth

= 6825 – 850

= 5975 lakhs

Market Capitalisation = MPS × No. of Shares

= 136.5 × 50

= 6825 lakhs

P/E Ratio $= \frac{MPS}{EPS}$

3 $= \frac{MPS}{45.5}$

∴ MPS = 3 × 45.5

∴ MPS = 136.5

ILLUSTRATION 8

Given the following figures, calculate the value of the firm using the Excess Earnings Model.

(All figures are in INR)

Working capital	3,00,000
Fixed assets	10,00,000
Normalized earnings (year just ended)	1,30,000
Required return for working capital	6%
Required return for fixed assets	10%
Growth rate of residual income	5%
Discount rate for intangible assets	14%

Solution:

Based on the required rates of return for working capital and fixed assets, the required earnings are:

Working capital: INR 3,00,000 × 6% = INR 18,000

Fixed assets: INR 10,00,000 × 10% = INR 1,00,000

Excess earnings = INR 1,30,000 – INR 18,000 – INR 1,00,000 = INR 12,000

Using the formula for a growing perpetuity, the discount rate for intangible assets, and the growth rate for excess earnings to calculate the value of intangibles:

$$\text{Value of intangible assets} = \frac{12{,}000 \times 1.05}{0.14 - 0.05} = \text{INR } 1{,}40{,}000$$

Total Firm value = INR 3,00,000 + INR 10,00,000 + INR 1,40,000 = INR 14,40,000

ILLUSTRATION 9

Saket Ltd. has developed a high-tech product which has reduced the Carbon emission from the burning of the fossil fuel. The product is in high demand. The product has been patented and has a market value of INR 200 Crore, which is not recorded in the books. The Net Worth of Saket Ltd. is INR 400 Crore. Long term debt is INR 600 Crore. The product generates a Net Operating Profit after Tax of INR 140 Crores. The rate on 365 days Government bond is 10 percent per annum. Market portfolio generates a return of 12 percent per annum. The stock of the company moves in tandem with the market. Calculate Economic Value added (EVA) of the company.

Solution:

EVA = Income Earned – (Cost of Capital × Total Investment)

	Amount (in Crores)
Net Worth	400
Long Term Debts	600
Patent Rights	200
Total	1200

$$\text{WACC } (K_o) = K_e \times \frac{E}{E+D} + K_d \times \frac{D}{E+D} \qquad = 12 \times \frac{400+200}{1200} + 10 \times \frac{600}{1200}$$

$$= 6\% + 5\% = 11\%$$

EVA = Profit Earned – WACC × Invested Capital

= INR 140 Crores – 11% × 1200 Crores = INR 8 Crores

5 Valuation in Merger & Acquisitions [Study Material - Module 9]

ILLUSTRATION 1

The following information is available for M/s Jain Ltd. for the year 2000.

(Amount in INR Crores)

Outstanding debt	1,000
Share price	35
No. of outstanding shares	32
Net income	7.75
EBIT	120
Interest expense	106.25
Capital expenditure	110
Depreciation	110
Working capital	17.5
Growth rate for EBIT (2001 to 2005)	7.00%
Growth rate (Beyond 2005)	4%
Free cash flow	135
Cost of equity	15%

The capital expenditure is expected to be equally offset by depreciation in future and the debt ratio of the company is expected to decline by 30% by 2005.

You are required to:

a. Compute the value of the firm.

b. Compute the value per share. Is the company under or overvalued?

Solution:

(a)

(i)

Computation for tax rate	INR in Crores
EBIT for year 2000	120
Interest	106.25
PBT	13.75
PAT	7.75
Tax Paid	6
Tax Rate	**44%**

(ii)

Cost of Capital	Till 2005
Present Debt	1,000 Cr
Interest Cost	10.63%
Equity Capital (32 cr shares × INR 35)	1,120 Cr

Component	Value	Weight	Cost	WACC
Debt	1,000	47%	5.99%	3%
Equity	1,120	53%	15%	8%
Cost of Capital				10.75%

Cost of Capital	Beyond 2005
Debt	700
Equity	1,120

Component	Value	Weight	Cost	WACC
Debt	700	38%	5.99%	2%
Equity	1,120	62%	15%	9%
Cost of Capital				11.53%

(iii)

Computation of FCF							Amount In INR Cr
Year	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**Terminal Value**
		1	2	3	4	5	
EBIT (1-t)		72.37	77.44	82.86	88.66	94.86	
Increase in Working Capital		1.23	1.31	1.40	1.50	1.61	
Free Cash Flow		71.15	76.13	81.45	87.16	93.26	135.00
PV of FCF @ 10.75%		64.24	62.07	59.96	57.93	55.97	
PV of Terminal Value @11.53%							1,079.69
PV Value	300.18						
Enterprise Value	1,379.87						
Less: Debt	700.00						
Value of the Firm	679.87						

As capital Exp and Depreciation are equal, they will not influence the free cash flow of the company.

$$\text{Terminal Value} = \frac{135 \times 1.04}{0.1153 - 0.04} \times \frac{1}{(1.1153)^5}$$

$$= \text{INR } 1{,}079.69 \text{ Cr}$$

Value of the Firm = PV of FCF upto 2005 + Terminal Value - Debt

= 300.18 + 1,079.69 – 700

= INR 679.87 Cr

(b) Value Per Share $= \frac{679.87}{32}$

= INR 21.25 / Share

ILLUSTRATION 2

Agarwal Ltd. has a value of INR 90 lakh and Jaiswal Ltd. has a value of INR 15 lakh. If the two firms merge, cost savings with a present value of INR 45 lakh would occur. Agarwal Ltd. proposes to offer INR 34 lakh as compensation to acquire Jaiswal Ltd. Calculate the net present value of the merger to the two firms.

Solution:

PVa = INR 90 Lakh

PVb = INR 15 Lakh

PVab **= PVa + PVb + Benefit**

= 90 + 15 + 45

= INR 150 Lakh

Compensation = INR 34 Lakh

Cost **= Compensation – PVb**

= 34 – 15

= INR 19 Lakh

NPV Agarwal **= Benefit – Cost**

= 45 – 19

= INR 26 Lakh

NPV Jaiswal = INR 19 Lakh

ILLUSTRATION 3

The relevant financial details of two firms, just prior to a merger announcement are as follows:

	Afternoon	Evening
Market Price per share	75	40
No. of shares	6,50,000	4,20,000
Market Value of Firm	4,87,50,000	1,68,00,000
Benefit	1,00,00,000	

Afternoon Ltd. offers 3,16,000 shares in exchange for 4,20,000 shares to the shareholders of firm

Evening Ltd. Assuming that the market values of the two firms just before the merger announcement are equal to their present values as separate entities, calculate the NPV to Afternoon Ltd. and Evening Ltd. respectively.

Solution:

Apparent cost of Evening Ltd

= INR (3,16,000 × 75) – INR 1,68,00,000

= INR 69,00,000

Share of Evening ltd in combined entity

$$= \frac{3,16,000}{6,50,000 + 3,16,000} = 0.3271$$

PVab = PVa + PVb + Benefit

= INR 487.5 Lakh + INR 168 Lakh + INR 100 Lakh

= INR 755.5 Lakh

Cost = (0.3271 × 755.5) - 168

= INR 79.13 Lakh

NPV to Afternoon Ltd = Benefit – Cost

= INR 100 Lakh – INR 79.13 Lakh

= INR 20.87 Lakh

NPV to Evening Ltd = Cost = INR 79.13 Lakh

ILLUSTRATION 4

The Merger proposal of Pj Ltd & Pd Ltd is under consideration. You are required to compute the NPV to Pd Ltd. using the capital budgeting technique. The following information is provided. Equity related post-tax cash flows of Pj Ltd.

Year	CF
1	130
2	90
3	105
4	125
5	110

Beyond year 5, the cash flows are expected to grow at a compound rate of 5% per year.

After the merger, the cash flows of the combined entity assume the following pattern

Year	CF
1	110
2	113
3	118
4	90
5	145

The cash flows beyond year 5 are expected to grow at a compound rate of 6% per year.

The number of outstanding shares of Pj Ltd. prior to the merger is 12,00,000. The number of outstanding shares of Pd Ltd. is INR 7,00,000. The proposed exchange ratio is 0.30

Note: Assume a discount rate of 13.50% in both the cases.

Solution:

PV of Cash flow before Merger	1	2	3	4	5	Terminal
Cashflow	130	90	105	125	110	
PVIFA, 13.5%	114.54	69.86	71.81	75.32	58.40	721.41
Sum of PV of Cashflows	1111.35					

$$\therefore \textbf{Terminal Value} = \frac{110 \times 1.05}{0.135 - 0.05} \times \frac{1}{(1.135)^5} = 721.41$$

PV of Cash flow After Merger	1	2	3	4	5	Terminal
Cashflow	110	113	118	90	145	
PV @13.5%	96.92	87.72	80.70	54.23	76.98	1088.01
Sum of PV of Cashflows	1484.56					

$$\therefore \textbf{Terminal Value} = \frac{145 \times 1.06}{0.135 - 0.06} \times \frac{1}{(1.135)^5} = \textbf{1,088.01}$$

Ownership Position of Shareholders of Pj Ltd in Combined Firm

$$= \frac{12,00,000}{12,00,000 \times (0.3 \times 7,00,000)} = 0.85$$

Calculation of NPV of the merger proposal from shareholders POV of Pj Ltd

NPV_{pj} = (0.85 × 1,484.56) – 1,111.35

= INR 152.11 Lakh

ILLUSTRATION 5

MNO Company is considering the acquisition of PQR Company. The Target Company would receive INR 70 for each share of its common stock. The Acquiring Company does not expect any change in its price/earnings ratio multiple after the merger and chooses to value the target company conservatively by assuming no earnings growth due to synergy.

Calculate

a. The purchase price premium

b. The exchange ratio

C. The number of new shares issued by the acquiring company

d. Post-merger EPS of the combined firms

e. Pre-merger EPS of the Acquiring Company

f. Pre-merger P/E ratio

g. Post-merger share price

h. Post-merger equity ownership distribution

The Following Additional Info is Available

	MNO	PQR
Earnings	3,70,000	92,000
Number of Shares	90,000	24,000
Market Price/share	43	57
Offer Price		70

Solution:

(a) Purchase Price Premium = Offer price for target company stock / Target Company market price per share

= 70 / 57 = 1.228

(b) Exchange Ratio = Price per share offered for target compay/ Makret price Per share for the acquiring Company

= 70 / 43 = 1.63

Acquiring company issues 1.63 shares for each share of target company.

(c) New shares issued by acquiring company

= 1.63 × 24,000 = 39,070

(d) Post Merger EPS of Combined Companies = Combined Earnings/ Total No. of Shares

Combined Earnings = 4,62,000

Total Shares = 1,29,070

Post merger EPS = 3.58

(e) Pre Merger EPS of Acquiring Company

= 3,70,000 / 90,000 = 4.1Pre Merger P/E

= 43 / 4.11 = 10.46

(f) Post merger share price = Post merger EPS × Pre merger P/E

= 3.58 × 10.46 = 37.44

(g) Post merger Equity Ownership distribution

Target Company = 39,070 / 1,29,070 = 30.27%

Acquiring Company = 100 – 30.27% = 69.73%

ILLUSTRATION 6

Apollo, a textile manufacturing company based in West Bengal, has aggressive plans for expanding its market share. The company is planning to set-up a manufacturing base near Odisha to cater to the customers based in North India. To get faster market access the company has decided in favor of an acquisition. The company has undertaken a detailed study of prospective takeover targets and finally identified Ganesh Ltd., an Odisha based manufacturer, as the company which fits in best with its strategic goals. After having collected the relevant information, the company is now faced

with the case of arriving at a reasonably correct value of Ganesh Ltd in order to begin takeover negotiations. The company's balance sheet is given below. Additional information is also given. Use the Discounted Cash Flow approach to value the company.

(Amount in INR Crore)

Liability	Amount	Asset	Amount
Share Capital	5	Land	2
Reserves	0.7	Buildings	1
Term Liability		Machinery	4
bank	3	Other	2
Other	2	Less : Accumulated Depreciation	4.5
Current Liabilities	13	Add : CWIP	1.2
		Total Fixed Asset	5.7
		Inventories	3
		Trade receivables	7
		Other	8
Total	**23.7**	**Total**	**23.7**

Capital Expenditure of INR 3 Cr will be Incurred in 2012 and 11 Cr in 2013

Other Information:

Particulars	2011	2012	2013	2014	2015	2016
Net Sales	60	65	68	72	75	80
Raw Material Cost	28	30	32	37	45	50
Power	2	1.5	1.8	2.6	1.4	2.3
Employee Benefit Expense	3	4	6	7	7	6
Administration Expense	1	1.5	1.8	2.1	2.4	2.7
Depreciation	0.8	1.2	1.5	1.8	2.1	2.5

Tax Rate	28%
Current Price	30
Beta	1.12
Rf	12%
Rm-Rf	3%
Growth Rate	9%
Bank Finance	18%
Pattern	
Additional Capital	12
Term Loan	10

Solution:

Computation of Cost of Capital

Number of Equity Shares = (5 + 12) / 10 = 1.7 Crore

Market Value of Equity = 1.7 × 30 = 51 Crore

Market Value of Debt = (3 + 2 + 10) = 15 Crore

Total = 66 crore

Component	Value	Weight	Cost	WACC
Debt	15	23%	12.96%	2.95%
Equity	51	77%	15%	11.87%
WACC	**66**			**14.81%**

Particulars	2011	2012	2013	2014	2015	2016	Terminal
Net Sales	60	65	68	72	75	80	
Less: Expenses							
Raw Material Cost	28	30	32	37	45	50	
Power	2	1.5	1.8	2.6	1.4	2.3	
Employee Benefit Exp	3	4	6	7	7	6	

Particulars	2011	2012	2013	2014	2015	2016	Terminal
Admin Exp	1	1.5	1.8	2.1	2.4	2.7	
Total Expenses	34	37	41.6	48.7	55.8	61	
EBITDA	**26**	**28**	**26.4**	**23.3**	**19.2**	**19**	
Depreciation	0.8	1.2	1.5	1.8	2.1	2.5	
EBIT	**25.2**	**26.8**	**24.9**	**21.5**	**17.1**	**16.5**	
NOPAT	18.14	19.3	17.93	15.48	12.31	11.88	
Gross Cashflow (NOPAT+Depreciation)	18.94	20.5	19.43	17.28	14.41	14.38	
Gross Investment		3	11				
Free Cash flow	18.94	17.5	8.43	17.28	14.41	14.38	269.57
PV of Free Cashflow @14.81%	16.5	13.27	5.57	9.94	7.22	6.28	117.68
Sum of PV of Cashflow	176.46						
Less :Debt	15						
Equity Value	**161.46**						

Computation of Terminal Value

$$= \frac{14.38 \times 1.09}{0.1481 - 0.09} \times \frac{1}{(1.1481)^6} = 117.68 \text{ crore}$$

(i) Value of the Company

= Sum of Present value of cashflows - Debt

= 176.46 Crore – 15 Crore = 161.46 Crore

Value per Share

= 161.46 Crore / 1.7 Crore = 94.98 / Share

(ii) Share Exchange ratio

Target co. share value / Acquirer co. Share Value = 94.98 / 30

= 3.17

Share to be issued to Transferor company

Target Co. shares X Exchange ratio = 1.7 Crore × 3.17

= 5.38 Crore shares

ILLUSTRATION 7

The shares of Amrit corporate Ltd. (ACL) are currently being traded for INR 27 per share. The top management together with their families control 36% of the 12 lakh shares outstanding. Piyush Company Ltd. (PCL) wishes to acquire ACL because of likely synergies. The estimated present value of these synergies is INR 76 lakh. Moreover, PCL feels that the management of ACL is overpaid. It feels that with better management motivation, lower salaries and fewer perks for the top management, approximately INR 3.75 lakh of expenses per annum can be saved. This would add INR 26.5 lakh in value to the acquisition.

The following additional information is available regarding PCL:

Earnings per share	INR 6.5
Number of shares outstanding	18 lakh
Market price of shares	INR 36

(a) What is the maximum price per share which PCL can offer to pay for ACL?

(b) What is the minimum price per share at which the management of ACL will be willing to give up their controlling interest?

(c) Calculate the Share exchange ratio

(d) Calculate Acquisition Premium

Solution:

(a)

PV of Company (12 Lakh × 27)	3,24,00,000
Synergies Gain	76,00,000
Savings	26,50,000
Maximum Value	4,26,50,000

Maximum Share Price = 4,26,50,000 / 12,00,000

= 35.54 / Share

(b)	Share Value of Amrit top Management	=	(27 × 12,00,000 × 36%)	= 1,16,64,000
	Value of giving Salaries			= 26,50,000
	Minimum Value			**= 1,43,14,000**
	Minimum Share Price	=	1,43,14,000 / (12,00,000 × 36%)	= 33.13 / Share
(c)	Price offered to Amrit Ltd	=	34	
	Share Exchange ratio	=	34 / 36	= 0.94
	Shares to be issued	=	0.94 × 12,00,000	= 11,33,333
(d)	Acquisition Premium	=	(34 – 27) / 27	= 26%

ILLUSTRATION 8

SK India Ltd. is a manufacturing company in the cement industry. The earnings of the company have dropped over the last few years and so the company is planning a major restructuring changing both its assets and liability mixes. The current earnings per share for the firm is ₹.10. The effects of restructuring on growth rate and on beta are as follows:

Particulars	Before	After
Return on Asset (ROA)	10%	18%
D/E	0.20	1
Beta	0.9	1.30
Interest rate	9%	10%
Pay-out ratio	0.50	0.25
Retention	0.50	0.75

The firm plans to borrow and repurchase the stock to get the optimal ratio. The firm is in the 35% tax bracket.

The earnings growth rate after 4 years is expected to be 7%, and the dividend pay-out is expected to be 50% after year 4, whether or not restructuring occurs. The beta of the stock is expected to be 1 in the stable phase, regardless of the restructuring. The Treasury bill rate is 7.5% and the market premium is 5.5%.

Estimate the increase in the price per share due to restructuring.

Solution:

Estimation of Growth Rate for the First 4 Years Before Restructuring

$g = b [ROA + D/E \{ROA - I (1 - t)\}]$

$= 0.5[0.10 + 0.20 \{0.10 - 0.09 (1 - 0.35)\}]$

$= 5.41\%$

After Restructuring

$g = b [ROA + D/E \{ROA - I (1 - t)\}]$

$= 0.75[0.18 + 1 \{0.18 - 0.10 (1 - 0.35)\}]$

$= 22.125\%$

Estimation of Cost of Equity for the First 4 Years Before Restructuring

$k_e = R_f + \beta (R_m - R_f)$

$= 7.5 + 0.9 (5.5)$

$= 12.45\%$

After Restructuring

$k_e = R_f + \beta (R_m - R_f)$

$= 7.5 + 1.3 (5.5)$

$= 14.65\%$

Cost of Equity after 4 Years

$k_e = R_f + \beta (R_m - R_f)$

$= 7.5 + 1 (5.5)$

$= 13\%$

Price per share before restructuring

$$= \frac{10(0.5)(1.0541)\left(1-\frac{(1.0541)^4}{(1.1245)^4}\right)}{0.1245-0.0541}+\frac{10(0.5)(1.0541)^4(1.07)}{(0.13-0.07)(1.1245)^4}$$

$= 17.054 + 68.87 = \text{INR } 85.924$

Price per share after restructuring

$$= \frac{10(0.25)(1.22125)\left(1-\frac{(1.22125)^4}{(1.1465)^4}\right)}{0.1465-0.22125} + \frac{10(0.5)(1.22125)^4(1.07)}{(0.13-0.07)(1.1465)^4}$$

= 11.729 + 114.86 = INR 126.59

Increase in price because of restructuring

= INR 126.59 – 85.924 = INR 40.67 approximately.

ILLUSTRATION 9

Dell, HP & Mac are three firms operating in the laptop industry similar in most aspects. The management of Firm Dice which is also in the laptop industry is not sure about the value of its company. Firm 'Acer' has 100 lakh as revenues, 60 lakh as book value of equity and 5 lakh as net income. Firm Acer attempts to study similar companies in the cement industry which are comparable to 'Acer'. The study reveals the following:

	Dell	HP	Mac
Market/Revenue	1.2	1.0	0.8
Market/Book	1.3	1.2	2
Market/Net income	20	15	25

Determine the value of 'Acer' using the Comparable Company approach.

Solution:

Since, the three companies Dell, HP & Mac are similar to Acer in most of the aspects, the average multiples can be taken as the proxies to determine the market value of Acer.

The averages can be calculated as below

Market value/Revenues = (1.2 + 1+ 0.8) × 1/3 = 1

Market value/Book = (1.3 + 1.2 + 2) × 1/3 = 1.5

Market value/Net income = (20 + 15 + 25) × 1/3 = 20

Estimation of Ratios

	Dell	HP	Mac	Average
Market/Revenue	1.2	1.0	0.8	1.0
Market/Book	1.3	1.2	2	1.5
Market/Net income	20	15	25	20

Application of Valuation Ratios to Company Acer

	Data (lakh)	Average M. Ratio	Indicated value of equity (lakh)
Revenues	100	1.0	100
BV of equity	60	1.5	90
Net income	5	20	100

Average = 1/3 × (100 + 90 + 100) = INR 97 lakh

Therefore, Value of firm Acer = INR 97 lakhs

ILLUSTRATION 10

ABC Ltd. is contemplating the acquisition of XYZ Ltd. The values of the two companies are ₹.20 lakh and ₹.10 lakh. ABC estimates that by combining the two companies, it will reduce marketing and administrative costs by ₹.50,000 per year in perpetuity. ABC can either pay ₹.14 lakh cash for XYZ or offer a 50% holding in ABC. The opportunity cost of capital is 10%.

a. What is the gain from merger?

b. What is the cost of the cash offer?

c. What is the cost of the stock alternative?

Solution:

Let the value of ABC and XYZ be represented as PVA and PVB and the value of the combined firm PV_{AB}.

a. Gain from the Merger

Gain from the merger = Reduction of costs due to the merger

ABC estimates that by combining the two companies, it will reduce marketing and administration costs by ₹. 50,000 per year perpetually.

Cost of capital = 10%

Hence, PV of gain = 50,000/0.10

= ₹ 5,00,000

b. Cost of the Cash Offer = Cash paid – PV_B

= 14,00,000 – 10,00,000 = ₹ 4,00,000

c. Cost of the Stock Alternative

When the sellers receive N shares worth PAB, the cost is given as

Cost = N × P_{AB} – PV_B

Here, 50% of the combined firm value is paid as stock

Combined firm value PV_{AB} = Gain + (PV_A + PV_B)

= 5,00,000 + (20,00,000 + 10,00,000)

= ₹ 35,00,000

Hence, value of stock offered = 0.50 × 35,00,000 = 17,50,000

Cost = 17,50,000 – 10,00,000

= ₹ 7,50,000.

ILLUSTRATION 11

Khushi Ltd. is considering the acquisition of Manisha Ltd. with equity. Relevant financial information is given below.

	Khushi Ltd.	Manisha Ltd.
Present earnings	INR 75 lakh	INR 40 lakh
Equity (no. of shares)	40,00,000	32,00,000
EPS (INR)	1.875	1.25
P/E ratio	10	6

Khushi Ltd. plans to offer a premium of 22% over the market price of Manisha Ltd.

a. What is the ratio of exchange of equity? How many new shares will be issued?

b. What are the earnings per share for the surviving company immediately following the merger?

c. If the price/earnings ratio stays at 10 times, what is the market price per share of the surviving company? What would happen if P/E decreases to 9?

Solution:

Estimation of MPS

	Khushi Ltd.	Manisha Ltd.
EPS (INR)	1.875	1.25
P/E ratio	10	6
Market price per share	18.75	7.5
(= EPS × P/E ratio)		

Shareholders of Manisha Ltd. are offered 7.5 × 1.22 = 9.15 per share in the shares of Khushi Ltd.

a. Exchange ratio = $\frac{9.15}{18.75}$ = 0.488 (rounded off to 0.5)

Number of new shares issued = 32,00,000 × 1/2

= 16,00,000 shares

b. Earnings of surviving company = 75 + 40 = INR 115 lakh Equity (shares)

= 40 + 16 = INR 56 lakh

EPS = 115/56 = INR 2.05

There is an increase in EPS as the company that is acquired has a low P/E ratio.

c. Market price per share when P/E = 10

= 2.05 × 10 = INR 20.53

Market price per share when P/E = 9 = 2.05 × 9 = INR 18.48

In the first case, share price rises from 18.75 to 20.53 due to the increase in EPS. In the second instance it falls owing to decrease in P/E ratio.

ILLUSTRATION 12

Jasmine Ltd. wants to acquire Avril Ltd. by exchanging 0.5 of its shares for each share of Avril Ltd. The relevant financial data are furnished below:

Particulars	Jasmine Ltd.	Avril Ltd.
Earnings after tax	INR 9,00,000	INR 1,80,000
Equity shares outstanding	3,00,000	90,000
Market price of the share	INR 36	INR 20

Calculate:

a. The EPS and the P/E ratio of the firms before the merger.

b. The number of equity shares required to be issued by Jasmine Ltd. for the acquisition of Avril Ltd.

c. EPS of Jasmine Ltd. after the acquisition.

d. Market price per share of Jasmine Ltd. after the acquisition, assuming its P/E multiple remains unchanged.

e. The market value of the merged firm.

Solution:

a. EPS and P/E before the Merger

	Jasmine Ltd.	Avril Ltd.
EPS (EAT/ No. of shares)	9,00,000/3,00,000 = INR 3	1,80,000/90,000 = INR 2
P/E (MPS/EPS)	36 /3 = 12 times	20 / 2 = 10 times

b. Number of equity shares required to be issued by Jasmine Ltd. for acquisition of Avril Ltd. 90,000 shares of Avril Ltd. x 0.5 exchange ratio = 45,000 shares

c. EPS of Jasmine Ltd. after the acquisition

(9,00,000 + 1,80,000)/(3,00,000 + 45,000) = INR 3.13 approximately

d. Expected market price per share of Jasmine Ltd. after the acquisition, assuming its P/E multiple remains unchanged = EPS x P/E

= 3.13 × 12 = INR 37.56

e. Market value of the merged firm = 37.56 × 3,45,000 = INR 1,29,58,200

ILLUSTRATION 13

Dipanwita Ltd., is planning to acquire and absorb the running business of Priti Ltd. The valuation is to be based on the recommendation of merchant bankers and the consideration is to be discharged in the form of equity shares to be issued by Dipanwita Ltd. As on 31.3.20X4, the paid-up capital of Dipanwita Ltd. consists of 90 lakhs shares of INR 10 each. The highest and the lowest market quotation during the last 6 months were INR560 and INR420. For the purpose of the exchange, the price per share is to be reckoned as the average of the highest and lowest market price during the last 6 months ended on 31.3.08. Priti Ltd.'s Balance Sheet as at 31.3.20X4 is summarised below:

Priti Ltd.'s Balance Sheet as at 31.3.20X4	INR In Lakhs
Sources:	
Share Capital	
20 lakhs equity shares of 10 each fully paid	200
10 lakhs equity shares of 10 each, 5 paid	50
Loans	100
Total	**350**
Uses:	
Fixed Assets (Net)	150
Net Current Assets	200
Total	**350**

An independent firm of merchant bankers engaged for the negotiation, have produced the following estimates of cash flows from the business of Priti Ltd.:

Year Ended	By Way of	INR Lakhs
31.3.09	After tax earnings for equity	115
31.3.10	After tax earnings for equity	120
31.3.11	After tax earnings for equity	125
31.3.12	After tax earnings for equity	110
31.3.13	After tax earnings for equity	100
	Terminal Value estimate	200

It is the recommendation of the merchant banker that the business of Priti Ltd. may be valued based on the average of

(i) Aggregate of discounted cash flows at 8% and

(ii) Net assets value. Present value factors at 8% for years

Year 1 - 5	0.93	0.86	0.79	0.74	0.68

You are required to:

(i) Calculate the total value of the business of Priti Ltd.

(ii) The number of shares to be issued by Dipanwita Ltd.; and

(iii) The basis of allocation of the shares among the shareholders of XY Ltd.

Solution:

Price per share of Dipanwita Ltd. for determination of number of shares to be issued

= (560 + 420)/2 = 490

Value of Priti Ltd based on future cash flow capitalization	INR Lakhs	594.3
Value of Priti Ltd based on net assets	INR Lakhs	250
(i) Average value of firm (594.3 + 250)/2		422.15
(ii) No. of shares in Dipanwita Ltd to be issued (4,22,15,000/490)	Nos.	86,115
(iii) Basis of allocation of shares:		
Fully paid equivalent shares in XY Ltd. (20+5) lakhs		25,00,000
Distribution to fully paid shareholders = 86,115 × 20/25		68,892
Distribution to partly paid shareholders = 86,115 – 68,892		17,223

Working Notes:

1. Calculate Discounted Cash Flow Value

Using the given cash flows, terminal value, and present value factors:

Year	Cash Flow (INR Lakhs)	PV Factor (8%)	Discounted Value (INR Lakhs)
1	115	0.93	106.95
2	120	0.86	103.2
3	125	0.79	98.75
4	110	0.74	81.4
5	100 + 200 (Terminal)	0.68	204
			594.3

2. Calculate Net Asset Value (NAV)

Priti Ltd.'s Net Assets from the balance sheet are:

Net Assets = Fixed Assets (Net) + Net Current Assets − Loans

NAV = 150 + 200 – 100 = 250 Lakhs

3. Price per Share of Dipanwita Ltd.

The share price is the average of the highest and lowest prices:

$$\text{Price per Share} = \frac{\text{Highest Price + Lowest Price}}{2} = \frac{560 + 420}{2} = \text{INR } 490.$$

NOTES

NOTES

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