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# FAIR VALUATION OF INVENTORY

APRIL 2019

## INTRODUCTION

Inventories constitute a significant proportion of assets, especially in manufacturing and trading entities. In case of business combinations of such entities as well as asset acquisitions, the fair value of inventories acquired needs to be determined. This newsletter discusses the methods of determining of fair valuation of inventories.

## FAIR VALUATION OF INVENTORIES

ASC 805: Business Combinations[1], IFRS 3: Business Combinations[2] and Ind AS 103: Business Combinations[3] (jointly referred to as "the standards") mandate that all assets, liabilities and minority interests acquired in a business combination are to be recognised at their respective fair values as on the acquisition date.

While the standards specifically scope out asset acquisitions, they mention that the acquirer shall identify and recognise the individual identifiable assets acquired, by allocating the cost of the group of assets to the individual identifiable assets and liabilities on the basis of their relative fair values at the date of purchase.

Per ASC 820: Fair Value Measurement[1], IFRS 13: Fair Value Measurement[2] and Ind AS 113: Fair Value Measurement[3], fair value is defined as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date."

In case of inventories, financial reporting standards do not provide any specific guidance. However, the fair value of inventory can be interpreted as the amount that would be received by the acquirer in sale of the inventory in its existing condition to a market participant at the acquisition date.

## I. COMPONENTS OF INVENTORY VALUE

The value constituents of inventory include the:

1. procurement cost of raw material
2. the direct and indirect expenses that were incurred to bring the inventory to its form as on the acquisition date
3. the profit anticipated on such expenses incurred, assets used, or capital invested.

[1] *ASC 805: Business Combinations, ASC 820: Fair Value Measurement and ASC 330: Inventory issued by Financial Accounting Standards Board*
[2] *IFRS 3: Business Combinations and IFRS 13: Fair Value Measurement issued by International Accounting Standards Board*
[3] *Ind AS 103: Business Combinations and Ind AS 113: Fair Value Measurement issued by Ministry of Corporate Affairs, India*

## II. APPROACHES TO VALUING INVENTORY

- ### TOP DOWN APPROACH

The top down approach of valuing inventories indicates starting from its expected sale value. The value of inventory is the expected sale value of the inventory adjusted for the costs to be incurred on the inventory and the profit on its sale attributable to the acquirer.

In the top down approach, the value of inventory is computed as follows:

| PARTICULARS | AMOUNTS (USD million) |
|---|---|
| Expected sale value | xx |
| Less: Costs of completion | (xx) |
| Less: Costs of disposal | (xx) |
| Less: Costs of holding inventory | (xx) |
| Less: Profit attributable to the acquirer | (xx) |
| Fair value of acquired inventory | xx |

The elements in the computation are explained below:

- **Expected sale value:** This is the expected sale value of the inventory.

- **Costs of completion:** These expenses particularly relate to work-in-progress inventory. They include the manufacturing costs incurred to bring the inventory to its saleable condition.

- **Costs of disposal:** These are administrative, selling and distribution expenses incurred for disposal of the inventory.

- **Costs of holding inventory:** These costs are a compensation to the acquirer for its investment in the inventory. The computation of these costs involves discounting the inventory value over its expected holding period using an appropriate discount rate. The cost of debt can be used as a proxy for estimation of the discount rate.

- **Profit attributable to the acquirer:** This component relates to the expected profit margin on sale of the inventory. It is computed by allocating the total profit to be earned, on a suitable basis (e.g. as a proportion of the costs to be incurred by the acquirer post the transaction). The acquiree's historical profit margins can be used as a proxy to estimate the profit on the inventory.

- ### BOTTOM UP APPROACH

The bottom up approach emphasises on the costs incurred for the inventory prior to the acquisition date. The value of inventory is computed by adding the profit attributable to the acquiree to the adjusted book value of the inventory.

In the bottom up approach, the value of inventory is computed as follows:

| PARTICULARS | AMOUNTS (USD million) |
|---|---|
| Adjusted carrying value of inventory | xx |
| Add: Profit attributable to the acquiree | xx |
| Fair value of acquired inventory | xx |

The elements in the above computation are explained below:

- **Adjusted carrying value:** It is the amount at which the inventory is recorded in the acquiree's books as on the acquisition date, further adjusted for costs under a market participant assumption. It represents all the costs that the acquiree has incurred for the inventory including procurement costs, manufacturing costs, administrative costs, adjustments for wastages and other directly attributable costs.

- **Profit attributable to the acquiree:** It is computed in the same manner as in the top-down approach.

## ➢ RECONCILING THE VALUES ARRIVED BY BOTH THE APPROACHES

Keeping all assumptions regarding market participants equal, the values computed from the top-down and bottom-up approaches should yield similar results. This is because the amounts that have not been deducted from the expected sale value in the top-down approach have been added to the carrying value in the bottom-up approach.

## ➢ SPECIFIC CONSIDERATIONS AND ISSUES IN VALUATION OF INVENTORY

- **Method of accounting for inventory:** The acquiree's method of accounting for inventory (i.e. FIFO or LIFO) is an important consideration for valuing it. The carrying value of inventory would represent the current prices if FIFO is used, and vice versa. This an important consideration when adjusting the carrying value of inventory in the bottom-up approach.

- **Discontinued inventory:** The acquirer may decide to discontinue certain inventory post-acquisition. In such cases, the behaviour of the market participants shall be considered; whether market participants would sell the inventory in the wholesale or retail market, scrap market or for a de minimis amount.

- **Stage of inventory:** In case of inventories at the research stage (e.g. pharma company researching on cancer medication), determination of fair valuation of inventories is a challenging task due to the lack of availability of Level 1 and Level 2 inputs per ASC 820.

**Example:** Fair valuation of work-in-progress

*Suppose ABC Inc. acquired XYZ Inc. for a purchase consideration of USD 100 million. Per the terms of agreement ABC Inc. also acquired inventories of XYZ Inc. As on the acquisition date, the inventories of XYZ Inc. consisted of work-in-progress inventory of USD 63 million.*

### STEP 1: PROFIT CALCULATION

| PARTICULARS | AMOUNTS (USD million) |
|---|---|
| Expected sale value | 190.0 |
| Less: Costs incurred till date (i.e. carrying value) | (63.0) |
| Less: Costs of finishing inventory @24% of expected sale value (based on historical trends) | (45.6) |
| Less: Costs of disposal @ 10% of expected sale value (based on historical trends) | (19.0) |
| PROFIT | 62.4 |

### STEP 2: ALLOCATION OF PROFITS

The profits will be allocated among ABC Inc. and XYZ Inc. based on the proportion of costs incurred by each entity.

The costs incurred by ABC Inc. and XYZ Inc. are as follows:

| PARTICULARS | COSTS INCURRED | **% of total costs** |
|---|---|---|
| Costs incurred by ABC Inc. (acquiree) | 63.0 | 49.37% |
| Costs incurred by XYZ Inc. (acquirer) | 64.6 | **50.63%** |
| Total costs | 127.6 | **100.00%** |

### STEP 3: INVENTORY STEP-UP (TOP DOWN APPROACH)

| PARTICULARS | AMOUNTS (USD million) |
|---|---|
| Estimated sale value | 190.0 |
| Less: Costs to complete | (45.6) |
| Less: Costs of disposal | (19.0) |
| Less: Profit attributable to acquirer (50.63%*62,400,000) | (31.6) |
| **Future value of inventory** | 93.8 |
| Inventory days (based on historical trends) | 143 |
| Discounting period (143/365) | 0.39 |
| Cost of debt | 4.00% |
| Present value factor | 0.98 |
| Present value of inventory | 92.4 |
| **Carrying value** | 63.0 |
| **Step up (Present value/Carrying value)** | 1.47 |

**OR**

### STEP 3: INVENTORY STEP-UP (BOTTOM UP APPROACH)

| PARTICULARS | AMOUNTS (USD million) |
|---|---|
| Costs incurred by XYZ Inc. (acquiree) | 63.0 |
| Add: Profits attributable to XYZ Inc. (acquiree) (49.37%*63,000,000) | 31.1 |
| **Future value of inventory** | 94.1 |
| Inventory days (Based on historical trends) | 143 |
| Discounting period (143/365) | 0.39 |
| Cost of debt | 4.00% |
| Present value factor | 0.98 |
| **Present value of inventory** | 92.7 |
| **Carrying value** | 63.0 |
| **Step up (Present value/ Carrying value)** | 1.47 |

**For valuing finished goods, the aforementioned process shall be followed, except there shall be no element of cost of completion.**

**For valuing raw materials, the aforementioned process shall be followed, except the estimated sale value shall be of the raw material (instead of the finished inventory) and there shall be no element of cost of completion**

## CONCLUSION

The fair valuation of inventories is a complex task for appraisers due to the level of subjectivity and estimations involved in the valuation process. While performing the valuation of inventories, it is pertinent for the appraiser to ensure that the valuation process is consistent with the fair valuation principles highlighted in the financial reporting standards.



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