# Martec International

# White Paper -
## The Retail and The Cost Methods of Accounting

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## About the Authors – Martec International

We help retailers, consumer goods manufacturers and their technology, logistics and other suppliers to grow their sales, market share and profitability, through a combination of our unique, industry specific training products, and performance support services.

We serve clients in nearly 60 countries.

# The Retail and The Cost Methods of Accounting

Approximately 70% of retailers use the retail method of accounting.  Mostly these are department stores, fashion retailers and many hard goods retailers.  The remainder, mostly grocers and some hard goods retailers, use cost accounting.  There is a slight swing to cost accounting, partly because more modern computer systems make this a lot more feasible and partly because of the growing trend to adopt SAP Retail software, which historically did not support the retail method.  Though the adoption of cost is a trend, it is best described as a small trend.

This section will compare the two methods of accounting.  In understanding the differences between the retail method and the cost method, the following need to be considered:

- How inventory is valued
- How physical inventories are affected
- How margins are calculated
- How cost of goods sold is calculated
- Markdowns verses price reductions
- Calculating key performance indicators, such as turn, GMROI and sales to stock ratios.
- Merchandise planning
- Open to buy planning and management

## Retail Method

The retail method was designed before computerized stock ledgers were common practice.  Its great advantage was that you could track the value of inventory with the minimum number of clerks.  Under the retail method, inventory is tracked all through the year at retail or selling price, rather than cost price.  It only gets converted to cost price when the year end balance sheet is produced for the official financial statements and the company tax returns (in the US).

Let's look at a simple example of how the retail method works if we bring a new line into the business.  Our initial purchase order is for 1,000 units, which will cost us $10 each. (Note:  This cost includes the purchase price and the freight to get it into our warehouse or stores).  We expect to put them on sale at $20 initially.  Hence the initial transaction in the column headed "1" will look like this:

| Transaction Type | Initial Order |
|---|---|
| Order Quantity | 1,000 |
| Cost $ | 10,000 |
| Opening Inventory in Units | 1,000 |
| Sales in Units | 0 |
| Closing Inventory in Units | 1,000 |
| Retail Value of Inventory $ | 20,000 |
| Cost Value of inventory $ | |
| Mark Up $ | 10,000 |
| Initial Mark Up % | 50 |
| Cumulative Mark Up | 50 |

In this case, the mark up is known as the initial mark up. At the end of the initial period, we post the sales achieved so far (transaction 2). Let's say we sold 200 units at full price, hence our sales revenue was $4,000. The retail value of our inventory started at $20,000. Now it is down to $16,000. Because sales were at full price, the mark up percent did not change.

| Transaction Type | Initial Order | Post Sales | | | |
|---|---|---|---|---|---|
| Order Quantity | 1,000 | | | | |
| Cost $ | 10,000 | | | | |
| Opening Inventory in Units | 1,000 | 1,000 | | | |
| Sales in Units | 0 | 200 | | | |
| Closing Inventory in Units | 1,000 | 800 | | | |
| Retail Value of Inventory $ | 20,000 | | | | |
| Cost Value of inventory $ | | | | | |
| Mark Up $ | 10,000 | | | | |
| Initial Mark Up % | 50 | 50 | | | |
| Cumulative Mark Up | 50 | 50 | | | |

We think this line will be very successful, so we decide to order more. We raise a purchase order for an additional 1,000 units, but we are able to negotiate a better cost price and we only pay $9.50 per unit. After we posted last week's sales, we had 800 units of inventory left. When this new order arrives the on hand will be 1,800. (For the purposes of this illustration, ignore the fact that we sell some more in the interim).

Let's assume that we leave the retail price at $20. Using the retail method, our inventory is now valued at 1,800 units times $20, or $36,000. However, we purchased elements of that inventory at different cost prices. Hence, we need a method to calculate the cost value of the inventory for year end accounting purposes.

| Transaction Type | Initial Order | Sales | Further Order | | |
|---|---|---|---|---|---|
| Order Quantity | 1,000 | | 1,000 | | |
| Cost $ | 10,000 | | 9500 | | |
| Opening Inventory in Units | 1,000 | 1,000 | 800 | | |
| Sales in Units | 0 | 200 | 0 | | |
| Closing Inventory in Units | 1,000 | 800 | 1,800 | | |
| Retail Value of Inventory $ | 20,000 | | 36,000 | | |
| Cost Value of inventory $ | | | | | |
| Mark Up $ | 10,000 | | | | |
| Initial Mark Up % | 50 | 50 | 52.5 | | |
| Cumulative Mark Up | 50 | 50 | 51.4 | | |

We previously had 800 units closing inventory valued at $16,000 retail with 50% mark up. We calculate the cost complement – (100% - 50% Initial mark up) times $20 times 800 units = $8,000.

The new order has a cost of $950 and a retail of $20,000. When we combine the two, we get the following:

| | Current Inventory | New Order | Combined |
|---|---|---|---|
| Retail Value $ | $16,000 | $20,000 | $36,000 |
| Cost $ | $8,000 | $9,500 | $17,500 |
| Mark Up% | 50% | 52.5% | 51.4% |

The resulting mark up (51.4%) is known as the cumulative initial mark up or CIMU.

If we then post the next batch of sales, we might get a result like the column headed 4 in the table above. Let's now suppose that our second order has proved to be too optimistic and we decide that we need to reduce the selling price to accelerate the rate of sale. In other words, we need to take a permanent markdown. Suppose we decide on 25%, each unit is now worth $15 at retail instead of $20, hence the retail value of our inventory is now $15 times 1,650 units = $24,750.

| Transaction Type | Initial Order | Sales | Further Order | Sales | Markdown |
|---|---|---|---|---|---|
| Order Quantity | 1,000 | | 1,000 | | |
| Cost $ | 10,000 | | 9500 | | |
| Opening Inventory in Units | 1,000 | 1,000 | 800 | 1,800 | 1,650 |
| Sales in Units | 0 | 200 | 0 | 150 | 0 |
| Closing Inventory in Units | 1,000 | 800 | 1,800 | 1,650 | 1,650 |
| Retail Value of Inventory $ | 20,000 | | 36,000 | 33,000 | 24,750 |
| Cost Value of inventory $ | | | | 16,005 | 16,005 |
| Mark Up $ | 10,000 | | | | 8,745 |
| Initial Mark Up % | 50 | 50 | 52.5 | 51.4 | |
| Cumulative Mark Up | 50 | 50 | 51.4 | 51.5 | 35.3 |

Prior to taking the markdown, the retail value was $33,000 and the cumulative initial mark up was 51.4%. We calculate the cost value of the inventory using the cost complement method as before:

Cost value = (100%-51.5%) x $20 x 1,650 = $16,005

With retail value of $24,750 after taking the markdown and a cost value of $16,005 the mark up is $8,745 and the mark up percent is 35.3% (8,745 divided by 24,750 times 100%). This is known as the CMU or cumulative mark up as it reflects any change to the inventory margin.

## Cost of Goods Sold

Knowing the sales and knowing the CMU, we can calculate the cost of goods sold for the time period under question using the cost complement calculation.

## Advantages

The retail method has several advantages:

1. In order to calculate the cost value of the inventory, you only need to know the retail value and the cumulative mark up.
2. For year end purposes, inventory has to be valued at the lower of cost or net realizable value (market value).  As you process markdowns to reflect the market value of the product in question, the cost complement method and the CMU give you an easy way to calculate the cost to use in year end financial statements.  In countries that charge tax on inventory (tax on assets), the retail method is an approved way to value inventory for tax assessment purposes.
3. As inventory is tracked at retail, it makes the process of conducting physical inventories simpler as all product in stores is marked at retail and retailers avoid giving stores cost details.
4. Markdowns are highly visible and quickly indicate areas of potential trouble for the retailer.
5. In merchandise planning, the retail method ensures that you buy enough inventory to achieve the planned retail sales allowing for the distortions caused by markdowns.
6. Since most of the industry uses the retail method, hiring personnel is made easier since 70% of new hires in buying, merchandising and finance are likely to know the retail method (excluding graduate entry).

Implicit in the retail method is FIFO inventory valuation.  In other words, as inventory quantities are down dated due to sales, write offs and theft, for example, the retail method assumes that the oldest stock is sold first.  This is known as First In First Out or FIFO.

# Cost Method

The cost method has become more popular with the development of more advanced computer systems, which handle the extra work in a much more economical fashion.

Under the cost method, there are four potential ways of valuing inventory:
- Specific method
- Average cost or moving average cost
- FIFO
- LIFO.

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## Specific Method

The specific method is the most labor intensive and tends to be used by retailers selling products such as high-end jewelers with expensive stones, or with Rolex watches that are tracked by serial number.  Though washing machines can be tracked by serial number, it wouldn't be worth the effort for the value involved in a single machine.

In this case, every single unit of inventory is tracked uniquely using its product serial number or a unique bar code attached to the product.  All inventory movements (receipts, sales, transfers, etc.) have to be tracked individually.

## Average Cost Method

To use the average cost it is necessary to keep a history of all individual transactions at cost.  Using the same example as used for the Retail Method, this might look as follows:

| Transaction | Units | Cost Price $ | Ending Unit Inventory | Average Cost $ | Average Cost Calculation | Ending $ Inventory | Charge to Cost of Goods Sold |
|---|---|---|---|---|---|---|---|
| Purchase | 1,000 | 10.00 | 1,000 | 10.00 | | 10,000 | |
| Sales | 200 | 10.00 | 800 | 10.00 | | 8,000 | $2,000 (200 x $10.00) |
| Purchase | 1,000 | 9.50 | 1,800 | 9.72 | ((1,000 – 200) x 10.00) + (1,000 x 9.50) / 1,800 = 9.72 | 17,496 (1,800 x 9.72) | |
| Sales | 150 | 9.72 | 1,650 | 9.70 | ((1,000-350)x10.00) + (1,000x9.50)/1,650 = 9.70 | 16,005 | $1,455 (150 x $9.70) |
| Price Reduction | | No Change | 1,650 | | | | |

Now, let's examine this more slowly.  Bringing in a new line, we made an initial purchase of 1,000 units at $10 per unit.  Our ending inventory once we have received the goods is 1,000 units and $10,000 at cost at an average cost of $10 per unit.  Over the next period, we sell 200 units and when we post this on the stock ledger our on hand inventory drops to 800 units, still at an average cost of $10.00 each.

As in the retail method example, we decide to make an additional purchase of 1,000 units and we manage to negotiate a better price of $9.50 each because our volume is growing.  We now recalculate our inventory and our average cost.  In this example, we have 800 units left at a value of $10 each giving $8,000 total.  We have a new order of 1,000 units at 9.50 each, a total value of $9,500.  Our combined inventory is therefore:

| | | |
|---|---|---|
| 800 units at $10.00 | = | $8,000 |
| 1,000 units at   $9.50 | = | $9,500 |
| Total    1,800 units at | = | $17,500 |
| | | |
| At an average cost of $17,500/1,800 | = | $9.72 |

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We then sell another 150 units, reducing our inventory to 1,650 units.  The average cost of this inventory is now:

| | | |
|---|---|---|
| 650 units at $10.00 | = | $6,500 |
| 1,000 units at   $9.50 | = | $9,500 |
| Total    1,650 units at | = | $16,000 |
| | | |
| At an average cost of $16,000/1,650 | = | $9.70 |

As in the retail method example, suppose sales proved to be more challenging than we had estimated and we decide to reduce the retail price from $20 retail to $15, none of the calculations above change.  Hence valuing inventory at year end at the lower of cost and market value requires something extra if market is believed to be below cost.  This will be addressed later.

## FIFO

Using the FIFO method, the summary table looks very similar.

| Transaction | Units | Cost Price $ | Ending Unit Inventory | Average Cost $ | Average Cost Calculation | Ending $ Inventory | Charge to Cost of Goods Sold |
|---|---|---|---|---|---|---|---|
| Purchase | 1,000 | 10.00 | 1,000 | | | 10,000 | |
| Sales | 200 | 10.00 | 800 | | | 8,000 | $2,000 (200 x $10.00) |
| Purchase | 1,000 | 9.50 | 1,800 | | | 17,500 (8,000 + 9.50) | |
| Sales | 150 | 10.00 | 1,650 | | | 16,000 | $1,500 (150 x $10.00) |

The main differences between this FIFO table and the previous average cost table are:

1. Under FIFO, we assume that we sell the oldest inventory first, hence every transaction uses the costs associated with the oldest inventory until it is used up.
2. Prior to the second purchase, the ending inventory value was $8,000.  Under the FIFO method, the inventory value of the second purchase is $9,500 and this brings the inventory total up to $17,500.
3. After the second purchase, there are still 800 units remaining from the first purchase. Hence the second batch of sales (of 150 units) is serviced from inventory purchased at $10 per unit, so the charge to the cost of goods sold is $1,500 and the ending inventory is $16,000.

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## LIFO

LIFO means Last In First Out.  This method operates exactly the same as FIFO except that for each transaction the most recent item cost is used until the most recent purchase is exhausted.  Then the next most recent is used and so on.

| Transaction | Units | Cost Price $ | Ending Unit Inventory | Average Cost $ | Average Cost Calculation | Ending $ Inventory | Charge to Cost of Goods Sold |
|---|---|---|---|---|---|---|---|
| Purchase | 1,000 | 10.00 | 1,000 | | | 10,000 | |
| Sales | 200 | 10.00 | 800 | | | 8,000 | $2,000 (200 x $10.00) |
| Purchase | 1,000 | 9.50 | 1,800 | | | 17,500 (8,000 + 9.50) | |
| Sales | 150 | 9.50 | 1,650 | | | 16,075 | $1,425 (150 x $9.50) |

Comparing Average Cost, LIFO and FIFO in this example gives the following results:

| Transaction | Units | Cost Price $ | Ending Unit Inv. | Ave Cost Ending $ Inv. | Ave Cost Charge to COGS | FIFO Ending $ Inv. | FIFO Charge to COGS | LIFO Ending $ Inv. | LIFO Charge to COGS |
|---|---|---|---|---|---|---|---|---|---|
| Purchase | 1,000 | 10.00 | 1,000 | 10,000 | | 10,000 | | 10,000 | |
| Sales | 200 | 10.00 | 800 | 8,000 | $2,000 | 8,000 | $2,000 | 8,000 | 2,000 |
| Purchase | 1,000 | 9.50 | 1,800 | 17,496 | | 17,500 | | 17,500 | |
| Sales | 150 | Varies by method | 1,650 | 16,005 | $1,455 | 16,000 | $1,500 | 16,075 | 1,425 |

The first two **rows** are the same under all methods because this is a new product line and the detail relates to the first purchase or the initial injection of stock.  Thereafter the differences start to emerge.

Which method should you use?  This decision is a matter of company accounting policy and will normally be determined by the Chief Financial Officer (in conjunction with the company's auditors if it is a public company).

Two of the factors that matter are the tax regime in your country of origin and inflation.  In some countries, retailers pay tax on the value of their end of year inventory, e.g. the USA.  In this case, using a valuation method that minimizes the inventory value also minimizes the tax burden.  Public stock exchanges examine the amount of money invested in stock in the company's balance sheet and look more favorably on companies that run with lower inventory.  If your core product line is apparel, textile prices have dropped steadily for 20 years - deflation or negative inflation.

If your core product line is based on petroleum products, inflation is a major challenge. These factors are important to consider in selecting an inventory valuation method.

Good practice is not to change methods too frequently so that each year's results are produced on a consistent basis.

## Physical Inventories

The primary reason for taking physical inventories is to make sure that inventory balances are accurate and to reflect shrink, which may come from theft, damage or bookkeeping error.

Before the widespread use of scanning, retailers typically conducted a physical inventory by counting the number of units at each retail price, multiplying that number by the price and recording the retail value of the stock. Under the retail method of accounting, this is still the basis of the method today. The retail value on the shop floor is determined and compared to the book retail value. Typically, any discrepancy is investigated (if it is big enough) and the book stock is updated by adjusting the retail value. The cost complement calculation will take care of adjusting the cost value of the stock whenever the calculation is performed.

Under cost accounting, the procedure is a little different. In the stores and warehouses each item is counted. The unit count is compared to the book unit record and adjustments are made when necessary. The stock written off reduces the value of the total stock by either the average cost, the FIFO cost or the LIFO cost depending on method used. In the specific method the cost for the unique item that is missing is used as the valuation of the change.

## Year End Balance Sheet Calculations

At the year end a balance Sheet is prepared and one of the components of the Balance Sheet is the money invested in inventory. Whether you use cost or retail, the Balance Sheet figure is **always** reported at cost.

Under generally accepted accounting practices, the value of the inventory stated in your accounts should be cost or net realizable value, whichever is lower. In other words, if the inventory is now worth less than you paid for it (obsolete or out of fashion, say), you can reduce the value in the balance sheet below cost, so you don't overstate your assets and you don't pay so much tax. You need a way of doing this that is acceptable to the tax authorities.

If you use the retail method of accounting and you process your markdowns conscientiously, the method takes care of the year end issue. If you use the cost method, you may have to take some extra action. The first decision is whether the product is still worth at least its cost. If so, there is nothing to do. If not, you have to determine a net realizable or fair value.

There are two possible approaches:

- Cost of reproduction method
- Comparative sales method
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The cost of reproduction method applies to products that are still available in the marketplace.  It can be as easy as checking with suppliers to determine the current replacement cost of an item or the current purchase price of something that is directly comparable.  This method is fine if the item is not obsolete.  If it is obsolete, then the valuation is trickier.

In this case, the comparative sales method may be used.  This involves using the sales price the product was sold at as close to the current time as possible and then reducing that price to reflect disposal costs.  Disposal costs include selling and support expenses, sales promotion expenses, related store occupancy costs for the time involved and so on.  This is a specialist area and advice should be taken from the Company's own Finance Department.

In a country where you don't pay tax on inventory, some retailers depreciate any stock that is over a year old.  In one retailer we know for example, they depreciate all inventory over a year old to one penny per unit.  They take the depreciation charge in the year in question.  In the year that they subsequently sell the inventory, the cost is one penny and therefore the percent gross margin is very large, whatever the retail price at that time.  Hence the margin gain offsets the depreciation charge to some degree.  You can't do this if you pay tax on inventory because it distorts your tax assessment.

## Key Performance Indicators

There are three key performance indicators that may be affected by your use of cost or retail accounting.   In this topic, we will restrict the discussion to the basic formulae and calculations.

### Inventory Turn or Stock Turn

In the **retail** method, inventory turn is calculated as:

$$\text{Inventory Turn} = \frac{\text{Net Sales}}{\text{Average Value of Inventory @ Retail}}$$

In the **cost** method, it is calculated as:

$$\text{Inventory Turn} = \frac{\text{Cost of Goods Sold}}{\text{Average Value of Inventory @ Cost}}$$

Some key points to note are:

1. Net sales is the money left in the register after refunds, exchanges, markdowns, etc.
2. In retail, because of the sharp peaks and troughs in sales, average inventory is calculated as the average of 13 monthly values -

$$\frac{BOM1 + EOM1 + EOM2 + EOM3 \ldots\ldots\ldots\ldots + EOM12}{13}$$

1. The precise calculation under the cost method depends on whether you use average cost, FIFO or LIFO.
2. At the level that buyers and merchandisers work, the discrepancies between the numbers caused by the precise inventory valuation method do not affect any strategic decisions that buyers and merchandisers are likely to make.

## GMROI

GMROI is calculated as:

$$GMROI = \frac{\$ \text{ Gross Profit}}{\$ \text{ Average Inventory @ Cost}}$$

GMROI is the gross profit made for a given investment in inventory. Since that investment is made at cost, GMROI is the one inventory measure that is calculated the same way irrespective of whether you use cost or retail accounting.

## Sales to Stock Ratio

Depending on retailer, you may use the term Stock to Sales Ratio. It doesn't matter. One is just the flip side of the other. The Sales to Stock Ratio is normally used in two main situations:

1. Comparing performance against competitors and other retailers.
2. In merchandise planning as one approach to determine inventory needs.

In the retail method, the calculation is:

$$Ratio = \frac{\$ \text{ Sales}}{\$ \text{ Inventory @ Retail}}$$

In the cost method it is the same formula but the inventory is measured at cost instead of retail.

# Merchandise Planning and Open To Buy

Under the retail method, merchandise plans are built by deriving the sales projection, then deriving the inventory needed to achieve those sales at retail price. The average margin or CMU is used to work backwards to inventory at cost and to calculate expected margins.

Under cost accounting, a common approach is to derive the sales estimate, then derive the corresponding cost of goods sold. Then the inventory requirements can be derived at cost. The disadvantage with this method is that you can fail to buy enough inventory to support planned promotions during the season.

The same approaches work for Open to Buy.

## Advantages and Disadvantages of the Retail and Cost Methods

| Factor | Retail Method | Cost Method |
|---|---|---|
| Valuing inventory only requires retail value and CMU. | Yes | No. Requires more detailed record keeping and more complex calculations. May vary by country. |
| Easy method to determine lower of cost or market value of inventory at year end | Yes | No. Requires several additional methods. More open to interpretation and dispute by tax authorities. |
| Identifies shrinkage easily | Yes | Needs detailed item by item inventory control to do it. |
| Markdowns highly visible | Yes | No |
| Record keeping | Needs stringent record keeping in markdowns, inventory shortage | Record keeping not so onerous |
| Gives a more accurate value of inventory | Fair | Yes, but subject to valuation method chosen |
| More frequent inventories possible when needed | Yes | Yes, but more costly |
| Easier to hire staff with the knowledge | Yes | No |
| Inventory more likely to be available to support sales | Yes | Only with more complexity |