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Inventory accounting for building materials chain retailers: An investigation into the application of the retail method

Francis M. Ricci
The University of Montana

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INVENTORY ACCOUNTING FOR BUILDING MATERIALS
CHAIN RETAILERS: AN INVESTIGATION INTO
THE APPLICATION OF THE RETAIL METHOD

By

Francis M. Ricci

B. S. University of Montana, 1965

Presented in partial fulfillment of the requirements for the degree of

Master of Business Administration

UNIVERSITY OF MONTANA
1967

Approved by:

[Signatures]

Date
JUN 21 1967
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CHAPTER I

GENERAL CONSIDERATIONS OF THE PROBLEM

Parallel to our economy, accounting is in a continual state of development. Because inventories are one of the most active and important resources in all economic activity, the need for proper inventory accounting and management control is great. Inventory accounting and control presents many problems, and a great deal of attention has been given these problems by educators and practitioners in the business community.

I. THE PROBLEM

Statement of the problem. The purpose of the study was (1) to investigate inventory accounting and control for building materials retailers; (2) to promote the use of the retail inventory accounting method for building materials chain retailers; and (3) through a case study, to examine an existing inventory accounting and control system and to demonstrate that the retail method can be advantageously applied.

Validation of the problem. The retail method of accounting for inventories was originally developed to cope
with the problems of inventory control of department stores. Department store inventories include thousands of items which are maintained in many departments. The retail method facilitates the control over such inventories in a manner superior to other accounting methods. Studies have been undertaken which show that the retail method has been adopted by several types of businesses in addition to department stores, but there is no indication that the method has been adopted by building materials concerns.\(^1\) Since inventories of building materials chain retailers are of the same general nature as department store inventories—thousands of products; various product lines; carried at many retail outlets—use of the retail method seems warranted.

Limitations. This study deals mainly with inventory accounting methods. That is, the major concern is with methods of accumulating information about inventories. It does not include treatment of flow of costs accounting procedures such as average-cost, first-in, first-out (FIFO), and last-in, first-out (LIFO). Although inventory control is frequently referred to, the study does not directly involve any inventory management techniques.

II. DEFINITION OF TERMS

Gross profit or profit margin. The gross profit is the difference between the amount realized by the sale of a product and its cost. Gross profit provides the funds out of which all costs and expenses of doing business, other than merchandise costs, must be met. If gross profit covers all costs and expenses and provides additional funds, a profit or net income has been earned.

Markups and markup cancellations. In retail trade, markups are increases above the original retail price. Markup cancellations are reductions in markups. Markup cancellations will not reduce price below the original price; a full cancellation will reduce the price to the original price.²

Markdowns and markdown cancellations. A markdown is a price reduction below the original sales price. A markdown cancellation reduces a markdown but does not increase the price above the original selling price.³

Inventory turnover rate. Turnover rate refers to the number of times an inventory is sold and replaced during a period. The rate is calculated by dividing the amount of


³Ibid., p. 294.
inventory sold during a period by the average amount of inventory on hand during the period. 4

Physical inventory. A physical inventory refers to determining the quantities of inventory on hand by counting, or measuring in other ways, and applying costs to those quantities to get a total cost valuation.

Yard. In the retail building material business, a yard is the retail outlet or store. This term is probably a carry-over from the "lumber yards" which were the forerunners to present building materials companies.

III. ORGANIZATION OF REMAINDER OF THE PAPER

Inventory accounting is described in Chapter II. The objectives of inventory accounting in general and for building materials chain retailers are examined. Methods of inventory accounting are enumerated, with special emphasis on the retail method. The conclusion that the retail method is particularly suited to the needs of building materials chain retailers is drawn.

Chapter III presents the first part of the case study. The setting of the case is given and the existing inventory accounting and control system is described and evaluated.

In Chapter IV, the retail method is applied to replace the existing system, and comparisons of the two systems are presented.

The study is summarized in Chapter V, and the final conclusions are made.

Publications concerning inventory accounting and management topics were reviewed, and their findings are used throughout the paper. The data for the case study was made available from a building materials chain retailer located in Montana.
CHAPTER II

INVENTORY ACCOUNTING

This chapter deals with the conceptual aspects of inventory accounting, with particular regard to building materials chain retailers. Literature on inventory accounting and management was investigated so that objectives of inventory accounting could be determined, the retail method described, and alternative methods considered.

I. OBJECTIVES OF INVENTORY ACCOUNTING

In an article on choices of inventory methods, Maurice Peloubet stated that:

The inventory question runs through all finance, accounting, and operating. It cannot be dealt with by itself but must be considered as an integral part of the business structure. . . .

Thus, before an inventory method can be selected and installed as a part of an entire accounting system, objectives which include recognition of all matters affected by inventory should be determined.

The broad objectives of inventory accounting,

regardless of size or type of business, encompass three principal needs: (1) proper income determination,\(^2\) (2) adequate control over inventory, and (3) economy in accomplishing proper income determination and adequate control. Income must be properly determined because it measures the performance of all the resources employed by a business enterprise. Income is determined by matching costs against revenues. Since revenues are obtained from sales of inventory, a proper income determination demands that the cost of inventory sold be specified. Cost of inventory sold is generally arrived at by deducting the cost of inventory at the end of the period for which income is being determined from the cost of inventory which was available for sale during the period.

As applied to inventory, cost is the total of all charges incurred in bringing the merchandise to its existing condition and location.\(^3\) However, for purposes of assigning a value to inventory, the rule of "lower of cost or market" applies. This rule is intended to provide a means of measuring the residual usefulness of inventory. As a general guide, "market" is indicated by the current cost of replacement of the goods as they would be obtained by purchase. When it has been determined that market is less


\(^3\)Ibid.
than cost, the difference should be treated as a cost of the period.\(^4\) Inventory accounting, as it relates to proper income determination, should therefore provide for matching of costs against revenues and valuation of inventory at the lower of cost or market.

Inventories are financially significant because they represent one of the most active elements in business operations, being continuously acquired, converted, and resold. Inventories often require a greater investment than any other resource.\(^5\) Hence, control over inventories is very important to the success of operations. The following statement describes the function of inventory control:

> Of itself, inventory control is not meant to solve inventory problems. Rather, it is designed to highlight conditions so inventory decision making can be based on facts rather than guesstimates.\(^6\)

The "conditions" which were referred to can be viewed in terms of the following basic objectives of inventory control:

1. Keep stocks of inventory at levels which are sufficient to satisfy customers, but not so great as to become overstocked.
2. Minimize the expense of carrying and ordering materials.

\(^4\)Ibid., p. 31.
3. Maintain turnover rates commensurate with the level of sales activities. 

An accounting system, therefore, should provide for proper financial accounting, in the sense that income should be correctly determined and inventories correctly valued, and for adequate control over inventory. Regardless of how well an accounting system provides the necessary information, it cannot be considered effective if the costs required for its operation are excessive. Since assigning values to the benefits provided by an accounting system would, for the most part, prove to be nebulous, all that can be said about the efficiency of a system is that the essential information should be provided at the least cost. Economy of operations, then, should be a prevailing objective for any accounting system.

Building materials chain retail operations generally consist of several yards which conduct business under diverse conditions in widespread locations. Inventories of building materials dealers are typically a heterogeneous mixture of thousands of products and therefore preclude management from closely supervising individual items. Because of varying conditions of competition and product

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8McNair and Hersum, op. cit., p. 5.
demand, inventory composition differs among the separate yards even though the same product lines are carried. The financial significance of individual products, therefore, is not uniform among the yards. For each yard, profit margins and turnover rates could be materially unequal for any one product. Thus, an inventory accounting method for a building materials chain retailer should provide information which will allow management to recognize differences among yards and products. Since the large number of individual products prohibits supervision on an item-by-item basis, information relevant to logical groupings, such as product lines, should be available for management's use in controlling inventory.

In order for the management of building materials chain retail firms to effectively control inventory, current data on inventory levels, sales, and acquisitions for product groupings and individual yards should be supplied by the accounting system. The major function of an inventory accounting method is to allow inventory levels to be determined. For chain building materials firms, inventory methods which permit the determination of levels of groups or classes of products for each yard should be utilized.

Furthermore, accounting systems should permit inventory activity to be matched to product classes. If an accounting system, of which the inventory method is a part, can provide information of levels, sales, and acquisitions
of product classes, the basic ingredients for inventory control are available. Performance of product classes can be measured by profit margins and turnover rates; inventory levels and turnover rates can be evaluated to determine costs of carrying product groups. Such information about inventory can, indeed, highlight conditions of product classes for management's scrutiny.

II. INVENTORY METHODS

Inventory accounting methods are used to ascertain the quantity and cost of inventory on hand. Inventory methods are classified as either periodic or perpetual. A periodic inventory method allows for inventory quantities and costs to be determined only at the end of a period when a physical inventory is taken. The perpetual methods involve maintenance of book records so that inventory positions can be determined without taking physical inventories. The book records, or book inventories, allow preparation of financial reports which require accurate inventory figures for periods between the times that physical inventories are taken. The accuracy of the book inventories of the perpetual methods are verified by taking physical inventories periodically.

Because of the advantages which perpetual methods

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offer over the physical system, the use of book inventories is widespread:

Practically all large trading and manufacturing enterprises, as well as many relatively small organizations, have adopted the perpetual inventory system as an integral part of their record keeping and internal control. This system offers a continuous check and control over inventories, as well as immediate data concerning inventory position. Purchases and production planning are facilitated, adequate supplies on hand are assured, and losses through damage and theft are fully disclosed. The additional costs of maintaining such a system are usually well repaid by the services provided to management through its adoption.¹⁰

The objectives of inventory accounting for building materials chain retailers imply that a perpetual or book inventory system is a prerequisite. If a book inventory was not maintained and if adequate accounting and control were to be exercised, a physical inventory would have to be taken at frequent intervals. Such a requirement would be a tremendous, impractical undertaking for an inventory composed of thousands of products.

There are four principal perpetual or book inventory methods: (1) stock records method, (2) gross-profit method, (3) cost-audit method, and (4) retail method.¹¹ A system of stock records requires a record for each product on which unit, and frequently cost, balances are maintained

¹⁰Ibid., p. 230.

by recording receipts and issues. The book inventory is
determined from the summation of the individual records.

In the gross-profit method, the inventory is deter­
mined by reducing the sales figure to cost and subtracting
the cost of merchandise sold from the cost of merchandise
which had been available for sale. The sales figure is re­
duced to cost by subtracting from it the amount that repre­
sents the approximate gross-profit or difference between
cost and selling price. Generally, a gross-profit percen­
tage is developed from past results and applied to the
sales figure to arrive at cost of sales.

The cost-audit method also allows the book inven­
tory to be determined by reducing sales to their cost
amounts. This method requires product cost records to be
maintained and the cost of each product sold to be recorded.
Usually, the costs are recorded on the sales invoices and
the total cost of merchandise sold is accumulated from the
invoices. At any time, the inventory figure is available
by subtracting the cost of sales from the total of the be­
ginning inventory and purchases.

The major distinction between the retail method and
the other inventory methods is that inventory is accounted
for by the use of retail prices in addition to costs. The
inventory at retail price is converted to cost by applica­
tion of a percentage which is derived from the relationship
between the retail value and cost value of the merchandise
available for sale. Since the book inventory calculation depends on the cost and retail amounts of the total merchandise available for sale, purchases must be recorded at both cost and retail. Illustration I (p. 15) shows how inventory is determined by use of the retail method.

The ending inventory at cost was determined by applying to the retail figure a percentage arrived at by dividing the cost of goods available by the sum of the original retail price of these goods plus the net markups. The computation was made on the basis of the cost and retail figures of the goods available before the net mark-downs were considered. The net effect of this computation is to include from the ending inventory increases that may be caused by increases in market values, as indicated by price markups, and to include in the ending inventory decreases that may be caused by price reductions, or net mark-downs. Therefore, the cost computation automatically results in valuing the inventory at the lower of cost or market.

In Chapter I it was noted that the retail method is used most widely in department stores. The retail method was developed for use in the department store field because the other methods were impractical. Department stores,


ILLUSTRATION I  
RETAIL METHOD OF INVENTORY CALCULATION

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<tr>
<th></th>
<th>Cost</th>
<th>Retail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td>$14,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Purchases (including freight)</td>
<td>63,000</td>
<td>90,000</td>
</tr>
<tr>
<td></td>
<td>77,000</td>
<td>110,000</td>
</tr>
<tr>
<td>Net markups (retail increases):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Markups</td>
<td>4,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Markup cancellations</td>
<td>(3,000)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,000</td>
<td>111,000</td>
</tr>
<tr>
<td>Goods available for sale</td>
<td>$77,000</td>
<td></td>
</tr>
<tr>
<td>Net markdowns (retail reductions):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Markdowns</td>
<td>(7,000)</td>
<td></td>
</tr>
<tr>
<td>Markdown cancellations</td>
<td>5,000</td>
<td>(2,000)</td>
</tr>
<tr>
<td>Sales price of goods available for sale</td>
<td>109,000</td>
<td></td>
</tr>
<tr>
<td>Deduct sales</td>
<td>84,227</td>
<td></td>
</tr>
<tr>
<td>Ending inventory: at retail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at cost</td>
<td>$24,773</td>
<td></td>
</tr>
<tr>
<td>at retail</td>
<td>$24,773</td>
<td></td>
</tr>
</tbody>
</table>

\[ \frac{77,000}{111,000} = 69.37\% \]

\[ \frac{24,773}{69.37\%} \]

\[ \$17,185 \]

\[ ^{14} \text{Moyer and Nautz, op. cit., p. 161.} \]
of course, have thousands of different products in various departments. In order to control inventory and departments, accurate information concerning inventory pricing, acquisitions and sales, and inventory levels is a necessity. Because of the tremendous volume of transactions, maintaining inventory records on a unit basis is not practical. Since the gross-profit method relies on past performance and broad averages, it is not considered accurate enough for inventory accounting purposes. The cost-audit method requires product-cost records and the recording of costs for each product sold, and therefore involves such an excessive amount of clerical effort that department stores cannot afford its use.\(^{15}\) The retail method does not require the keeping of unit-product records, allows for accurate accounting—lower of cost or market valuation is an inherent feature—and therefore is superior to the other methods for the needs of the department store field.

During the developmental period of the retail method, there were controversies raised by the tax authorities and professional accounting groups concerning the fact that the retail method is an averaging method.\(^{16}\) However, the retail method is now universally acceptable, so long as logical inventory categories are accounted for separately,

\(^{15}\) McNair, \textit{op. cit.}, pp. 54, 55.

\(^{16}\) McNair and Hersum, \textit{op. cit.}, pp. 61-76; and Hoffman, \textit{op. cit.}, pp. 16-21, 72.
on the basis of the following reasoning:

Averaging practices combine reasonable accuracy with practicality. The theoretical justification for the use of average costs is that when like units acquired at different times and at different costs are commingled so as to be equally available, the units become one entity. When units are removed, a certain portion of that entity has been severed, and a proportionate share of the cost attributed to the entity should be deducted from the total cost.\(^{17}\)

In addition to being a reasonably accurate method which does not require the maintenance of stock records, other reasons for the popularity of the retail method are:

1. Physical inventories are taken at retail and converted to cost which is generally much easier than obtaining cost prices for each product.
2. The accounting system can accommodate any number of inventory transactions.
3. The method allows for periodic determination of inventories and profits without the necessity of taking a physical inventory.
4. Decreases in inventory values are recorded as soon as retail prices are reduced.
5. The method simplifies disclosure and segregation of stock shortages by product categories.
6. Since only retail prices are used for recording sales, fewer errors are likely to result than if costing of sales is required such as under the stock-records method and the cost-audit method.
7. The method facilitates a proper valuation at lower of cost or market.
8. The method is advantageous for inventory control because all inventory activity can be measured on a retail basis rather than partly on a cost basis and partly on a retail basis which is the case for the other methods.\(^{18}\)

\(^{17}\)Hoffman, *op. cit.*, pp. 73-74.

\(^{18}\)Ibid., p. 128; and McNair, *op. cit.*, pp. 46-52.
The inventory accounting needs of building materials chain retailers and the advantages offered by the retail method indicate that the method should be readily applicable. Building materials stores are similar to department stores in that their inventories include thousands of products, the products easily fit into classes, and inventory control is a requirement for effective management. As disclosed in Chapter I, there is no indication that the retail method is used by building materials retailers. A possible explanation for this is that the present building materials field developed from establishments which initially dealt in relatively few products, such as lumber and coal. Regardless of the causes for the absence of the retail method in building materials trade, effective inventory management is an extremely important factor for the success of a modern building materials chain operation; and, the retail method provides features which strongly appear to fit the needs for inventory accounting and control for this type of business.
CHAPTER III

EXAMINATION OF AN INVENTORY SYSTEM

In order to further develop the suitability of the retail method for building materials chain retailers, a study directed at (1) an evaluation of an existing system, (2) an application of the retail method to supplant the existing method, and (3) a comparison of the two methods, was conducted. The study involved the inventory accounting and control system of a chain retail firm which operates in several localities in Montana. Data was assembled from financial operation reports, an operations manual, inquiry of the firm's employees, and observation. The basic forms and other requirements for the application of the retail method were adapted from available literature.

I. SETTING OF THE CASE

The ABC Company operates one yard in each of six cities in Montana; it markets more than 5,000 individual products. Annual sales are approximately $2 million. As a retail establishment, the major concern is with sales and service to customers.

Two basic requirements for inventory accounting and
control purposes of the company exist:

1. Inventory valuation to enable periodic profit or loss determination.
2. Inventory levels, sales, and cost of sales for product performance evaluation.

The need for separate and timely accountability for the individual yards of a chain operation was set forth in Chapter II. Each yard faces different conditions of competition, demand, and costs; therefore, gross margins, sales mix, and operating costs can be significantly dissimilar between yards. While the overall gross profit percentage attained at one yard may be sufficient to cover operating costs and produce a profit, the same percentage may not be adequate for other yards. Because of differences in turnover, a product which may be very profitable for one yard may be an expensive burden to another. For these and similar reasons, the inventory at each yard must be controlled by product.

For inventory accounting and control purposes, the Company's 5,000 products are classified into twelve categories: (1) lumber, (2) plywood, (3) wallboard, (4) molding, (5) doors and related supplies, (7) roofing materials and shingles, (8) insulation, (9) mason supplies, (10) hardware products, (11) paint, brushes and related supplies, and (12) miscellaneous, or all products not included in another category.

Inventory data was tabulated to illustrate the
importance of maintaining separate accountability by product category and yard. Tables 3 and 4, in the Appendix, show sales volume percentages and gross profit percentages by product category for each yard for the period July 1, 1966, through December 31, 1966. The data indicate that significant differences existed between yards and, further, imply that separate accountability is most desirable.

For example, hardware sales represented a considerably higher percentage of sales for Yard D than Yard A—20.2% to 12.1%, respectively; furthermore, the gross profit percentage produced by hardware sales was much greater for Yard D than Yard A—34.0% to 28.5%, respectively. On the basis of these figures, and assuming that costs of carrying and selling were relatively comparable, it appears as though hardware products, as a whole, were materially more profitable for Yard D than for Yard A for the six-month period. Similar relationships existed for other product categories between yards. Also, variations in sales volume and gross profits indicated that at least monthly supervision of product performance is warranted. (For variations in gross profits, see Table 5 in the Appendix.)

II. DESCRIPTION AND EVALUATION OF THE SYSTEM

The existing system includes features to provide information necessary for the basic accounting and control
requirements. The inventory method which provides the information is a modified version of the cost-audit method as described in Chapter II. For most products, actual costs are applied for costing sales; a cost factor of the sales price is applied to sales of the remaining products which are mainly low-value items. Book inventories are maintained, and each month an inventory value is determined for each yard and income statements are prepared. A product performance report, which presents sales and cost of sales by product category and yard, is also prepared monthly.

The procedures enumerated below describe how the inventory figures are compiled:

I. Annual Physical Inventories.
Annual physical inventories are taken at each yard. The employees who take the inventories list the products and the quantities. The unit costs maintained in product cost records (see below) are applied to the quantities. These inventory valuations become the ending balance for the preceding accounting period and the beginning balance for the succeeding period in the book inventories maintained at each yard. Inventory balances are not determined for each product category, so the book inventories show only total inventory values.
II. Increases in Inventory.

A. Purchases. — Recording of purchases originates at the yard level when a shipment has been received and the yard manager approves the invoices for payment. An approved purchase invoice is the source for two records:

1. Product cost records. — These are maintained at each yard for individual products on a unit cost basis. The unit costs are calculated from the purchase invoices and freight costs and are manually posted to the records. The costs posted from the last invoice received constitute the cost "record" for each product since these costs replace the costs which have been previously recorded.

2. Purchase records. — These records are maintained at the central accounting office. Each month a "purchase abstract" is prepared for each product showing all purchases, acquisitions,
by product category. These records are prepared manually from the purchase invoices which have been forwarded from the yards. The total monthly cost of purchases for each yard, which is added to the beginning balances in the book inventories, is taken from this record. The consolidated total which is accumulated from the yards' abstracts is charged monthly to the purchases account in the general ledger.

B. Freight costs.—As a general rule freight bills accompany the shipments and the costs are included with the purchase costs for posting to the product cost records. The freight bills are forwarded to the central accounting office with the purchase invoices and the freight charges are entered on the applicable yard's "purchase abstracts" by product category.

C. Merchandise transfers from other yards.—Inter-yard transfers are recorded at the costs in the

---

3 For the relatively few freight bills which do not accompany the purchase invoices, the charges are recorded directly to the general ledger purchases account. These bills are paid from petty cash at the yard level, and when the journal entry is prepared for reimbursing petty cash the freight costs are charged to the purchases account.
transferor's product cost records. A monthly journal entry is prepared which shows each yard's transfer activity. The transfers from other yards are added to the beginning balances in the book inventories for each yard.

III. Reduction in Inventory.

A. Sales.—The source for recording reductions in inventory as a result of sales is the sales invoice which has been cost-audited or cost-factored. Sales invoices are coded during the cost-auditing and cost-factoring process. The codes indicate the yard and the product category of the product or products listed on the invoice. The costed sales invoices provide the information for two records:

1. The transferor receives a 5% credit from the transferer for handling the merchandise. These credits and charges do not affect the inventory.

2. There is not a provision for adding sales returns back into the book inventories. Returns are relatively minor but they do result in differences between book inventories and the inventory as calculated from the annual physical inventory.

3. The cost factor applied is either .7 or .5 of sales price depending on the markup of the product being sold. These factors are merely approximations of the actual costs.

4. When a sale is made, the salesman or saleslady enters the product or products, the quantities, and the selling price or prices. If any discounts are given, the total prices are reduced to arrive at the net sales amount.
1. Yard sales report.—A report showing sales, both cash and credit, and cost of sales is prepared on a daily basis for each yard. The sales total for the month which is recorded in the general ledger is accumulated from these reports. The cost of sales totals are deducted from each yard’s book inventory.

2. Sales and cost of sales reports.—These reports, which are prepared monthly, constitute the basis for product performance evaluation. The reports present the absolute values for each yard. The reports are prepared at the central accounting office for the retail and accounting management. The procedures presented below describe the preparation of the report:

a.) The sales invoices, which have been costed and coded at the yards, are forwarded to the central accounting office.

b.) The invoices are then reviewed and for those which have more than one entry for a product category, subtotals are calculated. This procedure results in a sales subtotal and a cost subtotal for

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8 Another function served by this report, but not discussed here, is for cash control.
each product category which appears on the invoice.

c.) Next, the information on the invoices is transferred to automatic data processing cards. The key-punch operators record the code, which indicates a yard and product category, the sales price and the cost.

d.) In the final procedure the cards are tabulated and the report is printed.9

B. Merchandise transfers to other yards.—These are the complement of the transfers referred to above for inventory increases. The accounting treatment given to these transfers is the same as given above except, of course, that the amounts are deducted from the book inventories for each yard.

Of all the effort expended in inventory record-keeping—from taking and costing the physical inventory to recording increases and decreases—most is for the maintenance of accurate book inventories for each yard. The product performance report is actually a by-product of the record-keeping process. Since approximately 30,000 sales invoices are processed monthly, preparation of the performance

9This report also offers a control feature. The monthly totals, by yard, are agreed to the accumulated totals per the "daily" reports.
report did not become practicable until automatic data processing facilities were available. The entire processing of sales invoices requires a substantially greater number of man-hours than any other procedure in the inventory accounting. Table 1 shows the approximate hours spent for processing sales invoices. The findings in Table 1 show that, for a year, approximately 3,600 man-hours are used for determining the reduction in inventories resulting from sales and that about 930 man-hours (4530-3600) are used for preparing the product performance reports.

That management desires accurate book inventories so that reliable income statements for the individual yards and the company as a whole can be prepared is obvious. However, differences between book inventories and actual inventories can result from:

1. Errors committed during audit-costing sales invoices.
2. Factor-costing sales whose actual costs are different from the factored cost.
3. Failure to take into book inventories certain freight charges (see page 24, footnote 3).
4. Failure to account for shortages which result from theft.
5. Failure to record decreases in values less than cost as a result of obsolescence, deterioration, and similar causes of reduction in realizable
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Man-hours per month</th>
<th>Man-hours per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit-Costing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yard A</td>
<td>55</td>
<td>660</td>
</tr>
<tr>
<td>Yard B</td>
<td>50</td>
<td>600</td>
</tr>
<tr>
<td>Yard C</td>
<td>40</td>
<td>480</td>
</tr>
<tr>
<td>Yard D</td>
<td>50</td>
<td>600</td>
</tr>
<tr>
<td>Yard E</td>
<td>80</td>
<td>960</td>
</tr>
<tr>
<td>Yard F</td>
<td>25</td>
<td>300</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>3600</td>
</tr>
<tr>
<td>Subtotaling Sales and Costs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All yards</td>
<td>65</td>
<td>780</td>
</tr>
<tr>
<td>Key Punching and Tabulating:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key punching</td>
<td>10</td>
<td>120</td>
</tr>
<tr>
<td>Tabulating</td>
<td>2.5*</td>
<td>30*</td>
</tr>
<tr>
<td>Total</td>
<td>12.5</td>
<td>150</td>
</tr>
<tr>
<td>Totals</td>
<td>377.5</td>
<td>530</td>
</tr>
</tbody>
</table>

*The same number of machine hours, of course, is also required.*
value.

6. In general, failure to detect errors resulting from human frailties relative to all phases of the inventory record-keeping.

While giving due consideration to these factors which can contribute to differences, the inventory accounting system is designed to permit reasonably accurate inventory values to be determined, albeit a considerable amount of effort is required.

Product evaluation, however, is another matter. The monthly report which is available for management to use for this most important function does not, by itself, provide much information. One feature of the report which is meritorious is that the products are logically grouped into categories. On each report only sales and cost of merchandise sold figures for the month and year-to-date by product category and yard are listed, and then only in absolute terms. In order to obtain gross profit percentages, manual calculations must be made.\(^{10}\) The amount of performance evaluation which these figures alone allow cannot be very great. For instance, inventory levels by product category and therefore inventory turnover rates and other measurements which depend on investment in inventory categories are

\(^{10}\)A simple change in the calculator program would allow the data processing facilities to prepare this calculation.
not available. The major benefits which the sales and cost of sales report provides are that cross-reference figures are provided for checking the figures reported on the yard sales reports and, to a limited degree, product performance can be observed. A reasonable doubt exists concerning the value afforded by these benefits especially when related to the 930 man-hours and 30 machine-hours required each year for their production.
CHAPTER IV

UTILIZING THE RETAIL METHOD

I. APPLICATION OF THE RETAIL METHOD

As explained in Chapter II, the retail method is more than a mere record-keeping measure; rather, it is an inventory accounting method which facilitates inventory control. Since the main objectives of accounting for inventories are to provide accurate inventory valuations, and to provide the information necessary for adequate control and product performance evaluation, the value of any inventory method should be measured by its ability to adequately and efficiently fulfill these objectives. The retail method applied to the inventory accounting needs of the firm studied attempts to satisfy such requirements.

For the routine operation of the retail method the following figures are required:

1. Inventory at cost and retail.
2. Inventory acquisitions at cost and retail.
3. Net additional markups at retail.
4. Net markdowns and similar reductions (discounts) at retail.
5. Sales at retail.\textsuperscript{1}

Application of the retail method in this case, therefore, basically consisted of developing procedures for accumulating the necessary figures.

As a starting point for application of the retail method, a complete physical inventory would be necessary. Both costs and retail prices would be applied to the merchandise quantities and the resulting values would be entered in book inventories for each product category and each yard.\textsuperscript{2} (See Illustration II, p. 40.) Since the retail method allows inventory cost determination without reference to cost records, subsequent physical inventories would be taken only at retail.

Changes in inventory would be accounted for according to the following measures:

I. Additions to Inventory.

A. Purchases.\textsuperscript{3}—Accounting for purchases would simply require an extension of the procedure followed

\textsuperscript{1}McNair, \textit{op. cit.}, p. 107.

\textsuperscript{2}An explanation was given in Chapter II which emphasized that merchandise must be accounted for by categories in order that accurate and acceptable inventory costs can be calculated.

\textsuperscript{3}A better accounting treatment would be to record purchases net of cash discounts offered rather than at the gross invoice price which is recorded under the existing system. For accounting purposes, cost is the cash outlay required for purchase, and the cash outlay required is the invoice amount less cash discounts offered. When cash discounts are not taken an expense account, such as "Purchase
under the existing system. When the costs from the purchase invoices are posted to the "purchase abstract," the retail value of the merchandise purchased would also be recorded. The sole revision required would be to add a column for retail under each product category. The totals on the "purchase abstracts" would be entered in the applicable book inventory (see Illustration II, p. 40). Since the yard managers are responsible for pricing products, they would logically apply the retail prices to the purchase invoices when they approve them for payment. The cost of purchases for recording in the general ledger would be accumulated from the "abstracts" in the same routine followed under the existing system.

B. Freight.---Freight costs would be added to the cost columns on the "purchase abstracts," which is the same treatment as under the existing system (see p. 24).

C. Net additional markups.---Markups and markup cancellations would be reported by the yard managers since pricing is their responsibility. Markups

Discounts Lost" would be charged. Another aspect of this treatment is that management can see, by a glance at an income statement, the amounts of discounts lost which is, after all, more important than knowing the amounts of discounts "earned."
and markup cancellations, as well as any change in price from the originally recorded retail price, would be reported on a record similar to that shown in Illustration III in the Appendix. Each month the markups and markup cancellations would be summarized and the net additional markups would be added to the appropriate book inventory (see Illustration II, p. 40).

D. Merchandise transfers.--Interyard transfers constitute either an addition to merchandise purchases or a subtraction. The net amount of transfers would be added to or deducted from the applicable book inventory (see Illustration II, p. 40). Merchandise transfers would be reported to the central accounting office by the yard managers on a record similar to the form presented in Illustration IV in the Appendix. Both cost and retail values are required. The original cost incurred by the transferor yard for the merchandise is the appropriate cost for both yards. Retail values, however, can be different between yards. The retail value for the transferor yard is the retail value originally recorded when the merchandise was purchased; for the transforee

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4McNair and Hersum, op. cit., p. 82.
yard, the retail value is the selling price as determined by the yard manager.⁵

II. Deductions from Inventory.

A. Net markdowns.—Markdowns and markdown cancellations would be reported to the central accounting office by the yard managers initiating the price changes on a form similar to the record shown in Illustration III in the Appendix. Each month the markdowns and markdown cancellations would be summarized for inventory categories which experienced such price changes, and the net amounts of markdowns would be deducted from the retail total of the merchandise available for sale in the appropriate book inventory (see Illustration II, p. 40).

B. Discounts given on sales.—Customers' and employees' discounts must be accounted for because, just as markdowns, they are reductions to the retail values which were originally assigned to merchandise. Since discounts are listed on sales invoices, reporting discounts would be a matter of transferring the discount amounts to a price change form similar to that presented in Illustration III in the Appendix. Recording the discounts on the price change forms would most easily

⁵Ibid., p. 104.
be done at the yard level when the sales invoice is prepared. The total amount of discounts for the product categories would be accumulated each month and deducted from the retail amount of merchandise available for sale on the applicable book inventory (see Illustration II, p. 40).

C. Sales.—The sales figure would be obtained by the following procedures:

1. As the sales employees enter the item or items on the invoice, they would code each item and also group the items according to product category. This procedure would not require much effort since there are only twelve categories and since the instances when a sale consists of more than two or three categories are rare occurrences.

2. The total sales for each day would be accumulated and reported on the daily yard sales reports.

3. At the central accounting office, all sales invoices would be reviewed, as is done under the existing system, and subtotals listed on those which report sales pertaining to more than one category. It is possible, of course, that this procedure could be accomplished at the yards; however, the yard employees are
principally involved with sales efforts and should not be required to spend time doing clerical duties which otherwise could be spent attending to sales and service functions. The clerical workers at the central accounting office, on the other hand, are experienced at performing such duties which require close attention.

4. Finally, the information on the sales invoices would be transferred to data processing cards for future tabulation. Each month a report would be printed showing sales by yard and product category. These figures would serve two purposes:
   a.) To cross reference the total sales as reported on the yard daily sales report.
   b.) To supply the sales figures which would be deducted from the merchandise available at retail on the book inventories (see Illustration II, p. 40).

D. Merchandise Transfers.—As mentioned above, merchandise transfers to another yard are in essence a reduction in acquisitions of inventory and are therefore deducted from the beginning book inventory balances at both cost and retail. The accounting treatment for transfers was given in the
preceding discussion under "additions to inventory."

Illustration II (following page) is an example showing a book inventory page for a product category, and represents a complete summarization of the retail inventory method procedures which have been presented.

The listing below explains the preparation of the report:

1. The beginning inventory year-to-date figures would originate from the most recent physical inventory and would be carried forward month by month until the next physical inventory. The month figures would be taken from the closing balances as per the previous month's report.

2. The month purchase figures, both retail and cost, would be transferred from the "purchase abstract" report, as explained previously (see p. 33). The year-to-date figures would be the sum of the current month's purchases and the prior month's balances.

3. Since most freight charges are recorded on the "purchase abstracts" (see pp. 24 and 34), only those costs which are not accounted for by the normal means would be entered as "freight." The month figures would be taken from journal
ILLUSTRATION II
BOOK INVENTORY CONTROL REPORT

Yard  E
Product Category  Lumber  Month  August, 1966

<table>
<thead>
<tr>
<th>Line</th>
<th>Retail</th>
<th>Year-to-date</th>
<th>Cost</th>
<th>Month</th>
<th>Cost</th>
<th>Year-to-date</th>
<th>Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Beginning inventory additions:</td>
<td></td>
<td>9,467.83</td>
<td>75.92</td>
<td>8,926.44</td>
<td>73.51</td>
<td>7,187.98</td>
<td>6,561.83</td>
</tr>
<tr>
<td>2. Purchases</td>
<td></td>
<td>136,299.11</td>
<td>34,269.00</td>
<td>103,782.80</td>
<td>26,467.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Freight</td>
<td></td>
<td></td>
<td>189.25</td>
<td>34.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Transfers (net)</td>
<td></td>
<td>1,149.67</td>
<td>( 488.00)</td>
<td>827.76</td>
<td>( 390.40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Additional markups (net)</td>
<td></td>
<td>396.27</td>
<td>118.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adapted from Hoffman, op. cit., p. 121.
## ILLUSTRATION II--Continued

<table>
<thead>
<tr>
<th>Line</th>
<th>Retail</th>
<th>Cost</th>
<th>Year-to-date</th>
<th>Cost</th>
<th>Month</th>
<th>Cost</th>
<th>Year-to-date</th>
<th>Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Total purchases and retail additions</td>
<td>137,845.05</td>
<td>33,889.25</td>
<td>104,769.81</td>
<td>26,110.82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Merchandise available for sale (line 1 plus line 6)</td>
<td>147,312.88</td>
<td>42,815.69</td>
<td>111,957.29</td>
<td>32,672.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Cost - retail</td>
<td>-</td>
<td>-</td>
<td>73.12</td>
<td>76.31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Markdowns (net)</td>
<td>205.66</td>
<td>-</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Employee discounts</td>
<td>160.58</td>
<td>-</td>
<td>60.20</td>
<td>60.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Customer discounts</td>
<td>1,039.02</td>
<td>-</td>
<td>104.08</td>
<td>104.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Total retail reductions</td>
<td>1,425.26</td>
<td>-</td>
<td>164.28</td>
<td>164.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line</td>
<td>Retail</td>
<td>Cost</td>
<td>Month</td>
<td>Year-to-date</td>
<td>Month</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>------</td>
<td>-------</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. (Line 7 minus line 12)</td>
<td>145,887.62</td>
<td>41,651.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Less: sales</td>
<td>117,650.09</td>
<td>13,413.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Closing inventory</td>
<td>28,237.63</td>
<td>28,237.63</td>
<td>20,647.36</td>
<td>20,647.36</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
entries which record these additional freight costs (see p. 33, footnote 3). The year-to-date figure would be the sum of the current month's charges and the prior month's balances.

4. The month transfer figures would be accumulated from the transfer forms referred to previously and exhibited in the Appendix, Illustration IV. The year-to-date figures would be the current month balances added to the prior month's balances. Notice that during August, Yard E's lumber transfers to other yards exceeded lumber transfers (if any) from other yards; for year-to-date, however, the lumber transfers have been a net addition to the beginning inventory.

5. All price changes, lines 5, 9, 10, and 11, would originate from the record referred to in the previous explanations concerning price changes (see Appendix, Illustration III).

6. The sales figures would be taken from the tabulated sales reports (see p. 38).

The end result of the report is the calculation of the ending inventory at its lower of cost or market value. Attention is directed to the fact that the cost percentage

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A distribution of the freight costs to yards and categories would be prepared for this purpose.
in the year-to-date column differs from that in the month column (line 8). In the example this is a result of monthly variations in the price markon on purchases. In reducing the closing inventory's retail value to cost, the year-to-date cost percentage is used for both the year-to-date and month columns. There should not, of course, be two different amounts assigned as cost for the closing inventory, and since the year-to-date cost percentage levels off monthly variations, it is used. The report, therefore, serves a dual purpose. First of all, it serves as the book inventory which is necessary for monthly profit or loss determination; more importantly, it serves as a compact, but rather complete, report for management's use in inventory control.

The title of the report, "Book Inventory Control Report," indicates that it is designed to provide more information than merely the closing inventory valuation. A careful examination of the report will provide evidence that the retail method which has been set forth herein is a complete inventory accounting tool. In addition to permitting inventory costs to be calculated, information for effective performance evaluation is provided.

The retail inventory method would provide monthly inventory levels for each product category in each yard. By relating the inventory levels to sales, information

\[8\text{Hoffman, op. cit., p. 121.}\]
which can be used to estimate demand rates, to decide when to replenish stocks, and to determine how much to buy, for example, is readily available for each product category in each yard.\(^9\) Since inventory levels, sales, and purchases could be planned by product category, the monthly control report would allow comparisons between the planned performance and actual results. Evaluations could be directed to specific inventory categories and yards. In addition to its use for measuring product performance, the report could be used to provide checks on management's policies regarding pricing and discounts. Application of the retail method would, in summary, permit accurate inventory valuation and provide information for adequate inventory control.

II. COMPARISON OF SYSTEMS

For the purposes of comparison, the retail method and the existing cost-audit method were viewed in accordance to two criteria:

1. Sufficiency of information required for inventory accounting needs.
2. Efficiency of operation.

One objective of inventory accounting is to provide accurate inventory valuation. In respect to this objective it has been shown, in Chapter II, that the retail method is

\(^9\text{Ibid.}, p. 260.\)
an averaging method. The cost valuation is determined from the average relationship between cost and retail values of all the merchandise which has been available for sale during the period of interest. Therefore, the specific cost of the merchandise in inventory will not likely be determined by the retail method. The cost-audit method which has been described also includes an averaging feature. Many items are costed by factors which are based on average or approximate markups.

For chain operations which deal in large volumes of merchandise, it is doubtful if any accounting method will provide completely accurate costs. Based on the evidence which has been presented, the conclusion that both methods will provide reasonably accurate inventory values is reached. The retail method, however, has an inherent advantage, in respect to inventory valuation, over the cost-audit method. Retail price markdowns indicate decreases in market value, and since the retail method includes markdowns in its inventory calculation, a lower of cost or market value automatically results. Hence, depending on the extent of markdowns, the retail method probably allows for a somewhat more accurate valuation.

Another objective of inventory accounting is to provide adequate information for inventory control. The cost-audit method provides sales and cost of sales by
product category and yard, and inventory totals by yards. In addition to this information, the retail method provides inventory levels by product category and shows all inventory activity of each category. Furthermore, all information is presented in terms of percentages rather than simply absolute amounts. The retail method, therefore, is markedly superior in terms of fulfilling the inventory control objective.

In reference to the operating efficiency criterion, Table 2, which is a condensation of Table 1, p. 29, shows the approximate time required for processing a year's volume of sales invoices under the cost-audit method:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Man-hours per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit-costing</td>
<td>3600</td>
</tr>
<tr>
<td>Subtotaling invoices</td>
<td>780</td>
</tr>
<tr>
<td>Key punching and tabulation</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td><strong>4525</strong></td>
</tr>
</tbody>
</table>

The retail method would eliminate a considerable portion of
the effort spend for processing sales invoices under the cost-audit method. Since there is no need for costing sales, none of the time for audit-costing would be required. Operation of the retail method, as described previously, would involve subtotaling of invoices, key-punching, and tabulation. However, under the retail method, only the retail amounts would be dealt with whereas under the cost-audit method both cost and retail amounts are involved. As a result, the time required for these procedures would be substantially less under the retail method.

The retail method, in this case, would require the maintaining of seventy-two book inventories—one for each of the twelve product categories for the six yards. Under the cost-audit method one for each of the six yards is maintained. However, calculating a book inventory is a simple clerical duty. The additional time required under the retail method for maintaining book inventories, in view of the control information which would be provided, would logically be justified.

In retrospect of this case study, the retail method takes precedence over the cost-audit method. The inventory valuation includes an automatic provision for lower of cost or market; the provision for evaluation and control features would be greatly improved; and the clerical operation would be substantially more efficient.
CHAPTER V

SUMMARY AND CONCLUSIONS

For any merchandising or manufacturing firm, inventories constitute an extremely important asset. Not only is the investment in inventories frequently the largest current asset, but also it may well be a material portion of a company's total assets. Inventories are more sensitive to general business fluctuations than other assets in many respects. During periods of prosperous economic activity, inventories readily turn over and quantities on hand may not appear excessive. But a downward trend in the business cycle can cause many product lines to move slowly. Stocks pile up and obsolescence becomes a real possibility.¹

Because of the nature of inventories, management is vitally interested in inventory control. One essential of inventory control is an inventory accounting method which supplies the type of information needed by management to implement its inventory and financial policies.²

The retail method of accounting for inventories was originally developed for use by department stores whose

¹Moyer and Mautz, op. cit., p. 135.
²Ibid., p. 136.
inventories are located in many departments and contain thousands of heterogeneous products. Since inventories of retail building materials chain establishments are generally similar to those of department stores, an extension of the retail method to the building materials firms would appear logical. The major concern of this study, therefore, was to determine if the inventory accounting needs of retail building materials chains can be satisfied by application of the retail method.

The broad objectives of inventory accounting for building materials retail chains were identified as: (1) to allow for proper income determination, (2) to provide information for inventory control, and (3) to provide for efficiency in the accounting system. The specific needs concern the information required to control inventory by retail outlet, or yard, and product category. Various inventory accounting methods were examined in view of these objectives and needs, and the retail method appeared to be the best method for building materials chain retailers.

In order to determine if the application of the retail method for inventory accounting for building materials chain retailers could be practical, a case study was conducted. The inventory accounting and control system which the company uses was investigated and evaluated. The retail method was applied to the accounting system to
replace the existing method. Comparisons of the results under the two methods indicated that the retail method would be a very practical method for building materials chain retail companies. Furthermore, the information which could be provided by the retail method and the relative efficiency with which the method could operate illustrated the superiority of the retail method over the method used by the company.

In conclusion, the retail method of inventory accounting appears to be especially suited for building materials chain retail operations. For current practice the retail method would require further refinement for adoption by specific firms. The one area which undoubtedly needs more research is that of classifying products into categories.
APPENDIX
TABLE 3

SALES VOLUME BY PRODUCT CATEGORY AND YARD
(PERCENTAGE OF TOTAL DOLLAR SALES)
JULY 1, 1966-DECEMBER 31, 1966

<table>
<thead>
<tr>
<th></th>
<th>Yard A %</th>
<th>Yard B %</th>
<th>Yard C %</th>
<th>Yard D %</th>
<th>Yard E %</th>
<th>Yard F %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumber</td>
<td>26.4</td>
<td>21.7</td>
<td>15.3</td>
<td>18.7</td>
<td>19.7</td>
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<td>2.2</td>
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<td>2.8</td>
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<td>Yard C %</td>
<td>Yard D %</td>
<td>Yard E %</td>
<td>Yard F %</td>
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### Table 5

**Gross Profit Percentages for Lumber Products by Yard**

*For the Six Months July-December 1966*

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<th></th>
<th>Yard A</th>
<th>Yard B</th>
<th>Yard C</th>
<th>Yard D</th>
<th>Yard E</th>
<th>Yard F</th>
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</thead>
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<td>25.8</td>
<td>21.7</td>
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ILLUSTRATION III
PRICE CHANGE RECORD

Mark X the change which applies.

- Markup
- Markup cancellation
- Markdown
- Markdown cancellation
- Employee's Discount
- Customer's Discount

<table>
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<th>Code</th>
<th>Description</th>
<th>Quantity</th>
<th>Old Retail</th>
<th>New Retail</th>
<th>Difference</th>
<th>Amount</th>
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</table>

Manager

1Adapted from McNair and Hersum, op. cit., p. 84.
ILLUSTRATION IV
INVENTORY TRANSFER RECORD

INVENTORY TRANSFER

Date ____________

Transferred from yard ____________ to yard ____________

Manager ____________ Manager ____________

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit cost</th>
<th>Total cost</th>
<th>Unit retail</th>
<th>Total retail</th>
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</table>

Total _____ Total _____

\(^2\text{Adapted from McNair and Hersum, op. cit., p. 83.}\)
BIBLIOGRAPHY

Books


Publications of Learned Societies

Periodicals
