Exclusive IRR Survey
Inventory Carrying Costs: Is There a “Right” Way to Calculate Them?

In a rather dramatic shift, almost three of five respondents to a recent IRR survey said they do consider inventory carrying costs when making inventory management decisions. A short four years ago, a surprising 72% reported they didn’t.

Why the shift in practice. Quite simply, it’s the emphasis on improving the bottom line performance and of enhancing the organization’s

State of Logistics Report
Inventory Managers Are Responding Positively to The Economic Slowdown

“It is clear that logistics managers have done a better job controlling inventory investment during our current economic slowdown than they did during the so-called soft landing of 1995-1996 when the monthly inventory ranged between 1.4 and 1.44 months of supply,” announced Robert V. Delaney, vice president, Cass Information Systems, Inc. (StLouis; cass@cassinfo.com) and consultant, ProLogis.

By contrast, he indicated, the ratio in December 2000 was 1.36 months of supply. [Editor’s note: The preliminary report from the Commerce continued on page 12
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cash flow position. Inventory is the largest single asset on the balance sheet of many manufacturers and distributors.

Inventory management authority George J. Miller, CFPIM, president, PROACTION (Oak Park, Calif.; Gproaction@aol.com) tells IRR, “Inventory is a major capital investment affecting cash flow and profitability, as it often comprises one-third to one-half of companies’ assets.” There are significant expenses associated with possessing inventory (see sidebar, page 11). It is usually the most expensive asset to own and maintain, as Miller estimates inventory carrying costs typically run 25 to 30 cents or more on the dollar annually.

How inventory managers are “calculating” their inventory carrying costs. In many cases, unfortunately, the carrying cost rate is out of the hands of those who should be in the loop. For example, the more typical survey comments were:

• “It’s unknown to me, as it is handled at the corporate level,” mentions a stores supervisor at a midsize manufacturer of newsprint.

• “We use a basic, straight 10 percent per month based on criteria established by upper management,” offers a director of material control at a small electronics manufacturer.

• “We don’t do any formal calculations but use seven percent for carrying cost,” comments a purchasing and inventory control planner at a small plastic molder.

• “Our internal rule-of-thumb is 35% per year,” reports a supply chain management vice president at a large producer of electric power tools.

• “Our carrying costs are calculated by division accounting, and we use a rough 25% per annum to estimate our inventory carrying costs,” reveals a materials manager at a small manufacturer of electronic scales.

The “real-world” experiences of inventory managers in determining carrying costs. The IRR survey does contain some encouragement as many respondents shared their methodology of determining their specific inventory carrying costs.

Among them, the manager of procurement and stores of a midsize producer of specialty chemicals forwarded the most detailed analysis form. He revealed that the facility’s inventory carrying cost is 27%, which was calculated from considering the following factors:

• Depreciation on entire building (or portion of building) used to store the inventory.

• Heat and other utilities.

• Janitorial and guard personnel.

• Routine and special building maintenance and repair (include all supplies, contract work).

• Taxes on land and building.

• Insurance on building and equipment.

• Liability insurance.

• Estimated loss of return on own capital tied up in inventory.

• Tax on inventory.

• Insurance on inventory.

• Average yearly loss stemming from materials obsolescence and pilferage (listed separately).

• Cost of labor to receive, stock, identify, move and maintain materials.

• Extra accounting hours necessitated by inventory control, maintaining manpower and machine records, and

• Estimates of yearly cost of top management time spent solving inventory problems.

“Practical” approaches cited as inventory management professionals come to grips with costs. Needless to say, not all calculations are as detailed. Also, there is no pattern to calculation methodology.

For example, the logistics director at a midsize manufacturer of medical diagnostics equipment reports, “We keep it as simple as possible and look at two things: the cost of material and the cost of pallet locations.”
The director of distribution at a midsize processor of fruit juice lists warehouse space, taxes, insurance, overage, shrinkage, material handling and the cost of money invested as the elements in determining his inventory carrying cost. "Effectively, it's anything that changes with the level of inventory," he explains.

"We consider factors such as cost of possession, cost of purchase order generation, and handling costs," advises the division purchasing manager at a major provider of bronze and aluminum castings. The corporate office, he offers, establishes the methods of determining the allocations of these costs.

A purchasing/inventory analyst at a small producer of hose assemblies shares, "We include opportunity costs (10%), insurance and taxes (3%), material acquisition (7%), obsolescence (3%)." They also measure budget/actual costs vs. average inventory dollars.

"In our calculation we include the cost of product manufactured plus transportation and material handling expense," mentions the production and inventory planning manager at a large builder of HVAC equipment. "The warehouse dollar allocation is appropriated to product on a recurring monthly basis. Dollars are calculated at prime plus two percent."

What Factors Go Into Inventory "Cost of Ownership?"

The inventory carrying cost, expressed in terms of percent cost of inventory valuation per year of ownership, consists of:

- Cost of money—The cost of capital to the company or, in some cases, the "opportunity cost" or return that could be earned on the money by applying it productively elsewhere.
- Obsolescence—The risk of inventory never being used, or needing rework to make it usable, needs to be factored into the cost of owning inventory. In theory (and practice), the larger the inventory is, and the longer it is held, the more likely engineering changes, customer preferences and technological changes will render that inventory unusable.
- Shrinkage—A portion of inventory becomes unavailable to the owner due to loss, damage, theft or spoilage. The longer inventory is there and the more there is, the more likely this is to happen. Steps to prevent it only raise carrying costs in other areas, such as security, air conditioning, better control systems, recruiting policies, etc.
- Quality Factors—Allowances for yield, attrition, scrap and rework. This is really more of a function of the process than the amount of inventory invested and is more related to throughput, but is usually expressed as part of the aggregate inventory carrying cost.
- Technological or Price Obsolescence—Prices don't always go up. Therefore, it is desirable to minimize inventories in high-risk areas.
- Taxes—There are two dimensions to this: 1) In some cases, a tax is levied on inventories, so the more inventory, the more tax is paid. 2) Inventory is regarded as an asset by most accounting and tax rules. Therefore, building large inventories shows "profits" and profits are usually taxed, usually by multiple government entities.
- Insurance—The cost of carrying insurance on inventory needs to be considered, as well as insuring the space, equipment, people and other resources needed to control it.
- Space—Costly storage space sometimes occupies 25-30% of the total facility.
- Manpower—Inventory needs people to order, receive, inspect, record, move, count, store, retrieve, post it to the ledger, etc. People are the largest or second largest expense (behind material) for most manufacturers.
- Record-Keeping Systems—Software, procedures, equipment, and paper must be used to stay on top of inventory.
- Material Handling/Storage Equipment—Conveyors, forklifts, bar code readers, scales, AS/RS, trucks, carts, bins, racks, shelves must all be purchased, leased, maintained and cared for.
- Physical Inventories, Reconciliations—Must be conducted to ensure that inventories are properly accounted for and maintained.
- Transportation—Must be provided to move inventory in and out of the facility, to vendors, within the facility to different workstations and storage areas.
- Energy—Heat, light, humidity control, air conditioning, refrigeration and fuel must be consumed to make all this happen.

(Source: George J. Miller, CFPIM)
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The vice president of inventory management at a major manufacturer of healthcare products has calculated his inventory carrying cost at 35%. It is based on interest, warehouse, transportation, obsolescence, and other use of money.

A logistics manager at a midsize producer of electronic chemicals determines carrying costs by “taking any inventory that has not moved for 30 days and calculate what it cost us to store the material.”

Finally, the senior vice president of operations at a large maker of craft products states his methodology rather succinctly:

- Cost per storage location;
- Cost of capital, time value of money; and
- Price and freight differences.

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Department finds the inventory/sales ratio moved from 1.38 in March 2001 to 1.42 in April, leading some observers to note, “facilities have been only partially successful in unloading backlogs of unsold goods.”

Meanwhile, the Manufacturing Report on Business from the National Association of Purchasing Management (www.napm.org) for May 2001 finds inventories declining more rapidly. “Inventory liquidation has accelerated,” notes Norbert J. Ore, C.P.M., chair, NAPM Manufacturing Business Survey Committee. The NAPM Inventories Index for May is at 38.7% indicating a faster rate of inventory liquidation when compared to April’s 39.6%.

Inventory managers work to get control of inventory. In the 12th Annual State of Logistics Report, Delaney challenged the claim of many financial analysts and economists that the sudden and dramatic slowdown was due to excessive inventories. “There was a bit of involuntary buildup of inventory during the third quarter 2000, but the changes in inventory as a contribution to real GDP were negative in the second half of 2000,” he declared. “Our problem was rapidly declining sales due to sudden reductions in capital expenditures.”

The monthly inventory/sales ratio combining manufacturing, wholesale, and retail trade dipped to a record low of 1.31 months of supply in March 2000. The ratio increased to 1.32 months of supply at mid-year.

As the economic slowdown began in the third quarter of 2000, the inventory/sales ratio gradually increased. The December ratio was achieved “when logistics managers controlled the increase in inventory investment to only 0.1 percent,” Delaney points out. “That was solid

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