

# Accounting

## Valuing Economic Damages after an Armed Robbery

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**T**he role of the forensic accountant is to recreate economic reality without the benefit of traditional financial information and source documents. As a rule, the forensic accountant establishes the known variables and makes reasoned and informed estimates of the unknown variables.

Forensic work of this type is often in the context of litigation (civil and criminal) or disaster such as fire, flood, earthquake, etc. The result of the examiner's work is usually carefully scrutinized and challenged. The user of the accountant's report is often the insurer and/or the trier of fact (Judge, Jury, Arbitrator, etc.). It is common that the trier of fact is analyzing two "opposing" expert reports. Often the methodology and formulas used by the opposing experts are similar and differing results relate to the values used in the formulas.

In this case study, the context was a civil trial, a criminal investigation, and the lack of significant evidence upon which conclusions could be based. The forensic accountant was hired to determine the loss incurred as a result of an armed robbery. The loss comprised two elements. First was the value of the stolen inventory. Second was the damage associated with the interruption of business.

Downtown Los Angeles is the location of a concentration of jewelry vendors commonly known as the "Jewelry Mart." Several buildings in the same geographical area contain bazaar type facilities where small vendors rent booths within the mart to display their wares and conduct business. Each night, the vendors either take their inventory with them or store it on site, in a safe located within their rented space.

It was in one of these buildings that an armed robbery took place. The circumstances of the commission of the crime indicated that the robbery was well planned and efficiently executed. Four armed men apparently hid inside the building overnight to avoid detection and effectively bypass existing security systems. As was customary and predictable, the janitor came into the location accompanied by a security guard early the next morning. The armed and disguised intruders were waiting and they proceeded to assault the janitor and security guard. The victims of the physical assault were found hours later, handcuffed to plumbing fixtures in the restroom, and gagged to prevent their calling for help.

Physical evidence at the location indicated that the bandits dragged the safe from two adjacent booths to the service elevator. Once on the first floor, the safes were dragged out the back door of the building. The abrupt end of the scrapings indicated that the safes were loaded onto a vehicle and driven away. The bandits have never been identified. The safes were found several days later discarded and empty in an open field. All fingerprints had been removed and other traceable evidence was destroyed.

Almost immediately after the robbery, the victims experienced extraordinary levels of sympathy and assistance. (Hereinafter, "victims" refers to the owners of the stolen inventory. The forensic accountant was hired by the vendors and was not retained by or involved with the security guards.) Fellow vendors rallied around the victims. Inventory was advanced on consignment from suppliers. Cash was advanced from several sources to assist them. Due to the generosity and sense of community within the mart, the victims were back in business within three weeks. Since jewelry mart clientele is traditionally transient, there was not the traditional period of business ramp-up usually seen in other types of business. Within a short period, the victims were back in business.

The victims initially filed claims with their insurance companies. Eventually, the victims sued the owners of the building, the management of the building, the security company, the insurance carrier, and several others for relief. The monetary damages they were seeking were significant.

Experts were required to determine the amount of the loss and to effectively document and report the conclusions. Forensic accountants in particular were

required. The assets to be valued were gone and some of the accounting records that might be used to assist an accountant in determining the historical cost of the inventory were stored in the stolen safe. Therefore, a significant degree of analysis and extrapolation would be required to quantify the loss. The task of the forensic accountants was to determine with scant source documentation and poor historical financial records the amount of loss to the victims.

The formula used for determining the total economic damages incorporated estimated value of lost inventory plus the amount of income that was lost by the merchants between the date of the robbery and the date that normal business resumed.

The starting point in determining the victims' economic loss was to determine the amount of inventory secured in the stolen safe immediately before the robbery. This is not an unusual function for a forensic accountant. It is routine to assist a client in determining the amount of lost inventory from natural disaster, criminal behavior such as embezzlement, or several other scenarios.

Typically, the valuation of inventory involves the physical observation and count of inventory items. The item count is then multiplied by the cost per item. The extensions for each item are then totaled and the sum of the extensions is the total value of inventory on hand. When physical inventory is not available, as in this case, other means must be used to determine the value. It is common to rely on historical financial data and ratios to determine the historical cost of the lost inventory. In most cases, that method produces a highly reliable and accurate conclusion. There are three elements of financial records that are relevant and necessary to the calculation: historical sales, purchases of inventory, and periodic inventory counts.

Placing a value on inventory is purely mechanical if the inventory you are valuing is tangible and available for observation. When it is not, the value of the inventory must be solved for using a variation of a simple equation used by all accountants. The equation to determine the cost of goods sold in any given time period is:

$$\begin{aligned} & \text{Beginning inventory} \\ & + \text{Purchased Inventory} \\ & - \text{Ending inventory} \\ & \underline{\text{Cost of Goods Sold}} \end{aligned}$$

If the forensic accountant knows the value of some of the variables, the rest of the values can be determined. The relevant variation of the formula, for this case, was:

$$\begin{aligned} & \text{Beginning inventory} \\ & + \text{Purchased Inventory} \\ & - \text{Cost of Goods Sold} \\ & \underline{\text{Ending Inventory}} \end{aligned}$$

In this case, the variable that was known with the most degree of certainty was purchased inventory. Accounting records that were either incomplete or unavailable included periodic inventory counts and sales near the cutoff date (date of robbery) since those records were inside the safe when it was stolen. Without that information, it was impossible to accurately determine ending inventory without establishing,

through forensic means, more of the variables. In this case, beginning inventory and cost of goods sold for the period had to be calculated.

Determining an accurate beginning inventory number is important for two reasons. First, the date on which you have an accurate beginning inventory value determines the start of the period for which sales and purchases must be determined. If an accurate inventory number is available three weeks prior to the robbery, much less work is required to obtain accurate sales and purchases than if the most recent accurate inventory number is three years old.

Second, beginning inventory is the foundation and starting point of the determination of cost of goods sold and/or ending inventory. It is a necessary element of determining the amount of inventory available for sale during the period. There is a direct relationship between beginning inventory and ending inventory: if beginning inventory is overstated, ending inventory and/or cost of goods sold will be overstated. Conversely, if beginning inventory is understated, ending inventory and/or cost of goods sold will be understated.

Since there were no recent reliable inventory values, the forensic accountants reviewed tax returns, internal financial statements, etc. to determine if there was a pattern in the historical data. Ratios were reviewed to see if there was a consistent level of inventory maintained in relationship to sales, purchases, etc. Ultimately, historical inventory values were plotted and a straight-line projection method was used to arrive at an estimated beginning inventory value. Since scant sales records were available, the projection was used to estimate inventory at a time very close to the date of the robbery. This reduced the time and effort needed to recreate sales and purchases.

While many of the vendors' accounting records supporting purchases of inventory were unavailable, the forensic accountants were able to reconstruct purchases rather easily by reviewing cash disbursement records available from the bank and contacting suppliers to obtain copies of invoices.

The next problem was determining a value of cost of goods sold. This required the utilization of another fundamental financial formula:

$$\begin{aligned} & \text{Sales} \\ & - \text{Cost of Goods Sold} \\ & \underline{\text{Gross Profit}} \end{aligned}$$

Again, a variation of the above formula allows the forensic accountant to solve for any one of the variables. In this case, the relevant variation was:

$$\begin{aligned} & \text{Sales} \\ & - \text{Gross Profit} \\ & \underline{\text{Cost of Goods Sold}} \end{aligned}$$

In this case, sales were determinable after a review of cash records and sales invoices. From careful analysis of the historical "markup" by the merchant, an approximation of Gross Profit as a percentage of sales could be established. For example, if historically a vendor marked up his inventory 50% then it can be determined that the Gross Profit should be 33% of sales in any given period. This analysis is more dif-

difficult in a case where multiple mark-up rates exist for individual inventory items. There can also be complications if the price of inventory fluctuates often as in the jewelry business. As the price of gold fluctuates, the cost of jewelry fluctuates with it. However, the merchant may not pass the full fluctuation through to the customer for a variety of reasons. In this case, the markup rate was found to be relatively uniform across all product lines and had been stable in the recent period leading up to the robbery. The price of gold in the relevant period before the robbery was also stable.

Extensive review of historical transactions in this case allowed the forensic accountant to determine the standard markup rates (Sales price per unit / Cost per unit) and therefore solve for Gross Profit. This was done using the following formula:

$$\text{Gross Profit} = [1 - (1 / \text{markup rate})] \times \text{Sales}$$

Once that number was determined and inserted into the formula along with sales, cost of goods sold was determinable and could then be inserted into the original formula.

The result was a reasonable estimate of the value of jewelry in the safe when it was stolen. The limitations of that estimate should be highlighted. The beginning inventory value was a projection based on historical data. As noted before, any error in that estimate directly affected the value of ending inventory. Additionally, any error in the calculation of mark-up or in determining the purchases and

sales cut-off would have resulted in an error in the estimate of ending inventory. In this case, these issues were vigorously challenged throughout the discovery process and during depositions. Documentation of methodology and analysis was critical to the success of defending the conclusions of the forensic accountant.

It should also be noted that the above methodology results in a value of inventory at its historical cost. Many cases require a valuation of replacement value or fair market value. If the history of the cost per unit of inventory shows volatility, the examiner has not completed the engagement by completing the steps detailed above. The examiner would need to convert the historical values to fair market value or replacement value depending on the requirements of the user of the report.

Once the value of the stolen inventory was determined, the next step in quantifying total loss was to determine the damages caused by the unexpected and immediate cessation of normal business. In this case, the calculation of those damages was complicated by an unusual factor: the short amount of time the merchants were out of business.

Other events influenced the analysis of damages. Immediately after the discovery of the robbery, the property owner approached the vendors and offered free rent for three months to help them get back on their feet. One of the merchants staffed the booth by himself or with family, thus requiring no wages to be paid. The other hired a friend on an as-needed basis. The employee was terminated the day the robbery occurred. There were no other material overhead expenses.

Next, the forensic accountants analyzed historical financial data to determine the average length of time inventory was held before it was sold. The number of times inventory

turns over is useful in determining how many sales days worth of inventory was stolen. The examiner needed to verify that the estimated ending inventory was sufficient to support average sales volume in the loss period (three weeks). The formula for this analysis is:

$$\text{Sales} / \text{Average Inventory} = \text{Inventory Turnover}$$

As noted above, both variables were established in the first phase of the engagement. However, ending inventory was used as "average inventory" since there was insufficient evidence available to calculate an average. This was acceptable to the expert since there was no record of significant or material fluctuations in inventory levels. Interviews with the victims and the bookkeeper were relied on to determine the relative stability of inventory records.

The formula allowed the examiners to quickly determine that the amount of inventory in the stolen safe exceeded that needed for the period of time the merchants were out of business. The inventory in the safe was sufficient to maintain normal sales levels for the period that the victims were unable to conduct business. It is important to perform this analysis in the context of inventory costs that show volatility. There must also be consideration of sales trends. For example, had the robbery taken place during the Christmas season, historical analysis must be applied to estimate the average increase in sales during the period. Cyclical sales trends also need to be considered.

Information of this nature was considered through interviews of the victims, analysis of industry trends and review of historical accounting records.

The forensic accountants concluded that the total amount of the loss during the period after the robbery was the gross profit that would have been generated by the stolen inventory. To calculate the lost gross profit, the ending inventory value was "marked up" to its sales value. The sales value was then multiplied by the average gross profit percentage. No expenses were deducted from the calculated gross profit. This conclusion was based on the short "down time," the nonexistence of overhead during the loss period, and the relative ease with which the merchants were able to replace the lost inventory. It is customary to calculate losses in similar cases by projecting sales trends leading into the loss period and establishing the effect of the event on not just sales, but sales growth or contraction. The unusual circumstances of this case dictated a different conclusion.

In the end, the forensic accountants' conclusions were accepted and the case settled without going to trial. That, after all, is the goal of the forensic accountant in the context of litigation: present such a compelling case that both sides agree to settle before incurring the time and financial cost of a trial.

### About the author

Chris Hamilton is President and a principal of Hamilton Boynton & Speakman, An Accountancy Corporation, and Information Technology Group, Inc., a technology consulting firm, located in Encino, Camarillo, and San Francisco, California. He is a Certified Fraud Examiner, a Certified Public Accountant, and a Certified Valuation Analyst. Mr. Hamilton specializes in litigation consulting including forensic accounting, fraud examinations, and business valuations.