Displacement vs. Diffusion of Benefits and the Reduction of Inventory Losses in a Retail Environment

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Traditional security responses in the retail environment have focused on the employment of devices such as locks, cameras, and alarms to reduce shrinkage. Limited success has attended these efforts and this article reports an alternative approach to preventing theft in a large electronics and appliance retailer. High-risk merchandise was targeted for intensive cycle counting. Shrinkage was reduced substantially for targeted as well as nontargeted merchandise. These results were taken to support the concept of the diffusion of crime prevention benefits.

Keywords: Displacement; diffusion of benefits; shrinkage; internal theft; preventive audit survey; cycle counts

Introduction

The profit motive often conspires to create trade-offs that adversely affect the purpose of a retail entity's system of internal controls and overall security plan. Moreover, the geographic selection of sites (highly trafficked areas with many access points) and the dwindling quality (marginally literate) of entry-level labor resources tend to exacerbate the external and internal factors that impact on shrinkage, the financial term that represents the unexplained loss of physical inventory. The need to sell combines with negative environmental factors to exert constant upward pressure on shrinkage, wherein the retailer is often more part of the problem than part of the solution. How to balance the retailer's need to merchandise, maintain adequate levels of inventory, and expedite the flow of goods with the corresponding need to prevent losses represents a complex and traditionally antagonistic dilemma for the loss prevention expert.

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The following case illustrates how a focused strategy employing intensive intervention techniques reversed the historical losses of a major electronics and appliance retailer and yielded substantial "diffusion of benefits" (Clarke, 1992) for a wide variety of nontargeted inventory products.

The Problem

This study examines the loss history of a New Jersey-based discount electronics and appliance retailer between 1989 and 1991. During this 3-year period, the company employed a total of 1500 persons at four retail locations (superstores) and one distribution center.

Sales floor area of the four retail locations averages 40,000 square feet and each location has its own warehouse averaging another 40,000 square feet. The corporate distribution center encompasses 342,000 square feet. The distribution center and each superstore carries approximately $40 million in physical inventory, though seasonal fluctuations alter this number significantly (see *Table 1).*

Stores are open 10-15 hours per day, 7 days a week; the distribution center never closes. It ships two-to-four tractor trailer loads of merchandise to each store daily, as well as processes store returns, receives all purchases generated by corporate buyers, and prepares the routing and loading of customer deliveries. Interstore transfers are trucked in-house, while deliveries are shipped by an external contractor that administers its own traffic operation and truck fleet from within the distribution center.

Annual sales for 1989 were $300 million. End of the year shrinkage was reported at 1.5% of the cost of goods sold.

From a physical security perspective, retail and warehouse operations present access control problems (stores have four-to-five entrances and exits; the distribution center, 39) and merchandise control problems (the product line consists of over 7000 different "brown" goods (electronic products) and "white" goods (appliance products).

Table 1. Inventory Breakdown for Five Locations

Location	Inventory at Cost*
Distribution center	$24 million
Store 1	3 million
Store 2	8 million
Store 3	3 million
Store 4	3 million

•Not adjusted for seasonal variance.

Decentralized security staffs are supported by centralized investigative and audit divisions. The employee-to-security ratio is 61 to 1.

Prior to 1989, the company experienced rapid growth and the corresponding lack of organizational stability that it brings. The Management Information Service Department was not structured to accommodate the increase in capacity generated by exploding sales; operations was not accustomed to receiving, transferring, and delivering large quantities of goods quickly and efficiently; and security was, in short, overwhelmed.

These structural faults were eventually corrected but inventory shortages began to increase at a higher rate than previous trends. In addition to taking an end-of-the-year physical inventory, management required its inventory control department to take intermittent cycle counts (i.e., physical counts of particular product categories) of all product lines.

Cycle counting is a sampling process designed to test the accuracy of known (or believed to be known) inventory levels. It obviates the costly and time consuming need to take repetitive physical counts of a retailer's entire stock without abandoning the need to obtain reliable information about the accuracy of on hand quantities of merchandise (Jannis, Poedtke, and Ziegler, 1980). Table 2 shows the cycle count results for eight "shrinkage sensitive" categories for the sixteen month period between September 1989 and December 1990.

The variance in the percent of shrinkage reported for each category is a function of each product's relative distribution within the overall inventory. Ninety-four units of car stereo, for example, represents a loss of 8.99% of the entire stock in this product that was on hand at the time. Theft aside, factors influencing shrinkage rates are per unit costs and quantity. The relatively low rates of shrinkage for electronics and radar detectors are due, in large part, to the lower per unit costs and larger stocking levels. Higher priced products (car stereos and portable CDs), with lower relative unit losses, tend to correspond with higher rates of shrinkage expressed as a percent of dollar value at cost, while lower priced products (electronics and radar detectors), with high unit losses, tend to correspond with lower rates of shrinkage (even despite losses sustained from vigorous pilferage, shrinkage rates for these products have still not pierced the 2% threshold). The exception to this rule, as evidenced by both the high unit losses and high rates of shrinkage, was demonstrated by the camcorder and VCR product category. Strong consumer demand dictated that large quantities of these costly products always had to be kept in inventory.

Table 2. Cycle Count Results for Eight Product Categories prior to Intervention

Count Date	Merchandise Category	Unit Shrinkage	$ Shrinkage in %
09/16/89	Car stereos	-94	-8.99
05/06/90	Camcorders/VCRs	-475	-6.1
05/19/90	Big screen TVs	-123	-1.9
05/27/90	Electronics	-245	-1.4
08/31/90	Car stereos	-62	-10.8
10/03/90	Tapes and batteries	-6,273	-8.2
11/30/90	Portable CDs	-10	-9.8
12/13/90	Radar detectors	-46	-2.7
12/31/90	Previewed videos	-287	-2.1-

"Video tapes of popular movies.

By mid-year 1990, losses* had risen to unprecedented levels. In response, management took decisive steps to rapidly counter this problem by adjusting its focus and moving toward the development of an effective action plan that stressed intervention and prevention.

Methodology

The protection of merchandise prior to the adoption of new intervention measures consisted of a strategy that relied primarily on maintaining the physical security of inventory through the employment of alarms, locks, closed-circuit television monitoring, and guards. No measures were taken to determine when, how, or why thefts occurred. Unfortunately, this dictated a reactive approach that did nothing to identify fundamental weaknesses within the existing system of internal controls.

The questions confronting management were essentially these: Given the extent and rapid growth of inventory shortages, could this trend be reversed? How quickly would it take? How much would it cost?

In spite of the recent losses, the retail operations and marketing departments did not want any countermeasures adopted that would interfere with their achievement of robust sales. And though the finance department wanted to reduce losses, the expenditures required to hire additional security personnel and purchase more equipment was not an attractive alternative. Even so, could the security department be expected to be able to reasonably secure over $41 million in inventory of which 30% was in transit on any given day? If not, would it be forced to secure some products while ignoring others? Any strategy that attempted to require security to achieve control of the entire inventory, given the then current budgetary constraints, held out little hope of success. On the other hand, selective prevention posed the risk of merely transferring losses to other products thereby effectively "institutionalizing" shrinkage for the company.

Zero-shrinkage Targeting

Emphasis was shifted to improving internal controls that would create audit trails and facilitate tracking the flow of goods from the point of receipt to the point of sale. The intention of this shift, however, was not to abandon the use of physical security assets: It was designed to introduce a much needed perspective and orientation to security's approach that enhanced its ability to detect and, thereby, more effectively counter theft. The subsequent creation of an audit division assisted management in developing a historical sense of what products were most frequently stolen

*Calculation of shrinkage: The measurement of true shrinkage (i.e., the loss of physical inventory due to theft or destruction) is often clouded by the inventory valuation accounting method selected by management. The retail method is frequently used by retailers but it corrupts the true calculation of shrinkage because it assumes that all markdowns and markups are captured and reflected in the final numbers. Because shrinkage is reported in terms of dollars, a significant contribution to shrinkage can be attributed to the failure of this method to accurately reflect the true cost of goods sold. In the case under review, inventory valuation is calculated by average cost. This method avoids the pitfalls of employee carelessness and offers management a clearer picture of its true losses. The dollar values of the shrinkage reported in *Table 2* are, therefore, a reflection of problems related to theft and not to some other cause. It is important for administrators to make this distinction so that further drains on revenue are prevented by the misallocation of resources.

and analyzed, in conjunction with its newly formed investigative counterpart, how inventory theft was executed.

Several products were identified as "high-shrinkage" merchandise, and a variety of loss scenarios were discovered. Internal thefts were perpetrated by employees acting alone, using fraudulent documentation, or effective stealth techniques, as well as in consort with other co-workers. Often large quantities were stolen at one time, and, in most cases, there was a pronounced breakdown in operational procedures.

The exposure of specific theft trails assisted in securing their closure, but it was evident that a more intensive method of intervention had to be discovered if the runaway losses were to be stopped. Inherent with the problem of theft was the persistent popularity of electronics for resale on the street, the sheer volume of the inventory that required protection, the numerous opportunities for theft that still remained, and the limited resources that were available to achieve success.

Prior to the implementation of these new controls, not only was theft easily perpetrated, it was also readily concealed. For example, one minute, 50 camcorders were in stock; the next, only 45, with no discernible clues left behind to explain their disappearance or to pinpoint the time frame of their loss.

To accommodate all concerns (the need to merchandise, the need to control costs, and the fear of displacing losses from one product to another), a rational choice approach was embraced (Gott and Hirschi, 1990). Implicit in this theory is the fact that perception of control was equivalent to control. If dishonest employees could be successfully influenced to perceive that risk of detection and capture was high, they could be successfully discouraged from committing theft.

Since **all** the merchandise could not be secured **all** the time, a strategy was adopted that targeted two product categories for intensive control. Selection was based upon average cost, contribution to profit margin, loss history, and frequency of turnover. Camcorders and VCRs were subsequently chosen. The short-term objective was the reduction of losses in both categories to zero within 3 months. It was believed that the employment of a selective zero-shrinkage intervention strategy would remove the preexisting opportunities for employees to steal and increase the ability of the security department to identify when theft occurred, thereby enabling investigators to conduct a more productive inquiry.

By implementing this aggressive strategy, security management hoped to regain control over inventory and reverse the upward spiral of losses. If successful, its achievement of the reduction of shrinkage in a few products was expected to foster an increase in the perception of risk, detection, and apprehension among all groups of employees that would transfer positive gains to other types of shrinkage-sensitive merchandise.

Initial resistance to the approach flowed from three negative assumptions:

1. Internal thieves would target other products, i.e., "displace" to other goods.
2. A reduction in shortage to zero in some products would not appreciably offset other losses.
3. Security's emphasis on preventing losses in specific categories would imply a reduced sense of its commitment to reversing losses in general.

In spite of these objections, management believed **a priori** in the merits of the strategy.

Preventive Audit Survey

The field procedure used to target on camcorders and VCRs was the preventive audit survey (PAS). It was, in actuality, a minicycle count conducted chainwide on a daily basis. The intervention objectives were

1. To discover and correct inventory discrepancies.
2. To expose system weaknesses with receiving, transfers, and distribution.
3. To detect theft.
4. To reduce opportunities for theft by increasing frequencies of physical inspection.

Beginning January 1, 1991, loss prevention personnel entered the locked storage areas where high-shrinkage merchandise was secured to make daily counts of the stock of camcorders and VCRs. The physical counts were then compared to computerized perpetual records. Initially, this was a time-consuming process given the quantities involved. It did, however, ensure an accuracy and timeliness never before attained.

Windows of opportunity were closed, discrepancies (e.g., goods still in transit or sales credits issued for goods not received) were reconciled immediately, and unaccounted for shortages were attributed to internal theft. The PAS enabled investigators to associate losses with employees known to be present, and, since intervention was daily, prevented inventory theft from accumulating over a succession of work shifts, involving numerous employees, resulting in unfathomable solutions.

Table 3. Postintervention Cycle Counts for Targeted and Nontargeted Merchandise

Count Date	Merchandise Category	Unit Shrinkage	$ Shrinkage in%	Previous Shrinkage	+ / -
Targeted merchandise					
02/02/91	Camcorder/VCRs	**-46**	**-0.6**	-6.1	- 90%
03/09/91	Camcorder/VCRs	**- 6**	**-0.1**	-0.6	- 83%
04/16/91	Camcorder/VCRs	**- 0**	**0**	-0.1	- 100%
Nontargeted merchandise					
03/02/91	Big screen TVs	- 12	-1.85	-1.9	- 0.03%
04/20/91	Radar detectors	**0**	**0**	-2.7	-100%
05/23/91	Portable CDs	**0**	**0**	-9.8	-100%
08/08/91	Previewed videos	-197	**-1.81**	-2.1	- 14%
08/10/91	Car stereos	**0**	**0**	-8.99	- 100%
12/28/91	Big screen TVs	- **2**	-0.27	-1.85	- 85%

Even so, could this method of intervention realistically be expected to reduce pilferage overall?

Results

The impact of conducting preventive audit surveys was immediate: Discrepancies were reconciled instantly, losses resulting from theft were detected, and guilty employees were confronted. Even the prospect of recovery began to emerge. Consequently, investigators were able to cycle (i.e., acquire knowledge of a theft, select suspects, plan, implement the plan, obtain a result) through each loss incident more rapidly and destabilize the confidence of dishonest employees, who, heretofore, enjoyed both the advantages of confusion and anonymity. *Table 3* reflects the decreases achieved in shrinkage.

Management's initial objective of reaching zero shrinkage within 3 months for targeted products was realized in addition to its hoped for drop off in losses for nontargeted categories. Not only was zero shrinkage achieved with camcorders and VCRs but with radar detectors, portable CDs, and car stereos as well. Of the categories reported in *Table 2,* only big screen TVs and previewed videos continued to sustain losses. The shrinkage in big screens, however, dropped 85% from 1.85 to 0.27%, and though previewed videos registered only a 14% decrease, its incremental contribution to shrinkage was immaterial due to the negligible investment in inventory of this product. Moreover, videotapes, highly vulnerable to external theft, had little chance of benefiting from the preventive audit survey—a strategy strictly designed to thwart internal losses.

Of major significance, in terms of evaluating the effectiveness of the intervening methodology and its overall success, was the trade-off in costs, of which there was none. Identical resources had been merely redeployed and assigned more productive tasks.

Conclusions

The terms "displacement" and "diffusion of benefits" represent two adversarial points of view.t Displacement theory suggests that if a criminal is frustrated from perpetrating a crime against target A then the criminal will transfer his or her attack to target B (Clarke and McGrath, 1991). The residential alarm industry's profitability, for example, is dependent upon society's continued acceptance of this simple premise. The concept of diffusion of benefits, on the other hand, implies that a concentration of effort and resources in one area will inevitably spill over to similarly affect another, resulting in a coincidental windfall of "benefits." For retail loss prevention executives (or, for that matter, public law enforcement officials), the advantages to be gained from the successful exploitation of such a phenomenon are economic: Limited resources can be stretched to achieve traditionally costly objectives.

In the case of our electronics and appliance retailer, two observations can be made:

tSee Clarke (1992, p. 25): "As evidence accumulates of the limits to displacement, it seems likely that much of the skepticism about the value of situational prevention will diminish. Indeed, the debate about effectiveness may take an altogether different turn with the newly growing realization that situational prevention can sometimes produce the complete reverse of displacement. . . ."

1. Dishonest employees did not displace to other goods.
2. The efforts of a focused and coordinated security program did appear to extend the "diffusion of benefits" to nontargeted product categories resulting in the significant reduction of overall losses. It is also noteworthy that these results have remained constant over time.

The simple elimination of the opportunity for employees to commit theft was not the adopted strategy's sole objective. Follow up investigations, terminations, and prosecutions were important ingredients in the rational choice approach that anticipated reductions in losses through selective prevention enhanced by the increased perception of risk. It is impossible to state with certainty, however, that minus these perceptions displacement would have inevitably occurred. A possible explanation for the "diffusion of benefits" may be that once all the dishonest employees were identified and expelled from within the limited confines of the company, the probability of future losses was reduced, de facto, to zero. This presumes, of course, that no more dishonest employees were hired, and, of those remaining, none were predisposed to steal. Regardless of the fact that policing a single closed environment of 1500 employees is much less complex than having to police the entire community at large, any individual's needs, wants, and resistance to temptation is always evolving, creating changes in his or her perception of risk and the ultimate consequences.

It is highly unlikely that the pervasive reductions in shrinkage were due to the achievement of a Utopia. (The author can attest to the contrary!) What is likely, is that in smaller environments the potential for displacement can be arguably reduced while conditions for diffusion can be enhanced.

Attempts to generalize the results achieved in a controlled environment to a broader societal level, however, must proceed with caution. Larger environments contain greater numbers of factors that are considerably beyond the control of crime prevention tinkerers. Nevertheless, the accumulation of empirical data derived from any setting will help to validate in absolute terms intervention methods designed to decrease criminal opportunity.

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