

Shelf Price Accuracy in Supermarkets That Scan

Introduction and Executive Summary

Scanners were introduced in supermarkets in 1974 to improve efficiency and productivity in the food distribution system. The technology has brought many benefits to both consumers and the supermarket industry. For example, scanners:

- Reduce checkout time.
- Provide consumers a receipt that details the type and price of each item purchased.
- Help control costs by eliminating the labor needed to individually mark items.
- Generate electronic coupons for the products that customers purchase.
- Provide a means to help prevent the sale of alcohol and tobacco products to minors. Some supermarkets have programmed the registers to stop whenever such items are scanned, prompting the cashier to check customer ID cards.
- Provide a way to enhance and monitor price accuracy at the shelf.

Concerns have been raised about discrepancies between the prices on the shelf and in the scanner at the checkout counter. This issue has often been described as one of “scanner error”; that term is misleading, however, because it fails to identify the true cause, which is human error. When discrepancies occur, the technology itself is not malfunctioning; rather, store employees are not changing the shelf and scanner price at the same time. Since price changes are typically made in the scanner, the scanner reflects the true price. For this reason, the issue is better described as one of “shelf price accuracy.”

Supermarkets have always faced the challenge of controlling price-marking consistency — a challenge that has increased as typical store inventories have grown to a range of 30,000 to 50,000 separate items. In addition, competition has prompted stores to make more price changes — typically, hundreds per week — increasing the opportunities for human error.

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Food Marketing Institute (FMI) conducts programs in research, education, industry relations and public affairs on behalf of its 2,300 member companies — food retailers and wholesalers — in the United States and around the world. FMI's U.S. members operate approximately 26,000 retail food stores with a combined annual sales volume of \$340 billion — three-quarters of all food retail store sales in the United States. FMI's retail membership is composed of large multi-store chains, regional firms and independent supermarkets. Its international membership includes 200 companies from 60 countries.

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In stores that lack scanners, discrepancies occur when checkers inadvertently ring up the wrong prices or when employees fail to make price changes in a uniform manner. Discrepancy rates are higher in stores that mark items individually because this practice increases the opportunities for human error.

The industry is improving accuracy with technologies that change prices on shelf tags and scanners at the same time. In another solution, employees use portable computers to print out new shelf labels in the aisles. Many supermarkets are upgrading management controls, such as conducting frequent shelf price accuracy audits and assigning employees to monitor price changes full-time.

Using the measures described above, supermarkets have reduced error rates, according to research by the Federal Trade Commission (FTC). In the days before scanning, error rates were as high as 16 percent. With the help of scanning and tighter controls, supermarkets reduced the rate to 2.42 percent in 1998, the most recent year for which FTC data is available (*Price Check II — A Follow-up Report on the Accuracy of Checkout Scanners*). That rate includes both overcharges and undercharges, which were nearly the same at 1.36 percent and 1.06 percent, respectively.

Supermarkets also have the highest price accuracy rate among all types of retailers. The error rate for other retailers covered in the FTC report was 3.99 percent.

In addition, weights and measures officials have stepped up enforcement of laws that penalize retailers for overcharges. Also, their governing body, the National Conference on Weights and Measures (NCWM), developed a methodology to measure price consistency more accurately and better gauge the success of efforts to improve it. The methodology is described in the guide titled *Examination Procedure for Price Verification*.

1. What are scanner pricing errors and how do they occur?

The most common ones are discrepancies between the prices charged at the register and those posted on the shelf, resulting in either an undercharge or overcharge for the customer. Such inconsistencies are a product of human error: in most cases, store employees enter a price change in the scanning system without updating the shelf tag.

2. Is the supermarket industry concerned about this issue?

Absolutely. Overcharges erode customer loyalty, and undercharges cost the industry. Supermarkets are striving to achieve 100 percent pricing accuracy. Many have virtually eliminated overcharges with a relatively simple price-change practice: When the price of an item increases, they change the shelf label first and then the scanned price at the checkout; when the price decreases, they change it in the scanner first. This practice helps ensure that any errors will favor the customer.

3. How much do pricing errors cost customers?

The most reliable data show that the cost to consumers is minimal. The 1998 FTC report found that the error rate among food retailers averaged 2.42 percent with overcharges and undercharges about equal, 1.35

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percent vs. 1.06 percent (*Price Check II — A Follow-up Report on the Accuracy of Checkout Scanners*). The average overcharge was 66 cents. This report was based on a review of 32,753 items checked in 555 food retail stores in 36 states and the Virgin Islands.

A three-year study by The Center for Retailing at the University of South Carolina found that the error rate averaged 2.74 percent with undercharges exceeding overcharges 1.47 percent to 1.27 percent. Grocery stores had a much lower error rate than other retail outlets, in which the rate averaged 6.01 percent. These findings were based on a sample of 96,080 items checked in 1,582 stores in nine states from 1994 to 1997 (Guy Richard Clodfelter, "Pricing Accuracy at Grocery Stores and Other Retail Stores Using Scanning," *International Journal of Retail & Distribution Management*, Volume 26, Number 11, 1998).

The FTC and South Carolina data are based on a methodology developed by the National Conference on Weights and Measures (NCWM), titled the *Examination Procedure for Price Verification*. More than 40 states are now using the methodology to generate scientifically valid data. Among its requirements are that the minimum sample size per store be 50 items and that the sampling be conducted on a random basis, covering products both on sale and not. Studies that do not meet such minimum requirements are most likely invalid.

4. What about claims that scanning errors cost consumers \$1 billion or more a year?

There is no factual basis for such claims. In a November 1992 article ("The Price is Wrong"), *Information Week* magazine estimated that scanner errors cost consumers \$2.5 billion year. The estimate was based on false assumptions. Citing a 1990 study, the magazine reported that supermarket shelf prices "fail to match scanner prices 5 percent of the time." More recent and comprehensive research by the University of South Carolina puts the rate at 2.74 percent, with more than half the errors (1.47 percent) representing undercharges.

Then the magazine arbitrarily equated the error *rate* with the error *cost* to estimate \$7 billion in pricing mistakes on \$140 billion in sales in supermarkets that scan. The states that gather such data, however, find that cost of pricing errors is an extremely small percentage of sales. The magazine also assumed that overcharges exceed undercharges by a two-to-one ratio despite the fact that the most current and scientifically valid data shows that the ratio is about one-to-one.

Money magazine alleged that price errors cost consumers \$1 billion a year in its April 1993 issue ("Don't Get Cheated by Supermarket Scanners"). This claim has no statistical validity since it was based on samples of only 10 items per store. Samples of at least 50 randomly selected items are required in the NCWM's model methodology.

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5. What steps are supermarkets taking to improve pricing accuracy?

Many supermarkets assign the responsibility for maintaining consistent shelf and scanner prices to one individual, often called a price coordinator. The coordinator's duties include implementing all price changes; updating and maintaining the scanning system at the front end; and verifying and maintaining shelf labels, ad signs and pricing reports.

- Supermarkets conduct regular store audits and surveys to make sure the prices on the shelf, in the scanner and elsewhere all match.
- Some companies have formed internal task forces to improve pricing accuracy.
- Supermarkets teach their employees to report and correct errors in a timely manner and reward customers who are overcharged for items.
- Supermarkets are installing electronic shelf labels (ESL), which enable retailers to change an item's shelf and checkout price simultaneously. This technology is now used by 15 percent of food retailers, according to the report *FMI Technology Review Highlights, 2000*.
- Stores that use wireless/RF communication can quickly provide point-of-sale (POS) price verification. Remote checkout stands can communicate with the store's database without being physically attached to a local area network. Clerks, using wireless communication (hand-held scanners), can verify shelf prices from anywhere in the store.

The Food Marketing Institute (FMI) developed a best practices guide that describes the measures above and others: *Price Verification — Ensuring Accuracy at Store Level*.

6. How does the government monitor price accuracy?

Local and state weights and measures officials routinely check shelf and scan price accuracy in supermarkets and other retail establishments. Many jurisdictions impose large civil, criminal and administrative penalties — including fines as high as \$1 million — and support class action suits against retailers. Officials often make public the results of accuracy surveys to help consumers evaluate the performance of various stores. In recent years, government officials have begun addressing the problem more aggressively with larger fines and more frequent price checks.

7. What should consumers do if they find a difference between the shelf price and the scanned price?

Immediately report the discrepancy to the cashier and inquire about the store's policy for addressing price errors. These policies may include:

- Giving the customer the item for free.
- Providing a coupon for a free item.
- Awarding the customer a fixed dollar amount.
- Awarding the customer the difference in price.

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8. Would eliminating scanners improve the accuracy rate?

No. Supermarkets carry from 30,000 to 50,000 different items and make hundreds of price changes every week. Requiring all prices to be changed manually on all items would increase the discrepancy rate because it introduces many more opportunities for human error. Studies have shown that manual entry of prices result in error rates of 4.4–16 percent, according to the FTC.

Customers would also lose the many benefits of scanners. The technology reduces checkout time and provides receipts that detail each item purchased. It also helps supermarkets control costs by eliminating the labor needed to mark items individually. Many supermarkets program their scanners to generate electronic coupons for items that consumers purchase. Supermarkets also use the data gathered by scanners to tailor product assortment more precisely to consumer demand.

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9. How does item pricing legislation enter into this issue?

Some consumer advocates and lawmakers believe that requiring stores to individually price each item will improve accuracy and give shoppers a convenient means to verify price consistency at the checkout. Five states and many local jurisdictions currently have item pricing laws. Some laws feature a trigger mechanism, requiring retailers to item-price when accuracy rates fall below a certain level, such as 98 percent in a 300-item sample.

10. Is item pricing necessary to improve accuracy rates?

No — just the contrary. Individual item price-marking provides more opportunities for human error. Instead of making a single price change on the shelf tag, item pricing requires employees to re-price the entire stock of each item — often involving hundreds of price changes. Comparative data show that stores that item-price have higher error rates. Price error rates range from 4 percent to 7 percent in stores that item-price, according to the NCWM, compared with rates that are half as much in stores that only scan.

In addition, item pricing could lead to cost increases to cover the extra labor required to label each individual product. Labor is the largest single cost for supermarkets, accounting for 36 cents out of each dollar that consumers spend on food. Supermarkets can achieve 100 percent accuracy rates with improved management practices, technology and other measures — without item pricing.

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Sources of Additional Information

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