

May 2008

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Recommended Citation

Wyld, David C. (2008) "Back to the Future?: Why "Old School" Item Pricing Laws May Hold Back the Uses of RFID in Retail Settings," *The Coastal Business Journal*: Vol. 7 : No. 1 , Article 5.
Available at: <https://digitalcommons.coastal.edu/cbj/vol7/iss1/5>

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BACK TO THE FUTURE?: WHY “OLD SCHOOL” ITEM PRICING LAWS MAY HOLD BACK THE USE OF RFID IN RETAIL SETTINGS

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ABSTRACT

In an era of quickly advancing retail technology, 10 states and a number of major cities still mandate that individual price tags be placed on almost all items available for sale in grocery stores and other retail outlets. Research has shown that they are a major cost impediment for retail stores and a “hidden tax” facing consumers. At present, item pricing laws are also a factor in slowing adoption of RFID (radio frequency identification) technology in stores. The author provides an analysis of the present situation and recommendations for future action for retail and technology management.

INTRODUCTION

Prices change. It is one of the realities of our daily lives. In fact, Kackmeister (2007) recently found that over time, the volume of price changes in American retailing has been rapidly accelerating. This has been due to a number of factors, including rising competitive pressures, the expectations of consumers for sales and specials, and certainly not least, the ability of retailers to change prices more easily with their point-of-sale and inventory management systems. We have seen a great progression in retailing pricing technology over the past three decades. However, prior research has dealt with the impact of developing pricing technology in retail settings in only a limited fashion, including bar coding (Brown, 1997), electronic shelving systems (Goodstein & Escalas, 1995), physical item pricing (Langrehr & Langrehr 1983) and today, RFID (radio frequency identification) (Pate, Blaylock, & Southward, 2007).

Nault & Dexter (1995) found that the incorporation of information technology innovations in retailing can yield not just business intelligence benefits to the retailer, but added informational value to the customer as well. However, today, state and local laws mandating the use of the oldest pricing technology – requiring a physical price tag, sticker, or label to be placed on every item in a retailer’s inventory - may well work to hinder the adoption of the newest pricing technology – that of RFID-based retail systems. This article thus examines how to reconcile the need for shopper price awareness and consumer protection with the benefits of new retail technologies coming from the adoption of RFID technology to supplant and eventually, to replace, the venerable bar code technology in retaining.

ITEM PRICING LAWS

For those over forty years of age, we can likely recall the grocery store of old, where “stockboys” carried their price guns, with which they dutifully applied a price sticker to every can of corn, every package of chicken, every loaf of bread, and every gallon of milk in the store. At the checkout counter, the “checker” did just that – checking the surface of every item in the shopping cart for its price tag and then entering that price by punching numbers on the

mechanical cash register. It is a scene straight-out of *Back to the Future* (1985), as bar codes and scanners eliminated the need for putting a price tag on every item a long time ago – right?

Not entirely. Believe it or not, in 2008, in a significant part of the United States, grocery stores – and many other categories of retail stores - still place individual price tags on almost every item they sell. Why? It is simply because state and local laws require them to. These “item pricing laws” (IPLs) (also referred to as “scanner laws”) were largely enacted as “consumer protection” measures in the 1970s and 1980s to protect against fears that consumers were being overcharged due to checkout scanning errors (The Cato Institute, 2007). This was despite academic research of the time which demonstrated the relative accuracy of bar code-based price scanning (Welch & Massey, 1988). The research also showed limited value to physical item pricing in retail settings in very limited shown that in the early 1980s, fewer than 1 in 5 shoppers actually checked the accuracy of the prices they pay for goods at the checkout counter (Harris & Mills, 1982). Yet, these laws are still in vogue, as at late as 2005, New York’s Mayor Michael Bloomberg (2005) signed a law which significantly strengthened its municipal item pricing regulations.

Support for Item Pricing Laws

IPLs have been supported by not just consumer advocates, but by retail and grocery workers’ unions, who see the laws as protecting outmoded jobs (Martin, 2006). As of May 2008, item pricing laws are in place in ten U.S. states:

- Arizona
- California
- Connecticut
- Illinois
- Massachusetts
- Michigan
- New Hampshire
- New York
- North Dakota
- Rhode Island.

Additionally, item pricing laws exist in several large metropolitan areas in otherwise non-IPL states, including Chicago and Philadelphia. In Michigan, the state’s IPL covers almost every item for sale in any retail outlet priced over 30 cents, while in other states, their IPL laws are restricted to food stores. In Connecticut, retailers are exempted from that state’s IPL if they install electronic shelf labeling systems (at a cost of well in excess of \$100,000 per store) (Food Marketing Institute, 2007). Yet, the U.S. is not unique in having IPLs, as similar regulations exist in Israel, as well as select provinces of Canada and even some European countries (Bergen, et.al., 2005).

The laws are designed to give the consumer recourse in the case of scanner error, being able to point to the physical price tag on the item as the incontrovertible “truth” in pricing. Yet, while most of us have encountered scanner errors personally, the truth of the matter is that they are

increasingly rare – and not necessarily not in our favor. The U.S. Federal Trade Commission (FTC) (1998) has conducted the most comprehensive research on scanner accuracy to date. In its “Price Check II” study, the agency’s researchers checked prices of over 100,000 items at over a thousand stores. They found that one out of every thirty items was mispriced, with undercharges occurring *just as frequently* as overcharges. Also, the amounts by which consumers saved – by being undercharged for items due to a scanner error – actually exceeded the amounts they were overcharged, producing a “net savings” to the consumer. Surprisingly, the grocery industry outperformed the general retail industry, with errors occurring on approximately one out of every twenty-five items scanned (FTC) (1998). Most scanning errors do not occur as a result of error at the scan site. Rather, they are data entry errors as prices are entered/updated in the central computer systems controlling point-of-sale (POS) systems. Thus, the weekly regularity of grocery stores’ sales/discounting cycles and their need to focus on these updates likely accounts for their actually outperforming the general retail industry (Clark, 2000). Overall though, as POS systems and data systems have improved, scanning errors are not just becoming less frequent, they are also far less than a casual observer might expect – typically less than 1% of the retail price (Beck, 1997).

Thus, while scanning errors are rare, they do constitute a “moment of truth” for retailers, in that they have a chance to make or break a relationship with a customer (Carlzon, 1989). Thus, retailers are increasingly inclined to side with the consumer when they point out a possible scanning error. Simply put, the possible cents – or even dollars – loss from the scan of an item is outweighed by the cost of retaining that customer – or recruiting a replacement one. Further, the decision is not just to save face with the customer and retain his or her goodwill, but it is a practical one as well. By not contesting the customer’s view that the price on the shelf was slightly less than what the scan of the item showed, the store does not face the prospect of having the price check process “hold up the check-out line” for perhaps several minutes or more when such a discrepancy is brought to a clerk’s attention.

Criticism of Item Pricing Laws

Recently, item pricing laws have come under fire as a remnant of a bygone era in today’s high-tech retail environment, with some states having efforts to repeal or restrict their respective statutes. This has come as the laws have been increasingly criticized for the significant costs businesses incur to comply with the state mandates. Indeed, retailers’ costs are high – both in terms of compliance efforts and fines for non-compliance. The average grocery store sells over 5 million items each year, and in larger retail venues, that may double or even triple. With the need to apply price labels to the vast majority of these items, economic analysis has estimated that IPLs add between six and eleven percent to the overall labor costs of grocery chains operating in these locales (Food Marketing Institute, 2007). Christopher Flynn, the President of the Massachusetts Food Association, recently stated that his organization estimates that it costs an average grocery store between \$150,000 to \$300,000 annually to comply with that states’ IPL (quoted in Mohl, 2006, n.p.). In recent years, Wal-Mart, Home Depot, Office Max, and BJ’s Wholesale have faced major fines or settlements due to their alleged violations of state item pricing laws (Anonymous, 2006). IPLs also restrict the ability of retailers to change prices, due to the fact that price changes necessitate additional physical labor. Indeed, analysis has shown that stores in IPL states change their prices far less frequently and place fewer items on sale than

their counterparts in the rest of the country (Clark, 2000). Thus, rather than saving consumers money from the specter of inaccurate scanning, IPLs may restrict their ability to participate in sales and promotions, exacting another cost on consumers and retailers in these select states.

Item pricing laws have been aptly categorized by academicians studying the issue as a “hidden tax” on consumers, as retailers in item-pricing states are forced to pass the compliance costs on to their customers (Anonymous, 2006). In truth, this is because there is a fractional cost of labor added to every product sold in the store in an IPL state. This has been proven in scholarly research on the subject. In fact, a major study on the effect of item pricing laws is pending for publication in the *Journal of Law and Economics*. In this project, the researchers compared over three thousand prices in the tri-state region around New York, tracking prices on like items in:

- New York (an item pricing state)
- New Jersey (a non-item pricing state)
- Connecticut (an electronic shelf labeling state).

The researchers found that – holding other factors constant - prices in markets where item pricing was required were between 20 to 25 cents higher than prices on like items in states where item pricing was not required. In Connecticut, prices were found to be far less than in New York’s item pricing environment. However, due to the costs involved in acquiring and maintaining the electronic shelf labeling systems, prices in this market were – on average – ten cents higher than those found in non-item pricing markets (Bergen, et.al., 2005). One of the authors of the study, Dr. Paul Rubin, a professor of economics and law at Emory University in Atlanta, recently pronounced in *The Wall Street Journal* that “the laws are a bad deal for consumers” (Rubin, 2007, p. A9).

In essence, as shown in Table 1, item pricing laws have a net negative impact on **both** sides of the retail equation. They can be seen as a net negative for both retailers and shoppers, as the regulations contribute to high prices and less competition in the retail sector. Additionally, the millions of dollars and thousands of hours that are spent on enforcement of these laws by the states and locales with the statutes on their books are largely tax dollars being spent unnecessarily, as only a handful of intentional cases of systematic scanning overcharges have been uncovered over the past three decades (Federal Trade Commission, 1998).

TABLE 1: Impact of Item Pricing Laws on Retailers and Consumers

Retailers	Consumers
<ul style="list-style-type: none"> • Added labor costs • Added time to deliver goods to the shelf • More stockouts • Added compliance/legal costs • Lessened ability to change prices to existing stock 	<ul style="list-style-type: none"> • Higher prices overall • Lowered item availability • Fewer “sale priced” items

ANALYSIS

Item pricing laws are clearly holdovers from retailing’s past – much like other archaic laws that are still being dealt with in significant parts of the country today. Such legal anachronisms include:

- Laws in New Jersey and Oregon that prohibit customers from pumping their own gas (Schaeffer, 2003).
- So-called “blue laws” that are still on the books in parts of the Northeast and the South that restrict the sale of various items and prohibit stores from opening prior to noon or later on Sunday (Finer, 2004)
- Liquor laws that prohibit the sale of various strengths of alcohol – or any alcoholic beverage – in grocery and select retail outlets and/or on Sundays (Fillion, 2008).

Item pricing laws are thus an anachronism – a relic of retail’s pre-bar code era. They originated out of consumer mistrust of the introduction of bar code scanning, and they are perpetuated by legislators who continue to respond to the pressure and influence of both consumer advocacy groups and labor unions. All state and local governments that have these laws in place should thus take a hard look at the costs these laws are exacting on their jurisdictions, as they have been proven to make their retailers less competitive and their citizens pay more. Due to the fact that these laws impact well over a third of the U.S. population who live in IPL states – including the influential California and New York markets (U.S. Census Bureau, 2007), these laws have wide impact beyond the ten states in which they are currently on the books.

All major retail trade associations have taken stands against item pricing laws. However, the Food Marketing Institute (2007), based in Arlington, Virginia, has taken the stand that the laws, rather than simply adding unnecessary costs to retail operations and proving to be inflationary for consumers, harm **both** parties in the retail transaction by “curtailing” the abilities of retailers to reap the full benefits from important new technology. When bar codes came into mainstream use in the 1970s, individual item labeling was supplanted by what was then a fascinating new technology. Yet, retailers in IPL jurisdictions had to maintain both forms of labeling. Now, another fascinating new technology – RFID (radio frequency identification) - is being introduced in the retail landscape for identifying individual items. Major retailers, such as Wal-Mart and

Target in the U.S. and Metro and TESCO in Europe are making major investments in RFID technology, believing that this is the future of retail item identification (Wyld, 2007).

Conceptually, these technologies are quite similar, as both bar codes and RFID are automatic identification technologies intended to provide rapid and reliable item identification and tracking capabilities. The primary difference between the two technologies is the way in which they “read” objects. With bar coding, the reading device scans a printed label with optical laser or imaging technology. However, with RFID, the reading device scans, or interrogates, a tag using radio frequency signals. Thus, referring to RFID as “radio bar codes” – as many do - is a disservice to the technology, confusing the basics of the technology.

The specific differences between bar code technology and RFID are summarized in Table 2. In summary however, there are five primary advantages that RFID has over bar codes. These are:

1. Each RFID tag can have a unique code that ultimately allows every tagged item to be individually accounted for,
2. RFID allows for information to be read by radio waves from a tag, without requiring line of sight scanning or human intervention,
3. RFID allows for virtually simultaneous and instantaneous reading of multiple tags,
4. RFID tags can hold far greater amounts of information, which can be updated, and
5. RFID tags are far more durable.

The principal difference lies in the potential of RFID to provide *unique identifiers* for objects. While the bar code and the UPC (Universal Product Code) have become all-pervading and enabled a host of applications and efficiencies, they only identify a “thing” as belonging to a particular class, category, or type. Due to its data structure, a bar code can not uniquely identify the specific object before you. For instance, while the bar code on a box of cereal can tell you the type, size, and producer of that box of corn flakes, it can not tell you:

- Where the cereal was boxed?
- When the cereal was produced?
- The lot and/or production run during which the cereal was made?
- Where the cereal box had traveled in its journey to the shelf?

In sum, a bar code on an item can identify *only* the product and its manufacturer. Thus, a bar code on any one package of sliced meat in a grocery store is the same as on any other of a particular type/size from a particular firm. Likewise, the bar code on a case or pallet of military supplies can not tell one shipment from another. As such, it is impossible to tell from the bar code such important questions as:

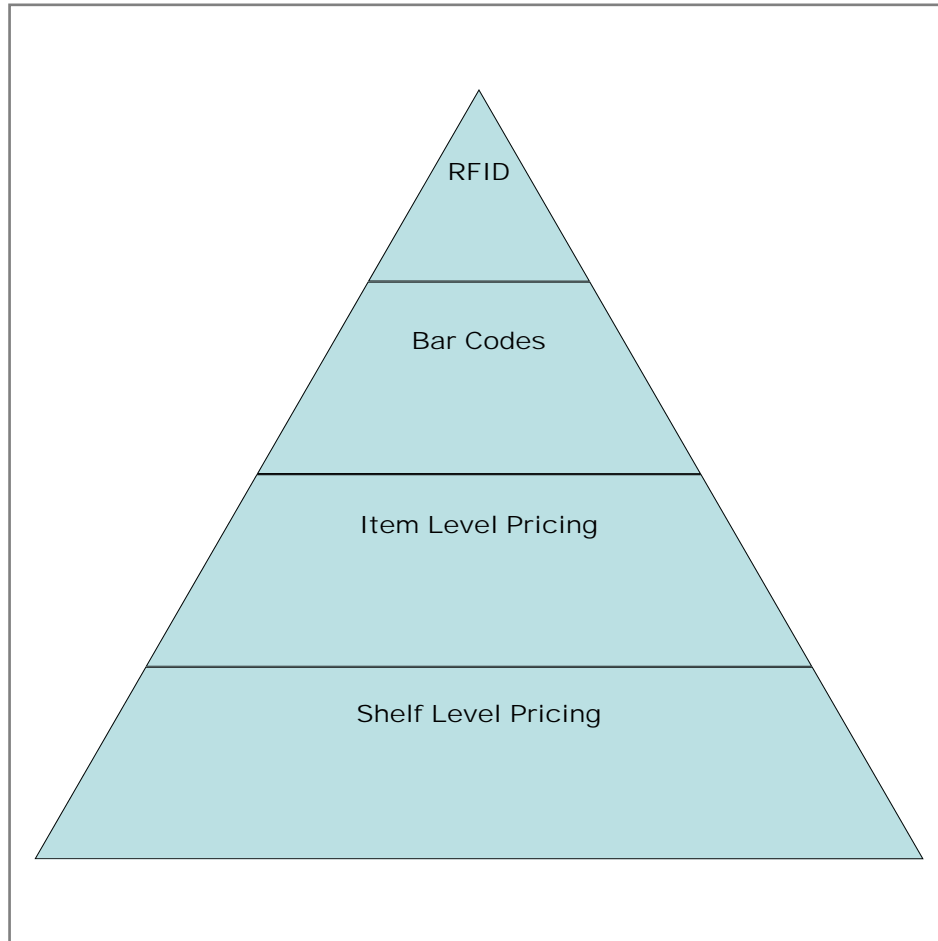
- Where was that particular item manufactured?
- In which lot/shift was the item manufactured?
- When was the product manufactured?
- When will the product expire?

TABLE 2: RFID and Bar Codes Compared

Bar Code Technology	RFID Technology
<ul style="list-style-type: none">• Bar Codes require line of sight to be read	<ul style="list-style-type: none">• RFID tags can be read or updated without line of sight
<ul style="list-style-type: none">• Bar Codes can only be read individually	<ul style="list-style-type: none">• Multiple RFID tags can be read simultaneously
<ul style="list-style-type: none">• Bar Codes cannot be read if they become dirty or damaged	<ul style="list-style-type: none">• RFID tags are able to cope with harsh and dirty environments
<ul style="list-style-type: none">• Bar Codes must be visible to be logged	<ul style="list-style-type: none">• RFID tags are ultra thin and can be printed on a label, and they can be read even when concealed within an item
<ul style="list-style-type: none">• Bar Codes can only identify the type of item	<ul style="list-style-type: none">• RFID tags can identify a specific item
<ul style="list-style-type: none">• Bar Code information cannot be updated	<ul style="list-style-type: none">• Electronic information can be overwritten repeatedly on RFID tags
<ul style="list-style-type: none">• Bar Codes must be manually tracked for item identification, making human error an issue	<ul style="list-style-type: none">• RFID tags can be automatically tracked, eliminating human error

As we rapidly approach the point where RFID labeling of individual items for retail sale will become both economically and technically feasible (Roberti, 2006), item-pricing laws are an unfortunate reality that leading-edge retailers and the RFID industry – indeed the entire auto-ID community - need to be particularly aware of. Without repeal of these laws, the ROI (return on investment) equation in retailing will be made more difficult, due to the added compliance costs in IPL states and locales. Indeed, as shown in Figure 1, this would then have quadruple redundancy of item identification in item pricing law jurisdictions! In these locations, there would be shelf-level pricing (required in all states), item-level pricing, bar code labeling, and RFID tagging of items. Still, retailers and the RFID industry must be mindful that rather than seeing these laws as being even more outmoded with the introduction of RFID tagging of products, there will be a significant segment of the population that will see the simple, old-fashioned, ink-on-paper-on glue price tag as being even more essential with the new technology (think about it, if a consumer doesn't trust optical scanning, are they going to have any more faith in radio waves?).

FIGURE 1: Four Levels of Identification in Retail Locations Covered by Item Pricing Laws



Thus, it will be incumbent for those in the retail and RFID industry to engage in consumer outreach and educational efforts to calm the fears of consumers and educate the general populace on the benefits that will come from the RFID-enabled “store of the future.” To make that store an economic reality, however, it will take legislative-level outreach and lobbying efforts to make certain that laws promoting 19th century product labeling will not hinder the adoption of the technology of the 21st century in any state or locale.

In the end however, ending the “back to the future” environment in these select locales – where price tags still are stamped on every can of coke, bag of rice, and, in some states, every item in a hardware store or electronics retailer, will prove beneficial for both retailers **and** consumers. We are on the cusp of many exciting developments in the retail environment – from the advent of electronic shelf labels (where prices and other product information can be readily available to shoppers) and true, contactless self-checkout (something akin to passing your basket through airport security and having the cart – and your form of payment - scanned). With other exciting innovations on the horizon, the store of the future may indeed be a very consumer-friendly environment – just maybe without those little labels.

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