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HARD DATA, SMART DECISIONS

Retail's Inventory Distortion Problem: Sizing it all up

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Who We Are
IHL Group is a global research and advisory firm specializing in technologies for the retail and hospitality industries. The company, based in Franklin, Tenn., generates timely data reports, offers advisory services and serves as the leading retail technology spokesperson for industry and vendor events.

What We Do
IHL provides customized business intelligence for retailers and retail technology vendors, with particular expertise in supply chain and store level systems. Our customers are retailers and retail technology providers who want to better understand what is going on in the overall technology market, or wish to identify specific equipment needs for the retail market.

When We Started
Greg Buzek served as Product Development Manager for two Fortune 500 retail technology suppliers for 6 years. Faced with making recommendations to senior management with spotty reports stuffed with technical jargon and unsubstantiated data, in 1996 he left to form IHL Group as an arms length consulting firm that delivers exacting research to corporate managers.

How We Work
Reliable market analysis is essential for corporations to accelerate revenue and expand their market share. Most research providers do not disclose data sources or statistically defend the validity of their assumptions. We do. We disclose in precise detail exactly how and why we reached our conclusions so that our customers can be comfortable with the data they are using.

What We Know
Our associates and advisors have over 100 years combined years of retail technology experience. Our associates have worked as product managers, sales representatives and executives in the retail market. We have the relationships, tools, and experience to meet your research and consulting needs.

The day begins…

so, it's early December, and our intrepid shopper has her holiday shopping list and she's heading to the mall during her lunch hour. She finds a parking space, makes it into the mall and heads off in the direction of a well-known specialty store to look for a gift for her mom and perhaps something for herself. She finds a sweater that would be nice for her mom, but her size is not available. She looks around for help but no one is available and she doesn't have the time right now to wait. Instead, she leaves and tries another store to find a gift - the sale is lost.

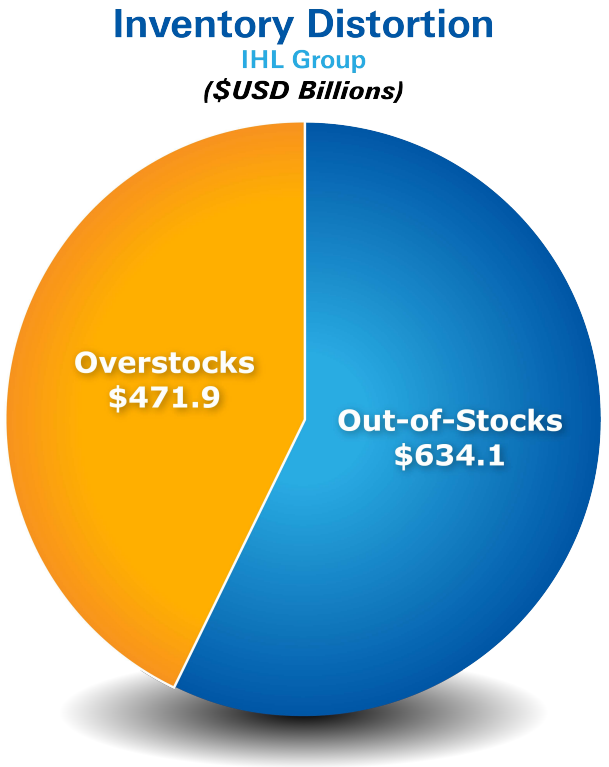
Inventory Distortion Defined

Our shopper has encountered an empty shelf/fixture, which is one type of out-of-stock situation. The converse of this problem is called an overstock situation, which is where the supply of a given product exceeds its demand. We call the combination of out-of-stocks and overstocks, **inventory distortion**, which is a problem that retailers the world over currently experience to the tune of $1.1 trillion. Nearly 40% of that happens during the holiday season.

That $1.1 Trillion equates to **7.3%** of Global Retail Sales.

On an annual basis, the out-of-stock component represents 56% of inventory distortion, and overstocks represent the remaining 44%. The interesting aspect of these two numbers has to do with what they represent. In the case of out-of-stocks, the $634 billion mostly represents a transfer of sales transactions among retailers in a given region.

Simply, if Retailer A does not have what the shopper is looking for, she will go down the block, across the mall, or online to make the purchase from a competitor. Bottom line, the sales are not lost to the industry, but rather transferred amongst the various competing retailers. Obviously, the retailer that gets their out-of-stock problem fixed earliest will reap huge benefits, at the expense of the competition. In the case of overstocks, however, the $472 billion represents sales lost to the industry. To help with the sense of scale, that's like saying that an amount equivalent to the annual revenue of Walmart are lost due to various issues such as over-discounting, spoilage, and other reasons.



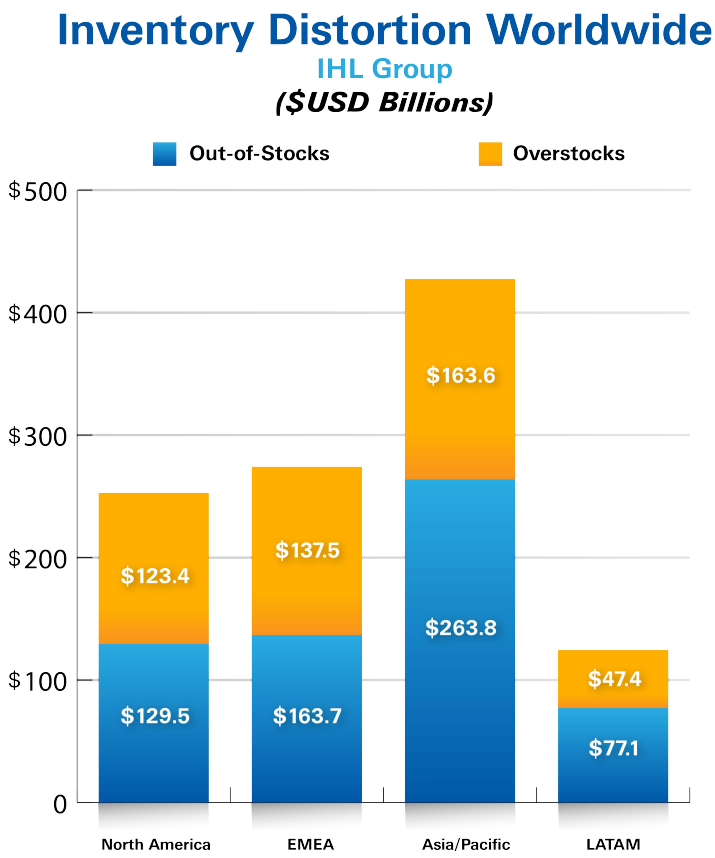
On a global basis, inventory distortion is not consistent across regions, as shown in the chart to the right. Some of the region-specific issues are detailed below.

North America – Better forecasting tools have improved overstock and out-of-stock performance in recent years, but income disparity is still driving challenges in certain categories.

EMEA – This region has many emerging markets with poor controls, which leads to increasing overstocks/ spoilage and out-of-stocks as economies grow. Stagnant economic growth in Europe is increasing returns.

Asia/Pacific – A booming middle class is leading to more out-of-stocks for key merchandise. The lack of refrigeration means spoilage remains a core issue.

LATAM – Product availability remains the largest problem in this region. Certain countries are growing, but theft, widespread corruption and income disparity leads to shortages, particularly for hard goods.



Out-of-stocks at brick-and-mortar stores can drive consumers to shop online.
In the US, online sales comprise 8.1% of total US retail sales.
This represents an **increase of 50%** in the past 3 years.

Magnification in the Holiday Season

Inventory distortion becomes especially acute during the period between Thanksgiving and Christmas Day. This is mainly due to the fact that between 20-30% of annual retail sales is compressed into (approximately) 30 days. The combination of more store foot traffic, longer daily shopping hours (hence longer retail employee work hours), increased promotions (including, but not limited to whatever is this year's "hot" item) and a host of non-retail distractions makes for an in-store retail environment that bears little resemblance to accuracy and efficiency.

One interesting situation that sometimes arises during the holidays is when the same single item can be both an out-of-stock cost at one point as well as an overstock at another time. For instance, if a retailer's marketing and inventory are not aligned properly, they may be driving shoppers to the store for merchandise that is out-of-stock. At that point, those are lost sales. Days (or weeks) later, when the merchandise does arrive at the store, the promotion may have expired, so the retailer then has to resort to heavier markdowns to sell the merchandise. This is particularly a problem with fashion retailers, who not only have to deal with the holidays, but seasonality as well.

Holiday issues aren't limited to things that retailers can control within their own enterprises, as a couple of recent situations can attest. In 2015, there were two separate trucking strikes at the ports of Los Angeles, Long Beach and San Diego. These strikes disrupted the supply of merchandise to retailers, which in turn caused inventory distortion before, during and after the holidays. More recently, in early September 2016 Hanjin Shipping Company, the 7th largest shipping company in the world, filed for bankruptcy protection. This left approximately $52 billion worth of merchandise (at retail) on ships that were either denied access to ports or unable to be off-loaded. The potential is very real that this merchandise will not make Black Friday and will arrive late for the holidays. Those retailers without the unified commerce technology that links the supply chain visibility to the marketing and promotional plans could be hit on both sides of the inventory distortion equation. On the flip side, those retailers who have a near-shoring effort in place can avoid the full effect of the supply chain disruption.

Finally, after the holiday decorations are put away and attention turns to NFL playoff games, it's at that point that retailers must deal with the issue of returns. According to NRF, returns account for 8% of retail sales, which for the most recent holiday season meant approximately $63 billion. These returns typically occur beginning the day after Christmas and lasting through the first couple weeks of January.

> 20% of all store returns occur immediately after the holidays.

What challenges are retailers really facing with customers?

Modern retail is very different from how it once was. Today's retail landscape looks nothing like stores of the past. There's more foot traffic, vastly more SKUs, many suppliers, increasing payment options, mobile transactions, more channels through which shoppers may purchase, one-day delivery, and the higher expectations and demands of the customers. The simple equation

of having the right product in the right place at the right time really isn't so simple anymore, and two of the most poignant reasons are described below.

Amazon/Online Threat – Prior to 1995, competition among retailers tended to be limited by the various boundaries between retail segments. The little cross-segment competition that did happen was typically the result of a Costco or Walmart Supercenter moving into the area. But then a company named Amazon arose, and everything changed. Consumers were no longer required to leave their homes in order to make purchases, and no longer did Retailer A only have to worry about competing with Retailer B down the block. With Amazon Prime memberships targeted at those with the most disposable income, and offers like free 2-day (if not same-day) delivery available, Amazon currently accounts for $0.51 of every new dollar spent in e-commerce in the US. Even more amazing is the fact that 49% of all e-commerce searches start at Amazon.com. And if competing with all that isn't enough of a hurdle for most retailers, Amazon's Web Services (AWS) is a leading player in cloud hosting, so retailers may actually be in the position of paying Amazon in order to compete with them.

> 50% of all US households have an Amazon Prime membership.

It's not like it was before … when stores were the main channel of interaction for retailers, consumers had no choice but to shop in stores. Today, retailers have to make shoppers want to shop in store; which is easier said than done. In the online world, digital consumers are recognized and greeted by name, their preferences and purchase history are readily accessible, in-stock levels are available, complimentary products are offered, and payment and delivery options are myriad.

How big is the problem, and how can technology help?
To get a good handle on what retailers actually face in terms of out-of-stocks and overstocks, it is important to look at things from a more granular perspective. It is also important to understand that the accepted retailer-systems-focused definitions of out-of-stocks and overstocks are not necessarily based in reality.

Out-of-Stocks – We define an out-of-stock as any situation wherein a consumer enters a store with the intent of purchasing a specific item, but leaves the store without having made that purchase because it was not readily available. This does not include substitute purchases, so if a consumer comes in for one brand of product, but buys another – while technically an out-of-stock, it is not a complete lost sale. Below we identify five specific types of out-of-stocks:

- *Empty shelf/fixture* – This is the classic out-of-stock situation, and the one in which our intrepid shopper found herself at the outset of this paper. There is shelf or fixture space for the item, but there is no stock for the item, size or color desired, nor was a purchase made of a substitute item.

The sale is lost to that retailer. This is by far the largest component of the worldwide inventory distortion problem. Technical solutions can be implemented outside of the store (category management, assortment planning, promotion management, and replenishment management, to name a few) as well as inside the store (plan-o-gramming, task management, etc.). In addition to technical solutions, there are also purely operational solutions like consistent monitoring of the sales floor, aisles, departments or fitting rooms to ensure that misplaced items are returned to their proper locations.

- *Can't find help* – This is when an item is not accessible on the sales floor. The shopper wants to inquire about availability, as the item could be in a stock room or high on a shelf, but there is no store associate available on the sales floor to assist. So they leave without purchasing. This problem is about half the size of the *Empty Shelf/Fixture*, but is probably more frustrating for the shopper because the item may be available, but there is no way to know, and the retailer loses because it's possible the item was available, but they didn't sell it. The planning and allocation processes worked fine, since the product is in the correct store. But now there is a store operations issue that needs to be addressed. One obvious solution would be to have more associates on the floor, and during the holiday shopping season some retailers hire associates for just that purpose.

But as retailers' staffing plans get leaner or stay flat, other solutions to address the need become even more critical. Whether it is as simple as a concierge call bell or as detailed as a shopper's mobile paging app, retailers need to make sure that when their shoppers need them, they can get in contact with them. More sophisticated shopper traffic solutions can be deployed to ensure the right coverage where and when shoppers are in the store. This is extremely beneficial during the holiday season as store traffic increases and store operational hours extend.

- *Stock is present but can't be accessed* – This category consists of situations that are somewhat similar to the previous bullet. In this case, however, a store associate is available, and may have even have helped the shopper locate an item. But even with the item in sight, or known to be in stock, it's not accessible. The store associate may not have access to the item's location, such as a locked stockroom or display cabinet, and they don't have the key. Or the item doesn't appear to be in the location where the system indicates, but it is truly in the store somewhere, or in the possession of another shopper, or actually stolen. Solutions range from improved employee training, to RFID inventory management and loss prevention solutions. This is one of the problems that require some serious focus if the retailer is starting to think about omni-channel retailing with buy-online/pick-up-in-store (BOPIS) or ship-

from-store as a fulfillment option for their customers.

- *Promo Price Mismatch* – This is the situation where the price/offer in the store does not match what was advertised online, in print or via radio/ TV so the consumer does not purchase the item. This is most frustrating on a day like Black Friday, when the sole purpose of most shoppers is to get an advertised deal. Obvious solutions include category management, assortment planning, replenishment and pricing and promotion management, but also should include legal solutions as well to ensure that the language in the promotional materials it clear, concise, and accurate. From a store operations perspective, having an associate go through the promotional materials before the items go on sale will go a long way to head off problems.

- *Other* – This is the situation where a consumer left the store without purchasing the item desired for any reason other than the item was less expensive elsewhere (and the four reasons above).

Overstocks – We recognize that overstocks are the result of insufficient demand for the retailer's inventory currently on hand. Unlike the out-of-stock calculation where we count the cost of that complete item that is lost due to the customer leaving the store, for overstocks we used an algorithm for looking at cost of the additional discounts only on the specific items. Thus, although this is not quite an apples-to-apples comparison of the two, it is far more realistic in the cost to retailers. In addition, where out-of-stocks may be sales where the industry captures that value by the sale going to a competitor (meaning these losses are to the retailer, not the industry), the overstock cost is a loss not only to the retailer but the industry as a whole.

For purposes of our analysis, we define an overstock as any situation wherein a retailer has on hand more stock of a particular item than is supported by current demand for that item, and where either discounting or spoilage takes place to reduce that overstock. To this end, we have identified the following specific types of overstocks:

- *The retailer bought too many* – An example might be a beach umbrella sold in a store in New York. The umbrella is non-perishable, but the window for selling it in New York lasts but a few weeks. During the holiday shopping season, an example might be a festive winter sweater. If an overstock situation occurs in either case, the umbrella may be sent to a store in South Florida, while the extra sweaters will result in costly markdowns to sell through the merchandise in order to purchase new current goods appropriate for the next season. In general, overstocks result in excessive promotional and discounting efforts to liquidate excess inventory. This is by far the largest component of the overstock problem worldwide, and the second largest component of worldwide inventory distortion.

Technical solutions include predictive analytics and forecasting solutions coupled with solutions for category management and assortment planning and allocation on the front end.

• *Spoilage* – These items have a shelf life attached to them, whether they are fresh produce, dairy products, medicinal products, or items such as fertilizer or paint thinner. Simply waiting for the quantity on hand to decline will not work, and is costly. Once the items near their expiration point, they must be deeply discounted or discarded once they have expired. Spoilage is the second-largest component of overstocks. Fresh item management solutions are applicable here, as are predictive analytics and forecasting solutions in conjunction with solutions for category management and assortment planning and allocation.

• *The vendor sent the wrong items* – All too often, particularly with vendor-managed inventory, the shelves and sales floor are stocked to look full, even if the wrong items came in. This is the third-largest reason for overstocks, and technically there are solutions available for vendor-managed inventory, inventory manage-ment, direct store delivery, scan-based trading and EDI.

• *Marketing is not synched with inventory* – In this case, the promotion is active, but the merchandise has not yet arrived. When it does arrive days or weeks) later, the customers are long gone. If retailers accept backorders, these orders can go unfulfilled for months. Needless to say, this can result in lost sales and customer dissatisfaction. Predictive Analytics and Forecasting, and Inventory Management solutions could help here.

• *Other* – This category accounts for all other overstock situations, such as poor training or employee issues affecting their ability to adequately sell the merchandise, competitive price matches, and more.

Shrink – Inventory shrink refers to the combination of deliberate actions or inadvertent human error that impact a retailer's inventory. The two largest components of deliberate shrink are internal theft (also known as employee theft or "sweet-hearting") and external theft (shoplifting). Combined, they account for between 70-80% of all shrink, with administrative errors (11-17%), vendor fraud / errors (5-7%) and other (4-6%) accounting for the rest. Shrink increases dramatically during the busy holiday shopping season. Solutions such as CCTV cameras, sales audits, inventory visibility, Electronic Article Surveillance (EAS), source tagging, cash management and other can all be used to combat the problem.

Key metrics and the impact on store sales

One of the points that should be clear is the fact that the level of out-of-stocks or overstocks that the retailer's systems report doesn't reflect the shoppers' reality in their stores. Typically, a

retailer's systems will inaccurately report the item-level on hand quantity which may take a heavy toll on the retailer's bottom line, make omni-channel fulfillment challenging and ultimately disappoint customers. Retailers need to take the reality of the shopper's experience into account, even if the numbers look dreadful. Only then can the retailer get serious about the problem he didn't realize he had, and only then can he make rational decisions about what steps to take next.

Various studies have been performed over the years and dozens of metrics have been cited in relation to potential improvements in store and revenue performance using some of the technologies previously described. Following is a selection of the more recent and pertinent metrics.

- **Overstocks** – Account for the equivalent of 3.2% of revenue worldwide.
- **Out-of-Stocks** – Account for the equivalent of 4.1% of revenue worldwide.
- **Inventory Accuracy** – Adopting item-level RFID can increase inventory accuracy up to 99% and maintain it at 95-99%. This level of accuracy enables retailers increase on-floor availability by up to 30% and successfully implement omni-channel strategies.

Why correct inventory is key to store order fulfillment

The driving force behind the concept of store order fulfillment has nothing to do with reducing the number of distribution centers (DCs). The real reasons behind orders shipped-from-store and buy online pick-up in store (BOPIS) orders are a combination of enhanced customer service and retailer financial considerations.

- **Enhanced Customer Service** – By utilizing the local stores' inventory rather than that of the DC, retailers can put their products closer to their customers, enabling quicker delivery time. This in turn can also be an avenue for offering customers free shipping (which is widely viewed as an attraction to consumers) and do it from zones much closer to the customer, which will reduce shipping costs.

  In addition, BOPIS orders offer customers the convenience of shopping at home and acquiring their purchase as soon as they need it. They will also avoid any additional shipping costs.

- **Retailer Financial Considerations** – The key component here is not just the reduced shipping costs, as previously mentioned. Rather, if a retailer can gain visibility and access into the true inventory that is in each store, they can leverage their owned inventory to fulfill customer demand regardless of current store location. This can drive online sales, improve order fulfillment rates and reduce potential overstock situations in some retail stores. Retailers may also benefit from better transportation and warehouse management plans which will increase efficiencies and save costs.

Obviously, the key to this is having visibility into the true inventory in each and every store. How does a retailer do this? Simply, item-level RFID represents the front line in such an effort. If every item or items in key categories in the store has an RFID tag, then inventory counts can be easily conducted more frequently rather than annually as traditionally done. This will enable retailers to maintain a high level of inventory accuracy for

every item or key category item in the store throughout the year. If and only if accurate item-level inventory can be maintained, omni-channel store fulfillment can be successful. Attempting to do ship-from-store or BOPIS without implementing item-level RFID is risky since the real available-to-promise inventory is uncertain which could result in delayed or unfulfilled orders and customer frustration and disappointment. Especially in the season of gift-giving, there is no room for error or the possibility of making customers unhappy.

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