HARD DATA, **SMART** DECISIONS

True Cost of Out-of-Stocks & Overstocks

Can Retailers Handle the Truth?

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Getting Better but Falling Further Behind

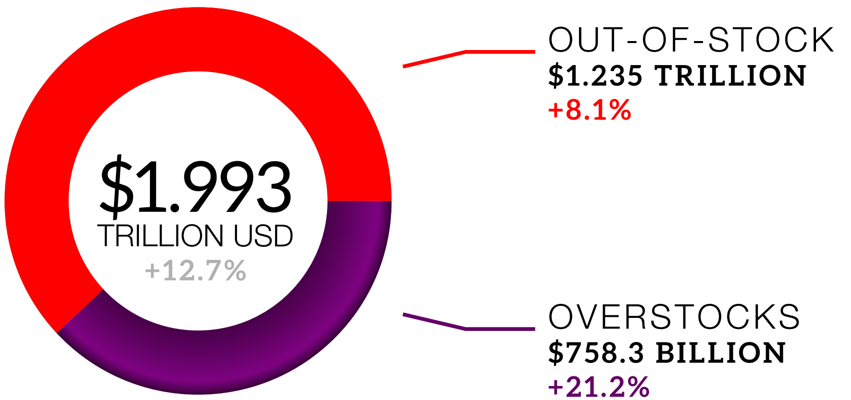
With apologies to Colonel Jessup in a "*Few Good Men*," it appears many retailers still can't handle the truth when it comes to the status of their inventory position. There is what their systems say about their in-stock position, but there is an entirely different reality for their shoppers. IHL Group has been tracking the worldwide cost of Inventory Distortion (the combined costs of out of stocks and overstocks) for more than 15 years. In 2022, the problem has grown to over $1.9 USD trillion worldwide, an increase of 12.7% since 2020, a year that included panic buying. But while we continue to see a significant disconnect between what retailers <u>think</u> the problem is and what their customers actually <u>experience</u>, believe it or not things are improving for retailers that are sufficiently focused on the items that are in their immediate control.

It would be easy to look at the top-end data regarding Inventory Distortion and conclude that all the energy and work put into improving the issue has been wasted. But nothing could be further from the truth. While the worldwide cost of Inventory Distortion is on pace to grow $230 billion from 2020 to 2022, overall sales are on pace for a growth of $3.6 trillion in the same period. The systems that are being deployed are working, but the massive disruptions due to gaps in the supply chain, shortages in personnel and raw materials, and government shutdowns have only grown the problem worldwide. Government intervention made the problem even worse; retail demand skyrocketed as free money was handed out at the same time that travel and other services were restricted. Then the same governments locked down supply routes, which caused massive shortages. And unless retailers had alternate domestic or near-shore sources for their goods, they were left in the lurch.

2022 TOTAL INVENTORY DISTORTION

Cost of Out-of-Stocks and Overstocks (Increase over 2020)

Source: IHL Group



ALL REGIONS IMPROVING BUT ASIA

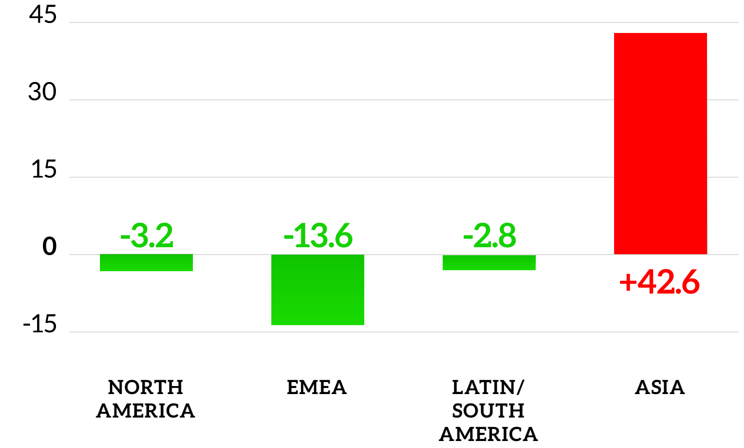
Just as retail sales didn't grow the same in all worldwide regions, the same is true for Inventory Distortion. In North America, the size of the issue declined 3.2% from 2020 (declines are good). Absent the panic buying early in the pandemic, the cost of out-of-stocks dropped from $225.7 billion in 2020 to $182.2 billion in 2022 (a 19.2% decline). But overstocks saw a 23.7% increase as seasonal products arrived too late in some cases. The increase in inflation, coupled with the effects of the war in Ukraine reverberated in the markets, created significant consumer shifts from what retailers had planned. When one considers that retail sales grew $888 billion during the same two years thanks to multiple rounds of government stimulus, the 3.2% decline in Inventory Distortion is even more impressive.

We see similar issues in Europe/Middle East/Africa (EMEA), but the better overstock situation in EMEA made for a better overall inventory distortion picture than in North America. Overall Inventory Distortion improved $68.3 billion or 13.6% from 2020 in EMEA. The biggest change came in overall retail sales. In EMEA if there was stimulus it was related to preserving jobs by guaranteeing up to 80% of salaries for those impacted by lockdowns rather than multiple rounds of cash handouts. As the region's consumers average much lower disposable income for the same salary ranges in North America, the combined impact led to $136 billion less sales from 2020. The lower demand resulted in an 18.7% decline in out-of-stocks. At the same time the region saw a 4.8% ($8.8 billion) improvement in overstocks; a lower percentage of income is spent for discretionary items in EMEA than in North America.

INVENTORY DISTORTION CHANGE

From 2020 to 2022

Source: IHL Group

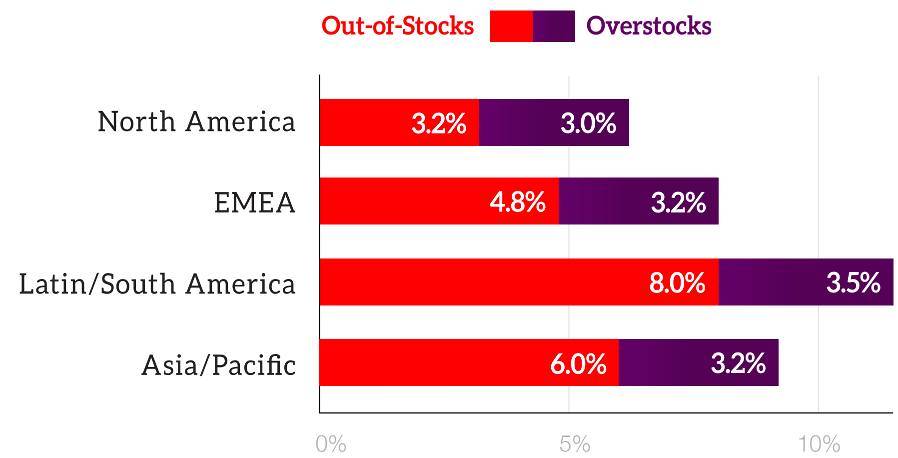


In Latin/South America there was little to no government stimulus, and during the period retail sales declined 3.6% as a result. This led to a 10.4% reduction ($13.9 billion) in out-of-stocks, but a 20.4% ($9.0 billion) increase in overstocks for a total of 2.8% reduction ($4.9 billion) in overall Inventory Distortion.

It is in the Asia/Pacific region where we see the largest growth in sales and Inventory Distortion. The economic rise of the middle class has seen rapid sales growth in the region, but much of that growth has come in an undisciplined manner when it comes to inventory management. Overall retail sales grew 35.9% during the period (an increase of $3 trillion) as consumers bought products rather than spend on travel, experiences, and gambling during the period. Inventory distortion grew 42.6% during the same period with out-of-stocks rising 45.2% ($209 billion) and overstocks growing 38.0% ($100.4 billion). Along with the overall increase in retail sales, the rapid and harsh lockdowns as seen in China created major out-of-stocks and overstocks in the region as they played both roles of manufacturer and end market for a lot of the output. When major cities went into lockdown, the impact on essential categories included a significant increase in spend while in discretionary categories saw massive drop in demand leading to significant overstocks. Lockdowns were not just limited to China. Australia and other countries also saw multiple lockdowns during the period disrupting retail sales and creating havoc in the supply chain.

INVENTORY DISTORTION AS PERCENT OF RETAIL SALES

Source: IHL Group



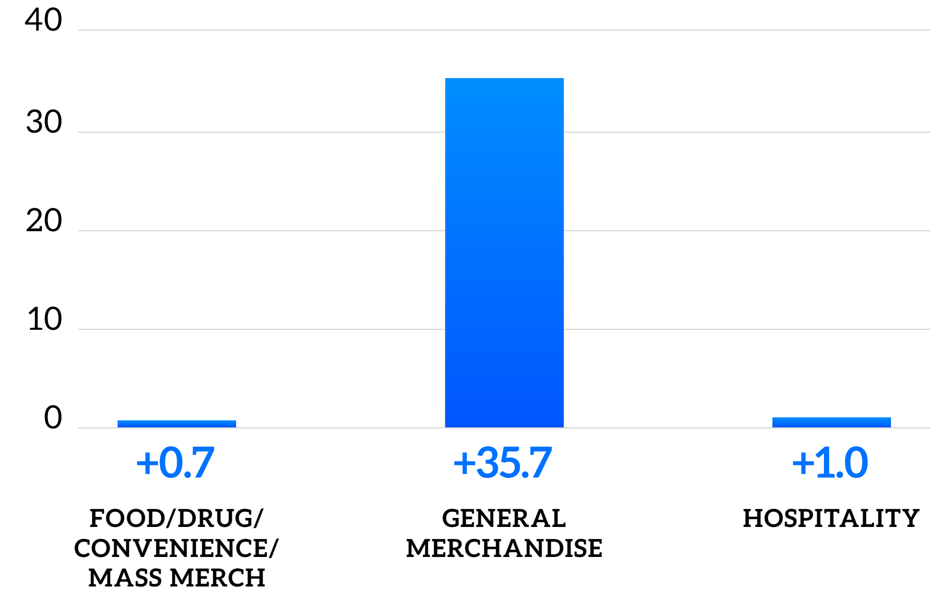
A Major Shift by Segments

We can't look at the issue of inventory distortion without understanding the challenges both regionally and by segments. Due to pandemic shutdowns, government definitions of essential vs non-essentials, port delays, the war in Ukraine and basically bad luck, each segment has seen wide swings in inventory distortion over the last two years. Of all of these, port delays and product arriving too late caused the biggest issues for retailers, particularly in seasonal businesses. For instance, if the delay is in laundry detergent, it does create an out of stock when it is not there, but not a huge overstock issue once it does arrive. That is not the case for winter coats that arrive in spring or patio equipment that doesn't arrive until summer. In this latter case the retailer experiences the impact of both the out-of-stock in the season it was meant to sell and then increased discounts due to overstocks so they can move the product when it arrives. Add to this the rapid rise in inflation and the shift in consumer spending to more consumer staples and experiences outside of the home, and we had a recipe that exponentially expanded the cost of overstocks in the last two years.

A TALE OF SEGMENTS

Inventory Distortion Worldwide Change From 2020 to 2022

Source: IHL Group



The consumer staple categories saw tremendous improvements in reducing Out-of-Stocks from 2020 to 2022 in North America and EMEA. In fact, for Food/Grocery, Drug Stores, Mass Merchants and Convenience/Gas, the overall cost of out-of-stocks inventory distortion dropped over $123.8 billion in these regions during the period. When you factor in that retail sales increased $173.5b at the same time in these regions, this is an incredible improvement in the categories where demand is more predictable, and items are less seasonal. While we saw huge spikes early in the pandemic, demands evened out for staples. There continue to be considerable supply chain disruptions to navigate in these segments, but not nearly as tough as those segments with a high seasonal component such as apparel, home goods, DIY, sporting goods, and holiday categories. When those items miss, they miss for a year and hit both sides of the equation in the same year. Worldwide we saw $216.1 billion increase in inventory distortion for seasonal categories from 2020 to 2022, an amount equal to 96% of the growth in inventory distortion in the last 2 years.

$85.9B

reduction in inventory distortion in consumer staples categories in North America and EMEA from 2020 to 2022.

Source: IHL Group

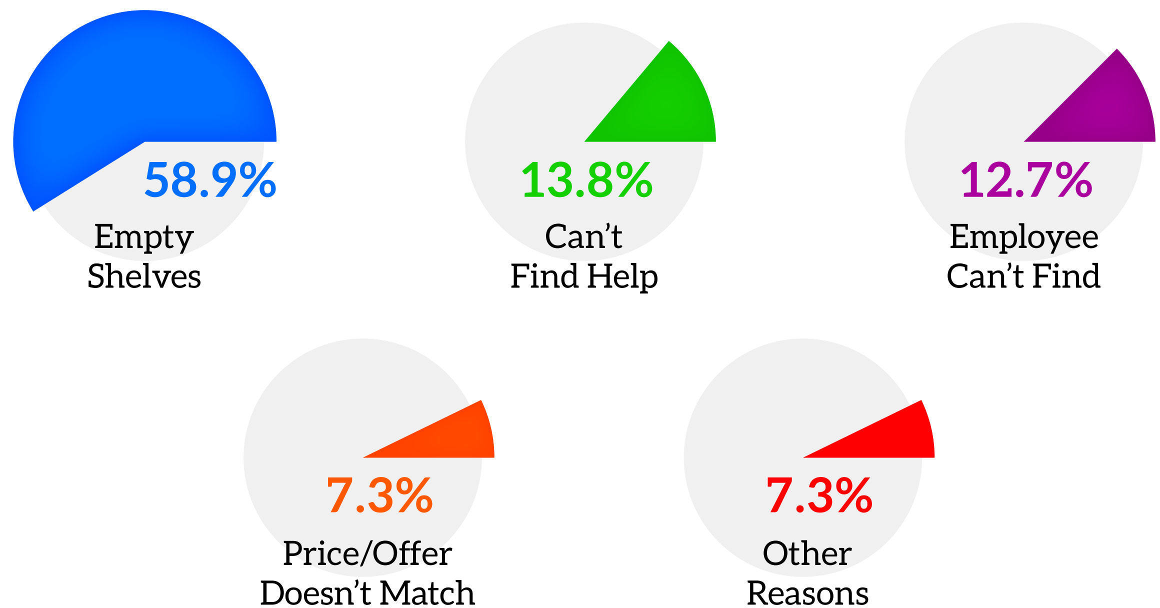
Then there were the restaurant and hospitality categories. During the early days of the pandemic, table service restaurants were forced to pivot to delivery and pickup options while fast food companies saw their dining rooms close and a rapid increase in drive-thru business. Then, as governments allowed the economies to open up and stimulus kept coming for some areas, these same companies were struggling to keep up as diners came back. The biggest issue was a lack of personnel to help, but the demand far outstripped supply for product as well. Menus were reduced and then shortages ensued. Yet despite having some of the greatest challenges, inventory distortion grew only 1% ($2.6 billion) worldwide with all of that coming from out-of-stocks, despite a 20.3% increase in sales for the period. Simply, restaurants were forced into a position where they had to say, “This is what we have to sell”.

What Customers Are Seeing

Whenever we look at the cost of inventory distortion, we like to define the cost based on what consumers see, not just in what retailers report that their systems are saying. And this means that our definition for an out-of-stock is anytime a consumer visits the store and leaves without buying something they intended to buy. And there are several reasons why the consumer didn't buy what they intended to buy.

The first reason is when they find the shelf empty. This occurred 62.2% of the time consumers didn't buy, and panic buying in 2020 was a significant driver for this reason. In 2022 this issue overall dropped to 58.9% of the problem in the minds of consumers. Still, it is by far the #1 reason, but it is less than it was just two years ago. It is important to mention segment differences once again. While grocery improved by 24% in the last two years, we saw a dramatic increase in empty shelves for clothing in Specialty Softgoods and Department Stores as retailers tightened inventories. Often consumers say it is not that the product is not in the stores, it is not just available in their size or the color they prefer.

WHY CUSTOMERS LEAVE WITHOUT BUYING
Worldwide
Source: IHL Group



Customer Facing Employee Shortages at Store Level Cost Retailers $171B in Lost Sales Annually.

Source: IHL Group

The next reason for out-of-stocks is that consumers leave their local stores because they can't find the help they need. Products were either locked up or on a shelf that wasn't attainable, and they left because there was simply no one to help. Retail stores lost millions of workers during the pandemic leaving almost all retail environments short-handed. Losses worldwide increased $31.6 billion in the last two years to nearly $171 billion in lost sales due to lack of available staff.

Related to this shortage of workers are price discrepancies due to the prices not being changed on the shelves. Consumers report they arrive expecting one price based on a circular or online price, but it is not the same once they get to the store. Retail workers have admitted that they don't have enough people locally to change the prices on the shelves each week for promotional items. Retailers are losing $89.7 billion in sales for this reason alone.

The next reason issue that consumers cite is one of the more frustrating. They find someone to help, but the associate cannot find the merchandise. Their handhelds or systems report it is in stock, but they cannot find the item in the store. This issue costs retailers $156.9 billion in sales annually and drives consumers crazy as they wait for associates to frantically search for the missing inventory.

The last category consumers report is a catchall category of other reasons. Often this is damaged product, meals that don't taste right or some other reason. In total this amounts to over $89.9 billion in losses worldwide annually.

Predicting the Unpredictable

In the previous section, we looked at the experience that consumers had in terms of what they were finding when they arrived at the store. The reasons cited for their out-of-stock experience have very real causes within the retail environment, and it is important for retailers to have a firm grasp of those causes in order to improve the situation. So far, we have discussed the high-end numbers and how retail sales and government shutdowns have affected the entire issue of inventory distortion. When you read those big numbers, it is tempting to think that organized retail is losing ground on this issue and that the heavy investments in systems are not working. That would be an incorrect conclusion and our research shows just the opposite.

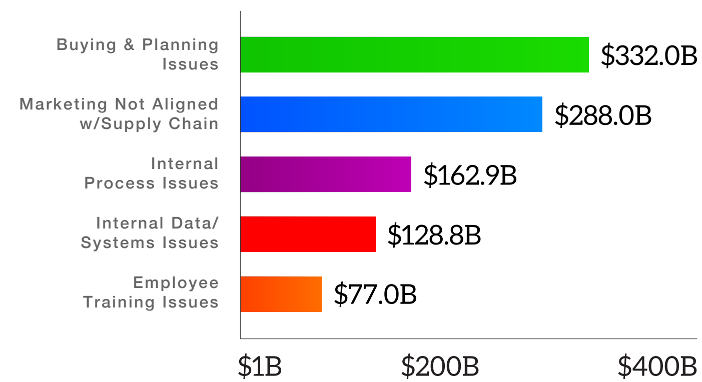
Looking deeper into the causes and changes for the inventory distortion issues for 2022, we see incredible improvements in the controllable issues. In North America and EMEA in 2020, we could state that $111 billion in lost sales was caused by bad processes. This improved nearly $16 billion in two years with the greatest impact happening in the Food/Grocery segment in those regions with $11.7 billion in improvement on processes alone.

The next cause is internal systems and data issues. This is where retailers have been spending millions on improvements. In those same regions, $13.3 billion can be attributed to updated

CONTROLLABLES: SYSTEMS, PROCESSES, TRAINING

2022 Costs - $988.7B Controllable by Retailers

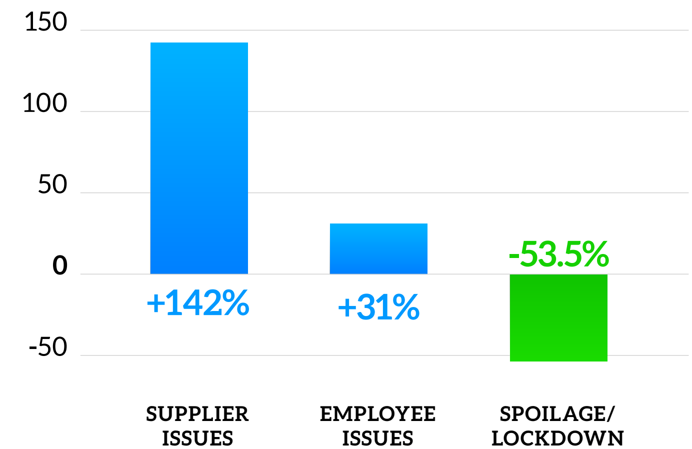
Source: IHL Group



SIGNIFICANT CHANGE IN CAUSES FROM 2020

Inventory Distortion

Source: IHL Group



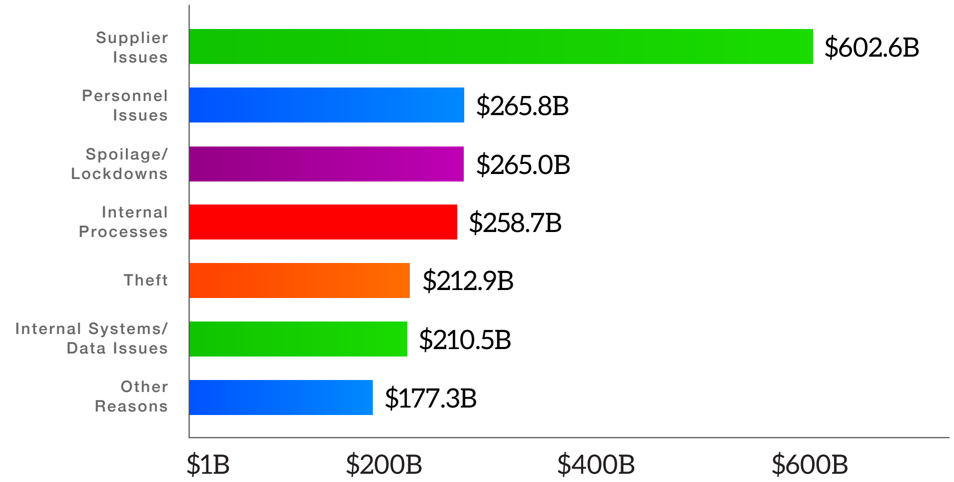
systems. Thus, even in a market where there has been continued chaos and shutdowns, the systems and process improvements have increased sales an additional $21.8 billion annually. When considering that overall sales in these regions increased over $800 billion, this reduction in the losses due to issues of internal systems and data problems is even more impressive.

This stands in stark contrast to the APAC region, where undisciplined retail growth created an additional loss of $89 billion where sales opportunities grew beyond systems and processes.

Improvements in systems and processes are the good news in inventory distortion. The not-so-good news rests in 3 causes: Vendor Issues, Personnel Issues, and Theft. Without question, vendor issues represent the single biggest contributor to out-of-stocks and overstocks. In 2022 this amounted to $602.6 billion in lost sales to the industry worldwide.

WHAT IS TO BLAME FOR INVENTORY DISTORTION?

2022 *Source: IHL Group*



The next major cause is related to personnel issues – whether it is lack of personnel, lack of training or personnel doing their own thing because they don't trust the systems. These personnel issues caused $265.8 billion in lost sales in 2022, up $31.6 billion from 2020.

Employee theft is also a significant cause of inventory distortion, and it accounted for $99.0 billion in lost sales in 2022. Consumer theft added another $114.1 billion in lost sales worldwide, for a total of $212.9 billion in lost sales. When theft occurs, it is especially tough for retailers as these companies have to sell $1.1 trillion in additional sales to cover for the lost items at just their purchasing cost of the merchandise stolen. Further, it creates data gaps between what the systems say are in stock and what the consumers see.

Finally, when it comes to inventory distortion, we cannot dismiss Surge/Lockdown impacts. While showing $304.6 billion less impact than in 2020, it still represents $265.0 billion in lost retail sales in 2022.

The bottom line? While systems and processes are delivering on results, the continued and unpredictable supply chain disruptions continue to press the total value of inventory distortion higher.

Erosion of Trust - Amazon Wins Big

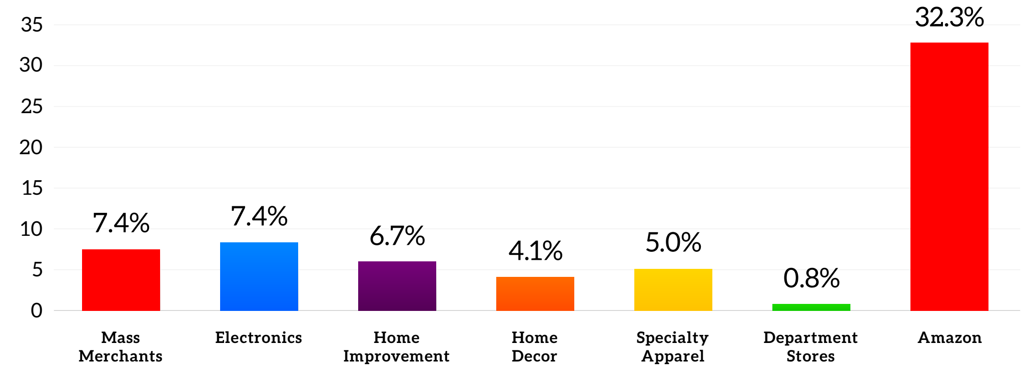
As we discuss the overall costs of Inventory Distortion, where the rubber really meets the road for consumers is that they are losing trust in their local retailer to have in stock what they want to buy when they want to buy it. Survey after survey shows that by far the single biggest reason they shop their local store is because they need the product now (75% of consumers say so). Fifty-seven percent (57%) want to touch and feel the item before they purchase it, and 39% said they shop in stores to support their local community.

But when consumers experience out-of-stocks in their local retailers, it erodes their trust in that retailer, increasingly driving them to Amazon and other online retailers/ marketplaces. The challenge for retailers is that in the last two years there has been a dramatic drop in consumer trust of their local retailers. When IHL asked consumers in 2022 if their trust in their local retailer increased or decreased based on them having in stock what they wanted to buy, their trust ***decreased*** at rates ranging from 4x to 35x higher than their trust ***increased.*** The best segment was Home Décor retailers where 34% said their trust decreased in their local retailer in the last 2 years vs 7% that said it increased (66% said their trust didn't change). The worst segment was Department Stores, where only 1% said their trust increased in the last two years vs 35% reporting their trust decreased.

PERCENT OF US CONSUMERS INCREASING TRUST IN RETAILERS TO BE IN STOCK - LAST 2 YEARS

Higher is Better

Source: IHL Group



All by itself, that data is alarming enough. But when contrasted with consumers' change in trust in Amazon, it should send chills down the spine of traditional retailers. Of those same consumers, 32% said their trust in Amazon increased in the last two years, a number 4.5x higher than Electronics and Mass Merchants who had the highest trust increase in physical retail based on stock position. For Department Stores, it was as high as 35x higher. That said, consumers have plenty of complaints about Amazon as well, as 26% said their trust in Amazon decreased in the same period, a number only slightly lower than each of the segments studied.

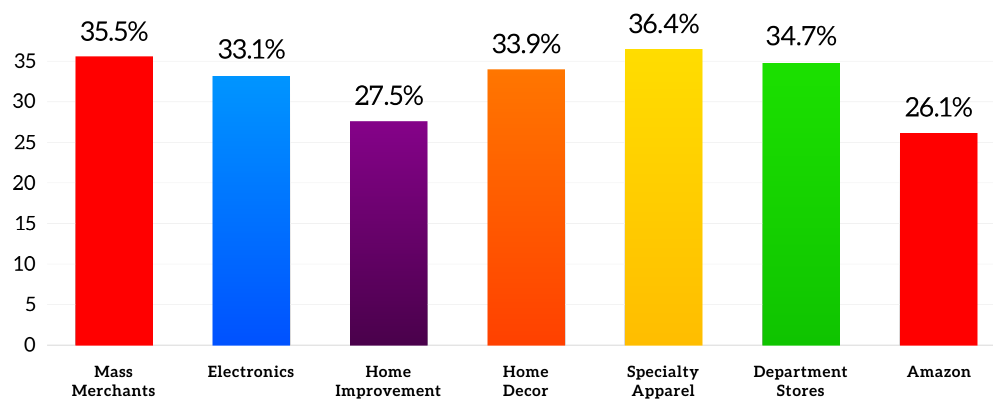
But where this data is particularly concerning is among the highest earning consumers with the highest disposable incomes. For households with incomes between $100,000 – $150,000, 50% increased their trust in Amazon in the last two years vs a maximum of 9.4% for the best segment (Specialty Apparel). And for households with incomes over $150,000 annually, their trust in Amazon increased 35.9% with the highest physical retailers increasing trust being Home Improvement retailers at 10.9% increase among this income range.

Thus, the in-stock position issues of local retailers are driving consumers to Amazon and other online marketplaces and the time that for retailers to fix their issues continues to dwindle. When the #1 reason consumers come to your store is because they need something now and expect you to have it and you don't, it doesn't matter how good your commercials are, how bright your stores are or how friendly your associates are...you are losing those customers.

PERCENT OF US CONSUMERS DECREASING TRUST IN RETAILERS TO BE IN STOCK - LAST 2 YEARS

Lower is Better

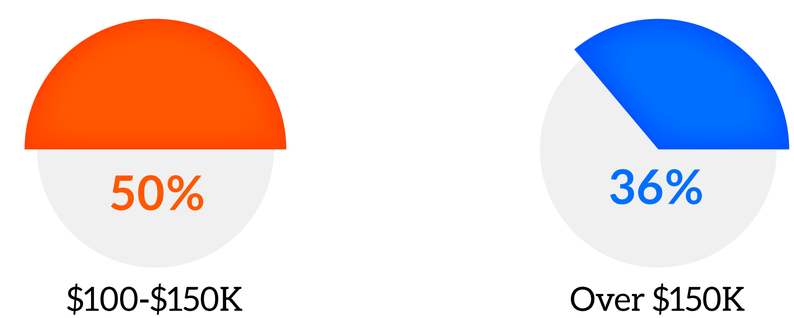
Source: IHL Group



HIGHEST INCOMES INCREASINGLY MOVING TO AMAZON

% That Increased Trust in Last 2 Years

Source: IHL Group



Key Technology Solutions Improving Results

Looking into solving the issue of Inventory Distortion there are both short term and longer-term things that can be done. Once again, we are looking at this from the perspective of the consumer...simply, when they come to stores and leave without buying what they intended to buy, why is that?

North American retailers lose **$27B** a year in sales because lines are too long.

Source: IHL Group

THINGS YOU CAN DO NOW

This may seem completely unrelated, but in the mind of the consumers it is not. There are two specific technologies that can be deployed almost immediately that are not affected by disruptions in the supply chain of products sold. In our recent survey of US consumers, when people leave stores without buying what they intended to purchase, they said that 14.5% of the time it was not because of empty shelves, but that the checkout lines were too long. To put that into perspective, this means that in North America retailers are losing $27 billion in sales simply because the lines are too long, and consumers walk out the door. Adding items like Self-Checkout or Scan & Go technologies can convert those shoppers who are already in your stores and wanting to buy.

Price discrepancies at the shelf lose retailers **$90 Billion** in sales a year worldwide.

Source: IHL Group

Another area where consumers find great disappointment is in the area of pricing disconnects. Retailers are losing close to $90 billion in sales worldwide at the store level simply because the pricing on the shelves didn't match the price in the promotion or online. Retailers have admitted that the personnel shortages are so acute in some regions that they do not have the people to make changes to the prices. Here, electronic shelf labels (ESLs) are a no-brainer. These devices also allow retailers to dynamically price against their competitors and change prices based on cost of last shipment, and retailers not only do not lose the sales, but can recapture the best profit margins. Further, when factoring the tremendous savings in labor costs, smart retailers are deploying ESLs as fast as possible. Recent IHL research among the fastest growing retailers showed a plan to adopt ESLs at a rate 843% faster than the average retailer in the next two years. They not only improve sales, but drastically lower labor costs associated with price changes.

Winning retailers investing in electronic shelf labels at a rate

843% higher

than average retailers in next two years.

Source: IHL Group

And finally, an immediate and important step retailers can take to address out-of-stocks is to get better inventory visibility and accuracy. Gone are the days where you can rely solely on an annual wall-to-wall inventory count to keep track of inventory levels. With turnkey inventory kits, store associates can be mobilized to perform targeted cycle counting as frequently as needed. Keep closer tabs on high value or high turnover items to ensure that they are always available.

NOT IMMEDIATE BUT QUICK DIVIDENDS

The next level of solutions cannot be simply dropped-in, but they can provide huge dividends once they are in place. The first is predictive and prescriptive analytics applied to operations and forecasting. A significant number of losses are due to spoilage, pricing discrepancies and theft/damaged products. There are solutions on the market that can aggregate multiple data sources such as transactions, inventory, logistics, vendor, etc. and apply artificial intelligence and machine learning to detect irregularities and flag them for further investigation. This helps retailers proactively catch issues that contribute to out-of-stocks. The technologies can similarly be used for other operational areas. When these technologies are deployed, we see significant improvements in overall profitability. Wayne Gretzky famously said that what made him such a great hockey player was that he always skated to where the puck was going to be. In similar fashion, understanding the real performance issues allows for the adjustments that improve overall inventory performance by helping to control the controllables.

Computer-aided ordering (CAO) is a technology that can considerably improve performance among a wide variety of products. The computer can recognize trends much faster than humans can, and IHL research has shown that the retailers who used CAO enjoyed sales increases that were 18% higher than their competitors in the same categories.

On average, retailers that use computer-aided-ordering experience

18% higher

sales growth than competitors in the same sector. *Source: IHL Group*

RFID and Computervision technologies can also provide significant benefits. Often the pushback from retailers comes from the business models being presented by vendors in these categories. But in a world where more and more of the business is coming from online orders for store fulfillment, knowing you have the product and knowing where it is in the stores is critical to profitability of those orders as well as walk-in customers.

LONGER-TERM SOLUTIONS

The solutions that often take a little longer to get the full benefits are better forecasting, inventory control and merchandising solutions. We are already seeing significant improvements in processes and systems issues when these are upgraded. In just the last two years, retailers have enjoyed over $23.9 billion in improvement in out-of-stocks due to better systems and processes in forecasting, merchandising and order orchestration. The key system that starts this process is central order management, a solution that allows for a single view of available inventory and where and when it is available for end customers. This becomes the single version of the truth (Available To Promise inventory (ATP)) that enterprises have for inventory and where it is in the chain. Irrespective of where orders come from - at stores, online, or over the phone, they can be fulfilled from a shared pool of inventory optimized for profit and operationalized for sustainability.

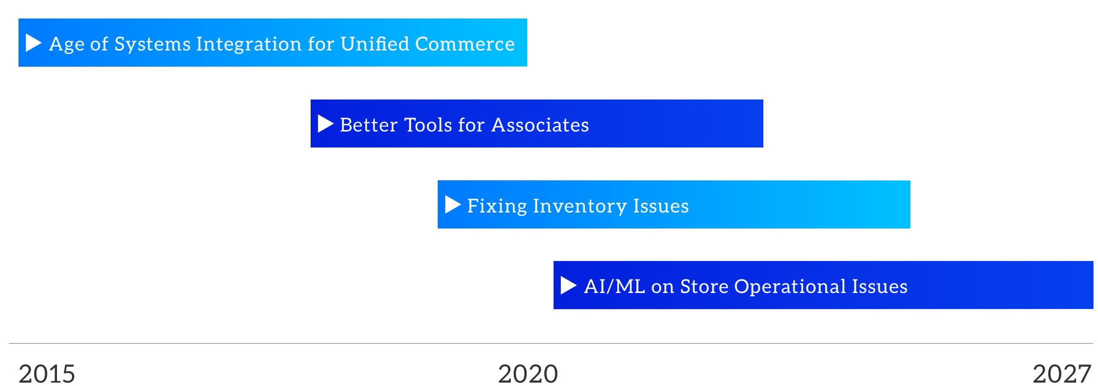
> Better systems and processes have provided
> **$23.9B+**
> in sales improvement in last 2 years alone.
> *Source: IHL Group*

Many of these longer-term solutions include artificial intelligence and machine learning that need time to learn from the historical data as well as have some dependencies on the cleanliness and tagged nature of the data. As disruptions in the supply chain occur, these systems will provide even greater improvements for retailers that have made the investment. And that is where the big gains will be seen – as the new normal sets in. The future of retail is really a race to clean, accurate and mostly consistent data. The retailers preparing for this reality will be best positioned in the future.

To truly eliminate, or at least reduce out-of-stocks, retailers must ensure their inventory is in the right location from the start and adjust for current demand. Today, retailers can no longer rely on historical data to allocate and replenish merchandise based on a one-time pre-season plan. They need to leverage external data sources, such as weather, local events and social media, and re-forecast frequently, adjusting for shifts in both in-store and omnichannel demand.

THE NEXT BATTLEGROUND IN RETAIL

Source: IHL Group



Is This the End of Just-in-Time Inventory?

This is certainly a discussion worth having in boardrooms. We fully expect the largest of retailers to do their own analyses of their markets, suppliers, and products to decide what is essential and those that are more discretionary to be better prepared for the next external disruption. They will choose more domestic suppliers and near-shoring for the most critical categories, perhaps even increasing warehouse space. These *Just-in-Time* vs *Just-in-Case* discussions are being had in executive boardrooms around the world for the largest retailers as well as the largest of producers. In so doing, they can be better prepared so as to not be caught off-guard in the future due to a lack of raw materials or port shutdowns. While shortage of warehouse space is the initial concern, the biggest question surrounds whether or not investors will allow companies to make such changes. Being better prepared for disruption means more infrastructure, more inventory, and lower profits in the short term for more redundancy in the future.

> Nearly **$1 trillion of the $1.9 trillion** inventory distortion issue is the result of a just-in-time inventory system that relied too heavily on production in a small handful of countries.
>
> *Source: IHL Group*

As we look at the entire inventory distortion issue, it is often hard to cut through the news to understand performance is actually improving on an individual retailer basis when systems are deployed properly. The most significant challenges to inventory distortion are the availability of workers and the disruptions outside of the immediate control of the retailer. Nearly $1 trillion of the $1.9 trillion inventory distortion issue is the result of a just-in-time inventory system that relied too heavily on production in a small handful of countries. Add in a pandemic, port shutdowns, governments determining who is an essential retailer and who is not, and an unexpected war between two countries controlling raw materials significant to the economies of the world and the job of getting inventory correct is a nearly impossible job at the moment. And yet, the smartest retailers are not only investing in the improvements necessary, but they are also doubling down on these improvements to be best positioned when things finally do get back to some sense of normal among manufacturers and ports. They are also making preparations to move from being reactive to being proactive in their preparations.

Finally, it is important to note that technology is not the savior here. The problem of inventory distortion is much bigger than what technology alone can solve. But technology is the great enabler that will separate those retailers that survive and thrive from those who barely make it in the next decade.