

Dialing In The Right Inventory: Your Fancy Software Is Probably Helping Less Than You Think

What Drives Inventory Levels in Your Supply Chain?

Inventory is critical to supply chain performance when it assures stock is at hand to serve customer needs while allowing production some leeway for efficient operation. Unfortunately, many companies have a good handle on neither. Despite lots of inventory, too often it's the wrong stuff, and the factory still gets whipsawed trying to plug the gaps.

Management understandably gets annoyed when such issues persist even after implementing advanced planning systems. Despite all their investments, they're still getting customer complaints at the same time they're writing down obsolete inventory AND authorizing overtime in the plants. What gives?

Demand and supply planning solutions can drive tremendous value for companies – they're critical to manage complex, high-volume supply chains and optimize versus constraints. What they *don't* do is prescribe critical business rules such as safety stock levels, lot sizes, and demand coverage horizons.

These *inputs* to planning systems are what ultimately dictate inventory levels, but they are typically managed inadequately. Defining these rules and parameters for best business results requires a thoughtful and repeatable approach. Just assuming it's getting the necessary focus in your current technology solution may be a huge blind spot.

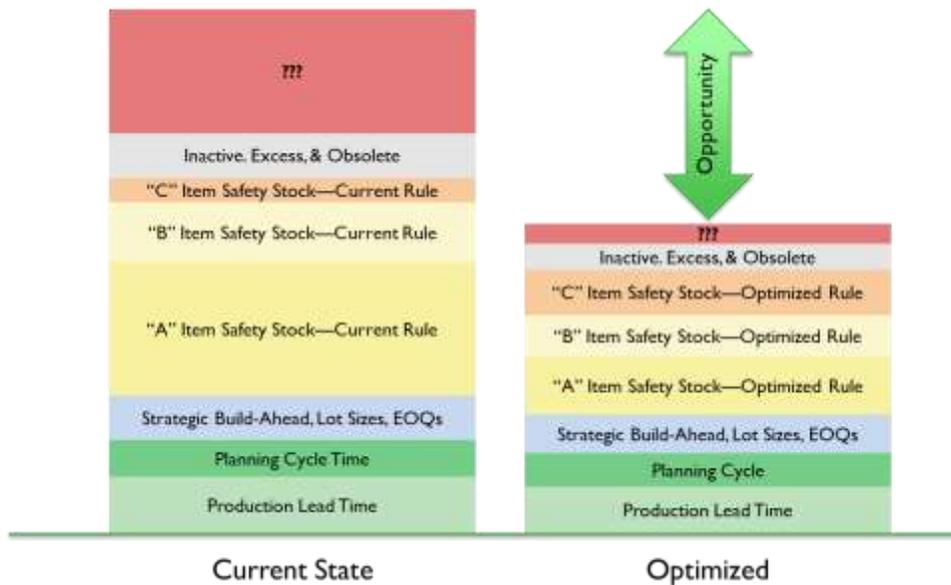
A Quick Refresher: Inventory Planning 101

Most companies struggle to answer fundamental questions with major impact on working capital, customer-facing performance, and manufacturing productivity:

1. How much inventory **should** I have?
2. Where do I make that happen?

There are only a few key drivers of an inventory “should-have” budget. Generally, these are:

- Cycle stock, which is a function of:
 - How long you need to produce, transfer, and ship goods
 - How long you wait between each planning and procurement cycle
 - How much you “round up” to get efficient run sizes or order quantities
- Strategic and risk stock:
 - Deliberate seasonal builds of inventory to smooth ahead of seasonal demand peaks, consume seasonally available raw materials, or hedge business continuity risks
- Safety stock:
 - How much extra you need to keep as buffers against demand or supply variability



We often do a standard diagnostic that deconstructs inventory into buckets such as these according to the “rule book” as expressed by the client. When we do this, we consistently find that there’s a big pile of inventory that is unexplainable by their own rules. We also find that, in the buffer (safety stock) category, most products have strayed far from their nominal targets on both the high and low sides.

Safety Stock Planning is Fundamentally Flawed

The biggest inventory wild card is nearly always safety stock. While stock targets should be data-driven, many companies oversimplify safety stock planning, using rules of thumb that do as much harm as good. Often expressed as days or weeks of supply, these allowances may look rational—even generous—when compared to production and procurement lead times. If it only takes a week to produce, why wouldn’t 3 weeks of inventory provide plenty of buffer? However intuitive, “one size fits all” ends up fitting almost none and rules end up being only loosely correlated with stated service level goals.

Lot Sizes are Underappreciated

Lot sizing – the standardized amounts of inventory purchased, manufactured, or shipped – clearly affect both inventory and operational costs. The classic model for optimizing lot sizes is the Economic Order Quantity (“EOQ”) which trades off inventory holding cost with a fixed cost per order. EOQ methods are often criticized as overly theoretical and impractical in real life because fixed order costs (which

are costs like transaction management, material handling, manufacturing set up times, etc.) are hard to define, but the trade-off between those costs and inventory is totally real. Even in the leanest supply chains, a “lot size of one” remains unrealistic. A sound analytical basis for setting lot size targets will promote sensible tradeoffs between inventory and supply chain operational costs.

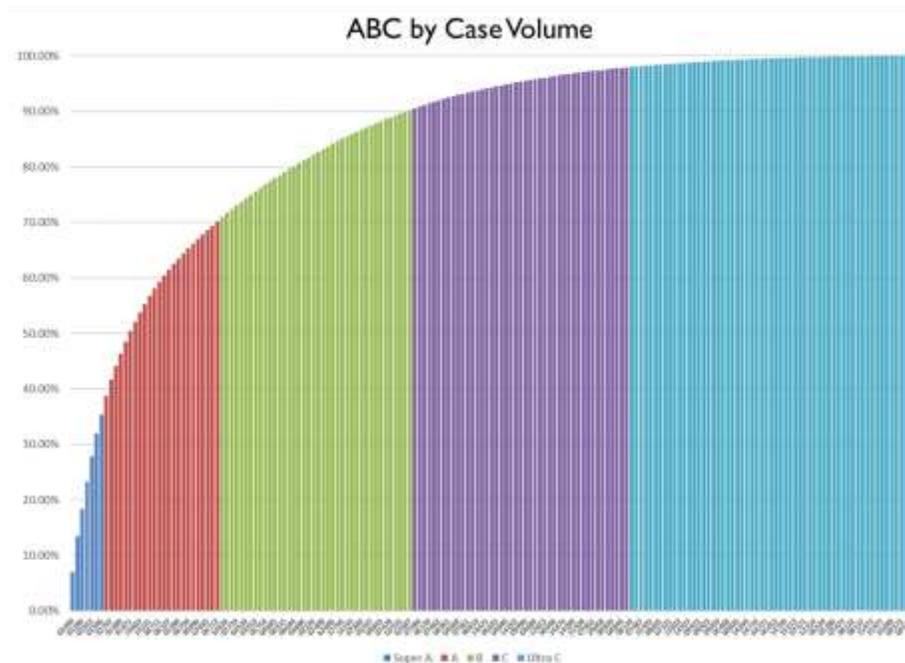
Translating Inventory Objectives into Supply Plans Can Be Tricky

Planning systems themselves don’t always help. In addition to safety stock and lot size parameters, systems can also consider a “demand coverage” parameter. While lot sizes relate somewhat reliably to the frequency of production, demand coverage targets act as an “order-up-to” level but don’t guarantee a predictable impact on production frequency (i.e. a 4-week demand coverage target may still initiate orders every week). Understanding how the final interplay of these and other parameters drives both inventory and ordering patterns is essential to planning inventory effectively.

Additionally, some dynamically peg their safety stocks to short term demand forecasts by expressing targets in terms of days or weeks-of-stock factors, often causing supply planning to oscillate safety stock targets cycle over cycle and bullwhip the factory. Time-based safety stock is enabled by most systems and, although it may seem intuitive, using such parameters to drive inventory levels should be discouraged.

One-Size-Fits All Policies Don’t Work

In addition to sound analytically-derived safety stock and lot sizing policies, policies such as on-time order fulfillment service levels and target order fulfillment lead times warrant review. Most companies’



product portfolios have relatively few high-volume items along with those that make up the “long tail” of less frequently ordered low volume SKUs. The implications for customer service performance at either end of this spectrum can vary by orders of magnitude.

Decisions on service goals require tradeoff analysis of inventory requirements vs. service levels, based on actual demand/supply variability. It almost always results in service targets being tiered based on

some type of ABC analysis (i.e. units-based, \$-based) or segmentation scheme, where increasing variability of the long tail forces you to ease up a bit on your service goals.

So How Do We Fix It?

Getting inventory under control in your supply chain typically involves four steps:

1. Defining analytically-based inventory planning parameters that align with business policy objectives and respect the physics of the supply chain
 - Safety stock is specific to each product's lead time and individual pattern of demand variability/forecastability, supply variability, and is a function of its service target. The analysis is unambiguous for most products. If variability or other inputs lead to safety stock recommendations that are "out of control" in terms of too much inventory, many companies establish guardrails to limit the max amount of safety stock but even this result is informative and can drive improvement efforts.
 - Lot sizing policies should trade off impacts on inventory costs, manufacturing capacity utilization, and other handling and logistics costs.
2. Creating a **repeatable process** for refreshing these parameters to include new products, changes in business priorities, and updates in other supply chain parameters like cost, lead-time, and variability
3. Correctly **configuring supply planning processes/systems** to correctly translate these parameters into the desired supply chain behavior
4. Ensuring the **plans translate into execution**

Why Does It Matter?

Supply chains have three objectives: serve the customer, reduce cost, and contain risk. Astute inventory planning is one of the few things that helps you accomplish all three. It can truly put you on a better performance curve.

Besides conserving working capital, savvy deployment of inventory helps you avoid opportunity costs of lost revenue. Both outages and delivery delays can be directly monetized. Beyond that, when inventory strategy is well-matched to supply and demand behavior, it drives visible improvements in planning, production, logistics, and procurement productivity and predictability. More activity goes "as expected" and much less effort gets thrown at fire drills that add only cost, not value. Finally, true resilience in the supply chain is promoted by a well calibrated inventory plan that provides elasticity without clogging the system.

Doing This Once Sounds Hard. Doing It Forever Sounds Really Hard.

The first time is a learning exercise, no question. Past that point, though, the challenges are mostly in assembling and preparing updated data sets so you can reliably repeat the analyses and decision processes with consistent results.

You need to scale, evolve, and sustain these analyses over time, and generally refresh your rules and parameters several times a year. Most get their start with Excel but find it's quite difficult to turn that into a process they can reasonably repeat and support. Spinnaker has developed a platform called

SCALE (Spinnaker Comprehensive AnaLytics Environment) to help companies make the leap from one-off analyses to durable, production analytics and governance. We have transformed our diagnostic methods into a rich toolkit that accelerates the adoption of production-strength inventory planning practices.

With SCALE we are able to efficiently adapt our inventory analytics to a wide variety of data sources and business needs. We can scale well beyond Excel capabilities and integrate with tools like Tableau for enhanced visualization.

The human component of this remains vital and we have process frameworks for the analysis, decision-making, and governance required for a stable, closed-loop process. We have tools and resources for helping the Excel-savvy planner make a graceful transition to SCALE.

How Can I Get My Teams On Board With This?

Moving forward requires both management and staff to agree that a data-driven, statistically valid approach will be used as widely as possible. This analysis is critical but taking the next steps to ensure the recommended policies translate through supply planning and execution processes, as intended, is certainly critical as well.

Making the change from familiar legacy traditions to a data-driven, analytically valid inventory planning process has many challenges but brings substantial rewards in service improvement, working capital reduction, and risk minimization. Spinnaker has worked with many companies to upgrade their inventory planning regardless of their present maturity or process sophistication. To find out how we can help your organization dial in the right inventory levels reach out and we'll be happy to discuss.

We hope you found this information to be helpful. To access more Spinnaker thought leadership [click here](#) or to learn more about our services [click here](#).

About Spinnaker:

Spinnaker is a supply chain services company that helps clients grow, manage risk, reduce costs, and improve customer service by developing world-class supply chain capabilities. Our services help clients develop the right supply chain strategy for their business challenges and implement the process and technology solutions to improve Demand/Supply Planning, Procurement and Sourcing, Logistics and Warehousing, and Reverse Logistics business performance. Spinnaker offers a unique service delivery model that combines the strength of deeply experienced management and technology consultants with a seasoned team of business process outsourcing (BPO) and 3rd-party logistics (3PL) professionals. Founded in 2002, Spinnaker has offices in Boston, Columbus, Denver, Houston, Memphis, Pittsburgh, London, and Singapore.

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