By Mark Chockalingam Ph.D.

True Demand

How to define and measure Demand for Forecasting?

Visit-
www.valuechainplanning.com
www.demandplanning.net

Valtitude

Abstract

An important building block to creating an accurate demand plan is the accuracy of your demand history. Since the purpose is to forecast all unconstrained customer demand in the future, we need to define and collect a history of true demand.

Since demand itself is unobservable, we use a proxy such as history of shipments or customer orders to measure demand. In this paper, we examine the demand components of observed shipment history and customer order stream. We illustrate the arguments in favor and against using these measures as a proxy for true demand and suggest some methods to address the corrections.

Demand

Demand is defined as aggregation of the customer's wants for an economic good at a particular point in time at a given price backed by their willingness and ability to pay for those goods.

Demand ≠ Shipments in a week/month

Demand ≠ Orders received in a week/month

➢ Although actual outbound shipments or inbound customer orders can be used as a proxy for calculating true demand, neither one can be taken as demand.

Demand meets Supply

There is market equilibrium when Demand meets Supply or when there is demand fulfillment.

Often denoted by the cliché –

- ✓ Right Product
- ✓ Right Place
- ✓ Right Time
- ✓ Right Quantity.

Valtitude

Price Equilibrium

➢ In competitive markets, Price is the result of Demand and Supply intersection

➢ When aggregate market demand equals aggregate market supply,

- Market is said to be in equilibrium

- A Market price is determined at that intersection so there is no excess demand or excess supply.

Demand in Contracting Markets

- ➢ In markets with reputation contracts and commitment pricing, Demand fulfillment is the norm
  - **Unfilled Demand causes reputation issues**
    - Out of Stocks
    - Customer complaints
  - **Excess Supply causes obsolete inventory and increased working capital costs.**
- ➢ This leads to the importance of a firm's Supply matching expected Demand:
  - **Leads us to the importance of calculating True Customer Demand**
  - **Highlights the importance of Demand Forecasting so Supply can be readied.**

How to calculate True Demand?

➢ True Demand is very important to understand and define in Contracting Markets as we discussed before.

➢ However True Demand is not observable. So, what do we do?

- we need to use a method and base it on a proxy to approximate True Demand.
- Empirically it is established that True Demand is greater than shipments and smaller than the total customer orders for the business.

Shipment History

➢ A history of Shipments to the customers represent a firm's supply schedule <u>not</u> demand - What the firm has been able to supply in the past to the customers.

➢ Shipments can be a good proxy for True Demand if all the following conditions are satisfied:

1. The firm did not have any inventory outages in the past

2. The firm did not have any supply chain execution issues and the demand fulfillment was 100%

3. Sales of phased-out products and obsolete inventory were correctly adjusted for in the demand calculation.
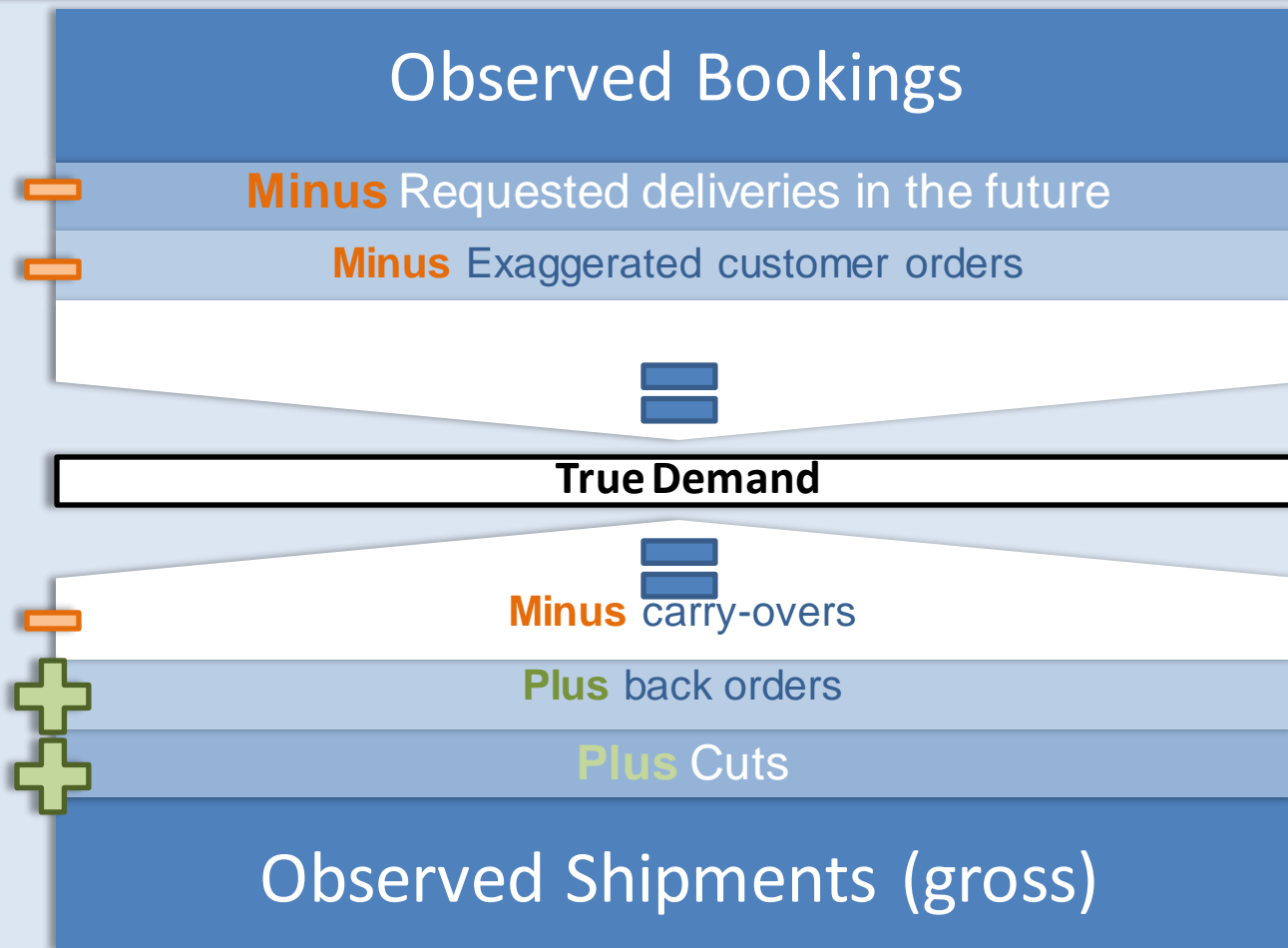
History of Customer Orders

Similarly, the historical stream of customer orders can be a good proxy for True demand if there were no inventory shortages or customer fulfillment issues.

In practice, Order history may suffer from the following issues:

➢ When a short-supply is expected in contracting markets, customers will place punitively exaggerated quantities on order.

➢ There may be inter-temporal order shifting – unfilled orders may move from one month to the next.

- Depends on backorder policies
- Cut orders may come back from the customer with a magnified quantity.

Orders Vs. Shipments

Observed Bookings

Minus Requested deliveries in the future

Minus Exaggerated customer orders

True Demand

Minus carry-overs

Plus back orders

Plus Cuts

Observed Shipments (gross)

Adjusted True Demand

In practice, we attempt to move towards True Demand by adjusting either the shipment history (supply schedule) or observed order history for the issues we discussed earlier.

Here are some plausible definitions companies have used to define True Demand:

= Shipments + a pre-determined % of cuts

=Shipments + (orders carried over to next period – orders brought forward from last period) + a pre-Determined % of cuts

Inventory Availability Date

Similarly, Order history can be adjusted as well. This process requires the calculation of an inventory availability date.

Inventory Availability date =

Customer Requested delivery date <u>minus</u>

Time it takes to fulfill the order.

Example: It takes three days to fulfill an order. An order requesting delivery on April 2 will be considered as true demand since the inventory should be available on March 30 itself.

Demand = All orders requiring delivery during the current period using the Inventory Availability Date calculation.

Adjustments to Order History

True Demand = Orders requiring inventory to be available in the current month minus

Adjustments for exaggerated customer orders during times of inventory shortage.

Adjustments for disappearing customer orders during periods of prolonged inventory shortage.

Gross Vs. Net

The secondary question is what to use – Gross versus Net.

Gross Shipments represents Total shipments to the customer without adjusting for returns.

If you use Shipments, you should use Gross Shipments

➢ Returns are unrelated to the Demand for the period.

➢ Returns cause inter-temporal shifts in supply that are unrelated to the demand.

Adjusting Net Shipments

Some companies also use a reverse-engineered Net shipments as the proxy for Demand as

Net Shipments + Returns + other adjustments = True Demand

The challenge with this definition is the time shifting caused by the returns. Returns are typically from a prior period so adding back the returns to the current period reflects more a financial calculation than to accurately reflect True Demand.

About The Author

Dr. Mark Chockalingam is Founder and Managing Principal, Valtitude formerly known as Demand Planning LLC, a Business Process and Strategy Consultancy firm. He has conducted numerous training and strategy facilitation workshops in the US and abroad and has worked with a variety of clients from Fortune 500 companies such as Wyeth, Miller SAB, FMC, Teva to small and medium size companies such as Au Bon pain, Multy Industries, Ticona- a divison of Celanese AG.

Prior to establishing his consulting practice, Mark has held important supply chain positions with several manufacturing companies. He was Director of Market Analysis and Demand Planning for the Gillette Company (now part of P&G), and prior to that he led the Sun care, Foot care and OTC forecasting processes for Schering-Plough Consumer HealthCare.

Mark has a Ph. D. in Finance from Arizona State University, an MBA from the University of Toledo and is a member of the Institute of Chartered Accountants of India.

About Valtitude

Valtitude is a consulting boutique comprised of seasoned experts with real-world supply chain experience and subject-matter expertise in demand forecasting, S&OP, Customer planning, and supply chain strategy.

We provide process and strategy consulting services to customers across a variety of industries -pharmaceuticals, CPG, High-Tech, Foods and Beverage, Quick Service Restaurants and Utilities.

Through our knowledge portal valuechainplanning.com, we offer a full menu of training programs through in- person and online courses in Demand Forecast Modeling, S&OP, Industry Forecasting, collaborative Forecasting using POS data.

Valtitude also offers a variety of informational articles and downloadable calculation templates, and a unique Demand Planning discussion forum.

Valtitude has worked with...

- NStar
- Abbott Labs
- Wyeth
- Au Bon Pain
- Teva
- Celanese
- Hill's Pet Nutrition
- Campbell's Soups
- Miller Brewing co.
- Texas Instruments
- Hewlett Packard
- World Kitchen
- Lifetime Products

- McCain Foods
- Lnoppen, Shanghai
- Vistakon J&J, Malaysia
- Pacific Cycles
- Smead
- White Wave foods
- Ross Products
- Fox entertainment
- Limited Brands
- Nomacorc
- F. Schumaker
- FMC Lithium

Contact Us

Mark Chockalingam, Ph.D.
Valtitude / Demand Planning, LLC
26 Henshaw Street

Woburn, MA 01801

Email: markc@valuechainplanning.com
Web: www.valuechainplanning.com

Phone: +1(781)995-0685