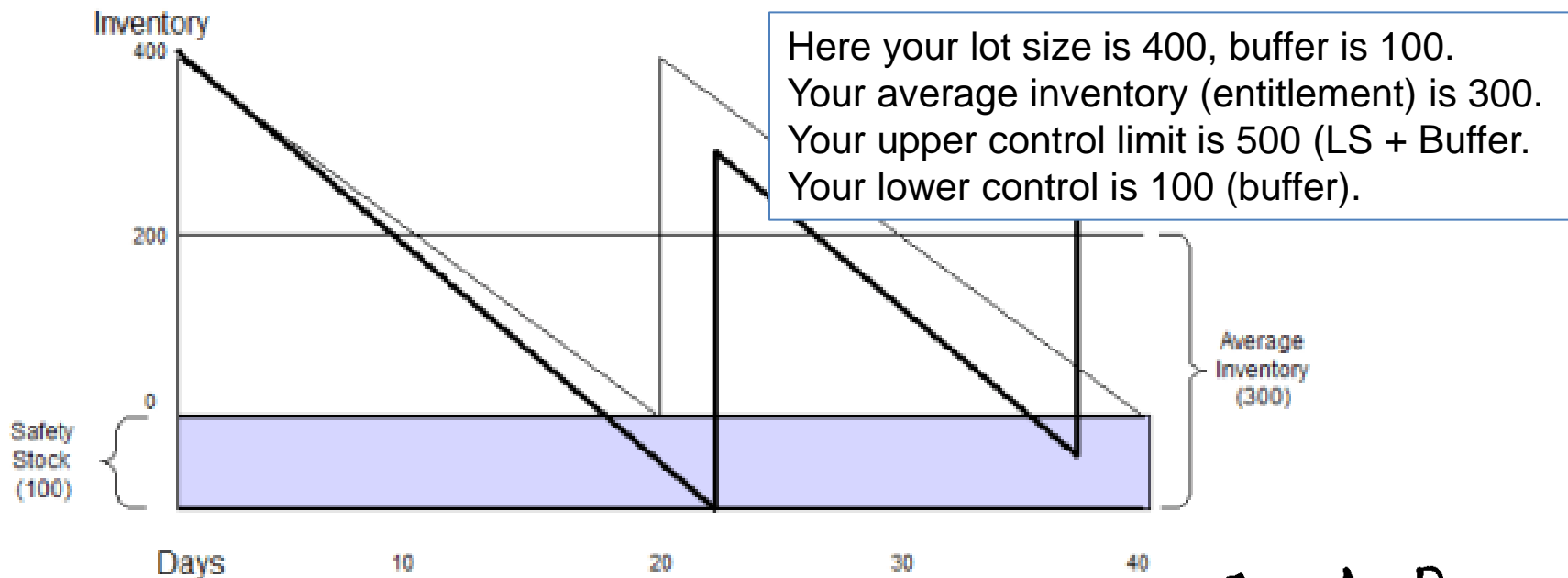# Inventory Entitlement

The Bearded One

2023

What is entitlement?

In supply planning there is a theoretical saw tooth pattern in terms of inventory level. When we get a lot in, inventory peaks at the lot size. Over time, we draw down to zero just as the next lot appears to take us back up. The idea is that on average, you should have an inventory level of ½ lot size. If you have buffer, on average it should be (½ lot size + buffer).

Here your lot size is 400, buffer is 100.
Your average inventory (entitlement) is 300.
Your upper control limit is 500 (LS + Buffer.
Your lower control is 100 (buffer).

Why does this matter?

Based on your system parameters, lot size and buffer, our inventory should have predictable outcomes. It should be a function of the parameters.

Is it? Test to find out.

Two general approaches:
- Test to control limits – are your inventory outcomes consistent with your control limits? Are you, for example, almost always under the upper control limit (Buffer plus one full lot size) and the lower control limit (buffer).
- Test for your variance to entitlement- after you calculate your expected entitlement (1/2 lot size plus buffer), how far off are you from your expected entitlement?
    - This is useful in studying where your $ are. For example, you can be within control limits, but if you have high lot sizes, you can be in control but still have a very high variance to entitlement.

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Warning! This is important!

But most people ignore it and do not think about it much, but it really does help to know if you are in control in terms of where you are with your parameters.

How much you complicate this is entirely up to you but the first part, what is our expected entitlement is just math, so do it.

After you know what your expected entitlement is, can you identify parts with the highest variance to entitlement? Remember, parts can be under the upper control limit, but still have a very high $ variance to entitlement. Can we reduce lot size?

How entitlement and nine blocks can work together

Below is an example of output of an excellent tool that is ever so slightly complicated in terms of being an excel sheet on steroids, but it can illustrate a key point….
We have 3,401 parts, and that is a lot (1).

We are $12.18 million over entitlement (2).

We have 118 parts in AX and 403 in AY segments for a total of 521 parts (3) (15% of total Parts) with $7.1 million above entitlement (4) (AX and AY =58% of the $ over entitled). When we dig into the segments, we will likely discover that we have a similar 80-20 rule inside the segments

Code	Count of Items	Items planned with order period compliance	Inv Entitlement $	On hand $	Above Entitlement	Below Entitlement
AX	118	112	$ 1,353,255	$ 2,917,510	$ 1,719,378	$ (155,122)
AY	403	403	$ 2,491,648	$ 7,630,790	$ 5,637,534	$ (498,393)
AZ	45	44	$ 163,419	$ 1,022,368	$ 943,871	$ (84,922)
BX	89	77	$ 108,378	$ 246,804	$ 146,106	$ (7,681)
BY	376	332	$ 459,291	$ 1,370,553	$ 985,001	$ (73,739)
BZ	79	62	$ 122,366	$ 674,495	$ 570,619	$ (18,490)
CX	624	333	$ 319,494	$ 746,308	$ 564,186	$ (137,372)
CY	1017	886	$ 387,727	$ 936,699	$ 595,909	$ (46,937)
CZ	650	419	$ 220,679	$ 1,212,128	$ 1,017,439	$ (25,989)
	3401	2668	$ 5,626,256	$ 16,757,654	$ 12,180,043	$ (1,048,645)

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Where we work

We will likely spend all our time in AX AY (or AH and AI).

We will likely never spend too much time working on "Z" items, and not on CZ items.

Segmentation guides us in all actions all the time without exception unless the building is on fire, then just get out.

When we look at the variances to entitlement, we should focus on CAUSES. Variances are almost always a result of a process gap, rarely just a "one off".