



Cost of Goods Sold & Inventory

Tutorial

November 2016



1.0 General

Please note the following guidance and instruction is to be used as an accompaniment to the 'CoGs & Inventory' Excel file.

Please feel free to get in touch at contact@lentransolutions.com if you would like additional guidance or to discuss the methodologies represented here and in the Excel file.

2.0 Tutorial

2.1 Aim and audience

The aim of this tutorial is to illustrate modelling approaches that integrate CoGS and inventory. The intended audience are those preparing corporate forecasts who seek to estimate working capital and its attendant impacts on cash / debt.

2.2 Tutorial conventions

Inventory management, in the 'real world' and at a granular level, is often represented by a complicated, specific and changeable set of choices and decisions and this tutorial does not seek to simulate all these variables. However, equally, the treatment of inventory here is often sufficiently accurate for the purposes of forecast modelling. The terms inventory, stock, and goods are used interchangeably in this tutorial. Sheet references are displayed as '**Sheet**' while section headings and line references are displayed as '*Item*'.

2.3 Linking CoGS and Inventory

To perpetuate business, sold goods need to be replenished. CoGS is used as a proxy to reorder goods to this end. Such reordering will likely occur before the goods are sold as production and/or shipment of these goods can create an inventory order lead time.

At this point it is important to emphasise that CoGS is only a proxy for stock reordering; there not a perfect correlation between CoGS and inventory. The inter-relationship between CoGS and inventory as presented is a simplification with the following ignored:

- Inventory valuation method
- Gross margin expansion / compression due to say foreign exchange – CoGS being the inverse of gross margin
- Slow moving or obsolete inventory

We demonstrate the CoGS / inventory relationship with two examples. The basic example (**Calcs_Basic**) illustrates the foundation calculations linking stock reordering, CoGS and ultimately inventory held for sale. It demonstrates the stock cycle from prepayment, through production or work in progress (WiP), into shipment of completed

product or stock in transit (SiT) and finally transitioning to inventory. 'Just in Time' inventory management is assumed.

The advanced example (**Calcs_Adv**) draws on the basic example adding:

- (i) complexity of opening balances for prepayments, WiP and SiT;
- (ii) and allowing user to differ creditor period from payments based on physical receipt of goods.

2.4 Basic example

The Stock ordering calculations capture stock ordering and payment:

- Revenue seasonality in gross revenue forecast – *row 8*
- Stock order referencing CoGS by using the OFFSET function and Stock cycle input as the column parameter – *row 14*¹
- Payment of stock in two instalments:
 - a 30% prepayment when the order is placed – *row 17*;
 - and a final 70% instalment when the stock is shipped – *row 18*

The Accounts calculations illustrate the transition of inventory from prepayment to inventory held for sale:

- Prepayments increases with deposits paid at order and decreases when orders are shipped – *row 24 & 25*
- WiP increases by the unpaid order amount and decreases when orders are shipped – *row 30 & 31*
- SiT increases when orders are shipped and decreases when goods are transferred to inventory – *row 36 to 38*
- Accounts payable decreases when orders are shipped – *row 50*
- Inventory increases as shipments arrive and decrease by CoGS – *row 43 & 44*

¹ See our OFFSET and SUM(OFFSET) tutorial for more guidance on these key Excel functions.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		Calculations: Basic version												
2		Tutorial: Costs of Goods Sold												
3		Forecast months	Num					1	2	3	4	5	6	7
4		Key calculations												
5		Stock ordering												
6		Cost of goods sold (CoGS)												
8		Gross Revenue	AUD '000		1,600			100	100	100	150	200	250	200
9		CoGS	% of revenue					30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
10		CoGS	AUD '000		480			30	30	30	45	60	75	60
11		Order												
12		CoGS	AUD '000		480			30	30	30	45	60	75	60
14		Stock order	AUD '000	2 Month(s)	420			30	45	60	75	60	45	30
15		Payment												
17		Payment due on order	AUD '000	30.00%	126			9	14	18	23	18	14	9
18		Payment due on shipping	AUD '000	70.00%	294			21	32	42	53	42	32	21
19		Total	AUD '000		420			30	45	60	75	60	45	30
20		Accounts												
21		Prepayments												
22		Balance b/f	AUD '000					50	59	64	68	73	68	64
24		Payment due on order	AUD '000		126			9	14	18	23	18	14	9
25		Transfer to SiT from prepayments	AUD '000	1 Month(s)	(126)			-	(9)	(14)	(18)	(23)	(18)	(14)
26		Balance c/f	AUD '000		50			59	64	68	73	68	64	59
27		Work in progress (WIP)												
28		Balance b/f	AUD '000					100	121	132	142	153	142	132
30		Order in production less prepayment	AUD '000		294			21	32	42	53	42	32	21
31		Transfer to SiT from WIP	AUD '000	1 Month(s)	(294)			-	(21)	(32)	(42)	(53)	(42)	(32)
32		Balance c/f	AUD '000		100			121	132	142	153	142	132	121
33		Stock in transit (SiT)												
34		Balance b/f	AUD '000					100	100	130	145	160	175	160
36		Transfer to SiT from prepayments	AUD '000		126			-	9	14	18	23	18	14
37		Transfer to SiT from WIP	AUD '000		294			-	21	32	42	53	42	32
38		Transfer from SiT to inventory	AUD '000	1 Month(s)	(420)			-	-	(30)	(45)	(60)	(75)	(60)
39		Balance c/f	AUD '000		100			100	130	145	160	175	160	145
40		Inventory												
41		Balance b/f	AUD '000					100	70	40	40	40	40	40
43		Transfer to inventory from SiT	AUD '000		420			-	-	30	45	60	75	60
44		CoGS	AUD '000		(480)			(30)	(30)	(30)	(45)	(60)	(75)	(60)
45		Balance c/f	AUD '000		100			70	40	40	40	40	40	40
46		Accounts payable												
47		Balance b/f	AUD '000					100	121	132	142	153	142	132
49		Payment due on shipping	AUD '000		294			21	32	42	53	42	32	21
50		Payment of accounts payable	AUD '000	1 Month(s)	(294)			-	(21)	(32)	(42)	(53)	(42)	(32)
51		Balance c/f	AUD '000		100			121	132	142	153	142	132	121

2.5 Advanced example

This example extends the concepts set out in the basic example, integrating historical transactions in the opening balances and enabling separation of payments from receipt of goods.

2.5.1 Historical transactions

Often modelling of CoGs and Inventory does not have the simplifying factor of being on a 'new' project with no historical transactions/movements to consider. In this case, to provide an exacting set of calculations going forward it is important to represent historical movements accurately.

In the case of this tutorial we have restricted the number of months of WIP or SiT to three. This allows the construct of the input frame seen at *lines 49 to 51* on the **Inputs** worksheet.

2.5.2 Accounts payable

In the basic example SiT was used as a leader for accounts payable – i.e. they were synonymous – this is a fair simplifying assumption, however it may not be adequate

in all cases. Hence, in the advanced example we have separated these two items and provided at *cell E54* of worksheet **Inputs** the option to specify this independently.

Accounts payable calculations can be found at *rows 62 to 66* of **Calcs_Adv**. The account is credited from 'Payments due on shipping', the magnitude of which is influenced in part by SiT, but critically not the timing which is determined locally in the payable account based on assumption made independently of SiT.

Hence, for example, this allows the user to pay during or indeed after the shipping process and not be limited to assuming payment at point of receipt.