

# MANAGEMENT ACCOUNTING – PERFORMANCE EVALUATION

**Tim Thompson** and **Vaughn White** provide a step-by-step worked example to show how to construct a detailed budget for a business.

**Planning and budgeting is one of the cornerstones of management accounting.** The benefits that can be derived from the process are well established. To exploit them, it's essential that you conduct budgeting in a logical, detailed and integrated way.

The following worked example of budget preparation using absorption costing is of a fictitious manufacturing company that has sales volume as its principal budget factor. In other firms the principal budget (or limiting) factor could be production capacity, labour or cash constraints.

We will be preparing the budget for the months of January to April inclusive, but in order to do this we'll need to process data from before and after these months. We will also be using forecast data for the months of May and June, together with the opening balance sheet at the start of January.

The sales volume is forecast to be 10,000 units for January. This is expected to grow by 200 units a month. The selling price is £2 per unit. From this, we can prepare the sales budget for the six months from January to June in both units and money (see panel 1).

It is the firm's inventory policy to hold enough units of finished goods at the end of each month to cover 40 per cent of the forecast sales for the next month. Each unit of finished goods requires 3kg of raw material, which costs £0.15 per kg, and 0.1 hours of direct labour, which costs £7.50 per hour. We're using an absorption costing system here, but we will consider the implications for the company of operating marginal costing in the next issue.

Now we can prepare the finished goods inventory budget in units (see panel 2), but we can't put this in monetary terms yet, as we don't know the fully absorbed cost per unit.

If the opening finished goods inventory at the start of January is forecast to be 3,000 units, we can prepare the production budget

## 1 Sales budget

	Jan	Feb	Mar	Apr	May	Jun
Units	10,000	10,200	10,400	10,600	10,800	11,000
Money	£20,000	£20,400	£20,800	£21,200	£21,600	£22,000

## 2 Finished goods inventory budget

	Jan	Feb	Mar	Apr	May	Jun
Sales units	10,000	10,200	10,400	10,600	10,800	11,000
Closing inventory	4,080*	4,160	4,240	4,320	4,400	

\* Jan inventory units = 40 per cent of Feb sales units

## 3 Production budget

	Jan	Feb	Mar	Apr	May
Sales	10,000	10,200	10,400	10,600	10,800
Closing inventory	4,080	4,160	4,240	4,320	4,400
	14,080	14,360	14,640	14,920	15,200
Opening inventory	(3,000)	(4,080)	(4,160)	(4,240)	(4,320)
Required production	11,080	10,280	10,480	10,680	10,880

(in units) to meet the sales and finished goods inventory budgets (see panel 3). Note that this opening inventory figure is not consistent with the firm's inventory policy.

We can now determine the fully absorbed cost per unit. The first stage in this calculation is to ascertain the overhead absorption rate. In this example, overheads are absorbed per unit. (In other situations the absorption basis may be different – for example, direct labour hours.) To calculate this we need to know the budgeted production overheads (£4,252 per month) and the total production units, which can be obtained from the production budget. Under normal circumstances we would calculate the overhead absorption rate as the total annual budgeted production overheads divided by the total annual budgeted production units. But, for the sake of simplicity in this example, let's assume a four-month "year" of January to April:

- Total budgeted production overheads (Jan to Apr) =  $4 \times £4,252 = £17,008$ .
- Total production units required (Jan to Apr) =  $11,080 + 10,280 + 10,480 + 10,680 = 42,520$ .
- Overhead absorption rate =  $£17,008 \div 42,520 = £0.40$  per unit.

From this we can calculate the fully absorbed cost per unit:

Material	3.0kg x £0.15 per kg =	£0.45
Labour	0.1 hours x £7.50 per hour =	£0.75
Overhead		£0.40
Total		£1.60

With these figures we can complete the finished goods inventory budget to include the monetary values (see panel 4, next page).

The company's inventory policy is to hold enough raw material at the end of each month to meet 30 per cent of the forecast production for the following month. With this information we can prepare the raw material

inventory budget in both weight and money (see panel 5).

If the opening raw material inventory in January is forecast to be 11,000kg, we can prepare the purchases budget in both weight and money (see panel 6). Note that the opening inventory is again not consistent with the firm's inventory policy.

Each unit of finished product requires 0.1 hours of direct labour, which we know costs £7.50 per hour, so we can prepare the direct labour budget in both hours and money (see panel 7).

Now that we've prepared all the detailed components, the next stage is to consolidate these into the master budget. In essence, this is a summary report reflecting the firm's overall budgeted performance and position. The master budget is the aggregation of all of the details to be found in the subordinate budgets for sales, inventory, production, purchases etc. It comprises the budgeted income statement, the cash budget and the budgeted balance sheets.

For the budgeted income statement we must calculate the cost of sales for each month using the fully absorbed cost per unit. We must also recognise any under- or over- absorption of costs. This occurs when there is a difference between the budgeted production overheads incurred (£4,252 per month) and the budgeted production overheads absorbed, which depends in this case on volume of units produced (see panel 8). Note that the total budgeted under- or over-absorption for the period adds up to zero. For budgetary purposes this has to be the case – if these numbers did not add up to zero, there would be an error somewhere in our calculations. Although the under/over absorptions “cancel each other out” over the four months, it's still helpful to budget for this on a monthly basis, since it will be useful when the actual monthly results are compared against the budgeted monthly figures.

To prepare the budgeted income statement (see panel 9), we need to know the budgeted non-production overheads. In this case they are £2,000 a month. While it's necessary for the company to realise profits in order to secure long-term survival and growth, it's also vital to forecast and control its cash position, especially in the short to medium term. Without a sound platform of liquidity, a company could face cash

## 4 Finished goods inventory budget

Month	Jan	Feb	Mar	Apr	May
Closing inventory: (units)	4,080	4,160	4,240	4,320	4,400
(£)	6,528*	6,656	6,784	6,912	7,040

\* Jan inventory money = 4,080 units x £1.60 per unit = £6,528

## 5 Raw material inventory budget

	Jan	Feb	Mar	Apr	May
Production units	11,080	10,280	10,480	10,680	10,880
Raw material usage (kg)	33,240*	30,840	31,440	32,040	32,640
Closing inventory: (kg)	9,252^	9,432	9,612	9,792	
(£)	1,388°	1,415	1,442	1,469	

\* Jan raw material usage = 11,080 (Jan production units) x 3kg = 33,240kg

^ Jan raw material inventory weight = 30,840 (Feb production usage) x 30% = 9,252kg

° Jan raw material inventory in monetary terms = 9,252kg x £0.15 per kg = £1,388

## 6 Purchases budget

	Jan	Feb	Mar	Apr
Production usage (kg)	33,240	30,840	31,440	32,040
Closing inventory (kg)	9,252	9,432	9,612	9,792
	42,492	40,272	41,052	41,832
Opening inventory (kg)	(11,000)	(9,252)	(9,432)	(9,612)
Purchases: weight (kg)	31,492	31,020	31,620	32,220
money (£)	4,724	4,653	4,743	4,833

## 7 Direct labour budget

	Jan	Feb	Mar	Apr
Production units	11,080	10,280	10,480	10,680
Direct labour: time (hours)	1,108	1,028	1,048	1,068
money (£)	8,310	7,710	7,860	8,010

## 8 Workings for budgeted income statement

	Jan	Feb	Mar	Apr
Budgeted production units	11,080	10,280	10,480	10,680
Budgeted overheads absorbed @ £0.40	£4,432	£4,112	£4,192	£4,272
Budgeted overheads incurred	(£4,252)	(£4,252)	(£4,252)	(£4,252)
Budgeted (under-)/over-absorption	£180	(£140)	(£60)	£20

## 9 Budgeted income statement

	Jan	Feb	Mar	Apr
Units	10,000	10,200	10,400	10,600
Sales (£)	20,000	20,400	20,800	21,200
Cost of sales (£)	(16,000)*	(16,320)	(16,640)	(16,960)
(Under-)/over-absorbed (£)	180	(140)	(60)	20
Gross profit (£)	4,180	3,940	4,100	4,260
Non-production overheads (£)	(2,000)	(2,000)	(2,000)	(2,000)
Net profit (£)	2,180	1,940	2,100	2,260

\* Jan cost of sales = 10,000 units x £1.60 per unit = £16,000

shortages that would jeopardise its future plans or even threaten the viability of the business. The cash budget provides a “feed-forward” control by identifying potential shortages, thereby allowing managers to take early corrective action.

Returning to our worked example, the following information is available to allow us to prepare the cash budget: the cash balance at the start of January is expected to be £8,000; half of sales are paid a month after delivery and half one month after that; raw materials are paid for one month after delivery; and direct labour and overheads are paid for in the month they’re incurred. Opening balances to be paid in full in January are receivables of £4,000 and payables of £2,000. These two balances illustrate a key point in cash budgeting: some of the sales and purchases completed before the budget period starts may be paid for during the budget period. Ours has a simple scenario in which these opening balances will both be paid in the first month of the budget period. In the real world, it’s much more likely that the payment of these opening balances would be spread across more than one month.

We can now prepare the workings (*panels 10 and 11*) for the cash budget (*panel 12*). The total budgeted monthly production and non-production overheads of £6,252 include £1,500 in depreciation. We must exclude this sum from the overheads because it is not a cash flow, giving a monthly figure of £4,752.

The last part of the master budget is the budgeted balance sheets. To prepare these, we must calculate the closing receivables and payables (see *panel 13*). We also need the opening balance sheet on January 1, which will form the column headed “December” in the final table (see *panel 14*).

How would the budget be affected if the firm used marginal costing? Would there be a significant effect on the above calculations? Also, what impact might the different costing methods have on the management’s attitudes to the company’s plans and activities? It’s over to you: using the above figures, prepare a budget for the firm using marginal costing and comment on the possible effects of this on the management’s attitudes. Look out for our answers in the next issue.

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### 10 Cash to be received from sales

	Jan	Feb	Mar	Apr
Turnover (£)	20,000	20,400	20,800	21,200
Cash receipts: opening receivables (£)	4,000			
one month (£)		10,000	10,200	10,400
two months (£)			10,000	10,200
Total cash receipts (£)	<u>4,000</u>	<u>10,000</u>	<u>20,200</u>	<u>20,600</u>

### 11 Cash to be paid for purchases

	Jan	Feb	Mar	Apr
Purchases (£)	4,724	4,653	4,743	4,833
Cash payments: opening payables (£)	2,000			
one month (£)		4,724	4,653	4,743

### 12 The cash budget

	Jan	Feb	Mar	Apr
Opening balance (£)	8,000	(3,062)	(10,248)	(7,313)
Receipts: sales (£)	4,000	10,000	20,200	20,600
Payments: purchases (£)	(2,000)	(4,724)	(4,653)	(4,743)
labour (£)	(8,310)	(7,710)	(7,860)	(8,010)
overheads (£)	<u>(4,752)</u>	<u>(4,752)</u>	<u>(4,752)</u>	<u>(4,752)</u>
Closing balance (£)	<u>(3,062)</u>	<u>(10,248)</u>	<u>(7,313)</u>	<u>(4,218)</u>

### 13 Closing receivables and payables

	Jan	Feb	Mar	Apr
Sales (£)	20,000	20,400	20,800	21,200
Opening receivables (£)	4,000	20,000	30,400	31,000
Receipts (£)	<u>(4,000)</u>	<u>(10,000)</u>	<u>(20,200)</u>	<u>(20,600)</u>
Closing receivables (£)	20,000	30,400	31,000	31,600
Purchases (£)	4,724	4,653	4,743	4,833
Opening payables (£)	2,000	4,724	4,653	4,743
Payments (£)	<u>(2,000)</u>	<u>(4,724)</u>	<u>(4,653)</u>	<u>(4,743)</u>
Closing payables (£)	4,724	4,653	4,743	4,833

### 14 Budgeted balance sheets

	Dec	Jan	Feb	Mar	Apr
<b>Non-current assets:</b> cost	20,000	20,000	20,000	20,000	20,000
depreciation	<u>(4,000)</u>	<u>(5,500)</u>	<u>(7,000)</u>	<u>(8,500)</u>	<u>(10,000)</u>
NBV	16,000	14,500	13,000	11,500	10,000
<b>Current assets:</b> inventory FG	4,800	6,528	6,656	6,784	6,912
inventory RM	1,650	1,388	1,415	1,442	1,469
receivables	4,000	20,000	30,400	31,000	31,600
cash	8,000				
<b>Current liabilities:</b> overdraft		(3,062)	(10,248)	(7,313)	(4,218)
payables	<u>(2,000)</u>	<u>(4,724)</u>	<u>(4,653)</u>	<u>(4,743)</u>	<u>(4,833)</u>
<b>Net assets</b>	32,450	34,630	36,570	38,670	40,930
<b>Capital brought forward</b>		32,450	34,630	36,570	38,670
<b>Profit</b>		<u>2,180</u>	<u>1,940</u>	<u>2,100</u>	<u>2,260</u>
<b>Capital carried forward</b>	32,450	34,630	36,570	38,670	40,930