

Preparing the Master Budget اعداد الموازنة الشاملة

A **budget** is **(a)** the quantitative expression of a proposed plan of action by management for a specified period and **(b)** an aid to coordinate what needs to be done to implement that plan.

A budget generally includes both financial and nonfinancial aspects of the plan, and it serves as a blueprint for the company to follow in an upcoming period.

Advantages of Budgets مزايا الموازنات

Budgets are an integral part of management control systems. When administered thoughtfully by managers, budgets do the following:

- 1- Promote coordination and communication among subunits within the company.
- 2- Provide a framework for judging performance and facilitating learning.
- 3- Motivate managers and other employees.

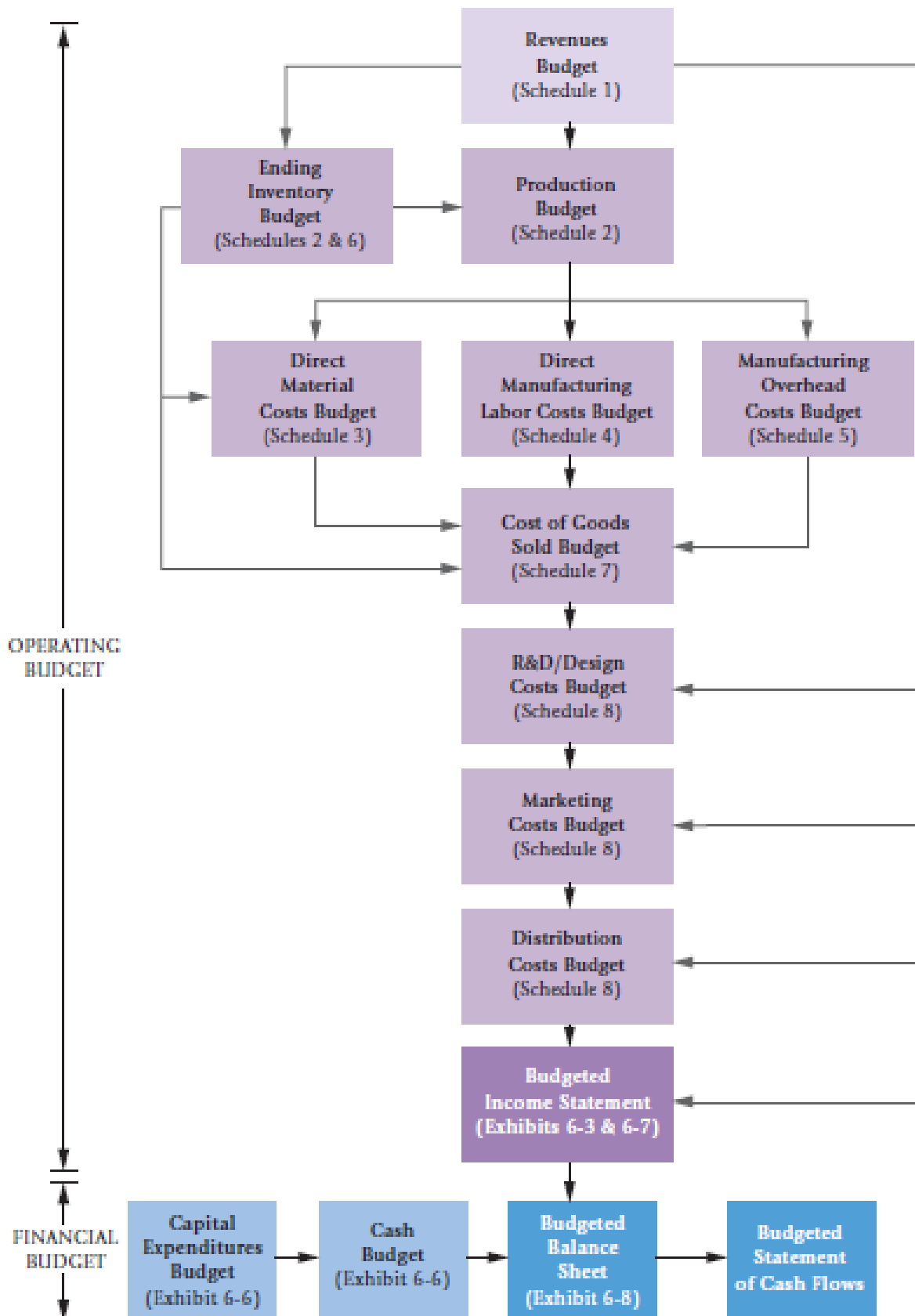
Developing an Operating Budget اعداد الموازنة التشغيلية

Budgets are typically developed for a set period, such as a month, quarter, year, and so on. The set period can itself be broken into sub periods. For example, a 12-month cash budget may be broken into 12 monthly periods so that cash inflows and outflows can be better coordinated.

Steps in Preparing an Operating Budget خطوات اعداد الموازنة التشغيلية

- 1- Identify the problem and uncertainties.
- 2- Obtain information.
- 3- Make predictions about the future.
- 4- Make decisions by choosing among alternatives.
- 5- Implement the decision, evaluate performance, and learn.

نظرة لهيكل الموازنة الشاملة Overview of the Master Budget



The following data are available for the 2012 budget:

Direct materials

- Red Oak \$ 7 per board foot (b.f.) (same as in 2011)
- Granite \$10 per square foot (sq. ft.) (same as in 2011)
- Direct manufacturing labor \$20 per hour

Content of Each Product Unit

	Product	
	Casual Granite Table	Deluxe Granite Table
Red Oak	12 board feet	12 board feet
Granite	6 square feet	8 square feet
Direct manufacturing labor	4 hours	6 hours

	Product	
	Casual Granite Table	Deluxe Granite Table
Expected sales in units	50,000	10,000
Selling price	\$ 600	\$ 800
Target ending inventory in units	11,000	500
Beginning inventory in units	1,000	500
Beginning inventory in dollars	\$384,000	\$262,000

	Direct Materials	
	Red Oak	Granite
Beginning inventory	70,000 b.f.	60,000 sq. ft.
Target ending inventory	80,000 b.f.	20,000 sq. ft.

Stylistic bases its budgeted cost information on the costs it predicts it will incur to support its revenue budget, taking into account the efficiency improvements it expects to make in 2012. Recall from Step 3 in the decision-making process (p. 188) that efficiency improvements are critical to offset anticipated increases in the cost of inputs and to maintain Stylistics 12% operating margin. Some companies rely heavily on past results when developing budgeted amounts; others rely on detailed engineering studies. Companies differ in how they compute their budgeted amounts.

Most companies have a budget manual that contains a company's particular instructions and relevant information for preparing its budgets. Although the details differ among companies, the following basic steps are common for developing the operating budget for a manufacturing company. Beginning with the revenues budget, each of the other budgets follows step-by-step in logical fashion.

Step 1: Prepare the Revenues Budget. A revenues budget, calculated in Schedule 1, is the usual starting point for the operating budget. That's because the production level and the inventory level—and therefore manufacturing costs—as well as nonmanufacturing costs,

generally depend on the forecasted level of unit sales or revenues. Many factors influence the sales forecast, including the sales volume in recent periods, general economic and industry conditions, market research studies, pricing policies, advertising and sales promotions, competition, and regulatory policies. In Stylistics case, the revenues budget for 2012 reflects Stylistic's strategy to grow revenues by increasing sales of Deluxe tables from 8,000 tables in 2011 to 10,000 tables in 2012.

Schedule 1: Revenues Budget
For the Year Ending December 31, 2012

	Units	Selling Price	Total Revenues
Casual	50,000	\$600	\$30,000,000
Deluxe	10,000	800	8,000,000
Total			<u><u>\$38,000,000</u></u>

The \$38,000,000 is the amount of revenues in the budgeted income statement. The revenues budget is often the result of elaborate information gathering and discussions among sales managers and sales representatives who have a detailed understanding of customer needs, market potential, and competitors' products. This information is often gathered through a customer response management (CRM) or sales management system. Statistical approaches such as regression and trend analysis can also help in sales forecasting. These techniques use indicators of economic activity and past sales data to forecast future sales. Managers should use statistical analysis only as one input to forecast sales. In the final analysis, the sales forecast should represent the collective experience and judgment of managers.

The usual starting point for Step 1 is to base revenues on expected demand. Occasionally, a factor other than demand limits budgeted revenues. For example, when demand is greater than available production capacity or a manufacturing input is in short supply, the revenues budget would be based on the maximum units that could be produced. Why? Because sales would be limited by the amount produced.

Step 2: Prepare the Production Budget (in Units). After revenues are budgeted, the manufacturing manager prepares the production budget, which is calculated in Schedule 2. The total finished goods units to be produced depend on budgeted unit sales and expected changes in units of inventory levels:

$$\begin{array}{r} \text{Budget} \\ \text{production} \\ \text{(units)} \end{array} - \begin{array}{r} \text{Budget} \\ \text{sales} \\ \text{(units)} \end{array} + \begin{array}{r} \text{Target ending} \\ \text{finished goods} \\ \text{inventory} \\ \text{(units)} \end{array} - \begin{array}{r} \text{Beginning} \\ \text{finished goods} \\ \text{inventory} \\ \text{(units)} \end{array}$$

Schedule 2: Production Budget (in Units)
For the Year Ending December 31, 2012

	Product	
	Casual	Deluxe
Budgeted unit sales (Schedule 1)	50,000	10,000
Add target ending finished goods inventory	11,000	500
Total required units	61,000	10,500
Deduct beginning finished goods inventory	1,000	500
Units of finished goods to be produced	<u>60,000</u>	<u>10,000</u>

Step 3: Prepare the Direct Material Usage Budget and Direct Material Purchases Budget.

The number of units to be produced, calculated in Schedule 2, is the key to computing the usage of direct materials in quantities and in dollars. The direct material quantities used depend on the efficiency with which materials are consumed to produce a table. In determining budgets, managers are constantly anticipating ways to make process improvements that increase quality and reduce waste, thereby reducing direct material usage and costs. Like many companies, Stylistic has a *bill of materials*, stored and updated in its computer systems. This document identifies how each product is manufactured, specifying all materials (and components), the sequence in which the materials are used, the quantity of materials in each finished unit, and the work centers where the operations are performed. For example, the bill of materials would indicate that 12 board feet of red oak and 6 square feet of granite are needed to produce each Casual coffee table, and 12 board feet of red oak and 8 square feet of granite to produce each Deluxe coffee table. This information is then used to calculate the amounts in Schedule 3A.

**Schedule 3A: Direct Material Usage Budget in Quantity and Dollars
For the Year Ending December 31, 2012**

	Material		Total
	Red Oak	Granite	
Physical Units Budget			
Direct materials required for Casual tables (60,000 units × 12 b.f. and 6 sq. ft.)	720,000 b.f.	360,000 sq. ft.	
Direct materials required for Deluxe tables (10,000 units × 12 b.f. and 8 sq. ft.)	120,000 b.f.	80,000 sq. ft.	
Total quantity of direct materials to be used	840,000 b.f.	440,000 sq. ft.	
Cost Budget			
Available from beginning direct materials inventory (under a FIFO cost-flow assumption)			
Red Oak: 70,000 b.f. × \$7 per b.f.	\$ 490,000		
Granite: 60,000 sq. ft. × \$10 per sq. ft.		\$ 600,000	
To be purchased this period			
Red Oak: (840,000 – 70,000) b.f. × \$7 per b.f.	5,390,000		
Granite: (440,000 – 60,000) sq. ft. × \$10 per sq. ft.		3,800,000	
Direct materials to be used this period	\$5,880,000	\$4,400,000	\$10,280,000

The purchasing manager prepares the budget for direct material purchases, calculated in Schedule 3B, based on the budgeted direct materials to be used, the beginning inventory of direct materials, and the target ending inventory of direct materials:

$$\begin{array}{rclcl}
 \text{Purchases} & & \text{Direct} & \text{Target ending} & \text{Beginning} \\
 \text{of direct} & = & \text{materials} & \text{inventory} & \text{inventory} \\
 \text{materials} & & \text{used in} & \text{of direct} & \text{of direct} \\
 & & \text{production} & \text{materials} & \text{materials} \\
 & & & + & -
 \end{array}$$

**Schedule 3B: Direct Material Purchases Budget
For the Year Ending December 31, 2012**

	Material		Total
	Red Oak	Granite	
Physical Units Budget			
To be used in production (from Schedule 3A)	840,000 b.f.	440,000 sq. ft.	
Add target ending inventory	80,000 b.f.	20,000 sq. ft.	
Total requirements	920,000 b.f.	460,000 sq. ft.	
Deduct beginning inventory	70,000 b.f.	60,000 sq. ft.	
Purchases to be made	850,000 b.f.	400,000 sq. ft.	
Cost Budget			
Red Oak: 850,000 b.f. × \$7 per b.f.	\$5,950,000		
Granite: 400,000 sq. ft. × \$10 per sq. ft.		\$4,000,000	
Purchases	\$5,950,000	\$4,000,000	\$9,950,000

Step 4: Prepare the Direct Manufacturing Labor Costs Budget. In this step, manufacturing managers use *labor standards*, the time allowed per unit of output, to calculate the direct manufacturing labor costs budget in Schedule 4. These costs depend on wage rates, production methods, process and efficiency improvements, and hiring plans.

**Schedule 4: Direct Manufacturing Labor Costs Budget
For the Year Ending December 31, 2012**

	Output Units Produced (Schedule 2)	Direct Manufacturing Labor-Hours per Unit	Total Hours	Hourly Wage Rate	Total
Casual	60,000	4	240,000	\$20	\$4,800,000
Deluxe	10,000	6	60,000	20	1,200,000
Total			<u>300,000</u>		<u>\$6,000,000</u>

Step 5: Prepare the Manufacturing Overhead Costs Budget. As we described earlier, direct manufacturing labor-hours is the cost driver for the variable portion of manufacturing operations overhead and setup labor-hours is the cost driver for the variable portion of machine setup overhead costs. The use of activity-based cost drivers such as these gives rise to *activity-based budgeting*. **Activity-based budgeting (ABB)** focuses on the budgeted cost of the activities necessary to produce and sell products and services. For the 300,000 direct manufacturing labor-hours, Stylistic's manufacturing managers estimate various line items of overhead costs that constitute manufacturing operations overhead (that is, all costs for which direct manufacturing labor-hours is the cost driver). Managers identify opportunities for process improvements and determine budgeted manufacturing operations overhead costs in the operating department. They also determine the resources that they will need from the two support departments—kilowatt hours of energy from the power department and hours of maintenance service from the maintenance department. The support department managers, in turn, plan the costs of personnel and supplies that they will need in order to provide the operating department with the support services it requires. The costs of the support departments are then allocated (first-stage cost allocation) as part of manufacturing operations overhead.

Chapter 15 describes how the allocation of support department costs to operating departments is done when support departments provide services to each other and to operating departments. The upper half of Schedule 5 shows the various line items

of costs that constitute manufacturing operations overhead costs—that is, all overhead costs that are caused by the 300,000 direct manufacturing labor-hours (the cost driver).

Stylistic’s managers determine how setups should be done for the Casual and Deluxe line of tables, taking into account past experiences and potential improvements in setup efficiency.

For example, managers consider the following:

- Increasing the length of the production run per batch so that fewer batches (and therefore fewer setups) are needed for the budgeted production of tables
- Decreasing the setup time per batch
- Reducing the supervisory time needed, for instance by increasing the skill base of workers

Stylistic’s managers forecast the following setup information for the Casual and Deluxe tables:

	Casual Tables	Deluxe Tables	Total
1. Quantity of tables to be produced	60,000 tables	10,000 tables	
2. Number of tables to be produced per batch	50 tables/batch	40 tables/batch	
3. Number of batches (1) ÷ (2)	1,200 batches	250 batches	
4. Setup time per batch	10 hours/batch	12 hours/batch	
5. Total setup-hours (3) × (4)	12,000 hours	3,000 hours	15,000 hours
6. Setup-hours per table (5) ÷ (1)	0.2 hour	0.3 hour	

Using an approach similar to the one described for manufacturing operations overhead costs, Stylistic’s managers estimate various line items of costs that comprise machine setup overhead costs—that is, all costs that are caused by the 15,000 setup labor-hours (the cost driver). Note how using activity-based cost drivers provide additional and detailed information that improves decision making compared with budgeting based solely on output-based cost drivers.

Of course, managers must always evaluate whether the expected benefit of adding more cost drivers exceeds the expected cost.⁵ The bottom half of Schedule 5 summarizes these costs.

**Schedule 5: Manufacturing Overhead Costs Budget
For the Year Ending December 31, 2012
Manufacturing Operations Overhead Costs**

Manufacturing Operations Overhead Costs		
Variable costs		
Supplies	\$1,500,000	
Indirect manufacturing labor	1,680,000	
Power (support department costs)	2,100,000	
Maintenance (support department costs)	<u>1,200,000</u>	\$6,480,000
Fixed costs (to support capacity of 300,000 direct manufacturing labor-hours)		
Depreciation	1,020,000	
Supervision	390,000	
Power (support department costs)	630,000	
Maintenance (support department costs)	<u>480,000</u>	2,520,000
Total manufacturing operations overhead costs		<u>\$9,000,000</u>
Machine Setup Overhead Costs		
Variable costs		
Supplies	\$ 390,000	
Indirect manufacturing labor	840,000	
Power (support department costs)	<u>90,000</u>	\$ 1,320,000
Fixed costs (to support capacity of 15,000 setup labor-hours)		
Depreciation	603,000	
Supervision	1,050,000	
Power (support department costs)	<u>27,000</u>	1,680,000
Total machine setup overhead costs		<u>\$ 3,000,000</u>
Total manufacturing operations overhead costs		<u>\$12,000,000</u>