

# Budgeting

## What comes after cost allocation?

- ▶ We have thought a lot about how to correctly track the consumption of resources in order to:
  - ▶ provide incentives and
  - ▶ make decisions.

Those discussions have been 'one off': One manager's incentives. One outsourcing decision. One volume decision. Today we will try to build those ideas into a planning framework.

# Budgets and Organizational Architecture

- ▶ A budget is management's forecast of revenues, expenses, or profits in a future time period based on a production plan.
- ▶ Budgets are plans not aspirations.
- ▶ Deviations, even income-increasing ones, are not innocuous.

# Budgets and Organizational Architecture

- ▶ Knowledge: Budgets communicate key planning assumptions such as product prices, units sales, and input prices.
- ▶ Partition Decision Rights: Budget sets guidelines on resources available for each segment.
- ▶ Performance Evaluation: Responsibility center's actual performance is compared to budget.

# Variances

- ▶ In statistics: A measure of the differences between the observations and the predictions.
- ▶ In managerial accounting: The difference between the budgeted and actual amounts.
- ▶ Related, but distinct. Managerial accounting variances are more closely related to 'errors' in statistics, this makes sense as they are errors in prediction.

# Variances

- ▶ Variances are termed 'favorable' and 'unfavorable' based on their impact on income.
- ▶ Keep in mind that budgets are plans, so any variance is evidence that things did not go according to plan.

# Variances

- ▶ Favorable (F) variance: actual revenue  $>$  budgeted revenue actual expense  $<$  budgeted expense
- ▶ Unfavorable (U) variance: actual revenue  $<$  budgeted revenue actual expense  $>$  budgeted expense

## Examples



## Example: Country Club

- ▶ Responsibility Centers: 1 profit center and 2 cost centers
- ▶ Measurement: Monthly reports compare actual revenues and expenses to budget.
- ▶ Budget process separates decision rights.
  - ▶ Initiation and implementation by professional managers.
  - ▶ Ratification and monitoring by Board of Directors and members.

## Example: Private University

**Responsibility centers in 4 colleges: 2 cost centers, 2 profit centers.**

- ▶ Knowledge:
  - ▶ Number of students drives revenue forecasts.
  - ▶ Faculty market drives faculty salary expense.

## Example: Private University

- ▶ Decision rights:
  - ▶ Lower levels prepare initial budgets.
  - ▶ Higher levels review and ratify budget.
  - ▶ *This process passes knowledge upward through the organization.*

## Example: Private University

- ▶ Agency problems:
  - ▶ Empire building: request “too large” a budget.
  - ▶ Externalities: Cost centers are more likely to add unprofitable programs than profit centers.

## Example: Large Corporation

- ▶ Responsibility centers:
  - ▶ 2 cost (manufacturing and marketing)
  - ▶ 1 revenue (sales)

## Example: Large Corporation

- ▶ Knowledge:
  - ▶ Vertical transfers (upward from lower to higher levels)
  - ▶ Horizontal transfers (marketing to manufacturing)
  - ▶ Identify potential bottlenecks in production
  - ▶ Identify financing needs

## Example: Large Corporation

- ▶ Contracting:
  - ▶ Budgets are internal contracts between operating segments
  - ▶ Divisional managers negotiate budgets
  - ▶ Executive managers negotiate disputes and review budgets for consistency with corporate strategy

Trade-offs



## Trade-off: Communication vs. Evaluation

- ▶ Budgets are used for both decision management and decision control.
- ▶ Optimal decision making requires managers fully reveal private knowledge about production and market conditions during budget negotiations.

## Trade-off: Communication vs. Evaluation

- ▶ When budgets are also used for performance evaluation, managers have an incentive to make biased budget forecasts so that their actual performance will look good relative to budget.

# Budget Ratcheting

- ▶ Ratchet effect: Basing next year's standard of performance on this year's actual performance.
- ▶ Disadvantages:
  - ▶ Performance targets usually adjusted upward
  - ▶ Employees reduce output to avoid being held to higher standards in the future

# Budget Ratcheting

- ▶ Possible Solution:
  - ▶ Eliminate budget targets
  - ▶ Estimate next year's sales
  - ▶ More frequent job rotation

# Budget Ratcheting

- ▶ Summary: While the ratchet effect creates dysfunctional behavior, the alternatives might produce even greater problems.

## Trade-off: Bottom-up vs. Top-down

- ▶ Top-down budgets:
  - ▶ Knowledge: Top management can make accurate aggregate forecasts
  - ▶ Decision rights: Begin with aggregate forecasts for firm, and then disaggregate down to lower levels
  - ▶ Decision control more important than decision management

## Trade-off: Bottom-up vs. Top-down

- ▶ Bottom-up budgets (participative budgeting):
  - ▶ Knowledge: Lower levels have more knowledge than top
  - ▶ Decision rights: Person being held responsible for meeting the target makes the initial budget forecast
  - ▶ Decision management more important than decision control

## Trade-off: Resolving Disagreements

- ▶ Top executive officers of firms have final decision rights over the entire budget process.
- ▶ Top executives resolve disputes among lower levels.
- ▶ After adoption, the budget is an informal set of contracts among the various units of the firm.



## Modern budgeting

# Modern Approaches to Budgeting

- ▶ Building the budget in two distinct steps
  - ▶ Step 1: Construct budgets in operational terms (Lowest levels of the organization)
  - ▶ Step 2: Developing a financial plan based on the operational plans from Step 1.

## Modern Approaches to Budgeting

- ▶ Constructing budgets for financial planning (decision management), but not using budgets as performance targets (decision control)
- ▶ Units are judged by comparing their actual performance with the actual performance of defined “peer units”.

# Modern Approaches to Budgeting

- ▶ Actual rewards can include consideration of both financial and non-financial performance measures.
- ▶ Data come directly from the design and function of the production process.

## What do you think of the Following Assertions?

- ▶ No simple “one-size-fits-all” panacea exists for resolving the conflict between decision management versus decision control when it comes to budgeting.
- ▶ Nor is such a solution ever likely to be found.

Horizon

## Short-run vs. Long-run

- ▶ Firms that use only short-term (annual) budgets do not create adequate incentives for long-term maintenance and responding to new opportunities.
- ▶ Strategic planning requires long-term budgets (2, 5, or 10 years).
- ▶ Financial lending institutions often require cash flow projections for the length of any proposed borrowing.
- ▶ Many firms require managers to prepare both short-term and long-term budgets as part of the periodic budget review.

## Budget Types/Terms/Policies



## Budget Types/Terms/Policies

*Modern firms use a mix of all of these types.*

## Line-Item Budgets

- ▶ Line-item budgets authorize managers to spend only up to the specified amount on each line item.
- ▶ Advantages:
  - ▶ Tight control reduces opportunities for managers to take actions inconsistent with firm goals

# Line-Item Budgets

- ▶ Disadvantages:
  - ▶ Inflexible in responding to unanticipated needs
  - ▶ Little incentive for cost savings

## Rolling Budgets

- ▶ A rolling budget is set each month over some time-period
- ▶ For example: Each month Cisco revises their budget for the next 18-months.

# Rolling Budgets

- ▶ Advantages:
  - ▶ Keeps budget more current in a changing environment
  - ▶ Managers may react in a more timely manner by better integrating planning and execution.

# Rolling Budgets

- ▶ Disadvantages:
  - ▶ Costs of software and management time
  - ▶ Key Solution: Use a single standardized web page for data entry and automatic roll up to the company-wide budget.

*Note: Similar to ABC, this is hard for companies with poor information systems and very natural for firms with modern information systems.*

# Budget Lapsing

**Budget lapsing is a requirement that funds allocated for a particular year cannot be carried over to the following year.**

# Budget Lapsing

- ▶ Advantages:
  - ▶ Tighter control than budgets that do not lapse
  - ▶ Prevents risk-averse managers from accumulating funds



# Budget Lapsing

- ▶ Disadvantages:
  - ▶ Encourages wasteful spending near end of fiscal year

# Incremental vs. Zero-Based Budgets

- ▶ **Incremental budgeting:**

- ▶ Begin with current year's core budget and make incremental changes
- ▶ Review focuses on incremental changes and may ignore inefficiencies in core budget

- ▶ **Zero-based budgeting (ZBB):**

- ▶ Mandates each line item in total must be justified each year
- ▶ Motivates managers to eliminate inefficient expenses
- ▶ Useful when firm is changing strategic direction
- ▶ Becomes less useful when same justifications are used each year

## Static Budgets

- ▶ Do not vary with volume, such as costs that should be fixed
- ▶ Volume changes may create budget variances
- ▶ Since managers are not insulated from volume changes, they have incentives to mitigate impact of adverse volume changes

## Flexible Budgets

- ▶ Do adjust for changes in volume, such as semivariable costs that include a fixed and variable component
- ▶ Evaluate performance after adjusting for volume effects
- ▶ Manager is not held responsible for volume changes

## Note

The static and flexible budgets will be used in the next lecture to decompose variances!

Example: Sandy Cove Bank

## Sandy Cove Bank

- ▶ Sandy Cove is a new small commercial bank in Sandy Cove, Michigan.
- ▶ The bank limits interest rate risk by matching the maturity of its assets to the maturity of its liabilities.
- ▶ By maintaining a spread between interest rates charged and interest rates paid, the bank plans to earn a small income.

## Sandy Cove Bank

- ▶ Management establishes a flexible budget based on interest rates for each department.
- ▶ The Boat and Car Loan Department offers five-year loans.
- ▶ It matches certificates of deposit (CDs) against car and boat loans.



## Sandy Cove Bank

- ▶ Given all the uncertainty about interest rates, management believes that five-year savings interest rates could vary between 2 percent and 16 percent for the coming year. (*Note: 'Given' in this sentence embeds a critical management accounting activity: forecasting.*)
- ▶ The savings rate is the rate paid on CD savings accounts.
- ▶ The loan rate is the rate charged on auto and boat loans.

## Sandy Cove Bank

- ▶ Expected new demand for fixed-rate, five-year loans and the new supply of fixed-rate, five-year savings accounts at various interest rates.

Loan Rate	Loan Demand	Savings Rate	Savings Supply
6%	\$12,100,000	2%	\$ 4,700,000
7%	10,000,000	3%	5,420,000
8%	8,070,000	4%	8,630,000
9%	6,030,000	5%	9,830,000
10%	4,420,000	6%	11,800,000

- ▶ There are no loans from previous years. Note that the department maintains a 4 percent spread between loan and savings rates to cover processing, loan default, and overhead.

## Sandy Cove Bank

- ▶ The amount of new loans granted is always the lesser of the loan demand and loan supply.
- ▶ For simplicity, this bank may lend 100 percent of deposits.
- ▶ In practice, this rate is set by policy makers and regulators not the bank itself.

## Sandy Cove Bank

- ▶ Although rates are set nationally, the bank may pay or charge slightly different rates to limit demand or boost supply as needed in its local market.
- ▶ The Boat and Car Loan Department incurs processing, loan default, and overhead expenses related to these accounts.

## Sandy Cove Bank

- ▶ The first two expenses vary, depending on the dollar amount of the accounts.
- ▶ The annual processing expense is budgeted to be 1.5 percent of the loan accounts.
- ▶ Default expense is budgeted at 1 percent of the amount loaned per year.

## Sandy Cove Bank

- ▶ Again, loans and savings would ideally be the same.
- ▶ Overhead expenses are estimated to be \$30,000 for the year, regardless of the amount loaned.

## SCB Question 1

1. Calculate the processing, loan default, and overhead expenses for each possible interest rate.

Loan Rate	Loan Demand	Savings Rate	Savings Supply	New Loans
6%	\$12.1 M	2%	\$ 4.7 M	\$ 4.7 M
7%	10	3%	5.42	5.42
8%	8.07	4%	8.63	8.07
9%	6.03	5%	9.83	6.03
10%	4.42	6%	11.8	4.42

## SCB Solution 1

Loan Rate	Loan Demand	Savings Rate	Savings Supply	New Loans	Processing Expenses
6%	\$12.1 M	2%	\$ 4.7 M	\$ 4.7 M	\$70,500
7%	10	3%	5.42	5.42	81,300
8%	8.07	4%	8.63	8.07	121,050
9%	6.03	5%	9.83	6.03	90,450
10%	4.42	6%	11.8	4.42	66,300

- Processing is 1.5% of loan accounts



## SCB Solution 1

Loan Rate	Loan Demand	Savings Rate	Savings Supply	New Loans	Processing Expenses	Default Exp
6%	\$12.1 M	2%	\$ 4.7 M	\$ 4.7 M	\$70,500	\$47,000
7%	10	3%	5.42	5.42	81,300	54,200
8%	8.07	4%	8.63	8.07	121,050	80,700
9%	6.03	5%	9.83	6.03	90,450	60,300
10%	4.42	6%	11.8	4.42	66,300	44,200

- Default expense is budgeted at 1 percent of the amount loaned per year.

## SCB Solution 1

Loan Rate	Loan De-mand	Savings Rate	Savings Supply	New Loans	Processing Expenses	Default Exp	Overhead Expenses
6%	\$12.1M	2%	\$ 4.7M	\$ 4.7M	\$70,500	\$47,000	\$30,000
7%	10	3%	5.42	5.42	81,300	54,200	30,000
8%	8.07	4%	8.63	8.07	121,050	80,700	30,000
9%	6.03	5%	9.83	6.03	90,450	60,300	30,000
10%	4.42	6%	11.8	4.42	66,300	44,200	30,000

- ▶ These are the budgeted expenses, this is the foundation of financing plans to make sure that these resources are in place when they are needed.
- ▶ In this case it is the deposits that need to be in place for the lending to happen.

# Logical flow

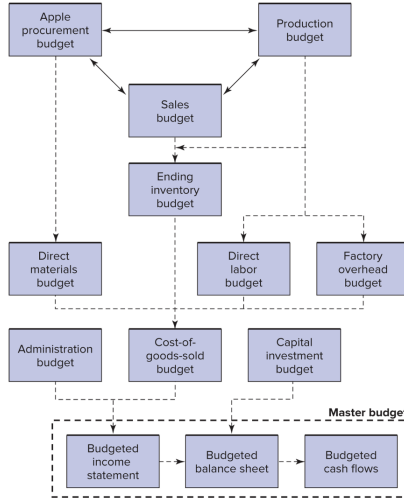


Figure 1: Logical flow

## SCB Question 2

2. Create an annual budgeted income statement for five-year loans and deposits for the Boat and Car Loan Department given a savings interest rate of 4 percent. Remember to match supply and demand.

Interest income	$\$8,070,000 \times 8\% =$	\$645,600
Interest expense	$\$8,070,000 \times 4\% =$	322,800
Net interest income		\$322,800
Fixed overhead		30,000
Processing expense		121,050
Default expense		80,700
Net income		\$ 91,050

## SCB Question 3

3. Table 2 shows the actual income statement for the Boat and Car Loan Department. Included are the actual loans and savings for the same period. Calculate the variances and provide a possible explanation.

	Budget	Actual
Interest income	\$645,600	\$ 645,766
Interest expense	322,800	314,360
Net interest income	\$322,800	\$ 331,406
Fixed overhead	30,000	30,200
Processing expense	121,050	130,522
Default expense	80,700	77,800
Net income	\$ 91,050	\$ 92,884
Loans	8,070,000	\$8,062,000
Deposits	8,070,000	\$8,123,000

## SCB Solution 3

	Budget	Actual	Fav. (Unfav.) Variance
Interest income	\$645,600	\$ 645,766	\$ 166
Interest expense	322,800	314,360	8,440
Net interest income	\$322,800	\$ 331,406	\$ 8,606
Fixed overhead	30,000	30,200	(200)
Processing expense	121,050	130,522	(9,472)
Default expense	80,700	77,800	2,900
Net income	\$ 91,050	\$ 92,884	1,834
Loans	8,070,000	\$8,062,000	\$ (8,000)
Deposits	8,070,000	\$8,123,000	\$(53,000)

## SCB Solution 3

- ▶ Even though loans were lower and deposits were higher than expected, interest income was higher and interest expense was lower than expected.
- ▶ The answer can be obtained by calculating the average interest rates earned and paid.

## SCB Solution 3

- ▶ On \$8,062,000 worth of loans, Sandy Cove earned \$645,766 interest, or 8.01 percent (0.01 percent more than expected).
- ▶ Similarly, it paid only 3.87 percent (0.13 percent less) on deposits.



## SCB Solution 3

- ▶ Therefore, the net interest income variance of \$8,606 is a combination of two effects: the variance in the actual loans and deposits (quantity) and the variance in the interest rates (price).
- ▶ The combined effects are a favorable interest income variance, a favorable interest expense variance, and an overall favorable net interest income variance.

## SCB Solution 3

- ▶ At a savings interest rate of 4 percent, there is an excess supply of deposits over demand for loans.
- ▶ The Boat and Car Loan Department lowered the interest rate on deposits to stem additional deposits.

## SCB Solution 3

- ▶ The increase in the interest rate on loans can be attributed only to an increase in the demand for loans, which resulted in the department charging a slightly higher average interest rate.
- ▶ The higher processing expense could be related to the higher number of accounts processed and improvements in the default rate.
- ▶ That is, the favorable default expense could be attributed to an improved screening process-related to spending more on processing.

## Master Budget

## NaturApples data

- ▶ NaturApples is an upstate New York apple processor with two products: applesauce and apple pie filling.
- ▶ The applesauce is eaten as is, and the pie filling is used to make apple pies.
- ▶ Two types of apples are purchased from local growers, McCouns and Grannys.
- ▶ They are processed and packed in tin cans as either applesauce or pie filling.
- ▶ Principal markets are institutional buyers, such as hospitals, public schools, Page 236 military bases, and universities.
- ▶ NaturApples is a small processor.
- ▶ Its market is regional and is serviced by four sales reps who call on customers in a four-state area.
- ▶ A fifth salesperson markets the products to food distributors, who then sell them directly to restaurants.

## NaturApples data

- ▶ The firm is organized into two departments: processing and marketing.
- ▶ Each is headed by a vice president who reports directly to the president.
- ▶ The vice president of finance is responsible for all financial aspects of the firm, including preparing budgets.
- ▶ The three vice presidents and the president make up NaturApples's executive committee, which oversees the budgeting process.

## NaturApples data

- ▶ Apples are harvested in the fall of each year.
- ▶ The firm has long-term contracts with a number of local apple growers for their crops.
- ▶ If the local harvest is smaller than expected, additional apples can be purchased in the spot market.
- ▶ Likewise, if more apples are delivered than NaturApples wants to process, the extra apples can be sold in the spot market.
- ▶ Long-term contracts with local farmers and spot-market purchases and sales are the responsibility of the president and the vice president of finance.

## NaturApples data

- ▶ Once harvested, the apples are stored either in coolers at NaturApples or in third-party warehouses until NaturApples processes them.
- ▶ Processing takes nine months.
- ▶ In October, the plant starts up after a three-month shutdown.
- ▶ Workers first thoroughly clean and inspect all equipment.



## NaturApples data

- ▶ The apples begin arriving in the middle of October.
- ▶ By the end of November, the apple harvest is in warehouses or started in production.
- ▶ By June, all of the apples have been processed and the plant shuts down for July, August, and September.
- ▶ NaturApples has a fiscal year starting October 1 and ending September 30.

## NaturApples data

- ▶ Each of the two products (applesauce and pie filling) uses a combination of the two types of apples (McCouns and Grannys).
- ▶ The production process consists of inspection, washing, peeling, and coring.
- ▶ The apples are either mashed for applesauce or diced for pie filling and then are combined with other ingredients such as spices and chemical stabilizers and cooked in vats.
- ▶ Both products are immediately canned on a single canning line in five-pound tins and packed in cases of 12 cans per case.
- ▶ The product has a two-year shelf life and is inventoried until ordered by the customer.
- ▶ Independent truckers deliver apples to NaturApples and deliver finished product to customers.

## NaturApples budgeting process

- ▶ The budgeting process begins in August for the next fiscal year's budget, which will begin in 14 months.
- ▶ That is, even though the current fiscal year beginning in October has not yet started, the preparation of next year's budget begins in August.
- ▶ In August, the coming fall harvest is reasonably well known.

## NaturApples budgeting process

- ▶ The president and the vice president of finance forecast the following year's crop harvest under long-term contract.
- ▶ The vice president of marketing begins forecasting sales that will be made from the harvest a year from this fall.
- ▶ Likewise, the processing vice president forecasts production costs and capacity.

## NaturApples budgeting process

- ▶ Every 2 months for the next 14 months, these budgets are revised with regard to marketing, processing, and apple procurement in light of any new information, and all three vice presidents and the president meet for a morning to discuss their revisions.

## NaturApples budgeting process

- ▶ In June of each year, the final master budget for the next fiscal year, which begins October 1, is adopted by the executive committee and approved by the board of directors.
- ▶ The executive committee also meets weekly to review current-year operations as compared with budget and to discuss other operational issues.

## NaturApples budgeting process

- ▶ The figure on the next slide is a schematic that illustrates the relations among component budgets and the NaturApples master budget.
- ▶ The master budget encompasses the budgeted income statement, budgeted balance sheet, and budgeted cash flows at the bottom of the figure.
- ▶ All the other budgets provide the supporting detail, including the various key planning assumptions underlying the master budget.

Logical flow



# Logical flow

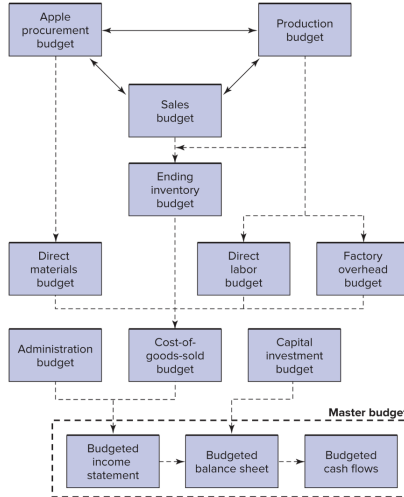


Figure 2: Logical flow

# Logical flow

- ▶ Logical relationships
  - ▶ Sales budget drives production and purchasing
  - ▶ Production drives materials and labor budget
  - ▶ Production and sales drive inventory and cost of goods sold

# Logical flow

- ▶ Master budget statements
  - ▶ Budgeted income statement
  - ▶ Budgeted balance sheet
  - ▶ Budgeted cash flows

## Three key processes

1. procurement
2. sales
3. production

- ▶ These must all be internally consistent so that the volumes produced match the volumes procured and sold.
- ▶ These also determine ending inventory, and flow through the rest of the system.

## NaturApples budgeting process

- ▶ Given the production budget, the direct labor and factory overhead budgets can be generated.
- ▶ These last two budgets and the direct materials budget (from the apple procurement estimates) determine the cost-of-goods-sold budget.

## NaturApples budgeting process

- ▶ The budgeted income statement can then be prepared using these budgets and the budget for administration, which includes senior officer salaries and other administrative expenses not included elsewhere.

## NaturApples budgeting process

- ▶ Toward the bottom of the figure is the capital investment budget, which is based on an analysis of investment proposals.
- ▶ All profitable projects are in the capital investment budget, including those projects started in previous years but not yet completed.
- ▶ The capital investment budget and budgeted income statement are used to prepare NaturApples's budgeted balance sheet and then the cash flow budget.
- ▶ The remainder of this appendix illustrates the preparation of these various component budgets.

## NaturApples budgeting process

- ▶ NaturApples uses the following accounting conventions:
  1. FIFO is used for inventory accounting.
  2. Factory overhead is estimated using a flexible budget.



## NaturApples budgeting process

- ▶ Variable overhead varies with the number of direct labor hours in the plant.
- ▶ Total overhead is then assigned to product costs using the number of hours of direct labor in the product.
- ▶ The table on the next slide provides the basic data for the budgeting illustration.

## NaturApples budgeting process

- ▶ This table contains some primary operating data, such as the beginning inventory figures.
- ▶ The bottom half of the table also shows the amount of each type of apple required to make a case of applesauce and a case of pie filling.

## Basic data

Basic Data for Budgeting Example for Fiscal Year Beginning 10/1/19:

	Cases	Cost/Case	
Beginning Inventory	13,500	\$57.96	\$782,460
Sauce	2,300	\$48.81	\$112,263
Pie filling	McCoun	Granny	
Pounds of Apples/Case			
Sauce	60	40	
Pie filling	50	30	

## Departmental budgets

- ▶ By June, the executive committee has agreed on next year's volumes.
- ▶ The sales budget for the next fiscal year is given in the next table.

## Departmental budgets

- ▶ The executive committee agrees that the firm should be able to sell 140,000 cases of sauce at \$68.95 per case and 60,000 cases of pie filling at \$53.95 per case.
- ▶ These quantities and prices were derived after exploring alternative price-quantity combinations.

## Departmental budgets (sales)

- ▶ In particular, these price-quantity points represent the managers' best judgment of where profits are maximized.
- ▶ Presumably, higher prices (and thus lower sales) or lower prices (and higher sales) would both result in lower profits than the combinations in the next table.

	Budgeted Cases	Budgeted Price/Case	Budgeted Revenue
Sauce	140,000	\$68.95	\$ 9,653,000
Pie filling	60,000	53.95	3,237,000
Total			\$12,890,000