Chapter 9
Flexible Budgets and Performance Analysis

Solutions to Questions

9-1 The planning budget is prepared for the planned level of activity. It is static because it is not adjusted even if the level of activity subsequently changes.

9-2 A flexible budget can be adjusted to reflect any level of activity—including the actual level of activity. By contrast, a static planning budget is prepared for a single level of activity and is not subsequently adjusted.

9-3 Actual results can differ from the budget for many reasons. Very broadly speaking, the differences are usually due to a change in the level of activity, changes in prices, and changes in how effectively resources are managed.

9-4 As noted above, a difference between the budget and actual results can be due to many factors. Most importantly, the level of activity can have a very big impact on costs. From a manager's perspective, a variance that is due to a change in activity is very different from a variance that is due to changes in prices and changes in how effectively resources are managed. A variance of the first kind requires very different actions from a variance of the second kind. Consequently, these two kinds of variances should be clearly separated from each other. When the budget is directly compared to the actual results, these two kinds of variances are lumped together.

9-5 An activity variance is the difference between a revenue or cost item in the flexible budget and the same item in the static planning budget. An activity variance is due solely to the difference in the actual level of activity used in the flexible budget and the level of activity assumed in the planning budget. Caution should be exercised in interpreting an activity variance. The "favorable" and "unfavorable" labels are perhaps misleading for activity variances that involve costs. A "favorable" activity variance for a cost occurs because the cost has some variable component and the actual level of activity is less than the planned level of activity. An "unfavorable" activity variance for a cost occurs because the cost has some variable component and the actual level of activity is greater than the planned level of activity.

9-6 A revenue variance is the difference between the actual revenue for the period and how much the revenue should have been, given the actual level of activity. A revenue variance is easy to interpret. A favorable revenue variance occurs because the revenue is greater than expected for the actual level of activity. An unfavorable revenue variance occurs because the revenue is less than expected for the actual level of activity.

9-7 A spending variance is the difference between the actual amount of the cost and how much a cost should have been, given the actual level of activity. Like the revenue variance, the interpretation of a spending variance is straightforward. A favorable spending variance occurs because the cost is lower than expected for the actual level of activity. An unfavorable spending variance occurs because the cost is higher than expected for the actual level of activity.

9-8 In a flexible budget performance report, the actual results are not directly compared to the static planning budget. The flexible budget is interposed between the actual results and the static planning budget. The differences between the flexible budget and the static planning budget are activity variances. The differences between the actual results and the flexible budget are the revenue and spending variances. The flexible budget performance report cleanly separates the differences between the actual results and the static planning budget that are due to changes in activity (the activity variances) from the differences that are due to changes in prices and the effectiveness with which resources are managed (the revenue and spending variances).

9-9 The only difference between a flexible budget based on a single cost driver and one based on two cost drivers is the cost formulas. When there are two cost drivers, some costs may be a function of the first cost driver, some costs may be a function of the second cost driver, and some costs may be a function of both cost drivers.

9-10 When actual results are directly compared to the static planning budget, it is implicitly assumed that costs (and revenues) should not change with a change in the level of activity. This assumption is valid only for fixed costs. However, it is unlikely that all costs are fixed. Some are likely to be variable or mixed.

9-11 When the static planning budget is adjusted proportionately for a change in activity and then directly compared to actual results, it is implicitly assumed that costs should change in proportion to a change in the level of activity. This assumption is valid only for strictly variable costs. However, it is unlikely that all costs are strictly variable. Some are likely to be fixed or mixed.

The Foundational 15

1. The amount of revenue in the flexible budget for May is:

   Revenue:

Variable element per customer served (a)	$5,000
Actual activity (b)	35
Amount in flexible budget (a) × (b)	$175,000

2. The amount of employee salaries and wages in the flexible budget for May is:

   Employee salaries and wages:

Variable element per customer served (a)	$1,100
Actual activity (b)	35
Variable portion of the amount (a) × (b)	$38,500

Variable portion of the amount	$38,500
Fixed element per month	50,000
Amount in flexible budget	$88,500

3. The amount of travel expenses in the flexible budget for May is:

   Travel expenses:

Variable element per customer served (a)	$600
Actual activity (b)	35
Amount in flexible budget (a) × (b)	$21,000

4. The amount of Other Expenses included in the flexible budget for May would be the fixed element per month of $36,000.

5. The net income reported in the flexible budget can be derived by combining the answers to questions 1-4 as follows:

Revenue		$175,000
Employee salaries and wages	$88,500	
Travel expenses	21,000	
Other expenses	36,000	145,500
Net operating income		$ 29,500

The Foundational 15

6. The revenue variance for May is:

Actual results	Revenue Variance	Flexible Budget
$160,000	$15,000 U	$175,000

7. The employee salaries and wages spending variance for May is:

Actual results	Spending Variance	Flexible Budget
$88,000	$500 F	$88,500

8. The travel expenses spending variance for May is:

Actual results	Spending Variance	Flexible Budget
$19,000	$2,000 F	$21,000

9. The other expenses spending variance for May is:

Actual results	Spending Variance	Flexible Budget
$34,500	$1,500 F	$36,000

10. The amount of revenue in the planning budget for May is:

Revenue:	
Variable element per customer served (a).......	$5,000
Planned level of activity (b)............................	30
Amount in planning budget (a) × (b).............	$150,000

11. The amount of employee salaries and wages in the planning budget for May is:

Employee salaries and wages:	
Variable element per customer served (a).......	$1,100
Actual activity (b)	30
Variable portion of the amount (a) × (b).........	$33,000
Variable portion of the amount.......................	$33,000
Fixed element per month	50,000
Amount in planning budget	$83,000

The Foundational 15

12. The amount of travel expenses in the planning budget for May is:

Travel expenses:	
Variable element per customer served (a).......	$600
Actual activity (b)...	30
Amount in planning budget (a) × (b).............	$18,000

13. The amount of Other Expenses included in the planning budget for May would be the fixed element per month of $36,000.

14. The activity variance for revenue for May is:

Flexible Budget	Activity Variance	Planning Budget
$175,000	$25,000 F	$150,000

15. The activity variances for the expenses for May are as follows:

	Flexible Budget	Activity Variance	Planning Budget
Employee salaries and wages	$88,500	$5,500 U	$83,000
Travel expenses	$21,000	$3,000 U	$18,000
Other expenses	$36,000	$0	$36,000

Exercise 9-1 (10 minutes)

Puget Sound Divers
Flexible Budget
For the Month Ended May 31

Actual diving-hours	105
Revenue ($365.00q)	$38,325
Expenses:	
Wages and salaries ($8,000 + $125.00q)	21,125
Supplies ($3.00q)	315
Equipment rental ($1,800 + $32.00q)	5,160
Insurance ($3,400)	3,400
Miscellaneous ($630 + $1.80q)	819
Total expense	30,819
Net operating income	$ 7,506

Exercise 9-2 (15 minutes)

1. The activity variances are shown below:

Flight Café
Activity Variances
For the Month Ended July 31

	Flexible Budget	*Planning Budget*	*Activity Variances*	
Meals	17,800	18,000		
Revenue ($4.50q)	$80,100	$81,000	$900	U
Expenses:				
Raw materials ($2.40q)	42,720	43,200	480	F
Wages and salaries ($5,200 + $0.30q)	10,540	10,600	60	F
Utilities ($2,400 + $0.05q)	3,290	3,300	10	F
Facility rent ($4,300)	4,300	4,300	0	
Insurance ($2,300)	2,300	2,300	0	
Miscellaneous ($680 + $0.10q)	2,460	2,480	20	F
Total expense	65,610	66,180	570	F
Net operating income	$14,490	$14,820	$330	U

2. Management should be concerned that the level of activity fell below what had been planned for the month. This led to an expected decline in profits of $330. However, the individual items on the report should not receive much management attention. The unfavorable variance for revenue and the favorable variances for expenses are entirely caused by the drop in activity.

Exercise 9-3 (15 minutes)

Quilcene Oysteria
Revenue and Spending Variances
For the Month Ended August 31

	Actual Results	*Flexible Budget*	*Revenue and Spending Variances*	
Pounds	8,000	8,000		
Revenue ($4.00q)	$35,200	$32,000	$3,200	F
Expenses:				
Packing supplies ($0.50q)	4,200	4,000	200	U
Oyster bed maintenance ($3,200)	3,100	3,200	100	F
Wages and salaries ($2,900 + $0.30q)	5,640	5,300	340	U
Shipping ($0.80q)	6,950	6,400	550	U
Utilities ($830)	810	830	20	F
Other ($450 + $0.05q)	980	850	130	U
Total expense	21,680	20,580	1,100	U
Net operating income	$13,520	$11,420	$2,100	F

Exercise 9-4 (20 minutes)

1.

Vulcan Flyovers
Flexible Budget Performance Report
For the Month Ended July 31

	Actual Results	*Revenue and Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Flights (q)	48			48			50
Revenue ($320.00q)	$13,650	$1,710	U	$15,360	$640	U	$16,000
Expenses:							
Wages and salaries ($4,000 + $82.00q)	8,430	494	U	7,936	164	F	8,100
Fuel ($23.00q)	1,260	156	U	1,104	46	F	1,150
Airport fees ($650 + $38.00q)	2,350	124	F	2,474	76	F	2,550
Aircraft depreciation ($7.00q)	336	0		336	14	F	350
Office expenses ($190 + $2.00q)	460	174	U	286	4	F	290
Total expense	12,836	700	U	12,136	304	F	12,440
Net operating income	$ 814	$2,410	U	$ 3,224	$336	U	$ 3,560

2. The overall $336 unfavorable activity variance is due to activity falling below what had been planned for the month. The $1,710 unfavorable revenue variance is very large relative to the company's net operating income and should be investigated. Was this due to discounts given or perhaps a lower average number of passengers per flight than usual? The $494 unfavorable spending variance for wages and salaries is also large and should be investigated. The other spending variances are relatively small, but are worth some management attention—particularly if they recur next month.

Exercise 9-5 (15 minutes)

Alyeski Tours
Planning Budget
For the Month Ended July 31

Budgeted cruises (q_1)	24
Budgeted passengers (q_2)	1,400
Revenue (25.00q_2$)	$35,000
Expenses:	
Vessel operating costs ($5,200 + 480.00q_1$ +2.00q_2$)	19,520
Advertising ($1,700)	1,700
Administrative costs ($4,300 + 24.00q_1$ +1.00q_2$)	6,276
Insurance ($2,900)	2,900
Total expense	30,396
Net operating income	$ 4,604

Exercise 9-6 (10 minutes)

The variance report compares actual results to the planning budget and should *not* be used to evaluate how well costs were controlled during April. The planning budget is based on 100 jobs, but the actual results are for 105 jobs. Consequently, the actual revenues and many of the actual costs *should* have been different from what was budgeted at the beginning of the period. Direct comparisons of budgeted to actual costs are valid only if the costs are fixed.

To evaluate how well revenues and costs were controlled, it is necessary to estimate what the revenues and costs should have been for the actual level of activity using a flexible budget. The flexible budget amounts can then be compared to the actual results to evaluate how well revenues and costs were controlled.

Exercise 9-7 (15 minutes)

The adjusted budget was created by multiplying each item in the budget by the ratio 105/100; in other words, each item was adjusted upward by 5%. This procedure provides valid benchmarks for revenues and for costs that are strictly variable, but overstates what fixed and mixed costs should be. Fixed costs, for example, should not increase at all if the activity level increases by 5%—providing, of course, that this level of activity is within the relevant range. Mixed costs should increase less than 5%.

To evaluate how well revenues and costs were controlled, it is necessary to estimate what the revenues and costs should have been for the actual level of activity using a flexible budget that explicitly recognizes fixed and mixed costs. The flexible budget amounts can then be compared to the actual results to evaluate how well revenues and costs were controlled.

Exercise 9-8 (20 minutes)

	Flexible Budget	Planning Budget	Activity Variances	
Repair-hours (q)	2,900	2,800		
Revenue ($44.50q)	$129,050	$124,600	$4,450	F
Expenses:				
Wages and salaries ($23,200 + $16.30q)	70,470	68,840	1,630	U
Parts and supplies ($8.60q)	24,940	24,080	860	U
Equipment depreciation ($1,600 + $0.40q)	2,760	2,720	40	U
Truck operating expenses ($6,400 + $1.70q)	11,330	11,160	170	U
Rent ($3,480)	3,480	3,480	0	
Administrative expenses ($4,500 + $0.80q)	6,820	6,740	80	U
Total expense	119,800	117,020	2,780	U
Net operating income	$ 9,250	$ 7,580	$1,670	F

Exercise 9-9 (10 minutes)

Wyckam Manufacturing Inc.
Planning Budget for Manufacturing Costs
For the Month Ended June 30

Budgeted machine-hours (q)	5,000
Direct materials ($4.25q)..............	$21,250
Direct labor ($36,800)..................	36,800
Supplies ($0.30q)	1,500
Utilities ($1,400 + $0.05q)	1,650
Depreciation ($16,700)	16,700
Insurance ($12,700)	12,700
Total manufacturing cost..............	$90,600

Exercise 9-10 (15 minutes)

Lavage Rapide
Planning Budget
For the Month Ended August 31

Budgeted cars washed (q)	9,000
Revenue ($4.90q)	$44,100
Expenses:	
Cleaning supplies ($0.80q)	7,200
Electricity ($1,200 + $0.15q)	2,550
Maintenance ($0.20q)	1,800
Wages and salaries ($5,000 + $0.30q)	7,700
Depreciation ($6,000)	6,000
Rent ($8,000)	8,000
Administrative expenses ($4,000 + $0.10q)	4,900
Total expense	38,150
Net operating income	$ 5,950

Exercise 9-11 (15 minutes)

Lavage Rapide
Flexible Budget
For the Month Ended August 31

Actual cars washed (q)	8,800
Revenue ($4.90q)	$43,120
Expenses:	
Cleaning supplies ($0.80q)	7,040
Electricity ($1,200 + $0.15q)	2,520
Maintenance ($0.20q)	1,760
Wages and salaries ($5,000 + $0.30q)	7,640
Depreciation ($6,000)	6,000
Rent ($8,000)	8,000
Administrative expenses ($4,000 + $0.10q)	4,880
Total expense	37,840
Net operating income	$ 5,280

Exercise 9-12 (20 minutes)

	Flexible Budget	*Planning Budget*	*Activity Variances*	
Cars washed (q)	8,800	9,000		
Revenue ($4.90q)	$43,120	$44,100	$980	U
Expenses:				
Cleaning supplies ($0.80q)	7,040	7,200	160	F
Electricity ($1,200 + $0.15q)	2,520	2,550	30	F
Maintenance ($0.20q)	1,760	1,800	40	F
Wages and salaries ($5,000 + $0.30q)	7,640	7,700	60	F
Depreciation ($6,000)	6,000	6,000	0	
Rent ($8,000)	8,000	8,000	0	
Administrative expenses ($4,000 + $0.10q)	4,880	4,900	20	F
Total expense	37,840	38,150	310	F
Net operating income	$ 5,280	$ 5,950	$670	U

Exercise 9-13 (20 minutes)

Lavage Rapide
Revenue and Spending Variances
For the Month Ended August 31

	Actual Results	*Flexible Budget*	*Revenue and Spending Variances*	
Cars washed (q)	8,800	8,800		
Revenue ($4.90q)	$43,080	$43,120	$ 40	U
Expenses:				
Cleaning supplies ($0.80q)	7,560	7,040	520	U
Electricity ($1,200 + $0.15q)	2,670	2,520	150	U
Maintenance ($0.20q)	2,260	1,760	500	U
Wages and salaries ($5,000 + $0.30q)	8,500	7,640	860	U
Depreciation ($6,000)	6,000	6,000	0	
Rent ($8,000)	8,000	8,000	0	
Administrative expenses ($4,000 + $0.10q)	4,950	4,880	70	U
Total expense	39,940	37,840	2,100	U
Net operating income	$ 3,140	$ 5,280	$2,140	U

Exercise 9-14 (30 minutes)

Lavage Rapide
Flexible Budget Performance Report
For the Month Ended August 31

	Actual Results	*Revenue and Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Cars washed (q)	8,800			8,800			9,000
Revenue ($4.90q)	$43,080	$ 40	U	$43,120	$980	U	$44,100
Expenses:							
Cleaning supplies ($0.80q)	7,560	520	U	7,040	160	F	7,200
Electricity ($1,200 + $0.15q)	2,670	150	U	2,520	30	F	2,550
Maintenance ($0.20q)	2,260	500	U	1,760	40	F	1,800
Wages and salaries ($5,000 + $0.30q)	8,500	860	U	7,640	60	F	7,700
Depreciation ($6,000)	6,000	0		6,000	0		6,000
Rent ($8,000)	8,000	0		8,000	0		8,000
Administrative expenses ($4,000 + $0.10q)	4,950	70	U	4,880	20	F	4,900
Total expense	39,940	2,100	U	37,840	310	F	38,150
Net operating income	$ 3,140	$2,140	U	$ 5,280	$670	U	$ 5,950

Exercise 9-15 (45 minutes)

1. The planning budget appears below. Note that the report does not include revenue or net operating income because the production department is a cost center that does not have any revenue.

Packaging Solutions Corporation
Production Department Planning Budget
For the Month Ended March 31

Budgeted labor-hours (q)	8,000
Direct labor ($15.80q)	$126,400
Indirect labor ($8,200 + $1.60q)	21,000
Utilities ($6,400 + $0.80q)	12,800
Supplies ($1,100 + $0.40q)	4,300
Equipment depreciation ($23,000 + $3.70q)	52,600
Factory rent ($8,400)	8,400
Property taxes ($2,100)	2,100
Factory administration ($11,700 + $1.90q)	26,900
Total expense	$254,500

2. The flexible budget appears below. Like the planning budget, this report does not include revenue or net operating income because the production department is a cost center that does not have any revenue.

Packaging Solutions Corporation
Production Department Flexible Budget
For the Month Ended March 31

Actual labor-hours (q)	8,400
Direct labor ($15.80q)	$132,720
Indirect labor ($8,200 + $1.60q)	21,640
Utilities ($6,400 + $0.80q)	13,120
Supplies ($1,100 + $0.40q)	4,460
Equipment depreciation ($23,000 + $3.70q)	54,080
Factory rent ($8,400)	8,400
Property taxes ($2,100)	2,100
Factory administration ($11,700 + $1.90q)	27,660
Total expense	$264,180

Exercise 9-15 (continued)

3. The flexible budget performance report appears below. This report does not include revenue or net operating income because the production department is a cost center that does not have any revenue.

Packaging Solutions Corporation
Production Department Flexible Budget Performance Report
For the Month Ended March 31

	Actual Results	*Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Labor-hours (q)	8,400			8,400			8,000
Direct labor ($15.80q)	$134,730	$2,010	U	$132,720	$6,320	U	$126,400
Indirect labor ($8,200 + $1.60q)	19,860	1,780	F	21,640	640	U	21,000
Utilities ($6,400 + $0.80q)	14,570	1,450	U	13,120	320	U	12,800
Supplies ($1,100 + $0.40q)	4,980	520	U	4,460	160	U	4,300
Equipment depreciation ($23,000 + $3.70q)	54,080	0		54,080	1,480	U	52,600
Factory rent ($8,400)	8,700	300	U	8,400	0		8,400
Property taxes ($2,100)	2,100	0		2,100	0		2,100
Factory administration ($11,700 + $1.90q)	26,470	1,190	F	27,660	760	U	26,900
Total expense	$265,490	$1,310	U	$264,180	$9,680	U	$254,500

Exercise 9-15 (continued)

4. The overall unfavorable activity variance of $9,680 occurred because the actual level of activity exceeded the budgeted level of activity. The production manager certainly should not be held responsible for this unfavorable variance if this increased activity was due to more orders or more sales. On the other hand, the overall unfavorable spending variance of $1,310 may be of concern to management. Why did the unfavorable—and favorable—variances occur? Even the relatively small unfavorable spending variance for supplies of $520 should probably be investigated because, as a percentage of what the cost should have been ($520/$4,460 = 11.7%), this variance is fairly large.

Exercise 9-16 (20 minutes)

Via Gelato
Revenue and Spending Variances
For the Month Ended June 30

	Actual Results	*Flexible Budget*	*Revenue and Spending Variances*	
Liters (q)	6,200	6,200		
Revenue ($12.00q)	$71,540	$74,400	$2,860	U
Expenses:				
Raw materials ($4.65q)	29,230	28,830	400	U
Wages ($5,600 + $1.40q)	13,860	14,280	420	F
Utilities ($1,630 + $0.20q)	3,270	2,870	400	U
Rent ($2,600)	2,600	2,600	0	
Insurance ($1,350)	1,350	1,350	0	
Miscellaneous ($650 + $0.35q)	2,590	2,820	230	F
Total expense	52,900	52,750	150	U
Net operating income	$18,640	$21,650	$3,010	U

Exercise 9-17 (30 minutes)

AirQual Test Corporation
Flexible Budget Performance Report
For the Month Ended February 28

	Actual Results	*Revenue and Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Jobs (q)	52			52			50
Revenue ($360.00q)	$18,950	$230	F	$18,720	$720	F	$18,000
Expenses:							
Technician wages ($6,400)	6,450	50	U	6,400	0		6,400
Mobile lab operating expenses ($2,900 + $35.00q)	4,530	190	F	4,720	70	U	4,650
Office expenses ($2,600 + $2.00q)	3,050	346	U	2,704	4	U	2,700
Advertising expenses ($970)	995	25	U	970	0		970
Insurance ($1,680)	1,680	0		1,680	0		1,680
Miscellaneous expenses ($500 + $3.00q)	465	191	F	656	6	U	650
Total expense	17,170	40	U	17,130	80	U	17,050
Net operating income	$ 1,780	$190	F	$ 1,590	$640	F	$ 950

Exercise 9-18 (45 minutes)

1. The planning budget based on 3 courses and 45 students appears below:

Gourmand Cooking School
Planning Budget
For the Month Ended September 30

Budgeted courses (q_1)	3
Budgeted students (q_2)	45
Revenue (800q_2$)	$36,000
Expenses:	
Instructor wages ($3,080$q_1$)	9,240
Classroom supplies (260q_2$)	11,700
Utilities ($870 + 130q_1$)	1,260
Campus rent ($4,200)	4,200
Insurance ($1,890)	1,890
Administrative expenses ($3,270 + 15q_1$ +4q_2$)	3,495
Total expense	31,785
Net operating income	$ 4,215

2. The flexible budget based on 3 courses and 42 students appears below:

Gourmand Cooking School
Flexible Budget
For the Month Ended September 30

Actual courses (q_1)	3
Actual students (q_2)	42
Revenue (800q_2$)	$33,600
Expenses:	
Instructor wages ($3,080$q_1$)	9,240
Classroom supplies (260q_2$)	10,920
Utilities ($870 + 130q_1$)	1,260
Campus rent ($4,200)	4,200
Insurance ($1,890)	1,890
Administrative expenses ($3,270 + 15q_1$ +4q_2$)	3,483
Total expense	30,993
Net operating income	$ 2,607

Exercise 9-18 (continued)

3. The flexible budget performance report for September appears below:

Gourmand Cooking School
Flexible Budget Performance Report
For the Month Ended September 30

	Actual Results	*Revenue and Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Courses (q1)	3			3			3
Students (q2)	42			42			45
Revenue ($800q2)	$32,400	$1,200	U	$33,600	$2,400	U	$36,000
Expenses:							
Instructor wages ($3,080q1)	9,080	160	F	9,240	0		9,240
Classroom supplies ($260q2)	8,540	2,380	F	10,920	780	F	11,700
Utilities ($870 + $130q1)	1,530	270	U	1,260	0		1,260
Campus rent ($4,200)	4,200	0		4,200	0		4,200
Insurance ($1,890)	1,890	0		1,890	0		1,890
Administrative expenses ($3,270 + $15q1 +$4q2)	3,790	307	U	3,483	12	F	3,495
Total expense	29,030	1,963	F	30,993	792	F	31,785
Net operating income	$ 3,370	$ 763	F	$ 2,607	$ 1,608	U	$ 4,215

Problem 9-19 (30 minutes)

1. The activity variances are shown below:

FAB Corporation
Activity Variances
For the Month Ended March 31

	Flexible Budget	*Planning Budget*	*Activity Variances*	
Machine-hours (q)	26,000	30,000		
Utilities ($20,600 + $0.10q)	$ 23,200	$ 23,600	$ 400	F
Maintenance ($40,000 + $1.60q)	81,600	88,000	6,400	F
Supplies ($0.30q)	7,800	9,000	1,200	F
Indirect labor ($130,000 + $0.70q)	148,200	151,000	2,800	F
Depreciation ($70,000)	70,000	70,000	0	
Total	$330,800	$341,600	$10,800	F

The activity variances are all favorable because the actual activity was less than the planned activity and therefore all of the variable costs should be lower than planned in the original budget.

Problem 9-19 (continued)

2. The spending variances are computed below:

FAB Corporation
Spending Variances
For the Month Ended March 31

	Actual Results	*Flexible Budget*	*Spending Variances*	
Machine-hours (q)	26,000	26,000		
Utilities ($20,600 + $0.10q)	$ 24,200	$ 23,200	$1,000	U
Maintenance ($40,000 + $1.60q)	78,100	81,600	3,500	F
Supplies ($0.30q)	8,400	7,800	600	U
Indirect labor ($130,000 + $0.70q)	149,600	148,200	1,400	U
Depreciation ($70,000)	71,500	70,000	1,500	U
Total	$331,800	$330,800	$1,000	U

An unfavorable spending variance means that the actual cost was greater than what the cost should have been for the actual level of activity. A favorable spending variance means that the actual cost was less than what the cost should have been for the actual level of activity. While this makes intuitive sense, sometimes a favorable variance may not be good. For example, the rather large favorable variance for maintenance might have resulted from performing less maintenance. Since these variances are all fairly large, they should all probably be investigated.

Problem 9-20 (30 minutes)

1.

Milano Pizza
Flexible Budget Performance Report
For the Month Ended November 30

	Actual Results	Revenue and Spending Variances		Flexible Budget	Activity Variances		Planning Budget
Pizzas (q_1)	1,240			1,240			1,200
Deliveries (q_2)	174			174			180
Revenue (13.50q_1$)	$17,420	$680	F	$16,740	$540	F	$16,200
Expenses:							
Pizza ingredients (3.80q_1$)	4,985	273	U	4,712	152	U	4,560
Kitchen staff ($5,220)	5,281	61	U	5,220	0		5,220
Utilities ($630 + 0.05q_1$)	984	292	U	692	2	U	690
Delivery person (3.50q_2$)	609	0		609	21	F	630
Delivery vehicle ($540 + 1.50q_2$)	655	146	F	801	9	F	810
Equipment depreciation ($275)	275	0		275	0		275
Rent ($1,830)	1,830	0		1,830	0		1,830
Miscellaneous ($820 + 0.15q_1$)	954	52	F	1,006	6	U	1,000
Total expense	15,573	428	U	15,145	130	U	15,015
Net operating income	$ 1,847	$252	F	$ 1,595	$410	F	$ 1,185

Problem 9-20 (continued)

2. Some of the activity variances are favorable and some are unfavorable. This occurs because there are two cost drivers (i.e., measures of activity) and one is up while the other is down. The actual number of pizzas delivered is greater than budgeted, so the activity variance for revenue is favorable, but the activity variances for pizza ingredients, utilities, and miscellaneous are unfavorable. In contrast, the actual number of deliveries is less than budgeted, so the activity variances for the delivery person and the delivery vehicle are favorable.

Problem 9-21 (45 minutes)

1. The variance report should *not* be used to evaluate how well costs were controlled. In July, the planning budget was based on 150 lessons, but the actual results are for 155 lessons—an increase of more than 3% over budget. Consequently, the actual revenues and many of the actual costs *should* have been different from what was budgeted at the beginning of the period. For example, instructor wages, a variable cost, should have increased by more than 3% because of the increase in activity, but the variance report assumes that they should not have increased at all. This results in a spurious unfavorable variance for instructor wages. Direct comparisons of budgeted to actual costs are valid only if the costs are fixed.

2. See the following page.

3. The overall activity variance for net operating income was $435 F (favorable). That means that as a consequence of the increase in activity from 150 lessons to 155 lessons, the net operating income should have been up $435 over budget. However, it wasn't. The budgeted net operating income was $8,030 and the actual net operating income was $8,080, so the profit was up by only $50—not $435 as it should have been. There are many reasons for this—as shown in the revenue and spending variances. Perhaps most importantly, fuel costs were much higher than expected. The spending variance for fuel was $425 U (unfavorable) and may have been due to an increase in the price of fuel that is beyond the owner/manager's control. Most of the other spending variances were favorable, so with the exception of this item, costs seem to have been adequately controlled. In addition, the unfavorable revenue variance of $200 indicates that revenue was slightly less than they should have been. This variance is very small relative to the size of the revenue, so it may not justify investigation.

Problem 9-21 (continued)

TipTop Flight School
Flexible Budget Performance Report
For the Month Ended July 31

	Actual Results	*Revenue and Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Lessons (q)	155			155			150
Revenue ($220q)	$33,900	$200	U	$34,100	$1,100	F	$33,000
Expenses:							
Instructor wages ($65q)	9,870	205	F	10,075	325	U	9,750
Aircraft depreciation ($38q)	5,890	0		5,890	190	U	5,700
Fuel ($15q)	2,750	425	U	2,325	75	U	2,250
Maintenance ($530 + $12q)	2,450	60	U	2,390	60	U	2,330
Ground facility expenses ($1,250 + $2q)	1,540	20	F	1,560	10	U	1,550
Administration ($3,240 + $1q)	3,320	75	F	3,395	5	U	3,390
Total expense	25,820	185	U	25,635	665	U	24,970
Net operating income	$ 8,080	$385	U	$ 8,465	$ 435	F	$ 8,030

Problem 9-22 (30 minutes)

1. Performance should be evaluated using a flexible budget performance report. In this case, the report will not include revenues.

St. Lucia Blood Bank
Flexible Budget Performance Report
For the Month Ended September 30

	Actual Results	*Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Liters of blood collected (q)	620			620			500
Medical supplies ($15.00q)	$ 9,250	$ 50	F	$ 9,300	$1,800	U	$ 7,500
Lab tests ($12.00q)	6,180	1,260	F	7,440	1,440	U	6,000
Equipment depreciation ($2,500)	2,800	300	U	2,500	0		2,500
Rent ($1,000)	1,000	0		1,000	0		1,000
Utilities ($500)	570	70	U	500	0		500
Administration ($10,000 + $2.50q)......	11,740	190	U	11,550	300	U	11,250
Total expense	$31,540	$ 750	F	$32,290	$3,540	U	$28,750

2. The overall unfavorable activity variance of $3,540 was caused by the 24% increase in activity. There is no reason to investigate this particular variance. The overall spending variance is $750 F, which would seem to indicate that costs were well-controlled. However, the favorable $1,260 spending variance for lab tests is curious. The fact that this variance is favorable indicates that less was spent on lab tests than should have been spent according to the cost formula. Why? Did the blood bank get a substantial discount on the lab tests? Did the blood bank fail to perform required lab tests? If so, was this wise? In addition, the unfavorable spending variance of $300 for equipment depreciation requires some explanation. Was more equipment obtained to collect the additional blood?

Problem 9-23 (45 minutes)

1. The report prepared by the bookkeeper compares average budgeted per unit revenues and costs to average actual per unit revenues and costs. This approach implicitly assumes that all costs are strictly variable; only variable costs should be constant on a per unit basis. The average fixed cost should decrease as the level of activity increases and should increase as the level of activity decreases. In this case, the actual level of activity was greater than the budgeted level of activity. As a consequence, the average cost per unit for any cost that is fixed or mixed (such as office expenses, equipment depreciation, rent, and insurance) *should* decline and show a favorable variance. This makes it difficult to interpret the variance for a mixed or fixed cost. For example, was the favorable $9 variance per exchange for rent due simply to the increased volume or did the company actually save any money on its rent? Because of this ambiguity, the report prepared by the bookkeeper is not as useful as a performance report prepared using a flexible budget.

2. A flexible budget performance report would be much more helpful in assessing the performance of the company than the report prepared by the bookkeeper. To construct such a report, we first need to determine the cost formulas as follows, where q is the number of exchanges completed:

Revenue	$395q	The revenue all comes from fees.
Legal and search fees	$165q	Variable cost
Office expenses	$5,200 + $5q	$5,200 is fixed; $5 = ($135 × 40 − $5,200)/40
Equipment depreciation	$400	$400 = $10 × 40
Rent	$1,800	$1,800 = $45 × 40
Insurance	$200	$200 = $5 × 40

Problem 9-23 (continued)

Exchange Corp.
Flexible Budget Performance Report
For the Month Ended May 31

	Actual Results	*Revenue and Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Exchanges completed (q)	50			50			40
Revenue ($395q)	$19,250	$500	U	$19,750	$3,950	F	$15,800
Expenses:							
Legal and search fees ($165q)....	9,200	950	U	8,250	1,650	U	6,600
Office expenses ($5,200 + $5q)	5,600	150	U	5,450	50	U	5,400
Equipment depreciation ($400)...	400	0		400	0		400
Rent ($1,800)...........................	1,800	0		1,800	0		1,800
Insurance ($200)......................	200	0		200	0		200
Total expense	17,200	1,100	U	16,100	1,700	U	14,400
Net operating income	$ 2,050	$1,600	U	$ 3,650	$2,250	F	$ 1,400

3. On the one hand, the increase in the number of exchanges completed was positive. The overall favorable activity of $2,250 indicates that the net operating income should have increased by that amount because of the increase in activity. However, the net operating income did not actually increase by nearly that much. This was due to the unfavorable revenue variance and a number of unfavorable spending variances, all of which should be investigated by the owner.

Problem 9-24 (45 minutes)

1. The cost reports are of little use for assessing how well costs were controlled. The problem is that the company is comparing budgeted costs at one level of activity to actual costs at another level of activity. Costs that are variable will naturally be different at these two different levels of activity. Although the cost reports do a good job of showing whether fixed costs were controlled, they do not do a good job of showing whether variable costs were controlled. Since sales have chronically failed to meet budget, the level of activity in the factory is also likely to have chronically been below budget. Consequently, the variances for variable costs have likely been favorable simply because activity has been less than budgeted in the production departments. No wonder the production supervisors have been pleased with the reports.

2. The company should use a flexible budget approach to evaluate cost control. Under the flexible budget approach, the actual costs incurred in working 35,000 machine-hours are compared to what the costs should have been for that level of activity.

3. See the following page.

4. The flexible budget performance report provides a much clearer picture of the performance of the Assembly Department than the original cost control report prepared by the company. The overall activity variance is $13,500 F (favorable) which simply reflects the fact that the actual level of activity was significantly less than the budgeted level of activity. The variable costs would naturally be less than budgeted.

   The spending variances indicate that costs were *not* controlled by the Assembly Department. All three of the variable costs have large unfavorable spending variances and those variances are significantly larger than the one favorable spending variance on the report.

Problem 9-24 (continued)

3.

Westmont Corporation
Assembly Department
Flexible Budget Performance Report
For the Month Ended March 31

	Actual Results	*Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Machine-hours (q)	35,000			35,000			40,000
Supplies ($0.80q)*	$ 29,700	$ 1,700	U	$ 28,000	$4,000	F	$ 32,000
Scrap ($0.50q)*	19,500	2,000	U	17,500	2,500	F	20,000
Indirect materials ($1.40q)*	51,800	2,800	U	49,000	7,000	F	56,000
Wages and salaries ($80,000)	79,200	800	F	80,000	0		80,000
Equipment depreciation ($60,000)	60,000	0		60,000	0		60,000
Total	$240,200	$ 5,700	U	$234,500	$13,500	F	$248,000

*The variable cost per machine-hour is obtained by dividing the total variable cost from the planning budget by 30,000 machine-hours.

Problem 9-25 (45 minutes)

1. The cost control report compares the planning budget, which was prepared for 35,000 machine-hours, to actual results for 38,000 machine-hours. This is like comparing apples to oranges. Costs that are variable or mixed *should* be higher when the activity level is 38,000 rather than 35,000 machine-hours. Direct comparisons of budgeted to actual costs are valid only if the costs are fixed. The cost control report prepared by the company should *not* be used to evaluate how well costs were controlled.

Problem 9-25 (continued)

2. A report that would be helpful in assessing how well costs were controlled appears below:

Freemont Corporation—Machining Department
Flexible Budget Performance Report
For the Month Ended June 30

	Actual Results	*Spending Variances*		*Flexible Budget*	*Activity Variances*		*Planning Budget*
Machine-hours (q)	38,000			38,000			35,000
Direct labor wages ($2.30q)	$ 86,100	$ 1,300	F	$ 87,400	$6,900	U	$ 80,500
Supplies ($0.60q)	23,100	300	U	22,800	1,800	U	21,000
Maintenance ($92,000 + $1.20q)	137,300	300	F	137,600	3,600	U	134,000
Utilities ($11,700 + $0.10q)	15,700	200	U	15,500	300	U	15,200
Supervision ($38,000)	38,000	0		38,000	0		38,000
Depreciation ($80,000)	80,000	0		80,000	0		80,000
Total	$380,200	$ 1,100	F	$381,300	$12,600	U	$368,700

Note that in this new report the overall spending variance is favorable—indicating that costs were most likely under control.