ESERCIZI

1 PERFORMANCE REPORT

Dagmar Company budgeted the following amounts:

Variable costs of production:	
Direct materials	3 pounds @0.80 per pound
Direct labor	0.5 hr.@$12.00 per hour
Variable overhead	0.5 hr. @ $1.50
Fixed overhead:	
Materials handling	$6,200
Depreciation	$2,600

At the end of the year, Dagmar had the following actual costs for production of 2,900 units:

Direct materials	$ 6,900
Direct labor	17,340
Variable overhead	2,200
Fixed overhead:	
Materials handling	6,300
Depreciation	2,600

Required:

Prepare a performance report using a budget based on the actual level of production.

2 VARIABLE OVERHEAD SPENDING AND EFFICIENCY VARIANCES, COLUMNAR AND FORMULA APPROACHES

A company provided the following information:

Standard variable overhead rate (*SVOR*) per direct labor hour
$4.50 Actual variable overhead rate (*AVOR*) per direct labor hour
$4.52 Actual direct labor hours worked (*AH*)
36,100
Actual production in units
12.000

Required:

1. Using the columnar approach, calculate the variable overhead spending and effi ciency variances.
2. Using the formula approach, calculate the variable overhead spending variance.
3. Using the formula approach, calculate the variable overhead efficiency variance.
4. Calculate the total variable overhead variance.

3 TOTAL FIXED OVERHEAD VARIANCE

A company provided the following data:

Standard fixed overhead rate (SFOR)	$7 per direct labor hour
Actual fixed overhead costs	$250,895
Standard hours allowed per unit	3 hours
Actual production	12.000 units

Required:

1. Calculate the standard hours allowed for actual production.
2. Calculate the applied fixed overhead.
3. Calculate the total fixed overhead variance.

4 FIXED OVERHEAD SPENDING AND VOLUME VARIANCES, COLUMNAR AND FORMULA APPROACHES

A company provided the following information:

Standard fixed overhead rate (*SFOR*) per direct labor hour	$7.00
Actual fixed overhead rate (*AFOR*) per direct labor hour	$6.95
Actual direct labor hours worked (*AH*)	36,100
Actual production in units	12,000
Standard hours allowed for actual units produced (*SH*)	36,000

Required:

1. Using the columnar approach, calculate the fixed overhead spending and efficiency variances.
2. Using the formula approach, calculate the fixed overhead spending variance.
3. Using the formula approach, calculate the fixed overhead efficiency variance.
4. Calculate the total fixed overhead variance.

5 STATIC BUDGET FOR AN ACTIVITY

Jefferson Company decided to look more closely at the inspection activity in its factory. The following information for a year was collected:

Demand for inspections: 130,000
Resources needed:

a. 7 inspectors, capable of inspecting 20,000 units per year. Salary is $35,000 each.
b. Supplies (small tools, oil, rags) expected to cost $0.60 per inspection.
c. Workbenches, computers, etc., depreciation: $16,700 per year.
d. Factory space for the inspection station, utilities: $13,400 per year.

Required:

Prepare a static budget for the inspection activity for the year.

6 ACTIVITY-BASED PERFORMANCE REPORT

Cohlmia Company produced 32,000 units last year. The information on the actual costs and budgeted costs at actual production of four activities is provided below.

Activity	Actual Cost	Budgeted Cost for Actual Production
Maintenance	$187,300	$190,000
Machining	204,000	205,000
Setting up	114,000	112,500
Purchasing	135,300	135,000

Required:

Prepare an activity-based performance report for the four activities for the past year.

Exercise 21-30 PERFORMANCE REPORT

Master Budget	**Actual Data**
Budgeted production: 2,500	Actual production: 2,600 units
Materials: 2 leather strips @ $3.00	Materials cost: $15,250
Labor: 0.5 hr. @ $12.00	Labor cost: $16,000

Required:

1. Prepare a performance report using a budget based on expected production.
2. Comment on the limitations of this report.

7 FLEXIBLE BUDGET FOR VARIOUS LEVELS OF PRODUCTION

Budgeted amounts for the year:

Materials	2 leather strips @
Labor	0.5 hr. @ $12.00
Variable overhead	0.5 hr. @ $1.00
Fixed overhead	$4,500

Required:

1. Prepare a flexible budget for 2,000, 3,000, and 4,000 units.
2. Calculate the unit cost at 2,000, 3,000, and 4,000 units. What happens to unit cost as the number of units produced increases?

8 VARIABLE OVERHEAD VARIANCES, SERVICE COMPANY

Joven Inc. operates a delivery service for over 70 restaurants. The corporation has a fleet of vehicles and has invested in a sophisticated, computerized communications system to coordinate its deliveries. Joven has gathered the following actual data on last year's delivery operations:

Deliveries made	42,000
Direct labor	30,000 direct labor hours@$7.00
Actual variable overhead	$138,000

Joven employs a standard costing system. During the year, a variable overhead rate of $4.05 per hour was used. The labor standard requires 0.75 hour per delivery.

Required:

1. Compute the standard hours allowed for actual deliveries made last year.
2. Compute the variable overhead spending and efficiency variances.

9 FIXED OVERHEAD VARIANCES

Refer to Exercise 21-34. Assume that the actual fixed overhead was $420,000. Budgeted fixed overhead was $405,000, based on practical capacity of 33,750 direct labor hours.

Required:

1. Calculate the standard fixed overhead rate based on budgeted fixed overhead and practical capacity.
2. Compute the fixed overhead spending and volume variances.

10 OVERHEAD APPLICATION, FIXED AND VARIABLE OVERHEAD VARIANCES

Tules Company is planning to produce 2,400,000 power drills for the coming year. The company uses direct labor hours to assign overhead to products. Each drill requires 0.5 standard hour of labor for completion. The total budgeted overhead was $2,700,000. The total fixed overhead budgeted for the coming year is $1,320,000. Predetermined overhead rates are calculated using expected production, measured in direct labor hours. Actual results for the year are:

Actual production (units)	2,360,000
Actual direct labor hours	1,190,000
Actual variable overhead	$1,410,000
Actual fixed overhead	$1,260,000

Required:

1. Compute the applied fixed overhead.
2. Compute the fixed overhead spending and efficiency variances.
3. Compute the applied variable overhead.
4. Compute the variable overhead spending and volume variances.

11 OVERHEAD APPLICATION, FIXED AND VARIABLE VARIANCES

Messner Company is planning to produce 280,000 units for the coming year. The company uses direct labor hours to assign overhead to products. Each unit requires 0.9 standard hour of labor for completion. The total variable overhead budgeted was $801,360. The total fixed overhead budgeted for the coming year is $1,386,000. Predetermined overhead rates are calculated using direct labor hours based on expected production. Actual results for the year are:

Actual production (units)	291,000
Actual direct labor hours	259,000
Actual fixed overhead	$1,410,000
Actual variable overhead	$829,000

Required:

1. Compute the fixed overhead rate.
2. Compute the applied fixed overhead.
3. Compute the fixed overhead spending and volume variances.
4. Compute the applied variable overhead.
5. Compute the variable overhead spending and efficiency variances.

12 ACTIVITY FLEXIBLE BUDGET

Pulaski Company provided information on the following three overhead activities.

Activity	Driver	Fixed Cost	Variable Rate
Engineering	Engineering hours	$50,000	$5.50

Machining	Machine hours	25,000	2.00
Receiving	Receiving orders	43,000	5.60

Pulaski has found that the following driver levels are associated with two different levels of production.

Driver	40,000 units	50,000 units
Engineering hours	500	750
Machine hours	60,000	75,000
Receiving orders	12,000	16,000

Required:

Prepare an activity-based flexible budget for the two levels of activity.

13 FLEXIBLE BUDGET FOR VARIOUS PRODUCTION LEVELS

Refer to the information provided in **Problem 12.**

Required:

1. Calculate the direct labor hours required for production that is 10 percent higher than expected. Calculate the direct labor hours required for production that is 20 percent lower than expected.
2. Prepare an overhead budget that reflects production that is 10 percent higher than expected, and for production that is 20 percent lower than expected. (Hint: Use total direct labor hours calculated in Requirement 1.)

14 PERFORMANCE REPORT BASED ON ACTUAL PRODUCTION

Refer to the information provided in **Problem 21-43**. Assume that Pet-Care actually produced 120,000 bags of BasicDiet and 100,000 bags of SpecialDiet. The actual overhead costs incurred were as follows:

Maintenance $ 40,500
Indirect labor 119,000
Power 31,700
Rent 18,000

Required:

1. Calculate the number of direct labor hours budgeted for actual production of the two products.
2. Prepare a performance report for the period based on actual production.
3. Based on the report, would you judge any of the variances to be significant? Can you think of some possible reasons for the variances?

15 KICKER SPEAKERS, BEFORE-THE-FACT FLEXIBLE BUDGETING, FLEXIBLE BUDGETING FOR THE NEW SOLO X18 MODEL

Stillwater Designs is considering a new Kicker speaker model: Solo X18, which is a large and expensive subwoofer (projected price is $760 to distributors). The company controls the design specifications of the model and contracts with manufacturers in mainland China to produce the model. Stillwater Designs pays the freight and custom duties. The product is shipped to Stillwater and then sold to distributors throughout the United States.

The market for this type of subwoofer is small and competitive. It is expected to have a 3-year life cycle. Market test reviews were encouraging. One potential customer noted that the speaker could make a deaf person hear again. Another remarked that the bass could be heard two miles away. Another customer was simply impressed by the size and watts of the subwoofer (a maximum of 10,000 watts capability). Encouraged by the results of market tests, the Product Steering Committee also wanted to review the financial analysis. The projected revenues and costs at three levels of sales volume are as follows (for the 3-year life cycle):

	Pessimistic	Most Likely	Optimistic

Sales volume (units)	72,000	150,000	250,000
Variable costs (total):			
Acquisition cost	$43,200,000	$ 90,000,000	$150,000,000
Freight	4,320,000	9,000,000	15,000,000
Duties	1,800,000	3,750,000	6,250,000
Total	$49,320,000	$102,750,000	$171,250,000
Fixed costs (total):			
Engineering (R&D)	$10,000,000	$ 10,000,000	$ 10,000,000
Overhead	3,000,000	3,000,000	3,000,000
Total	$13,000,000	$ 13,000,000	$ 13,000,000

Required:

1. Prepare flexible budget formulas for the cost items listed for the Solo X18 model. Also, provide a flexible budget formula for total costs.
2. Prepare an income statement for each of the three levels of sales volume. Discuss the value of before-the-fact flexible budgeting and relate this to the current example.
3. Form a group with two to four other students. Assume that the group is acting as a Product Steering Committee. Evaluate the feasibility of producing the Solo X18 model (using the given financial data and the results of Requirements 1 and 2.) If the financial performance of the model is questionable, discuss possible courses of action that the company might take to improve the financial performance of the product. Also, discuss some reasons why the company might wish to produce the model even if it does not promise a good financial return.

16 FLEXIBLE BUDGETING

Fruta Inc. purchases fruit from numerous growers and packs fruit boxes and fruit baskets for sale. Fruta has developed the following flexible budget for overhead for the coming year. Activity level is measured in direct labor hours.

		Activity Level (hours)		
		2000	**2,500**	**3,000**
Variable costs:				
Maintenance	$0.8	$ 1,60	$ 2,00	$ 2,40
Supplies	0	0	0	0
Power	0.2	40	500	600
	0	$ 2,800	$ 3,500	$ 4,200
		$ 4,800	$ 4,800	$ 4,800
		18,000	18,000	18,000
Total variable costs		$22,800	$22,800	$22,800
Fixed costs:		$25,600	$26,300	$27,000
Depreciation				
Salaries				
Total fixed costs				
Total overhead costs				

Required:

1. Prepare an overhead budget for May.
2. The Cushing High School Parent–Teacher Organization ordered 200 gift baskets from Fruta to be given to high school teachers and support staff as a thank you for a successful school year. These gift baskets must be ready by May 31 and were not included in the original production budget for May. Without preparing a new overhead budget, what is Fruta's new total budgeted overhead for May?

17 PERFORMANCE REPORTING

Fernando's is a hole-in-the-wall sandwich shop just off the State University campus. Customers enter off the street into a small counter area to order one of 10 varieties of sandwiches and a soft drink. All orders must be taken out because there is no space for dining in.

The owner of Fernando's is Luis Azaria, son of Fernando Azaria who founded the shop. Luis is attempting to construct a series of budgets. He has accumulated the following information:

a. The average sandwich (which sells for $4.50) requires 1 roll, 4 ounces of meat, 2 ounces of cheese, 0.05 head of lettuce, 0.25 of a tomato, and a healthy squirt (1 ounce) of secret sauce. (We can't reveal the recipe here, but it includes Serrano pep per and hoisin sauce.)
b. Each customer typically orders one soft drink (average price $1.50) consisting of a cup and 12 ounces of soda. Refills on the soda are free, but this offer is seldom taken advantage of because the typical customer carries his/her sandwich and soda back to the office or common area.
c. Use of paper supplies (napkins, bag, sandwich wrap, cups) varies somewhat from customer to customer but averages $1,650 per month.
d. Fernando's is open for two 4-hour shifts. The noon shift on Monday through Friday requires two workers earning $10 per hour. The evening shift is only worked on Fri day, Saturday, and Sunday nights. The two evening shift employees also earn $10 per hour. There are 4.3 weeks in a month.
e. Rent is $575 per month. Other monthly cash expenses average $1,800.
f Food costs are:

Meat	$7.00/lb
Cheese	$6.00/lb
Rolls	$28.80/gross
Lettuce (a box contains 24 heads)	$12.00/box
Tomatoes (a box contains about 20 tomatoes)	$4/box
Secret sauce	$6.40/gallon
Soda (syrup and carbonated water)	$2.56/gallon

In a normal month when school is in session, Fernando's sells 5,000 sandwiches and 5,000 sodas. In October, State U holds its homecoming celebration. Therefore, Luis figured that if he added a noon shift on Saturday and Sunday of homecoming weekend, October sales would be 30 percent higher than normal. To advertise his noon shifts during homecoming weekend, Luis bought cups emblazoned with the State U Homecoming schedule. This added $200 to paper costs for the month. Last year, he added two additional shifts, and his sales goal was realized.

Required:

1. Prepare a flexible budget for a normal school month.
2. Prepare a flexible budget for October.
3. Do you think it was worthwhile for Luis to add the additional shifts for homecoming weekend last October?

18 FUNCTIONAL VERSUS ACTIVITY FLEXIBLE BUDGETING

Amy Bunker, production manager, was upset with the latest performance report, which indicated that she was $100,000 over budget. Given the efforts that she and her workers had made, she was confident that they had met or beat the budget. Now she was not only upset but also genuinely puzzled over the results. Three items—direct labor, power, and setups—were over budget. The actual costs for these three items follow:

Direct labor	$210,000
Power	135,000
Setups	140,000
Total	$485,000

Amy knew that her operation had produced more units than originally had been budgeted so more power and labor had naturally been used. She also knew that the uncertainty in scheduling had led to more setups than planned. When she pointed this out to Gary Grant, the controller, he assured her that the budgeted costs had been adjusted for the increase in productive activity. Curious, Amy questioned Gary about the methods used to make the adjustment.

Gary: If the actual level of activity differs from the original planned level, we adjust the budget by using budget formulas—formulas that allow us to predict the costs for different levels of activity.

Amy: The approach sounds reasonable. However, I'm sure something is wrong here. Tell me exactly how you adjusted the costs of direct labor, power, and setups.

Gary: First, we obtain formulas for the individual items in the budget by using the method of least squares. We assume that cost variations can be explained by variations in productive activity where activity is measured by direct labor hours. Here is a list of the cost formulas for the three items you mentioned. The variable X is the number of direct labor hours.

Direct labor cost = $10X
Power cost = $5,000 + $4X
Setup cost = $100,000

Amy: I think I see the problem. Power costs don't have a lot to do with direct labor hours. They have more to do with machine hours. As production increases, machine hours increase more rapidly than direct labor hours. Also, . . .

Gary: You know, you have a point. The coefficient of determination for power cost is only about 50 percent. That leaves a lot of unexplained cost variation. The coefficient for labor, however, is much better—it explains about 96 percent of the cost variation. Setup costs, of course, are fixed.

Amy: Well, as I was about to say, setup costs also have little to do with direct labor hours. And I might add that they certainly are not fixed—at least not all of them. We had to do more setups than our original plan called for because of the scheduling changes. And we have to pay our people when they work extra hours. It seems like we are always paying overtime. I wonder if we simply do not have enough people for the setup activity. Also, there are supplies that are used for each setup, and these are not cheap. Did you build these extra costs of increased setup activity into your budget?

Gary: No, we assumed that setup costs were fixed. I see now that some of them could vary as the number of setups increases. Amy, let me see if I can develop some cost formulas based on better explanatory variables. I'll get back to you in a few days.

Assume that after a few days' work, Gary developed the following cost formulas, all with a coefficient of determination greater than 90 percent:

Direct labor cost = $10X, where X = Direct labor hours
Power cost = $68,000 + 0.9Y, where Y = Machine hours
Setup cost = $98,000 + $400Z, where Z = Number of setups

The actual measure of each activity driver is as follows:

Direct labor hours	20,000
Machine hours	90,000
Number of setups	110

Required:

1. Prepare a performance report for direct labor, power, and setups using the direct labor-based formulas.
2. Prepare a performance report for direct labor, power, and setups using the multiple cost driver formulas that Gary developed.
3. Of the two approaches, which provides the more accurate picture of Amy's performance? Why?

19 ACTIVITY FLEXIBLE BUDGETING

Billy Adams, controller for Westcott, Inc., prepared the following budget for manufacturing costs at two different levels of activity for 2010:

DIRECT LABOR HOURS

	Level of Activity	
	50,000	**100,000**
Direct materials	$300,000	$ 600,000
Direct labor	200,000	400,000
Depreciation (plant)	100,000	100,000
Subtotal	$600,000	$1,100,000

MACHINE HOURS

	Level of Activity	
	200,000	**300,000**
Maintaining equipment	$ 360,000	$ 510,000
Machining	112,000	162,000
Subtotal	$472,000	$ 672,000

MATERIAL MOVES

	Level of Activity	
	20,000	**40,000**
Materials handling	$165,000	$290,000

NUMBER OF BATCHES INSPECTED

	Level of Activity	
	100	**200**
Inspecting products	$ 125,000	$ 225,000
Total	$1,362,000	$2,287,000

During 2009, Westcott employees worked a total of 80,000 direct labor hours, used 250,000 machine hours, made 32,000 moves, and performed 120 batch inspections. The following actual costs were incurred:

Direct materials	$440,000
Direct labor	355,000
Depreciation	100,000
Maintenance	425,000
Machining	142,000

Materials handling	232,500
Inspecting products	160,000

Westcott applies overhead using rates based on direct labor hours, machine hours, number of moves, and number of batches. The second level of activity (the far right column in the preceding table) is the practical level of activity (the available activity for resources acquired in advance of usage) and is used to compute predetermined overhead pool rates.

Required:

1. Prepare a performance report for Westcott's manufacturing costs in 2010.
2. Assume that one of the products produced by Westcott is budgeted to use 10,000 direct labor hours, 15,000 machine hours, and 500 moves and will be produced in five batches. A total of 10,000 units will be produced during the year. Calculate the budgeted unit manufacturing cost.
3. One of Westcott's managers said the following: ''Budgeting at the activity level makes a lot of sense. It really helps us manage costs better. But this budget really needs to provide more detailed information. For example, I know that the materials handling activity involves the usage of forklifts and operators, and this information is lost with simply reporting the total cost of the activity for various levels of output. We have four forklifts, each capable of providing 10,000 moves per year. We lease these forklifts for five years, at $10,000 per year. Furthermore, for our two shifts, we need up to eight operators if we run all four forklifts. Each operator is paid a salary of $30,000 per year. Also, I know that fuel costs us about $0.25 per move.''

Based on these comments, explain how this additional information may help Westcott to better manage its costs. Also, assuming that these are the only three items, expand the detail of the flexible budget for materials handling to reveal the cost of these three resource items for 20,000 moves and 40,000 moves, respectively. You may wish to review the concepts of flexible, committed, and discretionary resources found in Chapter 14

20 FLEXIBLE BUDGETING

At the beginning of last year, Jean Bingham, controller for Thorpe Inc., prepared the following budget for conversion costs at two levels of activity for the coming year:

	Direct Labor Hours	
	100,000	**120,000**
Direct labor	$1,000,000	$1,200,000
Supervision	180,000	180,000
Utilities	18,000	21,000
Depreciation	225,000	225,000
Supplies	25,000	30,000
Maintenance	240,000	284,000
Rent	120,000	120,000
Other	60,000	70,000
Total manufacturing cost	$1,868,000	$2,130,000

During the year, the company worked a total of 112,000 direct labor hours and incurred the following actual costs:

Direct labor	$963,200
Supervision	190,000
Utilities	20,500
Depreciation	225,000
Supplies	24,640
Maintenance	237,000
Rent	120,000
Other	60,500

Thorpe applied overhead on the basis of direct labor hours. Normal volume of 120,000 direct labor hours is the activity level to be used to compute the predetermined overhead rate.

Required:

1. Determine the cost formula for each of Thorpe's conversion costs. (Hint: Use the high-low method.)
2. Prepare a performance report for Thorpe's conversion costs for last year. Should any cost item be given special attention? Explain.

21 OVERHEAD APPLICATION, OVERHEAD VARIANCES

Tavera Company uses a standard cost system. The direct labor standard indicates that six direct labor hours should be used for every unit produced. Tavera produces one product. The normal production volume is 120,000 units of this product. The budgeted overhead for the coming year is as follows:

Fixed overhead $2,160,000*
Variable overhead 1,440,000

* At normal volume.

Tavera applies overhead on the basis of direct labor hours.

During the year, Tavera produced 119,000 units, worked 731,850 direct labor hours, and incurred actual fixed overhead costs of $2.25 million and actual variable overhead costs of $1.425 million.

Required:

1. Calculate the standard fixed overhead rate and the standard variable overhead rate.
2. Compute the applied fixed overhead and the applied variable overhead. What is the total fixed overhead variance? Total variable overhead variance?
3. Break down the total fixed overhead variance into a spending variance and a volume variance. Discuss the significance of each.
4. Compute the variable overhead spending and efficiency variances. Discuss the significance of each.
5. Journal entries for overhead variances were not discussed in this chapter. Typically, the overhead variance entries happen at the end of the year. Assume that applied fixed (variable) overhead is accumulated on the credit side of the fixed (variable overhead) control account. Actual fixed (variable) overhead costs are accumulated on the debit side of the respective control accounts. At the end of the year, the balance in each control account is the total (fixed) variable variance. Create accounts for each of the four overhead variances and close out the total variances to each of these four variance accounts. These four variance accounts are then usually disposed of by closing them to Cost of Goods Sold.

Form a group with two to four other students, and prepare the journal entries that isolate the four variances. Finally, prepare the journal entries that close these variances to Cost of Goods Sold.

22 OVERHEAD VARIANCE ANALYSIS

The Lubbock plant of Morril's Small Motor Division produces a major subassembly for a 6.0 horsepower motor for lawn mowers. The plant uses a standard costing system for production costing and control. The standard cost sheet for the subassembly follows:

Direct materials (6.0 lbs. @ $5.00) $30.00
Direct labor (1.6 hrs. @ $12.00) 19.20
Variable overhead (1.6 hrs. @ $10.00) 16.00
Fixed overhead (1.6 hrs. @ $6.00) 9.60
Standard unit cost $74.80

During the year, the Lubbock plant had the following actual production activity:

a. Production of motors totaled 50,000 units.
b. The company used 82,000 direct labor hours at a total cost of $1,066,000.
c. Actual fixed overhead totaled $556,000.
d. Actual variable overhead totaled $860,000

The Lubbock plant's practical activity is 60,000 units per year. Standard overhead rates are computed based on practical activity measured in standard direct labor hours.

Required:

1. Compute the variable overhead spending and efficiency variances.
2. Compute the fixed overhead spending and volume variances. Interpret the volume variance. What can be done to reduce this variance?

23 FIXED OVERHEAD SPENDING AND VOLUME VARIANCES, CAPACITY MANAGEMENT

Lorale Company, a producer of recreational vehicles, recently decided to begin producing a major subassembly for jet skis. The subassembly would be used by Lorale's jet ski plants and also would be sold to other producers. The decision was made to lease two large buildings in two different locations: Little Rock, Arkansas, and Athens, Georgia. The company agreed to a 11-year, renewable lease contract. The plants were of the same size, and each had 10 production lines. New equipment was purchased for each line and workers were hired to operate the equipment. The company also hired production line supervisors for each plant. A supervisor is capable of directing up to two production lines per shift. Two shifts are run for each plant. The practical production capacity of each plant is 300,000 subassemblies per year. Two standard direct labor hours are allowed for each subassembly. The costs for leasing, equipment depreciation, and supervision for a single plant are as follows (the costs are assumed to be the same for each plant):

Supervision (10 supervisors @ $50,000)	$ 500,000
Building lease (annual payment)	800,000
Equipment depreciation (annual)	1,100,000
Total fixed overhead costs*	$2,400,000

* For simplicity, assume these are the only fixed overhead costs.

After beginning operations, Lorale discovered that demand for the product in the region covered by the Little Rock plant was less than anticipated. At the end of the first year, only 240,000 units were sold. The Athens plant sold 300,000 units as expected. The actual fixed overhead costs at the end of the first year were $2,500,000 (for each plant).

Required:

1. Calculate a fixed overhead rate based on standard direct labor hours.
2. Calculate the fixed overhead spending and volume variances for the Little Rock and Athens plants. What is the most likely cause of the spending variance? Why are the volume variances different for the two plants?
3. Suppose that from now on the sales for the Little Rock plant are expected to be no more than 240,000 units. What actions would you take to manage the capacity costs (fixed overhead costs)?
4. Calculate the fixed overhead cost per subassembly for each plant. Do they differ? Should they differ? Explain. Do ABC concepts help in analyzing this issue?

24 ETHICAL CONSIDERATIONS; FLEXIBLE BUDGETING AND THE ENVIRONMENT

Harry Johnson, the chief financial officer of Ur Thrift, Inc, a large retailer, had just finished a meeting with the Roger Swasey, the chief financial officer of the large retailer, and Connie Baker, its environmental officer. Over the years, Harry had overseen the development of a number of cost formulas that allowed Ur Thrift to budget the variable costs of a variety of items. For example, packaging for one of its private line of dolls had a cost formula of Y = $2.20X, where X represented the number of dolls sold. The formula was used to calculate the expected packaging costs which were then compared with the actual packaging costs. Over the last several years, the actual costs and budgeted costs were virtually on target, prompting Harry to claim that packaging costs were well controlled.

Connie Baker, however, argued that the packaging costs were not well controlled. In fact, she was adamant in her view that the packaging was excessive and that by reducing the packaging, costs could be reduced and the environmental impacts reduced as well. She argued that the company had an ethical obligation to reduce environmental impacts and that cost savings would also be captured, improving the profitability of the company. As another example, Connie discussed the fleet of trucks used by Ur Thrift to move goods from its warehouses to retail outlets. The fuel cost formula was $3X, where X represented gallons of fuel consumed. She pointed out that the performance data also

revealed that fuel costs were in control. Yet her office had recently recommended the installation of an auxiliary power unit to heat and cool the cabs of the trucks during the mandatory ten-hour breaks required of its drivers, thus avoiding the need to have the engine idle during this rest period. She claimed that this would significantly reduce fuel costs and easily pay for the new auxiliary units in a short period of time.

Connie had also made some comments that caused Harry to pause and do some soul searching. She noted that the financial officers of the company should be more concerned about reducing costs than simply predicting what they should be. Thus (according to her view), cost formulas are useful only to tell us where we currently are so that they can be used to assess how to reduce costs. The so-called flexible budgets are simply a means of enforcing static standards. She also said that the company's managers had an ethical obligation to not overconsume the resources of the planet. She urged both Harry and Roger to help position the company so that it could reduce its environmental impacts.

Required:

Do financial officers have an ethical obligation to help in reducing negative environmental impacts? Identify and discuss which of the Institute of Management Accountant's ethical standards might be used to sustain this point of view. Also, describe the role that flexible budgeting may play in reducing environmental impacts.

SOLUZIONI

Esercizio 1

	Actual		Performance Report Budgeted	
		Variance*		
Units produced	2,900		2,900	—
Direct materials	$ 6,900		$ 6,960	$ (60) *F*
Direct labor	17,340		17,400	(60) *F*
Variable overhead	2,200		2,175	25 *U*
Fixed overhead:				
Materials handling	6,300		6,200	100 *U*
Depreciation	2,600		2,600	—
Total	$35,340		$ 35,335	5 *U*

*Variances equal actual amounts less budgeted amounts. If actual cost is less than budgeted cost, the variance is *F* (favorable). If actual cost is more than budgeted cost, the variance is *U* (unfavorable).

Esercizio 2

1. Columnar approach:

1. AH × AVOR	2. AH × SVOR	3. SH × SVOR
36,100 × $4.52	36,100 × $4.50	36,000 × $4.50
$163,172	$162,450	$162,000
	$722 *U*	$450 *U*
	Spending	Efficiency

2. Variable overhead spending variance = (AVOR – SVOR) AH
= ($4.52 – $4.50)36,100
= $722 *U*

3. Variable overhead efficiency variance = (AH – SH) SVOR
= (36,100 – 36,000)$4.50
= $450 *U*

4.

Variable overhead spending variance	$ 722 *U*
Variable overhead efficiency variance	450 *U*
Total variable overhead variance	$1,172 *U*

Esercizio 3

1. Standard hours for actual units = SH per unit × Actual units produced
   = 3 × 12,000
   = 36,000

2. Applied fixed overhead = Standard hours for actual units × SFOR
   = 36,000 × $7
   = $252,000

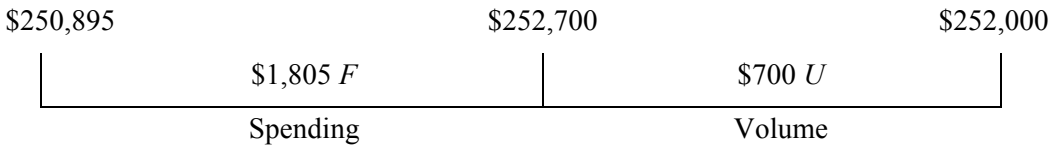
3.

Actual fixed overhead	$250,895	
Applied fixed overhead	252,000	
Total fixed overhead variance	$ (1,105)	*F*

Esercizio 4

1. Columnar approach:

1. AH × AFOR	2. AH × SFOR	3. SH × SFOR
36,100 × $6.95	36,100 × $7.00	36,000 × $7.00



2. Fixed overhead spending variance = (AFOR – SFOR)AH
   = ($6.95 – $7.00)36,100
   = $1,805 *F*

3. Fixed overhead efficiency variance = (AH – SH)SFOR
   = (36,100 – 36,000)$7.00
   = $700 *U*

4.

Fixed overhead spending variance	$1,805	*F*
Fixed overhead efficiency variance	700	*U*
Total fixed overhead variance	$1,105	*F*

Esercizio 5

Salaries (7 inspectors × $35,000)	$245,000
Supplies (130,000 × $0.60)	78,000
Workbenches, computer depreciation	16,700

Factory space, utilities	13,400
Total inspection cost	$353,100

Esercizio 6

	Performance Report		
	Actual		Budgeted
	Variance*		
Units produced	32,000	32,000	—
Maintenance	$187,300	$190,000	$(2,700) *F*
Machining	204,000	205,000	(1,000) *F*
Setting up	114,000	112,500	1,500 *U*
Purchasing	135,300	135,000	300 *U*
Total	$640,600	$642,500	$(1,900) *F*

*Variances equal actual amounts less budgeted amounts. If actual cost is less than budgeted cost, the variance is *F* (favorable). If actual cost is more than budgeted cost, the variance is *U* (unfavorable).

Esercizio 7

1.

	Performance Report		
	Actual		Budgeted
	Variance		
Units produced	2,600	2,500	100 *F*
Direct materials cost	$15,250	$15,000[a]	$ 250 *U*
Direct labor cost	16,000	15,000[b]	1,000 *U*
Total	$31,250	$30,000	$1,250 *U*

[a]2 leather strips × $3 per strip × 2,500 units
[b]0.5 direct labor hour × $12 × 2,500 units

2. The performance report compares costs at two different levels of activity—2,600 units actually produced and 2,500 units budgeted—and so cannot be used to assess efficiency.

Esercizio 8

1.

		Flexible Budget for		
	Cost Formula	2,000 units	3,000 units	4,000 units
Direct materials	$ 6.00	$12,000	$18,000	$24,000
Direct labor	6.00	12,000	18,000	24,000
Variable overhead	0.50	1,000	1,500	2,000
Fixed overhead	4,500	4,500	4,500	4,500
Total		$29,500	$42,000	$54,500

2. Unit cost at 2,000 units = $\frac{\$29,500}{2,000} = \$14.75$

   Unit cost at 3,000 units = $\frac{\$42,000}{3,000} = \$14.00$

   Unit cost at 4,000 units = $\frac{\$54,500}{4,000} = \$13.635$

   The cost per unit goes down as the number of units produced increases because fixed cost is spread over a greater number of units.

Esercizio 9

1. Standard direct labor hrs required = Actual deliveries × Standard direct labor hrs
   = 42,000 × 0.75
   = 31,500 direct labor hours

2. Variable overhead analysis:

Actual VOH		Budgeted VOH		Applied VOH
		$4.05 × 30,000 hrs		$4.05 × 31,500 hrs
$138,000		$121,500		$127,575
	$16,500 *U*		$6,075 *F*	
	Spending		Efficiency	

Esercizio 10

1. Standard fixed overhead rate (SFOR) $= \frac{\text{Budgeted fixed overhead}}{\text{Practical capacity}}$

   $= \frac{\$405,000}{33,750 \text{ direct labor hours}}$

   = $12

2. Fixed overhead analysis:

Actual FOH	Budgeted FOH	Applied FOH
	$12 × 33,750	$12 × 31,500
$420,000	$405,000	$378,000

\$15,000 *U*	\$27,000 *U*
Spending	Volume

Esercizio 11

1. Fixed overhead rate = $\frac{\$1,320,000}{1,200,000\ *}$ = \$1.10 per DLH

   *Budgeted hours = 2,400,000 units × 0.5 direct labor hours = 1,200,000

   SH = 2,360,000 units × 0.5 direct labor hours = 1,180,000

   Applied FOH = \$1.10 × 1,180,000 = \$1,298,000

2. Fixed overhead analysis:

Actual FOH	Budgeted FOH	Applied FOH
	\$1.10 × 1,200,000	\$1.10 × 1,180,000
\$1,260,000	\$1,320,000	\$1,298,000
	\$60,000 *F*	\$22,000 *U*
	Spending	Volume

3. Variable OH rate = $\frac{\$2,700,000 - \$1,320,000}{1,200,000}$

   = \$1.15 per DLH

4. Variable overhead analysis:

Actual VOH	Budgeted VOH	Applied VOH
	\$1.15 × 1,190,000	\$1.15 × 1,180,000
\$1,410,000	\$1,368,500	\$1,357,000
	\$41,500 *U*	\$11,500 *U*
	Spending	Efficiency

Esercizio 12

1. Standard hours for budgeted production = Budgeted units × Standard hours per unit
   = 280,000 × 0.90
   = 252,000 standard hours

$$\text{Fixed overhead rate} = \frac{\textbf{Budgeted fixed overhead}}{\textbf{Budgeted standard hours}}$$

$$= \frac{\textbf{\$1,386,000}}{\textbf{252,000}} = \$5.50 \text{ per DLH}$$

2. Applied FOH = Fixed overhead rate × Standard hours for actual production
   = \$5.50 × (291,000 units × 0.90 direct labor hour)
   = \$1,440,450

3. Fixed overhead analysis:

Actual FOH		Budgeted FOH		Applied FOH
\$1,410,000		\$1,386,000		\$1,440,450
	\$24,000 *U*		\$54,450 *F*	
	Spending		Volume	

4. $$\text{Variable OH rate} = \frac{\textbf{Budgeted variable overhead}}{\textbf{Budgeted standard hours}}$$

$$= \frac{\textbf{\$801,360}}{\textbf{280,000 × 0.90}}$$

   = \$3.18 per DLH

5. Variable overhead analysis:

Actual VOH		Budgeted VOH		Applied VOH
				\$3.18 × 261,900*
\$829,000		\$801,360		\$832,842
	\$27,640 *U*		\$31,482 *F*	
	Spending		Efficiency	

*Actual units × Standard hours per unit = 291,000 × 0.90

Esercizio 13

			Required for 40,000 units	Required for 50,000 units
	Fixed	Variable	500 eng. hrs	750 eng. hrs
Engineering	\$50,000	\$5.50	\$52,750	\$54,125
	Fixed	Variable	60,000 mhrs	75,000 mhrs
Machining	\$25,000	\$2.00	\$145,000	\$175,000
			Purchase	Purchase

	Fixed	Variable	Orders 12,000	Orders 16,000
Receiving	$43,000	$5.60	$110,200	$132,600
Total			$307,950	$361,725

Esercizio 14

1. Direct labor hours for 10% higher = 55,000 hours + (0.10 × 55,000)
   = 60,500 direct labor hours

   Direct labor hours for 20% lower = 55,000 hours – (0.20 × 55,000)
   = 44,000 direct labor hours

2. *10% higher:*

Pet-Care Company
Overhead Budget
For the Coming Year

	Formula	Activity Level 60,500 Hours	
Variable costs:			
Maintenance	$0.40	$24,200	
Power	0.50	30,250	
Indirect labor	1.60	96,800	
Total variable costs			$151,250
Fixed costs:			
Maintenance		$17,000	
Indirect labor		26,500	
Rent		18,000	
Total fixed costs			61,500
Total overhead costs			$212,750

20% lower:

Pet-Care Company
Overhead Budget
For the Coming Year

	Formula	Activity Level 44,000 Hours	
Variable costs:			
Maintenance	$0.40	$17,600	
Power	0.50	22,000	
Indirect labor	1.60	70,400	
Total variable costs			$110,000
Fixed costs:			
Maintenance		$17,000	
Indirect labor		26,500	
Rent		18,000	
Total fixed costs			61,500
Total overhead costs			$171,500

Esercizio 15

1. Direct labor hours = (120,000 bags × 0.25 hours) + (100,000 bags × 0.30 hours)
   = 30,000 + 30,000
   = 60,000 direct labor hours

2.

Pet-Care Company
Performance Report
For the Current Year

	Actual	Budget	Variance
Units produced	220,000	220,000	0
Production costs:*			
Maintenance	$ 40,500	$ 41,000	$ 500 *F*
Power	31,700	30,000	1,700 *U*
Indirect labor	119,000	122,500	3,500 *F*
Rent	18,000	18,000	0
Total costs	$209,200	$211,500	$2,300 *F*

*Flexible budget amounts are based on 60,000 DLH:

Maintenance:	$17,000 + $0.40(60,000)	=	$41,000
Power:	$0.50(60,000)	=	$30,000
Indirect labor:	$26,500 + $1.60(60,000)	=	$122,500

3. All of the variances are within 5% to 10% of budgeted amounts. Most would probably view the variances as immaterial. Reasons for variances are numerous. For example, a favorable maintenance variance could be caused by less preventive maintenance or by increased efficiency by individual maintenance workers. Indirect labor could be favorable because (among other things) lower-priced labor was used to carry out higher-skilled jobs. Power could be more expensive than planned because of a rate increase. An investigation would be needed to know exactly why the variances occurred.

Esercizio 16

1.

Item	Fixed	Variable*
Acquisition		$600
Freight		60
Duties		25
Engineering	$ 10,000,000	
Overhead	3,000,000	
Total	$ 13,000,000	$685

*Cost/level of activity

2.

	Pessimistic	Most Likely	Optimistic
Sales (@ $760)	$ 54,720,000	$114,000,000	$190,000,000
Less costs:			

Variable (@ $685)	49,320,000	102,750,000	171,250,000
Fixed	13,000,000	13,000,000	13,000,000
Projected income	$ (7,600,000)	$ (1,750,000)	$ 5,750,000

Before-the fact flexible budgeting allows managers to assess risk and uncertainty. In this example, managers would see very quickly that the most likely scenario promises an expected loss. Only if the sales are in the optimistic range will the company show a positive return.

3. The financial performance as revealed in Requirements 1 and 2 is not very promising. Two out of three scenarios lose money. Only the optimistic scenario promises a positive return, and it is only about 3% of sales. Most steering committees would be reluctant to press ahead with the new product given these projected financial results. One possibility is to instruct engineering to produce a design that reduces the cost—especially the acquisition cost. It may be possible to produce a design that lowers the manufacturing cost of the outsourced producers and Stillwater Designs' acquisition cost. By reducing the weight and bulkiness of the product, freight costs may also be reduced. After all the cost improvements are obtained that can be, then the question becomes—if the return is questionable—would the company still want to produce the product?

   Producing a product that will not stand by itself is sometimes desirable. The product may be needed to enhance the image of the company—especially one that thrives on customers that like to impress others with the volume and loudness of speakers. The comments by potential customers on the loudness and the range of the subwoofer reveal the need to have this product for completeness. Having this product may increase the reputation of the entire product line and increase sales of smaller subwoofers. If so, then production of the Solo X18 may be justified.

Esercizio 17

1. Since the specific production amounts expected for May are not given, we must assume that May uses 1/12 of the annual hours. Thus, the budget for May for each of the three levels is given below:

Fruta, Inc.
Overhead Budget
For the Month of May

		Activity Level (hours)*		
	Formula	167	208	250
Variable costs:				
Maintenance	$0.80	$ 133.60	$ 166.40	$ 200.00
Supplies	0.20	33.40	41.60	50.00
Power	0.40	66.80	83.20	100.00
Total variable costs		$ 233.80	$ 291.20	$ 350.00
Fixed costs:				
Depreciation		$ 400.00	$ 400.00	$ 400.00
Salaries		1,500.00	1,500.00	1,500.00
Total fixed costs		$1,900.00	$1,900.00	$1,900.00
Total overhead costs		$2,133.80	$2,191.20	$2,250.00

$* \frac{\text{annual hours}}{12}$

2. Without knowing the hours used per basket, there is no way to prepare a new overhead budget for May. For example, if the hours used per basket were 0.50, then the expected hours used would be 100. This would be multiplied by $1.40 to yield $140, which could then be added to May's original budget.

Esercizio 18

1. Flexible budget for a normal school month:

Revenue	
Sandwiches (5,000 × $4.50)	$ 22,500
Sodas (5,000 × $1.50)	7,500
Total revenue	$ 30,000
Variable costs:	
Food[a] (5,000 × $2.83)	$14,150
Soda[b] (5,000 × $0.24)	1,200
Monthly costs:	
Paper	1,650
Rent	575
Other	1,800
Direct labor[c] ($1,720 + $1,032)	2,752
Total costs	$22,127

[a]Cost per sandwich:

Meat: $(\frac{4}{16} \times \$7.00)$	$ 1.75
Cheese: $(\frac{2}{16} \times \$6)$	0.75
Roll: $(\frac{\$28.80}{144})$	0.20
Lettuce: $(0.05 \times \frac{1}{24} \times \$12)$	0.03
Tomato: $(0.25 \times \frac{1}{20} \times \$4)$	0.05
Secret sauce: $(\frac{1}{128} \times \$6.40)$	0.05
Total	$ 2.83

[b]Cost per 12 oz. drink = $\frac{12}{128} \times \$2.56 = \$0.24$

[c]Noon shift labor cost = (4 hrs × 5 days × 2 workers × 4.3 weeks per month × $10)
= $1,720

Evening shift labor cost = (4 hrs × 3 nights × 2 workers × 4.3 weeks per month × $10)
= $1,032

2. Flexible budget for October:

Revenue	
Sandwiches (6,500 × $4.50)	$29,250
Sodas (6,500 × $1.50)	9,750
Total revenue	$39,000

Variable costs:	
Food[a] (6,500 × $2.83)	$18,395
Soda[b] (6,500 × $0.24)	1,560
Monthly costs:	
Paper ($1,650 + $200)	1,850
Rent	575
Other	1,800
Direct labor[c]	2,912
Total costs	$27,092

[a]Cost per sandwich:

Meat: ($\frac{4}{16}$ × $7.00)	$ 1.75
Cheese: ($\frac{2}{16}$ × $6)	0.75
Roll: ($\frac{\$28.80}{144}$)	0.20
Lettuce: (0.05 × $\frac{1}{24}$ × $12)	0.03
Tomato: (0.25 × $\frac{1}{20}$ × $4)	0.05
Secret sauce: ($\frac{1}{128}$ × $6.40)	0.05
Total	$ 2.83

[b]Cost per 12 oz. drink = $\frac{12}{128}$ × $2.56 = $0.24

[c]Noon shift labor cost = (4 hrs × 5 days × 2 workers × 4.3 weeks per month × $10)
= $1,720

Homecoming weekend noon shifts = (4 hrs × 2 days × 2 workers × $10)
= $160

Evening shift labor cost = (4 hrs × 3 nights × 2 workers × 4.3 weeks per month × $10)
= $1,032

Total October labor cost = $1,720 + $160 + $1,032 = $2,912

3. Yes, the increase in revenue was $9,000 ($39,000 – $30,000) but cost increased by only $4,965 ($27,092 – $22,127).

Esercizio 19

1.

	Actual Costs	Budgeted Costs	Budget Variance	
Direct labor	$210,000	$200,000	$ 10,000	*U*
Power	135,000	85,000	50,000	*U*
Setups	140,000	100,000	40,000	*U*
Total	$485,000	$385,000	$100,000	*U*

Note: Budgeted costs use the actual direct labor hours and the labor-based cost formulas. Example: Direct labor cost = $10 × 20,000 = $200,000; power cost = $5,000 + ($4 × 20,000) = $85,000; and setup cost = $100,000 (fixed).

2 Actual Costs Budgeted Costs Budget Variance

Direct labor	$210,000	$200,000	$ 10,000	*U*
Power	135,000	149,000	14,000	*F*
Setups	140,000	142,000	2,000	*F*
Total	$485,000	$491,000	$ 6,000	*F*

Note: Budgeted costs use the individual driver formulas: Direct labor = $10 × 20,000 = $200,000; power = $68,000 + ($0.90 × 90,000) = $149,000; and setups = $98,000 + ($400 × 110) = $142,000.

3. The multiple cost driver approach captures the cause-and-effect cost relationships and, consequently, is more accurate than the direct labor-based approach.

Esercizio 20

1.

Westcott, Inc.
Performance Report
For the Year 2010

	Actual Costs	Budgeted Costs*	Budget Variance	
Direct materials	$ 440,000	$ 480,000	$ 40,000	*F*
Direct labor	355,000	320,000	35,000	*U*
Depreciation	100,000	100,000	0	
Maintenance	425,000	435,000	10,000	*F*
Machining	142,000	137,000	5,000	*U*
Materials handling	232,500	240,000	7,500	*F*
Inspecting products	160,000	145,000	15,000	*U*
Total	$1,854,500	$1,857,000	$ 2,500	*F*

*Budget formulas for each item can be computed by using the high-low method (using the appropriate cost driver for each method). Using this approach, the budgeted costs for the actual activity levels are computed as follows:

- Direct materials: $6 × 80,000
- Direct labor: $4 × 80,000
- Depreciation: $100,000
- Maintenance: $60,000 + ($1.50 × 250,000)
- Machining: $12,000 + ($0.50 × 250,000)
- Materials handling: $40,000 + ($6.25 × 32,000)
- Inspecting products: $25,000 + ($1,000 × 120)

2. Pool rates: $\frac{\$1,100,000}{100,000}$ = $11 per direct labor hour

$\frac{\$672,000}{300,000}$ = $2.24 per machine hour

$\frac{\$290,000}{40,000}$ = $7.25 per move

$$\frac{\$225{,}000}{200} = \$1{,}125 \text{ per batch}$$

Note: The first pool has material and labor costs included.

Unit cost:

Pool 1: $11 × 10,000	=	$110,000
Pool 2: $2.24 × 15,000	=	33,600
Pool 3: $7.25 × 500	=	3,625
Pool 4: $1,125 × 5	=	5,625
Total		$152,850
Units	÷	10,000
Unit cost	$	15.29*

*Rounded

3. Knowing the resources consumed by activities and how the resource costs change with the activity driver should provide more insight into managing the activity and its associated costs. For example, if moves could be reduced to 20,000 from the expected 40,000, then costs can be reduced by not only eliminating the need for four operators, but by reducing the need to lease from four to two forklifts. However, in the short run, the cost of leasing forklifts may persist even though demand for their service is reduced.

	20,000 moves	40,000 moves
Materials handling:		
Forklifts	$ 40,000	$ 40,000
Operators	120,000	240,000
Fuel	5,000	10,000
Total	$165,000	$290,000

The detail assumes that forklift leases must continue in the short run but that the number of operators may be reduced (assumes each operator can do 5,000 moves per year).

Esercizio 21

1. Direct labor = $10 × Direct labor hours

Variable rate $$= \frac{\text{High cost} - \text{Low cost}}{\text{High activity} - \text{Low activity}}$$
$$= \frac{\$1{,}200{,}000 - \$1{,}000{,}000}{120{,}000 - 100{,}000}$$
= $10 per direct labor hour

Fixed cost = High cost – ($10)(120,000)
= $0

Supervision = $180,000

Utilities = $3,000 + ($0.15 × Direct labor hours)

Variable rate $$= \frac{\text{High cost} - \text{Low cost}}{\text{High activity} - \text{Low activity}}$$
$$= \frac{\$21{,}000 - \$18{,}000}{120{,}000 - 100{,}000}$$
= $0.15 per direct labor hour

Fixed cost = High cost – ($0.15)(120,000)

= $3,000

Depreciation = $225,000

Supplies = $0.25 × Direct labor hours

Variable rate $= \frac{\textbf{High cost − Low cost}}{\textbf{High activity − Low activity}}$

$= \frac{\textbf{\$30,000 − \$25,000}}{\textbf{120,000 − 100,000}}$

= $0.25 per direct labor hour

Fixed cost = High cost – ($0.25)(120,000)

= $0

Maintenance = $20,000 + ($2.20 × Direct labor hours)

Variable rate $= \frac{\textbf{High cost − Low cost}}{\textbf{High activity − Low activity}}$

$= \frac{\textbf{\$284,000 − \$240,000}}{\textbf{120,000 − 100,000}}$

= $2.20 per direct labor hour

Fixed cost = High cost – ($2.20)(120,000)

= $20,000

Rent = $120,000

Other = 10,000 + ($0.50 × Direct labor hours)

Variable rate $= \frac{\textbf{High cost − Low cost}}{\textbf{High activity − Low activity}}$

$= \frac{\textbf{\$70,000 − \$60,000}}{\textbf{120,000 − 100,000}}$

= $0.50 per direct labor hour

Fixed cost = High cost – ($0.50)(120,000)

= $10,000

2.

Thorpe, Inc.
Conversion Cost Report
For Last Year

Conversion Cost	Actual	Budget	Variance	
Direct labor[a]	$ 963,200	$1,120,000	$156,800	*F*
Supervision	190,000	180,000	10,000	*U*
Utilities[b]	20,500	19,800	700	*U*
Depreciation	225,000	225,000	0	
Supplies[c]	24,640	28,000	3,360	*F*
Maintenance[d]	237,000	266,400	29,400	*F*
Rent	120,000	120,000	0	
Other[e]	60,500	66,000	5,500	*F*
Total conversion cost	$1,840,840	$2,025,200	$184,360	*U*

[a]($10)(112,000 DLH) = $1,120,000.
[b]$3,000 + ($0.15 × 112,000) = $19,800.
[c]($0.25)(112,000 DLH) = $28,000.
[d]$20,000 + ($2.20 × 112,000) = $266,400.
[e]$10,000 + ($0.50 × 112,000) = $66,000.

The direct labor cost variance should be given special attention because it is such a large variance compared to the other variances. The figures should be checked for accuracy and to be sure that all direct labor costs are being accounted for.

Esercizio 22

1. Standard fixed overhead rate $= \dfrac{\$2,160,000}{120,000 \times 6}$
   = $3.00 per DLH

   Standard variable overhead rate $= \dfrac{\$1,440,000}{720,000}$
   = $2.00 per DLH

2. Fixed: 119,000 × 6 × $3.00 = $2,142,000
   Variable: 119,000 × 6 × $2.00 = $1,428,000

   Total FOH variance = $2,250,000 – $2,142,000
   = $108,000 *U*

   Total VOH variance = $1,425,000 – $1,428,000
   = $3,000 *F*

3. Fixed overhead analysis:

Actual FOH	Budgeted FOH	Applied FOH
$2,250,000	$2,160,000	$2,142,000
$90,000 *U* (Spending)		$18,000 *U* (Volume)

   The spending variance is the difference between planned and actual costs. Each item's variance should be analyzed to see if these costs can be reduced. The volume variance is the incorrect prediction of volume, or alternatively, it is a signal of the loss or gain that occurred because of producing at a level different from the expected level.

4. Variable overhead analysis:

Actual VOH	Budgeted VOH	Applied VOH
	$2 × 731,850	
$1,425,000	$1,463,700	$1,428,000
$38,700 *F* (Spending)		$35,700 *U* (Efficiency)

The variable overhead spending variance is the difference between the actual variable overhead costs and the budgeted costs for the actual hours used. The variable overhead efficiency variance is the savings or extra cost attributable to the efficiency of labor usage.

5. Overhead variance isolation:

VOH Control	3,000	
VOH Efficiency Variance	35,700	
VOH Spending Variance		38,700
FOH Spending Variance	90,000	
FOH Volume Variance	18,000	
FOH Control		108,000

Closing to Cost of Goods Sold:

Cost of Goods Sold	143,700	
VOH Efficiency Variance		35,700
FOH Spending Variance		90,000
FOH Volume Variance		18,000
VOH Spending Variance	38,700	
Cost of Goods Sold		38,700

Esercizio 23

1. Variable overhead variances:

Actual VOH	Budgeted VOH	Applied VOH
	$10 × 82,000	$10 × 80,000
$860,000	$820,000	$800,000
$40,000 *U*	$20,000 *U*	
Spending	Efficiency	

Formula approach:

VOH spending variance = Actual VOH – (SVOR × AH)
= $860,000 – ($10 × 82,000)
= $40,000 *U*

VOH efficiency variance = (AH – SH)SVOR
= (82,000 – 80,000)$10
= $20,000 *U*

2. Fixed overhead variances:

Actual FOH	Budgeted FOH	Applied FOH
	$6 × 1.6 × 60,000	$6 × 1.6 × 50,000
$556,000	$576,000	$480,000
$20,000 *F*	$96,000 *U*	
Spending	Volume	

The volume is a measure of unused capacity. This cost is reduced as production increases. Thus, selling more goods is the key to reducing this capacity (at least in the short run).

Esercizio 24

1. Shumaker Company
Performance Report

	Actual Costs	Costs*	Budgeted Variance
Direct materials	$ 775,000	$ 750,000	$25,000 *U*
Direct labor	590,000	600,000	10,000 *F*
Variable overhead	310,000	300,000	10,000 *U*
Fixed overhead	180,000	165,000	15,000 *U*
Total	$1,855,000	$1,815,000	$40,000 *U*

*Uses the variable unit standard costs for materials, labor, and variable overhead (e.g., DM = $15 × 50,000); fixed overhead = $3.00 × 55,000 (the FOH rate is based on expected production).

2. a. FOH variances:

Spending variance = Actual FOH – Budgeted FOH
= $180,000 – $165,000
= $15,000 *U*

Volume variance = Budgeted FOH – (FOH rate × SH)
= $165,000 – ($2.50 × 60,000)
= $15,000 *U*

Note: FOH rate is calculated as follows:

Hours allowed $= \frac{\textbf{60,000 hours}}{\textbf{50,000 units}} = 1.20$ hours per unit

Standard FOH rate $= \frac{\textbf{\$3.00 per unit}}{\textbf{1.20 hours per unit}} = \$2.50$/hour

b. VOH variances:

Variable OH rate $= \frac{\textbf{\$300,000}}{\textbf{60,000 hours}} = \$5.00$/hour

Spending variance = Actual VOH – (SVOR × AH)
= $310,000 – ($5.00 × 63,000)
= $5,000 *F*

Efficiency variance = (AH – SH)SVOR
= (63,000 – 60,000)$5.00
= $15,000 *U*

Esercizio 25

1. Fixed overhead rate $= \frac{\textbf{\$2,400,000}}{\textbf{600,000 hours *}}$
= $4 per hour

*Standard hours allowed = 2 × 300,000 units.

2. Athens plant:

Actual FOH	Budgeted FOH	Applied FOH
$2,500,000	$2,400,000	$4 × 600,000
$100,000 *U*	0	
Spending	Volume	

Little Rock plant:

Actual FOH	Budgeted FOH	Applied FOH $4 × 480,000 =
$2,500,000	$2,400,000	$1,920,000
$100,000 *U*	$480,000 *U*	
Spending	Volume	

The spending variance is almost certainly caused by supervisor salaries (for example, an unexpected midyear increase due to union pressures). It is unlikely that the lease payments or depreciation would be greater than budgeted. Changing the terms on a 10-year lease in the first year would be unusual (unless there is some sort of special clause permitting increased payments for something like unexpected inflation). Also, the depreciation should be on target (unless more equipment was purchased or the depreciation budget was set before the price of the equipment was known with certainty).

The volume variance is easy to explain. The Little Rock plant produced less than expected, and so there was an unused capacity cost: $4 × 120,000 hours = $480,000. The Athens plant had no unused capacity.

3. It appears that the 120,000-hour unused capacity (60,000 subassemblies) is permanent for the Little Rock plant. This plant has 10 supervisors, each making $50,000. Supervision is a step-cost driven by the number of production lines. Unused capacity of 120,000 hours means that two lines can be shut down, saving the salaries of two supervisors ($100,000 at the original salary level). The equipment for the two lines is owned. If it could be sold, then the money could be reinvested and the depreciation charge would be reduced by 20% (two lines shut down out of 10). There is no way to directly reduce the lease payments for the building. Perhaps the company could use the space to establish production lines for a different product. Or perhaps the space could be subleased. Another possibility is to keep the supervisors and equipment and try to fill the unused capacity with special orders—orders for the subassembly below the regular selling price from a market not normally served. If the selling price is sufficient to cover the variable costs and cover at least the salaries and depreciation for the two lines, then the special order option may be a possibility. This option, however, is fraught with risks, e.g., the risk of finding enough orders to justify keeping the supervisors and equipment, the risk of alienating regular customers who pay full price, and the risk of violating price discrimination laws. [*Note:* You may wish to point out the value of the resource usage model in answering this question (see Chapter 3)].

4. For each plant, the standard fixed overhead rate is $4 per direct labor hour. Since each subassembly should use two hours, the fixed overhead cost per unit is $8, regardless of where they are produced. Should they differ? Some may argue that the rate for the Little Rock plant needs to be recalculated. For example, one possibility is to use expected actual capacity, instead of practical capacity. In this case, the Little Rock plant would have a fixed overhead rate of $2,400,000/480,000 hours = $5 per hour and a cost per subassembly of $10. The question is: Should the subassemblies be charged for the cost of the unused capacity? ABC suggests a negative response. Products should be charged for the resources they use, and

the cost of unused capacity should be reported as a separate item to draw management's attention to the need to manage this unused capacity.

Esercizio 26

1. If reducing negative environmental impacts is a legitimate firm-wide objective or if legally mandated, then there is an ethical obligation to help achieve the desired reduction. Furthermore, if it is possible to reduce environmental impacts while simultaneously reducing costs, then this would seem to be an outcome that ought to be pursued for the well-being of the firm; thus, it can be argued that in this case there is also an ethical obligation to act. In terms of ethical standards, that of competence is the most obvious category for sustaining the argument that an ethical obligation exists to help in reducing environmental impacts. Ethical professional practice requires continuous development of knowledge and skills and performance of duties in accordance with relevant laws, regulations, and technical standards. Flexible budgeting uses cost formulas and thus requires the financial expert to identify costs that vary with specific drivers. Some of these drivers can be environmental variables such as kilowatt hours, gallons of fuel, pounds of toxic chemicals, etc. Thus, reducing the output should reduce the projected cost either by reducing the output itself or by reducing the unit variable cost.
2. Any financial officer should be concerned with cost reduction. If reducing environmental waste or pollutants also produces a reduction in cost, then it seems like there is an ethical obligation to undertake and support these objectives. To refuse to engage in acts that will simultaneously reduce costs and negative environmental impacts seems unethical. There is an issue of credibility (Standard IV) —the need to communicate information in the right way and to disclose all relevant information. There is also a need for competence (Standard I) —an obligation to have the knowledge and skills needed to support such actions.
3. A variety of answers will emerge. There are always ethical dilemmas that can surface when performance evaluations occur. For example, is it ethical for a financial executive to deliberately and systematically overstate the unit variable cost in a flexible budget? (The objective may be to force subordinate managers to find ways to reduce costs.) Alternatively, a subordinate manager may report more maintenance hours than actually used, and simultaneously reduce preventive maintenance. The flexible budget will then project a higher expected cost than the actual costs incurred. The objective may be to achieve a bonus or salary increase.