

Foundations of Accounting & Finance

Prof. Arun Kumar Gopalswamy

Department of Management Studies - IIT Madras

Week - 09

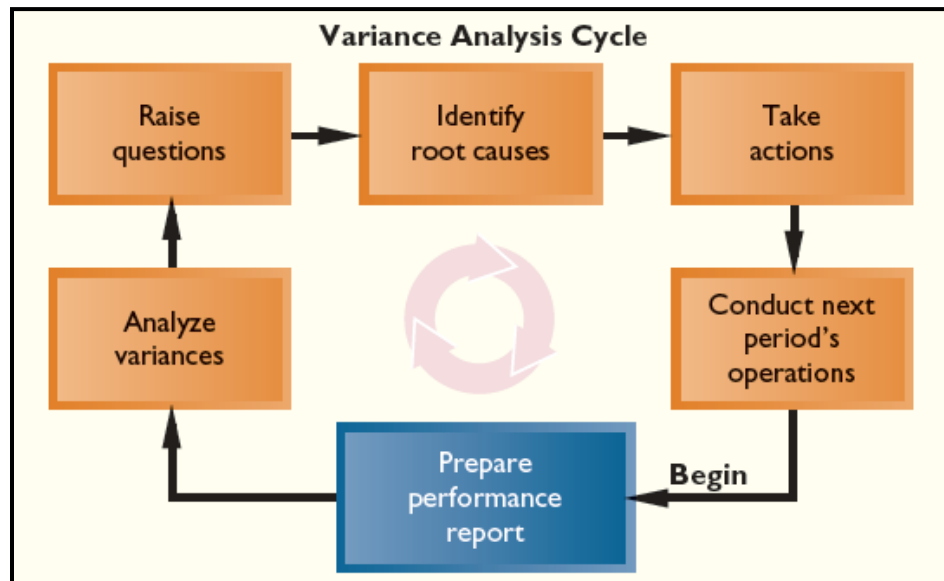
Lecture – 40

Flexible Budget and Variance Analysis

Introduction

Variance analysis, also known as standard costing, is a crucial aspect that follows budgeting. It involves examining the differences between actual results and budgeted figures. To facilitate this analysis, we introduce another vital tool: the flexible budget.

Variance Analysis Cycle



In variance analysis, we aim to understand the reasons behind the differences between budgeted and actual costs. Identifying the root cause of variations is crucial for taking corrective action. Variance is typically categorized as favourable or unfavourable, but it is important to note that favourable variance isn't always beneficial.

For instance, let us consider a scenario where the budget allocates resources for producing 500 units of a product, but only 400 units are actually produced. In this case, all cost figures would show a favourable variance because less money was spent than budgeted. However, this favourable

variance does not necessarily indicate good performance because the output fell short of expectations.

To address this, we utilize a flexible budgeting approach. Instead of comparing actual costs to the original budget for 500 units, we create a new budget specifically tailored for the actual output of 400 units. This flexible budget allows for an accurate comparison and helps identify areas where costs may be higher or lower than expected. By maintaining flexibility in our budgeting approach, we can effectively analyse variances and make informed decisions to improve performance.

Characteristics of Flexible Budgets

Planning budgets are designed for a specific, anticipated level of activity. Assessing performance becomes challenging when the actual activity deviates from the planned level.

Now, let us get into the evaluation of this performance. What are its distinct characteristics? We craft budgets tailored to the pertinent level of activity, basing them on the actual activity level. A standardized budget is already in place. Subsequently, I adjust this budget to align with the actual activity—the fundamental output or activity performed.

Deficiencies of the Static Planning Budget: Example

Larry’s Lawn Service provides lawn care in a planned community where all lawns are approximately the same size. At the end of May, Larry prepared his June budget based on mowing 500 lawns. Since all of the lawns are similar in size, Larry felt that the number of lawns mowed in a month would be the best way to measure overall activity for his business.

Larry’s Planning Budget

Larry's Lawn Service For the Month Ended June 30		
	Revenue/Cost Formulas	Planning Budget
Number of lawns (Q)		500
Revenue	(\$75Q)	\$ 37,500
Expenses:		
Wages and salaries	(\$5,000 + \$30Q)	\$ 20,000
Gasoline and supplies	(\$9Q)	4,500
Equipment maintenance	(\$3Q)	1,500
Office and shop utilities	(\$1,000)	1,000
Office and shop rent	(\$2,000)	2,000
Equipment Depreciation	(\$2,500)	2,500
Insurance	(\$1,000)	1,000
Total expenses		32,500
Net operating income		\$ 5,000

In this phase, Q represents the quantity. So, with Q set at 500 lawns, the revenue projection is 75 multiplied by 500. Wages and salaries encompass both fixed and variable components, as indicated. The fixed component is 5000, while the variable component is 30 dollars per lawn,

resulting in 30 multiplied by Q. Gasoline and supplies are purely variable at 9Q. Equipment maintenance is set at 3Q, while shops and utilities amount to 6000 dollars, and office rent to 2000. Additional expenses include depreciation, insurance, and so forth. Larry anticipates a net profit of 5000 dollars.

Larry's Actual Results

The following is the revenue and expenditure statement:

Larry's Lawn Service For the Month Ended June 30	
	<u>Actual Results</u>
Number of lawns	550
Revenue	\$ 43,000
Expenses:	
Wages and salaries	\$ 23,500
Gasoline and supplies	5,100
Equipment maintenance	1,300
Office and shop utilities	950
Office and shop rent	2,000
Equipment Depreciation	2,500
Insurance	1,200
Total expenses	36,550
Net operating income	\$ 6,450

However, when reviewing his actual performance, Larry finds that he has not mowed 500 lawns as planned, but rather 550 lawns.

Larry's Actual Results Compared with the Planning Budget

Now, let us do a comparison with the actual and planned results.

Larry's Lawn Service For the Month Ended June 30				
	<u>Revenue/Cost Formulas</u>	<u>Actual Results</u>	<u>Planning Budget</u>	<u>Variances</u>
Number of lawns (Q)		550	500	
Revenue	(\$75Q)	\$ 43,000	\$ 37,500	\$ 5,500 F
Expenses:				
Wages and salaries	(\$5,000 + \$30Q)	\$ 23,500	\$ 20,000	\$ 3,500 U
Gasoline and supplies	(\$9Q)	5,100	4,500	600 U
Equipment maintenance	(\$3Q)	1,300	1,500	200 F
Office and shop utilities	(\$1,000)	950	1,000	50 F
Office and shop rent	(\$2,000)	2,000	2,000	-
Equipment Depreciation	(\$2,500)	2,500	2,500	-
Insurance	(\$1,000)	1,200	1,000	200 U
Total expenses		36,550	32,500	4,050 U
Net operating income		\$ 6,450	\$ 5,000	\$ 1,450 F

Let's consider the scenario where revenue shows a favourable variance of 5500, which is fantastic news. However, wages and salaries, as well as gasoline and supplies, display unfavourable variances because they are variable costs. It's worth noting that the actual number of lawns mowed was 550, exceeding the planned 500.

Now, with a net operating profit of 6450 compared to the expected 5000, it seems like everything is going well. However, it's essential to recognize that the planned budget isn't suitable for comparison in this case. Since the planned budget was based on the assumption of mowing 500 lawns, it's necessary to create a flexible budget tailored to the actual activity of 550 lawns. Only then can we accurately assess the favourable and unfavourable differences.

Moving forward, let's delve into the next aspect, building upon the explanation provided.

Larry's Actual Results Compared with the Planning Budget

Revenue/Cost Formulas	Actual Results	Planning Budget	Variances
Number of lawns (Q)	550	500	
Revenue (\$75Q)	\$ 43,000	\$ 37,500	\$ 5,500 F
Expenses:			
Wages and salaries	3,500	3,000	500 U
Gasoline and supplies	600	500	100 U
Repairs and maintenance	200	200	0 F
Office and shop utilities (\$1,000)	950	1,000	50 F
Depreciation	200	200	0 U
Total expenses	4,050	3,900	150 U
Net operating income	\$ 6,450	\$ 5,000	\$ 1,450 F

F = Favorable variance that occurs when actual revenue is greater than budgeted revenue.

U = Unfavorable variance that occurs when actual costs are greater than budgeted costs.

F = Favorable variance that occurs when actual costs are less than budgeted costs.

Unfavorable variances occur when actual revenue surpasses budgeted revenue, and unfavorable variances arise when actual costs exceed the budget. This highlights a limitation of static planning, which can lead to inaccurate estimations. To address this, we need flexibility. So, I'll prepare a budget tailored to mowing 550 lawns, anticipating a revenue of \$41,250 and corresponding expenses. With this, I expect a net operating income of \$6,650, which I'll use for comparison in the next step: analyzing activity variances.

Activity variances reveal the disparities between the planned and flexible budgets. Next, I will compare these with the actual results. The actual revenue of \$43,000 exceeds the expected \$41,250, resulting in a favourable revenue variance of \$1,750. However, costs amounting to \$23,500, compared to the ideal flexible budget of \$21,500, show an unfavourable variance of \$2,000.

Now, I'll delve deeper into these variances. Have costs genuinely increased, or have there been oversights? I'll scrutinize each expense category. For instance, while I expected to spend \$4,950 on gasoline, I actually spent \$5,100, resulting in an unfavourable variance. Conversely, I spent only \$1,300 on equipment instead of the expected \$1,650, yielding a favourable variance. Office utilities display a favourable variance of \$950, but insurance shows an unfavourable variance. Regarding profit, while I anticipated \$6,650, I only earned \$6,450, indicating an unfavourable variance.

These are spending variances, complementing the earlier revenue variance. Now, let's apply numerical examples to further understand this concept, exploring two scenarios.

Larry's Actual Results Compared with the Planning Budget

Revenue/Cost Formulas	Actual Results	Planning Budget	Variances
Number of lawns (Q)	550	500	
Revenue (\$75Q)	\$ 43,000	\$ 37,500	\$ 5,500 F
Expenses:			
Gasoline	5,100	4,950	150 U
Equipment	1,300	1,650	350 F
Office and shop utilities (\$1,000)	950	1,000	50 F
Insurance	1,000	950	50 U
Total expenses	8,350	8,550	200 F
Net operating income	\$ 6,450	\$ 5,000	\$ 1,450 F

Since these variances are **unfavorable**, has Larry done a poor job controlling costs?

Since these variances are **unfavorable**, has Larry done a poor job controlling costs?

Since these variances are **favorable**, has Larry done a good job controlling costs?

Example

Vulcan Flyovers offers scenic overflights of Mount St. Helens, the volcano in Washington State that explosively erupted in 1982. Data concerning the company's operations in July appear below:

Vulcan Flyovers			
Operating Data			
For the Month Ended July 31			
	Actual Results	Flexible Budget	Planning Budget
Flights (q)	48	48	50
Revenue (\$320.00q)	\$ 13,650	\$ 15,360	\$ 16,000
Expenses:			
Wages and salaries (\$4,000 + \$82.00q)	8,430	7,936	8,100
Fuel (\$23.00q)	1,260	1,104	1,150
Airport fees (\$650 + \$38.00q)	2,350	2,474	2,550
Aircraft depreciation (\$7.00q)	336	336	350
Office expenses (\$190 + \$2.00q)	460	286	290
Total expense	12,836	12,136	12,440
Net operating income	\$ 814	\$ 3,224	\$ 3,560

The company measures its activity in terms of flights. Customers can buy individual tickets for overflights or hire an entire plane for an overflight at a discount.

Required:

1. Prepare a flexible budget performance report for July that includes revenue and spending variances and activity variances.
2. Which of the variances should be of concern to management? Explain.

Solution:

Let us analyse the figures for flights, considering actual, flexible, and planned budgets. We will examine the revenue and spending variances, as well as the activity variance.

First, we have the actual results, which show 48 flights. Now, let us calculate the variances. The flexible budget also reflects 48 flights, matching the actual results. However, the planned budget projected 50 flights. It is important to note that we are assessing both revenue and spending variances, alongside the activity variance.

Revenue

Now, let us get into the revenue aspect. Each flight is priced at \$320. Looking at the actual results The earned revenue is \$13,650. Comparing this to the flexible budget, which is calculated as 48 flights multiplied by \$320, we get \$15,360. Meanwhile, the planned budget projected revenue of \$16,000.

So, what does this reveal? The revenue and spending comparison highlights an unfavourable variance. What does unfavourable mean in this context? It means that I should have earned a certain amount, but the firm have actually earned less. Therefore, it is marked as unfavourable. Let us denote this in red for clarity, with "U" for unfavourable and "F" for favourable.

Considering the activity budget, due to the lower-than-budgeted activity level, my flexible budget revenue is also lower. Hence, this aspect is unfavourable as well.

Expenses

Wages and salaries

Let us delve into the expenses, starting with wages and salaries. The total expense for wages and salaries comprises a fixed amount of \$4,000 plus \$82 per flight.

The actual result amounts to \$8,430. Now, let us calculate the flexible budget, which should have been \$4,000 plus \$82 multiplied by 48 flights. However, the actual expenditure exceeds this amount, indicating an unfavourable spending variance.

Now, comparing this to the planned budget of \$8,100, we find a favourable variance. This means that although the actual expenditure exceeded the flexible budget, it remained below the planned budget, resulting in a favourable variance.

Fuel

Fuel costs are entirely variable, calculated at \$23 per flight.

The actual expenditure on fuel amounts to \$1,260. Comparing this to the budgeted amount, which should have been \$48 multiplied by \$23, we find that the actual expenditure exceeds the budgeted amount, resulting in an unfavourable variance.

Now, let us compare this to the flexible budget. The actual fuel expenditure of \$1,150 is lower than the flexible budget of \$1,104, indicating a favourable variance.

Airport Fee

Next, let us discuss the airport fee, which comprises a base fee of \$650 plus \$38 per flight.

The actual expenditure on airport fees amounts to \$2,350. Comparing this to the budgeted amount, which should have been \$650 plus \$38 multiplied by 48 flights, we find that the actual expenditure is lower than the budgeted amount, resulting in a favourable variance.

This favourable variance is attributed to the reduction in activity levels. When comparing to the flexible budget, which is estimated for the actual level of activity, the variance remains favourable. Therefore, the \$76 difference represents a favourable outcome in this case.

Aircraft depreciation

Next, let us analyse aircraft depreciation, which is calculated at a rate of \$7 per flight.

The actual depreciation expense amounts to \$336. Comparing this to the budgeted depreciation, which should have been \$7 multiplied by 48 flights, also equalling \$336, we find that the actual expense matches the budgeted amount exactly. Consequently, there is no variance in this case.

As a result, there is no difference between the actual and budgeted figures, leading to a variance of \$0. This lack of variance signifies that the aircraft depreciation expense aligned precisely with the budgeted expectation

Office expenses

Next, let us consider office expenses, which comprise a fixed component of \$190 plus a variable component of \$2 per flight.

The actual office expenses amount to \$460. Comparing this to the flexible budget calculation, which should have been \$190 plus \$2 multiplied by 48 flights, totalling \$286, we observe an

unfavourable variance of \$174. This discrepancy indicates that the actual office expenses exceeded the flexible budget, resulting in an unfavourable variance.

This unfavourable variance is a comparison between the actual and flexible budget figures, representing a revenue variance. The decrease in activity level contributes to this variance. Specifically, the activity variance in this case is \$290, and there is an additional \$4 variance due to other factors.

Total expenses

Finally, let us examine the total expenses. By summing up all the individual expense items, we arrive at the total expenses for this analysis. Upon reviewing the total expenses and comparing them with the budgeted amounts, we observe an overall unfavourable variance. However, there is one notable exception: the variance associated with the reduction in activity level appears to be favourable, amounting to approximately \$304.

In summary, while the overall expenses show an unfavourable variance, the reduction in activity has led to a favourable outcome in this particular case.

Net operating income

Let us calculate the net operating income. The actual net operating income is \$814. In an ideal scenario, it should have been \$3560. However, there is a substantial unfavourable variance of \$2746. This unfavourable variance indicates that the actual earnings are significantly lower than what was expected. It is crucial to note that this unfavourable variance in operating earnings is quite substantial and requires attention.

When we analyse the variances further, we find that the activity variance of \$336 is unfavourable. This variance is primarily due to the decrease in activity levels. Initially, we planned for 550 flights, but only 48 flights were realized, leading to this unfavourable activity variance.

Additionally, there is a revenue and spending variance of \$1710. This variance is attributed to inefficiencies in revenue collection. It is important to recognize that the second variance, stemming from revenue and spending, is particularly concerning as it directly impacts the company's ability to generate revenue effectively.

While both variances are of concern, the revenue and spending variance holds more significance for the company's financial performance. The unfavourable variances in wages and salaries, fuel, and office expenditure also require attention, as they contribute to the overall unfavourable variance in total expenses.

In summary, while all variances are important, addressing the revenue and spending variance is critical for improving the company's financial performance. Now, let us solve another numerical example before concluding our discussion.

	Unfavourable marked in Red		Favourable marked in Blue		
	Actual results	Revenue and spending variances	Flexible budget	Activity variance	Planning budget
Flights (Q)	48		48		50
Revenue (@ 320 per Q)	13,650	1,710	15360	640	16000
Expenses:					
Wages and sal (4000 + 82Q)	8,430	494	7936	164	8100
Fuel 23 Q	1,260	156	1104	46	1150
airport fee (650 + 38Q)	2,350	124	2474	76	2550
aircraft dep (7 Q)	336	-	336	14	350
office exp 190 + 2 Q	460	174	286	4	290
total expenses	12,836	700	12,136	304	12,440
net operatng income	814	2,410	3,224	336	3,560

Example

AirQual Test Corporation provides on-site air quality testing services. The company has provided the following cost formulas and actual results for the month of February:

	Fixed Component per month	Variable Component per month	Actual Total for February
Revenue		\$ 360	\$ 18,950
Technician wages	\$ 6,400		\$ 6,450
Mobile lab operating expenses	\$ 2,900	\$ 35	\$ 4,530
Office expenses	\$ 2,600	\$ 2	\$ 3,050
Advertising expenses	\$ 970		\$ 995
Insurance	\$ 1,680		\$ 1,680
Miscellaneous expenses	\$ 500	\$ 3	\$ 465

The company uses the number of jobs as its measure of activity. For example, mobile lab operating expenses should be \$2,900 plus \$35 per job, and the actual mobile lab operating expenses for February were \$4,530. The company expected to work 50 jobs in February, but actually worked 52 jobs.

Required:

Prepare a flexible budget performance report showing AirQual Test Corporation's revenue and spending variances and activity variances for February.

Solution

Let us begin by preparing the flexible budget for the month of February using the actual results provided. First, we will examine the actual results, followed by the spending variance, flexible budget, activity variance, and planned budget. This structured approach will allow us to understand the variances and their impact on the overall budgeting process. Let us get into the details and analyse each aspect systematically.

Actual results

Let us start by listing all the aspects: revenue, technician, managers, mobile lab, operating expenses, office expenses, advertising expenses, insurance, and miscellaneous. I have recorded the input in the actual results for each of these: revenue \$18,950, technician \$6,450, mobile lab operating expenses \$4,530, operating expenses \$3,050, advertising expenses \$995, insurance \$1,680, and miscellaneous expenses \$465. The total expenses amounting to \$17,170 and the resultant net operating income is \$1780.

Now, let us prepare the planned budget. Additionally, we need to consider the number of jobs completed, which is 52 for both actual and flexible budgets, whereas it was 50 for planned. This will be crucial for accurately calculating the flexible and fixed budgets.

Planned Budget

Let us examine the planned budget. What should the revenue be? It is \$360 multiplied by the number of jobs. Now, what about the technical wages? They are fixed at \$6,400.

Mobile lab operating expenses amount to approximately \$2,900, with an additional \$35 per job. Office expenses should be \$2,600, plus \$2 for each job. Advertising expenses remain fixed at \$970. Insurance costs stay at \$1,680, unchanged. Lastly, miscellaneous expenses total \$500, plus \$3 for each job in the planned budget.

Flexible Budget

Now, let us get into the flexible budget. The revenue should be \$360 multiplied by the number of jobs. Upon analysis, more revenue has been earned than anticipated, resulting in a favourable variance.

With 52 activities, the planned 50 has been exceeded. So, the activity variance is also favourable because more has been earned with the increased activity.

Now, into expenses: Technical wages were budgeted at \$6,400, but \$50 more has been spent, which is unfavourable.

For mobile lab expenses, the budget was \$2,900 plus \$35 per job, totalling \$4,720 for 52 jobs. However, only \$4,530 has been spent, which is favourable.

In terms of office expenses, the budget was \$2,600 plus \$2 per job, but more has been spent, resulting in an unfavourable variance.

Advertising expenses were budgeted at \$970, but \$995 has been spent, which is unfavourable.

Insurance expenses remain unchanged at \$1,680, resulting in no variance.

Miscellaneous expenses were budgeted at \$500 plus \$3 per job, totalling \$656 for 52 jobs. However, only \$465 has been spent, which is highly favourable.

Total expenses

After summing up all the individual expenses, the total expenditure is unfavourable. Despite some expenses showing favourable variances, the overall total expenditure is unfavourable. This indicates an excess of expenditure, requiring additional funds to be sourced.

Net operating income

The net operating income is calculated as revenue minus expenditure. Despite the increase in activity resulting in higher profit, the actual increase is only \$190 compared to the expected \$640. This discrepancy prompts a closer examination of both favourable and unfavourable variances. While earning more revenue is favourable, it necessitates a review of budgeting practices to ensure accuracy in cost and revenue projections. This analysis involves assessing both spending and activity variances to identify areas for improvement.

	Unfavourable marked in Red		Favourable marked in Blue		Planned budget
	Actual results	Spending variance	flexible budget	Activity variance	
number of jobs	52		52		50
Revenue	18,950	230	18720	720	18000
technician wages	6,450	50	6400	0	6400
mobile lab operating expenses	4,530	190	4720	70	4650
office expenses	3,050	346	2704	4	2700
advertising expenses	995	25	970	0	970
insurance	1,680	-	1680	0	1680
mis exp	465	191	656	6	650
TOTAL EXPENSES	17,170	40	17,130	80	17,050
net operating income	1,780	190	1,590	640	950