

**Widget Works, Inc.**  
**Demonstration problem for standard costing,**  
**profit variance analysis and income reconciliation.**  
**BUSA 323—Cost Accounting & Control Systems**  
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Widget Works [WW] is a manufacturer of high quality widgets for home and industry. WW's president and CEO, Wanda Widget, has just met with her accountant, who said he thought the net loss for FY '05 would be "...in the neighborhood of \$38,000." This was quite a shock to Wanda, who recalled that budgeted profit had been a bit under \$90K.

Shaken by this unpleasant turn of events, Wanda reflected on the decisions she had made over the past year. The company had historically enjoyed relatively high profitability, but recent changes in economic conditions and moves by competitors had precipitated decisions which, in retrospect, may have been ill-advised. After devoting considerable thought to the matter, Wanda has decided to hire you as an outside consultant to assist her in analyzing the situation and to provide an independent perspective.

As you settle into a chair in Wanda's office, she explains her dilemma and the decisions that seem to have led to the sizable loss for the year.

"Our budget for FY '05 showed only modest changes from the prior year. We realized that the competitive environment had changed, so we tried to be pretty realistic in our planning. Around the first of January we had what we thought would be a break for us when a new supplier of raw material offered us a special deal on carbon butyl dioxide [CBD], the principle material used in widget manufacture. The sales rep said that they had experienced difficulties in the production process which had resulted in product of slightly inferior quality. However, he said they were giving us such a good price that we would easily make up for any losses due to abnormal waste of material. Now I am worried that we may have gotten snookered on the deal. We wound up using a lot more material than we should have and the labor times went through the roof. I am also concerned that the poor quality of the raw material caused an increase in our variable overhead costs. The primary variable overhead items are electricity, which is used to operate the heaters that cure the CBD after it has been molded, and adhesive which is used to fasten the components together. For the output that we achieved, we wound up using a lot more power and more adhesive as well.

Getting snookered on the material was bad enough, but then our competitors cut their price in an effort to gain market share. We responded by cutting our price by three bucks a unit, but we still didn't meet our sales volume estimates for the year. I even raised the sales commission to 12% on the lower sales price so that our sales people wouldn't take a hit because of the price reduction. Even that didn't enable us to meet our target volume.

I would like to be able to sort out the impact of all this. Is there some way we can break out the numbers so we can see the individual impact of these decisions on our profitability? Oh, by the way, here is the information we used to develop the budget."

Standards	Price or rate	Qty per unit
Direct material cost/foot	\$2.50	3.0
Direct labor cost/DLH	\$7.00	1.50
Variable ohd rate/DLH	\$2.80	
Budgeted fixed overhead	\$157,500	
Planned output (denominator )	35,000	Units
Fixed overhead rate/DLH	\$ 3.00	
Budgeted unit sales	35,000	
Budgeted sales price	\$36.95	
Variable selling & admin expenses [commissions]	\$3.70	10.0%
Fixed selling & admin expenses	\$140,000	

"Also, when my accountant was in here discussing the results for 2005, he left the following information regarding actual outcomes for the year"

Actual Outcomes		Costs	Quantities
Direct material purchased	\$250,000	125,000	feet
Direct material used		120,000	feet
Direct labor used	\$401,500	55,000	DLH
Variable overhead	\$165,000		
Fixed overhead	\$160,000		
Actual production		36,000	units
Units sold		34,000	units
Variable selling & admin exp	\$4.07	12%	
Fixed Selling & admin exp	\$143,690	\$0.10898	
Selling price/unit	\$33.95		

**Required:**

1. Determine the standard variable manufacturing cost of one widget.
2. Determine the standard absorption cost of one widget.
3. Prepare a budgeted income statement for FY '05, based on WW's budget estimates.
4. Calculate all manufacturing variances.
5. Prepare a year-end income statement. Assume that all variances are written off against cost of goods sold.
6. Refer to the attached summary of variances. Prepare a full analysis [Level 1 through Level 4] of Widget Works' performance for FY '05. Prepare a written summary for Wanda Widget that explains clearly the large difference between her budgeted net income and the actual loss experienced in FY '05. [Note that there is no market size variance here and there are no product or material mix variances.]

## Introduction to profit variance analysis

The next several classes [and several sections from the text] will cover the general topic of *profit variance analysis*. As the phrase implies, the main focus of this effort is determining why profit turned out to be different from what we expected it would be [i.e., the budgeted amount]. Before we can discuss the variances, a bit of terminology regarding budgets is in order.

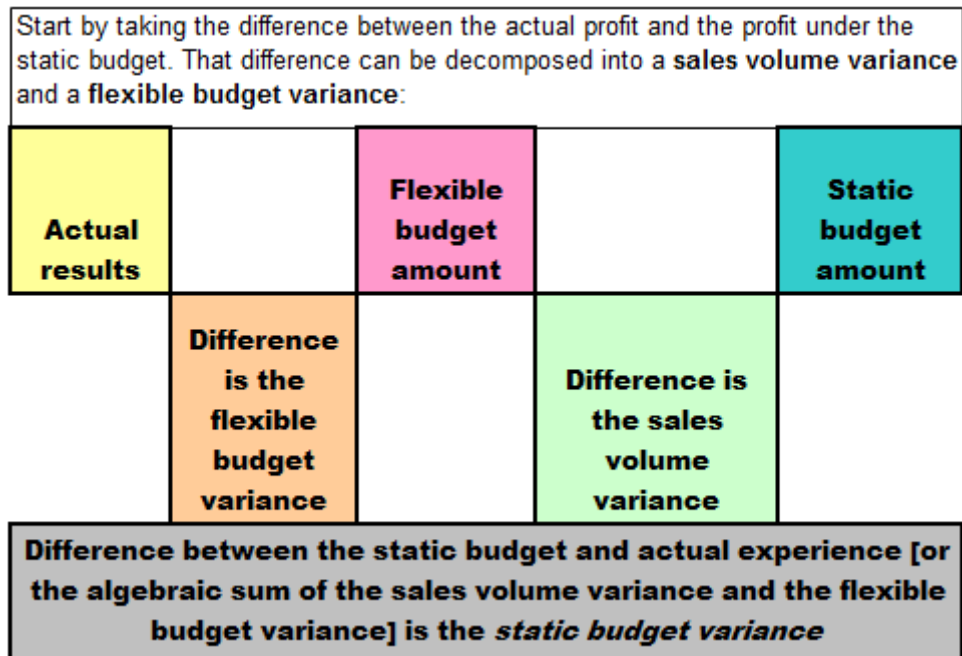
The *static budget* is simply the quantity [or related dollar value] predicted in advance. The *flexible budget* projects costs and revenues based on the volume of business actually experienced. If we project that sales will be 50,000 units but we actually sell 55,000 units, we need to flex the budget so that our costs and revenues will reflect what *should* happen at the actual volume. Comparing actual experience at 55,000 units with projected outcomes at 50,000 units is an apples-and-oranges comparison which provides no useful information for managerial decision making or for evaluation of operations.

The various reasons why profit might differ from expectations are in the column on the left. The monetary impact of that difference is reflected in the variance named in the second column. In the third column, I have identified the most relevant portions of the text where that variance is discussed.

What happened?	What we call the resulting variance	Where you can find more about it in the book
Sales volumes [total quantities] were higher or lower than expected	Sales volume variance [SVV]	pp. 229 - 230
Sales prices were higher or lower than expected	Sales price variance [SPV]	pp. 515 – 517
Sales quantities were larger or smaller than expected	Sales quantity variance [SQV; note that there is a distinction between the <b>sales volume variance</b> and the <b>sales quantity variance</b> . The SVV arises from the difference between the flexible budget and the static budget. The SQV is the contribution margin impact arising from selling different total quantities at the budgeted sales mix percentage at the budgeted contribution margin per unit.	pp. 517 – 519
Sales mix was different from expectation [e.g., we sold more higher contribution products and fewer lower contribution items]	Sales mix variance [SMV]	pp. 517 – 519
Wage rates differed from those expected	Direct labor rate variance [DLRV]	pp. 233 - 234
We used more or fewer labor hours than expected	Direct labor efficiency variance [DLEV]	p. 235

Unit costs of raw materials were higher or lower than expected	Direct material price variance [DMPV]	pp. 233 - 234
We used more or less raw material than expected	Direct material efficiency [DMEV]	p. 235
We used more or fewer overhead resources than expected	Variable overhead efficiency variance [VOEV] Variable overhead spending variance [VOSV] Fixed overhead spending [or budget] variance [FOBV]	pp. 263 - 272
The prices of overhead resources differed from expectation	Variable overhead spending Fixed overhead spending	pp. 263 – 272
Fixed overhead applied was greater or less than the fixed overhead budget	Fixed overhead denominator variance or fixed overhead production volume variance [FODV or FOPVV]	pp. 270 - 271

Note that the algebraic sum of the variances will always equal the difference between expected and actual profit. The variances tell us WHY we achieved outcomes that were different from those we expected. Therefore, understanding the *magnitude*, *direction*, and *reason* for the variances is critical to understanding the impact of managerial decisions on organizational performance. The reconciliation between budgeted and actual profit can be summarized as follows:



The flexible budget variance can be decomposed into a series of variances which provide progressively more detailed information about the profit impact of a number of managerial decisions. This entire process is often referred to as "peeling the onion."

<b>Actual results</b>		<b>Actual inputs at budgeted prices</b>		<b>Flexible budget amount</b>
	<b>Sales price, material price, labor rate, and overhead spending variances</b>		<b>Sales quantity, manufacturing efficiency, and production volume variances</b>	
<b>Difference between the flexible budget amount and actual experience [or the algebraic sum of the respective variances] is the flexible budget variance</b>				

<b>Actual market size</b>		<b>Actual market size @ budgeted market share</b>		<b>Static budget</b>
	<b>Market share variance</b>		<b>Market size variance</b>	
<b>The sales quantity variance can be decomposed into a market share and a market size variance</b>				