

A COMMON SENSE APPROACH TO TEACHING COST VARIANCES:

NO CHEAT SHEETS REQUIRED

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ABSTRACT

This paper presents an alternative way of presenting cost variance calculations that helps students correctly solve typical cost variance problems and focus on the size of the variances rather than the labels of ‘favorable’ and ‘unfavorable’. This method uses three modifications to traditional methods of instruction to avoid some common pitfalls that may lead students to incorrectly perceive unfavorable variances as negative and needing attention while favorable variances are positive and do not need attention. The three suggested modifications to traditional instruction are easily implemented with any existing course materials.

INTRODUCTION

When explaining cost variances, most managerial and cost accounting textbooks will indicate that students should refrain from assigning positive and negative connotations to the terms “favorable” and “unfavorable.” Of course, thinking of variances in terms of “good” and “bad” presents problems because favorable variances do not always indicate a positive business outcome while unfavorable variances do not always indicate problems. Yet, students persist in assigning “positive” and “negative” labels to cost variances. Further, these misperceptions can keep students from looking at the size of the variance, which is often the factor determining whether a variance requires management investigation and attention. A critical look at the common approaches for demonstrating cost variance calculations reveals several reasons for this dysfunctional persistence. This paper offers an approach to teaching variance calculations that mitigates the desire to think of variances as “positive” or “negative” based on whether it is favorable or unfavorable and instead focus on the size of the variance.

TRADITIONAL METHODS OF TEACHING COST VARIANCES

First, the most common approach to demonstrating variance calculations reduces the computations to formulas. For example, the calculation for the direct materials price variance (DMPV) may be shown as:

$$\text{DMPV} = (\text{Actual Price} \times \text{Actual Quantity}) - (\text{Standard Price} \times \text{Actual Quantity})$$

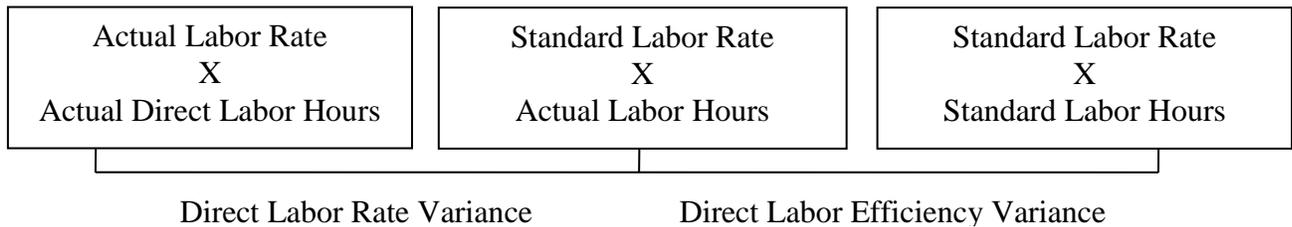
or alternatively,

$$\text{DMPV} = (\text{Actual Price} - \text{Standard Price}) \times \text{Actual Quantity}$$

Then, the student labels the variance as favorable or unfavorable based on whether the computation yields a positive or negative number. This decision rule, while yielding a correct answer on computational exam questions, reinforces the incorrect notion that variances are positive and negative. Additionally, many introductory students are completely baffled by what they are doing as the formulas above yield positive numbers for unfavorable variances and

negative numbers for favorable variances. At this point, many students and teachers decide that the best approach to handling the whole problem is to use “cheat sheets” (“formula sheets”) or something similar for the test. While such an approach will certainly improve test scores, it does nothing to improve understanding of what cost variances are or what they tell accountants and managers.

Some textbooks and instructors have sought to combat the problems associated with using formulas for cost variance calculations by first presenting the variances with a diagram. For example, the direct labor cost variances may be illustrated as:



Using something similar to the above, the teacher tries to emphasize that the variance is measuring the difference between actual and standard. However, diagrams are then used to derive the formulas and, again, students base the unfavorable or favorable designation on whether the formula yields a positive or negative number.

The tendency to use positive/negative labels for favorable/unfavorable variances is worsened when instructors demonstrate how to “add” the price variance and quantity variance to find the total variance. For example, the total direct materials price variance is shown as:

$$\text{DM Variance} = \text{DM Price Variance} + \text{DM Quantity Variance}$$

Of course, the above requires that the student sum variances as positive and negative numbers.

MODIFICATIONS TO TRADITIONAL METHODS

Three simple modifications to the traditional approach remove the association of positive and negative numbers from the variance calculations and allow students to properly focus their attention on the size of variances. If instructors avoid presenting cost variances using terminology and symbols associated with positive and negative numbers, it is much less likely that students will think about cost variances as positive and negative. Further, the modifications described allow instructors to clearly communicate the meaning of variances in a way that makes sense to almost all students, thus eliminating the need for students to try and memorize a long list of formulas to succeed on tests.

The first modification made is to change the timing of when the variance is labeled as favorable or unfavorable. The formula and diagram approaches described above label the variances as favorable or unfavorable after the variance is computed. A better way is to begin the cost variance presentation with a simple definition of a variance being a comparison of actual results with standards. Variances are labeled as favorable or unfavorable based on whether they have an unfavorable or favorable effect on income. The favorable or unfavorable label can be assigned by following the simple decision rule of:

If Actual > Standard, then unfavorable; if Actual < Standard, then favorable.

Thus, the variance can be easily labeled before the amount of the variance is calculated. Further, it is generally fairly easy for students to understand the logic behind labeling a variance based on a comparison of Actual and Standard amounts. That is, it makes sense to students that if we actually spent more than our standard, then that would have an “unfavorable” effect on income. Similarly, if we used less of an input than the standard allows, this would have a “favorable” effect on income.

Once the variance is labeled, the formulas can then be used to determine the amount. However, it is no longer necessary for the formula to yield a positive or negative number because the favorable/unfavorable designation has already been done. Thus, the absolute value of the traditional formulas can be used. For example,

$$\text{DM Price Variance} = | [\text{Actual Price} - \text{Standard Price}] \times \text{Actual Quantity} |$$

Using the above, all variance amounts are computed as positive numbers. At this point, the instructor can explain that the size of the variance is often an indicator that a variance may warrant investigation and attention. Such an explanation makes sense with how students understand absolute value.

The second modification is purely a cosmetic change to the traditional presentation of the formulas. Rather than using parentheses, use brackets to enclose the difference. Most students associate the use of parentheses with negative numbers, “outflows” and the like. The use of brackets eliminates that association while preserving the correct order of mathematical operations.

The third modification occurs when computing total variances (or the flexible budget variance). Rather than “adding” or “summing” variances to arrive at the total variance, the instructor can demonstrate “combining” price and quantity variances to determine the total cost variance. A special symbol, such as \oplus , can be used to indicate this procedure and thus avoid the inappropriate use of positive and negative numbers in the computation. For example, the total direct labor cost variance can be shown as:

$$\text{Total DL Variance} = \text{DL Rate Variance} \oplus \text{DL Efficiency Variance}$$

Virtually all students understand the procedure when just a few simple examples are discussed. For example, the instructor may show the following:

$$\$100 \text{ U} \oplus \$300 \text{ U} = \$400 \text{ U}$$

$$\$100 \text{ F} \oplus \$300 \text{ U} = \$200 \text{ U}$$

$$\$100 \text{ F} \oplus \$300 \text{ F} = \$400 \text{ F}$$

Combining variances, rather than “adding” or “summing” them, is also useful in explaining how the total cost variance (the flexible budget variance), is made up of the price (or rate or spending) variance and the quantity (or efficiency) variance. Additionally, the use of combining can be used to illustrate how inter-related variances may be combined to determine whether or not the action taken had an overall favorable or unfavorable effect on income.

All of the above modifications can be easily implemented and used with any textbook approach to cost variances. When demonstrating problems, the instructor simply asks for the variance to be labeled as favorable or unfavorable before solving for the amount of the variance. After the variance is labeled, then calculate the amount as an absolute value. In addition, the instructor uses language like “combining”, instead of “adding”, and uses some symbol, like \oplus , to indicate the combination of variances. If the instructor never treats variances as positive and negative, then students are much less likely to think of variances as positive and negative. Instead, students see how variances are a simple, common sense approach to comparing what actually happened with what the standards indicate should have happened. Variance calculations are seen as a straightforward tool to help accountants and managers be efficient in focusing on areas requiring their attention. Happily, neither students nor teachers feel the need to use “cheat sheets” to succeed on the Managerial Accounting test!