

# TRICorporation

## Experiential Leadership and Simulation Programs

Improved decision-making. Enhanced performance. Exceptional results.

### "Understanding and Analyzing Variances"

#### Critical Equation #2 for Business Leaders

$$\text{Variance} = \text{OM}_I - \text{OM}_J$$

#### **Overview**

All business leaders need to be able to create and manage a budget. This can be a relatively simple process of making sure expenditures do not exceed agreed upon limits or, when one has responsibility for an operating profit and loss statement, quite complicated and require considerable expertise. Careers have been made or lost because of the ability or inability to understand, communicate and take effective action on how a business is doing relative to its plan. The difference between a budgeted amount and the actual amount over a specified period of time, in either absolute dollars or percentages, is commonly known as a variance.

The heart and soul of managing a small department or a global enterprise is in understanding the drivers of your business in the form of variances. Knowledge of operational finance, the language of business, is essential to successful applications of variance analysis.

Understanding Critical Equation #2 can

- Enhance your company's competitive advantage
- Demonstrate effective risk management, and
- Increase the probability of meeting your commitments.

Variances come in three fundamental types: *Planning*, *Execution* and *Growth*. Effective business leaders need a working proficiency of all three. The difference between good and great companies often is a function of how capable their leaders are at understanding each of these variances. Success will be measured in incremental shareholder value.

#### **Profitable Growth**

Imagine that your business had the following year- over- year income statement:

# TRICorporation

## Experiential Leadership and Simulation Programs

Improved decision-making. Enhanced performance. Exceptional results.

TRICorporation

Experiential Leadership and Simulation Programs  
Improved decision-making. Enhanced performance. Exceptional results.

### Simplified Income Statement

	<u>2009</u>	<u>2010</u>	<u>Change</u>
Sales	100	110	10%
- Costs	66	69	4.5%
Operating Margin	34	41	20.6%
OM%	34%	37.2%	

You have Sales and Operating Margin (OM) growth. Operating margin has grown at a faster rate than Sales, resulting in the %Operating Margin (OM%) increase from 34% to 37.2%. In absolute dollars, the OM has improved by \$7 because costs have not increased as fast as sales. This is as good as it gets in business and, in the simplest form, is what people call **“Profitable Growth”** or the holy grail of business performance (admittedly, this does not imply that realized returns have necessarily exceeded our cost of capital).

Every business leader knows, however, you better be able to explain what drove the \$7 improvement in year over year profits. Did the \$7 come from price inflation, net volume change (share change and/or growth in the entire market), cost inflation (cost of labor rates, material prices, etc.) or productivity change from process improvements and the like? Other key variances not displayed here for tractability, but perhaps relevant to your business, might include: mix changes in products or services, foreign exchange or other fundamental drivers unique to your particular industry and business model.

Whatever the relevant drivers, effective business leaders must be able to identify the drivers that are controllable and those that are uncontrollable. It is the degree of control, or lack thereof, that puts a risk management perspective into variance analysis.

#### Variance Analysis

Many of you will be familiar with the following presentation format in the exhibit that follows. The so-called **“Floating Bars,” “Walks,” or “Bridges”** is used to visually portray the aforementioned \$7 variance.

# TRICorporation

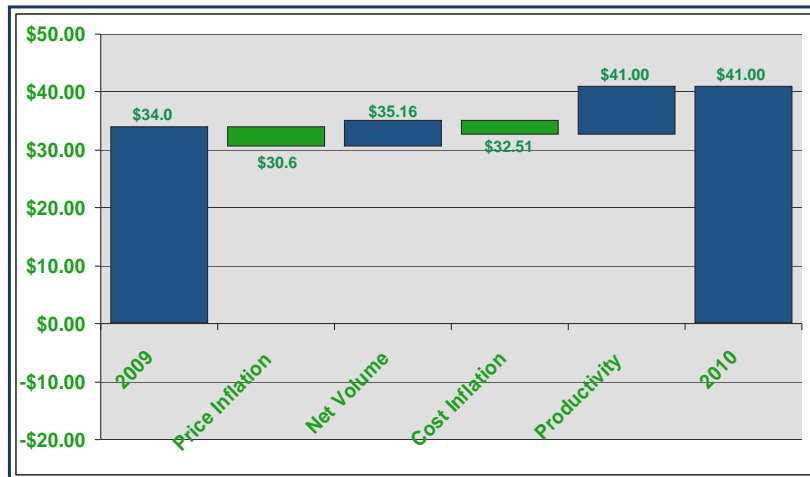
## Experiential Leadership and Simulation Programs

Improved decision-making. Enhanced performance. Exceptional results.

**TRICorporation**

Experiential Leadership and Simulation Programs  
Improved decision-making. Enhanced performance. Exceptional results.

### OM Variance Walk Chart



This brings us to Critical Equation #2 in business,  $Variance = OM_I - OM_J$  which can be expressed as,

$$[Sales_{Yr1} - Sales_{Yr1}/(1+Price)] + \{ [Sales_{Yr1}/(1+Price)] - Sales_{Yr0} \} - \{ [Sales_{Yr1}/(1+Price)] * (Costs_{Yr0}/Sales_{Yr0}) - Costs_{Yr0} \} - [Costs_{Yr1} - Costs_{Yr1}/(1+Cost)] + \{ [Sales_{Yr1}/(1+Price)] * (Costs_{Yr0}/Sales_{Yr0}) - Costs_{Yr1}/(1+Cost) \}$$

where,

- $Sales_{Yr1}$ ,  $Sales_{Yr0}$ ,  $Costs_{Yr1}$ ,  $Costs_{Yr0}$  are Sales and Costs, respectively in Yr1 and Yr 0
- Price is the inflation or deflation associated with your product's selling price
- Cost is the inflation or deflation associated with your costs (e.g., suppliers raising price, labor rates going down, etc).

We do not mean to make the "mathematics" of the formula onerous but rather to point out the critical drivers of planning, executing and meeting commitments that are embedded within the formula. This is the only road we know to achieve profitable growth for any organization committed to creating long-term value for its shareholders.

The next exhibit is a numerical example of a variance walk with price, volume, cost and productivity variances. Note that the data from our original exhibit is in the upper right hand corner. In this example, we provide additional information to understand the drivers of the \$7 total operating margin variance. The assumptions are in the left hand column. The price inflation was -3% (i.e., price levels of the company's products decreased year over year). The cost inflation was 4% (e.g., suppliers raising price). Both the price and cost variance fall directly to the operating margin. The volume variance has two components, sales and costs. The \$4.56 represents the incremental operating margin from the volume growth of 13.4% year over year. Note: in the absence of productivity, the change in operating margin

# TRICorporation

## Experiential Leadership and Simulation Programs

Improved decision-making. Enhanced performance. Exceptional results.

would have been negative (the cumulative profitability of the price, volume and cost variances). The productivity variance in the double asterisks is the % change in sales in real terms relative to the % change in costs in real terms (i.e., inflation adjusted).

### Operating Margin Variance Analysis

	2009	2010
1 Sales	\$100	\$110
2 Price Inflation (%)		-3%
3 Infl. Adj. Sales (\$) Sales '10/(1+Price Inf.)		113.4
4 Prior Year Sales (\$)		\$100
5 Price Inflation (\$) (1) - (3)		-3.4
6 Volume (%) [(3)/(4) - 1]x 100%		13.4%
7 Volume Sales (\$) (6) x 4		13.4
8 Costs *(\$)	\$66	\$69
9 Cost Inflation (%)		4%
10 Infl. Adj. Costs (\$) Costs '10/(1+Cost Inf.)		66.35
11 Prior Year Costs (\$)		\$66
12 Cost Inflation (\$) (10) - (8)		-2.65
13 Volume Costs (\$) (6) x Costs '09		8.84
14 Total Cost Productivity**(%)		12.8%
15 Productivity (\$) (14) x (10)***		8.49

\* CGS, G&A, R&D - Variable and Fixed

\*\*

$$\left( \frac{\text{Inventory Adj. Sales}}{\text{Prior Year Sales}} - 1 \right) \times 100\% = 1.134$$

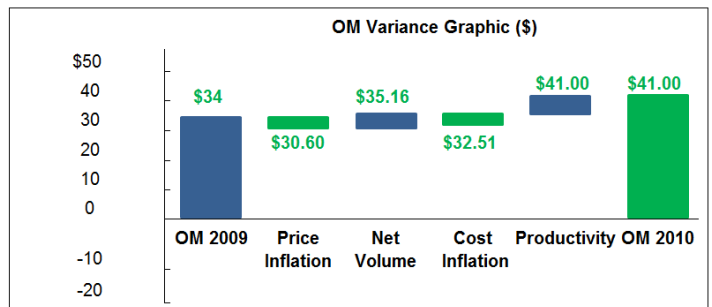
$$\left( \frac{\text{Inflation Adj. Costs}}{\text{Prior Year Costs}} - 1 \right) \times 100\% = 1.005$$

\*\*\* Or as  

$$\text{Infl. Adj. Sales}_{10} \times (\text{Costs/Sales})_{09} - \text{Infl. Adj. Costs}_{10}$$

	2009	2010	% Change
Sales	\$100	\$110	+10%
- Costs	66	69	+4.5%
Operating Margin	\$34	\$41	+20.6%
OM%	34%	37.2%	

	2009	Price Inflation	Net Volume	Cost Inflation	Productivity	2010
Sales	\$100		\$13.40			\$110
- Costs	66		8.84			69
Operating Margin	\$34	-3.4	\$4.56	-2.65	8.49	\$41



Productivity, if measured correctly, is inflation-adjusted and represents the sum of all process improvements, such as LEAN activities, Six Sigma applications, labor and equipment efficiency, removal of redundancy and waste. If you carefully examine the definition of productivity as found with the three asterisks, you will note the technically correct definition of productivity. In the example, many would assume that since the total cost productivity was 12.8% the costs dropped by 12.8%. A correct interpretation is: in the absence of productivity, costs would have been 12.8% higher (a subtle difference). It is worth noting that, in our opinion, supplier management is not a productivity activity but impacts profitability through cost inflation. From variance decomposition we can see what is really contributing to the growth of a business and where incentive compensation should be paid. From a risk management perspective, we should be able to determine our controllable and non-controllable variances given the dynamics of our industry and business model.

### Planning, Meeting Commitments & Growth Variances

The prior discussion was aimed at growth variances (e.g., year-to-year, quarter-to-quarter, etc). This was one of the three areas using variance analysis that makes sense for business decision-making under uncertainty. There are two other related areas, variance analysis applied to planning and execution. The exhibit below is what is commonly called a "3-Up Walk." You will note there are three columns, Planning, Meeting Commitments (i.e., Execution) and Growth. The calculations of all three columns use the logic of Critical Equation # 2.

# TRICorporation

## Experiential Leadership and Simulation Programs

Improved decision-making. Enhanced performance. Exceptional results.

### 3-Up Variance Analysis -- Planning, Meeting Commitments & Growth

		Variances (\$000s)						Comments on Plan to Actual
		Planning		Meeting Commitments		Growth		
OM		2009 Actual	34	2010 Plan	44	2009 Actual	34	
+Σ	Price		1	+	-4.4	=	-3.4	Competitive pressure...failed to lock in forward price contract
	Volume		3	+	1.6	=	4.6	Closed unanticipated national account
	Cost		2	+	-4.6	=	-2.6	Supplier cost pressure on key comp
	Productivity		4	+	4.4	=	8.4	Significant ramp on lean late in year
= OM		2010 Plan	44	2010 Actual	41	2010 Actual	41	

In this example, the actual operating margin in 2009 was \$34 with a plan of \$44. The variances show the contribution of each bucket to the delta of \$10. For example, Volume is expected to contribute \$3 of incremental operating margin during 2010. The value of Planning variances is seeing where risks may lie in a plan. Volume is expected to contribute 30% of the incremental growth in OM. Is this realistic, given the industry, the capabilities of our sales organization, our customers, and current sales pipeline? Perhaps we know this because of a backlog or have visibility into the high probability of closing some key accounts. What if the Planning variance showed that price was providing 80% OM growth for the year in plan and we were in a very competitive marketplace? This would be an immediate red flag from a risk perspective. In our first exhibit, assuming 2009 was actual and 2010 pro forma, that risk insight would have been close to impossible to detect regardless of how complex the P&L might be.

The column entitled Meeting Commitments is all about execution risk and your ability to deliver on a plan. Many finance professionals would suggest that this column, is the most crucial discussion point during a business review. We believe all three columns are critical to understand, and inter-related. Positive and negative variances in Meeting Commitments need to be reviewed in terms of what is controllable or not. Reasonable people can differ on the level of control. For decades, Wall Street has had a preoccupation with meeting net income targets. In recent years, interest in meeting sales and cash commitments has increased. Internally as well, meeting commitments has increased in importance as the environment has become significantly more volatile. One growing use is the application of stress and shock tests to assumptions, in particular in initial budgets. These tools also can be useful during scenario and other strategic planning efforts.

The final column is where it all started. Note the sum of the Planning and Meeting Commitments columns equal the Growth column, hence the previous comment about inter-relatedness.

#### Summary

We have outlined our perspective on understanding and analyzing variances. We believe that meeting commitments is a fundamental responsibility of business leaders regardless of economic conditions. To improve the probability of

# TRICorporation

## Experiential Leadership and Simulation Programs

Improved decision-making. Enhanced performance. Exceptional results.

meeting commitments, business leaders must understand variances and act on this understanding in a timely and deliberate fashion. Try putting your own values for price inflation, cost inflation and changes in volume into the model on our website and see how your company's operating variances can be seen graphically in the **Walk** format.

If you have questions or want more information on variance analysis please contact us at [TRIContact@tri-simulation.com](mailto:TRIContact@tri-simulation.com).

Tri Corporation provides this note for educational purposes only. The information contained herein does not constitute legal, tax, accounting, management, financial or investment advice and should not be used as a substitute for experiential training or consultation with professionals in those disciplines. The information is provided "as is," and without warranty of any kind, express or implied, including but not limited to warranties of performance, merchantability, and fitness for a particular purpose.