Faith's Country Primitives:
An Excel Project In Flexible
Budgeting And Standard Cost Analysis

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ABSTRACT

Cost accounting textbooks typically contain extensive technical coverage of standard costing and variance analysis in a manufacturing context. Covering the material adequately usually requires multiple class lectures, due to the complexity of the material. The calculations involved are detailed, multi-step, and can be numerically intensive. In order to make the material accessible to the learner, most textbook problems focus on the individual steps inherent in the budgeting, calculation, analysis, and interpretation process of standard costing and variance analysis. This simplification makes it feasible to deliver the material efficiently in the classroom. However, this pedagogical efficiency occurs at a cost, in that students may fail to understand the overall process and how the individual steps are interrelated.

This case has been used over the course of 10 semesters with over 500 students in a junior level Cost Accounting class for accounting majors. It has proven to be an effective tool for both reinforcing the variance analysis content that is delivered in the classroom, as well as for giving students an opportunity to practice and extend their Excel skills.

Keywords: Standard Costing; Excel; Variance Analysis

INTRODUCTION

*T*his paper presents an integrated Excel-based case that can be used in conjunction with a standard costing teaching module. The Excel-based case contains this Introduction and 4 case sections. The first case section contains the Student Case Description and Case Attachments. The second case section contains the Student Project Test Instructions and Data. The third section contains a printed copy of the Excel Spreadsheet Solutions to the Original Case and to the Project Test. The fourth and final case section contains the Teaching Notes and Suggestions for the Instructor. As noted later in the paper, an electronic version of the Excel spreadsheet, formulas, and solutions are also available to faculty upon request.

SECTION 1: STUDENT CASE DESCRIPTION AND CASE ATTACHMENTS

A. Project Overview. Faith's Country Primitives Company produces and sells fabric country primitive toys for use in home decor. Each toy uses cotton for the toy's clothing, fiber for the toy's outer shell, and stuffing for the toy's interior. You are the Controller for Faith's. As sales have grown, you have also become increasingly busy. To save yourself some time, you have decided to automate some of the reports that you have been producing manually every month. As a first step, you have decided to create an Excel spreadsheet program that your clerk can use to produce monthly variance reports for management.

Every month, your clerk will input new figures into your spreadsheet. However, your clerk isn't very knowledgeable about accounting, so he will need to depend on your Excel program to be accurate, complete, and understandable. Your clerk only knows how to input data, save files, and print in Excel.

Your project is to create and produce three interconnected Standard Costing and Variance Analysis Reports in Excel. You must e-mail your Excel file to your professor by the Due Date. To demonstrate that your project works, you will also be required to test your project (Excel file) in a separately scheduled Project Test Session.

B. Creating the Reports. Creating your report will require you to create at least three worksheets in your Excel Workbook:

- Worksheet 1: Data Input Worksheet,
- Worksheet 2: A Flexible Budget Variance Report, and
- Worksheet 3: A Price and Efficiency Variance Report.

You will probably find it helpful to create additional Intermediary Worksheets to organize your calculations. However, these Intermediary Worksheets are not required.

Worksheet 1: The Report Name of Worksheet 1 is "Data Input Worksheet." Worksheet 1 should be a duplicate of the sample included as Attachment 1. Worksheet 1 should be formatted and highlighted as similarly as possible to the provided sample. Worksheet 1 serves as an input sheet for the rest of your Excel model. Every highlighted value is subject to change during the Project Test Session of your model. Data cannot be input into the other worksheets during the Project Test Session.

Your first worksheet must be used for data input only. Your second and third worksheets are reports for management. These latter reports must use the input data from the first worksheet, plus your Excel formulas, to generate a Flexible Budget Variance Analysis Report (Worksheet 2) and a Price and Efficiency Variance Report (Worksheet 3).

Therefore, your Workbook must be structured so that it will: (1) allow for any of the highlighted information on Worksheet 1 to be changed and (2) automatically adjust for these changes and correctly generate revised numbers, variance indicators, dates, etc. on the other two worksheets.

Rounding: Round all numbers on Worksheet 1 to the 3rd decimal place.

Worksheet 2: The Report Name of Worksheet 2 is "Flexible Budget Variance Report." Be sure to include a separate line item for each of the types of Direct Material for Faith's (Fiber, Stuffing, Cotton). See Attachment 2 for an outline of the format for this worksheet.[1]

Rounding: Round the "Standards" Column on Worksheet 2 to the 3rd decimal place. Round the other columns on Worksheet 2 to the nearest whole dollar.

Worksheet 3: The Report Name of Worksheet 3 is "Price and Efficiency Variance Report." You must complete a table that organizes and reports the Price Variance, Efficiency Variance, and Flexible Budget Variances for each of the 6 different cost items (fiber, stuffing, cotton, labor, variable overhead, and fixed overhead). See Attachment 3 for an outline of the format for this worksheet.

Rounding: Round the variances on Worksheet 3 to the 3rd decimal place.

Optional Additional Intermediary Worksheets. Do not show any additional or intermediary calculations or formulas on Worksheets 1, 2, or 3 of your Report, other than what is required. Management is already knowledgeable about how variances are calculated, and Management does not want to see a cluttered report.

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[1] Horngren, Datar, and Rajan (2015) provide a thorough technical presentation of the material in Chapters 7 and 8. An example of the basic format for a Flexible Budget Variance report is found on page 253.

You may create additional optional worksheets to organize and calculate your variances or to organize intermediary figures. You may leave the optional worksheets in your workbook. These additional worksheets will not be graded; they will be for your use only.

Variance Absolute Values and Indicators. All variances must be reported as Absolute Values. You must also use the appropriate macros and/or "Nested If" commands to automatically indicate whether the variances are Favorable [F], Unfavorable [U], or neither (-), whenever variances are reported. Do not use colors to represent the Favorable or Unfavorable variances.

Attachment 1
Original Input Data

Faith's Country Primitives Company
Data Input Worksheet
January   2017

Faith's Master Budget for Calendar Year   **2017**

Selling Price	$80.000	per toy
Expected <u>Monthly</u> Sales	9,500.000	toys

Direct Materials

Standard Price of Cotton per yard	$5.000	
Standard Quantity of Cotton per toy	1.850	yds.
Standard Price of Fiber per yard	$7.300	
Standard Quantity of Fiber per toy	2.250	yds.
Standard Price of Stuffing per ounce	$0.220	
Standard Quantity of Stuffing per toy	9.870	oz.

Direct Labor

Standard Price of Labor	$15.250	per hour
Stand Quantity of Labor per toy	0.100	hours

Variable Manufacturing Overhead (in machine hours)

Standard Price	$45.000	per machine hour
Standard Quantity	0.300	machine hour(s) per toy
Fixed Overhead Per Month	$120,000.000	per month

Faith's Actual Results for   **January**   **2017**

Units Produced and Sold	11,115.000	toys	
Revenue			$ 903.093.750
Direct Labor	1,004.200	hrs.	$ 17,230.000
Direct Materials – Cotton Purchased and Used	18,223.000	yds.	$ 101,574.000
Direct Materials – Fiber Purchased and Used	21,500.000	yds.	$ 192,235.810
Direct Materials – Stuffing Purchased and Used	119,094.000	oz.	$ 20,964.440
Variable Overhead	4,067.000	mach. hrs.	$ 149,600.000
Fixed Overhead			$ 124,500.000

Attachment 2

Faith's Country Primitives Flexible Budget Variance Report Month Year						
	Actual Results	Flexible Budget Variances	Flexible Budget	Sales Volume Variances	Static Budget	Standards
Units Sold						
Revenue						
Variable Costs						
Direct Materials-Cotton						
Direct Materials-Fiber						
Direct Materials-Stuffing						
Direct Mfg. Labor						
Variable Mfg. Overhead						
Total Variable Costs						
Contribution Margin						
Fixed Manufacturing Costs						
Operating Income						

Attachment 3

Faith's Country Primitives Price and Efficiency Variance Report Month Year			
	Price or Spending Variance	Efficiency Variance	Flexible Budget Variance
Direct Material-Cotton			
Direct Material-Fiber			
Direct Material-Stuffing			
Direct Labor			
Variable Overhead			
Fixed Overhead			

SECTION 2: STUDENT PROJECT TEST INSTRUCTIONS AND DATA

There will be a formal Student Project Test Session scheduled in a Computer Lab. During the Project Test Session, the following will be expected.

- You must load the <u>same</u> Excel file that was submitted to your professor.
- You must print each of the Original Worksheets 1, 2, and 3 on separate pages.
- You will be given revised test input data and dates for the highlighted information on Worksheet 1. (Note that the changed information is "boxed.")
- You must change the highlighted information on Worksheet 1, as indicated. Worksheets 2 and 3 must then automatically and correctly generate revised numbers and dates.
- You will print each of the Revised Worksheets 1, 2, and 3 on separate pages.

Remember that you cannot input any numbers directly into Worksheets 2 and 3 during this Test Session. Therefore, your Original Project must include formulas that will automatically use the revised Test data from Worksheet 1 to generate the correct figures and dates for Worksheets 2 and 3.

<div align="right">Attachment 4
Project Test Input Data</div>

Faith's Country Primitives Company
Data Input Worksheet
May-Test   2018

Faith's Master Budget for Calendar Year   **2018**

Selling Price	$79.000	per toy
Expected <u>Monthly</u> Sales	10,000.000	toys
Direct Materials		
Standard Price of Cotton per yard	$4.750	
Standard Quantity of Cotton per toy	2.000	yds.
Standard Price of Fiber per yard	$7.900	
Standard Quantity of Fiber per toy	2.500	yds.
Standard Price of Stuffing per ounce	$0.300	
Standard Quantity of Stuffing per toy	9.300	oz.
Direct Labor		
Standard Price of Labor	$15.000	per hour
Stand Quantity of Labor per toy	0.200	hours
Variable Manufacturing Overhead (in machine hours)		
Standard Price	$51.000	per machine hour
Standard Quantity	0.400	machine hour(s) per toy
Fixed Overhead	$130,000.000	per month

Faith's Actual Results for   **May-Test   2018**

Units Produced and Sold	9,500.000	toys	
Revenue			$ 748,000.000
Direct Labor	1,805.000	hrs.	$ 28,000.000
Direct Materials – Cotton Purchased and Used	19,950.000	yds.	$ 93,765.000
Direct Materials – Fiber Purchased and Used	24,000.00	yds.	$ 187,200.000
Direct Materials – Stuffing Purchased and Used	87,400.00	oz.	$ 27,531.000
Variable Overhead	3,900.000	mach. hrs.	$ 195,000.000
Fixed Overhead			$ 129,000.000

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SECTION 3: EXCEL SPREADSHEET SOLUTIONS
TO THE ORIGINAL CASE AND TO THE PROJECT TEST

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The Excel-generated solutions to the Original Case are provided as Exhibits 1, 2 and 3. Exhibit 3 contains an optional Intermediary Worksheet that students might use to organize their intermediary work product.

Exhibits 4, 5, and 6 contain the solutions to the Project Test, as well as an optional Intermediary Worksheet.

All of the Excel solution files (with formulas) are available to other faculty by contacting the author by e-mail (ksilvester@siena.edu) and providing verification of college affiliation.

Exhibit 1
Solution - Original Project Data

Faith's Country Primitives
Flexible Budget Variance Report
January 2017

	Actual Results	Flexible Budget Variances			Flexible Budget	Sales Volume Variances			Static Budget		Standards
Units Sold	11,115	0	-		11,115	1,615	F		9,500		1
Revenue	$ 903,094	$ 13,894	F	$	889,200	$129,200	F	$	760,000	$	80.00
Variable Costs											
Direct Materials-Cotton	$ 101,574	$ 1,240	F	$	102,814	$ 14,939	U	$	87,875	$	9.250
Direct Materials-Fiber	$ 192,236	$ 9,672	U	$	182,564	$ 26,526	U	$	156,038	$	16.425
Direct Materials-Stuffing	$ 20,964	$ 3,171	F	$	24,135	$ 3,507	U	$	20,628	$	2.171
Direct Mfg. Labor	$ 17,230	$ 280	U	$	16,950	$ 2,463	U	$	14,488	$	1.525
Variable Mfg. Overhead	$ 149,600	$ 453	F	$	150,053	$ 21,803	U	$	128,250	$	13.500
Total Variable Costs	$ 481,604	$ 5,089	U	$	476,516	$ 69,237	U	$	407,278	$	42.871
Contribution Margin	$ 421,490	$ 8,805	F	$	412,684	$ 59,963	F	$	352,722	$	37.129
Fixed Manufacturing Costs	$ 124,500	$ 4,500	U	$	120,000	$ 0	-	$	120,000		
Operating Income	$ 296,990	$ 4,305	F	$	292,684	$ 59,963	F	$	232,722		

Exhibit 2
Solution - Original Project Data

Faith's Country Primitives
Price and Efficiency Variance Report
January 2017

	Price or Spending Variance		Efficiency Variance		Flexible Budget Variance	
Direct Material-Cotton	$ 10,459.00	U	$ 11,698.750	F	$ 1,239.750	F
Direct Material-Fiber	$ 35,285.810	U	$ 25,613.875	F	$ 9,671.935	U
Direct Material-Stuffing	$ 5,236.240	F	$ 2,065.569	U	$ 3,170.671	F
Direct Labor	$ 1,915.950	U	$ 1,636.325	F	$ 279.625	U
Variable Overhead	$ 33,415.00	F	$ 32,962.500	U	$ 452.500	F
Fixed Overhead	$ 4,500.00	U	$ -	-	$ 4,500.000	U

Exhibit 3
Solution - Original Project Data

Faith's Country Primitives
Additional Detailed Work
January 2017

Direct Materials-Cotton

		Actual		Flex	
Output		11,115		11,115	
Inputs / Output		1.6395		1.85	
Total Input Quantity		18,223.00		20,562.75	
Price of Input	$	5.574	$	5.000	
Total Cost	$	101,574.00	$	105,813.75	

Price Variance					
Difference in Prices	$	0.574			
Total Actual Quantity		18,223.000			
			$	10,459.00	U
Efficiency Variance					
Difference in Total Quantity		2,339.750			
Standard Price	$	5.000			
			$	11,698.750	F
Flexible Budget Variance			$	1,239.750	F

Direct Materials-Fiber

		Actual		Flex	
Output		11,115		11,115	
Inputs / Output		1.9343		2.25	
Total Input Quantity		21,500.000		25,008.75	
Price of Input	$	8.941	$	7.30	
Total Cost	$	192,235.81	$	182,563.88	

Price Variance					
Difference in Prices	$	1.641			
Total Actual Quantity		21,500.000			
			$	35,285.810	U
Efficiency Variance					
Difference in Total Quantity		3,508.750			
Standard Price	$	7.300			
			$	25,613.875	F
Flexible Budget Variance			$	9,671.935	U

Direct Materials-Stuffing

	Actual		Flex
Output	11,115		11,115
Inputs / Output	10.7147		9.87
Total Input Quantity	119,094.00		109,705.05
Price of Input	$ 0.176	$	0.220
Total Cost	$ 20,964.44	$	24,135.11

Price Variance				
Difference in Prices	$	0.044		
Total Actual Quantity		119,094.000		
			$ 5,236.240	F

Efficiency Variance				
Difference in Total Quantity		9,388.950		
Standard Price	$	0.220		
			$ 2,065.569	U

Flexible Budget Variance		$ 3,170.671	F

Direct Labor

	Actual		Flex
Output	11,115		11,115
Inputs / Output	0.0903		0.100
Total Input Quantity	1,004.20		1,111.50
Price of Input	$ 17.158	$	15.250
Total Cost	$ 17,230.00	$	16,950.38

Price Variance				
Difference in Prices	$	1.908		
Total Actual Quantity		1,004.200		
			$ 1,915.950	U

Efficiency Variance				
Difference in Total Quantity		107.300		
Standard Price	$	15.250		
			$ 1,636.325	F

Flexible Budget Variance		$ 279.625	U

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Variable Overhead

	Actual		Flex
Output	11,115		11,115
Inputs / Output	0.3659		0.300
Total Input Quantity	4,067.00		3,334.50
Price of Input	$ 36.78	$	45.00
Total Cost	$ 149,600.00	$	150,052.50

Price Variance

Difference in Prices	$	8.216		
Total Actual Quantity		4,067.000		
			$ 33,415.000	F

Efficiency Variance

Difference in Total Quantity		732.500		
Standard Price	$	45.000		
			$ 32,962.500	U

Flexible Budget Variance			$ 452.500	F

Fixed Overhead

	Actual		Flex
Output	11,115		11,115
Total Cost	$ 124,500.000	$	120,000.000

Price Variance

			$ 4,500.000	U

Efficiency Variance

			$ -	-

Flexible Budget Variance			$ 4,500.000	U

Exhibit 4
Solution - Project Test

	Actual Results	Flexible Budget Variances		Flexible Budget	Sales Volume Variances		Static Budget	Standards
Faith's Country Primitives **Flexible Budget Variance Report** **May-Test 2018**								
Units Sold	9,500	0	-	9,500	500	U	10,000	1
Revenue	$ 748,000	$ 2,500	U	$ 750,500	$ 39,500	U	$ 790,000	$ 79.000
Variable Costs								
Direct Materials-Cotton	$ 93,765	$ 3,515	U	$ 90,250	$ 4,750	F	$ 95,000	$ 9.500
Direct Materials-Fiber	$ 187,200	$ 425	F	$ 187,625	$ 9,875	F	$ 197,500	$ 19.750
Direct Materials-Stuffing	$ 27,531	$ 1,026	U	$ 26,505	$ 1,395	F	$ 27,900	$ 2.790
Direct Mfg. Labor	$ 28,000	$ 500	F	$ 28,500	$ 1,500	F	$ 30,000	$ 3.000
Variable Mfg. Overhead	$ 195,000	$ 1,200	U	$ 193,800	$ 10,200	F	$ 204,000	$ 20.400
Total Variable Costs	$ 531,496	$ 4,816	U	$ 526,680	$ 27,720	F	$ 554,400	$ 55.440
Contribution Margin	$ 216,504	$ 7,316	U	$ 223,820	$ 11,780	U	$ 235,600	$ 23.560
Fixed Manufacturing Costs	$ 129,000	$ 1,000	F	$ 130,000	$ 0	-	$ 130,000	
Operating Income	$ 87,504	$ 6,316	U	$ 93,820	$ 11,780	U	$ 105,600	

Exhibit 5
Solution - Project Test

	Price or Spending Variance		Efficiency Variance		Flexible Budget Variance	
Faith's Country Primitives **Price and Efficiency Variance Report** **May-Test 2018**						
Direct Material-Cotton	$ 997.500	F	$ 4,512.500	U	$ 3,515.000	U
Direct Material-Fiber	$ 2,400.000	F	$ 1,975.000	U	$ 425.000	F
Direct Material-Stuffing	$ 1,311.000	U	$ 285.000	F	$ 1,026.000	U
Direct Labor	$ 925.000	U	$ 1,425.000	F	$ 500.000	F
Variable Overhead	$ 3,900.000	F	$ 5,100.000	U	$ 1,200.00	U
Fixed Overhead	$ 1,000.000	F	$ -	-	$ 1,000.000	F

Exhibit 6
Solution - Project Test

Faith's Country Primitives
Additional Detailed Work
May-Test 2018

Direct Materials-Cotton

		Actual		Flex	
Output		9,500		9,500	
Inputs / Output		2.1000		2.000	
Total Input Quantity		19,950.00		19,000.00	
Price of Input	$	4.700	$	4.750	
Total Cost	$	93,765.00	$	90,250.00	

Price Variance
Difference in Prices	$	0.050			
Total Actual Quantity		19,950.000			
			$	997.500	F

Efficiency Variance
Difference in Total Quantity		950.000			
Standard Price	$	4.750			
			$	4,512.500	U

Flexible Budget Variance			$	3,515.000	U

Direct Materials-Fiber

		Actual		Flex	
Output		9,500		9,500	
Inputs / Output		2.5263		2.500	
Total Input Quantity		24,000.00		23,750.00	
Price of Input	$	7.800	$	7.900	
Total Cost	$	187,200.00	$	187,625.00	

Price Variance
Difference in Prices	$	0.100			
Total Actual Quantity		24,000.000			
			$	2,400.000	F

Efficiency Variance
Difference in Total Quantity		250.000			
Standard Price	$	7.900			
			$	1,975.000	U

Flexible Budget Variance			$	425.000	F

Direct Materials-Stuffing

		Actual		Flex
Output		9,500		9,500
Inputs / Output		9.200		9.300
Total Input Quantity		87,400.00		88,350.00
Price of Input	$	0.315	$	0.300
Total Cost	$	27,531.00	$	26,505.00

Price Variance					
Difference in Prices	$	0.015			
Total Actual Quantity		87,400.000			
			$	1,311.000	U
Efficiency Variance					
Difference in Total Quantity		950.000			
Standard Price	$	0.300			
			$	285.000	F
Flexible Budget Variance			$	1,026.000	U

Direct Labor

		Actual		Flex
Output		9.500		9.500
Inputs / Output		0.1900		0.200
Total Input Quantity		1,805.00		1,900.00
Price of Input	$	15.512	$	15.000
Total Cost	$	28,000.00	$	28,500.00

Price Variance					
Difference in Prices	$	0.512			
Total Actual Quantity		1,805.000			
			$	925.000	U
Efficiency Variance					
Difference in Total Quantity		95.000			
Standard Price	$	15.000			
			$	1,425.000	F
Flexible Budget Variance			$	500.000	F

Variable Overhead

		Actual		Flex	
Output		9,500		9,500	
Inputs / Output		0.4105		0.400	
Total Input Quantity		3,900.00		3,800.00	
Price of Input	$	50.00	$	51.00	
Total Cost	$	195,000.000	$	193,800.00	

Price Variance					
Difference in Prices	$	1.000			
Total Actual Quantity		3,900.00			
			$	3,900.000	F

Efficiency Variance					
Difference in Total Quantity		100.000			
Standard Price	$	51.000			
			$	5,100.000	U

Flexible Budget Variance			$	1,200.00	U

Fixed Overhead

		Actual		Flex	
Output		9,500		9,500	
Total Cost	$	129,000.000	$	130,000.00	

Price Variance					
			$	1,000.000	F

Efficiency Variance					
			$	-	-

Flexible Budget Variance			$	1,000.000	F

SECTION 4: TEACHING NOTES AND SUGGESTIONS FOR THE INSTRUCTOR

Cost accounting textbooks typically contain extensive technical coverage of standard costing and variance analysis in a manufacturing context. Covering the material adequately usually requires multiple class lectures, due to the complexity of the material. The calculations involved are detailed, multi-step, and can be numerically intensive. In order to make the material accessible to the learner, most textbook problems focus on the individual steps inherent in the budgeting, calculation, analysis, and interpretation process of standard costing and variance analysis. This simplification makes it feasible to deliver the material efficiently in the classroom. However, this pedagogical efficiency occurs at a cost, in that students may fail to understand the overall process and how the individual steps are interrelated.

This case has been used over the course of 10 semesters with over 500 students in a junior level Cost Accounting class for accounting majors. It has proven to be an effective tool for both reinforcing the variance analysis content that is delivered in the classroom, as well as for giving students an opportunity to practice and extend their Excel skills.

A few additional details regarding the project appear below.

A. **Timing of Assignment.**   Students seem to benefit most if this project is assigned at the <u>beginning</u> of the technical coverage of a Standard Costing, Flexible Budgeting, and Variance Analysis content module. The project can then be referenced and explained as each section of the technical material is covered.
B. **Student Time to Complete.** The project generally takes about 4 hours to complete, assuming that the students have a basic competence with Excel. This seems to hold true whether the project is done individually or in groups of two students.
C. **Project Benefits for Students**.   As mentioned above, a strong educational benefit of this project is that it requires students to prepare an entire set of standard costing reports – beginning with the calculation of a Standard Cost and culminating in the generation of Price and Efficiency Variances. However, additional significant benefits include:

- Teaching the use of an Input Page that feeds the other worksheets,
- Forcing the extensive use of linking between and within worksheets in a workbook,
- Reinforcing basic Excel skills (summation, referencing, division, etc.),
- Introducing a few more advanced skills (Nested If Statements and Absolute Value Functions), and
- Emphasizing the importance of data organization in analysis and reporting.

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