Decision Making-BW Manufacturing Company

Subclass F Group 4B

Cai Yitong 3035235185
Cao Zifan 3035331795
Fu Shangke 3035331965
Hong Yanrong 3035332115
Qin Tianyi 3035351288

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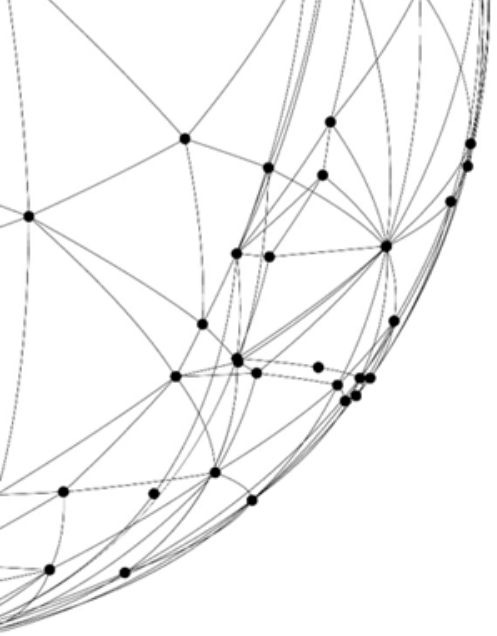
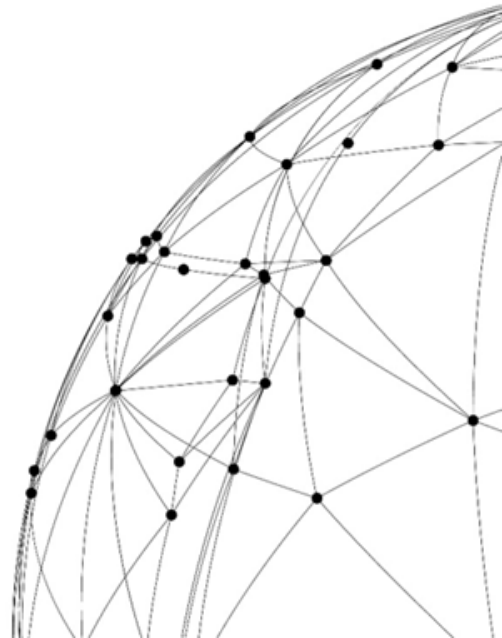


01

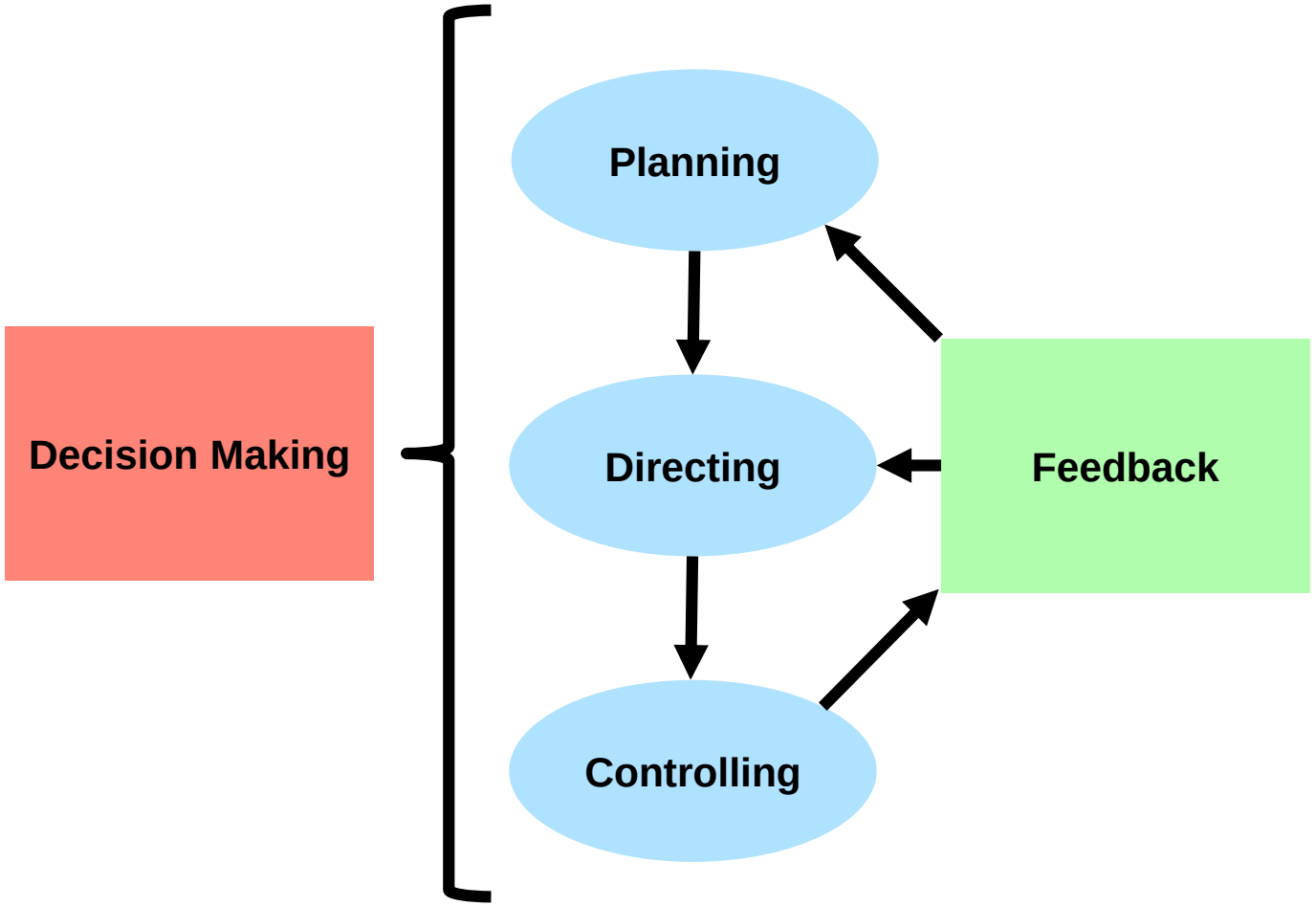
Introduction & Rationale



Managerial Accounting

- In our case, we played the role of MA, and helped managers of BW Manufacturing

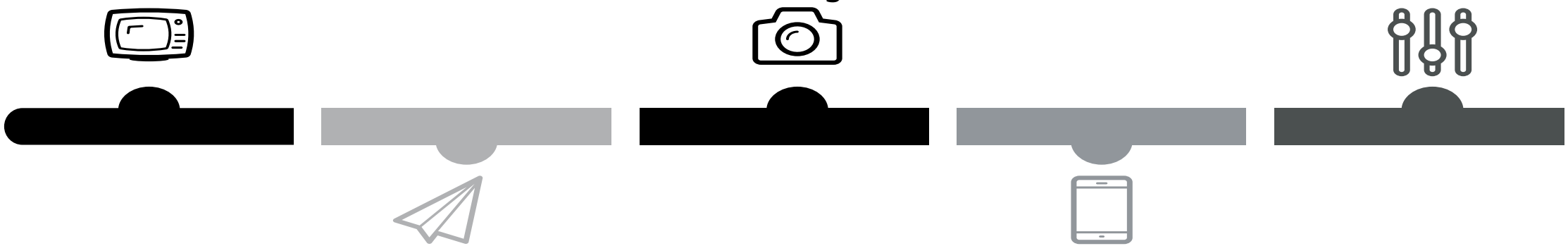
(1) Plan-making budget with standard costs
(2) Make decisions- operating decisions and marketing decisions
(3) Control- reflect on the effectiveness of decisions



Case Background

BW Manufacturing

- Three primary models for gas grills
- Small player in the industry but good



Mid-December 2008 (planning)

- A draft of operating budget of 2009

December 2008

- Comparison of the influence of three options
- Choose option 2
- Revised budget for 2009

Early January of 2010

- rough draft of the actual 2009 operating results

Review of the options (controlling)

- Compare with values of Grill C

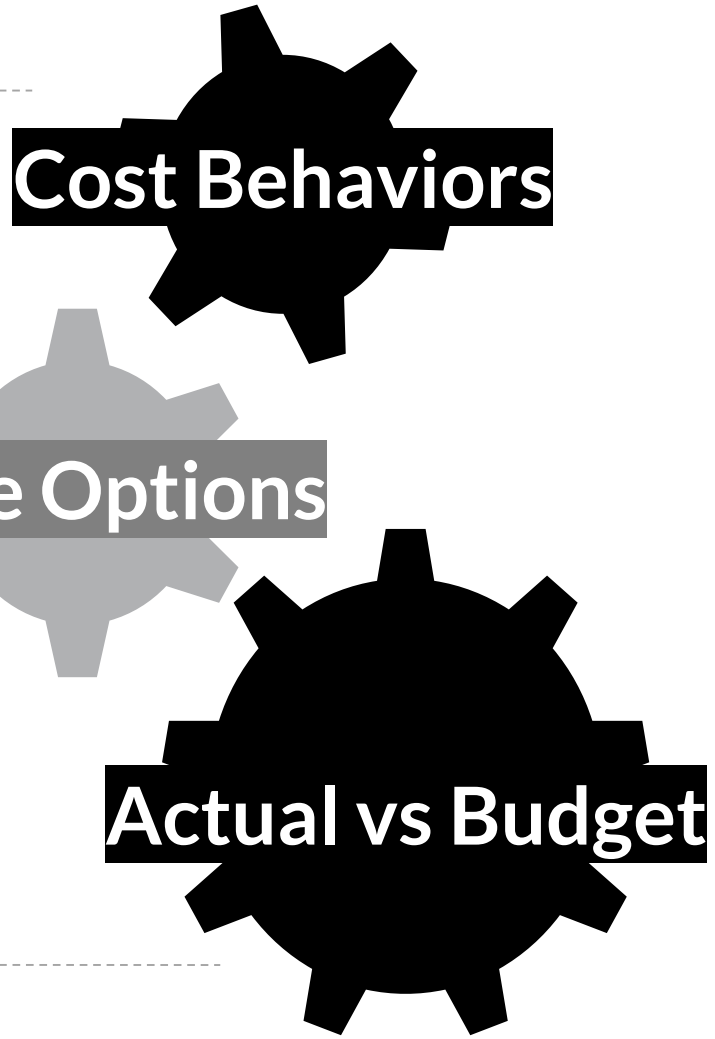
Rationale

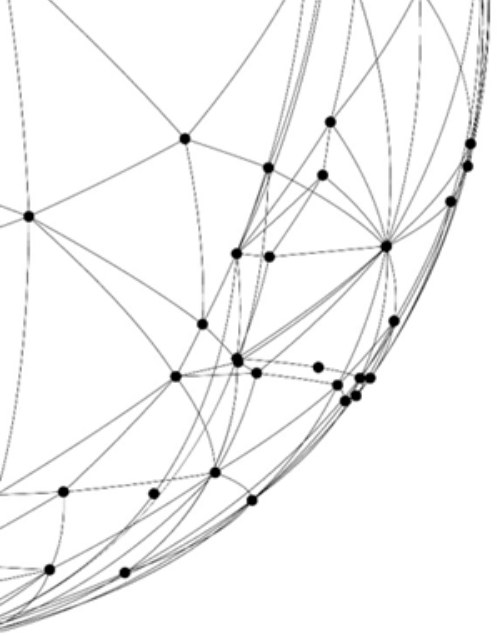
Rearrange standard costs to variable costing based on cost behavior

Budgeted income statement for three options and CVP analysis

Gap between actual and budget and underlying reasons

How is BW manufacturing's management doing?





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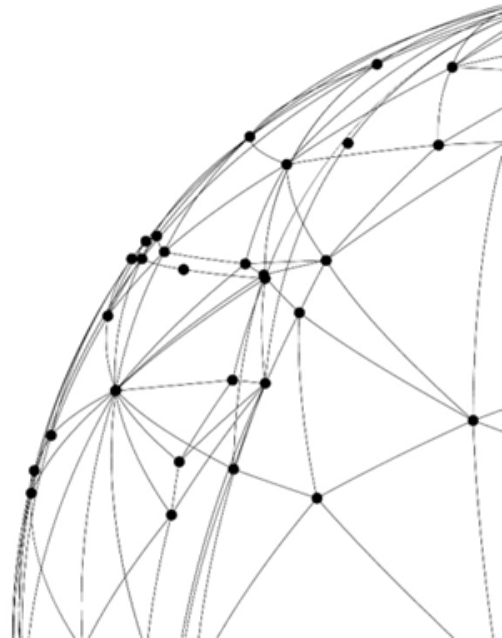
Cost Behaviors



Standard Costs Analysis

BW MANUFACTURING COMPANY Standard Costs			
	Grill A	Grill B	Grill C
Planned Volume (units)	80,000	120,000	200,000
Per unit:			
Sales price	$150	$110	$80
Direct costs:			
Materials	17	10	7
Labor	21	16	4
Subtotal	$38.00	$26.00	$11.00
Indirect costs:			
Supplies	7	2	1
Labor	10	8	4
Supervision	8	3	1
Energy	12	6	4
Depreciation	22	7	5
Head office support	12	6	3
All other	11	2	1
Subtotal	$82.00	$34.00	$19.00
Total product cost	$120.00	$60.00	$30.00
Product-line profitability	$30.00	$50.00	$50.00

Assumptions:

Variable Cost: Directly related to production volume

Mixed Cost: One-half varies with direct labor; the rest is fixed

Fixed Cost: Unrelated to production volume

Transform to Variable Costing

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Product-line profitability	$30.00	$50.00	$50.00

Rearrangement:

Directly related to production volume: Keep

One-half varies with direct labor; the rest is fixed: Per Unit variable cost = 0.5×Original Indirect Cost per unit, treat the rest as fixed

Unrelated to production volume: Original per unit cost × Planned Volume in this situation

Variable Costing

Rearrange	BW MANUFACTURING COMPANY Variable Cost		
	Grill A	Grill B	Grill C
Planned Volume (units)	80000	120000	200000
Price	150	110	80
Variable costs:			
Materials	17	10	7
Direct labor	21	16	4
Supplies	7	2	1
Indirect labor	5	4	2
Energy	6	3	2
Total variable cots	56	35	16
Contribution Margin	94	75	64
Fixed costs:			
Indirect labor	400000	480000	400000
Supervision	640000	360000	200000
Energy	480000	360000	400000
Depreciation	1760000	840000	1000000
Head office	960000	720000	600000
All other	880000	240000	200000
Total Fixed Cost	5120000	3000000	2800000
Fixed Cost allocated to each unit	64	25	14
Total cost per unit	120	60	30
Profitability per unit	30	50	50

Product Costs
Direct Material
Direct Labor
Variable MOH

Period Costs
Fixed MOH
Fixed Selling and Administrative Expenses

Standard Situation

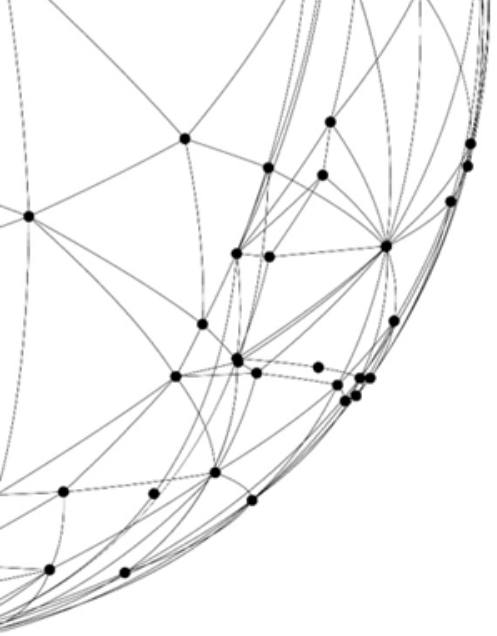
Standard Planned Volume

	Grill A	Grill B	Grill C
Planned Volume (units)	8000	120000	200000
Price	150	110	80

Assumptions:
Selling, general and administrative , other costs, interest income and interest expense are likely to be the same no matter how the production line changes

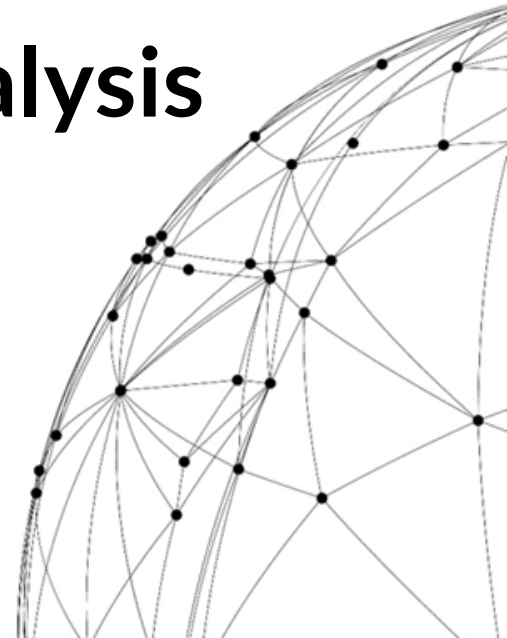
Tax rate = 2238000/6680000=35%

BW Manufacturing Company 2009 Operating Results: Draft 1/19/2010			
Revenue			41200000
Variable Costs:	Materials	3960000	
	Direct labor	4400000	
	Supplies	1000000	
	Indirect labor	1280000	
	Energy	1240000	
Total variable cots			11880000
Fixed Costs:	Indirect labor	1280000	
	Supervision	1200000	
	Energy	1240000	
	Depreciation	3600000	
	Head office	2280000	
	All other	1320000	
Total fixed cost			10920000
Total cost			22800000
Gross margin			18400000
SG&A			9350000
Other costs			2100000
Operating income			6950000
Less: interest expense			420000
Plus: interest income			150000
Income before tax			6680000
Income taxes			2338000
Net income			**4342000**



03

Three Options & Cost-Volume-Profit Analysis



Option 1

Drop Grill A, no influence to other two

	Grill A	Grill B	Grill C
Planned Volume (units)	0	120000	200000
Price	0	110	80

Comment:
Drop Grill A, also means drop fixed cost on the production line of product A

Much lower Net Income than standard

BW Manufacturing Company 2009 Operating Results: Draft 1/19/2010			
Revenue			29,200,000
Variable Costs:	Materials	2600000	
	Direct labor	2720000	
	Supplies	440000	
	Indirect labor	880000	
	Energy	760000	
Total variable cots			7400000
Fixed Costs:	Indirect labor	880000	
	Supervision	560000	
	Energy	760000	
	Depreciation	1840000	
	Head office	1320000	
	All other	440000	
Total fixed cost			5800000
Total cost			13200000
Gross margin			16,000,000
SG&A			9350000
Other costs			2100000
Operating income			4,550,000
Less: interest expense			420000
Plus: interest income			150000
Income before tax			4,280,000
Income taxes			1498000
Net income			**2,782,000**

Option 2

Lower the price of Grill C to 75, which leads to a 20000 units increase of its sales, no influence to the others

	Grill A	Grill B	Grill C
Planned Volume (units)	80000	120000	220000
Price	150	110	75

Comment:
Lower contribution margin and lower profitability per unit for Grill C

Much higher net income than standard

BW Manufacturing Company 2009 Operating Results: Draft 1/19/2010			
Revenue			41700000
Variable Costs:	Materials	4100000	
	Direct labor	4480000	
	Supplies	1020000	
	Indirect labor	1320000	
	Energy	1280000	
Total variable cots			12200000
Fixed Costs:	Indirect labor	1280000	
	Supervision	1200000	
	Energy	1240000	
	Depreciation	3600000	
	Head office	2280000	
	All other	1320000	
Total fixed cost			10920000
Total cost			23120000
Gross margin			18580000
SG&A			9350000
Other costs			2100000
Operating income			7130000
Less: interest expense			420000
Plus: interest income			150000
Income before tax			6860000
Income taxes			2401000
Net income			**4459000**

Option 3

Shift advertising focus, which leads to 10000 increase in Grill C's volume and 10000 decrease in Grill A's volume

	Grill A	Grill B	Grill C
Planned Volume (units)	7000	120000	210000
Price	150	110	80

Comment:
Grill A has higher contribution margin than Grill C, so definitely lower the net income

Lower Net Income than standard

BW Manufacturing Company 2009 Operating Results: Draft 1/19/2010			
Revenue			40500000
Variable Costs:	Materials	3860000	
	Direct labor	4230000	
	Supplies	940000	
	Indirect labor	1250000	
	Energy	1200000	
Total variable cots			11480000
Fixed Costs:	Indirect labor	1280000	
	Supervision	1200000	
	Energy	1240000	
	Depreciation	3600000	
	Head office	2280000	
	All other	1320000	
Total fixed cost			10920000
Total cost			22400000
Gross margin			18100000
SG&A			9350000
Other costs			2100000
Operating income			6650000
Less: interest expense			420000
Plus: interest income			150000
Income before tax			6380000
Income taxes			2233000
Net income			**4147000**

Cross-Products CVP Comparison

Standard Situation	Grill A	Grill B	Grill C
Planned Volume (units)	80000	120000	200000
Price	150	110	80
VC	56	35	16
Contribution Margin	94	75	64
FC	5120000	3000000	2800000
FC/unit	64	25	14
Total cost per unit	120	60	30
Profitability per unit	30	50	50
Contribution Margin	7520000	9000000	12800000
Contribution Margin/Unit	94	75	64
CM percent	62.67%	68.18%	80.00%
BE Sales	8170212.77	4400000.00	3500000.00
BE Point (in units)	54468.09	40000.00	43750.00
Margin of Safety	3829787.23	8800000.00	12500000.00
Margin of Safety(in units)	25531.91	80000.00	156250.00
Margin of Safety ratio	31.91%	66.67%	78.13%

Grill A has highest price and Contribution Margin, but lowest profitability per unit.

Grill A has the lowest CM percent and margin of safety ratio, which means it's harder to cover the fixed cost and thus riskier

Cross Options CVP Comparison

	Standard	Option 1	Option 2	Option 3
Net Income	4,342,000	2,782,000	4,459,000	4,147,000
W-A CM	73.30	68.13	70.24	72.55
W-A CM ratio	71.17%	74.66%	70.74%	71.65%
DOL	4.22	4.79	4.14	4.36
Margin of Safety Ratio	62.76%	73.39%	62.98%	62.37%

Admit they are not the same sales mix, thus those ratio may not be too applicable

Option 2:
Advantage:
highest Net Income
lowest degree of leverage, lower risk

Disadvantage:
lowest CM ratio, which means a smaller portion of its sales can be used to cover fixed cost
low margin of safety ratio: higher risk

04

Actual vs Budget

Static budget vs flexible budget

- volume variance:

	Grill A	**Grill B**	**Grill C**
Actual volume (units)	115,000	110,000	225,000
Planned volume (units)	80,000	120,000	220,000

- incorporate flexible budget: calculate the total cost that should have been incurred, given the actual volume of products achieved

- advantages: ”apples-to-apples ”comparison

Static budget vs flexible budget

BW Manufacturing Company Static Budget 2009			
Revenue			41700000
Variable Costs:	Materials	4100000	
	Direct labor	4480000	
	Supplies	1020000	
	Indirect labor	1320000	
	Energy	1280000	
Total variable costs			12200000
Fixed Costs:	Indirect labor	1280000	
	Supervision	1200000	
	Energy	1240000	
	Depreciation	3600000	
	Head office	2280000	
	All other	1320000	
Total fixed cost			10920000
Total cost			23120000
Gross margin			18580000
SG&A			9350000
Other costs			2100000
Operating income			7130000
Less: interest expense			420000
Plus: interest income			150000
Income before tax			6860000
Income taxes			2401000
Net income			**4459000**

BW Manufacturing Company Flexible Budget 2009			
Revenue			46,225,000
Variable Costs:	Materials	4630000	
	Direct labor	5075000	
	Supplies	1250000	
	Indirect labor	1465000	
	Energy	1470000	
Total variable costs			13890000
Fixed Costs:	Indirect labor	1280000	
	Supervision	1200000	
	Energy	1240000	
	Depreciation	3600000	
	Head office	2280000	
	All other	1320000	
Total fixed cost			10920000
Total cost			24810000
Gross margin			21415000
SG&A			9350000
Other costs			2100000
Operating income			9965000
Less: interest expense			420000
Plus: interest income			150000
Income before tax			9695000
Income taxes			3393250
Net income			**6301750**

Flexible budget vs actual operating result

- Flexible budget variance: the difference between the actual cost for the products produced and the flexible budget
- The actual operating result:
  - ✓ higher variable and fixed cost
  - ✓ lower net income
  - ✓ the original judgment: “BW Manufacturing Company performs better than had been expected” could be inaccurate.

	Static Budget	**Actual Operating**	**Flexible Budget**
Net Income	4459000	5794750	6301750

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Flexible budget vs actual operating result

BW Manufacturing Company Flexible Budget 2009			
Revenue			46,225,000
Variable Costs:	Materials	4630000	
	Direct labor	5075000	
	Supplies	1250000	
	Indirect labor	1465000	
	Energy	1470000	
Total variable costs			13890000
Fixed Costs:	Indirect labor	1280000	
	Supervision	1200000	
	Energy	1240000	
	Depreciation	3600000	
	Head office	2280000	
	All other	1320000	
Total fixed cost			10920000
Total cost			24810000
Gross margin			21415000
SG&A			9350000
Other costs			2100000
Operating income			9965000
Less: interest expense			420000
Plus: interest income			150000
Income before tax			9695000
Income taxes			3393250
Net income			**6301750**

BW Manufacturing Company 2009 Operating Results: Draft 1/19/2010			
Revenue			46225000
Variable Costs:	Materials	4800000	
	Direct labor	5200000	
	Supplies	1300000	
	Indirect labor	1500000	
	Energy	1600000	
Total variable cost			14400000
Fixed Costs:	Indirect labor	1300000	
	Supervision	1200000	
	Energy	1350000	
	Depreciation	3660000	
	Head office	2300000	
	All other	1380000	
Total fixed cost			11190000
Total cost			25590000
Gross margin			20635000
SG&A			9350000
Other costs			2100000
Operating income			9185000
Less: interest expense			420000
Plus: interest income			150000
Income before tax			8915000
Income taxes			3120250
Net income			**5794750**

Underlying reasons of the gap between budget and actual operating result

Underlying reasons: inconsistence with the assumptions of CVP

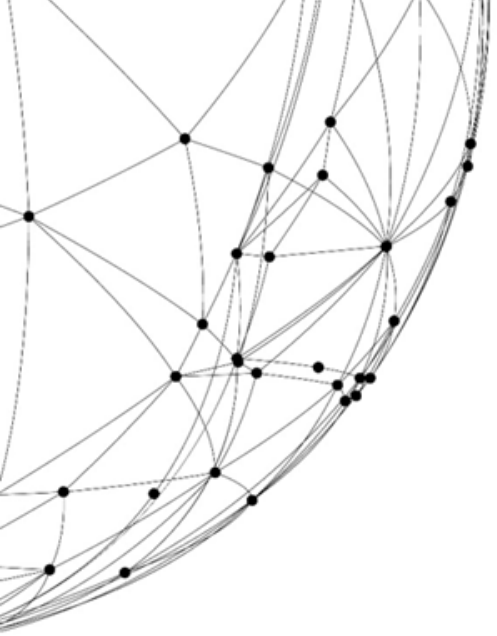
- Revenues and cost functions are not linear
- Total fixed cost and unit variable costs could be not constant beyond certain range
- insufficient cost control system

Flexible budget variance: a joint result of price variance and quantity variance

- No information related to “input”rather than “product”
- Hard to figure out the exact level of price variance and quantity variance
- whose responsibility: product manager or purchase manager?

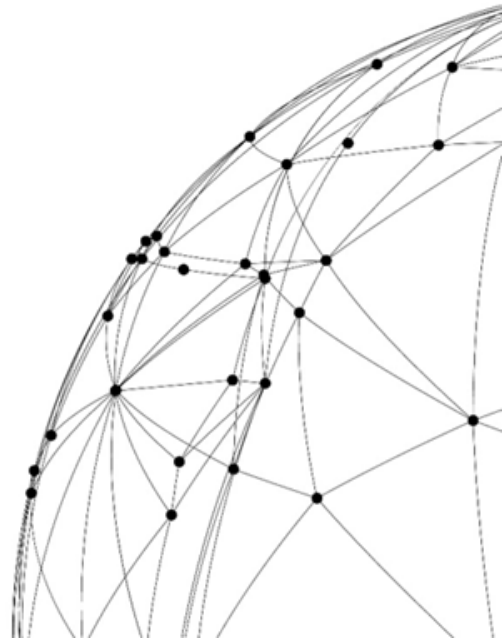
Performance evaluation across departments

- In general, actual volume > planned volume: contribution mainly from sales department
- Possible adjustments in product deparment and purchase deparment to better control manufacturing cost



05

Implications and Conclusion



Standard Costs and Variance

Standard Costs:

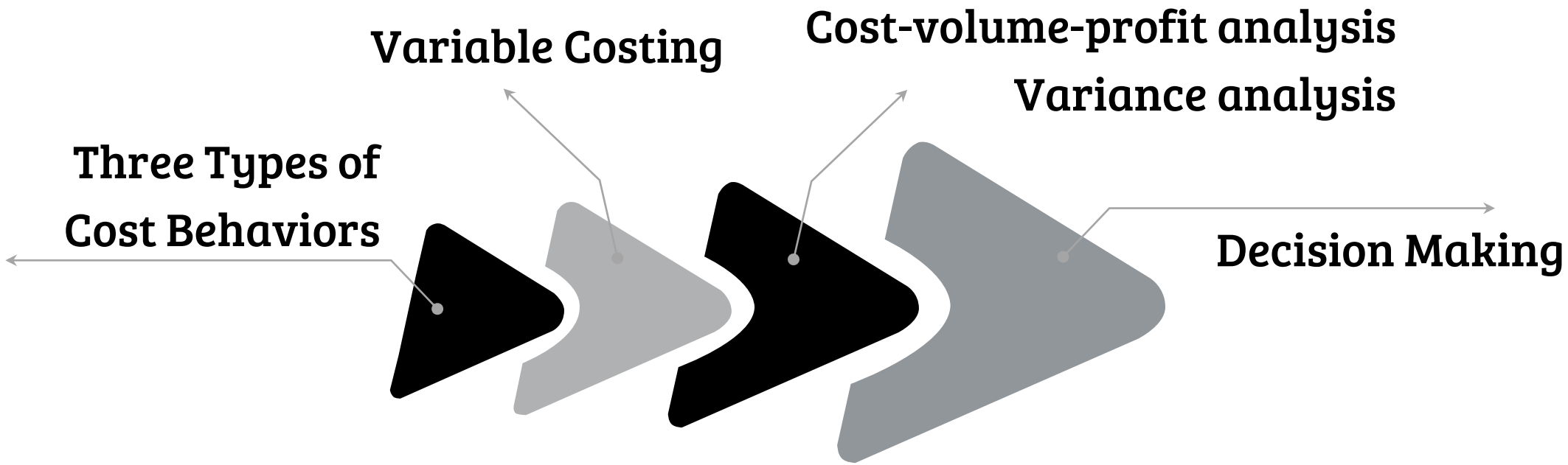
- A budget for a single unit of product
- Reflect the value of inventories & COGS
- Benchmark for evaluating actual costs

In our case:

- Information for DM,DL,MOH variance is not available
- Still, standard costs provide a fundamental base for flexible budgets
- Budgets result indicate future improvements such as products mix changes.

Source: https://www.accountingcoach.com/standard-costing/explanation

Cost Behaviors & Variable Costing



Operating income= Sales price per unit * Volume sold – Variable costs per unit * Volume Sold – Fixed costs

CVP Analysis

(1) CVP Assumptions are not true in the real world
Assumption(Sales mix will not change) is not met in the case
(2) Show impacts of varying sales volume and products costs on operating income
(3) CM & CM ratio, B/E points, Margin of Safety Ratio, DOL
(4) Sensitivity of profits in terms of production changes

Option 1
Change in production line
Operating decision

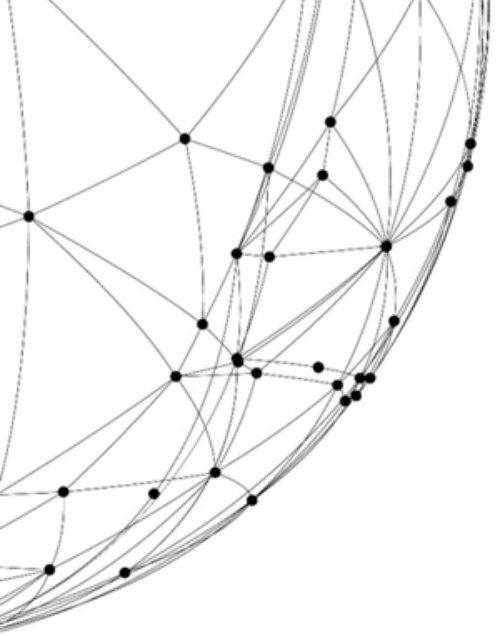
Option 3:
Change in volumes
Marketing decision

Option 2
Change in price and volume
Marketing decision

Source: https://www.investopedia.com/terms/c/cost-volume-profit-analysis.asp

What we have learned

- Cost Analysis: Standard Costs, Variable Costing, CVP Analysis
- How to apply accounting tools to support decisions for management purpose
- Better understanding of the nature of managerial accounting



Q&A

THANK YOU VERY MUCH