Budget Planning & Cost Control

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Outline

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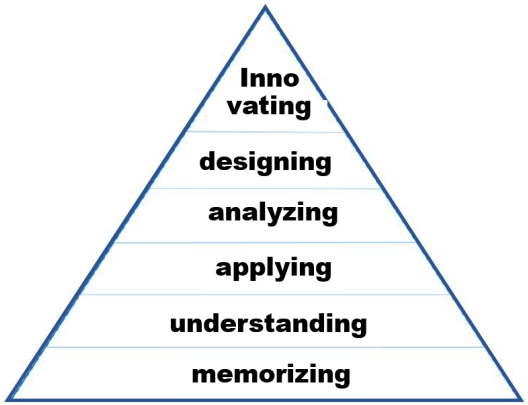
Goals



- Understanding and analyzing 'various' budgets as well as their limitations

Textbook and references

Official Textbook

Ngaoprasert08 Ngaoprasertwong, J. 2008. *Industrial Cost Analysis and Budgeting*. Chulalongkorn Print. Bangkok.

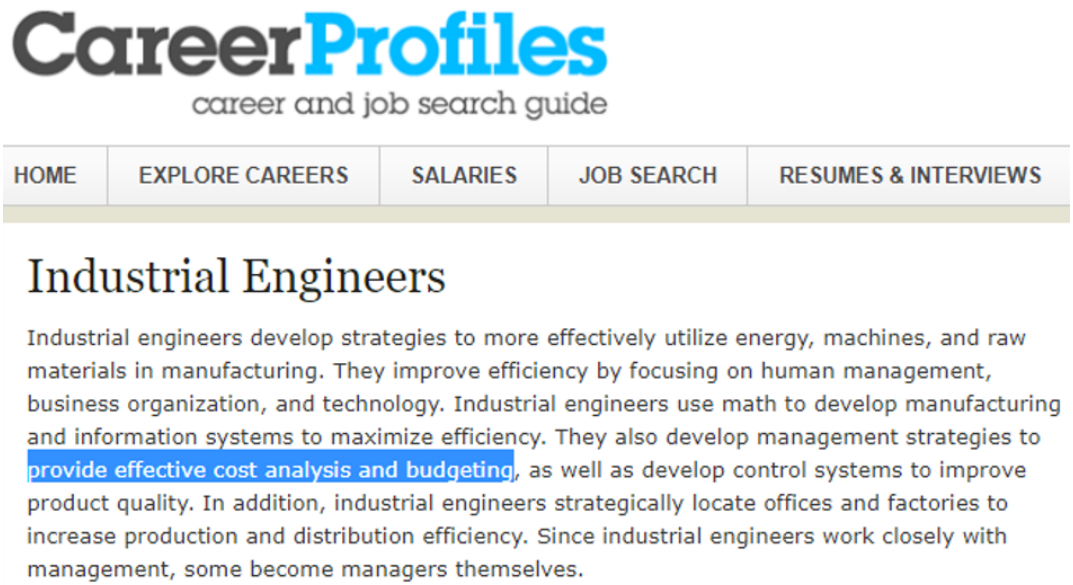
Reference Textbooks

Zimmer17 Zimmerman, J.L. 2017. *Accounting for Decision Making and Control*, McGraw-Hill, New York

Shim11 Shim, J.K., Siegel, J.G., Shim, A.I. 2011. *Budgeting Basics and Beyond*. Wiley. New Jersey.

Why IE must know [industrial] cost & budgeting?

- **Opportunity for more profit:** setup good plan and control cost → profit
- **Costing insight:** reveals structure and underlying problems
- **Budgeting as grand plan:** resource, time, project scope, communication
- **Accounting = Data Source:** actual activity, performance, recorded expenditure → Data Mining, ML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Industrial Engineers

Industrial engineers develop strategies to more effectively utilize energy, machines, and raw materials in manufacturing. They improve efficiency by focusing on human management, business organization, and technology. Industrial engineers use math to develop manufacturing and information systems to maximize efficiency. They also develop management strategies to provide effective cost analysis and budgeting, as well as develop control systems to improve product quality. In addition, industrial engineers strategically locate offices and factories to increase production and distribution efficiency. Since industrial engineers work closely with management, some become managers themselves.

Important Costing Concept. So far

- **Direct Costs:** a cost that can be conveniently and economically traced (traced) to a cost object
- **Indirect Costs:** a cost that cannot be conveniently or economically traced (tracked) to a cost object.
- **Variable Costs:** a constant on a per-unit of production.
- **Fixed Costs:** a change with a respected of level of production.
- **Cost Driver:** a variable that affects costs over a given time span
- **Relevant Range:** a band of normal activity level in which the relationship between the level and a cost
- **Contribute Margin Ratio:** $\frac{\text{sale price - unit cost}}{\text{sale price}}$
- **Cost-Volume-Profit (CVP):** analysis to determine how costs and volume affect operating income and net income.
- **Break-Even Point:** a sale level that yields no profit or loss
- **Actual Cost:** a occurred cost
- **Budgeted Cost:** a predicted cost

What is Budgeting?

A quantitative expression of a plan for a defined period of time [to achieve the objective]. It may include planned sales volumes and revenues, resource quantities, costs and expenses, assets, liabilities and cash flows.

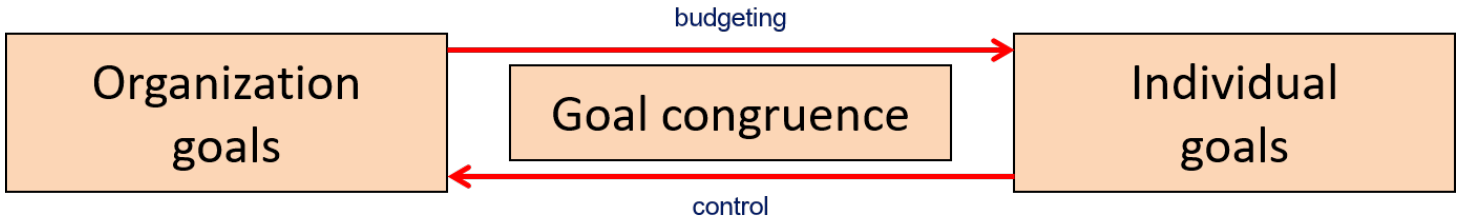
CIMA Official Terminology, 2005

Example of budget

รายการ	งบการเงินรวม ปี 2553 (ตรวจสอบแล้ว)		งบการเงินรวม ปี 2554 (ตรวจสอบแล้ว)		งบการเงินรวม ปี 2555 (ตรวจสอบแล้ว)	
	จำนวน	%	จำนวน	%	จำนวน	%
งบกำไรขาดทุนเบ็ดเสร็จ (ล้านบาท)						
รายได้จากค่าเช่ารถยนต์	1,073.39	48.87	1,096.94	47.94	1,101.86	45.70
รายได้จากการขายรถยนต์	1,059.06	48.22	1,098.56	48.01	1,309.21	54.30
รายได้อื่น	63.88	2.91	92.67	4.05	91.17	3.78
รวมค่าใช้จ่าย	1,697.32	77.28	1,729.58	75.59	1,887.42	78.28
กำไรก่อนต้นทุนทางการเงินและภาษีเงินได้	499.01	22.72	558.59	24.41	614.82	25.50
ต้นทุนทางการเงิน	118.66	5.40	103.04	4.50	92.08	3.82
ภาษีเงินได้	34.62	1.58	130.06	5.68	125.46	5.20
กำไรสุทธิ	345.74	15.74	325.50	14.23	397.29	16.48
งบแสดงฐานะการเงิน (ล้านบาท)						
สินทรัพย์รวม	3,542.01	100.00	3,652.17	100.00	3,658.91	100.00
หนี้สินรวม	2,264.68	63.94	2,247.98	61.55	2,054.91	56.16
ส่วนของผู้ถือหุ้น	1,277.33	36.06	1,404.19	38.45	1,604.00	43.84

Why do we need budgeting?

Budget is a tool for managers prepared by accountant



- **planning process:** projection future and decision tool
- **evaluating process:** link individual goal to performance $\rightarrow$ KPI
- **prioritizing process:** communicate and coordinate goals
- **allocating resource & responsibility:** cost control, financial planning,

Example: Bay View Country Club

Bay View Country Club is a private club with 350 members who pay initial fee $45,000 and $385 monthly fee. The club has 3 departments, particulary restaurant, golf course, and gift shop. The budgeting and actual operating result of the club as well as that of previous year are followed:

	Actual September	*Budget September*	*Favorable (Unfavorable) Variance*		*Last Year Septermber*
Revenues					
Dues	133,350	134,750	(1,400)		129,600
Guest fees	2,900	2,500	400		2,200
Food and bar	46,000	44,500	1,500		45,000
Golf carts	2,200	1,900	300		2,100
Miscellaneous	1,600	1,800	(200)		1,700
Total Revenue	186,050	185,450	600		180,600
Expense					
Food and bar	57,000	51,300	(5,700)		49,700
Golf bourse	79,500	80,000	500		75,000
Admin & maintenance	47,050	45,350	(1,700)		45,600
Interest on dept	8,500	8,500	-		9,000
Total Expense	192,050	185,150	(6,900)		179,300
Net operating suplus (deficit)	(6,000)	300	(6,300)		1,300

Assuming that all inventory is negligible. Analyze and suggest improvement.

Zimmerman, J.L., *Accounting for Decision Making and Control*. pp 219-221

Example: Bay View Country Club II

	Actual September	*Budget September*	*Favorable (Unfavorable) Variance*		*Last Year Septermber*
Revenues					
Parties	8,300	11,500	(3,200)		11,000
Food	24,000	22,000	2,000		21,500
Bar	12,700	10,500	2,200		10,500
Mics.	1,000	500	500		2,000
Total Revenue	46,000	44,500	1,500		45,000
Expense					
Parties	9,000	4,000	(5,000)		5,000
Food	44,000	43,000	(1,000)		40,000
Bar	4,000	4,300	300		4,700
Total Expense	57,000	51,300	(5,700)		49,700
Net operating suplus (deficit)	(11,000)	(6,800)	(4,200)		(4,700)

Zimmerman, J.L., *Accounting for Decision Making and Control*. pp 219-221

Cause of variance?:

- **Party:** under-projected revenue, over-budgeted expense
- **Budgeting process:** cur.budget not consider last.actual, lack of control

Example: Shocker Company

The sale budgeting/forecast of Shocker Company shows quarterly sales for the next year as follows

Quarter	qty	units
1	10,000	EA
2	8,000	EA
3	12,000	EA
4	14,000	EA

If the policy states that the company must prepare 20% of finish goods inventory for the next quarter at the end of previous quarter, and the remaining inventory the beginning of Quarter 1 is 2,200 EA. Calculate budget production quantity in each quarter.

Zimmerman, J.L., *Accounting for Decision Making and Control*. pp 225

Inventory of Shocker Company

$$\begin{aligned} \text{inv}_{t-1} + \text{produce}_t &= \text{sell}_t + \text{inv}_t \\ \text{produce}_t &= \text{sell}_t + \text{inv}_t - \text{inv}_{t-1} \end{aligned}$$

	Q1	Q2	Q3	Q4
fore.sell	10,000	8,000	12,000	14,000
prep next	1,600	2,400	2,800	
avail. now	-2,200	-1,600	-2,400	-2,800
produce				

Thinking point:

- **Timing:** when to pay for RM?
- **Production:** value of FG and RM inventory (20% reasonable)
- **Revenue:** sell FG with credit,

Example: Shocker Company I

Shocker Company determines the selling price and standard cost of this FG at \$5.00 and \$4.00 per EA, respectively. If production and selling quantities follow the plan and the company expects to receive 60% of revenue of within this quarter and the remaining 40% of revenue in the next quarter. What are (1) inventory value of FG, (2) cost of good sold, and (3) budgeted income?

	Q0	Q1	Q2	Q3	Q4
fore.sell (EA)	-	10,000	8,000	12,000	14,000
produced (EA)		9,400	8,800	12,400	13,600
inventory (EA)	2,200	1,600	2,400	2,800	2,400
revenue (1000USD)					
CoGS (1000USD)					
inventory value (1000USD)					
income (1000USD)					

- **unit cost of inventory** \$4.0-\$5.0 lesser of cost or market value^{GAAP}

Thinking point:

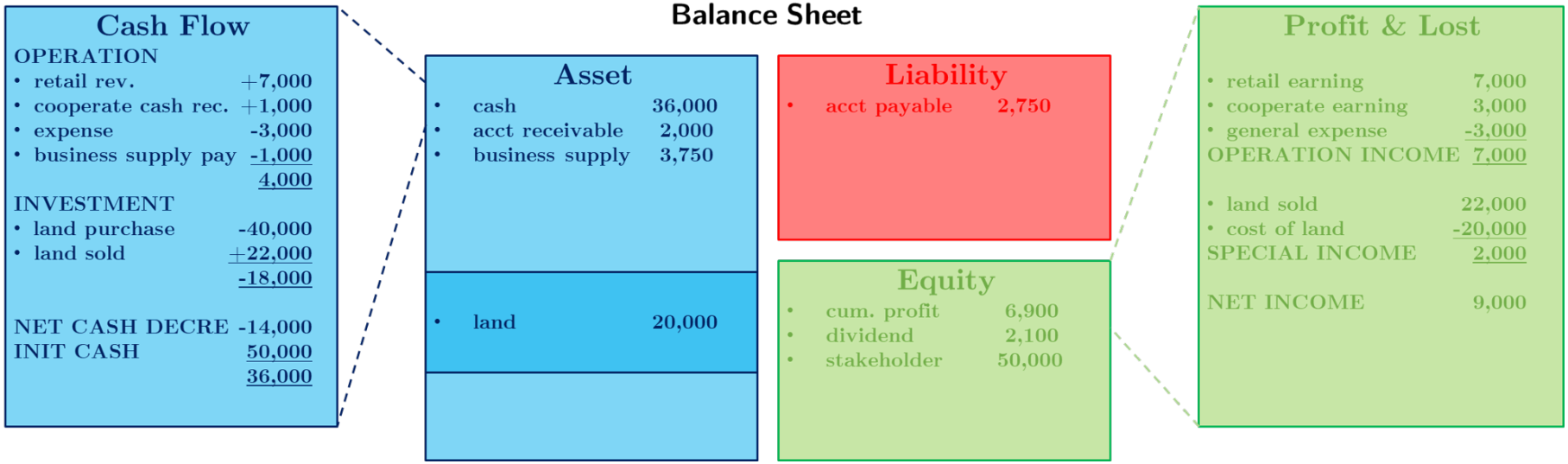
- **Actual :** If the actual selling qualities are 9500, 9500, 11000, and 13000 respectively. How the *actual* value of inventory, CoGS, and income changed?

Important type of Budgets...

- **Master Budget:** an aggregate of all company's individual budgets, consisting of operating and financial budgets
- **Production Budget:** an operation budgeting that projects production of FG and requirement of RM
- **Financial Budget:** an financial budgeting that projects incoming and outgoing flows of business both long term and short term
- **Cost of Goods Sold Budget:** an operation budgeting that projects standard costs of sold products, exclude period cost
- **Capital Expenditure Budget:** a decision making related to investment and capital expenditure
- **Cash Budget:** a financial budgeting that projects channels of cash in/out within a specific period
- **Budgeted Income Statement:**a operating budget that reports actual earnings and expenses for a given period of time
- **Budgeted Balance Sheet:** a financial budgeting that shows asset, liability and equity at a specific period

source: 'Budgeting Basic and Beyond', Shim *et al.*

RECAP: Three basic financial statements



- **Balance Sheet (BS):** snap short of assets → form & quantity
- **Profit & Loss (P&L):** revenue in core business + depreciation → margin
- **Cash Flow (SC):** activities of cash and taxes → liquidity of business

RECAP: Financial Ratio Analysis

- **What:** a ratio of meaningful information about a company
- **Purpose:** trace & compare financial performance of a company
- **Categories:**
  - Liquidity Ratio: $\text{cur. ratio} = \frac{\text{cur. asset}}{\text{cur. liability}}$, $\text{quick ratio} = \frac{\text{quick asset}}{\text{cur. liability}}$
  - Profitability Ratio: $\text{gross margin} = \frac{\text{gross profit}}{\text{sales}}$, $\text{ROE} = \frac{\text{EBIT (return)}}{\text{avg. equity}}$
  - Activity Ratio: $\text{payable turnover} = \frac{\text{sales}}{\text{avg. acc. payable}}$,
    $\text{inventory turnover} = \frac{\text{sales}}{\text{avg. inventory}}$
  - Leverage Ratio: $\frac{\text{fix asset}}{\text{equity}}$, $\text{debt2equity} = \frac{\text{liability}}{\text{equity}}$

Goal: Income Statement and Balance Sheet

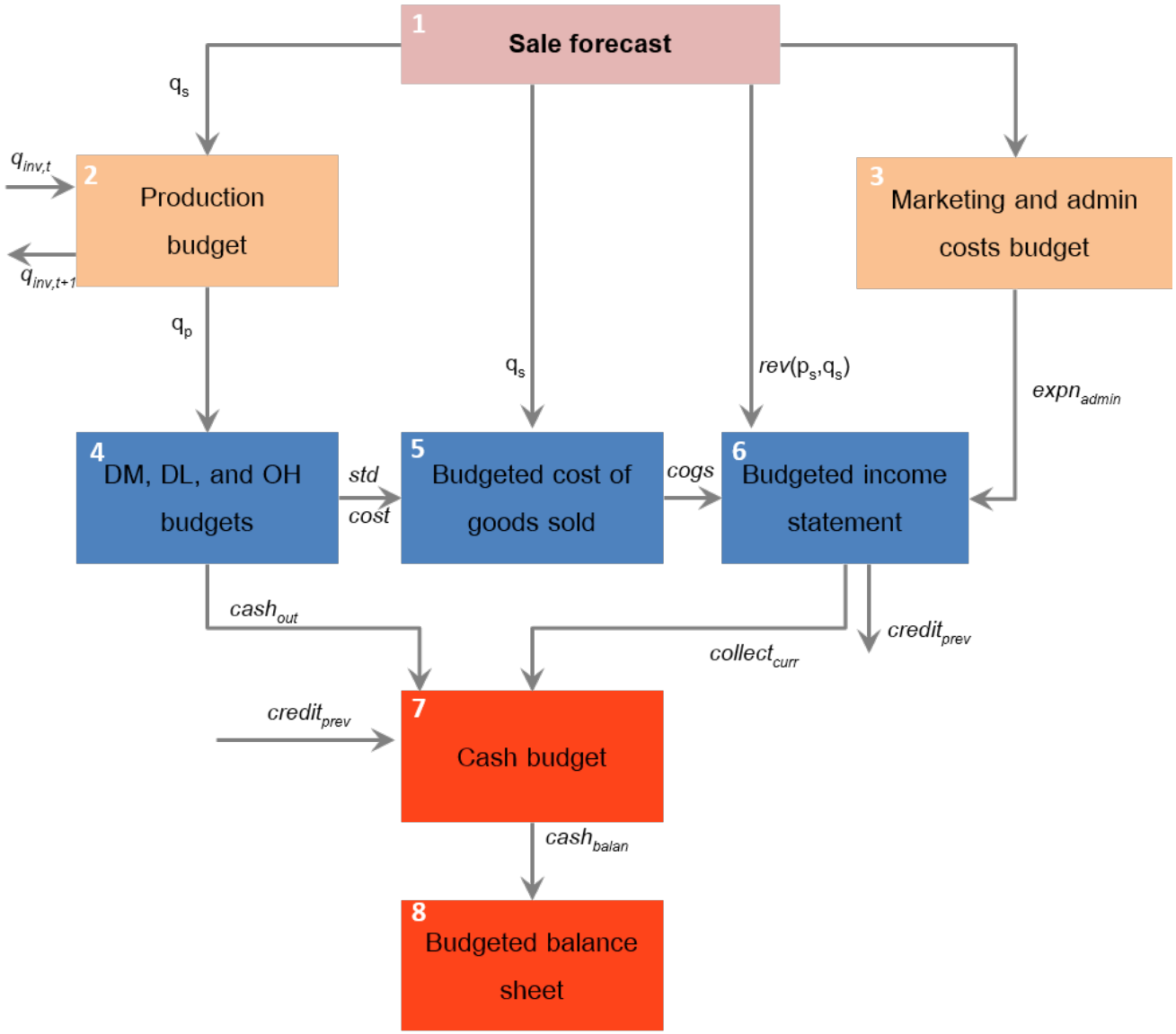
Reflection, Inc.
Budgeted Income Statement
For Year Ended December 31, 20X3

	Annual Budget	Quarter			
		1st	2d	3d	4th
Operating Revenue:					
Net Sales (Schedule 1)	$2,075,600	$488,000	$552,300	$579,600	$455,700
Cost of Merchandise Sold:					
Beginning Inventory	$ 129,360	$129,360	$143,140	$150,280	$117,980
Purchases (Schedule 2)	1,362,720	341,700	364,820	343,060	313,140
Total Merchandise Available	$1,492,080	$471,060	$507,960	$493,340	$431,120
Less Ending Inventory	136,000	143,140	150,280	117,980	136,000
Cost of Merchandise Sold	$1,356,080	$327,920	$357,680	$375,360	$295,120
Gross Profit on Operations	$ 719,520	$160,080	$194,620	$204,240	$160,580
Operating Expenses:					
Selling Expenses (Schedule 3)	$ 362,040	$ 86,330	$ 95,670	$100,130	$ 79,910

DIMSDALE SPORTS COMPANY
Estimated Balance Sheet
December 31, 2013

Assets			Liabilities and Equity		
Cash	$ 36,000		Accounts payable	$360,000	
Accounts receivable	525,000		Bank loan payable	15,000	
Inventory	150,000		Taxes payable (due 3/15/2014)	90,000	
Total current assets		$ 711,000	Total liabilities		$465,000
Equipment	540,000		Common stock	472,500	
Less accumulated depreciation	67,500		Retained earnings	246,000	
Equipment, net		472,500	Total stockholders' equity		718,500
Total assets		$1,183,500	Total liabilities and equity		$1,183,500

Grand Plan


1 Sale forecast
q_s
$q_{inv,t}$
2 Production budget
$q_{inv,t+1}$
3 Marketing and admin costs budget
q_p
q_s
$rev(p_s,q_s)$
$expn_{admin}$
4 DM, DL, and OH budgets
std cost
5 Budgeted cost of goods sold
cogs
6 Budgeted income statement
$cash_{out}$
$collect_{curr}$
$credit_{prev}$
$credit_{prev}$
7 Cash budget
$cash_{balan}$
8 Budgeted balance sheet

1) Sale Forecast and 2) Production Budget

1) Sale Forecast

ผลิตภัณฑ์	ราคาต่อหน่วย (บาท)	ปริมาณ (หน่วย)	รายได้จากการขาย (บาท)
ก	3.50	220,000	770,000
ข	4.50	300,000	1,350,000
		รวมทั้งสิ้น	2,120,000

2) Production Budget

ผลิตภัณฑ์	ปริมาณขาย	ปริมาณสินค้าปลายปี	หน่วยผลิตที่ต้องการ	สินค้าต้นปี	จำนวนหน่วยที่จะต้องผลิต
ก	220,000	25,000	245,000	30,000	215,000
ข	300,000	28,000	328,000	18,000	310,000

Side Note: Sale Forecasting

What are basic data to forecast sales?

- **internal company:** targeted growth/sales, capacity
- **past sale:** historical data of company or industry
- **economic trend:** seasonal, industry cycle, economic crisis
- **political or legal event:** e.g, tax exempt, change in regulation, Thailand 4.0

Who and How?

- **internal sale persons:** sales (close to customer) VS executive (bias, insights)
- **market research:** market survey, cut/potion of market share
- **forecasting model:** Delphi, Naive, Moving Average, Exponential Smoothing, Regression

3) Marketing and Admin. Costs Budget

Marketing Cost		Administrative Cost	
เงินเดือนผู้จัดการฝ่ายขาย	50,000 บาท	เงินเดือนผู้บริหาร	120,000 บาท
เงินเดือนพนักงานขาย	30,000 บาท	ค่าใช้จ่ายในการเดินทาง	28,000 บาท
ค่านายหน้าพนักงานขาย	45,000 บาท	ค่าเสื่อมราคาเครื่องมือ	50,000 บาท
ค่าใช้จ่ายในการเดินทาง	42,000 บาท	ค่าเช่า	32,000 บาท
เงินเดือนเสมียนพนักงาน	12,500 บาท	ค่าประกันภัย	1,500 บาท
ของใช้สิ้นเปลือง	10,800 บาท	เงินเดือนเสมียนพนักงาน	78,000 บาท
ค่าเสื่อมราคาเครื่องมือ	58,400 บาท	ของใช้สิ้นเปลือง	15,000 บาท
ค่าโฆษณา	38,000 บาท	ค่าโทรศัพท์	6,000 บาท
ค่าเช่า	65,000 บาท	บริการสังคม	11,500 บาท
รวมทั้งสิ้น	351,700 บาท	รวมทั้งสิ้น	342,000 บาท

4) DM, DL, OH Costs Budget

Direct Material

ผลิตภัณฑ์	จำนวนหน่วยที่ต้องการผลิต	น้ำหนักต่อหน่วย	จำนวนหน่วยที่ต้องใช้
ก	215,000	3 ปอนด์	645,000 ปอนด์
ข	310,000	2 ปอนด์	620,000 ปอนด์

วัตถุดิบ	ปริมาณที่ต้องใช้	วัตถุปลายปีต้องการ	วัตถุต้องการทั้งหมด	วัตถุต้นปีมีอยู่	จำนวนหน่วยที่ซื้อ	ต้นทุนต่อหน่วย	ทุนในการซื้อวัตถุ
A	645,000	55,000	700,000	45,000	655,000	0.150	98,250
B	620,000	80,000	700,000	90,000	610,000	0.265	161,650
							259,900

Direct Labor

ผลิตภัณฑ์	จำนวนหน่วยผลิต	เวลาที่ใช้ต่อหน่วย	ชม.แรงงานที่ใช้	อัตรา	ต้นทุนแรงงานทางตรง
ก	215,000	0.5	107,500	1.80	193,500
ข	310,000	0.6	186,000	1.80	334,800
			293,500		528,300

Overhead

เงินเดือน	109,000 บาท
ค่าแรงงานทางอ้อม (V)	170,000 บาท
วัตถุทางอ้อม (V)	90,500 บาท
ค่าเดินทาง	2,500 บาท
ค่าบริการต่าง ๆ	20,400 บาท
ภาษี (V)	33,000 บาท
ค่าเสื่อมราคา	108,250 บาท
ค่าประกันภัย	24,000 บาท
รวมทั้งสิ้น	557,650 บาท

5) Budgeted Cost of Goods Sold

Standard Cost

วัตถุทางตรง	ผลผลิต ก.	ผลผลิต ข.
A: 3 ปอนด์ ๆ ละ .15 บาท	0.45	
B: 2 ปอนด์ ๆ ละ .265 บาท		0.53
แรงงานทางตรง		
.5 ชม. ๆ ละ 1.80 บาท	0.90	
.6 ชม. ๆ ละ 1.80 บาท		1.08
ค่าใช้จ่ายโรงงาน		
ค่าใช้จ่ายเปลี่ยนแปลง 1 บาท/ชม.แรงงานทางตรง	0.50	0.60
ค่าใช้จ่ายคงที่ ชม. .90 บาท/ชม.แรงงานทางตรง	0.45	0.54
รวมต้นทุนมาตรฐานต่อหน่วย	2.30	2.75

Budgeted Cost of Goods Sold

ผลิตภัณฑ์	ราคามาตรฐาน ต่อหน่วย (บาท)	ปริมาณ (หน่วย)	รายได้จากการขาย (บาท)
ก	2.30	220,000	506,000
ข	2.75	300,000	825,000
		รวมทั้งสิ้น	1,331,000

6) Budgeted Income Statement

ยอดขาย (1)		2,120,000 บาท
ต้นทุนสินค้าขาย (5)		1,331,000 บาท
กำไรเบื้องต้น		789,000 บาท
ค่าใช้จ่ายในการขาย (3)	351,700	
ค่าใช้จ่ายในการบริหาร (3)	342,000	693,700 บาท
		95,300 บาท
ดอกเบี้ยพันธบัตรจ่าย		0 บาท
กำไรก่อนหักภาษี		95,300 บาท
หักภาษี		45,150 บาท
กำไรสุทธิ		50,150 บาท

THINKING POINT:

- Is this company happy?

7) Cash Budget

Cash In	Cash Out	
ในการตั้งงบประมาณเงินสด ต้องคำนึงถึงลูกหนี้ และเงินที่พึงจะได้รับในระหว่างปีงบประมาณ สมมติว่า ธุรกิจมีลูกหนี้คงเหลืออยู่เมื่อต้นปีงบประมาณ 110,000 บาท และคาดคะเนได้ว่า จะเก็บเงินได้ 95% จากยอดขายระหว่างปี ฉะนั้น งบประมาณเงินสดคำนวณได้ ดังนี้	งบประมาณเงินสดค่าใช้จ่าย	
	งบประมาณเงินสดจ่ายวัสดุทางตรง (4)	259,000 บาท
	งบประมาณค่าใช้จ่ายแรงงานทางตรง (4)	528,300 บาท
	งบประมาณค่าใช้จ่ายโรงงาน (4)	557,650 บาท
	งบประมาณค่าใช้จ่ายในการขาย (3)	351,700 บาท
	งบประมาณค่าใช้จ่ายในการบริหาร (3)	342,000 บาท
	ค่าประกันภัยที่ต้องจ่ายล่วงหน้า (make_up)	24,800 บาท
	ภาษีปีงบประมาณก่อนซึ่งต้องจ่ายในปีนี้ (bal_sheet)	55,000 บาท
	ค่าใช้จ่ายค้างจ่าย อื่นๆ ซึ่งต้องจ่ายในปีนี้(bal_sheet)	53,000 บาท
	เครื่องมือเครื่องจักรที่จะซื้อใหม่	250,000 บาท
	เงินปันผลจ่าย	23,500 บาท
	ค่าประกันภัย (remove from 3)	-25,500 บาท
	ค่าเสื่อมราคา (remove from 3 & 4)	-216,650 บาท
	ยอดรวม	2,202,800 บาท
เก็บได้จากลูกหนี้ 110,000 บาท		
เก็บได้ 95% จากยอดขายระหว่างปี 2,014,000 บาท		
รวมทั้งสิ้น 2,124,000 บาท		
ลูกหนี้ค้างจ่าย 106,000 บาท		

cash_{end}: 2,124,000-2,202,800 = -78,800

8) Balance Sheet

Begin of Period				End of Period			
ทรัพย์สิน		หนี้สินและส่วนของผู้ถือหุ้น		ทรัพย์สิน		หนี้สินและส่วนของผู้ถือหุ้น	
เงินสด	112,000	ตั๋วแลกเงินจ่าย	0	เงินสด	33,200	ตั๋วแลกเงินจ่าย	0
ลูกหนี้	110,000	ค่าแรงค้างจ่าย	0	ลูกหนี้	106,000	ค่าแรงค้างจ่าย	0
วัตถุดิบ	30,600	รายจ่ายอื่น ๆ ค้างจ่าย	53,000	วัตถุดิบ	29,450	รายจ่ายอื่น ๆ ค้างจ่าย	65,000
งานระหว่างทำ	87,900	สำรองภาษี	55,000	งานระหว่างทำ	87,900	สำรองภาษี	45,150
สินค้าสำเร็จรูป	118,500	พันธบัตร	0	สินค้าสำเร็จรูป	134,500	พันธบัตร	0
ค่าประกันภัยยังไม่หมดอายุ	6,200	หุ้นสามัญ	1,200,000	ค่าประกันภัยยังไม่หมดอายุ	5,500	หุ้นสามัญ	1,200,000
เครื่องจักรและเครื่องมือ	1,035,000	กำไรสะสม	292,200	เครื่องจักรและเครื่องมือ	1,068,350	กำไรสะสม	319,750
ลิขสิทธิ์และเครื่องหมายการค้า	100,000			ลิขสิทธิ์และเครื่องหมายการค้า	165,000		
รวม	1,600,200	รวม	1,600,200	รวม	1,629,900	รวม	1,629,900

Thinking point:

- Is this company healthy?

8) Balance Sheet for Ratio Analysis

		Begin	Ending
ASSET	cash	112,000	86,200
	account receivable	110,000	106,000
	raw material	30,600	29,450
	work-in process	67,900	87,900
	finish good	118,500	134,500
	issuance	6,200	3,500
	machine & equipment	1,035,000	1,068,350
	copyright & license	100,000	165,000
LIABILITY	account payable	53,000	65,000
	tax payable	55,000	45,150
EQUITY	cumm. Profit/loss	292,209	319,750
	common stock	1,200,000	1,200,000
MICS	sale	-	2,120,000
	net income	-	95,300

IMPORTANT RATIOS:

- **Current Ratio:** $\frac{\text{cur.asset}}{\text{cur.liability}} \rightarrow \frac{445.2k}{108.0k} = 4.12$ and ??
- **Quick Ratio:** $\frac{\text{cur.asset}_{noInv}}{\text{cur.liability}} \rightarrow \frac{228.2k}{108.0k} = 2.11$ and ??
- **Return of Equity (ROE):** $\frac{\text{EBIT}}{\text{equity}} \rightarrow \frac{95.3k}{\frac{1}{2}(1492.209k+1519.75k)} = 0.0627$
- **Inventory Turnover:** $\frac{\text{sale}}{\text{avg.inventory}} \rightarrow \frac{2120.0k}{\frac{1}{2}(217.0k+251.85k)} = 9.04$

Budgeting cycle

- **Budget preparation:** group activity/ quantify tasks, drivers, and std rate/ summary
  - ***Top-Down*** executive mgt setups budget without participates e.g., project
  - ***Bottom-Up*** participates involves in budgeting/planning
- **Approve budget:** negotiation input & output, cost saving initiative, project
- **Manage budget:** transfer to operations, KPI , plan, exact timing
- **Follow-Up budget:** variance, issues, review next budget

Conflict of interests in budgetting

- Rigid (line item/ lapsing of period)
- Easy to achieve budget (plan and control)
- Spend it or lose it (gov budget)

Terminology of Budget Creation

- **Line item budget:** classifies by nature of costs, e.g., labor, material, revenue
- **Program budget:** classifies by reason/objective, e.g., sell, manufacturing
- **Incremental budget:** starts with actual/past budget and scale based on inflation, volume
- **Zero-based budget:** starts with objective and find alternative cost with allowance
- **Static Budget:** budget for a single activity level; usually in the master budget for admin, retail
- **Flexible Budget:** budget depend on level of output indicates revenues, costs, and profits for different levels of activity

Preparing Flexility budget for OH

A company considers two budgeting plans. (1) static budgeting with production estimates 7.5k MC hours with budgeted electricity at 15.0k THB. (2) flexible budgeting with production estimates 6.0k, 7.5k, and 9.0k MC hours with budgeted electricity at 12.0k, 15.0k, and 18.0 THB, respectively. If the company produces 2,000 units using MC hour 6,000 with actual electivity 12.8k THB. Calculate variance and discuss two budgeting plans.

	Actual	*Budget*	*Variance*
Static Budget			
Electivity (@7.5MC hour)	12,800	15,000	2,200(F)
Flexible Budget			
Electivity (@6.0MC hour)	12,800	12,000	800(U)

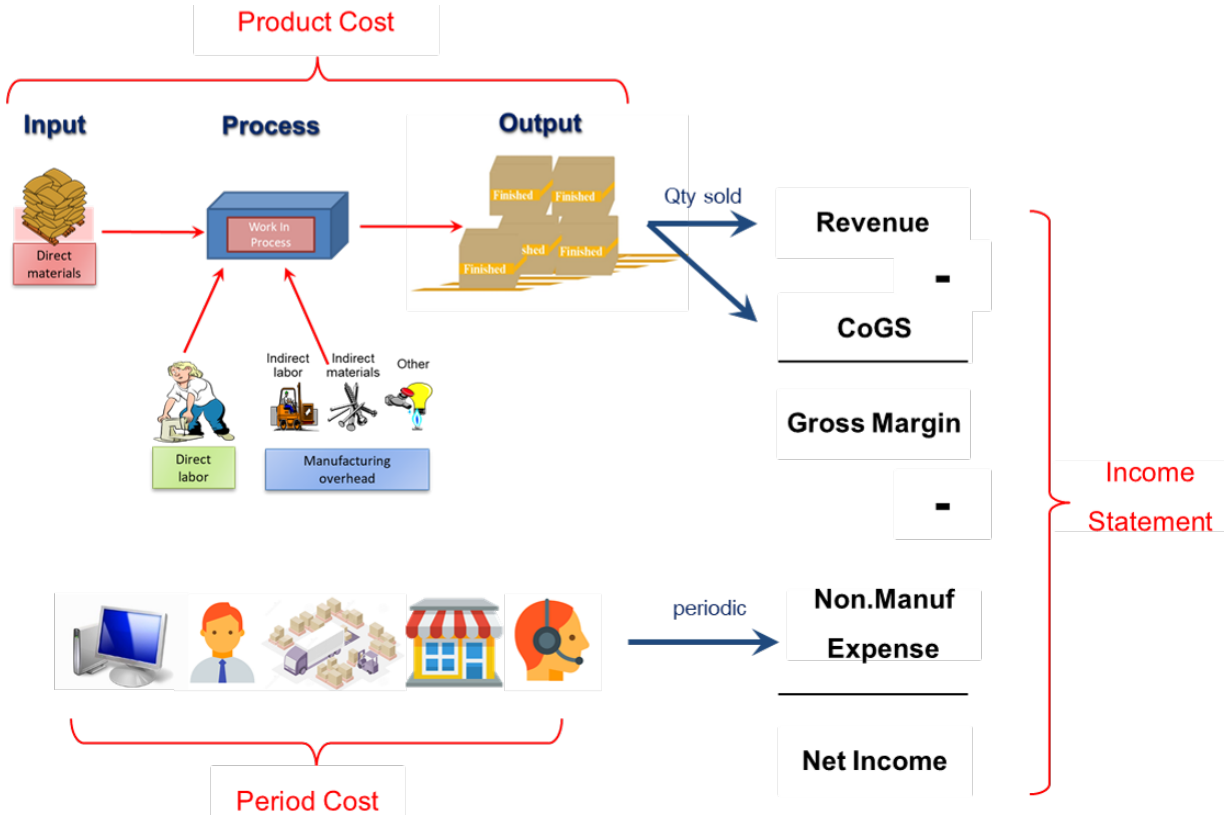
Awareness and Limitation of budgeting

- **Reasonable:** forecasting sale with cost, Actual VS Forecast
- **Flexible:** group for estimation; what is a best group
- **Contingency:** buffer if actual $\neq$ planned
- **Summary** summary everything in 1 page

Limitation

- **budget = art:** many revision, unexpected, experience
- **organization conflicts:** saving VS spending
- **time consumption:** executive support
- **budget $\rightarrow$ game:** reward by performance

Re-Cap: Cost Classification



- **Product costs:** costs of converting RM into FG, i.e., DL, DM, OH
- **Period costs** other costs in business, i.e., marketing, sell, administrative

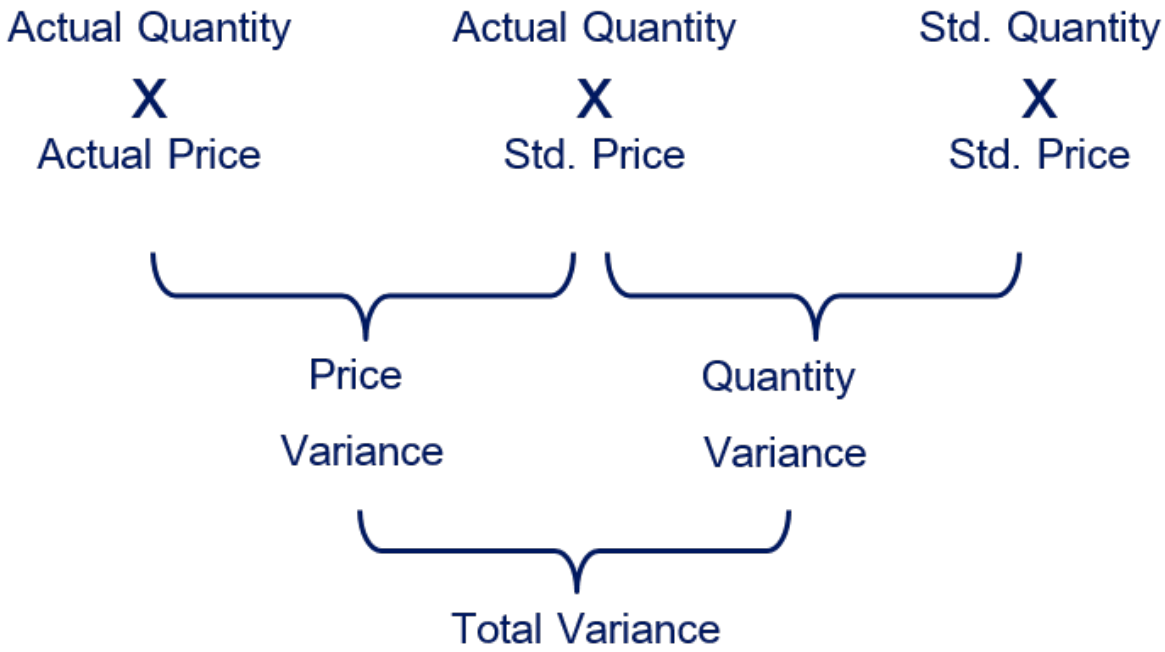
What is variance?

cost variance

Difference between a cost's actual amount and its budgeted/planned amount

- **Favorable variance:** difference that increases operating profit
- **Unfavorable variance:** difference that reduces operating profit

Direct [Labor & Material] Variance Model

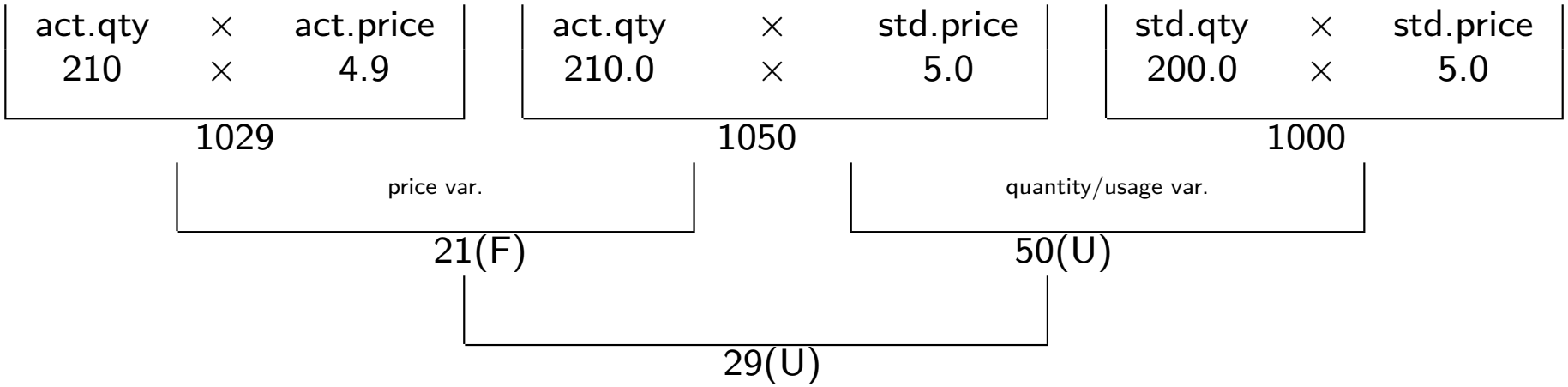


Note

- **given actual:** actual result may include discount/ coupon (Actual Qty $\times$ Actual Price)
- **material warning:** production $\neq$ purchasing

Example of Material Variance

A pillow company has 0.1 kg standard fiberfill per pillow at $5.00 per kg. Last month 210 kgs of fiberfill were purchased and used to make 2,000 pillows. The material cost a total of $1,029. Analyze all variance and recommend solution

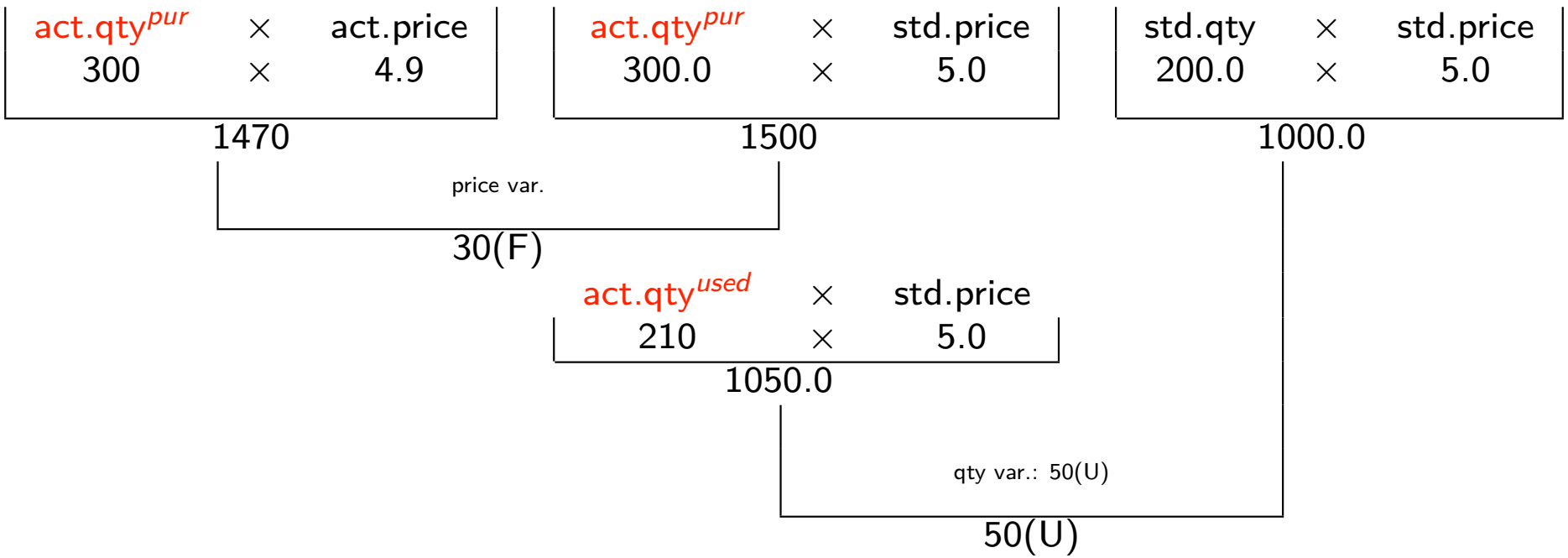


- **Unfavorable Quantity Variance:** Production → waste/spoil?, RM quality issue?
- **What if:** purchased 300 kgs at $1,470 (@ $4.9 per kg), how to reevaluate?

Thinking point:

- If we have inventory, how calculation change? → Raw Material Inventory

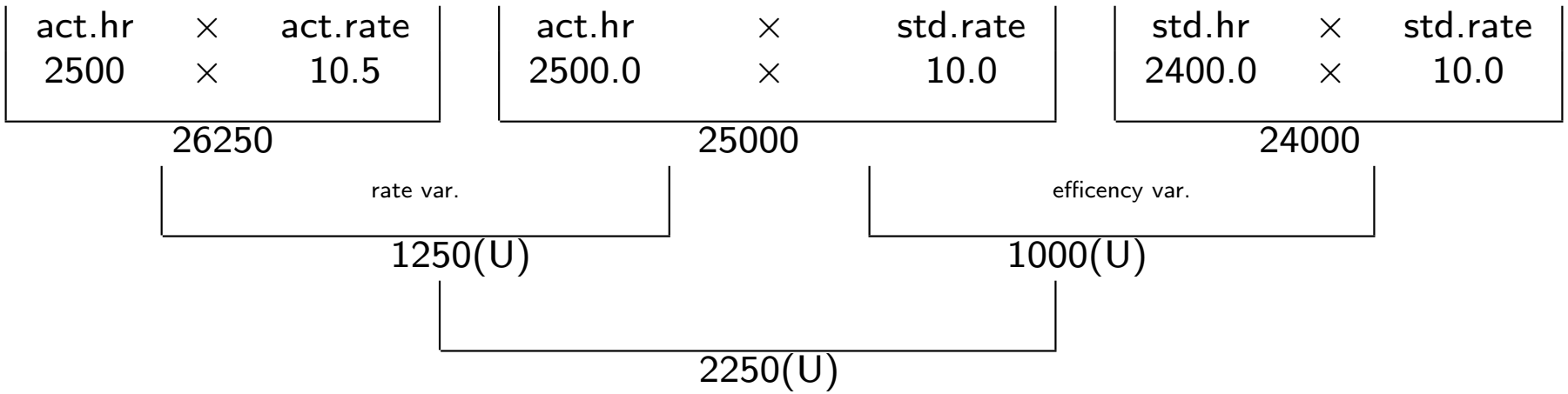
If quantity used ≠ quantity purchased, then



- Price Variance and Quantity Variance: 30(F) and 50(U)
- Remainder: (300-210) 90 × 5.0 = 450.0 → RM inventory

Example of Labor Variance

A pillow company uses 1.2 standard hours per pillow at $10.00 per hour. Last month, employees actually worked 2,500 hours at a total labor cost of $26,250 to make 2,000 pillow



- **Unfavorable Rate Variance:** Production → OT, skilled mixed,
- **Unfavorable Efficient Variance:** Production → M/C problem, quality problem, motivation

Cause of Variances

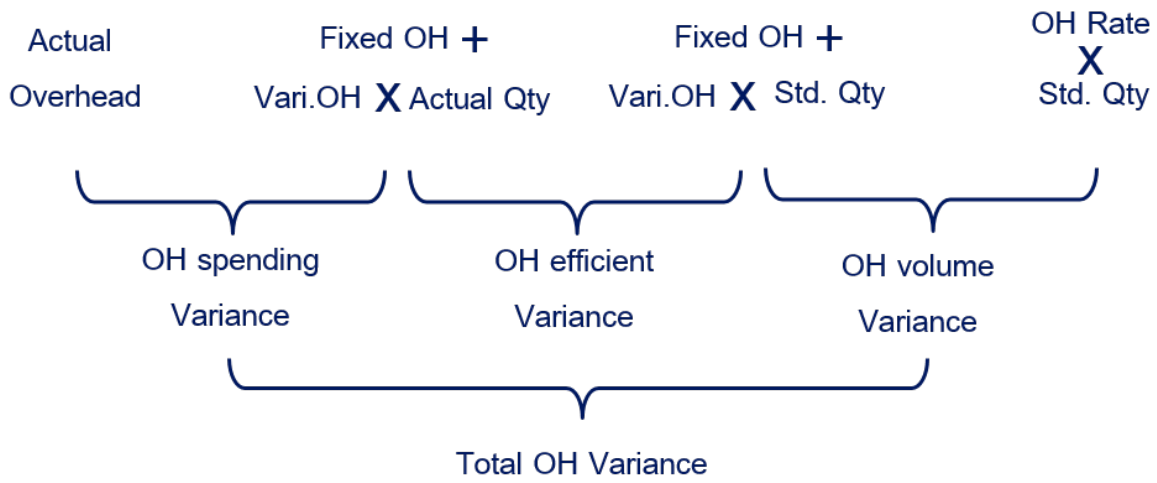
Material Variance

- **Price Variance** purchasing methods, price increase, diff grade → Purchasing
- **Usage Variance** spoil/waste, quality issue, experiment → Production
- **Raw Material Inventory** speculation, yield, order qty. → Purchasing

Labor Variance

- **Rate Variance:** higher wage, incorrect allocation worker → Production
- **Efficiency Variance:** wrong std time, Mixed, Workstation configuration, training → Production

Overhead Variance Model



- **OH. Spending:** actual paid VS linear model with actual qty
- **OH. Efficiency:** linear model with actual qty VS std qty
- **OH. Volume:** linear model with std qty VS simplified OH

Example of Overhead Variance

The milling department use standard machine hours to allocate overhead to products. If budgeted volume for the year was 36,000 MC hour. Fixed overhead of this department is at $720,000 and variable overhead cost is estimated to be $ 10 per MC hour. During the year, two products were milled with following information.

	Product 1	Product 2
United milled	10500	12000
Std MC hour per unit	2.0	1.0
Actual MC hour used	23000	13000

If the actual overhead incurred was $1.1 million. Calculate all variance

- **OH. Rate:** $\frac{\$720.0k+(\$10.0)(36.0k)}{36.0k} = 30.0$ USD per MC hr
- **Std.Vol:** $10.5k \times 2 + 12.0k \times 1 = 33.0k$ MC hour
- **Act.Vol:** $36.0k$ MC hour
- **OH.Spending:** $1,100.0k - [720.0k + (10.0)(36.0k)] = 20.0k(U)$ USD
- **OH.Eff.:** $[720.0k + (10.0)(36.0k)] - [720.0k + (10.0)(33.0k)] = 30.0k(U)USD$
- **OH.Vol.:** $[720.0k + (10.0)(33.0k)] - (30)(33.0k) = 60.0k(U)USD$

Regional Company Sale

A company produces only one FG with average selling price 56.0THB. If the sale by regions of this company is:

	Region					inventory	
	1	2	3	4	5	end.qty	end.inv.cost
						204,650	9,618,550
Jan	67,500	80,000	35,000	101,000	91,500	201,500	9,663,940
Feb	64,000	89,500	41,000	97,500	87,500	195,900	9,393,405
Mar	70,500	86,000	29,500	112,000	101,500	206,100	9,888,678

230,285 119,185

Suppose one unit of FG requires one unit of RM with cost 44.0THB, and RM inventory at the end of each month must be 55% of next month. If April production is 216,710 unit, construct budgeted sale, budgeted production.

Budgeted Sale & Production

		Jan	Feb	Mar	Total
Total Sale	(unit)	375,000	379,500	408,500	1,163,000
(1)	(THB)	21,000,000	21,252,000	22,876,000	65,128,000
Begin.FG.Inv	(unit)	204,650	201,500	195,900	602,050
End.FG.Inv	(unit)	201,500	195,900	206,100	603,500
FG.produced	(unit)	371,850	373,900	418,700	1,164,450
		16,361,400	16,451,600	18,422,800	51,235,800

purchased DM & used DM

			Jan	Feb	Mar	Total
FG.produced	P	(unit)	371,850	373,900	418,700	1,164,450
Begin.RM.Inv	$0.55 \times P_t$	(unit)	204,518	205,645	230,285	640,448
End.RM.Inv	$0.55 \times P_{t+1}$	(unit)	205,645	230,285	119,185	555,115
RM.purchases		(unit)	372,978	398,540	307,600	1,079,118
		(THB)	16,411,010	17,535,760	13,534,400	47,481,170
FG.Sale		(unit)	375,000	379,500	408,500	1,163,000
RM.used		(THB)	16,361,400	16,451,600	18,422,800	51,235,800

Regional Company Std labor and OH

		Jan	Feb	Mar	Total
std.labor per unit	(hr/unit)	0.834409	0.830115	0.856078	
hour rate	(THB/hr)	3.595359	3.613957	3.504352	
DL	(hr)	310,275	310,380	358,440	979,095
	(THB)	1,115,550	1,121,700	1,256,099	3,493,349
FOH_{fix}	8700 (THB/mth)	8700	8700	8700	26,100
FOH_{var}(DL)	1.12 (THB/hr)	347,508	347,626	401,453	1,096,586
SOH_{fix}	7600 (THB/mth)	7600	7600	7600	22,800
SOH_{var}(sale)	0.10%(THB)	21,000	21,252	22,876	65,128

Budgeted Cost of Goods Sold

	Jan	Feb	Mar	Total
Begin.FG.Inv	9,618,550	9,663,940	9,393,405	
RM.used	16,361,400	16,451,600	18,422,800	
DL	1,115,550	1,121,700	1,256,099	
FOH_{var}	347,510	347,626	401,453	
FOH_{fix}	8,700	8,700	8,700	
FG.producd	17,833,158	17,929,626	20,089,052	55,851,838
End.FG.Inv	9,663,940	9,393,405	9,888,678	
COGS	17,787,770	18,200,161	19,593,779	55,581,710

Budgeted Income Statement

	Jan	Feb	Mar	Total
Sale	21,000,000	21,252,000	22,876,000	65,128,000
CoGS	17,787,768	18,200,161	19,593,779	55,581,708
Oper.Profit	3,212,232	3,051,839	3,282,221	9,546,292
SOH_{var}	21,000	21,252	22,876	65,128
SOH_{fix}	7,600	7,600	7,600	22,800
Gross Profit	3,183,632	3,022,987	3,251,745	9,458,364
TAX (40%)	1,273,453	1,209,195	1,300,698	3,783,346
Net Profit	1,910,179	1,813,792	1,951,047	5,675,019

Budgeted Cash Flow statement

	Jan	Feb	Mar
Begin Cash	500,000	2,319,779	3,324,592
Sale	21,000,000	21,252,000	22,876,000
Total CashIn	21,500,000	23,571,799	26,200,592
RM.purchased	16,410,988	17,535,760	13,534,664
DL	1,115,550	1,121,700	1,256,099
FOH_{var}	347,510	347,626	401,453
FOH^{α}_{fix}	6,200	6,200	6,200
SOH^{β}_{var}	18,900	19,127	20,588
SOH_{fix}	7,600	7,600	7,600
TAX	1,273,453	1,209,195	1,300,698
Total CashOut	19,180,201	20,247,207	16,527,302
Difference	2,319,799	3,324,592	9,673,289

α = subtracted 2,500 from depreciation

β = subtracted lose sale 0.1%

RECAP: Financial statement

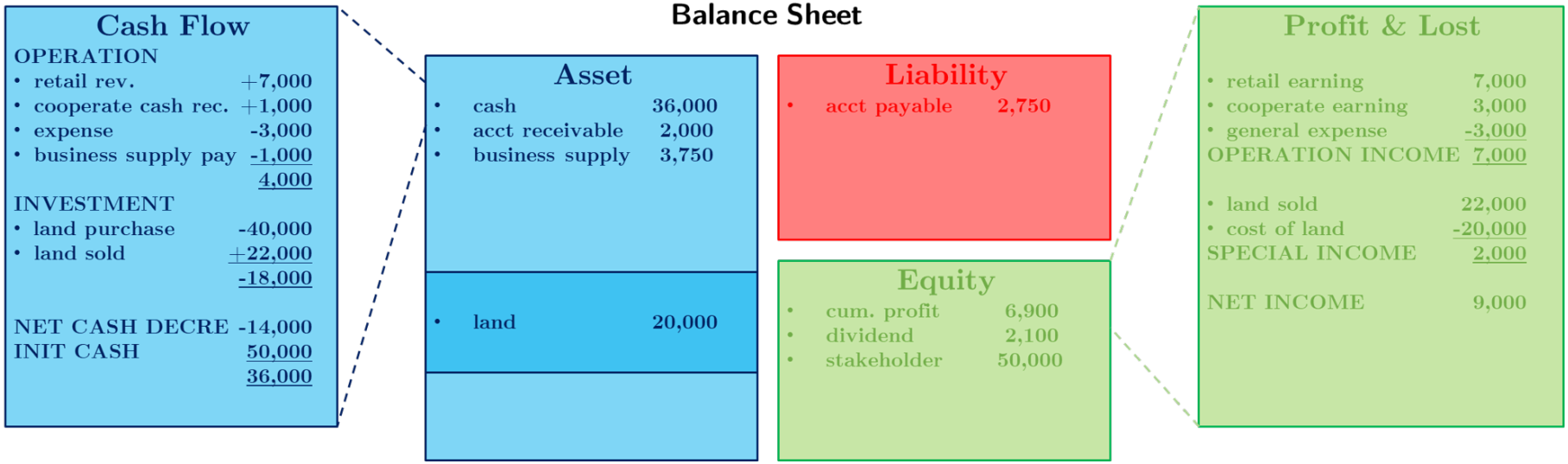
Basic concept

- **Conservative measurement:** business activities with conservative → money, no quantity
- **Dual aspect:** every transaction → gain & lose of benefit
- **Full Disclosure Principle:** all relevant information must be noted → footnote

$$\text{Asset} = \text{Equity} + \text{Liability}$$

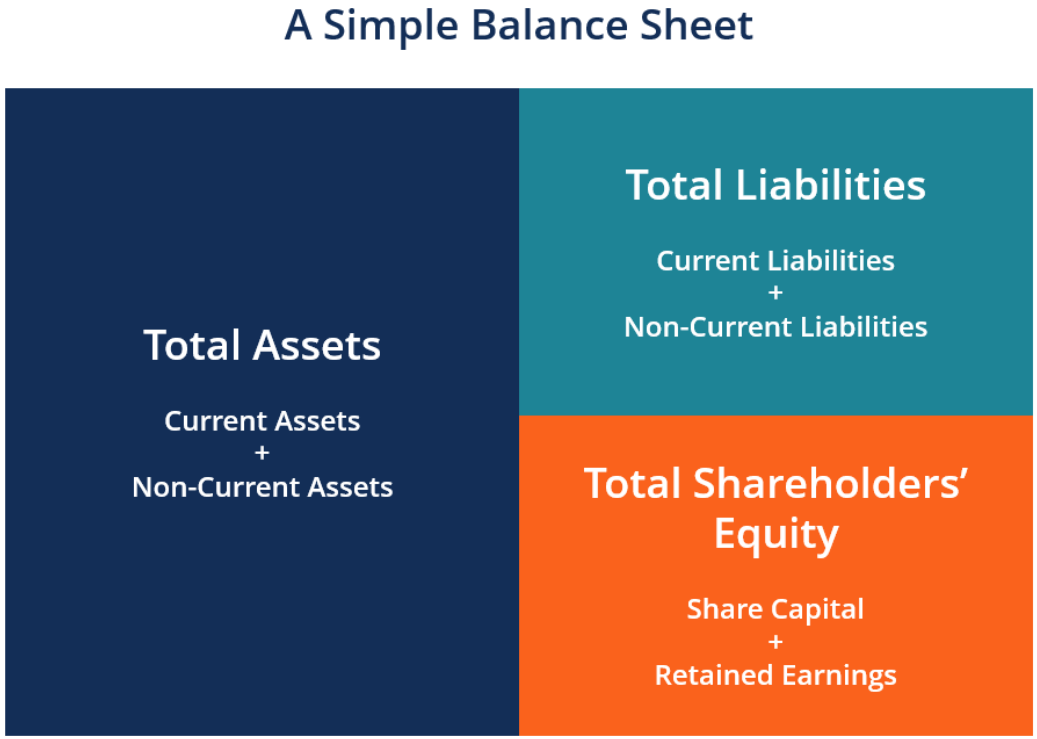
- **Asset:** What you own, e.g., cash, IOU, RM, FG, land, machine, building
- **Equity:** What you stake, e.g., profit/lost, stock share
- **Liability:** What you borrow, e.g., bank loan, bond, credit card

Three basic financial statements



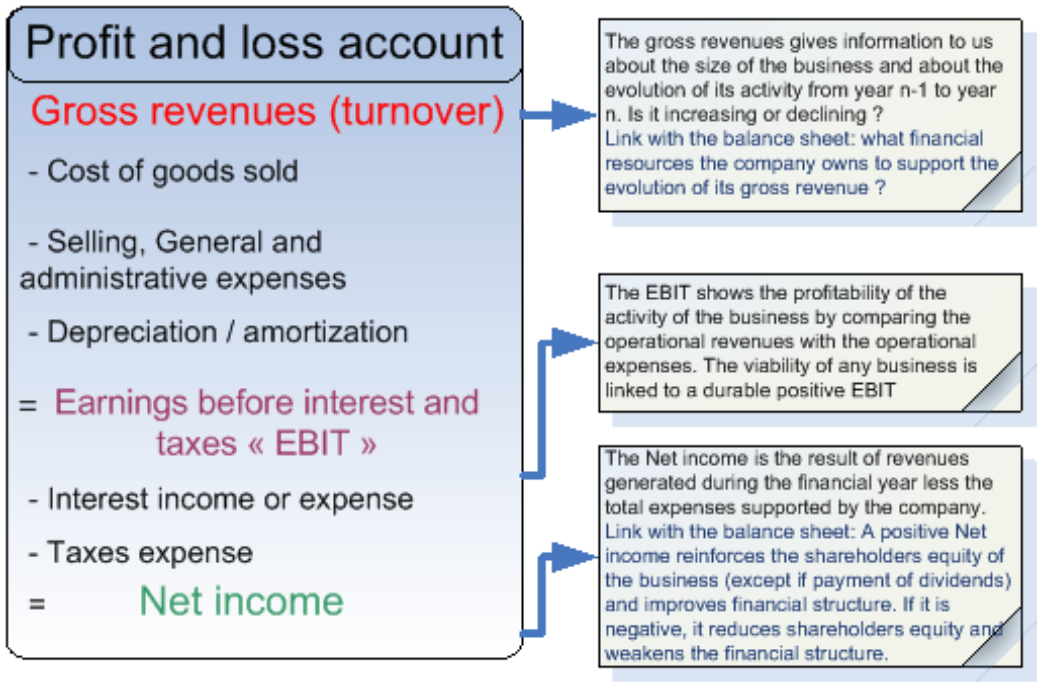
- **Balance Sheet (BS):** snap short of assets → form & quantity
- **Profit & Loss (P&L):** revenue in core business + depreciation → margin
- **Cash Flow (SC):** activities of cash and taxes → liquidity of business

Balance Sheet



- **Current:** can liquidated within 1 year, i.e., cash, inventory, listed cooperate share
- **Non-Current:** cannot liquidated within 1 year, i.e. building, land, bond
- **Fixed Asset:** larger category of non-current asset, including intangible,

Profit and Loss/ Income Statement



- **Gross Profit:** profit before considering admin, market, general
- **Operating Profit:** profit after considering admin, market, general
- **EBITDA:** profits before considering investment, tax, depreciation, amortization
- **Net Profit:** after pay for everything → equality (BS)

Statement of Cash flow

For the *Four Months* Ended April 30, 2017

Operating Activities	
Net income	$ 300
Increase in inventory	(200)
Increase in supplies	(150)
Increase in Accounts payable	150
Cash provided (used) in operating activities	100
Investing Activities	0
Financing Activities	
Investment by owner	2,000
Net increase in cash	2,100
Cash at the beginning of the month	0
Cash at April 30, 2017	$2,100

- **Operation:** cash in/out from main operation activity
- **Investment:** cash in/out from investment and special activity
- **Financial:** cash in/out from bank, including dividend

Notes on Financial Statements

- **Require all, equally important:** each statement has its own purpose.
- **Aware of practice:** special revenue/expense, inventory at cost/market, deprecation
- **understand business:** compare with similar business, ratio analysis

Where to look?

- **Validation:** over-valuation, non-current asset, unusual inventory
- **Benchmark:** industry- or company- comparison
- **Collect-ability:** debt & credit collectable? $\rightarrow$ low margin
- **Ratio Analysis:** ROA,

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