Chapter 12

Responsibility Centres *and* Transfer Pricing

Learning Objectives

1. Explain the role of responsibility accounting in fostering goal congruence. √
2. Define and give an example of a Cost centre, a Revenue centre, a Profit centre, and an Investment centre. Evaluation of each centre.
3. Compute an investment centre's return on investment (ROI), residual income (RI), and economic value added (EVA).
4. Explain how a manager can improve ROI.

Learning Objectives (cont'd)

5. Describe some advantages and disadvantages of both ROI and residual income as divisional performance measures.
6. Explain how to measure a division's income and invested capital.
7. Use the General Economic rule to set an optimal transfer price.
8. Explain how to base a transfer price on 1. Market Prices, 2. costs, or 3. negotiations.

Ch. 12 part I **Responsibility Accounting**

Accounting is also structured to measure the performance of people and/or departments to foster Goal Congruence.

A Responsibility centre is a sub-unit in an organization whose manager is held accountable for specified financial results.

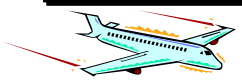
Goal Congruence

Responsibility Centres (cont'd)

Cost Centre
Segment has control over the incurrence of costs.

The Paint Department in an automobile plant.

Revenue Centre
Segment is responsible for the revenue of a unit because of control.



The Reservations Department of an airline.

Responsibility Centres (cont'd)

Profit Centre
Segment has control over both costs and revenues.

Company-owned restaurant in a fast-food chain.

Investment Centre
Segment has control over profits and invested capital.

A division of a large corporation.

Performance [aka Variance] Reports

he budgeted and
amounts, and the
es between these
s, of key financial
ppropriate for the
of responsibility
centre.

	Flexible Budget*		Actual Results*		Variance†	
	February	Year to Date	February	Year to Date	February	Year to Date
Company	$30,660	$64,567	$30,716	$64,570	$56 F	$ 3 F
Maui Division	$18,400	$38,620	$18,470	$38,630	$70 F	$10 F
Oahu Division	12,260	25,947	12,246	25,940	14 U	7 U
Total profit	$30,660	$64,567	$30,716	$64,570	$56 F	$ 3 F
Oahu Division						
Waimea Beach Resort	$6,050	$12,700	$6,060	$12,740	$10 F	$40 F
Diamond Head Lodge	2,100	4,500	2,050	4,430	50 U	70 U
Waikiki Sands Hotel	4,110	8,747	4,136	8,770	26 F	23 F
Total profit	$12,260	$25,947	$12,246	$25,940	$14 U	$ 7 U
Waikiki Sands Hotel						
Grounds and Maintenance	($45)	($90)	($44)	($90)	$ 1 F	—
Housekeeping and Custodial	(40)	(90)	(41)	(90)	1 U	—
Recreational Services	40	85	41	88	1 F	$ 3 F
Hospitality	2,800	6,000	2,840	6,030	40 F	30 F
Food and Beverage	1,355	2,842	1,340	2,832	15 F	10 U
Total profit	$4,110	$8,747	$4,136	$8,770	$26 F	$23 F
Food and Beverage Department						
Banquets and Catering	$600	$1,260	$605	$1,265	$ 5 F	$ 5 F
Restaurants	1,785	3,750	1,760	3,740	25 U	10 U
Kitchen	(1,030)	(2,168)	(1,025)	(2,173)	5 F	5 U
Total profit	$1,355	$2,842	$1,340	$2,832	$15 U	$10 U
Kitchen						
Kitchen staff wages	($80)	($168)	($78)	($169)	$ 2 F	$ 1 U
Food	(675)	(1,420)	(678)	(1,421)	3 U	1 U
Paper products	(120)	(250)	(115)	(248)	5 F	2 F
Variable overhead	(70)	(150)	(71)	(154)	1 U	4 U
Fixed overhead	(85)	(180)	(83)	(181)	2 F	1 U
Total expense	($1,030)	($2,168)	($1,025)	($2,173)	$ 5 F	$ 5 U

*Numbers without parentheses denote profit; numbers with parentheses denote expenses; numbers in thousands.
†F denotes favorable variance; U denotes unfavorable variance.

Measuring Performance in Investment Centres

Investment Centre managers make decisions that affect both profit and invested capital.

Corporate Headquarters

Investment/Profit Centre Evaluation →
1. Return on investment,
2. Residual income, or
3. ~~Economic value added~~

Return on Investment (ROI)

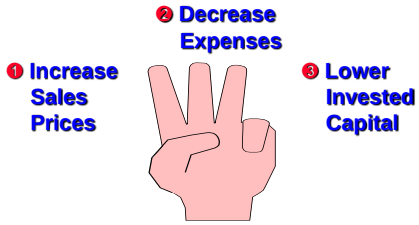
$$ROI = \frac{\text{Income}}{\text{Invested Capital}}$$

$$ROI = \frac{\text{Income}}{\text{Sales Revenue}} \times \frac{\text{Sales Revenue}}{\text{Invested Capital}}$$

Sales Margin

Capital Turnover

Improving ROI



Three ways to improve ROI

ROI Advantages and Disadvantages

- ROI measures return in a percentage form rather than in absolute dollars, which is helpful when comparing segments of different sizes. *Why?*
- A drawback to using ROI is the potential of decreased goal congruence. *How??*

Residual Income

Investment centre profit
– Investment charge
= Residual income

Investment capital
× Imputed interest rate
= Investment charge

Investment centre's minimum required rate of return

Residual Income Advantages and Disadvantages

- As long as the residual income of a project is a positive amount, the project is deemed attractive because it increases a manager's income pool. Thus, any project that returns more than the corporate min. return will be accepted in accordance with top management's desire.
- Since residual income is expressed in absolute dollar terms, *an analyst* forfeits the ability to compare firms/divisions of differing sizes on a common basis.

In Summary

Both ROI and residual income are useful, but both tools have drawbacks. Therefore, companies will use a combination of ROI and residual income (as well as other measures) to evaluate performance.

Issues: Measuring Investment Capital

3 Issues must be considered before we can properly measure the investment capital:

First: what assets should be included?

1. Total assets.
2. Total productive assets.
3. Only the assets controllable by the manager being evaluated.

Second : Should we use beginning or ending values?

Third Issue: Should the assets be shown at historical or current cost?

Measuring Investment Centre Income

Division managers should be evaluated on profit margin they control.

– Exclude these costs:

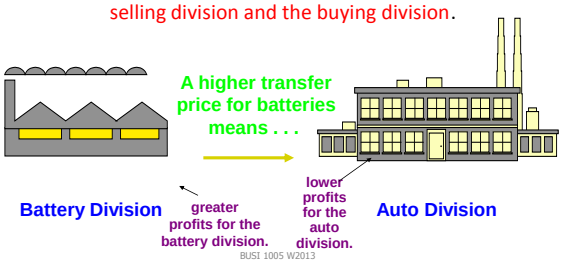
- Costs traceable to the division but not controlled by the division manager.
- Common costs incurred elsewhere and allocated to the division. *BSC*

The key Controllability.

CH. 12 Part II

Transfer Pricing

The transfer price affects the profit measure for both the selling division and the buying division.



Goal Congruence!

The ideal transfer price allows each division manager to make decisions that maximize the company's profit, while attempting to maximize his/her own division's profit. **This is the GOAL**

General-Transfer-Pricing Rule

Transfer price	=	Additional outlay cost per unit incurred because goods are transferred	+	Opportunity cost per unit to the organization because of the transfer

Scenario I: No Excess Capacity

- The Battery Division makes a standard 12-volt battery.

Production capacity	300,000 units
Selling price per battery	$40 (to outsiders)
Variable costs per battery	$18
Fixed costs per battery	$7 (at 300,000 units)

- The Battery division is currently selling 300,000 batteries to outsiders at $40. The Auto Division can use 100,000 of these batteries in its X-7 model.

What is the appropriate transfer price?

Scenario I: No Excess Capacity (cont'd)

Transfer price	=	Additional outlay cost per unit incurred because goods are transferred	+	Opportunity cost per unit to the organization because of the transfer
Transfer price	=	$18 variable cost per battery	+	$22 Contribution lost if outside sales given up
Transfer price	=	$40 per battery		

Scenario I: No Excess Capacity (cont'd)

Auto division can purchase 100,000 batteries from an outside supplier for less than $40.

Auto division can purchase 100,000 batteries from an outside supplier for more than $40.

Transfer will not occur.

$40 transfer price

Transfer will occur.

Scenario I: No Excess Capacity (cont'd)

Rule of Thumb:

When the selling division is operating at capacity, the transfer price should be set at the market price.

Q. What if mktg. costs are less if sold internally ?

Scenario II: Excess Capacity

- The Battery Division makes a standard 12-volt battery.

Production capacity	300,000 units
Selling price per battery	$40 (to outsiders)
Variable costs per battery	$18
Fixed costs per battery	$7 (at 300,000 units)

- The Battery division is currently selling 150,000 batteries to outsiders at $40. The Auto Division can use 100,000 of these batteries in its X-7 model. It can purchase them for $38 from an outside supplier.

What is the appropriate transfer price?

Scenario II: Excess Capacity

Transfer price	=	Additional outlay cost per unit incurred because goods are transferred	+	Opportunity cost per unit to the organization because of the transfer
Transfer price	=	$18 variable cost per battery	+	$0
Transfer price	=	$18 per battery		

Optimal TP is lower

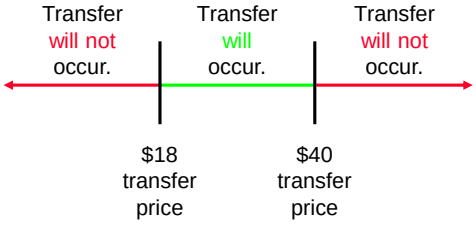
Scenario II: Excess Capacity

Rule:

When the selling division is operating below capacity, the minimum transfer price is the variable cost per unit.

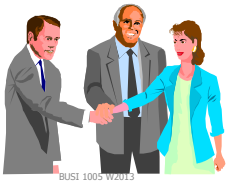
So, the transfer price will be no lower than $18, and no higher than $40.

Scenario II: Excess Capacity



Setting Transfer Prices

The value placed on transfer goods is used to make it possible to transfer goods between divisions while allowing them to retain their autonomy. What is autonomy?



Setting Transfer Prices

Conflicts may be resolved by . . .

1. Direct intervention by top management.
2. Centrally established transfer price policies.
3. Negotiated transfer prices.
4. Market based pricing

Setting Transfer Prices (cont'd)

Top management may become swamped with pricing disputes causing division managers to lose autonomy.

Undermining Divisional Autonomy

Transfer prices are used in a decentralized environment where managers have authority to make decisions and control operations. When disputes arise, top management should step aside and let the division managers resolve the issues. Intervention would decrease the divisional autonomy. However, sometimes upper mgmt. steps in. When?

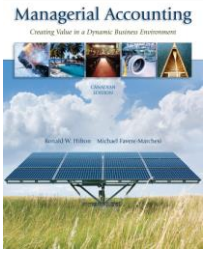
An International Perspective

Since tax rates and import duties are different in different countries, companies have incentives to set transfer prices that will:

1. Increase revenues in low-tax countries.
2. Increase costs in high-tax countries.
3. Reduce cost of goods transferred to high-import-duty countries.

WE COVER INTENATIONAL TRANSFER PRICING IN BUSI 3008.

Chapter 13

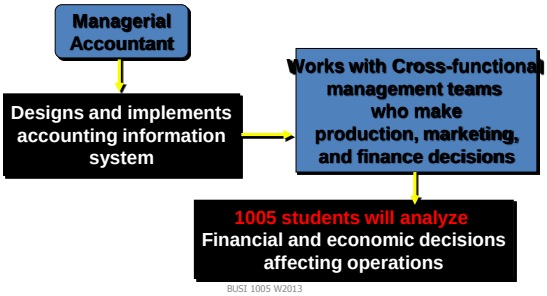


Decision Making: Relevant Costs and Benefits

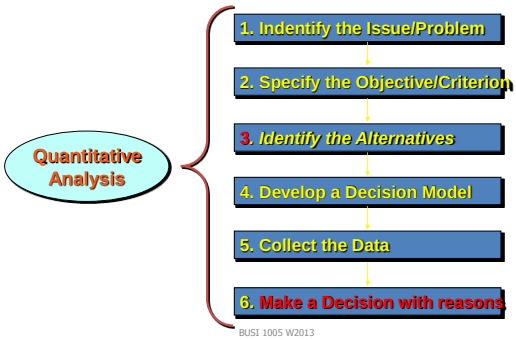
Learning Objectives

1. Identify relevant costs and benefits, giving proper treatment to sunk costs, opportunity costs, and unit costs.
2. Prepare analyses of various special decisions: Keep or replace equipment, special order, make or Buy -properly identifying the relevant costs and benefits.
3. Analyze manufacturing decisions involving joint products and limited resources.

The Managerial Accountant's Role in Decision Making



The Decision-Making Process (CTI)



Relevant Information

Information is relevant to a *decision* problem when . . .

1. It has a bearing on the future, &
2. It differs among competing alternatives.

Opportunity cost:
is the cost of a forgone alternative.
These costs are relevant in the decision-making process.

Sunk costs
Costs that have already been incurred. They do not affect any future cost and cannot be changed by any current or future action.

Sunk costs are not relevant to decisions

Relevant Costs

Worldwide Airways is thinking about replacing a three year old loader with a new, more efficient loader.

New loader	
List price	$ 15,000
Annual operating expenses	45,000
Expected life in years	1
Old loader	
Original cost	$100,000
Remaining book value	25,000
Disposal value now	5,000
Annual variable expenses	80,000
Remaining life in years	1

Relevant Costs (cont'd)

If we keep the old loader, we will have depreciation costs of $25,000. If we replace the old loader, we will write-off the $25,000 when sold. There is no difference in the cost, so it is not relevant.

The $5,000 proceeds will only be realized if we replace the old loader. This amount is relevant.

3 Columns Relevant Costs (cont'd)

	Keep Old Loader	Replace Old Loader	Differential Cost to keep
Depreciation of old loader			
Write-off of old loader			$ -
Proceeds from sale of old loader		(5,000)	5,000
Cost of new loader		15,000	(15,000)
Operating costs	80,000	45,000	35,000
Total costs	$ 80,000	$ 55,000	$ 25,000

operating costs, cost of new loader, and sale of old loader
Are relevant
Decision here would be to replace old loader, given the info.

1 column Relevant Costs (cont'd)

Here is an analysis that includes only relevant Incremental/differential costs: Note the answer is the same as previous slide

Incremental Benefit to replace	
Disposal value of old loader	5,000
Cost of the new loader	(15,000)
Savings in V. exp.from new loader	$ 35,000
Net effect	$ 25,000

Accept or Reject a Special Order

- A travel agency offers Worldwide Airways ***$150,000*** for a round-trip flight from Hawaii to Japan on a jumbo jet.
- Worldwide usually gets ***$250,000*** in revenue from this flight.
- The airline is not currently planning to add any new routes and has two planes that are idle and could be used to meet the needs of the agency.
- The next screen shows cost data developed by managerial accountants at Worldwide.

Accept or Reject a Special Order: data

Typical Flight Between Japan and Hawaii		
Revenue:		
Passenger	$ 250,000	
Cargo	30,000	
Total		$ 280,000
Expenses:		
Variable expenses	90,000	
Allocated fixed expense	100,000	
Total		190,000
Profit		$ 90,000

Worldwide will save about $5,000 in reservation and ticketing costs if the charter is accepted.

Accept or Reject a Special Order: Incremental column only

Assumes excess capacity		
Special price for charter		$150,000
Variable cost per flight	$90,000	
Reservation cost savings	(5,000)	
Variable cost of charter		85,000
Contribution from charter		$ 65,000

Since the charter will contribute to fixed costs and Worldwide has idle capacity, the company should accept the flight.

Accept or Reject a Special Order (cont'd)

What if Worldwide had no excess capacity? If Worldwide adds the charter, it will have to cut its *least profitable* route that currently contributes $80,000 to fixed costs and profits. Should Worldwide still accept the charter?

Accept or Reject a Special Order: Incremental column only

Assumes no excess capacity		
Special price for charter		$ 150,000
Variable cost per flight	$ 90,000	
Reservation cost savings	(5,000)	
Variable cost of charter	85,000	
Opportunity cost:		
Lost contribution on route	80,000	165,000
Total		$ (15,000)

Worldwide has no excess capacity, so it should reject the special charter.

Accept or Reject a Special Order (cont'd)

With excess capacity . . .

- Relevant costs will usually be the variable costs associated with the special order.

Without excess capacity . . .

- Same as above, but opportunity cost of using the firm's facilities for the special order are also relevant.

Make-or-Buy Decision

Outsource a Product or Service

- An Ontario bakery has offered to supply the in-flight desserts for 21¢ each.
- Here are Worldwide's current cost for in flight desserts:

Variable costs:	
Direct material	$ 0.06
Direct labour	0.04
Variable overhead	0.04
Fixed costs:	
Supervisory salaries	0.04
Depreciation of equipment	0.07
Total cost per dessert	$ 0.25

Outsource a Product or Service (cont'd)

Not all of the allocated fixed costs will be saved if Worldwide purchases from the outside bakery.

	Current Cost/ Dessert	Cost of Outsourcing	Incremental Savings from Out.
Variable costs:			
Direct material	$ 0.06	-	$ 0.06
Direct labour	0.04	-	0.04
Variable overhead	0.04	-	0.04
Fixed costs:			
Supervisory salaries	0.04	0.03	0.01
Equipment depreciation	0.07	0.07	-
Price to outsource		0.21	(0.21)
Total cost per dessert	$ 0.25	$ 0.31	$ (0.06)

Outsource a Product or Service (cont'd)

If Worldwide purchases the dessert for 21¢, it will only save 15¢ so Worldwide will have a loss of 6¢ per dessert purchased.

Ch. 13 part II **Learning Objectives**

1. Keep or drop a business segment, subsidiary, division etc.

2. Analyze manufacturing decisions involving joint products and limited resources.

3. Decisions Involving Limited Resources

Add or Drop a Product

Worldwide Airways offers its passengers the opportunity to join its World Express Club. Club membership entitles a traveler to use the club facilities at the airport in Toronto.

Club privileges include a private lounge and restaurant, discounts on meals and beverages, and use of a small health spa.

Add or Drop a Product (cont'd)

Sales		$200,000
Less: Variable Costs:		
Food/Beverage	$70,000	
Personnel	40,000	
Variable overhead	25,000	(135,000)
Contribution Margin		65,000
Less: Fixed Costs:		
Depreciation	$30,000	
Supervisor salary	20,000	
Insurance	10,000	
Airport fees	5,000	
Allocated overhead	10,000	(75,000)
Loss		$ (10,000)

If the spa is dropped depreciation, insurance, and allocated overhead remain

3 column: Add or Drop a Product (cont'd)

	KEEP CLUB	ELIMINATE	DIFFERENTIAL
Sales	$200,000	0	$200,000
Food/Beverage	(70,000)	0	(70,000)
Personnel	(40,000)	0	(40,000)
Variable overhead	(25,000)	0	(25,000)
Contribution Margin	65,000	0	65,000
Depreciation	(30,000)	(30,000)	0
Supervisor salary	(20,000)	0	(20,000)
Insurance	(10,000)	(10,000)	0
Airport fees	(5,000)	0	(5,000)
Allocated overhead	(10,000)	(10,000)	0
Loss	$ (10,000)	$(50,000)	$ 40,000

Add or Drop a Product (cont'd)

	KEEP CLUB	ELIMINATE	DIFFERENTIAL
Sales	$200,000	0	$200,000
Food/Beverage	(70,000)	0	(70,000)
Personnel	(40,000)	0	(40,000)
Variable overhead	(25,000)	0	(25,000)
Contribution Margin	65,000	0	65,000
Depreciation	(30,000)	(30,000)	0
Supervisor salary	(20,000)	0	(20,000)
Insurance	(10,000)	(10,000)	0
Airport fees	(5,000)	0	(5,000)
Allocated overhead	(10,000)	(10,000)	0
Loss	(10,000)	(50,000)	40,000

NOT AVOIDABLE

AVOIDABLE

The positive $40,000 differential amount reflects the fact that the company is $40,000 better off by keeping the club.

Add or Drop a Product (cont'd)

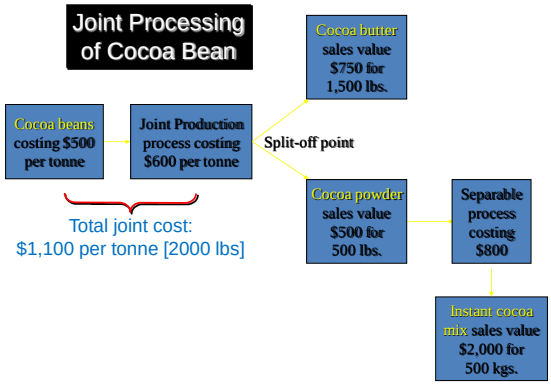
	KEEP CLUB	ELIMINATE	DIFFERENTIAL
Sales	$200,000	0	$200,000
Food/Beverage	(70,000)	0	(70,000)
Personnel	(40,000)	0	(40,000)
Variable overhead	(25,000)	0	(25,000)
Contribution Margin	65,000	0	65,000
Avoidable fixed costs			
Supervisor salary	(20,000)	0	(20,000)
Airport fees	(5,000)	0	(5,000)
Profit/Loss	$ 40,000		$ 40,000

Worldwide airlines would also lose the contribution margin of $65,000. However, would save the avoidable fixed costs. Still it is better to keep club by $40,000.

More Decisions in Manufacturing Firms

Joint Products:
Sell or Process Further

A joint production process resulting in two or more products. The point in the production process where the joint products are identifiable as separate products is called the split-off point.



Joint Products

Relative Sales Value Method

Joint Costs	Joint Products	Sales Value at Split-Off	Relative Proportion	Allocation of Joint Costs
$ 1,100	Cocoa Butter	$ 750	60%	$ 660
	Cocoa Powder	500	40%	440
		$ 1,250	100%	$ 1,100

$750 ÷ $1,250 = 60%

60% × $1,100 = $660

Joint Products (cont'd)

- Cocoa butter is sold at the end of the joint processing.
- Cocoa powder may be sold now or processed into instant cocoa mix. Further processing costs of $800 will be incurred if the company elects to make instant cocoa mix.

Joint Products (cont'd)

Process Further		
Sales value of instant cocoa mix	$	2,000
Sales value of cocoa powder		(500)
Incremental revenue	$	1,500
Less: separable processing costs		(800)
Net benefit of further processing	$	700

The cocoa powder should be processed into instant cocoa mix.

Decisions Involving Limited Resources

Martin, Inc. produces two products and selected data is shown below:

	Products	
	Webs	Highs
Selling price per unit	$ 60	$ 50
Less: variable expenses per unit	36	35
Contribution margin per unit	$ 24	$ 15
Current demand per week (units)	2,000	2,200
Contribution margin ratio	40%	30%
Processing time required on the lathe per unit	1.00 min.	0.50 min.

Decisions Involving Limited Resources (cont'd)

- The lathe is the scarce resource. The lathe is being used at 100% of its capacity.
- The lathe capacity is 2,400 minutes per week.

Should Martin focus its efforts on Webs or Highs?

Decisions Involving Limited Resources (cont'd)

Let's calculate the contribution margin per unit of the scarce resource, the lathe.

		Products			
		Webs		Highs	
Contribution margin per unit		$ 24		$ 15	
Time required to produce one unit	÷	1.00	min. ÷	0.50	min.
Contribution margin per minute		$ 24	min.	$ 30	min.

Highs should be emphasized. It is the more valuable use of the scarce resource, the lathe, yielding a contribution margin of $30 per minute as opposed to $24 per minute for the Webs. If there are no other considerations, the best plan would be to produce to meet current demand for Highs and then use remaining capacity to make Webs.√

Decisions Involving Limited Resources (cont'd)

Let's see how this plan would work.

Allotting the Scarce Resource – The Lathe

Weekly demand for Highs	2,200 units
Time required per unit	x .50 minutes
Time required to make Highs	1,100 minutes
Total lathe time available	2,400 minutes
Time used to produce Highs	1,100 minutes
Time available for Webs	1,300 minutes
Time required per unit	x 1.00 minute
Production of Webs	1,300 units

Decisions Involving Limited Resources (cont'd)

According to the plan, Martin will produce 2,200 Highs and 1,300 Webs. Martin's contribution margin looks like this:

	Webs	Highs
Production and sales (units)	1,300	2,200
Contribution margin per unit	$ 24	$ 15
Total contribution margin	$ 31,200	$ 33,000

The total contribution margin for Martin, Inc. is $64,200. Any other combination would result in less contribution.

Ch 15 - Capital Investments (L/T)*

Calculating Present Values

- the issue: comparing cash flows today with cash flows in the future
- the solution: bring all cash flows to the same point in time, i.e. today, t=0

Present Values- 1 cash flow

- you expect to receive $100,000 in 20 years time, how much is this worth today[i.e., now] at 8%?

  FV = $100,000

  i = 8

  n = 20

  Solve for PV

Present Value of an Annuity

multiple cash flows

- you just won the cash for life lottery, it will pay you $75,000 per year for the next 45 years. How much is it worth now if the interest rate is 6%?

  PMT = 75000

  i = 6

  n = 45

  Solve for PV

Net present value

- discount all future cash flows at the company's required rate of return **(always given)** and compare to the initial cash outflow
  - net present value (NPV)= - Initial Investment + PV of future cash flows
  - If NPV > 0, the projects adds value and should be accepted
  - If NPV < 0, the project does not return the required rate of return and **should be rejected**
- working capital investments: treat as cash *outflows* when investment is made, cash inflows when recovered (usually cash inflows at the end of a project)

PROS

Gives an absolute $ amount to compare to other investments

Easy to use

Easy to adjust for risk of project

Used in practice