

BU111 Exam-Aid Session Fall 2016

MIKE HEJMEJ & MICHAEL BLAIR





What is JDCC?



Annual undergraduate business competition between 14 universities in Central Canada

Universities compete in:

- Academic (8 teams), Debate, Sports, Social, Charity

Laurier has won School of the Year for the past 7 Years!

- Your donation today goes towards fueling win #8, thank you!





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id=0B4HCYHCswYdKVIhkMVBiSmZONIE](https://drive.google.com/open?id=0B4HCYHCswYdKVIhkMVBiSmZONIE)

NAMALDI, COSTA RICA



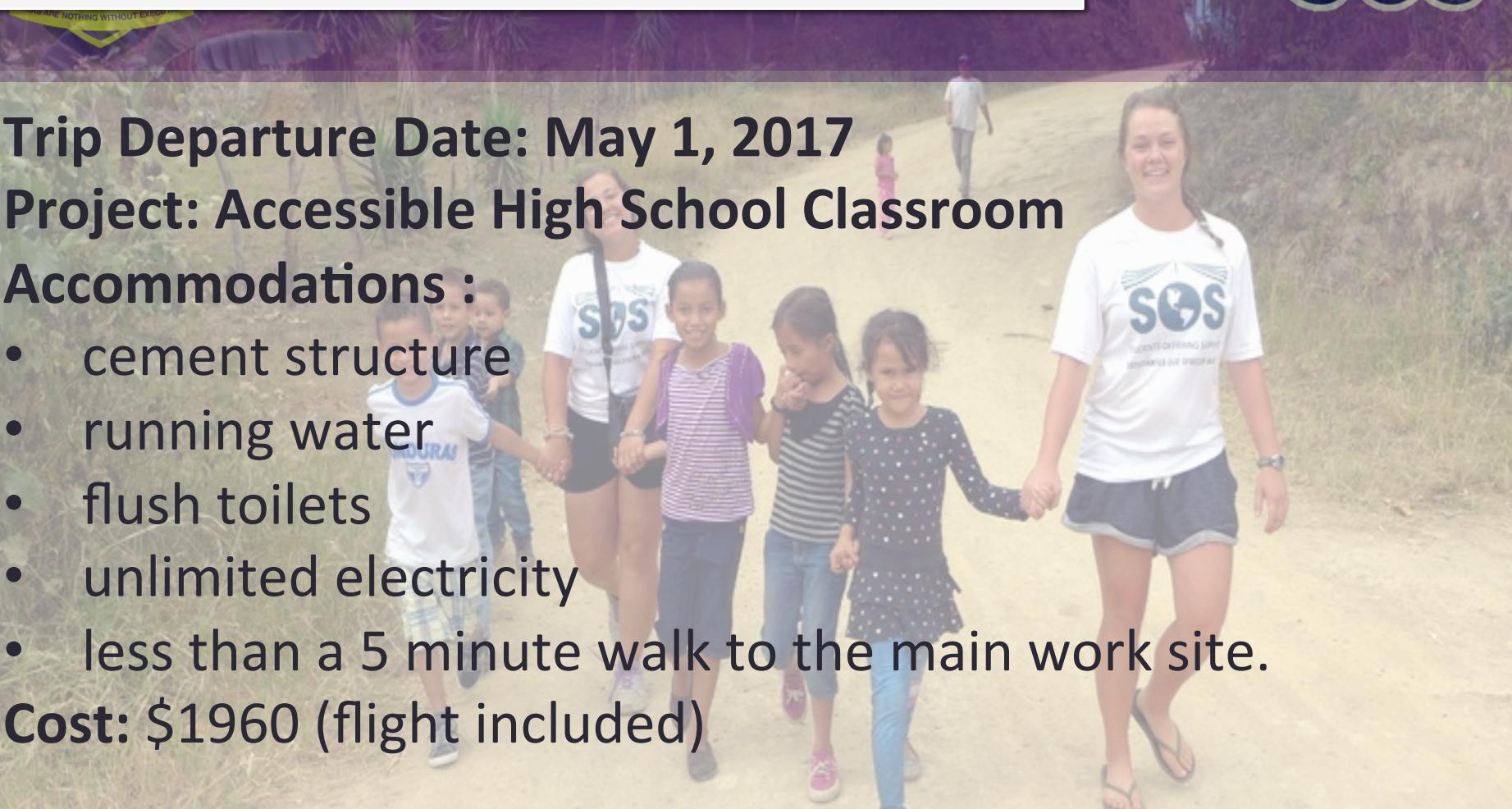
Trip Departure Date: May 1, 2017

Project: Accessible High School Classroom

Accommodations :

- cement structure
- running water
- flush toilets
- unlimited electricity
- less than a 5 minute walk to the main work site.

Cost: \$1960 (flight included)



BRISAS DE SAN LUIS, NICARAGUA

Trip Departure Date: August 16, 2017

Project: Elementary School Construction

Accommodations:

- cement structure
- running water
- flush toilets
- electricity.
- 30 minute drive away from the worksite with secure transport provided

Cost: \$1150 (+ flight)





CELEBRATE SURVIVING
WITH THE PERFECT TEE!

\$15

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Meet your tutors - Mike

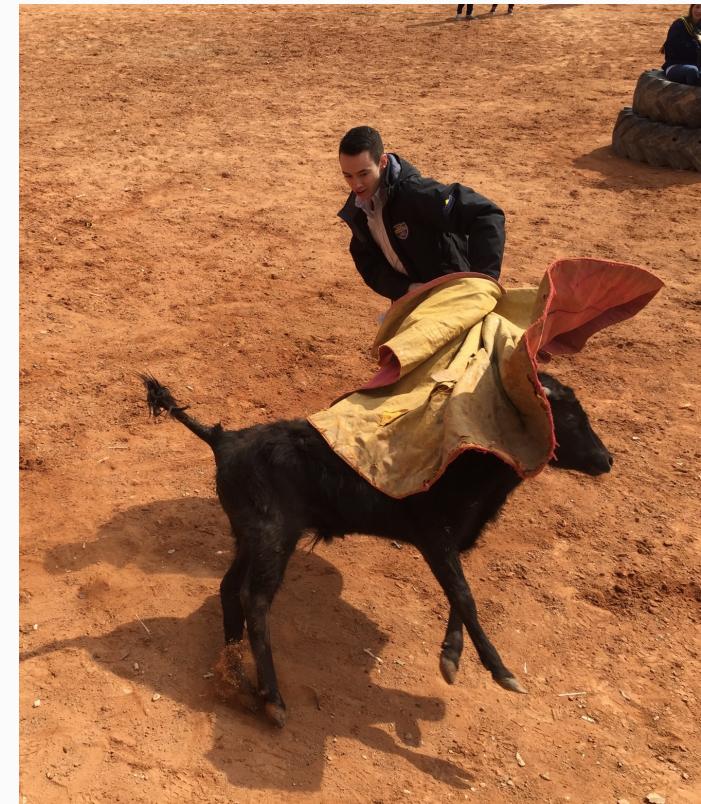
Program: 5th year BMath/BBA (UW/WLU)

Involvements:

- **Case Comps** – International Business Captain, Former Entrepreneurship Captain, Former Entre. Delegate, UNICC 2016 (Spain) delegate
- **TA** – BU111/121, MATH239

Career:

Hobbies: EDM producing, tennis, food





Meet your tutors - Michael

Program: BMath/BBA (UW/WLU) Alumnus

Involvements:

- **Case Comps** – JDCC Academic Captain, Former Strategy Captain, Former Strategy Delegate, UNICC 2016 (Spain) delegate
- **TA** – BU111/121/395/491 MATH 114/136/235/239

Career:



Hobbies: Taking names





Slides & Feedback



After the session, use your unique code to access all these slides.

Please take the 20 seconds to leave us some comments! It helps us put on better and better sessions. (**Like for BU121**)



Agenda

- Social Factors
 - Ethics
 - CSR
 - Managing Stakeholders
 - Demographics
- Political Factors
 - How Government Influences Businesses, vice versa
 - IP Rights
 - Types of Corporations
 - International Trade & Globalization
- Economic Factors
 - Going Long (Buy-Sell Transactions)
 - Margin Buying
 - Short Selling
 - Approx. Yield of Bonds
- Time Value of Money
 - Explanation of Concepts
 - Retirement
 - Car Leasing
 - Bond Pricing
- Technological Factors
 - Opportunities & Threats

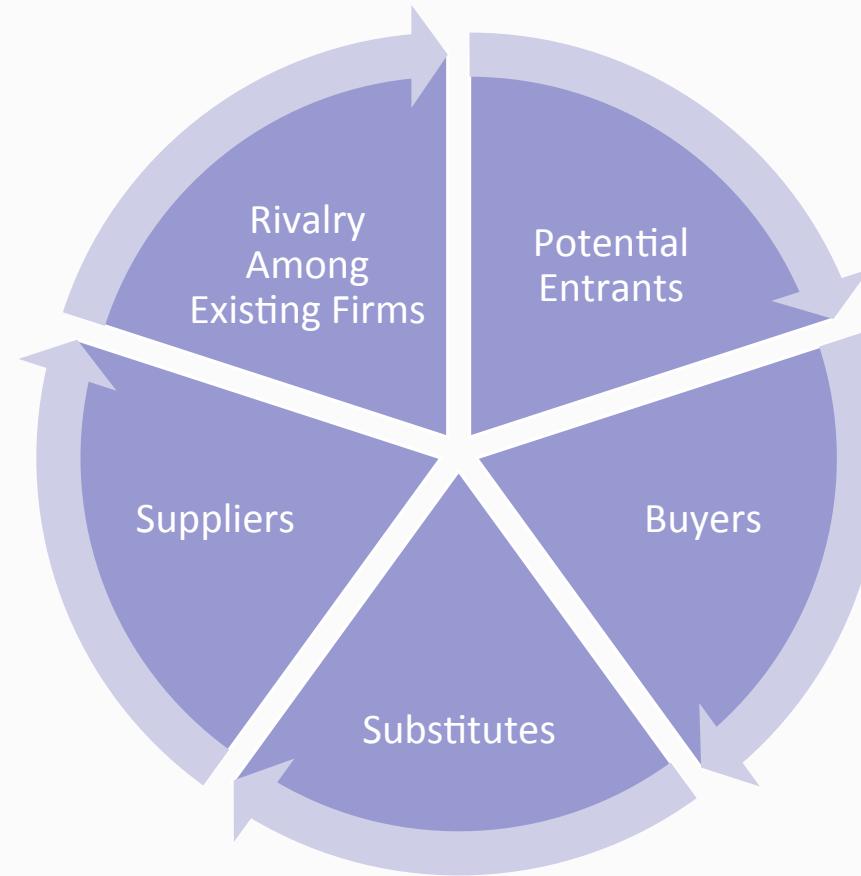


Recap: Critical Success Factors



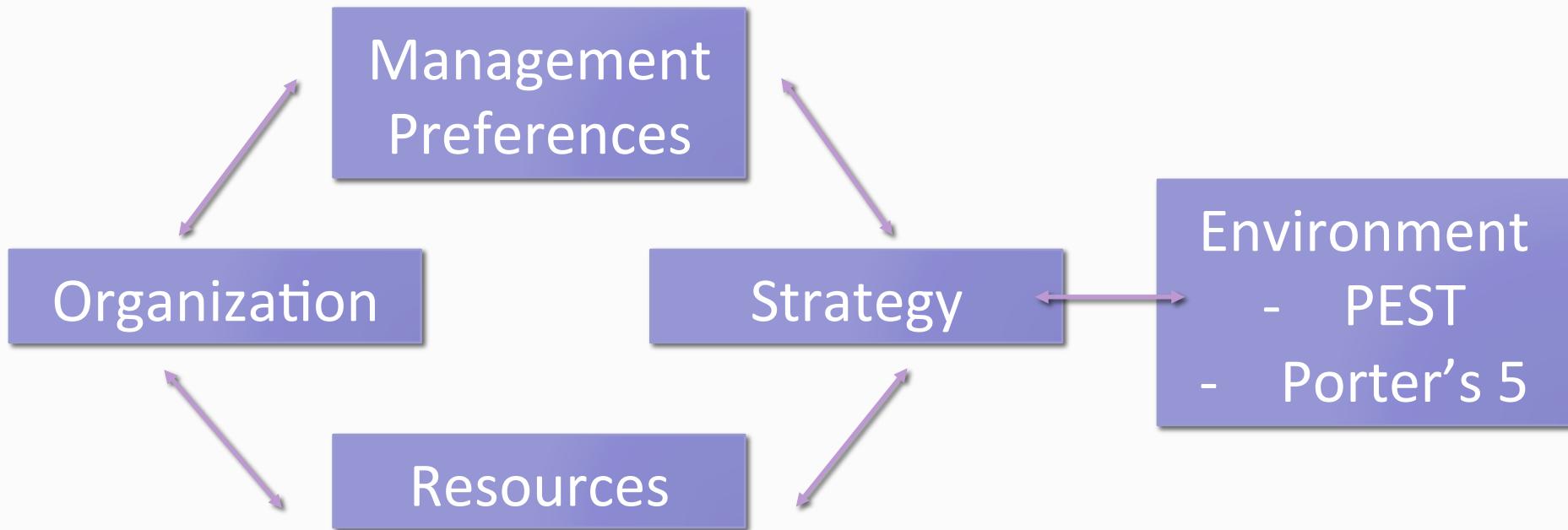


Recap: Porter's Five Forces





Recap: Diamond-E



Alignment needed for the strategy to be
a) possible and b) successful



Social Factors

Social Factors

Political Factors

Economic
Factors

Time Value of \$

Technology
Factors

14



Ethics & Its Importance

Ethics

- The beliefs an individual has about what is right and wrong
- Ex. I believe it is wrong to sell drugs in residence

Business Ethics

- Standards that managers hold and guide managers in their work
- Influenced based upon individual ethics
- Ex. My RLAC believes it is wrong to sell drugs in residence

Corporate Social Responsibility

- The responsibility that organizations have to all stakeholders
- Ex. Laurier has a responsibility to its students and to the city of Waterloo to not let people sell drugs in residence

Social Factors

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Factors

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Factors



What is an ethical dilemma?

A complex ethical situation

- Not black and white, not right and wrong but everywhere in between

Managers must determine how to approach these situations

“Ethics is knowing the difference between what you have a right to do and what is right to do.”

- Potter Stewart, American Judge



Four Approaches to CSR



Obstructionist Stance

- Do as little as possible, and work to do less



Defensive stance

- Doing only what you're required to do

Accommodative stance

- Going a bit above what you need to do, but only when asked

Proactive stance

- Looking for opportunities to incorporate CSR into a business's strategy



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Influencing Managerial Ethics



Set specific hiring criteria

Engage in managerial role modelling

Establish a code of ethics, mission statement or value system

Define and work to a specific organizational culture

Define specific goals rewards and evaluation metrics

Set up employee protection mechanisms





Influencing Managerial Ethics



Set specific hiring criteria

Engage in mandatory training

Establish a code of ethics

Define and reward ethical behavior

Define specific performance metrics

Set up employee protection measures

DIAMOND-E
MANAGERIAL
PREFERENCES



Value system

are

metrics



Why Bother With CSR?



Effective CSR can improve profitability



Promotes higher levels of operating efficiency



Improves trust and loyalty of customers and employees



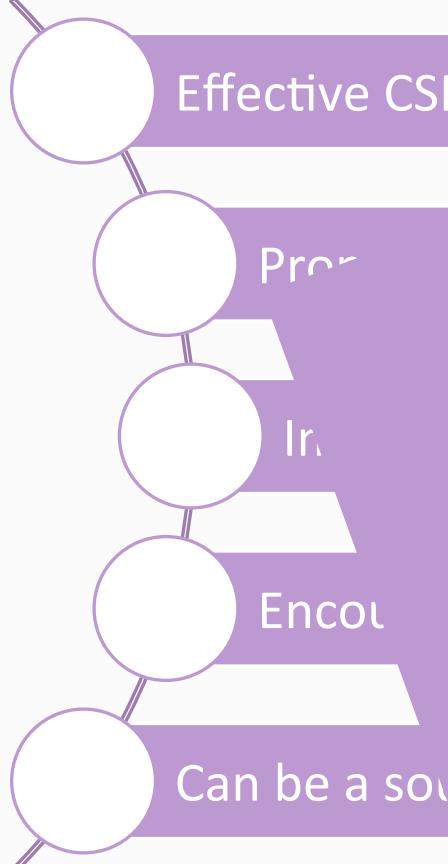
Encourages continuous improvement and innovation



Can be a source of distinctive competitive advantage



Why Bother With CSR?



**CRITICAL
SUCCESS
FACTORS**





Stakeholders



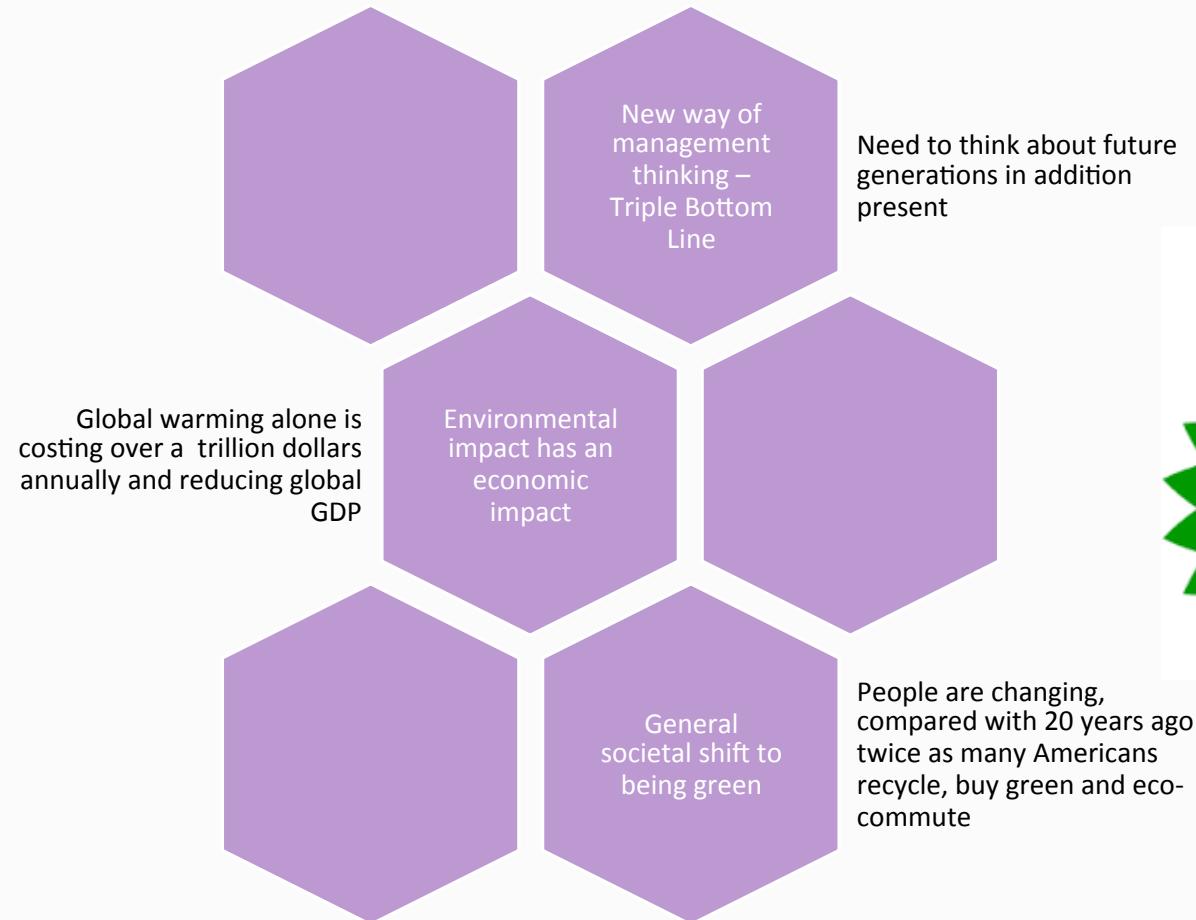
Those who are affected by an organization's activities

- Have varying (sometimes conflicting) views and degrees of importance.
- They allow the business to operate and must be “compensated” for that

Stakeholders could be:	Stakeholders have the expectations of:
<ul style="list-style-type: none">- Owners- Customers- Employees- Society- Environment	<ul style="list-style-type: none">- ROI/profit- Quality, choice etc- Fair pay, safe work- Concern for the community- Responsible stewardship



Why is there a responsibility towards the environment?





Why is there a responsibility towards society?



Minimizing social issues improves business environment

Looking beyond overall economic growth to deal with income inequality

- Increases potential customers!

Opportunities for innovative business models that deliver economic and social value



STUDENTS OFFERING SUPPORT

Social Factors

Political Factors

Economic
Factors

Time Value of \$

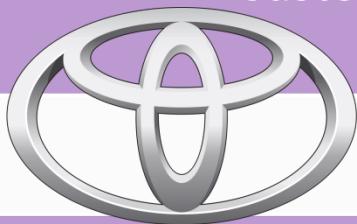
Technology
Factors



Why is there a responsibility to customers?



Customers provide revenue – they should get what they want!



TOYOTA



Consumers have a set of rights

Right to safe products,

Right to be informed about relevant aspects of a product (proper care etc)

Right to be heard (Toll free numbers etc)

Right to choose what they buy (free and open competition)

Right to be educated about purchases (side effects etc)

Right to courteous service



Companies need to be ethical in their advertising and pricing

Collusion within the industry

Ethical and True advertising

"Undercover" advertising

Social Factors

Political Factors

Economic Factors

Time Value of \$

Technology Factors



Why is there a responsibility to employees?



Provides businesses with talent, skills, labour

How?

- Need to engage employees effectively to make sure they don't go elsewhere!



LAZARIDIS

School of Business & Economics

- Responsible hiring & promotion, compensation, protection for whistleblowers



Why is there a responsibility to investors?



They provide you with the capital to operate
Investors are represented through a board of directors

- Can lead to conflict of interests
 - SOLUTION: new regulations, disclosure rules and legal attitude





Stakeholder Responsibility Summary

Stakeholder	Areas	Reasons	Action
Natural Environment	Air, Water and Land Pollution	1) Change in management thinking 2) Economic impact 3) Change in societal attitudes	Corporate Greening instead of Greenwashing
Society	Poverty, Health and Education	1) Societal attitude shift 2) Affect on human capabilities 3) Assists with social issues (political chaos, terrorism, etc)	New business models using business skills for social benefit (SOS) and more business and community partnerships
Customers	Pricing, Advertising, Rights	They provide the business with revenue	Consumerism (respect the rights), Ethics in advertising, fair pricing
Employees	Hiring, promotion, compensation, training	They provide the business with talent, skills and labour	Responsible hiring and promotion, safe working conditions, opportunities for advancement, protection
Investors	Financial management, reporting	Investors provide the business with capital	Focus on ROI, responsible and transparent management and reporting, no insider trading



So... Why manage stakeholders?

Improve ability to predict/control environment

Align company with societal values

Higher level of trust/commitment from employees and customers

Develop entry barriers



Managing Stakeholders

- Identify key stakeholders
- Categorize them on the two dimensions
- Formulate a strategy to improve organization's situation
- Implement and manage strategy!

		Potential for Threat	
		High	Low
Potential Cooperation	High	Name: Mixed Blessing Example: Profs Strategy: Collaborate	Name Supportive Example: SOS instructors Strategy: Involve
	Low	Name: Non-supportive Example: Your “friends” Strategy: Defend	Name: Marginal Example: Pet rock Strategy: Monitor



Demographics

Study of human population

Allows businesses to predict trends, make predictions, and understand changing business environment

Often grouped into 'cohorts'

- Grouped based on birthdate
- Progress through life in a similar fashion, similar experiences, needs, wants

Basic Girls



16-26yrs... usually blonde



Love the Biebs, everything
Pumpkin Spice, need UGGs
and “Cant even”



Demographics in Canada

Aging baby boomers are changing the marketplace

- Increasing # of seniors, need for elder care, less working aged people

Children of baby boomers = echo generation

- Higher amount of disposable income

Increasing # of one person households

- Lost economies of scale, fewer households with children

Increasing # of one-parent families



Demographics in Canada

Increased immigration to Canada

- Immigrants are younger and live in cities

Increasing urban concentration in Canada

- Higher median age in rural areas, highly concentrated population in a few areas



Political Factors





**How Government
Influences
Business**

**How Business
Influences
Government**



How Government Influences Business

- Customer** {
 - Ex. Government hiring construction company to build new road
- Competitor** {
 - Ex. CBC is in competition with other, private TV Channels
- Regulator** {
 - Ex. LLBO regulates the sale of alcohol in restaurants
- Taxation Agent** {
 - Ex. Corporate Taxes
- Provider of incentives, \$** {
 - Ex. Provides business loans to small businesses
- Provider of essential services** {
 - Ex. Transportation infrastructure used by shipping companies, Education provides skilled workforce



How Government Influences Business

Link to Porter's Five Forces



Customer

- Increases Buyer Power – Government is a large, established entity



Competitor

- Increases Rivalry – Government is highly capable due to their access to resources



Regulator

- Decreases Threat of Potential Entrants – Government prevents new businesses from entering highly regulated industries



Taxation Agent

- Increases Substitutes Power – If substitute industries are taxed at a lower rate than your industry, increases their price competitiveness



Provider of incentives, \$

- Increases Threat of Potential Entrants – Government provides \$\$, increases access to capital resources



Provider of essential services

- Increases Threat of New Entrants – New businesses are able to distribute their product easily by using the developed infrastructure



**How Government
Influences
Business**

**How Business
Influences
Government**



How Business Influences Government

- Lobbyists**
 - Politicians hired to persuade government to pass favourable legislation
- Trade Associations**
 - Fragmented industries group together
 - Increases bargaining power
- Industry Contacts**
 - Provides expert opinion on industry
 - I.e. Assessments of environmental impacts
- Advertising**
 - Pays for advertisement to sway voters
 - Popular in US (PACS)



Intellectual Property Rights



Legal rights that grant exclusive rights to creator

- Technology, processes, designs

Why are they important?

- Protects new businesses
- Encourages innovation between businesses, creates an incentive through providing competitive advantage

Forms of Intellectual Property Protection

Trademarks

- Words, designs, symbol used to identify product/ business
 - Creates brand names
 - Protected for 15 years, option to renew
- 

Copyrights

- Protects original work of art
 - No registration necessary
 - Protected for life of creator + 50 years
- 

Patents

- Exclusive rights to inventions
 - Must be new, useful, and ingenious
 - Protected for 20 years
- 



Forms of Ownership

4 Main Types



Sole
Proprietorship

Partnership

Corporation

Co-operative



Forms of Ownership

4 Main Types



Sole Proprietorship	Partnership	Corporation	Co-operative
<ul style="list-style-type: none">• Owner managed business, full control• Easy to form• Unregulated• Taxed at personal income rate• Unlimited liability• Lack of continuity• Lack of resources and \$\$	<ul style="list-style-type: none">• Two or more owners• General partnership: Joint liability• Limited partnership: Liability limited to investment• Easy to form, not as easy as S.P.• More \$\$ and other resources• Taxed at personal income rate• Lack of continuity	<ul style="list-style-type: none">• Separate legal entity• Managed by BOD• Public, Private, Crown• Lower tax rates• Limited Liability• Easy to transfer ownership• Double Taxation• Lack of Secrecy	<ul style="list-style-type: none">• Business created to provide value to members• Profits of business are redistributed to owners based on sales



Barriers to International Trade

Social and cultural differences

- Adapting to customer needs

Overcome by partnerships with other firms

Economic differences

- Exchange rates

Legal and political differences

- Quotas, tariffs, subsidies
- Protectionism
- Local content laws
- Business practice laws

Overcome by Free Trade Agreements



Strategies to Enter a Foreign Market





Economic Factors

Social Factors

Political Factors

Economic
Factors

Time Value of \$

Technology
Factors



Bonds



Debt that is issued by a business or government

- An ‘IOU’ with fixed interest payments
- Legally binding – MUST be paid, or company declares bankruptcy
 - Gets paid back before stockholders
- Fixed end date



Types of Bonds

Secured vs. Unsecured

- Does it have an asset backing it or not?

Registered bonds vs. bearer bonds

- Do you register your name with the debt issuer or just hold onto the certificate?

Callable

- Issuer can pay back principal rather than continue coupon payments

Convertible

- Can be converted into shares

Serial

- Bonds mature at a gradual pace



What determines a bond's value?



At issuance

- Interest rates, quality of issuer, features
 - If you can get 3% interest from your savings account, would you buy debt with a coupon of 2%? No!
 - Debt carries additional risk of default, investors need to be compensated for it!

Social Factors

Political Factors

Economic
Factors

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Factors



What determines a bond's value?



When traded

- Coupon rate & interest rates
 - When interest rates go up, price of bond of a bond goes down
 - Why? Bond prices are inversely correlated – investors desire a certain yield, if interest rates go up, investors can simply put their money in a savings account. Bond prices fall in order to compensate and meet the desired yield of investors
- Market/economic risk, inflation
 - If there is a high risk of default, investors will demand a higher yield



So... What is yield?

Our return on investment

Helps us compare various investments

- Should I buy this bond or that bond, this bond or that stock, this bond or a savings account

$$\text{Yield} = \frac{\text{What you made}}{\text{What you paid}} = \frac{\text{Interest} + \text{Capital Gain}}{\text{What you paid}} = x\%$$

$$\begin{aligned} & \text{coupon rate} \times \text{face value} + \frac{\text{face value} - \text{price paid}}{\text{time to maturity}} \\ = & \frac{\text{face value} - \text{price paid}}{\text{price paid}} \end{aligned}$$



Lets try a question...

Nicole did such a great job on her BU111 exam that her parents give her \$1000. After studying the market she decides to invest in a bond for JDCC Inc., with a coupon of 8%. The bond has a face value of \$1000 and is currently trading at \$850. The bond will mature in 3 years so that she can afford her grad trip to Punta Cana. What is the Yield to Maturity?



How to do it



Step 1: Identify the information

Coupon rate: 8% Purchase price: \$850

Face value: \$1000 Time to maturity: 3 years

Step 2: Calculate Components

Annual bond interest: $8\% \times \$1000 = \80

Annual capital gain: $\frac{\$1000 - \$850}{3}$

Step 3: Plug components in & calculate

$$YTM = \frac{\$80 + \$50}{\$850} = 15.29\%$$



So, why is yield different than coupon rate?



Yield accounts for additional risk that comes from investing in a bond

Yield = interest rate + risk premium



Three scenarios for bond prices

At a premium

- Bond is trading at HIGHER than face value
- Occurs when the coupon is higher than yield

At a discount

- Bond is trading LOWER face value
- Occurs when the coupon is lower than yield

At par

- Bond is trading EXACTLY AT face value
- Occurs when the coupon is equal to yield



Reading bond pricing quotations

Written as:

- Issuer, Coupon, Maturity Date, Price, Yield
- JDCC, 5, 24/01/2014, \$1,500, 3.5



Common Shares

Voting Rights:

- Stocks represent a part ownership in the corporation. Each share has one voting right to elect the Board of Directors

No Fixed Term:

- You are an owner, and the company does not have to repay you. You can hold the shares for forever!

Variable Return:

- Increase in stock price or payment of dividends based on performance of the company, investor perceptions
 - High return in profitable years, low or negative return in unprofitable years

Discretionary Payment:

- Dividends are paid only when the company is profitable

High Risk:

- High possibility of generating a return, high risk of losing it all



Preferred Shares

No Voting Rights:

- Preferred shareholders give up their voting rights in exchange for a guaranteed dividend

No Fixed Term:

- Preferred shareholders are still owners of the company
- Can own the stock forever!

Fixed Return:

- Dividend is fixed every year

Non- Discretionary Payment:

- Legally, the company has to pay the dividend
- Cumulative: Dividends unpaid in one year must be paid in the next profitable year

Low Risk:

- Lower possibility of generating a return (since it is fixed), low risk



Priority In the Case of Bankruptcy





Investment Problems

Going Long



Going Long: Simple transaction of buying shares and selling them later

- The investor makes money when the price of the shares increases between the time that they bought it and the time that they sold it
- Buy at a price and sell at a higher price

Capital Gain: The amount of money you gained from the transaction

- Difference between what you received from the sale and what you spent to purchase the shares

Yield: Percentage return (money made) on the investment

- $\text{Yield} = \frac{\text{What you made}}{\text{What you paid}}$



Example

You buy 150 shares of company ABC at \$10/share. A month later, you sell those shares at \$13/share. What is your capital gain and yield?

Buy 150 shares @ \$10	\$1,500
Add: Purchase commission of 2%	<u>30</u>
What you spent to purchase the shares	\$1,530
Sell 150 shares @ \$13	\$1,950
Less: Sale commission of 2%	<u>39</u>
What you received from the sale	\$1,911

Capital Gain = \$1,911 - \$1,530 = \$381

Yield = \$381 / \$1,500 = 25.4%





Margin Buying

Purchase of an investment by paying an amount (margin) and borrowing the balance from your broker

- Margin is expressed as a % of the market value of the investment

Investor opens a margin account with their broker and deposits funds to purchase investment



Margin Buying



Minimum Margin Requirement: Set by the broker. The margin must always be greater than the minimum margin requirement

Margin Call: When the share price drops, and you must deposit more money into the margin account to meet the minimum margin requirement

Leverage: The concept of engaging in a transaction that has a greater value than the amount that you have available

- Offers the potential for higher reward at the cost of the potential for higher risks
- Example: Margin buying



Example

You instruct your broker to purchase ABC at \$10 on October 25th, 2011. As per your speculation, the market price increases and on April 25th 2012, you instruct your broker to sell at \$13.

Now throughout this transaction, you only have \$1,500 to invest, so your broker loans funds at a rate of 8% with margin requirement is 75%.

What is your Capital gain, and Yield as of April 25th?



Example

Step #1: Calculate the broker loan

$$0.75x = \$1,500$$

x = Total amount in margin account = \$2,000

Broker loan = \$2,000 - \$1,500 = **\$500**



Example

Step #2: Calculate the interest on the loan

Loan period: October 25th – April 25th: 6 months

$$\begin{aligned}\text{Interest} &= 8\% \times \$500 \times (6/12 \text{ months}) \\ &= \$40 \times (6/12 \text{ months}) \\ &= \$20\end{aligned}$$



Example

Step #3: Calculate capital gain/loss and yield

Sold 200 shares at \$13/share	\$2,600
Buy 200 shares at \$10/share	<u>\$2,000</u>
Profit Before Commissions	\$600
Less: Purchase commissions at 2%	\$ 40
Less: Sale commissions at 2%	\$ 52
Less: Interest Paid	<u>\$ 20</u>
	\$ 488

$$\text{Yield} = \$488/\$1,500 = 32.53\%$$



Example: Margin Call

What if the stock went from \$10 down to \$8 at November 25th, 2011, and then up to \$13? What is the amount on your margin call?

Step #1: Calculate the maximum broker loan

Market Value of Shares = $200 \times \$8/\text{share} = \$1,600$

Broker Loan = $1600 \times 0.25 = \$400$

Step #2: Calculate the margin call

Change in broker loan = $\$500^* - \$400 = \$100$

*Previous broker loan

To meet the margin requirement the investor will need deposit \$100 into their margin account.



Example: Margin Call

Step #2: Calculate the interest on the loan

$$\text{Interest} = 8\% \times \$500 \times (1/12 \text{ months})$$

$$= \$40 \times (1/12 \text{ months})$$

$$= \$3.33$$

$$\text{Interest} = 8\% \times \$400 \times (5/12 \text{ months})$$

$$= \$32 \times (5/12 \text{ months})$$

$$= \$13.33$$

Total Interest = \$16.66



Example: Margin Call

Step #3: Calculate capital gain/loss and yield

Sold 200 shares at \$13/share	\$2,600
Buy 200 shares at \$10/share	<u>\$2,000</u>
Profit Before Commissions	\$600
Less: Purchase commissions at 2%	\$ 40
Less: Sale commissions at 2%	\$ 52
Less: Interest Paid	<u>\$ 16.66</u>
	\$ 491.34

$$\text{Yield} = \$491.34 / \$1,600 = 30.71\%$$



Selling Short



Investors capitalize on the price of a stock *decreasing*
You borrow shares from a broker and sell them right away

- The funds are kept in a short account with the broker

After the market price of a stock falls, you use the funds in the short account to buy back the shares at a lower price

- The shares are returned to the broker, and you keep the profit you made from the transaction

Same concept of buy low, sell high – but in reverse order



Selling Short



The short account must maintain a balance equal to 150% of the current market value of the shares

- When the shares are initially sold, 100% of the balance comes from the shares themselves, and 50% is deposited by the investor
- Example of leverage

Short Call: If the price of the stock goes up, you must deposit more money into the short account (so it equals 150%)

- The current market values of the shares increases



Example

You sell short 100 shares of XYZ on May 1st, and buy them back on July 1st. The market price per share during this time is as follows:

- \$35 on May 1st
- \$33 on July 1st

Calculate the deposit into the short account on May 1st. Calculate the total capital gain and yield on the investment.



Example

Step 1: Determine the deposit in your short account

Proceeds from sale of shares = CMV = 100 shares @ \$35 = \$3,500

Sale commission at 2% = \$70

Amount in short account = 150% of CMV = 1.5(\$3,500) = \$5,250

Deposit made into short account = 50% of CMV = **\$1,750**



Example

Step #2: Calculate capital gain/loss and yield

Sold 100 shares at \$35/share	\$3,500
Buy 100 shares at \$33/share	<u>\$3,300</u>
Profit Before Commissions	\$ 200
Less: Sales commissions at 2%	\$ 70
Less: Purchase commissions at 2%	<u>\$ 66</u>
Capital Gain	\$ 64

Yield = Capital Gains/Amount Deposited

$$= \$64/\$1750 = 3.66\%$$

Time Value of Money

It's okay... TVM is as scared of you as you are of it





Time Value of Money

A dollar today is worth more than a dollar tomorrow... Why?

1) Interest Rates

- The sooner you receive the money, the quicker you can start earning a return

2) Inflation

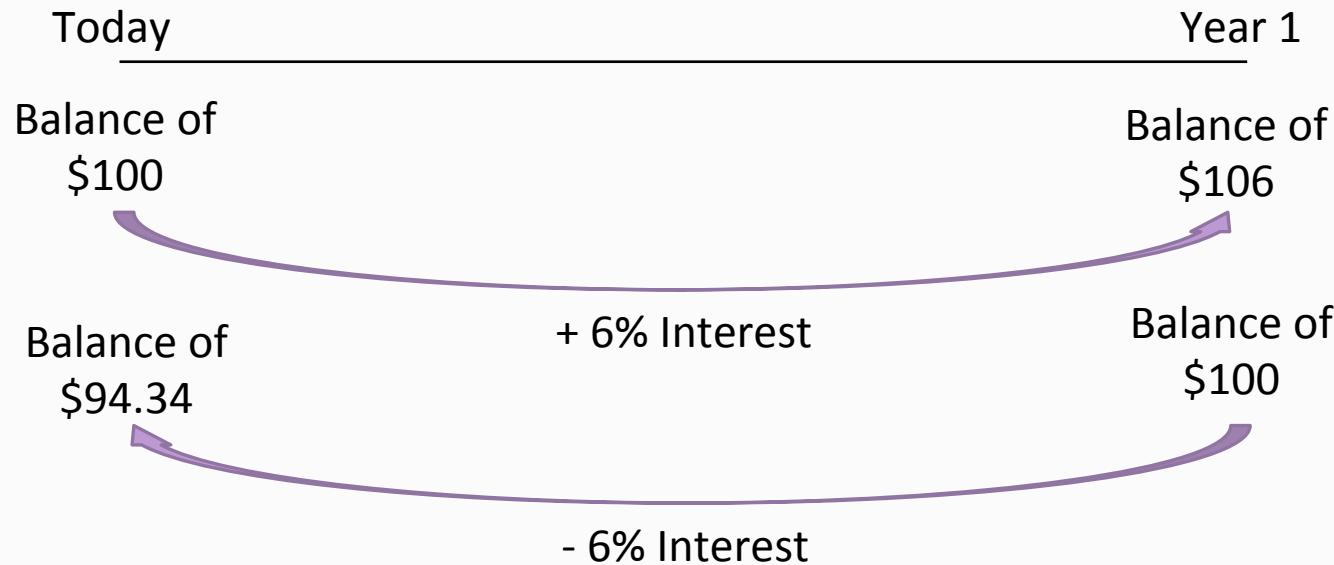
- The purchasing power of money decreases over time

3) Risk

- There is a greater chance you will not receive the money as time goes on



Time Value of Money



These two \$100 bank accounts are not equivalent since they occur at different points in time

TVM helps us to compare cash flows at different time periods

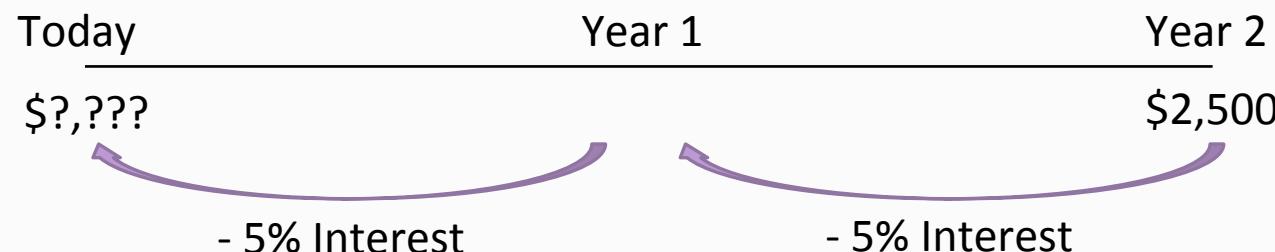


TVM – Single Amount

$$FV_{\text{single amt}} = PV(1+r)^n$$

$$PV_{\text{single amt}} = FV/(1+r)^n$$

Example: What would you be willing to pay for a payment of \$2,500 two years from now? Market interest rates are 5%.



$$PV = \$2,500 / (1.05)^2 = \$2,267.57$$



TVM – Single Amount



$$FV \downarrow \text{single amt} = PV(1+r) \uparrow n$$

$$PV \downarrow \text{single amt} = FV/(1+r) \uparrow n$$

What would be your balance after 4 years if you deposited \$10,000 today in a bank account earning 3.75% interest?

- A) \$9,290.17
- B) \$11,586.50
- C) \$10,375.00
- D) \$8,630.73



TVM – Single Amount



$$FV \downarrow \text{single amt} = PV(1+r) \uparrow n$$

$$PV \downarrow \text{single amt} = FV / (1+r) \uparrow n$$

What would be your balance after 4 years if you deposited \$10,000 today in a bank account earning 3.75% interest?

B) \$11,586.50

Why?

- 1) This question is asking for the FV so we pick the 1st formula.
- 2) n=4, PV= 10,000 and r=0.0375
- 3) We're done.



TVM - Annuities



Multiple constant payments over a period of time

- The payments are of the **same size**
- The payments occur at the **same interval** (every year, every month, etc.)

Ordinary Annuity: Payments are made at the end of every period

Annuity Due: Payments are made at the beginning of every month

Problems include solving for present value, future value or payment amount



TVM – Annuities

Formulae



$$PV \downarrow \text{ordinary annuity} = PMT [1/r - 1/r(1+r)^n]$$

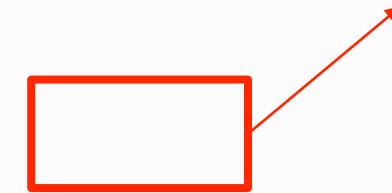
$$PV \downarrow \text{annuity due} = PMT [1/r - 1/r(1+r)^n] (1+r)$$



One additional period of interest

$$FV \downarrow \text{ordinary annuity} = PMT [(1+r)^n - 1/r]$$

$$FV \downarrow \text{annuity due} = PMT [(1+r)^n - 1/r] (1+r)$$





TVM – Compounding Periods

Compounding: Earning interest on interest

- At the end of each compounding period, the interest becomes part of the principal and starts earning interest itself

The greater the number of compounding periods, the faster your investment grows

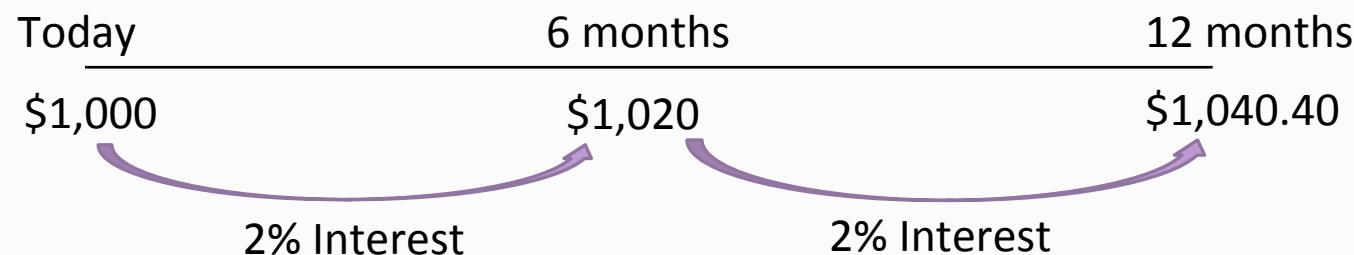
- The rate that you actually earn (effective interest rate) increases as the number of compounding periods increases, since you earn more interest on interest



TVM – Effective Interest Rate

The amount of interest you actually (effectively) earn increases with the number of compounding periods

Example: \$1,000 invested @ 4%, compounded semi-annually



$$\text{Actual (Effective) Interest} = \$40.40/\$1,000 = 4.04\%$$

The extra 0.04% is due to interest earned on interest!



TVM – Effective Interest Rate

Interest rate used in PV/FV calculations must match the effective rate per compounding period

■ *Effective Rate per Payment Period*

r_{nom} is the nominal interest rate

m is the number of compound periods as per the nominal interest

p is the number of payment periods in one year

Example: 4% compounded semi-annually, payments made annually

$$\text{Effective Rate} = (1 + 0.04/2)^{12/1} - 1 = 0.0404 \text{ or } 4.04\%$$

Matching schedules	r & n adjustments
Yes	New $r = r \div \text{payment frequency}$ New $n = n \times \text{payment frequency}$
No	$r = \text{Effective rate for payment period}$ New $n = n \times \text{payment frequency}$
Interest stated as APR	$r = \text{APR} \div \text{payment frequency}$ New $n = n \times \text{payment frequency}$



TVM – Effective Interest Rate

What is the effective interest rate of an investment that pays quarterly and earns 4% compounded quarterly?

- A) 4.00%
- B) 1.125%
- C) 1.025%
- D) 1.00%



TVM – Effective Interest Rate

What is the effective interest rate of an investment that pays quarterly and earns 4% compounded quarterly?

- A) 4.00%
- B) 1.125%
- C) 1.025%
- D) 1.00%

The compound and payment frequency are both quarterly so divide 4% by the number of payments a year (4) and we're done.



TVM – Effective Interest Rate

What is the effective *monthly* interest rate of an investment that earns 4% compounded quarterly?

$$\begin{aligned} \text{Effective Monthly Rate} &= (1+0.04/4)^{14/12} - 1 \\ &= 0.0033 \text{ or } 0.33\% \end{aligned}$$



Bonds



We use the time value of money to help us value bonds

We receive regular interest payments

- Use PV of ordinary annuity formula

We receive one lump sum payment

- Use PV of a single amount formula

So we use:

$$\text{Bond Price} = PV_{\text{single amount}} + PV_{\text{ordinary annuity}}$$



Bond Price - Example

To raise funds for the #DriveForTwentyFive, JDCC Inc. has decided to issue bonds. The bonds have a face value of \$1000, a coupon rate of 6% with semi-annual payments. The bond will mature in 20 years, and current interest rates are 4%. How much would you pay for this bond?



Bond Price - Example

Step 1: Calculate coupon payment

$$\text{Coupon Payment} = \frac{\$1,000 \times .06}{2} = \$30$$

Step 2: Determine important information

$$\text{PMT} = \$30 \quad n=20*2=40 \quad r=.04/2=.02$$

$$FV_{\text{single amount}} = \$1,000$$

Step 3: Plug variables into formula

$$PV = \$30 \left(\frac{1}{.02} - \left(\frac{1}{.02(1+.02)^{40}} \right) \right) + \frac{\$1,000}{(1+.02)^{40}}$$

$$PV = \$820.66 + \$452.89 = \$1,273.55$$



Bond Price - Example

When working with bonds remember...

- Face Value (usually = par) is assumed to be \$1000
- Bonds are assumed to pay semi-annual coupons and compound semi-annually
- Trading price can be quoted in reference to par value (1.25, or 80% of par or 30% premium/discount)
- Lump sum is the Single Amount
Coupon payments are the Ordinary Annuity



Car Leases

Car leases are an annuity due

- Payments are made at the **beginning** of each month

Car leases have three parts:

- Sticker price (MSRP)
- Lease payments
- Residual value

Sum of these parts is equal to the present value of the lease



Car Lease - Example

Mike wins the lottery! He decides to invest nearly all of it in a GIC, but wants to buy himself a car first. The price of the his new BMW is \$35,120. Since Germany is far away, freight is \$3,000. He has been offered a lease for 4 years at an APR of 5.2%. The residual value of the car is 30%. What would be the monthly lease payments on the car if there is prepayment of \$5,000?





Car Lease - Example

Step 1: Determine important information

$$n = 36 \quad r = .052/12 = .00433 \quad \text{Residual} = \$35,120(.3) = \$10,536$$

$$\text{Cost of Car} = \$35,120 + \$3,000 = \$38,120 \quad \text{Prepayment} = \$5,000$$

Step 2+3: Plug variables into equation and solve

We have the present value of the prepayment, the lease payments and the residual – multiple cash outflows. Lease payments are made at the beginning of the month

$$PV = \$5,000 + PV_{\text{annuity due}} + PV_{\text{residual}}$$

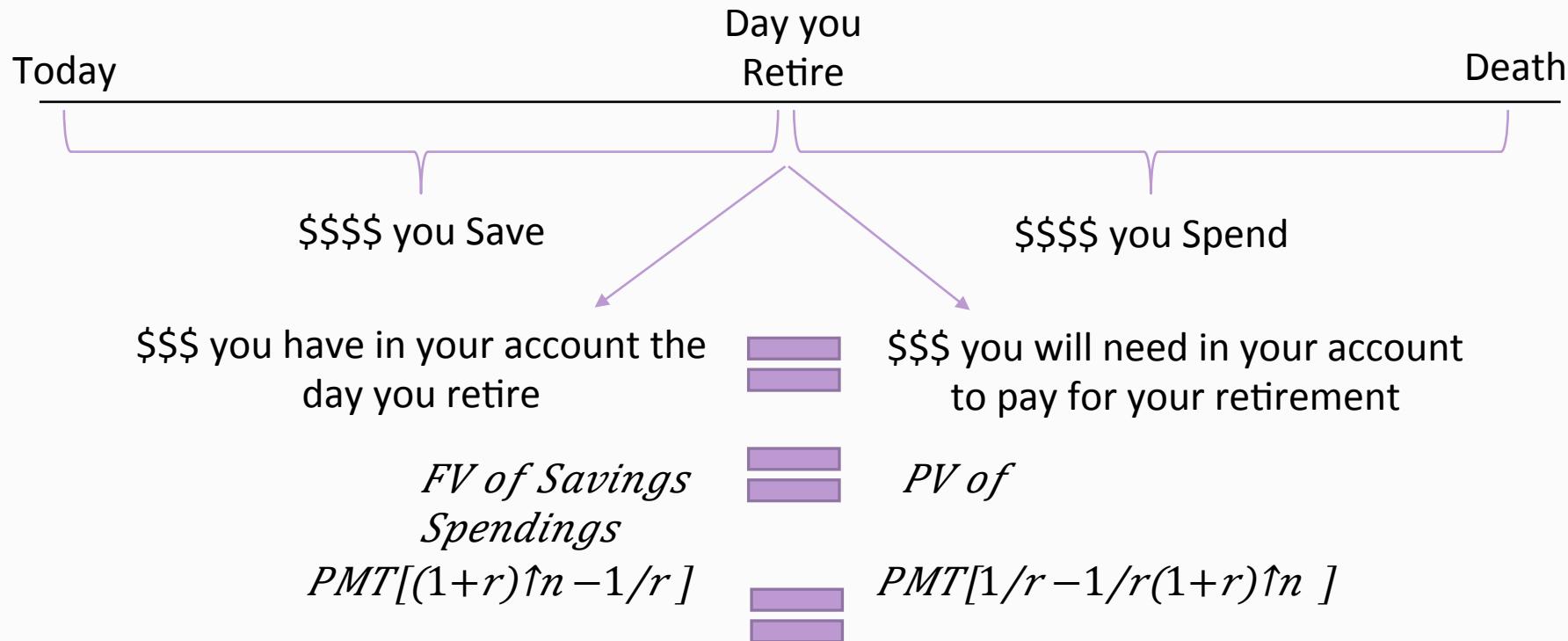
$$\$38,120 = \$5,000 + PMT \left(\frac{1}{.00433} - \frac{1}{.00433(1.00433)^{36}} \right) (1.00433) + \frac{\$10,536}{(1.00433)^{36}}$$

$$\$38,120 = \$5,000 + PMT(33.41) + \$9,018.29$$

$$PMT = \$721.39$$



Retirement





TVM - Retirement

You are 40 years old and want to retire at age 55. Each year, starting one year from now, you will deposit an equal amount into a savings account that pays 6% interest, compounded semi-annually. The last deposit will be on your 55th birthday. On your 55th birthday you will move your savings into a safer bank account that pays only 3.5% interest, compounded annually. You will withdraw your annual income of \$150,000 at the end of that year (on your 56th birthday) and each subsequent year until your 85th birthday (you expect to pass away later that year).

How much do you have to save each year to make this retirement plan happen?

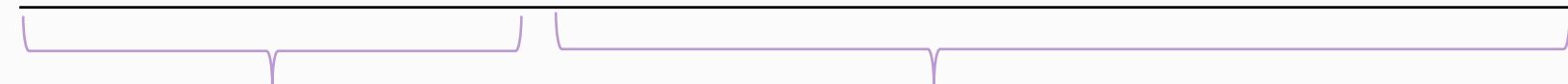


TVM - Retirement

40th birthday

55th birthday

85th birthday



■ *FV of Retirement@Savings = PV of Retirement@Spending*

$$\text{Effective Annual Rate} = (1 + 0.06/2)^{12/1} - 1 = 6.09\%$$

$$\begin{aligned} FV \text{ of Savings} &= PMT[(1+r)^n - 1/r] = PMT[(1.0609)^{15} \\ &- 1/0.0609] = PMT(23.4362) \end{aligned}$$

$$PV \text{ of Spending} = \$150,000 / 1/0.035 - 1/0.035(1.035)^{30} = \$2,758,807.81$$

$$PMT(23.4362) = \$2,758,807.81$$

$$PMT = \$117,715.62$$



TVM - Perpetuity

Perpetuity: An annuity that continues on forever.....

- The value of the next payment received in the future is less valuable than the previous

Example: Preferred dividends in a public company

- Assumption: The company will continue forever, and you will hold those shares forever

Example: Preferred shares of BMO pay a dividend of \$1.25 per share. If market interest rates are at 3%, what is the price you are willing to pay per share?

$$PV = \frac{PMT}{r} = \frac{1.25}{0.03} = \$41.67$$



TVM Tips & Tricks

When Reading Word Problems

- Underline, highlight or tag the key variables as you see them in the problem.
Variables like.... (n, r, pmt, pv, etc)
- Recognize what words indicate PV, FV, SA or Annuity (and due)
Sentences like... (Today, Immediately, At the end of each year, how much would you pay now, what will it be worth then,)
- 1) Read the problem 2) PV or FV 3) Single or Annuity 3.1)
Due or Ordinary 4) Anything strange/unique?
- If you have to change r or n make that your first calculation
and then “throw out” the old values



TVM Tips & Tricks



Remember the assumptions... (Leases are always annuity due, bonds have semi-annual coupons etc)

If you are solving for “n” write the decimal answer and then round up to the next payment period (the 1st period you will have fully paid off the loan)



TVM Tips & Tricks



Show your steps!

Use V.E.N.T.

Even if you get the wrong final answer you can still get marks for identifying the correct formula and subbing in the correct variables. If you only write down your final answer and it's wrong you're losing 100 % of the marks.



TVM Tips & Tricks



Practice. Practice. Practice.

TVM can smell fear.



Technology Factors

Social Factors

Political Factors

Economic
Factors

Time Value of \$

Technology
Factors

105



Technology Overview



What is technology?

- Internet – e-commerce platforms, new communication options etc.
- Information technology – how firms manage information and communicate it with other firms
- So much more – technology is significantly more than just computers and information

Why is technology important?

- New advances in technology place extreme demands on businesses
- There is a need for continuous learning and scanning
- These demands create large challenges for companies

How does technology impact business decisions?

- Changes what we can make, how we make it, and how we sell/distribute it
- Creates a number of opportunities and threats

Social Factors

Political Factors

Economic
Factors

Time Value of \$

Technology
Factors



Opportunities & Threats

Management & Organizational Processes

- Instant access to information
 - Allows for more data driven decisions & instant analysis of decisions
 - Related challenge is information overload
- Improved customer service & communication
 - More avenues for receiving feedback & acting on it
 - Allows companies to bypass traditional mediums that may confuse your message or have high costs
- Leaner organizations & improved efficiency

Mass customization

- Better meet customer needs by providing them the features they want while maintaining scale

Increased competitiveness within the industry

- Faster innovation cycles
 - Allows for more lower costs to develop products (e.g. prototyping)
 - Can develop into a barrier to entry
- Technology can facilitate cooperation & collaboration with other firms

Social Factors

Political Factors

Economic
Factors

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Technology
Factors



Opportunities & Threats



Threats

- Extremely unpredictable
 - Requires consistent scanning of the environment – both time consuming and expensive
- Disruptive technologies
 - New entrants can radically change the industry and change the ‘rules of engagement’
- Harder to sustain advantages
 - Imitating some technology products is very simple (e.g. some apps)
 - Technology makes it easier to ‘reverse-engineer’ a rivals product
- Information Overload
 - Too much information can cause “analysis paralysis” where nobody can make a decision because there is too much to consider

Some things are both an opportunity & a threat

- Independence of company and workplace (telecommuting etc.)
 - More difficult to manage employees and connections
 - Can increase employee satisfaction and even ability (depending on your hiring pool)

Social Factors

Political Factors

Economic
Factors

Time Value of \$

Technology
Factors



Important Technology Concepts



Complementary goods: products that are needed to give your product value

- Creates a vicious/virtuous cycle
- E.g. Apps & smartphones

Technology standards

- Products need to meet a technology standard; affects the compatibility of complementary goods
- E.g. VHS vs. BetaMax, DVD vs. Bluray

Installed base & network effects

- Installed base is simply how many users you have
- Network effects are the value generated/dependent on users/size of installed base

Social Factors

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Factors

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Technology
Factors



Important Technology Concepts

Lock-in → Size of investment

- What does the consumer have to 'give-up'? How can we make this bigger?
- Eg. Video game consoles

Switching costs → Cost for a consumer to switch

- This presents a significant barrier to entry → if it costs too much to switch we can't steal customers from existing competitors

Social Factors

Political Factors

Economic
Factors

Time Value of \$

Technology
Factors



Important Technology Concepts



Solutions:

- Ensure product compatibility with standards
- Develop alliances with or incentives for complementary goods suppliers – make them want to produce goods for you
- Work to increase the size of your installed base
- Reduce switching costs – this makes it easier for consumers to switch, which means they are more likely to do so
- Provide a significant leap in performance – make the benefit of switching outweigh the cost to switch

Social Factors

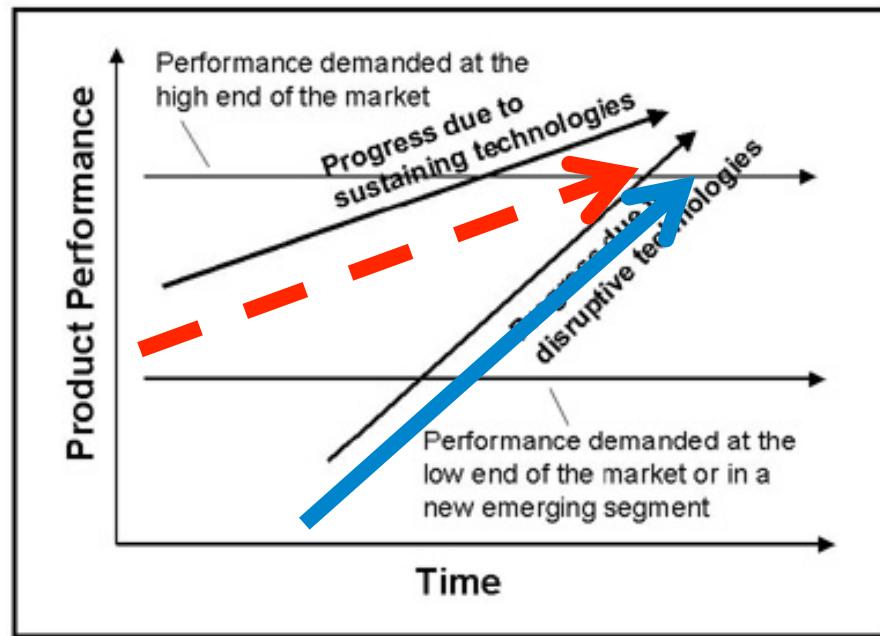
Political Factors

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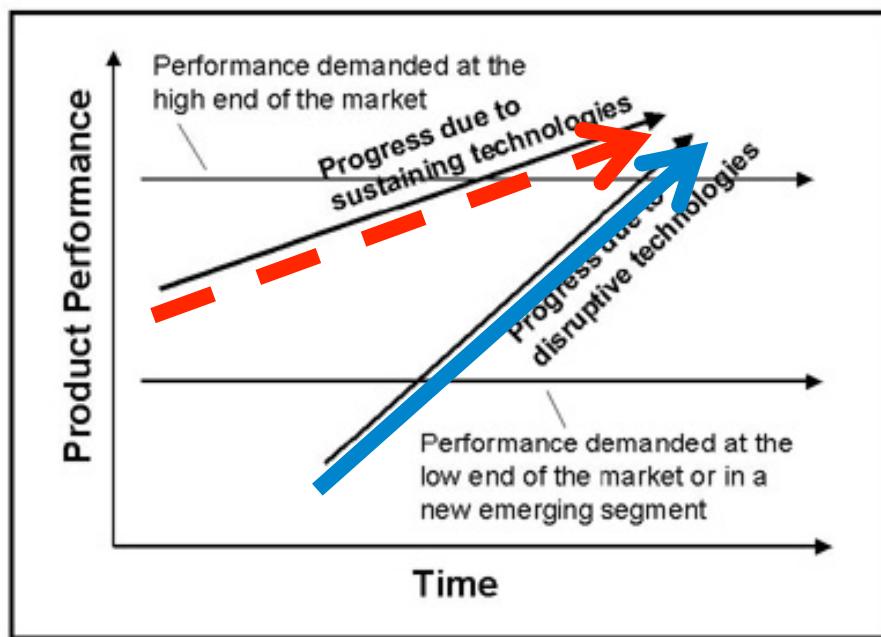
Sustaining Technology



Sustaining Technology

- Marginal/incremental improvements to existing products
 - These improvements are largely expected by the environment
- These improvements provide current customers with an enhanced product
 - Core product and attributes remain the same
 - Target customers are in high-value segments
- Existing firms can leverage their scale and current abilities to win

Disruptive Technology



Disruptive Technology

- New package of attributes
 - These attributes aren't valued by traditional customers
- Start out by targeting the lower end of the market
 - These customers can accept lower performance in the short run
 - Rapid improvements allow these new attributes to move upmarket
 - This results in these technologies overtaking existing firms who have improved slower

Source: Teradyne (n.d.) *The innovator's dilemma*. Retrieved from <http://web.mit.edu/6.933/www/Fall2000/teradyne/clay.html>



Why do large firms sometimes fail?

- Large companies often have slow response times
- Unable to make changes that are needed to keep up with new firms
- Diamond-E: A company can only follow a strategy that is consistent internally

Organizational structure & capabilities

- Focus on core customers and high-value markets
- Weed out ideas that don't meet current customers' needs
- Niche markets are unattractive – low margins, uncertain growth potential

Organizational Processes

- Managers worry about self-preservation
- Easy strategy is to focus on current high margin opportunities
- Why risk focusing on a small and unattractive segment? You just get blamed if it fails

Management preferences & biases

Social Factors

Political Factors

Economic Factors

Time Value of \$

Technology Factors



How to avoid failure if you are the large firm

Strategies to avoid failure

- Design products around the task they accomplish rather than the customer it is for – “Why are you hiring a milkshake?”
- Monitor markets outside of your own industry & current target markets
 - Disruptive innovations can develop in seemingly unrelated industries & markets
- Partner with younger firms (strategic alliance) – extremely common in biotechnology
 - You provide them with capital, distribution, expertise, and a customer base
 - They provide the innovation
- Establish independent venture units within the organization
 - Allows these teams to focus on new markets and new ideas without worrying about existing markets
 - Leverages resources of the parent company

Social Factors

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Factors

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Technology
Factors



How can you compete if you are a small firm?

Enter with a new product or radically different process

Large firms won't be interested in the market

Target things that existing competitors are not good at



Target lower margin and niche markets

Current competitors don't want to compete in these markets

Allows you to gain a foothold and refine product to meet mainstream need



Move up-market

Use capabilities and improvements developed in peripheral markets to better serve mainstream customers & compete against large firms

The End!
Questions?

THANKS FOR ATTENDING!



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WITH THE PERFECT TEE!

\$15

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