Managing and Identifying Risk

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"There's always an element of risk. No one has a crystal ball. OK, I have one, but no one knows how it works."

"All of life is the management of risk, not its elimination"

- Risk is the volatility of unexpected outcomes.
- In the context of financial risk the volatility is in:
  1. the prices of inputs and outputs
  2. the value of assets and liabilities
- Firms need to consider the impact of such uncertainty on their cashflows and/or balance sheet.
- Firms decide which risks to accept or manage.
  - The choice depends on their business strategy, competitive position and stakeholder preferences.

Where are the Risks?
How Big Are the Risks?

Types of Risk

Risk management requires that a firm's exposures to risk are identified, quantified and managed (or not).

1. *Business risk* – manufacturing and marketing its products to create a competitive advantage.
    - How does this risk depend on our actions? Others' actions?
    - Is this something we should hedge?

2. *Financial risk* – sensitivity of cashflows and earnings to movements in financial markets (e.g., interest rates, exchange rates, commodity prices, …).
    - How do these impact our profitability? Our competitive position domestically? In foreign markets?
    - Is this something we should hedge?

Financial Risks?

Examples of Risk

- Financial risks:
  - Market risks (changes in prices, interest rates, etc.)
  - Credit risks (counterparty risk)
  - Liquidity risks (ability to buy/sell when needed)

- Other risks can have financial implications and may interact with the financial risks. For example,
  - Operational risks, legal risks, strategic risks, reputation risks, regulatory risks …

➢ Financial risk management is the process of creating economic value using financial tools or operating decisions *to manage the exposure to financial risks.*

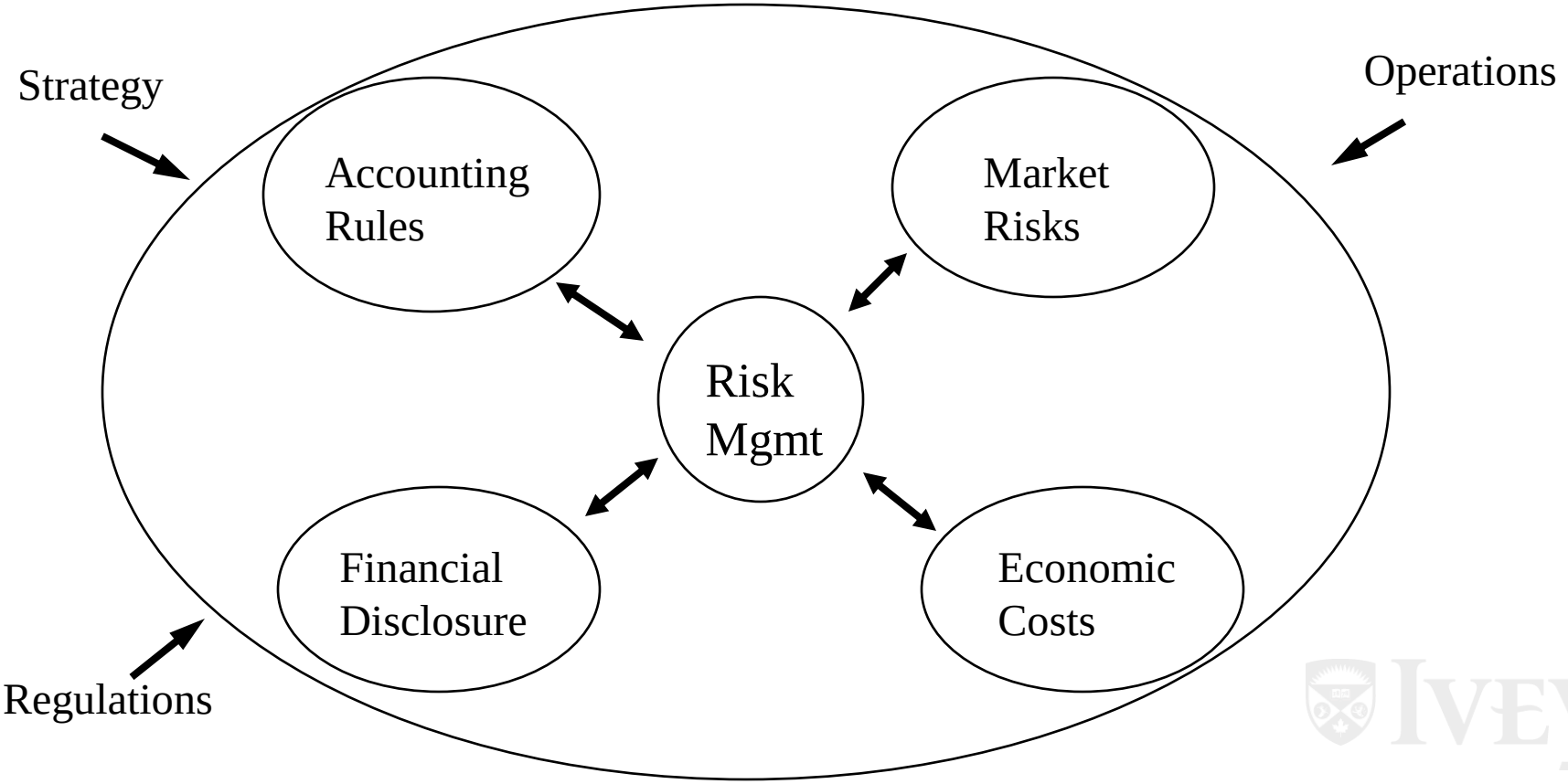
Global CEOs Major Concerns

	2011	2012	2013
1.	recession/economy	recession/economy	recession/economy
2.	FX volatility	FX volatility	FX volatility
3.	skilled labour	capital markets	public debt
4.	regulation	public debt	over-regulation
5.	public debt	skilled labour	capital markets
6.	capital markets	over-regulation	tax burden
7.	consumer demand	energy costs	skilled labour
8.	tax burden	consumer demand	consumer demand
9.	new market entrants	new market entrants	new market entrants

Source: PWC CEO Survey

Factors Influencing Risk Management

Modern risk management considers the following:



Steps in Risk Management

- Identify which factors impact key evaluation metrics and identify how each factor impacts these metrics.
  - Large, diversified firms may have less net exposure to different financial risks and they may be less of an issue with respect to their effects on CFs and the B/S.
- Assess the volatility/uncertainty of these factors using historical data.
- Develop pro-forma models of the impact of each factor on these metrics, especially cashflow, earnings and key balance sheet ratios (e.g., sensitivity analysis).
- Set corporate policies regarding acceptable levels of earnings and shareholder value at risk.
- Set procedures for monitoring and managing risk.

Identification of Risks

We need to develop a framework for identifying risk.
We start with the largest international risk – FX risk.

- Transaction Risk
  - Gain or loss on a *contracted* transaction resulting from a change in exchange rates.
- Translation or Accounting Risk
  - Effects of changes in exchange rates on the translation back of *assets and liabilities* denoted in foreign currencies into the domestic currency denominated financial statements.
- Economic or Operating Risk
  - Changes in the value of a firm induced by changes in demand for its products or supply of its production factors caused by changes in exchange rates *over time*.

Challenges in FX Risk Management

- Objectives of FX Risk Management for different types of firms:

	Public	Private
1. Eliminate FX gains / losses	30%	41 %
2. Minimize earnings volatility	38 %	17 %
3. Optimize domestic cashflows	19 %	17 %
4. Protect budget forecasts	7 %	19 %
5. Maintain competitive position	6 %	8 %
• Firms with Risk Management Policies	80 %	42 %

Source: Wells Fargo FX Management Survey

Example of Transaction Risk

- A US electronics company contracted to sell 100,000 semiconductors to a French computer manufacturer for a price of €10/ piece. Delivery is in 90 days with payment upon delivery.
- If the exchange rate was $1.40/EUR when the contract was signed the US firm expects to get $1,400,000 from this sale.
- If the exchange rate changes to $1.30/EUR, the US firm will only get $1,300,000.
- The possible change in revenues is “transaction risk”.

Example of Translation Risk

- If our US electronics company decided to set up a French subsidiary to do this and future transactions. Its balance sheet could be, assuming 1.25 USD/EUR:

Assets	Parent ($)	Sub (EUR)	Consolidated ($).
Cash	500,000	100,000	625,000
Operating Assets	5,000,000	900,000	6,125,000
Subsidiary (Hist Cost)	625,000		.
Total	6,125,000		6,750,000
Liabilities			
Long-term Debt	5,725,000	500,000	6,350,000
Equity	400,000		400,000 .
Total	6,125,000		6,750,000

- What is (are) the most important item(s) here to the US parent?

Example of Translation Risk

- If our US electronics company decided to set up a French subsidiary to do this and future transactions. Its balance sheet assuming 1.50 USD/EUR:

Assets	Parent ($)	Sub (EUR)	Consolidated ($).
Cash	500,000	100,000	650,000
Operating Assets	5,000,000	900,000	6,350,000
Subsidiary (Hist Cost)	625,000		.
Total	6,125,000		7,000,000
Liabilities			
Long-term Debt	5,725,000	500,000	6,475,000
Equity	**400,000**		**525,000** .
Total	6,125,000		7,000,000

Example of Translation Risk

- If our US electronics company decided to set up a French subsidiary to do this and future transactions. Its balance sheet assuming **1.00 USD/EUR:**

Assets	Parent ($)	Sub (EUR)	Consolidated ($).
Cash	500,000	100,000	600,000
Operating Assets	5,000,000	900,000	5,900,000
Subsidiary (Hist Cost)	625,000		.
Total	6,125,000		6,500,000
Liabilities			
Long-term Debt	5,725,000	500,000	6,225,000
Equity	**400,000**		**275,000** .
Total	6,750,000		6,500,000

Economic or Operating Risk

There are two components to be considered:

- *Future exposure*: the impact of unexpected exchange rate changes on the value of future income denominated in different currencies.
  - If our contract is for the next 20 years, how will unexpected exchange rate changes impact the PV of our future cashflows and profitability? What impact will this have on our long-term viability?
- *Competitive exposure*: the impact of exchange rate changes on the ability of a firm to compete based on their impact on the costs and revenues for the firm and its competitors.
  - When the value of the yen was low, Japanese imports flooded markets in North America.

The Hedging Decision

Why not?

- Shareholders can diversify away risks themselves. There is no need for the firm to do this for them (M&M Proposition I).
- Costly to hedge and it does not increase the expected cashflows, so why incur the cost?
- Managers can not outguess the market, so in equilibrium (on average) the expected value of hedging is zero.
- Managers may hedge to increase their job security, but not to maximize firm value.
- Hedging is irrelevant, since it can not decrease a firm's systematic risk and that is all investors care about.

The Hedging Decision (cont'd)

Why?

- Management knows more about the firm's risk profile, so it can hedge its risks better than shareholders.
- Decreases the risk of bankruptcy.
  - For a given amount of debt, hedging reduces the probability of bankruptcy. The cost of the threat of financial distress can be very high, both directly and indirectly.
- Smoothes earnings - stock markets like this!
- Firms may have to forego positive NPV projects because they cannot raise capital or accurately predict their cashflows.

Managing Transaction Risks

- A transaction exposure is created as soon as the seller quotes a price in foreign currency terms and exists until the buyer settles the bill.
- Recall our example: a U.S. company expects to receive €1 million in three months. What could the U.S. company do to manage this risk?
- Alternatives for managing transaction risk:
  - Remain unhedged
  - Use forwards/futures
  - Use a money market hedge
  - Use options

Managing Transaction Risks

- Remaining *unhedged* means that we have decided to accept the transaction risk.
  - We get all of the benefit and suffer all of the costs of changes in the exchange rate.

- *Forward/futures*: we agree to exchange currencies at a stated rate at a given future date.
  - What happens if the contract is not awarded if we use forwards? futures?
  - What is the expected value of this strategy in an efficient market?

Managing Transaction Risks

- *Money Market Hedge*: we borrow in the foreign currency, exchange that for our domestic currency at the spot rate. When we get paid the foreign currency we pay back the loan and interest with the proceeds.
  - The costs will be similar to those of a forward. The final cost will depend on the interest rate differential and how we invest the domestic currency obtained after converting the loan.

- Both the Money Market Hedge and the Forward contract remove the risk of future exchange rate movements. We get a known amount in the future. Downsides?

Managing Transaction Risks

- *Options*: we can purchase a put option on the foreign currency so that we can lock in a minimum price at which we can sell the proceeds from our transaction.
  - What happens if the foreign currency appreciates versus our home currency? Depreciates?
  - What happens if we do not get the contract?

- Unlike the two previous alternatives, this is not riskless.
  - Not riskless? The option allows the possibility for gains if the exchange rate moves in the right direction, and a floor for the losses if it does not. As a result, there is uncertainty about the value of this alternative. We can get a "floor" on the price, but it comes at a cost.

Summary: Managing Transaction Risks

For our transaction risk example:

- Unhedged → do nothing
- Forward/future → buy a forward/future to sell €1,000,000 for 1.30 USD/EUR in 90 days
- Money Market → borrow €990,099 today at 4%, convert to USD, and invest in US. Owe €1,000,000 in 90 days
- Option → buy a put on Euros to sell €1,000,000 at a strike price of 1.30 USD/EUR in 90 days (why not 1.25 USD/EUR?).
- How to decide which to use?
  - Cost of each alternative? Risk tolerance of firm? Corporate policy for exposure to transaction risk?

Managing Translation Risks

- This is not a cash risk. It is a paper risk.
  - How big a deal if it is not a cash risk?

- Accounting exposure arises when the financial statements of foreign affiliates (stated in foreign currency) must be restated in the parent company's currency for the preparation of consolidated financial statements.

  - The translation of the foreign affiliates assets and liabilities (and possibly derivatives) may result in an increase or decrease in the parent company's net worth and reported net income due to changes in the exchange rate since the last report.

- Main alternative:
  - Balance Sheet hedge

Managing Translation Risks

- *Balance Sheet Hedge*: the firm maintains an equal amount of foreign currency assets and liabilities on its balance sheet to remove the net exposure. How to do this:

1. Convert (or not) existing cash into the parent company's domestic currency immediately (control foreign assets on the balance sheet).
2. Delay (or speed up) the repayment of subsidiary debts (control foreign debts on the balance sheet).
3. Forward or Money Market hedges: if the parent has a net asset (liability) FX exposure due to the subsidiary, have the parent firm add an equal sized liability (asset) in the foreign currency to offset it.

- The goal is to decrease the **net** value of foreign assets that need to be converted to the domestic currency.

Summary: Managing Translation Risks

- For our example we could, for example:
  - Pay out the 100,000 Euros from cash and convert to dollars. This would decrease the value of the asset.
  - Parent firm could borrow 500,000 Euros to have total Euro liabilities on its balance sheet that offset the Euro assets from the foreign affiliate.
  - Parent firm could take on other types of Euro liabilities such as forward contracts etc.

Managing Operating Risks

- They are long-term risks that can be influenced by many unknown events. We will focus on changes exchange rates.
- Some alternatives to hedge operating risks:
- Matching currency cashflows: offset a continuous stream of future foreign income with foreign debt requiring a corresponding set of payments.
  - This is similar to a series of forwards financing domestic debt.
- Credit Market Swaps: two firms in different countries borrow long-term in their home country and make the payments for the other company (swap) using their stream of foreign income. This keeps the liabilities on the firms' books in their home currency.
- Diversify operations across countries (natural hedges)

Summary:
Managing Operating Risks

We have 100M Yen cashflows guaranteed every year for the next 10 years.

- *Matching currency cashflows*: borrow Yen for 10 years. Every year make 100M Yen payments (both interest and principal). In 10 years the debt is repaid. This is similar to a series of forward contracts to sell 100M Yen every year for 10 years to pay a domestic debt.
- *Credit Market Swap*: borrow US dollars for 10 years and swap this with a Japanese firm having borrowed Yen for 10 years. We make their 100M Yen interest payments and they make our USD interest payments. This keeps the liabilities on the firms' books in their home currency.
- *Diversify operations* across countries so there are some cashflows outflows in Yen as well.

What Do Canadian Firms Think?

- Canadian firms are risk-averse. 75% would be willing to accept lower profits to have lower uncertainty in profits.
- Fluctuating exchange rates is a major concern for trade-engaged businesses because it can result in unpredictable profit margins.
  - In industries where profits margins are tight, (e.g. wood products, automotive, textiles) short-term swings in the value of the Canadian dollar can easily lead to losses.
  - Profit volatility negatively impacts the firm's ability to access bank lending, since it increases risk for bankers analyzing a firm's income statements.
- Most firms that managed foreign exchange risk are doing so to protect profit margins on export sales.
  - In fact, 85% said this was their primary objective in managing foreign exchange risk; followed by increasing the predictability of profits which was a key objective for 55%.

Source: http://www.edc.ca/english/docs/fx_currency_risk_management_e.pdf

Who is Hedging Currency Risk?

- Survey of currency derivative use by firm size. The sample was 372 large U.S. firms for fiscal year end 1991 that had foreign exchange rate exposure as of fiscal year-end 1990. Companies are among the 500 largest (by sales) companies in the Fortune 500:

4th Quartile	(largest firms)	75.3%
3rd Quartile		38.7%
2nd Quartile		34.3%
1st Quartile	(smallest firms)	17.2%

Source; C. Geczi, B. Minton and C. Schrand "Why Firms Use Derivatives," *The Journal of Finance,* September 1997.

How are they Hedging FX Risk?

Type of Instrument	Frequency of Use
Futures/Forward Contracts	94%
Option Collars	10%
Swaps	8%
Options	6%

Source: Wells Fargo FX Risk Management Survey, 2011