2. How Do Firms Manage Financial Risk?

FRM Part 1: Foundations of Risk Management

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1 Modern Imperative to Manage Risk

Why do firms today stress the important of finance risk management?

- Need: As markets liberalized in the 1970s, financial risks grew as price volatility shot up
- Opportunity: The growth in market volatility helped spawn new financial instruments, allowing for more opportunities to manage risk

1.1 The Risk Management Road Map

The risk management process is continuous and it iterates between the following milestones with their various characteristics:

1. *Identify risk appetite*
    - process of identifying corporate goals and risks
    - identify which risks should be managed
    - create a *risk appetite statement* in *broad* terms
2. *Map risks*
    - map risks (defined later)
    - assess and measure risk and impact
    - perform a risk-reward analysis of the risk management strategy
    - choose strategy
    - create a risk appetite statement in *detailed* terms
3. *Operationalize risk appetite*
    - express the risk appetite in operational terms
4. *Implement*
    - choose tactics and instruments to implement the risk strategy defined
5. *Re-evaluate regularly*
    - regularly re-evaluate risk management to capture any potential changes in risk appetite, business activity, etc.

1.2 Risks from Using Risk Management Instruments

Risk management instruments allow firms to hedge economic risk exposures but they can also introduce other types of risk exposures.
Some of these instruments can easily go from being used to hedging a position to becoming a speculative asset if used incorrectly and increasing a particular risk exposure that is associated with that financial instrument.

A good hedging philosophy is that just because a position can be hedged, doesn't necessarily mean that is should be hedged.

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2 Risk Appetite

Risk appetite is the amount and types of risk a firm is willing to accept.

Risk capacity is the *maximum* amount of risk a firm can absorb.

In the modern era, the risk appetite statement is a board-approved statement that is meant to guide management and inform investors.

Practically, the risk appetite is

- a literal statement about the firm's willingness to take risk in pursuit of business goals usually in the form of a board-approved internal document
- the sum of the mechanisms linking this statement to day-to-day risk management operations

Note these two concepts aren't the same. Risk appetite generally should be set well below a firm's total risk bearing capacity and above the amount of risk the firm is currently exposed to. This ensures the firm could absorb more risk if necessary due to some unforeseen event and be able to remain solvent.

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3 Risk Mapping

Mapping risk is a way to recognize important netting and diversification effects and to put in place a plan for increasing these effects over the years. It should not ignore risks that are difficult to track in terms of exposure and cash flow.

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4 Strategy Selection

After identifying and mapping risks, the next step for the risk manager is to prioritize by defining the important/ urgent/severe risks.

Next, the firm needs to assess the costs and benefits of the various risk management strategies. This leads to a decision needing to be made by the firm on how to handle these risks.

Typically, one of four actions can be taken:

- *Retain* - the firm accepts the risks partially or in their entirety, this can often be expressed as "the cost of doing business" in many cases
- *Avoid* - a firm may want to sidestep a risk entirely if they regard it as "unnatural" to their business, this can sometimes result in stopping or not engaging with a particular business transactions or activity
- *Transfer* - a firm can use some kind of financial instrument or insurance to transfer the risk to a third party; this is often in the form of insurance, financial derivatives, and securitization
- *Mitigate* - a firm can attempt to mitigate some of its risks in various ways that are specific to the type of risk exposure
  - E.g. To mitigate credit risk (losses from default), a firm can ask the obligor for more collateral.
  - E.g. A firm can mitigate pricing risk of fuel by investing in more efficient motor vehicles.

The board and senior management (c-suite) are typically the ones tasked with choosing one of the above strategies. It is the risk managers duty to provide input to help them choose the strategy while staying within their prescribed risk appetite.

An important but difficult part of the risk management strategy selection is factoring in costs. Costs aren't always transparent and in some cases can be potentially harder to quantify.

Once the strategy has been selected, the firm need to make sure to *rightsize* the risk management strategy. This involves allocating the proper amount funds and resources so the team carrying out the risk management strategy can function correctly.

Part of rightsizing is to choose and implement *risk limits*. Risk limits are a threshold used to monitor the actual risk exposures of a specific risk or activity to ensure the level of risk remains within tolerance. Once we've observed a risk limit has been reached, we then need to re-evaluate the risk and determine what action to take.

The types of risk limits include:

- *Stop loss limit* - set the loss threshold which limits losses from escalating beyond a stop limit price
- *Notional limit* - sets the notional exposure parameters (wut?)
- *Risk specific limits* - target a very specific risk and set a limit for it
- *Maturity/Gap limits* - minimize the amount of transactions that mature in any given period
- *Concentration limits* - sets tolerance levels for concentration exposures
- *Greek limits* - an options specific limit relative to the values of the Greeks
- *VaR* - an attempt at an aggregated risk threshold
- *Stress testing or scenario analysis* - risk at specific stress points and combinations of them

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5 Hedging Operational and Financial Risks

Hedging operational risks covers activities in production and sales. This type of hedging affects *income statement risks*. Recall, an *income statement* shows a company's revenues and expenses during a particular period.

Hedging our financial risks relates to a firm's *balance sheet risks*. Recall, a *balance sheet* is a financial statement that reports a company's assets, liabilities, and shareholder equity at a specific point in time.

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6 Pricing Risk

Input costs can have significant impact on a firm's ability to conduct business in a competitive manner. So the firm's *pricing risk* refers to the fluctuations in price for things needed for revenue.

To hedge against price of input risk, we can use derivatives such as forwards or futures contracts to buy a specific quantity of our inputs at a fixed cost to make this an *expected loss* determined in advanced.

Doing this will ensure that we know the costs of losses beforehand, allowing for better financial and risk planning.

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7 Foreign Currency Risk

The goal when dealing with foreign currency risk is to control our exposure to exchange rate fluctuations that impact both future cash flows and the fair value of assets and liabilities.

One way to hedge against this is to use currency put options or forward contracts. This is because we want to focus on the impact of foreign exchange rate fluctuations on net monetary assets and forwards allow for a fixed amount at a fixed changed rate that would offset any impact of rate changes on net monetary assets.

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8 Interest Rate Risk

The goal of hedging interest rate risk is to control exposure to unfavorable interest rate fluctuations.

One method of hedging against the interest rate fluctuations is to use swaptions that protect against losses and minimize borrowing costs.

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9 Static and Dynamic Hedging Strategies

Static hedging strategies are when the risky investment strategy is initially determined and an appropriate hedging vehicle is used to match that position as closely as possible to minimize basis risk. This can be thought of as a one time action.

Dynamic hedging strategies recognize the attributes of a risky position may change with time and these create or find positions that can change with it. Dynamic hedging is more complex than static hedging and can also be time consuming. Dynamic hedging can also incur large transaction costs if they are updated too frequently.

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10 Risk Transfer Toolbox

If the risk management strategy involves transferring risk to a third party, there are few different tools the risk manager has at their disposal to do so. These financial instruments each have unique characteristics and capabilities that allow for different types of risk transfer.
The can even be combined to create a complex hedging strategy.

The instruments can be *broadly* classified into the the following (Note: this is simply a brief overview, these instruments are explored in detail in different sections of the FRM curriculum):

- *Forwards* - a tailored agreement to exchange an agree upon quantity of an asset at a pre-agreed price at some future settlement date; the asset may be delivered physically or cash settlement
  - forwards are an OTC agreement (i.e. not found on an exchange)
- *Futures* - an exchanged-listed forward with standardized terms, subject to margining
  - note the difference between a forward is this derivative uses an exchange as an intermediary instead of a contract directly between two parties
- *Swaps* - an OTC agreement to swap the cash flows (or value) associated with two different economic positions until the maturity of the contract
- *Call option* - the purchaser of a call option has the right, but not the obligation, to buy the underlying asset at the agreed upon strike price at the maturity date (Euro) or at any point during an agree upon period (American)
- *Put option* - the purchaser of a put option has the right, but not the obligation, to sell the underlying asset at an agreed upon strike price at the maturity date or at any point during an agreed upon period
- *Exotic option* - options that exist beyond the plain vanilla puts and calls
- *Swaption* - the right, but not the obligation, to enter a swap at some future date at pre-agreed terms

Exchange-traded derivatives are good for liquidity, low transaction costs, and reduced counter-party risk. However, they are subject to *basis risk* since they are standardized and may not be an exact match to a risk manager's needs in terms of underlying timing or location of delivery.

To reduce basis risk, consider OTC products that can be highly customized to fit your exact risk exposures, so think forwards, calls, and swaps.
Again, these are simply brief definitions of these derivatives and they'll be explored in-depth in book 3 of the FRM

curriculum, *Financial Markets and Products*, so don't worry about not fully understanding them yet.

You can also refer to *Derivatives for the Trading Floor* by Boyle and McDougall for further detail as well.
