WORLDQUANT UNIVERSITY

Financial Markets Module 1

MSc Financial Engineering

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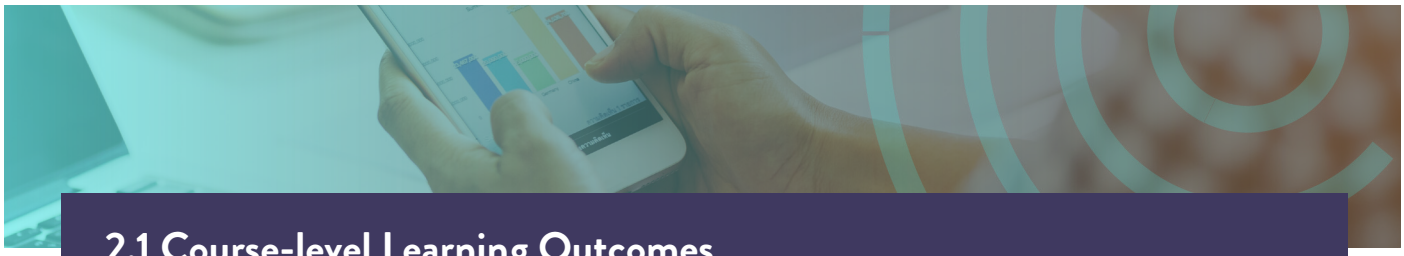
1. Brief

This document contains the core content for Module 1 of Financial Markets, entitled Market Regulation. It consists of four video lecture transcripts, four sets of supplementary notes, and a peer review question.

2. Course Context

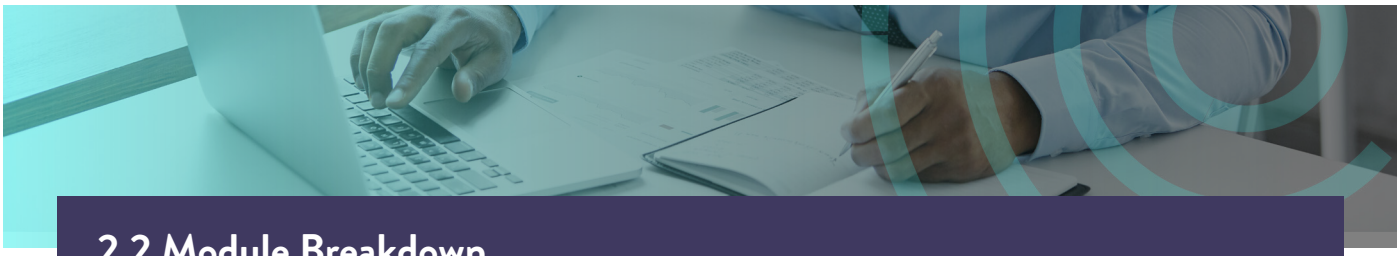
Financial Markets is the first course presented in the WorldQuant University (WQU) Master of Science in Financial Engineering (MScFE) program. The course sets the tone for the wider program, providing the context for the field of financial engineering, while introducing learners to the financial markets, the analysis of market events and the valuations of financial instruments.



2.1 Course-level Learning Outcomes

Upon completion of the Financial Markets course, you will be able to:

1. Describe the types and components of financial markets.
2. Identify and define the key characteristics of financial instruments.
3. Evaluate the different ways in which financial instruments can address risk.
4. Perform valuations of simple financial instruments (especially bonds and options).
5. Understand the impact of credit risk within financial markets.



2.2 Module Breakdown

The Financial Markets course consists of the following one-week modules:

1. Introduction to Financial Markets
2. Market Regulation
3. Interest and Money Markets
4. Fixed Income and Bond Markets
5. Stock and Equity Markets
6. Futures, Options and Derivatives
7. Market Making and Trading

3. Module 1

Introduction to Financial Markets

Beginning with a brief history of financial markets, the first module introduces key components such as the different types of financial markets, role players within them, and functions that these markets serve. Later in the module the focus shifts to probability, the impact of risk in financial systems, and the ways in which financial instruments can be used to address it.

3.1 Module-level Learning Outcomes

Upon completion of the Introduction to Financial Markets module, you will be able to:

1. Understand the elements that make up a financial market.
2. Evaluate various market events.
3. Understand the role and potential impact of risk within financial markets.

3.2 Transcripts and Notes

3.2.1 Transcript: A Brief History of Financial Markets

Hello and welcome to Financial Markets, the first course in the WorldQuant University Master's in Financial Engineering program. My name is Bryony Ortlepp, I am your lecturer for this course, and in this – the first video of Module 1 – I'd like to introduce you to the subject of financial markets.

We'll begin this module by taking a brief look at the origins of financial markets and the various key elements within a financial market. This will lay the foundation for us to launch into the fundamental principles of risk and risk management. Overall, this module will set a theoretical platform for the rest of the financial market content that form part of this course. So, with that in mind, let's begin.

Ask ten people to define financial markets and it's likely you'll get ten different answers. The name may conjure thoughts of Wall Street billionaires in suits, the great recession, big banking or frantic trading floors. But when pushed, it's not an easy thing to define, even though all of us are subject to its influence.

For this reason, we'll begin by spending some time unpacking the foundational principles and processes that constitute the vast interconnected web that is global financial markets.

The pre-cursor to our modern-day financial markets had its roots in necessity. In other words, someone had a good or service they could render, and at the same time had a need to fulfil. For example, a person who had a boat and was able to fish was able to supply their surplus fish to someone who did not have a boat yet needed to eat.

Let us suppose the person without a boat was a strong and skilled builder. The fisherman would be able to trade their catch – a good – in exchange for the builder building them shelter – a service. This may be a very crude example, but it highlights the underlying, foundational principles of a market system. First, there must be a need or a want. Second, there must be an ability and

willingness to meet that need. And lastly, there must be an agreed-upon value attributed to the good or service.

This illustrates what today is known as a barter system. However, as the complexities of trade grew, and economies expanded, it became necessary to create a universally accepted tender for the trade of goods and services against which the value of these items could be benchmarked. This led to the introduction of money as recognized legal tender. There was suddenly a way for those with more highly valued skills or goods to store up surplus tender, and thereby increase their access to other goods and services. The development of legal tender gave rise to an explosion of trade in goods and services that resulted in a plethora of systems, processes and technologies which today constitute our global financial system.

As the means to acquire evolved, so did the methods that we use to spend, save, invest and trade. Markets – centralized places of trade – were created to enable people to advertise their needs and offerings in a more public domain. Through markets, forces of supply and demand determine the prices of goods and services. As technologies have improved, isolated marketplaces have also begun adapting and integrating into a globalized, regulated and ultimately digitized arena.

Modern day financial markets are ever-functioning, ever-expanding, and deeply interconnected – even to the point that this interconnectedness can sometimes be to the detriment of the system as a whole, as we will learn in the second module which concerns market regulation.

With this historic context in mind, it is now necessary to understand the key functions of financial markets, as well as the major players that operate within the system. For this, please refer to the first set of supplementary notes. If you have any questions, remember to post and up-vote them on the forums so they can be addressed in the next live lecture.

3.2.2 Notes: Functions, Role Players and Types

During the initial phase of financial markets' development, markets arose from the need for participants to reciprocally exchange goods and services. This was in order to exchange their diverse goods and services for others that would allow them to satisfy a spectrum of desires and needs.

However, as these markets developed over time, and became more sophisticated through refinement, so did the reasons for them, the participants in them and the financial instruments themselves.

Functions

The primary reasons participants go to market are:

To raise capital

Participants who wish to raise funds for operations and other business activities can approach financial markets as a source of raising capital, knowing that a larger market offers a greater chance for:

- Competitive repayment terms (i.e. lower interest repayments),
- More favorable payment horizons (short-term vs long-term), and
- Better capital liquidity (ease of access to cash).

Profit incentive

Participants are always seeking to put their money to the best possible use. The profit incentive drives more active lenders to the table, creating forces of competition which drives prices down. This competition also spurs technological advancement which seeks to leverage efficiency in process and service.

Management of risk

Every investment carries some degree of risk. The higher the risk, the higher the risk premium which is applied in order to compensate for this risk. However, in an efficient market, it is not enough to hope that the risk premium covers the potential risk of loss. Instead, participants can hedge their risk – that is to say, they can make alternative investments that cover the initial investment's potential loss.

The prominent role players that participate in international financial markets include:

Role players

Governments

Sovereign states are also required to raise capital, sometimes in order to:

- Service debt (i.e. governments sometimes take loans to repay loans),
- Plug short-falls in revenue collection (taxes), and
- Other activities such as infrastructure spending.

Central banks

The role of central banks wvithin financial markets is a point of contention. Historically, the role of central banks was to monitor and maintain monetary supply. However, due the devastation of the last financial recession in 2008, central banks were forced to step in as market makers by flushing economies with cash (a policy known as quantitative easing or QE) in order to prevent economies from stalling. The effects of the intensive global QE cycles are still evident today in the form low interest rates globally, and bond and equity sensitivity to interest rate hikes.

This sensitivity to increases in interest rates has proliferated in the global markets since the start and subsequent 'tapering' of QE. As mentioned above, QE refers to the act of flushing an economy with money. This injection of money into the economy is usually done by the central/reserve bank buying up billions of bonds from banks and other financial lending institutions in the economy. This injection (supply) of money causes the cost of money to decrease due to principles of supply and demand. The cost of money is essentially inflation. In essence, after QE there is so much money in the economy that interest rates are low. When interest rates are low, it's cheap to buy credit (due to lower interest repayments) causing companies to stock up on cheap credit.

Investment banks

Companies that offer various financial goods and services which are often complex and offered on a large scale. Two examples are facilitators of mergers and acquisitions, and companies that act as intermediaries between issuers of securities and buyers of securities.

Insurance and re-insurance companies

Institutions that bear the risk of financial transactions and instruments by investing the premiums their clients pay into what are considered low-risk investment facilities, such as Treasury bills and government bonds.

Clearing houses

Clearing houses refer to companies that facilitate all activities between the commitment of a transaction until that transaction is settled in bulk. Some of these activities include clearing trades, settling trading accounts, and reporting of trading data. Clearing houses also ensure members have sufficient balances in order to pay for their traded goods/services.

Dealers / intermediaries / brokers

Institutions and agents that act as middle-men, often not having the necessary licensing to act as a bank. They thus merely facilitate financial transactions on behalf of other parties, including banks and public investors.

Market types

With a better understanding of the functions and role players, it is now important to introduce the different specialized markets that fall under the umbrella term of 'financial markets', as well as the different methods through which capital is raised within each of them:

1. Money markets
2. Capital markets
3. Currency markets
4. Commodities markets
5. Other markets

Money markets

Money markets refer to markets where highly liquid, short-term financial instruments are traded. Although there is no set period that defines 'short-term', the rule of thumb is that these instruments have a maturity of one year or less.

The instruments that are traded within the money market environment are comparably low in risk and volatility, especially when compared to those in capital markets. Money market instruments include:

- Deposits
- Certificates of Deposit
- Treasury Bills
- Commercial Paper

Capital markets

Capital markets refer to markets in which institutions with longer investment/financing horizons will participate, in order to access capital that they can use to fund their activities. Two main avenues for engaging in finance and investing activities in the capital markets are debt and equity.

Debt

In debt markets, institutions take on debt as a means of securing financing. They can issue bonds which guarantee fixed interest repayments (coupon rate) for a known time period, in return for an initial capital sum provided by the bond holder (face value or par value). The bond's face value is later repaid by the bond issuer (the bond principal) at the maturity of the bond.
The most prominent bond issuers within debt markets include:

- Government (sovereign debt)
- Corporate
- Treasury
- Municipal

Equity

In equity markets, institutions can raise capital by selling a portion of the company – which is divided into smaller components called shares/securities – then issuing these to investors. The investors are willing to purchase these shares in anticipation of dividend payouts (i.e. retained company earnings which are deferred to shareholders) and/or share price gains (i.e. capital gains).

The most prominent form of instrument traded in equity markets are securities (a.k.a shares or stocks) that are available as:

- Preference
- Common

Currency markets

Currency markets refer to financial markets that institutions use to trade various world currencies. Effectively, the currency markets enable these institutions to convert one national currency into another, thereby enabling these institutions to participate in international trade and investment. They also facilitate the crucial supply of currency for foreign exchange reserves, which are required by governments and central banks to hold in order to pay for foreign trade and investment.

Two primary avenues for trading in currency markets, are spot markets, and futures markets. Spot markets refer to markets in which the trade of instruments or commodities that are for immediate transfer are made. Futures markets refer to marketplaces in which the trade of instruments or commodities that are for future delivery are made. The instruments traded in these markets are called futures contracts. Futures contracts are traded instruments which stipulate the transfer of a specific instrument or commodity, at a specific quantity and quality, at a specific date in the future.

Commodities markets

Commodity markets refer to markets where institutions engage in the trade of perishable goods, such as natural resources and agricultural produce. However, since the value of these commodities are extremely volatile, companies typically do not engage in 'spot trading'. Instead, the primary instrument traded in commodities markets are derivative contracts, including but not limited to futures contracts, that specifies transfer at a future date. Equally commodities markets are public, and therefore allow investors to acquire and trade commodities exclusively for profit.

Other markets

There are many other types of markets with the global financial markets, for example:

- **Derivatives** markets which primarily deal with risk management/hedging,
- **Futures** markets which provide contracts for trade that are set at a specified future date, and
- **Interbank** lending markets are the markets that banks use to provide loans to one another.

3.2.3 Transcript: Elements of Financial Markets

As Newton's third law succinctly states, "For every action, there is an equal and opposite reaction". Although this was meant to be applied to the laws of motion, it rings true for financial markets as well. The intertwined nature of the buyer/seller relationship, combined with readily available information and the speedy processing of transactions, makes for a system that acts and reacts almost in unison.

In the previous section we grasped the purposes of financial markets, the role players within them, as well as the different types of financial markets. In this video we will explore a few other important delineations.

Debt markets versus Equity markets

As you would have read in the first set of notes, capital markets include **debt markets** and equity markets. In debt markets, institutions such as governments and municipalities issue financial instruments called bonds. These are fixed-income instruments that are denominated in a certain currency, and they specify the bond's coupon rate and maturity. Bonds are considered fixed income because the interest payment and date of maturity are specified in advance.

Equity markets, also known as stock or securities markets, are a meeting point at which company shares are issued and traded. Equity markets are vital to the market economy as they give companies access to capital and allow investors to become equity holders by owning a portion of a company.

Primary markets versus Secondary markets

Capital markets can be further delineated into primary and secondary markets. The **primary market** is the component of the capital market where institutions issue securities such as equity and preference shares through initial public offerings (known as first-time share offers). They are for investors who want the first chance at new investment opportunities. These companies or individuals may buy up new stock and retain it as privately held without it ever hitting the public market.

After the securities have been allocated to private investors, trading of these instruments begins in the **secondary market**. The purpose of secondary markets is for investors to engage in the back-and-forth trading of securities; rather than for companies to trade self-issued stock. In secondary markets, pricing can be affected by new information, liquidity shocks, and poor company performance.

Exchange markets versus Over-the-counter (OTC) markets

In **exchange markets**, such as the New York Stock Exchange, buyers and sellers simultaneously enter competitive bids and offers. Instruments are then traded if bids (proposed buying prices) are as large as offers (prices at which sellers are offering instruments). Matching bids and offers are coupled together and, once paired, the orders are executed.

An **over-the-counter (OTC) market** on the other hand, involves trades that are not centralized in an exchange. OTC trades take place directly between the buying and selling counterparties, possibly with intermediaries, but not under the supervision of an exchange. There is greater flexibility in OTC trades, as the parties can customize arrangements to their particular needs, while the transparency and liquidity offered by an exchange is sacrificed (exchanges publish price and other information and draw many traders to one place).

Spot/Cash and Futures markets

We have already discussed spot and futures markets in relation to currency markets, but **spot markets** in fact refer to any market type in which instruments and commodities are traded for immediate delivery through an exchange or OTC. The pricing of the goods or services bought and sold here happens almost instantly.

Similarly, **futures markets** refer to any market which trades in specialized derivative contracts, known as futures contracts. The pricing of these instruments is derived from the underlying instrument on which it is based; and in these markets participants buy and sell contracts for delivery due on a future date. Those trading in commodities trade in commodity derivatives as well. In the 1980s, there was a major upturn in the popularity of derivatives contracts when people began to trade financial futures on interest rates, stock indexes, and other instruments.

The variety of markets that exist today gives us great insight into how trade has developed over time. We, as a species, have managed to achieve incredible things only because we have had the ability to interact with one other and share our resources with each other. These markets – through their variety and ingenuity - have given us that ability.

3.2.4 Notes: Elements of Financial Markets (Part 2)

Thus far, our examination of financial markets has primarily focused on distinguishing and understanding various features that make up and drive how financial markets work. Here, we turn our focus to additional aspects that are not only by-products of the markets but also driving forces behind them.

Price determination and discovery

One of the underlying principles of market systems is that there must be an agreed-upon value attributed to a good or service. Price determination and price discovery refer to two processes according to which such a value may be set.

Price determination refers to the broader market price of a security, good, service or other instrument that is determined by the general level of what buyers are willing to pay and what sellers are willing to earn. This is affected by the general demand vs supply for the instrument.

Price discovery is the more specific agreement between buyer and seller in relation to the market context at the time of the trade. The instrument may be in high demand, or in excess supply. It may be of high quality in relation to its counterparts, or it may be of poor quality. These and other factors have an effect on the price of the specific instrument in question.

Think, for example, of how you would sell a car. First, you might establish the price by determining what other similar cars are sold for. Then, once a buyer has shown interest, you and they would determine a price based on the specifics of the car.

Information aggregation and coordination

In financial markets, the speed and accuracy with which information can be delivered to market participants has a direct effect on the returns that can be made. It is no wonder that the areas surrounding the NYSE (New York Stock Exchange) have some of the most advanced processing technologies in the world. A trade can be executed in less than half a millionth of a second – more than a million times faster than a human being can make a decision – because technology has automated each step from order to payment.

Not only are trade speeds fast, but quantitative trade data is also easily and cheaply displayed on platforms throughout the world for anyone to access in real-time. Simply by visiting a website, anyone can see spot (real-time) prices for almost any publicly traded financial product or instrument available. The intense competition of the markets drives the development of these technologies and information platforms, which in turn fuels more efficient, competitive markets.

Risk sharing

Risk sharing refers to the division of risk among more than one party so as to minimize the impact of loss. Another characteristic is that the risk is shared among those who have similar or equal risk of loss. It differs from insurance, which involves the transfer of risk from one party to another.

In traditional insurance, the associated risk is assumed to be known and, because the risk is known, the insurer can calculate, and therefore charge, a premium which the risk-averse party is willing to pay. Risk sharing differs from traditional insurance products in that the probability of loss is not fully known (as in the case of a new product).

For example, if a client (institution or government) requires a substantial loan from a bank, the bank may approach other banks and request that they assist with the risk by funding a portion of the loan each. This prevents the original bank from taking on the full risk of loss in the event the client defaults on their debt repayments.

Liquidity

Liquidity refers to the ease with which an asset can be converted into useable tender (cash mainly). It is an important concept in financial market practices, as it enables market participants to achieve their desired goals. Buyers and sellers want to be able to convert their product into cash as quickly as possible in order to meet the profit incentive (for investors in equity markets) or the borrowed principal sum (for lenders e.g. in the bond market) that motivated them to approach the market in the first place. This can only happen in a market arena that is constituted by efficiency of processes, shared information and availability of funds.

Where a market is illiquid, buyers and sellers are at risk of loss due to the time exposure involved. The recent boom and subsequent sell-off in crypto-currencies is a good example. During the sell-off period, there were so many sell-side instructions that exchanges were neither able to process them in time nor match the sell-side to an appropriate buy-side order. This left crypto traders sitting on their hands unable to trade, as they watched the value of their holdings dwindle.

By the time their trades were processed, their losses were exacerbated due to the illiquidity of the market or exchange.

Efficiency

Efficiency in a financial context refers to the fact that the specified prices reflect all available information regarding the particular instruments, making it impossible for participants to outperform the markets over time. The Efficient Market Hypothesis (EMH) states that: "asset prices fully reflect all available information. A direct implication is that it is impossible to 'beat the market' consistently on a risk-adjusted basis since market prices should only react to new information or changes in discount rates (the latter may be predictable or unpredictable)." Though the theory is by no means watertight, it draws our attention to an important aspect of price setting in the global financial market: that prices are driven upward or downward to the point at which the available information reflects an equilibrium price.

In practice, let's look at an example below:

If two different exchanges, the NYSE and the LSE, offered the same stock ABC Ltd on their platforms, and the NYSE sold ABC Ltd stock for $10, but the LSE sold ABC Ltd stock for $10.50, it could be assumed that the market could simultaneously buy up the cheaper ABC stock on the NYSE and sell it for more on the LSE.

This buying of shares on the NYSE would – through forces of supply and demand – drive up the price of ABC Ltd on the NYSE, while the selling of ABC Ltd on the LSE would drive down the price on that exchange. This would go on until the prices find equilibrium. This example – which is an example of arbitrage - gives a good indication of the efficiency of the market in practice.

3.2.5 Transcript: Risk and Probability

Imagine this scenario: You are standing at a casino table. You have one die in your hand and need to roll a six in order to win $1000. The stakes are high. If I were to ask, what is the probability of you rolling a six and winning big, what would your answer be? Most people would probably say you have a 1-in-6 chance of rolling a six. But they would be wrong.

You see, I forgot to mention that this dice has 10 sides.*

This example is sneaky, but it nevertheless reflects some important aspects of probability and risk.

However obvious this may sound, in order to determine probability, sufficient information is always a necessity. In the example, we had the information of a dice being rolled, and from that we could draw certain assumptions about the probability of rolling a 6.

Had I asked, "what are the chances of a person ordering a diet coke", you would need to know how thirsty the person is, and, of course, whether purchasing a diet coke is even possible at that moment. You'd be relying on pure guesswork.

Secondly, there are certain aspects of uncertainty that can easily be overlooked when approaching probability and risk determination. A dice usually has six sides, but not always. Unexpected or unlikely scenarios can never really be eliminated, and of course when they do occur they can thus be very difficult to quantify.

Risk lies in the probability of losing – which in our example equates to rolling any number other than 6. In the context of financial systems, risk lies in the potential for loss in the value of a given asset. This is a concept we will unpack later in the course.

Probability, on the other hand, is the likelihood of an event occurring, given the full set of possible outcomes. It assumes that some information about an occurrence is known, and that this information can be used to calculate the likelihood of an outcome occurring.

This is a fundamental (but not flawless) principle in financial risk assessment and management. If one does not have the appropriate information regarding an event, one cannot interpret the likelihood of that event occurring.

* Example sourced from article - https://www.glynholton.com/wp-content/uploads/papers/risk.pdf

In a market system, this relates to a financial institution or agent that does not have sufficient probability-related information to attribute an appropriate premium, charge, or interest rate to cover that event.

In a financial system, market participants are ultimately seeking to understand the value of an asset versus the risk of potential loss in relation to that asset. This is in order to determine an acceptable risk premium. Failing to do so with some degree of accuracy may mean over-paying for loss cover (which is in itself a type of risk of loss). From an insurer's point of view, undercharging for asset cover may lead to under-developed savings pools, exposing them to potential pay-out defaults.

In the notes to follow, we build on this foundational understanding to explore some of the techniques used by participants in the context of financial markets to manage risk.

3.2.6 Notes: Managing Risk in Financial Markets

Risk poses a universal threat to all market participants, which makes it necessary to manage. In approaching the field of risk management, it is useful to consider some additional characteristics that define financial markets. Owing to their competitiveness and focus on profit, participants in financial markets are always driven by a universal desire to protect their assets from loss. The ability of participants to mitigate potential losses is another important factor. To cover risk, they need to be able to pay for it.

Basic insights such as these have given rise to the development of many techniques that market participants rely on in order to manage risk. Below we explore four of these techniques. Each has a different approach, but all can clearly be observed when analyzing market participants and the financial instruments they use.

Avoidance

The first, and perhaps most obvious risk management technique, is avoidance. It is quite extreme and offers very little, if any, reward for the participant. An institution that is 100% risk averse would seek investment opportunities that charge them no risk premium – that is to say, assets that have not had a risk charge built into their capital repayment structure. An example of this would be investing in US Treasury Bills (or T-bills). This specific financial instrument is considered risk-free as it is backed by the US government which has never defaulted on its loan repayments.

It is obvious to see, however, that this risk-free approach only relates to default risk – i.e. the risk of the issuer missing repayments. Avoidance does not protect against inflation which erodes the value of money over time. It can therefore be argued that if inflation is present in the market environment, there will always be a risk of loss through inflation, even though default risk may be avoided through this technique.

Loss prevention or reduction

A second form of risk mitigation is loss prevention and reduction, in which risk is accepted while steps are taken to minimize the potential loss. Hedging is a popular and well-known example. It is a technique whereby the participant (or an agent acting on their behalf) will take the opposite position of their trade (known as an inversely correlated position). In this way, risk is mitigated as they stand to gain from either outcome, albeit to varying degrees.

Suppose you run a transport business. Fuel is therefore one of your largest expenses. You have heard that there are going to be cuts in the global supply of oil, which means the price of oil, and therefore fuel, is likely to increase in the coming months. This increase in expenses would harm your profit margin, so you decide to hedge your risk through a futures or forward contract which allows you to buy oil at a predetermined price at a date in the future.

Let us assume oil is priced at $50 per barrel. You buy oil, for delivery in six months, through a futures contract at a $60 per barrel future price, and six months later the oil price is $70 per barrel. You have offset your price risk by $10 per barrel ($70 - $60 = $10). In doing so you have essentially paid $10 less by buying oil ahead of time. Note, however that this saving is not strictly $10, since there may be costs associated with holding the asset until you need it.

Diversification

Known colloquially by the expression "Don't put all your eggs in one basket", diversification is a common technique, particularly in cases that involve risk management in securities and bond markets. The approach of this method is to minimize the potential for loss by pooling assets with different risk weightings in the most risk-efficient manner. In this way, investors can decide what risk they are willing to accept. They will then weigh up their 'risk appetite' against the return they seek to earn; and create a weighted investment that meets these goals.

Transferring risk

This technique mitigates risk by moving it from one party to another. This is done on the theoretical basis that the risk-averse party is willing to pay the loss-covering party a premium. An example of this is an insurance policy whereby a party pays frequent premiums. These premiums are determined by taking into account a variety of factors, such as:

- The size of the potential loss,
- The likelihood of the loss occurring, and
- The profile of the risk-averse party.

In financial markets, participants can use one or a combination of the four abovementioned techniques to manage their risk. However, it is important to be aware that each approach has its own intrinsic cost. For instance, risk avoidance may remove the risk of non-payment as you are either not involved in the product at all, or you are receiving interest repayments from an entity who will not default (e.g. US government treasury bills).

This, however, still comes at the cost of lower investment returns (lower risk means lower repayment because compensation for risk is lower), which in turn undermines the repayment value through the erosion of the value of money over time due to inflation. Hedging, on the other hand, has an element of speculation which brings with it uncertainty, and therefore even greater risk.

Fundamentally, there is no participant operating in the financial market context that can be completely removed from the effects of risk. The best they can do is to attempt to manage it to an acceptable degree.

3.2.7 Transcript: Instruments for Managing Risk

To provide a foundation for future modules, which deal with specific markets and instruments, in this video we will take a look at various markets and their instruments in relation to risk. In particular, we will focus on market-specific risk, and the instruments that are used to mitigate this risk.

Think back to earlier in the module, when we first touched on the different types of markets. You'll remember we covered the following aspects:

Money markets are characterized by short-term debt. They are considered highly liquid (meaning the instruments can easily be converted into cash) owing to the nature of the associated short-term interest.

When you think Capital markets, think debt and equity. The debt side has interest-bearing instruments such as bonds and debentures. Equities are portions of companies which the investor holds and has certain rights over. The better the company does, the more valuable the share becomes.

Currency markets are where international currencies are traded. This is the most liquid market as the instruments involved are already in cash form. This is also the largest market in the world, trading around 3 to 4 trillion US dollars per day.

Commodity markets are markets where soft goods like coffee, wheat, water, grain, soy beans are sold and bought. They also include the trade of hard goods, like iron ore, gold, platinum and copper. These are characterized by derivative and futures trading where participants look to buy or sell at future-dated prices and magnify their investments by creating greater sensitivity to the underlying assets.

Though integrated, money, capital, currency and commodity markets are not equally sensitive to all types of risk. Market characteristics will determine the most prevalent risks in each market. To briefly elaborate on this, I will now evaluate each of these markets and how risk impacts them.

Money markets

The key characteristics of the money market environment can be summarized as:

- Short-term in nature (< 1 year)
- Highly liquid (ease of conversion to cash)
- Lower repayment volatility and risk
- Lower rate of return

These features mitigate some risks and enhance others. Because interest payments are fixed, there is no real risk of volatility in the income being earned. However, there is risk that borrowers miss their payment or do not pay at all. This is known as default risk.

Capital markets

The key characteristics of the capital markets are:

- Medium-to-long-term horizon
- Higher risk (than Money Market)
- Higher return (than Money Market)
- A high degree of regulation

Capital markets deal with longer-term debt and equity. Generally speaking, longer-term loans hold higher repayment terms due to their prolonged exposure to potentially adverse price or payment risk.

Picture going for a hike in beautiful summer weather. Going for a short walk likely means the weather doesn't have a chance to turn on you, but the longer you're out (like for a five-day hike) the more likely it is that you'll be exposed to adverse conditions. This is true for market conditions too.

Currency markets

The key characteristics of the currency market are:

- Most liquid market
- Subject to price volatility
- Highly regulated
- Bulk trades

Currencies are extremely vulnerable to several types of external risk. Although they are the most liquid in nature, they arguably hold more exposure to political, economic and social risk than any other market or instrument.

An economic leader tweeting something merely interpreted as negative may result in volatility in the currency markets, regardless of the underlying fundamentals of the currency/ies and the validity of the statement. Currencies are extremely vulnerable to several types of external risk. Although they are the most liquid in nature, they arguably hold more exposure to political, economic and social risk than any other market or instrument.

An economic leader tweeting something merely interpreted as negative may result in volatility in the currency markets, regardless of the underlying fundamentals of the currency/ies and the validity of the statement.

Commodity markets

Commodity markets can be characterized by:

- A degree of speculation,
- The trade of physical goods,
- Bulk trades, and
- Futures and margin trading (margin trading is when funds are loaned from intermediaries in order to buy shares, allowing clients to purchase more than they would by themselves).

The greatest risk here is price risk – the risk that prices will move in an adverse direction to the futures trade employed. In this context, a farmer who locks in a future selling price of $100 for grain, will see a reduction in profit if the grain price appreciates to $120.

Now that we've covered the effects of risk in the four main types of financial markets, please refer to the next set of notes where we focus on risk in the context of financial instruments.

3.2.8 Notes: Risk and Financial Instruments

In this set of notes, we conclude the first module by focusing on some of the main financial instruments in relation to the risk they mitigate and are exposed to.

Understanding investment instruments in relation to the risk they mitigate is essential for any market participant. A company can spend massive resources assessing their risk exposure, but ultimately, if they do not use the correct instrument to manage that risk, they will still be exposed to great potential loss.

The alternative is also true. One does not do themselves any favors if they employ an investment instrument without knowing what risk that instrument exposes them to. Think of investing in a company's stock without realizing that its share price can fluctuate with the profit performance of that company. For this reason, we unpack each instrument in its relation to risk a little further below.

Bonds

Mitigation

- Because interest repayment rates (coupon rate) are fixed, and given that the principal is determined before sale, the income earned, and repayments required are highly predictable.
- Information concerning the reliability of the bond issuer is usually readily available through ratings agencies.

Exposure

- Generally, the function that a bond serves for the bond-holder is that it enables them to collect frequent payments, in the form of interest. If these payments are missed or neglected by the issuer, the investor will incur a loss. This is known as issuer, credit or default risk.
- Bonds operate in an interest rate environment. When interest rates rise, the value of a bond decreases. An investor who holds bonds in an interest rate hiking cycle may be exposed to loss. This is known as interest rate risk.

Equities

Mitigation

- Equities offer ownership. Unlike with debt, this means you as the investor are not reliant on a third party for capital payments – although there is an aspect of this in the form of a dividend distribution. The difference here is that equity owners have rights to the capital, and in most cases, they also have voting rights which they can exercise in forcing a dividend payout. If the company in question goes bankrupt, ownership attributes certain rights to the holder which may also minimize loss, even though the normal shareholder does not have first rights to payment.

Exposure

- Equity holders have high price exposure as shares are openly traded. As equities are seen as being longer-term investment instruments, in the short-term they may experience price volatility and devaluation. Generally, an instruments exposure to higher volatility means investors need to spend more time in the market to receive greater returns. However, this is not a rule, as an investor can buy a share today and sell it tomorrow. Although, it is accepted as a long-term market, it ultimately depends on the investors action.
- As mentioned above, a shareholder may exercise their vote to force a dividend distribution, but in cases where profits do not allow for a distribution, the shareholder will experience what is known as dividend risk.

Derivatives

Mitigation

- Derivatives are contractual agreements that specify settlement terms. This means that there is usually some leeway with regard to loss mitigation that allows owners to exercise terms should they feel the markets are not favorable.
- Traders are able to hedge against adverse price movements through futures, forwards, swaps and options, which are covered in more detail in Module 6.

Exposure

- The nature of derivatives is that they are less transparent than traditional investment instruments. They can be bundled into compilations of products which makes it difficult for holders to determine their associated level of risk.
- Derivatives can be very highly leveraged, meaning they are intentionally compiled to be sensitive to the price movements of the underlying asset for

the purpose of increasing returns. This leveraging however, also works in the opposite way and any adverse price movements could see investors' losses magnified through this product.

Unlisted securities

Mitigation

- Unlisted securities do not have to apply the same regulation standards as listed securities do. This means issuers can trade more cheaply and get to market quicker than going through an initial public offering (IPO).

Exposure

- Unregulated markets/instruments are never a haven for safety. Participants in these environments are likely to experience market manipulation and all sorts.

Universal risks

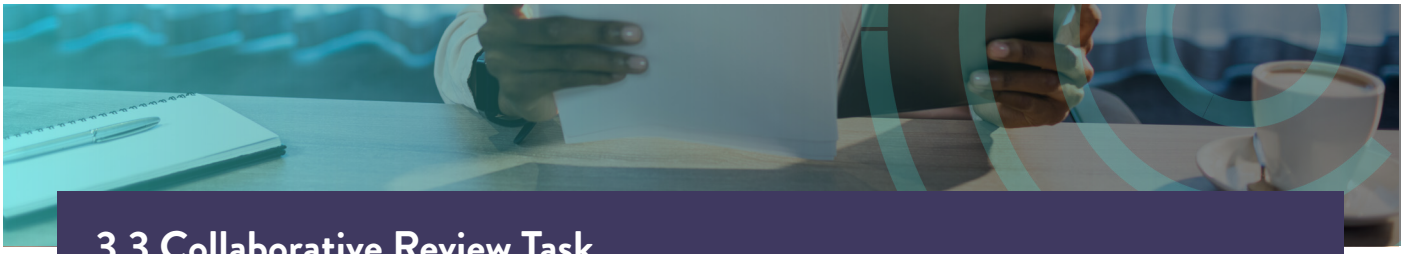
Finally, there are types of risk that cannot be avoided. These types of risks are broadly categorized into two parts:

Systemic risk

This refers to risk that is not isolated to one particular company, trader, intermediary or institution. Systemic risk affects the underlying components of the integrated systems of the entire financial market or even the financial system itself. It is usually very hard to foresee as it can originate from almost anywhere in the system, and when it arrives, both its direct and indirect effects can be severe. This type of risk usually requires an overhaul or serious amendment of the system that perpetuated it. The most recent example of this was the 2008 financial recession, covered in more detailed elsewhere in the program, which was triggered by mortgage defaults in the United States.

Black swan event

A black swan event refers to a risk event that is infrequent (maybe once or twice in a lifetime), unpredictable (you cannot foresee it with sufficient time to act) and catastrophic in its impact. The tsunami of 2004 would fit this description in a natural context. In a financial context, any major and drastic turndown, such as the dot-com bubble of 2000, fits this description.



3.3 Collaborative Review Task

In this module, you are required to complete a collaborative review task, which is designed to test your ability to apply and analyze the knowledge you have learned during the week.

Question

Case study

In its day, the collapse of energy conglomerate Enron was the largest corporate bankruptcy in history. Enron, a darling of Wall Street, which had won many awards for innovation and was highly regarded as a pioneering energy giant, was brought to its knees. The fallout from a governance, investment and commodity perspective was unprecedented.

Using the case study 'Enron Scandal: The Fall of a Wall Street Darling', and documentary 'Enron: The Smartest Guys in the Room' you are expected to apply your knowledge of:

- Financial markets,
- Financial instruments, and
- Risk.

Specifically, in the context of risk within financial markets, provide:

1. An analysis of the role financial instruments played in the downfall of Enron.
2. An analysis of the broader market effects resulting from the rise and fall of Enron.
3. Recommendations of risk mitigation techniques that could have been applied to minimize Enron's risk profile.