

Investment Management
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Lecture - 04
Ecology of Financial Markets

Hello, there. Welcome back to the course Investment Management. And so far, we have discussed about the investment process and what are the different securities or financial assets that are available for investors to put their money. In this session, we will talk about how the trading of those financial securities take place and what are the roles of demand and supply in the market. So, basically, we are going to talk about in this session, Ecology of Financial Markets.

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CONCEPTS COVERED

- Role of demand and supply in trading of financial securities
- Mechanism for trading of financial securities

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The topics that we are going to cover is the role of demand and supply in trading of financial securities and how those trading activities in financial market take place.

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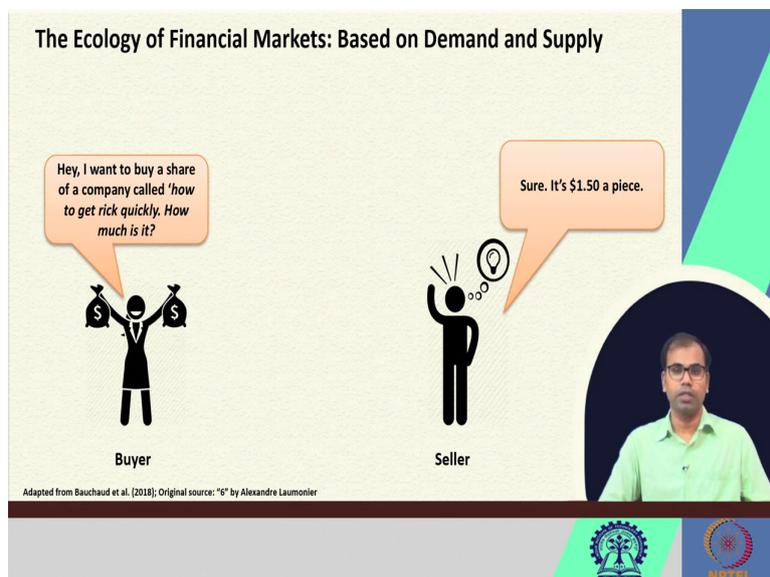
KEYWORDS

- Law of demand and supply
- Security trading
- Price discovery
- Trading mechanism

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So, before we start digging into the mechanism or the ecology of financial markets, I would like you to go through a conversation between two entities or two agents.

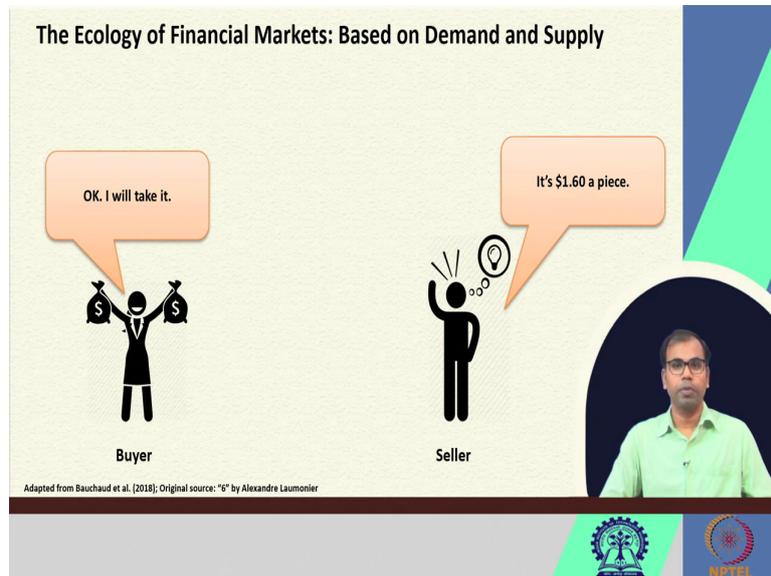
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Let us assume that they are buyer and a seller. This this buyers buyer and seller could be anyone. As we discussed earlier, the buyer could be an investor who have some spare funds that she wants to invest in, and seller could be the institution or entity or a company that would like to issue a financial security in lieu of the fund that are available with the buyer. So, it could be investor and the seller of the financial security or it could be lender and buyer borrower as well.

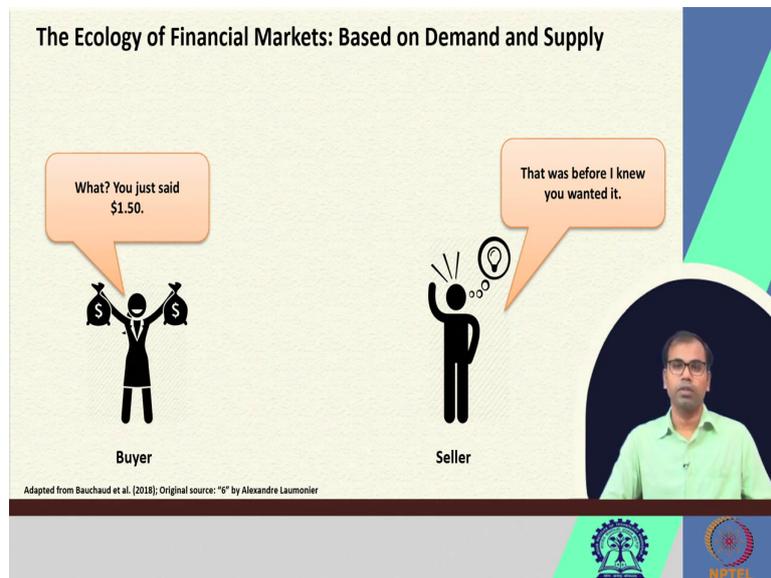
So, the conversation takes place in this manner. So, buyer has some spare funds and she would like to buy some financial asset, and she approaches the seller and ask for the price. The seller says, it is available for let us say 1 dollar 50 cents. That is fine.

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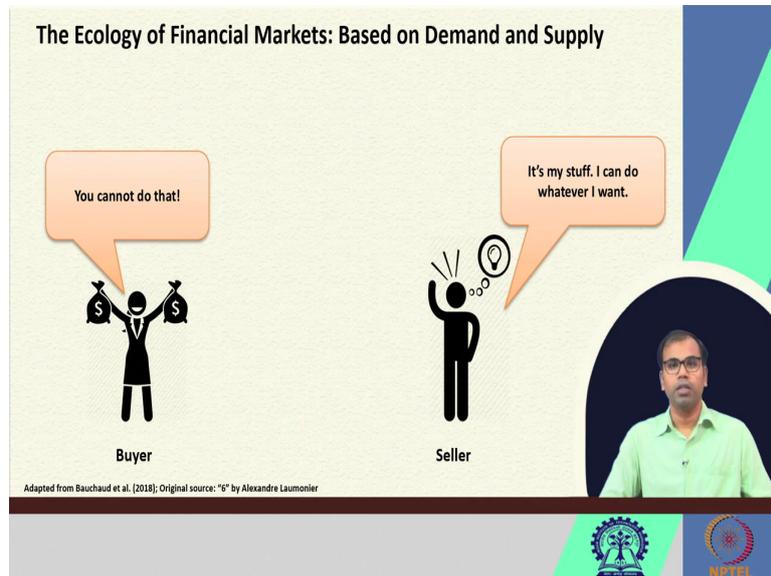
So, buyer is willing to buy that asset for 1 dollar 50 cents. And then, suddenly the seller suits up the price. It says, the same asset or same financial security is available for 1 dollar 60 cents.

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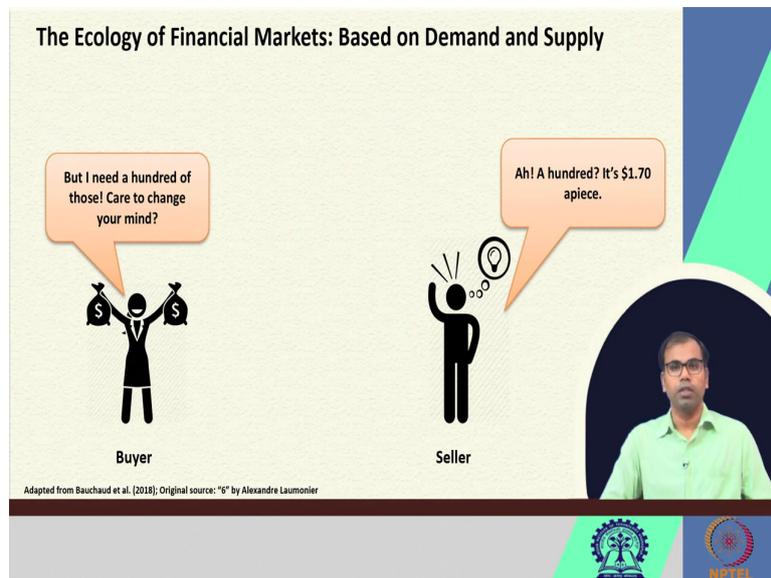
Now, that comes as a surprise to the buyer and she asked for a reason because just now the seller agreed to sell that financial security for 1 dollar 50 cents. Seller gives an explanation because seller knew now that the buyer is willing to buy that asset for a price, seller jumps up the price to 1 dollar 60 cents.

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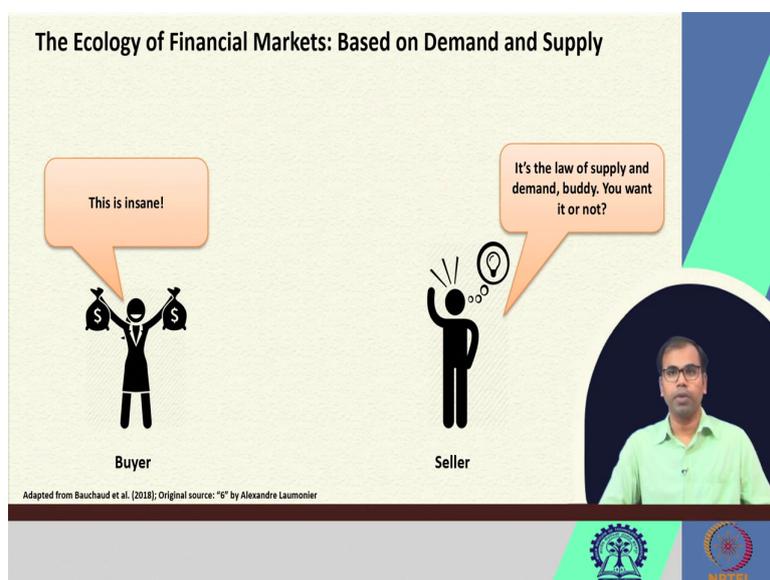
Well, that is a; buyer does not have a choice, so, she agreed to buy that asset and suddenly, she says, she would like to buy that asset to the extent of 100 units, right.

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So, the buyer is willing to buy that financial security to the tune of 100 units for a price of 1 dollar 60 cents. But suddenly, the seller suits up the price further and says, it is now available for 1 dollar 70 cents.

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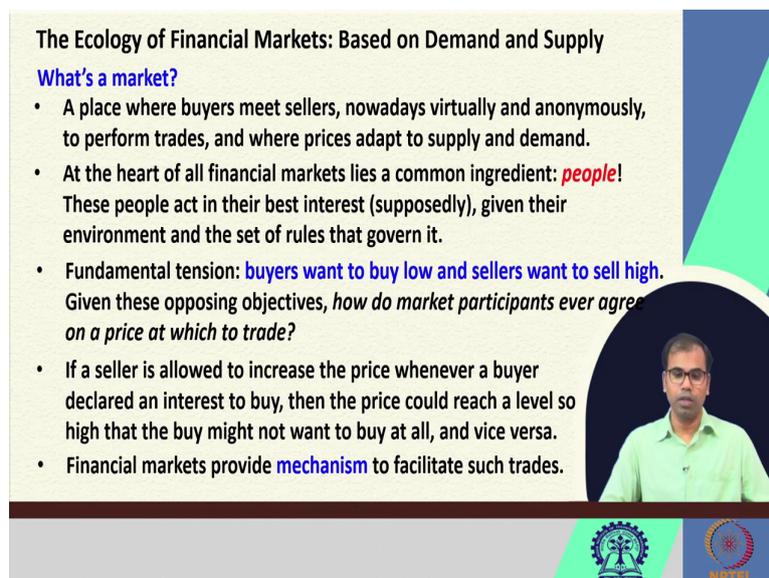


Well, seller has increased the price from 1 dollar 50 cents to 1 dollar 70 cents, and the buyer is surprised. But seller explains this is the simple law of demand and supply and that is why the more demand you have for a particular object or a particular financial security in this case, the price can go up further.

Now, that is a very simple conversation that can happen. But if you contextualize this conversation in financial market, you would should be able to relate why the prices of certain financial securities keep on going up and up, when we hear some good news about that particular financial security or for any reason there is increased demand for that financial security.

Now, here we are talking about activities of exchanging financial securities in a financial market.

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The Ecology of Financial Markets: Based on Demand and Supply

What's a market?

- A place where buyers meet sellers, nowadays virtually and anonymously, to perform trades, and where prices adapt to supply and demand.
- At the heart of all financial markets lies a common ingredient: **people!** These people act in their best interest (supposedly), given their environment and the set of rules that govern it.
- Fundamental tension: **buyers want to buy low and sellers want to sell high.** Given these opposing objectives, *how do market participants ever agree on a price at which to trade?*
- If a seller is allowed to increase the price whenever a buyer declared an interest to buy, then the price could reach a level so high that the buy might not want to buy at all, and vice versa.
- Financial markets provide **mechanism** to facilitate such trades.

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To elaborate on that let us first understand what a market is. Typically, a market is a place where buyer and seller meet. Nowadays, this meeting happens virtually and most likely anonymously as explained earlier, buyers might not know who the sellers are and vice versa.

So, seller does not know who the buyers are and probably they do not care. So, buyers and seller meet at a place to perform trades, and this is called market where the prices adopt to supply and demand of that particular financial security in this context.

Now, as we understand at the heart of every financial market lies a common ingredient, and that is human being, that is people. These are the people who act in their best interest or at

least economic say. So, they are supposed to be acting in their best interest. Given other constraints, such as the external environment and the set of rules that govern the financial market as such.

Now, the basic idea for which buyers and sellers operate in financial market is as following. Buyers want to buy a particular financial security or a set of financial securities for the lowest possible price and seller would like to sell that particular financial security for the highest possible price. Now, that is a conflicting objective, right.

So, given these opposing objective how does market, how does a market participant ever agree on a piece at a price which is acceptable to both buyers and sellers? That is what market does.

So, market basically encourage or allows a buyer and a seller to meet at a common place, agree on a common price and execute the trade of a financial security. Because if a seller is allowed to increase the price whenever a buyer declares an interest to buy, like it happened in the conversation that we had just seen.

Then, the price could reach to a level so high that the buy buyer might not even want to buy at certain point of time, or maybe the seller would not be able to sell that particular financial security or that asset for the price that he has increased to. Now, for this for solving this problem, we have the market or financial market that provides a mechanism to facilitate such trades between a buyer and a seller or a group of buyers and group of sellers.

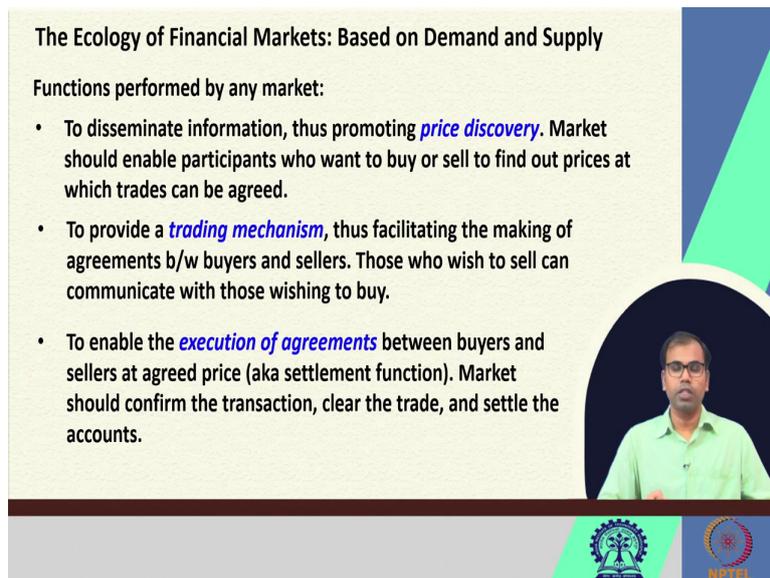
Now, you should be able to relate to different financial securities that we get to know about in media or by reading text or news items, where we hear that certain IPO has been oversubscribed. Because the underlying fact is more people have shown or more buyers have expressed their willingness to buy or subscribe to that IPO. And that is why IPO has been sold at a price that is much higher than the face value of that IPO.

The same can happen with any other asset. Suppose, it is a bond or for that matter a real estate. If more people are willing to buy are expressing their desire their willingness to buy

that particular asset and they are ready to pay a price, then seller has a choice to increase the price to the extent when he can get the highest possible price.

So, in financial markets also, buyers would want to buy at a lowest possible price, and seller would want to sell at the highest possible price.

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The Ecology of Financial Markets: Based on Demand and Supply

Functions performed by any market:

- To disseminate information, thus promoting *price discovery*. Market should enable participants who want to buy or sell to find out prices at which trades can be agreed.
- To provide a *trading mechanism*, thus facilitating the making of agreements b/w buyers and sellers. Those who wish to sell can communicate with those wishing to buy.
- To enable the *execution of agreements* between buyers and sellers at agreed price (aka settlement function). Market should confirm the transaction, clear the trade, and settle the accounts.

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Now, how does a financial market help in the process of execution of this such trade or such transactions of exchange of assets from buyer from seller to buyer and vice versa?

Well, we have to go back and discuss see what we had discussed about the functions performed by any financial market. We know that, finance the first and foremost function of financial market is provide information for capital allocation. To contextualize that, we can

say that financial market disseminates information you know in a manner that facilitate price discovery.

Which means, if buyers have agreed to pay a certain price, and sellers have been able to agree to that to sell that particular financial security at that price, then this is what the agreed price is. And this is done in financial market by way of price discovery.

So, market should enable participants both buyers and sellers who would want to buy or sell to find out prices at which trades can be agreed upon. So, if there is no market, then it could be very difficult for a buyer as well as for a seller to figure out what prices are available at which some buyers are willing to buy that financial security or a seller is willing to sell that financial security.

Second task that financial market performs is to provide a trading mechanism. So, trading mechanism facilitate the making of agreement between buyers and sellers. Because once we are able to match the buyers with the sellers at an agreed price, there should be some facilitation of making an agreement between the two who would honor the commitment.

So, those people who are willing to sell should be able to communicate their desire to sell that particular asset at a particular price to those who are willing to buy. So, if buyers do not get that information in time, probably the trade the exchange of that financial asset cannot take place.

If I am ready to pay a price, but that price is not communicated to the seller, then I might not be able to get that trade executed. So, that is the second major task of financial market where trading mechanism is facilitated.

And finally, once you have the trading mechanism facilitated by the financial market, the execution of agreement has to be taken care of. Which means, the financial market enables the execution of agreements between buyers and sellers at the agreed price that is also known as settlement functions.

If I have received the communication from a seller, that they are willing to sell certain financial asset at a particular price. And I have accepted to pay that price in lieu of the financial asset that I want to buy and that communication has been passed on to the seller, then this agreement has to be settled. And that happens in market only.

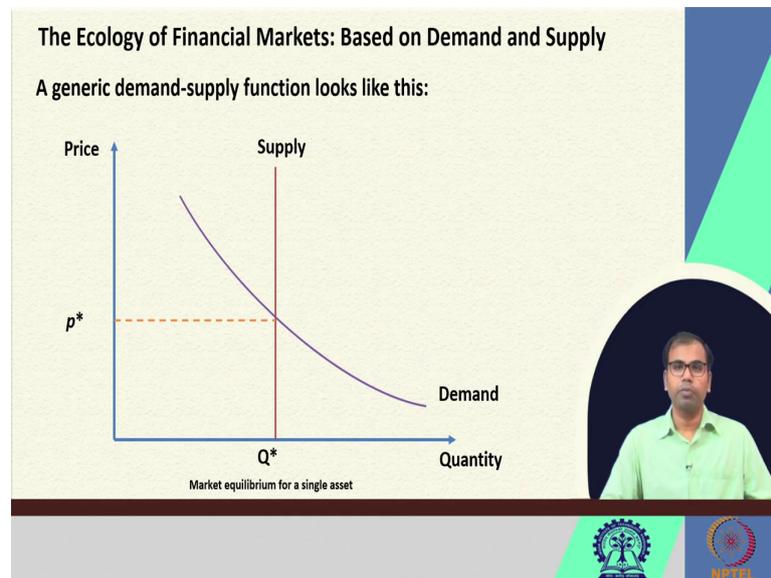
So, markets should confirm the transaction should clear the trade and settle the account by exchanging the money from buyer to seller. So, suppose, a company is issuing bonds or shares for that matter and communicated that it the bonds or the share will be issued at certain price. And there are n number of buyers or so called investors who are willing to pay that price for that financial security that is bond or the share.

That should reach, that information should reach to the issuer or seller of the instrument and then through financial market this agreement is honoured through by way of settlement function.

So, transaction is confirmed, trade is cleared, were executed and the accounts are settled, which means my money as a buyer my money should be given to the seller who has issued financial security in lieu of that fund.

So, these are prime 3 functions which a market performs. Now, of having known that the market should be able to perform these 3 major functions, so that the trade can be executed.

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Let us go back to the basic idea of demand and supply first. We know that a generic demand supply function looks like this, where on one axis we have price and another axis we have quantity.

So, whenever we have a limited supply or for that matter let us assume that we have a constant supply, Q^* . Then, we know that as demand increases, as demand for that particular commodity or item or financial security in this case increases, we have the situation where the price might go up.

So, if we see that we have a function a point where supply is matching with the demand that is the price that market facilitates or market offers to the sellers and that is how the price is determined.

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The Ecology of Financial Markets: Trading Mechanism

Market participants can be classified into the following broad groups:

- **Public investors** (who ultimately own the assets), **Brokers** (who act as agents for public investors for a fee), and **Dealers** (who do trade on their own).

An individual wishing to buy/sell a security must indicate the following:

- The **name** of the issuer of the security and the type of security that the investor wishes to trade (e.g., Tata Motor's equity share or a 10y Gov bond)
- Whether the order is a **buy or sell** of the specified security;
- **Order size**, i.e., quantity/volume of the security;
- The **type of order** that is being placed and for some type of orders, the order price (e.g., market order, limit order, short sell)
- The length of time the order is to be outstanding (for non-market orders).

*Trading through a brokerage house or self

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Now, if we talk about market participants, since there are multiple types of market participants who are acting on their own or on behalf of their clients or maybe there are some agencies which are acting on behalf of a set of people. We have already discussed about the investment companies or the dealers or brokers who are acting on behalf of their clients. And then, there are common public or common investors who are investing on their own.

So, we know that there are public investors who ultimately own those assets, where they have invested their money. Then, there are brokers, who act as agents for public investors in lieu of a fee. So, basically, they charge some fee for providing the services and execute the trades on behalf of the public investor or small investors.

And then, there are dealers, who trade on their own because they get lot of funds from a pool of people, pool of investors and they can use those funds to trade. So, dealers are those who

trade on who do the trading on their own. So, given that these broad 3 broad categories of market participants, we can understand, try to understand the trading mechanism in a financial market.

Now, if an individual or a market participant for that matter, is wishing to buy or sell a particular security, he or she must indicate certain information, should provide certain information to the system, to the market, so that the trade can be executed. What are those functions that are required to be provided?

First of all, whenever we place an order for buy or sell, we have to specify the name of the issuer of the security and the type of security that the investor wishes to trade. So, if I want to buy a security or sell a security for that matter, I must specify what security I am planning to buy or I am ordering to buy or sell.

So, it for example, it could be 20 stocks of Tata Motors or maybe 10 year Government of India bond or any other financial security that I would want to buy, I have to specify. So, the name of the security must be indicated. Then, we have to specify whether it is a buy or sell of that particular financial security, whether I am planning to buy or sell.

If I am placing an order for Tata Motors, I must indicate whether it is to buy shares of Tata Motors or sell the shares of Tata Motors. Subsequently, we have to specify the order size that is the quantity or the volume of the security. And mind it, this is very important because order size will reflect in the total value of the trade or the transaction.

So, if I am planning to buy 100 stocks of Tata Motors and each stock of Tata Motor is trading at 400 rupees or it is offered at 400 rupees per share, and I am planning to buy 100 shares it will be 40,000 rupees worth trade. And if I have buy mistake placed 4000 shares in the system or in the to the market then I have to pay 4000 shares into 400 rupees of each share.

So, that is how the total value of transaction will be determined. So, order size is an important factor to put in and the while placing the order for trading or in the buy or sell. Then, we have to also specify the type of order. Essentially, we have to indicate whether it is a particular type

of order for buy or sell, because in case it is a market order, it implies that you are placing the order to buy or sell at whatever price the current market is offering.

So, if the current market price is x rupees and I am placing the order in the form of market order, then it will be immediately executed at x rupee per piece. Whether it is a buy order or sell order; If I place let us say a buy order for 100 stocks of Tata Motors at market price as a market order, then whatever the current trading price of the Tata Motors share, my order will be executed at that price.

So, in in in case of market orders, we do not have to specify the price, but when we place a limit order, then we have to specify the price as well because it indicates that I want to buy 100 shares of a particular company at certain price per share. That is what the limit is.

So, limit is put on the price of the share which means if I am placing an order for 100 shares and I am specifying it as limit order, then I have to provide the price at which I want my share to be bought. Or for that matter if I am selling then that then also, I have to specify what should be the price at which it should be sold.

The downside of this type of order is if there is no other investor, there is no other market participant on the other side, whose quote, whose price expectation matches with yours then this trade cannot be executed. So, for example, if I am placing 100 shares placing a buy order for Tata Motors share to the tune of 100 shares and I am specifying it as limit order, then I have to specify the price as well.

And suppose, I am specifying the price at 400 rupees per share, in that case, there must be someone who is willing to sell 100 shares of Tata Motors at 400 rupees a piece, then only my order will be executed. If it is not matching with anyone who is willing to sell at that price, then it will not be executed in that case.

Similarly, if we are ordering some stop loss order or short selling order, then we have to specify the price. And finally, the length of the time for which that the order is to be

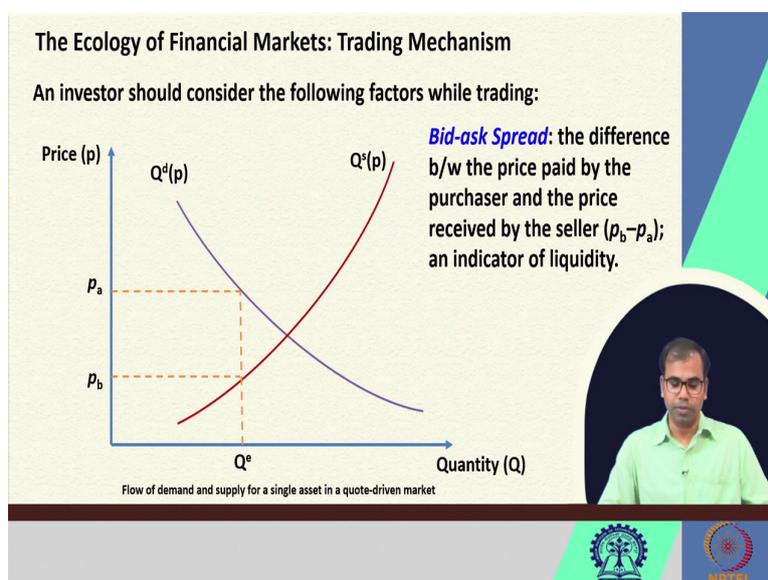
outstanding, particularly non-market order, which means if I am placing a limit order and I am specifying the price as well.

Then, I must tell the exchange, I must tell the system, I must tell the market that my order should be valid till the end of the day. Which means, before the market closes if the price is available for which I have specified to buy 100 shares of Tata Motors, then my order can be executed at any point of time till the end of the day.

So, these are the 5 things that we have to specify name of the security and the type of the security, whether it is equity or debt. And then we have to; we have to specify whether it is buy or sell, then we have to specify the order size, and then type of order whether it is a market order or limit order or short selling or stop loss order. And then finally, the length of the time for which the order needs to be valid.

These are certain inputs that we have to specify whenever we are planning to buy a security in the financial market.

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Now, having discussed about the types of securities and the basic law of demand and supply being prevalent in financial market, we also know that there are certain information that has to be communicated to the market. So that our order our trade can be executed. There are certain other factors which we must be careful about.

As an investor we must be considering the following factor while trading. And one of the major factors is basically the bid-ask spread. If you want to know more about the bid-ask spread, in intuitively it is the difference between the price paid by the purchaser or the buyer and the price received by the seller.

Essentially, if buyer is willing to pay certain price and seller is willing to pay certain other price, the price that is different from what the buyer is willing to pay, then the difference is known as bid-ask spread.

In finance literature, it is also an indicator of liquidity because you can understand if the difference between the bid and ask or the purchaser's price and seller's price are is small which means there are more willingness to accept this trade because the difference between the buyers and seller's price is minimal.

Graphically, if we try to indicate this, we can show on a two dimensional graph where we have price on one axis and quantity on another axis. Suppose that we have the demand for that particular share is indicated as Q_d at certain price, that is changing over a period of time, and similarly, we have supply for that same share for at Q_s p and that is changing over a period of time.

So, this is the function of time because suppose there is constant demand or supply then there is no need for seeing if there is any difference between the purchaser's expectation and the seller's expectation. So, here we have demand and supply for the particular share and if we want to see a quantity at which the trade has been executed.

So, we let us assume that Q_e is the quantity for which the trade has been completed and the price for demand and supply which is basically the price that is asked for and the price that is that has been taken as a bid. The difference between the price p_a and p_b , which is basically p_b minus p_a is the bid-ask spread. And this is as indicated earlier a measure of liquidity in the financial market.

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The Ecology of Financial Markets: Trading Mechanism

An investor should consider the following factors while trading:

- **Trade types:**
 - *Information traders:* those who believe that the prices are incorrect, take advantage of mispricing; such traders can drive price movements if they have superior information. What about noise traders?
 - *Liquidity traders:* Those with a surplus of/need for money; e.g., liquidate shares for purchasing an asset, or buy shares to park extra fund as stocks are good investments.
- **Trading costs:**
 - Three major sources of transaction costs: brokerage or commission and taxes (direct costs), bid-ask spread, and price impact of a large sale/purchase.
 - Vary with security types, trading platforms, and trade size.



Let not forget that a bid-ask spread is a better measure for markets which are quote driven. As we understand there are two types of markets where trading takes place. One is quote driven, and another is order driven.

So, quote driven, example, quote driven market for example, is NYSE, New York Stock Exchange and order driven market is our own National Stock Exchange. So, other than bid-ask spread, an investor must also be mindful of the types of trade that is taking place in the financial market.

For example, mainly there are two types of traders in market. One is information traders, essentially these are those, these are the people, who believe that the prices are incorrect which means the valuation of the assets which are being traded is not accurate. And that is why they take advantage of mispricing.

When I say mispricing, it implies that the prices at which the share or bond or for that matter any other asset is available for trade is not the accurate price. It could be either less or more than the price at which it is being traded.

So, if Tata Motors for example, is being traded at 400 rupees and I am an information trader, then I would believe that 400 rupees is not the correct value of one stock of one share of Tata Motors. It could be either less or more depending on my perspective. If it is less, then I would like to buy share of Tata Motors and if it is more than 400 rupees, the intrinsic value is more than 400 rupees, then I would like to sell, so that next period when the prices go towards equilibrium, I should be able to make some money.

And it is very interesting to note that such traders can drive price movements because if they have some superior information or superior skill set by which they have calculated the intrinsic value of the share accurately, then they can drive the price movement in the market.

One downside of this argument is the existence of noise traders because there are many people who could be acting upon certain information which might be considered as noise. And those, if those people are in substantial number, then they might drive the price in a particular direction and that might not be accurate always.

That is about information's traders. And the another category of trader is liquidity traders. Particularly, these are the people who have some surplus funds or who might be in the need of some funds, right. Suppose, for example, I have invested in stock market and I want to buy a car and I am in need of money. So, I can just liquidate my share holdings in the stock market, sell some shares, get the money and make the down payment for buying a car.

Similarly, if I have saved some money this month, maybe I know that stock market is going to give me a better return. So, I would park my extra savings, extra funds in the stocks, in the stock market in the shares.

So, these are the people who have some extra funds that can be invested in stock market or maybe they are in need of funds, that is why they are taking they are doing trading in the stock market. So, they are basically known as liquidity traders. They might not really drive the prices down because 1, they are not in substantial number and 2, they are not acting upon certain information which might be prevalent.

And finally, the last factor that an investor should be mindful of is trading cost. So, we know from financial economics argument that there are 3 major sources of transaction costs, brokerage or commission and taxes which are direct costs.

So, every time you make a transaction, you do some trading in the stock market, you have to pay some brokerage fees or commission. And of course, you have to pay taxes also if it is a short term gain or loss or long term gain or loss, accordingly you have to pay taxes.

And then other another cost is bid-ask spread, where you sell something at certain price and then you buy something else at certain price. So, the difference between these two values might be actually incurred incurring as a cost for you. And the third source of transaction cost is the price impact of a large sale or purchase.

Suppose, I have 1000, 100,000 shares of a company and I dump all those shares in one go. So, suddenly in the market there are 100,000 shares available for which buyers might not be as many available in the market and that will have an impact on the price of that particular share. So, that is called price impact. As we can understand from the demand supply curve, that if there is sudden supply increase and not enough demand, then prices would be going to fall.

So, these 3 sources of transaction cost has to be taken care of by an investor. These costs vary according to security types or trading platforms or exchanges where we are doing the trade and also the trade size.

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CONCLUSIONS

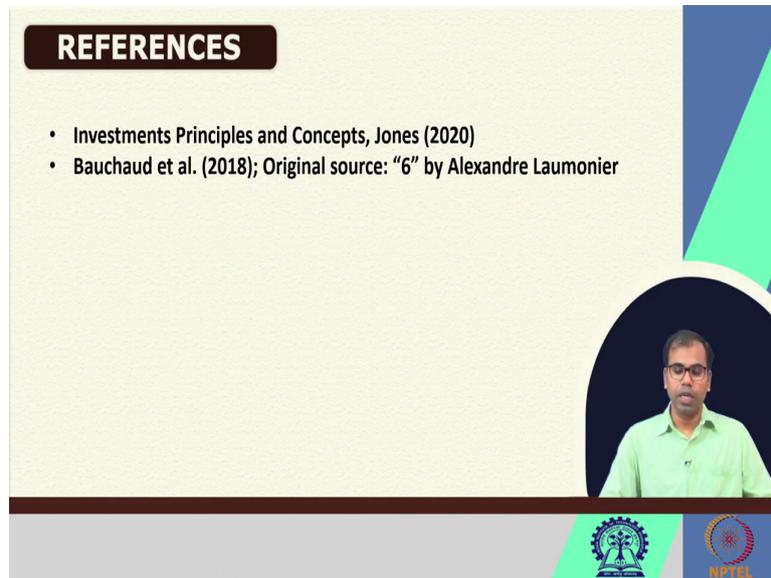
- In financial markets, the law of demand and supply largely determine the prices of securities.
- Markets facilitate trading of financial securities by way of providing price discovery, trading mechanism, and settlement of trades.
- An investors should take a note of several factors such as bid-ask-spread, types of trades, and trading costs.

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So, these are some factors which help us understand the trading mechanism which is basically some sort of function of demand and supply that we understand from the very basic economic concepts. So, to sum up we know that in financial market just like any other commodities, the law of demand and supply largely rule the game and the pricing prices of the securities are determined by the way of demand and supply.

The market, however, facilitate trading of financial securities by way of providing price discovery system, trading mechanism and settlement of trades. And when we are acting in the such a financial market for buying or selling a particular financial asset, we should take note of several factors such as bid-ask spread, type of trades that are taking place in the market, and trading cost.

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REFERENCES

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With this, I end up this session.

Thank you very much.