Financial Institutions And Markets

Prof. Jitendra Mahakud
Department of Humanities and Social Sciences
Indian Institute of Technology, Kharagpur

Lecture – 03
Efficiency of Financial Markets

So, in the previous class, we discussed about the Equilibrium in the Financial Market. But another thing you should know that if you really work in the financial market or if you want to participate in the financial market as an investor or as a depositor then we should ensure that how far the market is efficient.

Though efficiency of the financial market is a very important concept, whenever any market participants participate in the markets for some whatever reasons they have. Either they want to participate to deposit the money or they want to participate to invest in the stock market or they want to participate as a broker or they want to participate as an as a regulator does not matter, but everybody's concerns should be to know that whether the market is efficient or not. So, even if it is efficient or inefficient, how far this is a efficient, how far this is inefficient all kind of basic questions comes to the market or comes to the mind in the market point of view.

So, let us see that what do mean by the efficiency, how the market efficiency can be defined. So, whenever you to talk about the market efficiency if you see that there are there are some broad definitions and there are some narrow definitions.

(Refer Slide Time: 01:36)

What is Financial Market Efficiency?

- The ultimate focus of the efficiency in financial markets is on the non-wastefulness of factor use and the allocation of factors to the most socially productive purposes
- The market in which the price for any security effectively represents the expected net present value of all future profits
- Buying or selling the stock should, on average, return you only a fair measure of return for the associated risk.
- Conditions for Efficient Market
  - A large number of competing profit-maximizing participants analyze and value securities, each independently of the others
  - Active participation in the market
  - Individuals can not affect the market prices
  - Information must be free
  - Free entry and exit by market players must be uninhibited

Broad

Market

And the narrow definitions basically deal with the things related to a particular market and there are some definitions which link to the aggregate economy or art aggregate sense the whole financial system as a whole. So, here if you see that the first point the ultimate focus of the efficiency of the financial market is on the non-wastefulness of the factor use.

And the allocation of the factors to the most socially productive purposes, what does it mean? You know that the every resources or whatever we have these are scarce. So, we have to utilize those resources in such a way that we can maximize the revenue out of this, and whatever revenue we are basically maximizing, it should have some social implications.

That mean, this socially the product should be used in such a way where the maximum will fare can be generated out of this. So, if you can maximize the welfare we can say that the system is efficient using this scarce resources, but if you are not able to maximize the resources then we can say that the particular system is not efficient. So, this is basically the first part is basically a broad meaning of the concept of market efficiency, so which talks about the efficiency and the productivity of the resources whatever we have.

But little bit in a deeper sense if you understand that what exactly the market efficiency is. Here if you see that the second point if you observe the market in which the price of

any security effectively, the represents the expected net present value of all future profits. You see whenever you talk about the market the market as basically we get a price for any kind of product which is available in that particular market. So, whenever we get this particular price we saw that particular price or we observe that particular price we should ensure that price basically reflects all kind of cash flows what can be generated from that particular asset over a period of time.

So, if we feel that whatever prices basically we are getting that from that particular asset that should be if you discount it with respect to a particular discount rate, then the net present value of that particular cash flow should be equal to that price what we are observing from the market. So, that is very important you see. The price would reflect all available effective cash flows what you are getting from that particular asset in that is happening then what we can say the market is basically efficient fundamentally it is efficient.

So, if that is happening then buying and selling the stock or any other asset if you see the third point buying and selling the stock should on an average return, you only a fair measure of return for the associated rate risk. Little bit I can elaborate this thing that, if the market is efficient, then if anybody or all the participants who are investing in the market on an average this would get some amount of return that does not mean that some investor will get very high return.

And some investor will lose in the market, because what is happening whatever informations are available about the market that is available to everybody. So, because of that we should expect that a fair amount of return can be realized by all the market participants which are existing in this particular system. So, if that is happening then we can say the market is efficient, if that is not happening then we can say market is inefficient. You see these are the two things which are basically market specific, these are market specific. And here the broad definition what basically we have discussed that is basically you are related to the aggregate economy or in a country sense.

So, to make this market efficient what we should ensure that there are some conditions has to be satisfied. What are those conditions? The same thing to go back to the equilibrium part also we have discussed a large number of competing profit maximizing participants, but market participants should be more because everybody's expectations,

everybody's opinions, everybody's positions, should be considered whenever we are deciding the price. And this would be actively participating in the market. Somebody has started investing in the stock market after buying the stocks they has forgotten that whether he is taking the positions or not. So, that is what this would have some active participation in some places they can buy, and some days they can sale and some kind of activation of that particular investment position should be there, if that is not there then do particular participants should be ideal. So, there is active participants in the market is very much essential.

Any particular individual cannot affect the price. If anybody feels that, that is a rumor about a particular stock a lot this talk is going to, price of the stock is going to be down then if that particular person or particular individual will sell the stocks then the stock price should not be fluctuating. And that can happen whenever the market is basically full of more participants that actually have to have to ensure.

And the information must be free, whatever informations were getting about the stock and about any other instrument that should be free and the free entry and exit by the market players. And whenever the participant wants they can exit the market, whenever the participant wants they can enter the market. So, that is the major condition or that condition should be satisfied to analyze the concept of the market efficiency. So, these are the different conditions we have to keep in the mind that what basically the market efficiency is.

(Refer Slide Time: 08:02)

So, in aggregate sense the efficiency can be defined by 5 ways which is given by Tobin. If you see that we are we are talking about the name is James Tobin, the Tobin is a Nobel Laureate who was given this concept of market of is a concept of efficiency.

And Tobin has explained these things in 5 ways; one is the information arbitration efficiency already I told you repeatedly. This is the degree of gain possible by the use of commonly available information, if one can make large gains by using commonly available information then the financial markets are said to be inefficient. That means, if the availability of the information is equal to all the market participants, then one group of the individuals one group of the investors cannot get more return. And some group will not get any return that basically does not should not happen. If it is happening then the market is inefficient. If it is not happening or if it does not happen the market is efficient. So, from that point we can say the market is efficient from the information point of view.

Second one is basically I told you about the fundamental valuation efficiency. In the fundamental valuation efficiency what we say the intrinsic value of the asset should be equal to the market value. You see for any price there is a market value or the market price of the asset and another one is the intrinsic value. The intrinsic value is basically nothing but intrinsic value is basically calculated by discounting the cash flow with respect to a particular discount rate. So, here it is the cash flow what in a particular t is

equal to the time, in a particular time period, and r is equal to your discount rate which is sometimes we consider. If it is you are going for stock valuation it is our return from the stock if you are talking about the bond valuation it is nothing but the market interest rate, etcetera, etcetera. Then we are ensuring whatever price you are getting from this that should be equal to the market price. So, then we can say the particular market is fundamentally efficient.

If that does not prevail then we can say the market is not efficient from the fundamental point of view. So, therefore, the intensive value of an asset is the present value of the future stream of the cash flow that is what basically I have shown you here, and when the cash flows are discounted at an appropriate rate of discount that is the discount rate which is r. So, if you discount it the cash flow will be discounted with respect to r that we can get is they get the intrinsic value, and that intrinsic value should be equal to the market value. If that is happening then the market is fundamentally efficient.

Then the full insurance efficiency, what does it mean? It means that how you can whatever whenever you take a position in the financial market you are exposed to certain risk, certain kind of problem. So, how your risk or the probability of loss is going to be hedged by the financial market? If really you can hedge that particular position in the financial market we can say that the market is efficient from the insurance point of view, but it is not possible in the real sense we cannot hedge the complete risk in the market, because we do not have that kind of alternative investment which are although we have the derivatives instrument, other instrument which can be used as for the hazing purpose. But in general sense it is not possible to haze the complete risk what we are going to get it from the market.

So, because of that what we can say that the market cannot be fully insured or the market cannot be efficient from the insurance fully insurance point of view, but to some extent that efficiency is also important because that also decides that whether the market participant should have invested or will be interested to invest in the market or not. So, that is another thing.

And another thing is the functional or the operational efficiency. You see what do mean by the operational efficiency, whenever we do any kind of investments we do any kind of decisions we should ensure that whatever cost, I am incurring to make that investment

that should be minimum. So, lower the minimum cost the basically the positions will be more and the market will be more competitive if market will be more competitive then that leads to a perfectly competitive market.

Then the price what you are getting from the market that is basically a fair price or the price which is basically is useful for concluding any kind of things from the market or maybe you can say that that price is a real indicator of the market developments. But here the question is that we have to ensure that the transaction cost in the market should be minimum. If higher the transaction cost the market is inefficient lower the transaction cost market is efficient.

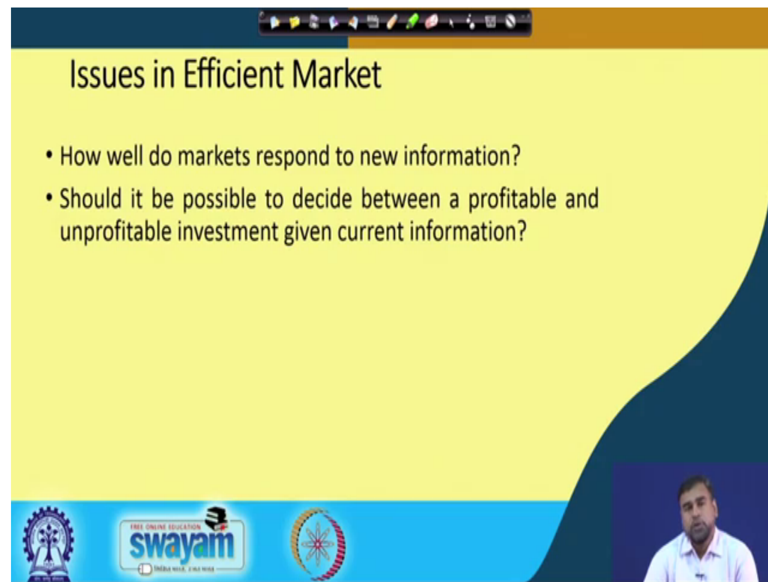
So, therefore, we have to ensure that it because that basically makes this investor makes the market participants more comfortable and convenient to participate in the market in a larger way. So, therefore, the market can be efficient if the transaction cost is list or market can be you can say in a clear cut way market can be personally efficient if the transaction cost is list.

And the last one is the allocation efficiency because from the beginning we talked about that is the resources are the scarce, and because of that you have to utilize the resources in such a way by that it can give you the maximum benefits or maximum welfare. So, even if you see that how we can define this allocative efficiency or allocation efficiency here if the marginal efficiency of the capital are adjusted for the risk differences is the highest. So, what do mean by the marginal efficiency of capital?

The marginal efficiency of the capital is nothing but whenever you are producing anything if you are any kind of product if you are adding one extra unit of the capital that is MEC. The MEC is basically nothing but whenever you are one extra unit of the capital how this particular capital is going to increase the amount of the production, addition of one extra unit to the capital how much extra output can be produced.

So, here what we are telling that whenever you are putting one extra unit of or extra rupee on a particular investment, how much extra return, I am going to get adjusted to the risk what I am facing. Wherever the particular value of that 1 rupee gives me the maximum that basically; if it is giving maximum then we can say that the market is efficient from the allocation point of view. So, that is the another concept which always we discussed in this regard.

(Refer Slide Time: 15:28)



Then, we can move into the different issues which are happening to the efficient market you see that another thing is how well do markets respond to new information, any new information comes to the market let reserve bank of India governor has announced something.

Any policy measures are taken by the finance ministry or anything which has happened or anything any crisis has happened in the US market because financial markets are highly integrated with the global market. So, anything which has happened in the global community any particular information, which comes to the market; how well the market is well equipped to respond to that information. Whether the market is so mature, market is so conducive to capture that information in a positive way or in a larger way or there is some kind of loophole some kind of gaps is existing in the market to capture that information which is, if it is negative information market perceive it negatively, if the positive if it is a positive information market perceives it positively.

What you see sometimes also humor people consider humor is a information. So, that creates the disturbance in the market, market become unstable, market become volatile, but we should ensure that those things should not be there in the system and those kind of things should not since the price away from the equilibrium price. So, because of that we should ensure that our system should be so efficient that any news which is coming to the market that particular news should be reflected in the price immediately and the

market should be efficient enough to capture that information efficiently. So, therefore, we have to ensure that how well do the market respond to the new information.

And second one is should it be possible to decide between a profitable and unprofitable investment given current information. There should not be any kind of gap between the different stakeholder to ensure that which one is good for them, which one is bad for them; which investment this would make to maximize the return, which investment this would not make. So, those kind of thing basically is very important whenever we talk about the efficiency of the market.

(Refer Slide Time: 17:47)

Efficient Market Hypothesis (EMH)

- The current prices of securities reflect all information about the security (Random Walk Hypothesis)
- New information regarding securities comes to the market in a random fashion
- Profit-maximizing investors adjust security prices rapidly to reflect the effect of new information. The expected returns implicit in the current price of a security should reflect its risk

Over the period of time if you see that the informational arbitrary efficiency has gained maximum attention and therefore, mostly the literature on efficient market is concentrated on the issues related to the information. How far the market is efficient from the information point of view; whether really the market is efficient or there should not be an information gap between the different market participants, or we can say that what level of information gap they have and how the investors or market participants in the market is going to use that information for their investment activities. So, these are the some of the things always we should ensure or we should know.

And in this context the hypothesis was created that that is called the efficient market hypothesis which was given by Eugene Fama long back in 1960s or 1970s, 1962 mostly he has given this concept. That the concept of efficient market hypothesis is quite

popular after that, and lot of resource lot of work has been carried out in this particular area. We will just discuss.

There are certain methods to analyze those things in a technical way, but here I will be discussing the concepts related to the efficient market hypothesis. And further maybe other courses like equatorial resource and investment, and portfolio manager analysis and portfolio management will be more you know more about this particular concept.

So, here if you see the efficient market hypothesis what does it mean, according to Fama the efficient market hypothesis is the current prices of securities reflect all information about the security. Why? Whenever we see the price of a particular stock or a particular bond we should ensure that the particular price reflects all available information that means, everybody's the information which is coming to the market that is basically captured through that particular stock. The stock price has been determined on the basis of all the information which have come to the market that we should always keep in the mind. We should ensure that.

Why it happens? What Fama said, this can happen because the new information regarding the securities which is come into the market that comes in the random fashion. Nobody knows what information will come in the next day or tomorrow. If I do not know that what information will come in the next day then obviously, that particular information when ever comes to the neck comes in the next day that if everybody is aware about that information then the price will behave in the different way.

But if I know what information will come in the next day and you do not know what information will come in the next day then what will happen, I can use that information to get some return and my return will be much more higher than the return what you are going to get. So, because of that what happens that creates the inefficiency in the market.

So, if the market prices follow a random walk, random walk in the sense randomly all the news all the informations are coming to the market then what happens that not a single group of the people are going to get very high return and some of the people or some group of the people who lose in the market. That does not basically should not happen, that should not happen in the market in the true sense.

So, in this context what we are trying to say if all the informations about the securities come to the market in a random fashion, then we can say that the stock prices follows a random walk. And, the information which is reflected in the stock price that captures all type of news all type of things which is events which are related to that particular stock.

And the profit maximizing investors are just security prices rapidly to reflect the effect of new information. The expected returns implicit in the current price of a security should reflect its risk. So, even if there is some new information is coming then the investor basically the demand and supply of that for a particular stock a particular asset will change accordingly.

If that particular thing will change accordingly, then what will happen? That the price what the equilibrium price will be established frequently or very fast, and in that context what happens if anybody gets that particular price he or she should ensure that the price is able to reflect all type of information which is coming to the market about that particular security. So that means, market is so conducive to gather all this information and as well as that is reflected in the prices so fast and it should be adjusted to the risk.

(Refer Slide Time: 23:01)

Market Efficiency Forms

- Efficient market hypothesis
  - To what extent do securities markets quickly and fully reflect different available information?
- Three levels of Market Efficiency
  - Weak form - prices reflect all **security-market** information
  - Semi strong form - prices reflect all **public** information
  - Strong form - prices reflect all **public and private** information

So, then Fama has said there are 3 types of efficient market, 3 levels of the market efficiency. So, here already I told you to what extent do securities market quickly and fully reflect different available information that is the basic theme of this hypothesis. And here Fama has talked about the 3 levels; one is weak form, semi strong form, and strong

form. I will discuss with you about the how to define this weak form of the efficiency or the semi strong form of efficiency and strong form of efficiency.

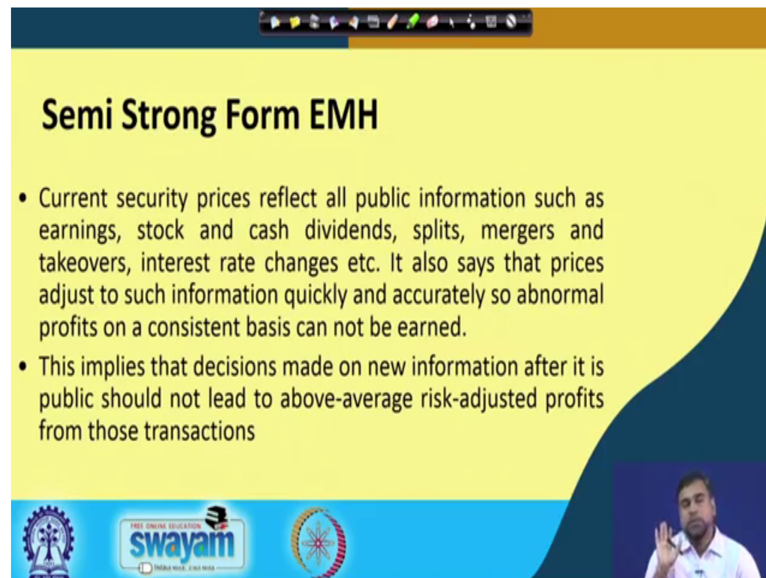
Already first part if you see that the weak form basically tells that prices reflect all security market information. Semi strong for a, semi strong form tales that price reflects all publicly in publicly available information. Strong form says it reflects all public and private information.

So, if you see that now we can see that what exactly it means. You see that weak form of efficient market hypothesis. What does it mean? According to the definition what he tells that the current price reflect all security market information including the historical sequence of the prices, rates of return, trading volume, and other markets generated information. What does it mean? If the current price reflects all available information, then what will happen the analyzing the past data you cannot predict the future.

So, the past rates of return and other market data should have no relationship with future rates of return. Why? Because the news is coming randomly, the information is coming randomly, if the information is coming randomly I do not know what is going to happen tomorrow and if some trend was happening 3 days back or 4 days back or 4 months back if I analyze that 4 months back data or 3 months back data, how that particular data is going to help me to say that whether the price of that particular security is going to offer down in the next day or the next month, that is very difficult to predict difficult to say.

If the market informations are coming randomly and the informations are already captured through the price of the particular security that we have to keep in the mind. If it is captured through that what all the informations are captured in the prices, and informations are coming randomly then the analysis of the past data cannot help you that whether the particular security price will be up in the next day or next month or not, that actually we have to keep in the mind.

(Refer Slide Time: 25:52)



And the second one is the semi strong form of efficient market hypothesis. What it tells? Already told you that the security prices reflect all publicly available information give me example, what does it mean.

That about a talk about a bond about anything whenever any publicly available information comes like whether the company pays a dividend or not, whether that is anymore the requisition is related to that or not, whether this is interested as change in the market or not, what kind of (Refer Time: 26:22) the company has. All kind of informations are available to everybody, then for any event for example, today company has paid to the announced that the company will pay the dividend.

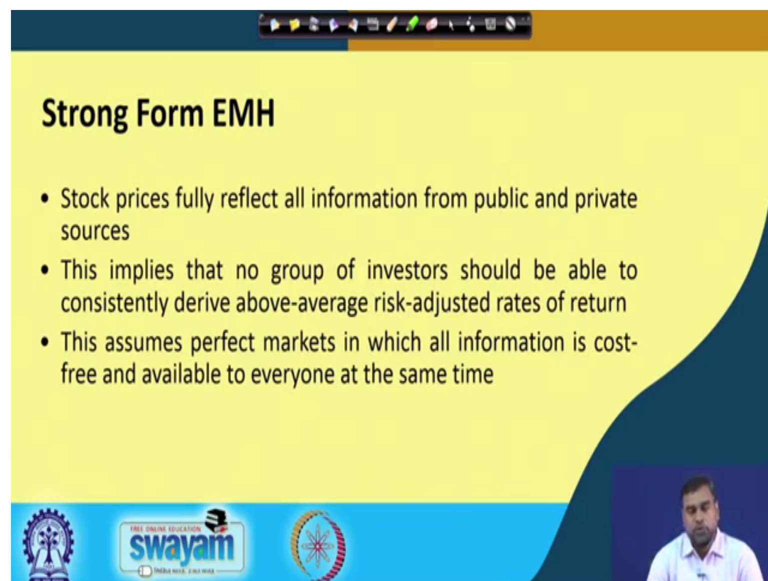
So, once the today's company has announced maybe to consider the today's return and once the dividend is paid on that is returned, and as well as the return what they are getting before and what they are getting after the payment of the dividend if you calculate the excess average return of that particular stock, on an average this particular exercise well excess of the average returns would be close to 0.

So, how you can get this excess return? Excess return is nothing but the actual return what you are getting minus the expected return. I will discuss more on expected return in the future sessions. So, therefore, what we can see that if all informations are available to everybody then that already reflected in the prices, then at any particular point of time once this information comes to the public in and around that event the excess average

return should be close to 0, if it is not close to 0 that means, somebody has used the information and somebody has not used it.

So, because of that some group have got very high return in a particular after this event and some group basically could not use that information because of that they get less return. Therefore, if all the information which are coming publicly and everybody is able to use that then in no sense at any point of time that we cannot get very high return from the market or any group of the people cannot get a very high return from the market. So, that is what basically the basic notion of this semi strong form of efficient market hypothesis.

(Refer Slide Time: 28:07)



And the last one is the strong form of efficient market hypothesis which talks about the public and private both the informations because the prices fully reflect (Refer Time: 28:16) talk bond or any other asset that reflect all information which is available publicly or privately. That means, there should not be any gap between public information private information, because in the practical sense it does not happen. Because the CEOs have more information, bigger investors have more information, (Refer Time: 28:32) fund managers are more information regulators are more information.

So, if anybody have used that more information obviously, those group of people can get more return than the common retail investor like us. So, in that context what we can say that any point of time if you have categorized that one group of the people who have the

private information, another group they do not have the private information you see that whether the return differences exist between them or not. So, if the return differences are there then we can say that the market is inefficient.

So, either if it is return differences is not there the market is strongly efficient, if return differences are there then we can say that the market is the market is inefficient. There is no concept of weakly inefficient strongly inefficient, we can say that weakly efficient some strongly efficient or strongly efficient or in aggregate we can say market is inefficient. But in I can give you one information that the Indian market is weakly efficient, US market is strongly efficient and no market is strongly efficient.

Next class will be discussing about how the financial market development is measured and how it is related to the economic development as a larger extent.

(Refer Slide Time: 29:51)

Please go through these particular references for this particular system.

Thank you very much.