Microfoundations of Macroeconomics

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Module No # 08
Lecture No # 37
Financial Crisis and Economy I

Welcome back so we are going to talk about the new topic and in this particular session we will be focusing on the financial crisis. So because financial crisis is an important topic in the area of macroeconomics and it involves everything. So, whether you are talking about inflation? Whether you are talking about unemployment? Whether you are talking about job creation? Whether you are talking about the monetary fiscal dimensions, all these things are added to this.

And that is why it has become really important to understand that what leads to what we call it as the full-fledged financial crisis. After global financial crisis 2007-2008 when we see the run of the economy then we find that we are in a much I would say better position. But the emergence of 2007 at global financial crisis has led to a special focus on understanding the reasons behind such type of emergence origin of crisis.

We have already discussed to some extent these dimensions when we are talking about I would say classical Keynesian new classical schools of economic thought. So I thought it will be good that we spend some time understanding the reasons behind the financial crisis in advance economies. Then we will be also towards the end covering up an important model which is called the diamond and the BIS model.

That in that setup what is the underlying idea, underlying idea is that if you have large number of depositors and these depositors deposit money in the bank. And if you have been given the preference that who is going to withdraw first then the person who withdraw at last he or she will have some kind of apprehension. That if, everyone will withdraw the money then they will be left out with no money.

So it is better that there will be complete rush to withdraw money from the bank and that leads to what we call it as the bank run. If you have the perfect competitive market in the banking structure then the bank run becomes quiet, I would say contagious phenomenon where the one bank failure may lead to the failure of another bank. So what are the remedies from where we

can think about the regulations in the banking sector which all regulations are helpful so will be talking about that.

But majorly our focus will be on the financial crisis that how we can understand the origin as well as the impact of the financial crisis what, are the stages? So I have referred a very good book to understand this so this is the brief outline.

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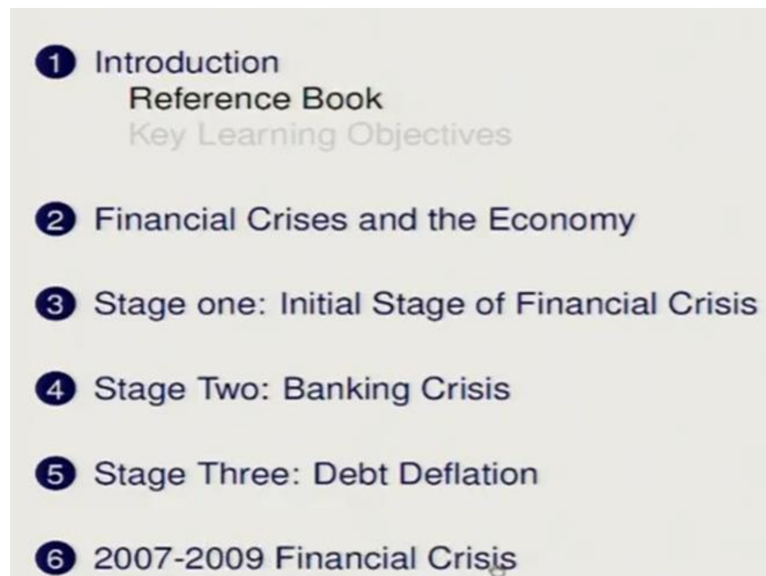

So first I will be talking about financial crisis and the economy, stage 1 initial stage of the financial crisis from where it starts, stage 2 the banking crisis, stage 3 is the debt deflation. And then we will be talking about the 2007-2009 financial crisis after that we will have the bank run kind of scenarios diamond and the bust model.

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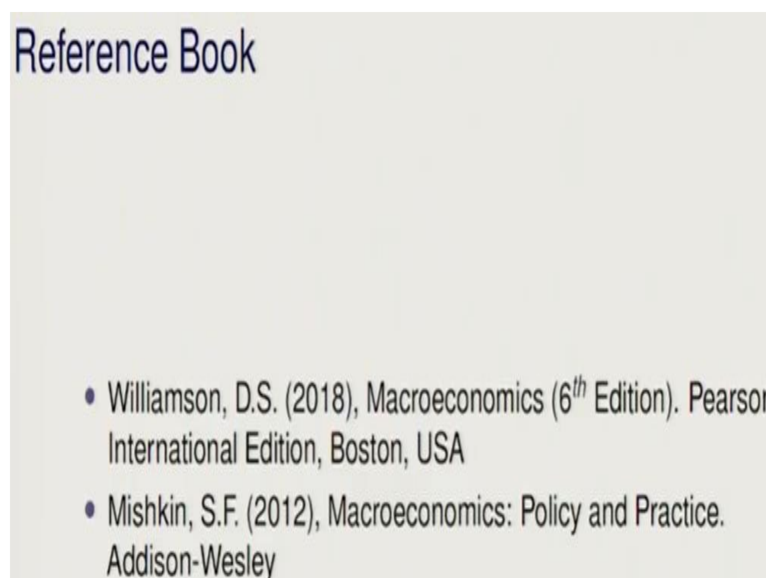

So here we have the Williamson book that we have referred, and the Mishkin which is the macroeconomics policy and practice. For first part that we are going to discuss it is coming from Mishkin and it talks about the macroeconomics policy and practice. Then here we have the Williamson which I have referred it for a diamond and the big model and under that we try to understand the bank run phenomena.

So I hope these 2 references will help you understand what are we going to discuss and these 2 will be the useful resource to refer for the for the financial crisis topic.

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So let us talk about the process of financial crisis origin and consequences, here we have as I mentioned the key learning objective will be that. We will be first seeing the origin of the financial crisis, then we will be thinking about 2007-2008 global financial crisis. Then we will be talking about in brief not very detailed, we talking about the Diamond Dybvig model of bank run.

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Financial Crisis

- How does financial crisis arise in an economy?
- What are the dynamics of financial crisis?
- Does information asymmetry play a role?

So financial crisis, so here if you think about the underlying regions behind financial crisis what are the reasons of emergence of financial crisis? So normally economist feels that you have certain imperfection in the society and if it is not address on time. Then this will spread to some other segments of the economy and ultimately what we see the coordination failure model so strategic complementarity will be broken.

And once you have the strategic complementarity broken then this will further create high work for all other variables. So this is the general phenomena that we often see in most of the economies. What are the dynamics of the financial crisis? If I think it dynamics in the sense that in the inter temporal setup if I am going into the period one scenario that what happens in period one? How it got transferred to period 2? How period 2 from period 2 it is coming to period 3?

So if you try and understand periodically stage 1, stage 2, state 3 now we are talking about. That the information asymmetry player role we have already seen when we are talking about credit market imperfections. That information asymmetry does have a role and you can understand from the perspective that if you have good number of borrowers and good number of bad borrowers. So if you have the good number of good borrowers and good number of bad borrowers then the equilibrium may be possible.

But you have large number of bad borrowers and less of good borrower then that become a big trouble. So in most of the cases what we find that the financial segment is occupied by such type of asymmetry. And this information asymmetry creates imbalance in the financial segment

that relates to what we call it the bank run, we have the bank panics. So the panics are basically the engulfed by such type of asymmetric scenarios.

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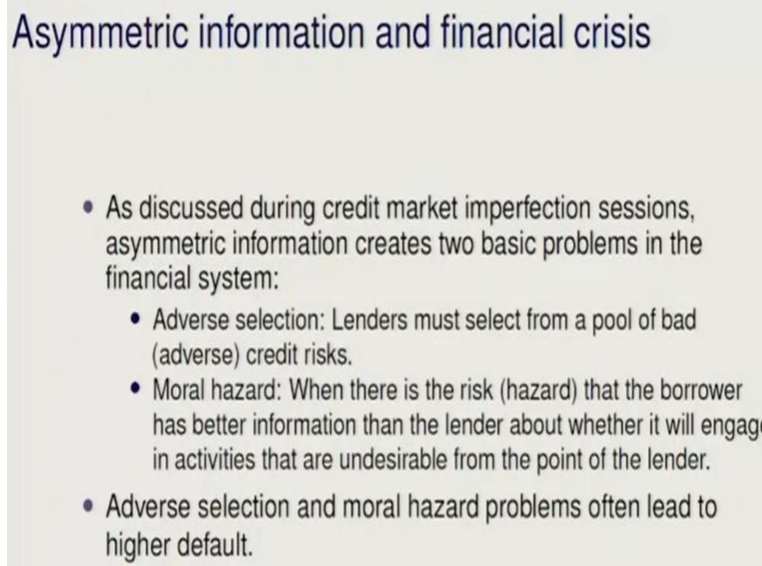

One we have already discussed as I mentioned so asymmetric information so this is the very basic stage of unfolding the financial crisis. So from here you have the setting up of the stage for the emergence of financial crisis. So maybe this could be the first stage in which we are talking about the emergence. So as we have already discussed about the credit market imperfections.

There we talk about limited commitment, then we talk about collateral, then we talked about how the collateral value decides about the borrowing capacity of the firm? So asymmetric information in if you think in a more literary way in economics, it has 2 major contributions. How? What are those contributions? One is that information asymmetry deals with what we call it as the adverse selection.

Which; means that lenders must select from a pool of bad adverse credit risk**.** So if you are talking about lenders in the sense that if the example could be that. If you do not know somebody what kind of a background he has and whether; he will be able to repay or not. So the kind of information that require about the repayment capacity of the borrower, then you do not find it comfortable to lend money.

So in most of the cases in the case of banking sector you have something called know your customer requirement. Under that if somebody is approaching the bank to seek a loan fresh loan. Then it is the bank which decides about it creates your profile and based on your profile

it includes every all aspects about your financial credit worthiness. And then based on the satisfactory requirement once it is fulfilled then bank will be giving you or sanctioning you the loan.

So in case of adverse election here it becomes really tough for the bank sometimes that even if the borrower is revealing information. Some of the critical components are not being covered and once the bank has sanctioned the money then it becomes really difficult to track. Then the second is about the moral hazard, so once somebody has got the loan or money from the banking segment or any financial intuitions it becomes easier to invest in those activities which are undesirable.

So banks may not or financial institutions may not have control on the borrower that where he or she is actually investing. So in some scenarios it may be possible to track the performance or the money invested. But for some reasons if; the money is flowing into risky investment if, the borrower is investing in risky or making a risky investment. Then you have the high likelihood that this money will not be recovered.

So which means that the moral hazard implied that if the borrower is not concerned about the repayment because he has got the money, and if he or she is making risky investment then there is high likelihood that it will not be. So without caring about the repayment if the investor is making investment decisions then those are part of the moral hazard. So adverse selection and more hazard problems often lead to what we call it as the higher default.

So you may be know in you may be reading in the newspaper even in India we have lot of cases of moral hazard, adverse selection. And through that recently if you are reading the newspaper then recently, we have the case of default which is about the shipyard company and this particular shipyard company has a very bad record of making repayment.

So once you have higher default in the economy then you have credit marketing imperfections lead to or discredit market imperfections linked with asymmetric information may distort the future growth prospect of the economy. So this is the very initial stage from here you have the penetration of all those borrowers all those defaulters in the economy, which may become later very difficult to manage. And ultimately it unfolds in the form of a full-fledged financial crisis so higher default becomes the reason**.**

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Agency Theory and Financial Crisis

- A financial crisis often is the product of asymmetric information linked financial disruptions when even good borrowers face difficulty in obtaining the credit. In other words, asymmetric information acts against the liquidity creation in the economy.
- The limiting opportunity spreads to limiting the productive investment opportunities of firms and households.

And then if you think about from the perspective of agency theory and the financial crisis then it becomes really important. Financial crisis often is the product of asymmetric information and it is also linked with the financial disruptions when even good borrowers face difficulty in obtaining the credit. So if you remember we discussed about credit market imperfections and there we had assumed that.

If you have a amount of good borrower then you have 1 minus a amount of bad borrower, and then in the denominator we had a coming as an so 1 + r upon I think the expression was in the denominator we had A. Now once we have the number of good borrowers rising if you have a more of a good borrower then the default cases will be lower and then the interest rate imperfections will also be or I would say credit market imperfections will be lower.

But when you have higher defaults in the economy then at that time what you find that even the good borrower will have difficult time in convincing the bank, and maybe the credit market tightness will not allow even good borrower to participate. So in that situation it becomes obvious that the good borrower will be exploring some alternative opportunities to borrow.

So alternative in instruments so commercial bills commercial papers become the norm to borrow, because majority of the good borrowers will be diverting towards some alternative assets from where they can generate money. So what does it mean, it means that if you have the credit market asymmetry or the information asymmetry this creates the scenario of a bad scenario for the good borrower also.

And this asymmetric information is talking about the ill liquidity into the system, so ill liquidity in the sense that the limited liquidity or it impacts the liquidity scenario in the economy the banks are not allowed to lend easily. So in India in 2016 when we had the Indian banking upheavals, which had led to a major sectoral shocks in the economy, so at that time also what we failed that when we had the banking sector shock.

So this banking sector shock created trouble for most of these segments in the economy, and then we found that at that time the even good borrowers the large companies were focusing on borrowing through different channels but not through the banking sector. Because banking sector was completely having a shocker because of this uncertainty that; the banking sector was facing in 2016.

The limiting opportunity spreads the limiting the productive investment opportunity or firms, so what it means that. If you have credit market asymmetric then it also distorts the prospect of good investment. If the firms are not able to make good amount of money, then they will of course, would like to delay the investment. And even if they are doing good and if they are not able to procure sufficient amount of capital from the bank then they will also not be paying that much attention.

So here it becomes very difficult even for the households, if they are not able to get because of stringent norms in the banking sector borrowing. Then they will be also postponing the consumption of capital assets. So that is what it becomes really important to understand.

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Dynamics of financial crisis

- Financial crises in advanced economies have progressed in two and sometimes three stages
- The limiting opportunity spreads to limiting the productive investment opportunities of firms and households.
- Stage One: Initiation of Financial Crisis
  - Mismanagement of financial liberalization/innovation
  - Asset-price booms and busts
  - A general increase in uncertainty caused by failures of major financial institutions

Then the financial crisis advanced economies have progressed in 2 and sometime 3 stages. So we will be now focusing on 2007-2008 global financial crises what it actually led to. And what are the normal steps that we have to follow when we talk about the financial crisis? So in a stage one it is the initial phase of the financial crisis what it leads to? It leads to the mismanagement or it is because of these 3 factors you have origination or initiation of the financial crisis that is stage 1.

What is that? It is about the mismanagement of financial liberalization innovation, asset price boom and busts. Then you have the general increase in uncertainty caused by failures of major financial intuition, so here it includes all.

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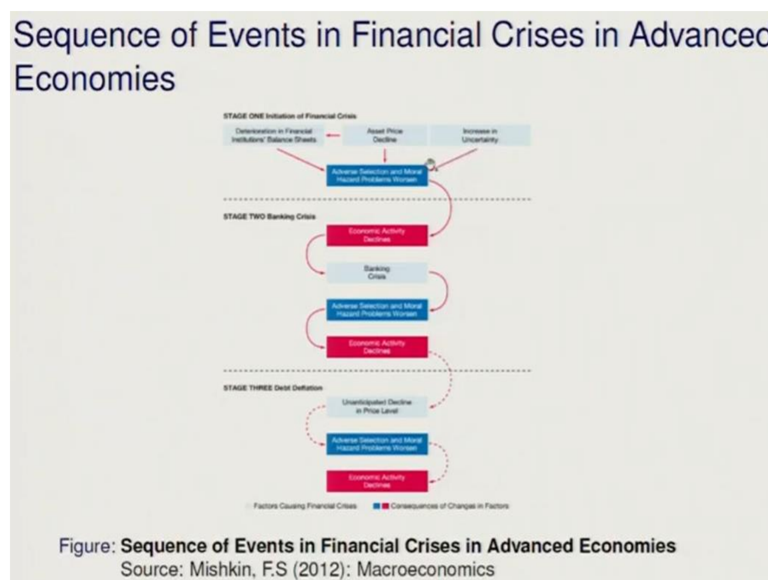

Figure: **Sequence of Events in Financial Crises in Advanced Economies**
Source: Mishkin, F.S (2012): Macroeconomics

So if you go by the stage one here we are talking about the asset price decline, so adverse selection and moral hazard problem version. So here it is increase in uncertainty asset price bubble and busts. And then here you have the deterioration in the financial intuitions balance sheet, so this is how we talk about so here it is. Let us talk one by one about these 3 components of stage 1.

One is about the mismanagement of financial liberalization innovation, so if I am talking about mismanagement so it includes that mismanagement of financial innovation liberalization in the sense that if you have the robust financial sector. So, one of the good things about the financial sector is that it allows you to participate more in the financial market through innovation.

So you can innovate and sell or launch in the market, so here were lot of products coming in the financial segment. Whether it is through the equity or through derivatives or different

channels? And what it does is that it creates investment scenarios that are going to generate better return than the existing assets. So once I have the new asset generated it becomes popular only when it provides higher reward with a limited risk.

Or even if it offers a higher risk, it should offer higher return a quite substantial higher return. So, in the financial sector when you have the financial innovation and when; you have the opening of the economy at the same time so here you have the financial liberalization taking place. So in most of the economies we have seen that we have almost followed the financial liberalization process and that we have allowed the capital from outside so foreign capital to flow into the economy.

And once we have the innovations taking place and these innovations are allowed to float anywhere across the world, then that creates trouble. Because if you have a problem arising in any of the segments then this; will have widespread impact on rest of the segments also. So that is what it basically I would say crux of the topic that we are discussing is this.

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The mismanagement of financial innovation and liberalization, the introduction of new financial product or an innovative financial product is often blamed for the origination of financial crisis. The role of these financial innovations become crucial when economic when economies operate under free capital flow, which means that if you have gone through some of the reports on the process of economic liberalization.

Or the financial liberalization then we had 1997 at Asian financial crisis, so that is also cited one of the reasons for such type of free capital flow. Financial liberalization has dark side 2

which all has the dark side; one is the credit boom and second is the deleveraging. When intuitions allow over leveraging and lending spree in the sense that if; you have gone for liberalizing your financial market for foreign investors or the financial institutions.

Then what typically happens that you have a large inflow of financial intuitions and these intuitions if you are not regulating in a proper manner, then these intuitions bring competition and this competition will also facilitate those forms which are not worthy of that kind of financial investment. So firms with some kind of regulatory arbitrage they would try to become over leverage in the sense that their capacity to repayment is about 200 crore's.

But since market is giving opportunity to borrow 400 crore's, and they know that they will not be able to pay they would like to borrow four hundred and still if they are stuck if their investment is stuck in some activities which are not of very high income generating. Then ultimately their cash flow declines and this creates trouble for the lending banks lending financial institution. So, financial institution will start hitting the shock because of this credit boom.

In most of the economies what we see is that especially in case of emerging economies it becomes really difficult to track the expansion path. So most of the electoral governments when they come in power they promise that they; will be going for huge amount of investment. So once they come in power they will be talking about how they can go for expanding the businesses, how they can process or facilitate the services at the very basic level for that they require money, and this money they will be investing.

So government is borrowing, the central bank is borrowing, it is allowing the banks to borrow money and lend it to those firms which are going to invest in such activities. If the firms are not able to repay then it will be extra burden on the financial institutions will further default on the loan, so create boom has lot of limitations. In most of the economies it has been found that whenever you have a credit bomb.

This boom creates a actual price bubble and this bubble when you have the correct valuation taking place this bubble becomes really difficult to handle. Second is about the deleveraging so higher loan default discourage the banks to lend further, which means that if you have the banking institutions playing a really difficult role. So here you have the higher loan default

which means that if the over leverage forms if they are not able to repay then what typically will happen that?

The forms or the financial institutions will understand not start lending and once the financial situation declined to land then here even the firms which are having a higher prospect of making good money, they will not be able to and finally you have the process of deleveraging started starting. One more dimension that has been often cited that some firms which; are having some kind of governance advantages.

Which means that they are politically connected, or if they have good influence in the government bodies, if some firms have a good connection with the bureaucracy or the political parties, then this they get extra benefit that we call it as the rent seeking opportunity. That with the funding or with the political donations firms always likes to associate with the political parties or political ideologies.

And ultimately what they get is that? They also penetrate in those activities where they are they do not have a specialization. But still they because of these connections they get the contract they operate and once they start feeling that they were they are not getting sufficient revenue or cash flow then they get out easily. But the loss created will not be compensated if the banks and financial institutions keep those loans on their book record for a long time and ultimately it creates a dead it becomes a dead asset for the financial intuition.

So a lot of time in the case of emerging economies and even in the first world economies we see that such type of phenomena is quite popular. And some of the studies have shown this there that there are positive impacts of the rent seeking in the economy. So this also adds value to the credit financial crisis understanding.

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Asset-price boom and bust

- Investor's psychology drives the prices of equity and real estate up from their fundamental economic values.
- The rise of asset prices above their fundamental economic values is an asset-price bubble.
- Asset-price bubbles are often also driven by credit booms, in which the large increase in credit is used to fund purchases of assets, thereby driving up their price.
- Examples of asset-price bubble include:
  - Housing price bubble
  - tech stock bubble during late 1990s
- When bubble bursts and asset prices realign with fundamental economic values, stock and real estate prices tumble, companies see their net worth decline, and the value of collateral they can pledge drops.

Then here you have the asset prime price boom and bust here is that, the investor's psychology drives the price of equity real estate up from their fundamental economic value. So if you have for example in 2000 before 2007 the when there was a bubble creation in the field of real estate. At that time majority of the housing buyers they had gone for borrowing money from the bank, and they purchased the high valued assets called housing because they thought that price will shoot up.

But because of the demand supply mismatch and because of the business cycle disturbance it had happened that the market started crashing. So even the borrowers had very difficult time because then you had the asset price burst started. So when you had bubble you purchased the houses which are not worth of 50 lakh also but you paid seventy lakh but when you have the market declining you saw that your housing prices started declining.

So then when people started selling those to meet to close their loan accounts it became really difficult for these households to close. And foreclosures led to the full fledge 2007-2008 financial crisis that we have. So asset price bubble normally it starts with credit booms these days we see that you have lot of advertisement about the mutual fund investment, and mutual fund investment since they are receiving a huge amount of money.

So their share in this total saving basket of the household has gone up but if, you are having more penetration of money in one direction. And if this money is not invested wisely then after sometime this bubble creation that you have because of the mutual fund it may also bust. So that is the appreciation that people have about the extra attention given to the mutual fund investment in India.

So in most of the countries it has been found that the asset price bubbles are linked with the credit boom, in which large increase in credit is used to purchase of assets, thereby driving up their prices. But once you have the prices coming down settling, we see that you have the disturbance coming so you have the bust. So asset price as I mentioned about the housing price bubble.

Then during or late nineteen nineties when you have the internet discovery taking place at that time lot of technology stocks also experience the similar kind of swings. So when everyone started investing so that we call it as dot com bubble also had created the similar kind of scenario. When bubble burst asset prices realign with fundamental economic values right, so maybe you purchase the house worth of 40 lakhs into 80 lakhs.

But when you have the crash or bust started you realize that the value of your house is coming down very significantly, and then this creates an extra burden on you and finally you are not able to settle your loan account. Stock and real estate prices stumble, company's see their net worth decline and the value of collateral they place drops. Which; means that as we have mentioned as we have already state the limited commitment.

Which; means that whenever the bank is having the apprehension that the borrower will not able to pay then they will be asking for collateral. The borrowing capacity of the borrower will depend upon the value of the underlying collateral. If the collateral value is higher then, they will have the higher borrowing capacity, if the collateral value is going to be lower then, they will be experiencing the lower borrowing capacity. So this is what we always try to understand here.

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Increase in uncertainty

- The above two factors create trouble for the economy and heightened uncertainty in the forms of stock market crash, failure of financial institution, systemic risk.
- Lehman Brothers and AIG in 2008.

Then the third component is about the increase in uncertainty, so the 2 factors that I mentioned about the asset price bubble, and then you have the financial innovation and liberalization. The management of financial innovation liberalization there you have a one more factor that because of this credit boom and the asset price bubble and burst.

It creates whenever you have the asset price bubble and bust taking place it creates a wave of shocks. And then we see that stock market falling then you have the failure of major financial institutions then you have what we call it at this systemic risk. So, interlinked intuitions if, one fails it' will have widespread impact on the all other ah intuition. So those kinds of phenomena become quite prevalent and then it leads to what we call it as the higher uncertainty.

So Lehman brothers and AIG in 2008 had created such type of scenarios and we saw that how it created the full-fledged financial crisis? So I will be stopping it here, and then we will be discussing further from this stage 2 and will be focusing on how we can understand the stage 2, stage 3 phases of the financial crisis. Thank you so much for your attention.