Economics of Banking and Finance Markets
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Lecture - 33
Types of Regulation-III

Hi everyone, welcome to this session, the main objective of this session is to discuss the financial crisis.

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Financial Crisis

1929 → Depression

2007-08 financial crisis: "Once-in-a-century credit tsunami"- Alan Greenspan

- A financial crisis occurs when there is a particularly large disruption to information flows in financial markets, with the result that financial frictions increase sharply, and financial markets stop functioning
- A financial crisis is any of a broad variety of situations in which some financial assets suddenly lose a large part of their nominal value and is often triggered by a panic or a run on banks.

So, we will be discussing what contributes to financial crisis, before I lay down the objective of this session, let me see what a financial crisis is. So, you might have heard that 2007-08 financial crisis and it is considered as said as: "once-in-a- century credit tsunami". This is the 2007-08-09 crisis, the other one crisis in 1929, this crisis was considered as the mothers of all financial crisis which then led to the great depression of 1929, lasting for nearly one decade.

So, this one is also one of the biggest financial crises and we are more familiar with the recent one, that is the 2007-08 financial crisis. So, let us give a proper definition of what is meant by financial crisis. So, a financial crisis occurs when there is a particularly large disruption to the information flows in financial markets, with the result that financial frictions increase sharply, and ultimately financial markets stop functioning.

That is, a financial crisis is any of a broad variety of situations in which some financial assets suddenly lose a large part of their nominal value and is often triggered by a panic or a run-on bank.

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Objectives

- Discuss the factors affecting financial crisis, from an economics lens
- Present these aspects in theoretical framework to understand the dynamics of financial crisis
- Apply these framework to understand the 2007-08 crisis

So, now we are going to discuss, from an economic lens, what are the factors affecting financial crisis. And in the subsequent session we will present all these factors and whatever aspects we have discussed in the previous sessions, especially the asymmetric information and we will be bringing everything together and presenting these aspects in a theoretical framework to understand the dynamics of financial crisis.

Then subsequent session we will be applying this framework to understand the 2007-2008 crisis and, we will be discussing the same framework to understand the financial crisis in some other emerging economies. So, let us now focus on the first part, that is, the factors affecting financial crisis. So, first we will list out various factors that affect, then we will discuss each of them in detail.

So, more importantly, the discussion will be confined an economic perspective and what are the theoretical pathway through which this can affect, but when we do this theoretical perspective, when we apply in the empirical part, it is not necessary that each of them is going to work the way we expect. There will be so many counter factors in the real economy because the real economy said more dynamic and very complex one, several factors will be working in various directions.

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Why financial crises occur?

Factors playing important roles in Financial crisis: Theoretical aspects
(through worsening the effects of the asymmetric information problems)

So, let us start with why does financial crisis occur? We are going to discuss mostly the theoretical aspects of the factors playing important roles in financial crisis. So, our focus will be about worsening the effects of the asymmetric information problem in the financial market. Then how come it will lead to the collapse of the market, means, the financial crisis.

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Factors affecting Financial crisis

1. Asset Market Effects

So, there are several factors. So, we will be listing out this one by one. Of the total six factors, the first one is asset market effects.

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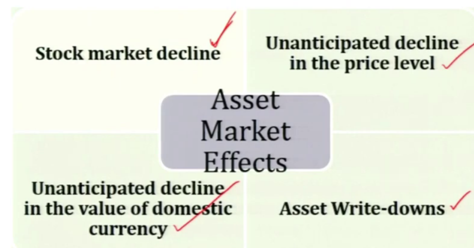

So, of this asset market effects, there are four related aspects, one is called a stock market decline; what if there is a stock market declines? That you can see that, of these factors that we are discussing, it all can, or either of this one, can lead to financial crisis. So, like then within asset market effect, we are first seeing stock market decline, if there is a stock market crash, the collapse of the stock market, then let us see that how that would lead to a financial crisis.

Then another thing is unanticipated decline in the price level, and the third thing is unanticipated decline in the value of the domestic currency, that is depreciation, then another the last one is asset write-downs, especially if there are lots of non-performing assets.

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1: Asset Market Effects

1: Stock market decline:

- Lead to deterioration in borrowing firms balance sheets
- Decline in Net worth: b/c share prices are the valuation of a corporations net worth

Effects of the decline in networth?

1) Less lending because lenders are now less protected against adverse selection...low investment. ---Low GDP

2) Low net worth...moral hazard. risky investment

So, let us discuss these one by one in the asset market effects framework.

The first one is the stock market decline. So, what would happen if there were collapse in the stock market, if there is a stock market crash? If most firms stock price decline, it would lead to deterioration in borrowing firms balance sheet. In the previous class we have seen that the net worth is equal to assets minus liabilities.

So, what if happen that if their stock price declines then; obviously, you know that when the stock price declines there will be decline in their net worth, when there is decline in their net worth and because share prices are the valuation of a corporation's net worth; that means, the assets this will be declining. So, as a result when the asset price declined, then you know that the net worth of the company also declines.

So, what are the effects of the decline in net worth? Let us recall whatever we have studied in the previous sessions, when there is a decline in the net worth of a company, we know that it will trigger out the adverse selection and moral hazard problems.

So, you can see that if the company's stock price decline, when the company's net worth declines, then there will be less lending to those institutions, because lenders are now less protected against adverse selection. Because of that, you can see that, when the lenders are less protected against adverse selection, they will be reluctant to lend to these firms, as a result the capital flow get affected.

That means, the capital flow from the surplus sector to the deficit sector will get affected, there will be less incentive for the households and institutional investors to lend in the market because they see that there is increased risk of default in the bond market, and even they would not invest in the company's IPO. So, as a result. we see low investment, which would eventually lead to low GDP and low employment.

Here itself you can see that this will be creating financial crisis, that means, low investment, lower lending means stopping of the functioning of the financial market. Similarly, we also seen that low net worth promotes moral hazard behavior. So, we have seen that there will be moral hazard behavior because there is low net worth.

If the companies' net worth is very low, their management would think that if they engage in risky activities, and if it earns them a huge profit, the company is going to benefit, if they lose it is the public money, the borrowed money. That means, because of the decline in stock price, which is leading to low net worth it will promote moral hazard behavior and the firms will be undertaking more risky investment.

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1: Asset Market Effects (contd…)

- **2: Unanticipated decline in the price level**
- Effect of deflation: Debt contracts (long period of 10-20 years) with fixed rate of interest (fixed in nominal terms) ??
- Leads to decline in net worth (because increase in the burden of debt…increase in the value of firms' borrowing liabilities)

Moving to second aspect, that is, unanticipated decline in the price level, if there is an unanticipated decline in the price level so, let us see for example, deflation. So, if it is an anticipated; obviously, you know that market will be prepared accordingly, but, if the decline in the price level is unanticipated, then it is going to affect the real interest rate. So, normally most of the interest rate will be fixed interest rate, not the flexible one.

So, what is going to happen suppose if the asset market effects, if you know as a result you know that if there is an effect of deflation the debt contracts you know that how does it affect the interest rate? The interest rate is 5, for example, suppose we say that rate of interest is 5 percentage for next 20 years.

If there is a deflation, then you know that they must anyway pay 5 percentage itself, but because of deflation, the value of money has increased right. So, they will be still paying 5 percentage, but the in real terms this 5 percentage may be equal to 10 percentage or may be 15 percentage or 20 percentage.

So, what we can see from here is that debt servicing, that is, the interest payment burden increases if there is deflation. So, that means, instead of the agreed nominal 5 percentage, but they will be still paying 5 percentage, but in real terms it is going to be much greater than these 5 percentages; that means, their debt servicing increases, this is nothing, but their liability is going to increase.

About the net worth, we already seen that that the assets minus liability. So, because of the increase in the debt that it is an interest payment, the real burden of interest payment also increases because the liability increases then; obviously, you know that the net worth is going to decline. So, this leads to decline in net worth because of the increase in the burden of debt, so; that means, increase in value of firm's borrowing liabilities.

So, this is this would make this firm vulnerable to adverse selection and moral hazard problems. So, this would lead to the worsening the asymmetric information problem. That means, there will be less lending and it also encourages the banks or the financial institutions or any institution to engage in risky activities.

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1: Asset Market Effects (contd…)

3: Unanticipated decline in the value of domestic currency

- Many firms issue debt denominated in foreign currency
- Unanticipated decline in foreign exchange rate of domestic currency: Debt burden of firms increase
- Results in declines in Net worth…leads to adverse selection and moral hazard

Then the third one is under the asset market effects; this one is unanticipated decline in the value of domestic currency. You know, many firms issue debt denominated in foreign currency, then what would happen? Suppose a firm in India issued a corporate commercial paper to borrow from abroad, that is borrowed in dollar and obviously, they must repay their debt and interest income in terms of dollar.

What if there is an unanticipated decline in foreign exchange rate of domestic currency, suppose at the time of borrowing, the exchange rate was 70 rupees, it was 1 dollar was equal to 70 rupees. what if there is the decline in the value of domestic currency, what if 1 dollar becomes 100 rupees? So, in this case you know that when there is an unanticipated decline in the value of domestic currency, now when they make the repayment of both principal and interest income, they must pay a higher amount.

So, they have taken for example, they have taken 1 million when the exchange rate was 70, but now due to depreciation, the firm need to pay 100 rupees to get 1 dollar; that means, during the repayment time they need to pay more. So, in this way the debt burden of firms increases.

The debt burden of firms increases here, and as a result again, we can say that firms' liabilities will be increasing, when firms' liability is increasing, we know that clearly the net worth of the firm is declining. So, this again through the asset market effects, we can see that it leads to adverse selection and moral hazard problem.

The points that we discussed in a couple of minutes before is relevant here as well; that means, declining net worth makes the firms, the borrowed firms, more vulnerable to adverse selection and moral hazard. And you can see that the issue of unanticipated decline in value of a domestic currency as well as the previous one, the unanticipated decline in the price level, both are macroeconomic risk, a systematic risk, affecting most of the firm.

And as a result, if most firms who borrowed from the market and their net worth declines, then you know that that would lead to hampering the flow of funds into the market. And as a result, overall, the smooth functioning of the financial market get disrupted, and as a result it will start stopping the market, and ultimately, we can see that a kind of financial crisis happen.

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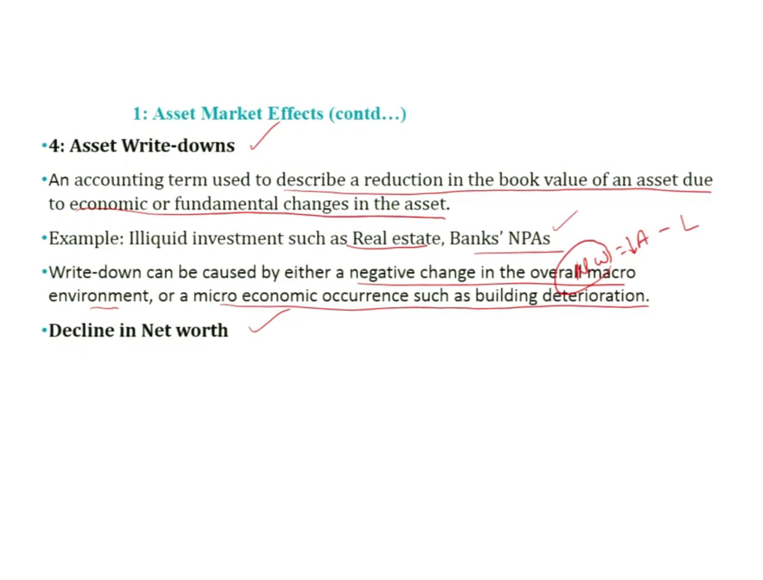

Then one more thing, that is coming under this asset market effect, is the asset write-downs. Here, in this case, what if the more and more non-performing assets are in firm's balance sheet. So, it is an accounting term, the asset write-down, this one is an accounting term used to describe a reduction in the book value of an asset due to economic or fundamental change in the asset. So, for example, illiquid investment such as real estate and bank's non-performing assets, and if there are for example, in the case of banks if there are non-performing assets in the bank for more than one year, then they must write - down this from the balance sheet.

So, after certain point of time they must take it out they have to write - down this from the balance sheet so; obviously, you know that our framework that the assets will be declining, that is nothing, but the net worth of the bank also will be declining.

So, it can also be caused by the either negative change in the overall macro-economic environment or micro economic occurrence such as building deteriorations etcetera. So, as a result the decline in net worth and we have seen that decline in net worth leads to the problem that we mentioned; that means, it worsens, it aggravates the asymmetric information problem and as a result you can see that adverse selection and moral hazard problem get worse, and as a result the smooth flow of fund from the surplus sector to the needy sector get disrupted.

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Factors affecting Financial crisis

1. Asset Market Effects
2. Increase in interest rates
3. Deterioration in Fin institutions Balance Sheets
4. Banking Crisis
5. Increase in Uncertainty
6. Government fiscal imbalances

Then coming to the second one, this one, is increase in interest rate in the market, what if there is increase in interest rate in the market? And how does it will lead to financial crisis?

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2: Increase in interest rates

- If increase in interest rate: due to i) increased demand for credit or ii) shortage of funds due to decline in MS
- **1) WTP the highest interest rates:** Individuals and firms with riskiest invest
- Firms of good credit risks are less likely to borrow & bad risks are still willing to borrow
- **2)Decline in Net worth:** High interest reduce the cash flow (the diff b/w cash receipts and expenditures) ...less internal finance...so have to rely on external finance.... subject to asymmetric information

So, if increase in interest rate is due to increase demand for credit or shortage of funds or due to decline in money supply, then what would happen? Suppose that there is increase in demand for credit or shortage of funds due to decline in money supply. So, you know that mainly interest rate increase will be happening either due to increase in demand or keeping money supply constant or increase in demand remains constant and there is decline in money supply. So, all these would lead to increase in interest rate.

So, let us see what if the market rate of interest rate increases. So, who is willing to pay highest interest rate? About the supplier of bonds, among the supplier of bonds that is firms so, you can see that a firms or individuals and firms with riskiest investment, they in fact will be willing to pay more, we can see that a firms with high default risk or poor ratings; that means, high risk firms are willing to pay highest interest rate in the market.

At the same time, we already know that when the market rate of interest increases, firms with good credit risk are less likely to borrow and obviously, bad risk are still willing to borrow. So, obviously, what is going to happen, apparently, you can see that the market will be overrepresented by high-risk individuals and firm borrowers, that is, high risk borrowers and then that would lead to the problem of adverse selection.

Because the market will be more with higher risk borrowers and eventually in the long term, we can see that they would not be paying back, they will be making default and as a result in the market, the lenders will be a reluctant to lend in the coming days. Not only that even the

adverse selection itself, we find that, if this kind of scenario happen, if there is an increase in interest rate, then good credit risk firm will back out and if only bad risk firms only in the market, then; obviously, the lenders also get the signal that the market consists of only high-risk firms.

So, eventually, the lenders stop lending in the market. Then if the increase in interest rate, we also see that this would reduce the cash flow of the firms, because you know that the liability of the borrowed firms is increasing so; that means, the cost of borrowing is increasing so, the cash flow, that is the difference between cash receipt and expenditure. So, there will be less internal finance for this firm because of the interest rate increases, the cost of borrowing increases. So, they must rely on external finance, and then again you know that this is subject to asymmetric information.

So, in one of the previous sessions we have seen that, because of the asymmetric information, internal finance is becoming the main source of borrowing for many firms. But if the interest rate increases, already most firms already will be having some debt burden anyway, an increase in interest rate reduces their cash flow. Thus, the internal finance will be getting affected because of the reduction in the cash flow.

So, as a result, they must depend on external finance, but again it will be subject to more asymmetric information, leading to adverse selection and moral hazard problem.

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Factors affecting Financial crisis

1. Asset Market Effects
2. Increase in interest rates
3. Deterioration in Fin institutions Balance Sheets
4. Banking Crisis
5. Increase in Uncertainty
6. Government fiscal imbalances

And third factor could possibly lead to financial crisis is deterioration in financial balance sheet.

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3: Deterioration in Fin institutions Balance Sheets

- **Fin institutions**, particularly **banks:** major role in Fin Market b/c they are well positioned to engage in information production… channelize capital to productive investments
- If Banks balance sheets deteriorate, their lending will come down…slow down in economic activities

What if financial institutions particularly banks when their balance sheet deteriorate to some reasons, maybe because of the systemic or that is the idiosyncratic or systematic risk; what if they balance sheet deteriorates.

So, suppose particularly of banks, you know that banks they play major role in financial market because they are well positioned to engage in information production. So, we have seen that banking industry, they are well positioned to engage in collection of information, production of information, and using this information for their own business, that is, they will be using it for their own business, that is to provide private loan, therefore, there would not be any free rider problem.

The banks channelize capital to productive investment, you know that since banks are having this comparative advantage, the households are not well familiar with the financial market, so they will be mostly preferring the banking system, that is, the households will be preferring banking system as to park their money (Refer Time: 23:06), that is, deposit their surplus.

So, banks are collecting these money and transferring these funds to the different sectors of the economy who can make it for productive investment. What if due to some reason which I

mentioned already the banks' balance sheet deteriorate; that means, if their bank balance deteriorates, then their lending will come down.

So, if banks' balance sheet deteriorates then; obviously, you know that banking crisis erupt, then their lending will come down and this will slowdown economic activities and because banks act as a one of the key financial intermediaries that is collecting money from those who are having surplus and channelizing these funds to the sectors where it can be put in productive use.

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4: Banking Crisis

- If the deterioration in banks balance sheet is severe, they start failing.
- Deposits can be pulled out quickly, but not bank loans
- **A Bank Panic:** Multiple banks fail simultaneously as withdrawal of deposits leading to bank failure

And fourth one, this is, little bit related to the issue that we discussed that the deterioration in the bank's balance sheet, we can see that what if there is a banking crisis due to the deterioration in the banks' balance sheet balance sheet. if there is a rumor that some banks are not paying back their deposit, then the depositors will be running to the bank, bank run will happen you know the deposit can be pulled out quickly, but at the same time you know that all these funds already been distributed in the market, in the loanable fund market. Banks cannot pull it back; bank cannot call back all the loans. We have seen that deposits are more liquid, but bank loans are less liquid.

So, this would lead to a bank panic; that means, if one bank fails and then because of the asymmetric information problem, multiple banks fail simultaneously, as withdrawal of deposit leading to bank failure. So, we have seen that even a good bank also would not be able to pay back deposit if all the deposit is turned to the counter collectively; that means,

everyone come to the bank, if the pace of bank run increases, then multiple banks fail simultaneously.

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4: Banking Crisis

- If the deterioration in banks balance sheet is severe, they start failing.
- **Deposits can be pulled out quickly, but bank loans**
- **A Bank Panic:** Multiple banks fail simultaneously as withdraw their deposits leading to bank failure
- Fear can spread from one institution to another
- Sources of contagion is Asymmetric information
- **Depositors:** Fearing the safety of their deposit, and not knowing the quality of Banks's loan portfolios

So, this fear can spread from one institution to another. So, we already seen sources of contagion is the asymmetric information. So, everyone because of this issue; because the fearing of the safety of their deposit because they do not know the quality of banks' loan portfolio, as a result there will be bank failure.

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5: Increase in Uncertainty

- If a dramatic increase in uncertainty in Fin Market due to Bank failures, or Stock Market crash....
- ....increase asymmetric information.....resulting inability for lenders to distinguish good credit risk and bad credit risks....
- .....less protection from adverse selection....less willing to lend...low investment...low GDP

Then another related fact is what if there is increase in uncertainty in the market, because one of the principles that we discussed in the beginning of this course was that uncertainty reduces welfare. So, for the welfare of the economy we prefer to have more certainty in the economy, what if there is increase in uncertainty? Increase in uncertainty about interest rate, about the inflation, about the economic conditions or political conditions, all these things if there is an increase in uncertainty, dramatic increase in uncertainty in financial market due to bank failure or stock market crash, then you know that the asymmetric information aggravates. This would result in inability for lenders to distinguish good credit risk and bad credit risk, and as a result there will be less protection from adverse selection for the potential investors, and they will be less willing to lend and then low investment and then low GDP.

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Factors affecting Financial crisis

1. Asset Market Effects
2. Increase in interest rates
3. Deterioration in Fin institutions Balance Sheets
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6. Government fiscal imbalances

Here we discussed five major aspects that would lead to a financial crisis, and we will discuss in the next session about the government fiscal imbalances.

Thank you, see you in the next session.

Keywords: financial crisis, asset market effects, increase in interest rates, asset write-downs, net worth, deterioration in financial institutions balance sheets, banking crisis, increase in uncertainty