

Lecture 7

Financial crisis = Increase in adverse selection and moral hazard problems due to a disruption of financial markets so that the financial system can no longer perform its main function of channeling funds to the most productive investment opportunities.

- Can be triggered by external or internal factors.
- Leads to a reduction in GDP growth (via reduction in investment).

A financial crisis arises if shocks to financial markets increase the *asymmetric information problem* and as a consequence disrupt the *functioning* of the financial system, resulting in a fall in investment and a contraction in real GDP growth. We can analyze the link between economic shocks, the asymmetric information problem and investment using the model of the firm's demand and supply of investment funds introduced last week.

Firms can raise some funds internally until a certain point. If firms want more funds they can obtain it externally, however this has a positive relation with the risk of financing. The demand of funds has a downward slope: the more you invest, the less risk you want to take.

A shift in F_s reduces investment funds available at any interest rate. Total investment falls.

A steeper slope implies that external suppliers ask for higher interest for any given level of funds beyond I^* . Total investment falls.

If the quality of financial intermediation decreases, the transaction costs increase, the wedge increases. This reduces overall investment.

Using the firm's supply and demand model for investment funds we will analyze the effect of:

- Internal factors:
 - Increase in interest rate
 - Increase in overall uncertainty
 - Fall in asset prices
 - Deflation
 - Bank run
- External factors:
 - Currency crisis (depreciation plus capital outflow)

Channels of financial crises

- Remember the definition of financial crises: The disruption of financial markets has to come as the consequence of an increase in asymmetric information problems (= moral hazard + adverse selection).
- How do the internal and external factors relate to the asymmetric information problem and how do they result in a fall in investment?

1. *Interest rate increase*

- The interest rate increases so investing becomes more expensive.
- Low-risk firms stop borrowing because they are unwilling/unable to pay higher interest. High-risk firms continue (adverse selection).
- Firms engage in more risky behavior to increase their profits (moral hazard).
- Higher risk makes F_s steeper, which causes lower investment.
- A higher interest rate also increases real value of the loan (higher real debt), which causes a reduction in net worth of firms.
- Reduces level of internal financing so F_s shifts left which results in lower level of investment.

2. *Overall increase in uncertainty*

- Uncertainty means an overall increase in riskiness of firms.
- Average risk faced by banks increases (more potentially “bad firms” in portfolio of bank).
- Higher risk makes F_s steeper, which results in lower investment.

3. *Fall in asset prices*

- Lower asset prices, which means a reduction in net worth of firms.
- Consequence: Lower level of internal financing, which makes F_s shift left, which results in lower investment.
- Consequence: Firms liable for smaller amount (There is less for banks to recover because the penalty for the default is smaller). This encourages more risky firms to apply for loans (adverse selection) and promotes more risky behavior of firms (moral hazard).
- Higher risk makes F_s steeper, which results in lower investment.

4. *Deflation*

- Deflation is increase in real value of debt, which means a reduction in net worth of firms.
- Lower level of internal financing makes F_s shift left which means lower investment.
- Firms liable for smaller amount. There is an increase in adverse selection and moral hazard problem, which causes higher risks for banks what makes F_s steeper what results in lower investment.

5. *Bank run*

- Bank run is a situation where deposit holders perceive bank deposits as more risky and withdraw funds from banks.
- Severe disruption of functioning of banks as financial intermediaries, therefore quality of screening and monitoring falls.
- Adverse selection and moral hazard problems increase what makes F_s steeper, which will result in lower investment.
- Transaction costs of banks increase (less efficient financial system) which causes a larger wedge, which results in lower investment.

External channel: Currency crises

- Currency crises are likely to arise in countries with fixed exchange rate and international capital mobility.
- A currency crisis typically leads to
 - Depreciation of the currency
 - Increase in interest rates (to fight the depreciation)
 - Capital outflow

How may these events contribute to a financial crisis?

1. *Depreciation of the domestic currency*

- Depreciation means the real value of foreign debt increases, which causes a reduction in net worth of firms (and banks).
- Reduction in net worth reduces internal level of financing makes sure that F_s shifts left.
- Reduced liability of firms and balance sheet problems of banks lead to more severe asymmetric information problems so F_s becomes steeper.
- Both forces reduce investment.

2. *Raising the interest rate*

Same effect as before (internal):

- Higher interest rates increase the moral hazard and adverse selection problem, therefore F_s becomes steeper.
- Higher interest rates also reduce the NW of firms (due to higher real value of debt), therefore F_s shifts left.
- Investment falls.

3. *Capital outflow*

- If domestic investment is largely funded by foreign loans: overall reduction in available funds, which makes sure that F_s shifts left.
- If foreign banks are better at screening and monitoring loan applicants: overall lending risk increases, which makes F_s steeper.
- If foreign banks operate more efficiently: wedge increases.
- All three forces reduce investment.

It is important how it effects the asymmetric information problem.

Figure: 7.1

1= No risk.

2= Realistic market with competition.

3= Lower level of internal financing.

4= Higher risks.

5= Higher transaction costs

A combination of the shocks can cause a massive reduction of investment.

Financial crises and over-investment

- The above-discussed shocks will have more severe consequences if previously there was over-investment: with over-investment it is more likely that a given shock will trigger a financial crisis.
- Over-investment is the result of too low perceived risks: Banks offer loans at too low interest rates and firms demand too many loans:
 - Because of too optimistic prospects.
 - Because of governmental guarantees of loans. Bail the banks out when the banks have too many faulty loans.

Example: economic recession in 2008. Over-lending made the damage worse.

Backward-bending savings curve

- We argued before that, due to risk, the external supply of funds increases in the interest rate.
- When interests are very high, firms may be unable to repay the loan. Savers may be worse off with very high interest rates than with lower interest rates. Because the firms are unable to pay back the bank loan. At low interest rates it is more likely to get the money back.
- Both arguments together imply that the savings curve may be backward-bending.
- In this case, an interest rate increase will not only have the usual effects but may make things even worse.

Figure 7.2:

1 to 2: negative slope eventually

three intersection points, three equilibria.

Which of the equilibria are stable?

- An equilibrium is **stable**, if starting from a position slightly outside of the equilibrium, the economy automatically moves back to the equilibrium.
- An equilibrium is **unstable**, if starting from a position slightly outside of the equilibrium, the economy automatically moves further away from the equilibrium.
- In the loanable funds market, the movements of the economy depend on whether $I > S$ or $I < S$.

$I > S$:

- Excess demand for funds.
- Interest rate will increase.
- Economy moves “upward”.

$I < S$:

- Excess supply of funds.
- Interest rate will fall.
- Economy moves “downward”.

So the difference in supply and demand determines whether the economy moves upward or downward.

Above 3 and between 1 and 2, there is excess supply of loanable funds, interest rate will fall, economy moves downward.

Below 1 and between 2 and 3, there is a excess demand of loanable funds, the economy moves “up”

Above point three and under point three are both moving at different directions, shown by the black arrows. They are both correcting each other closer to point three, what makes point three a stable equilibrium. This is the same for point 1.

Point two is unstable, because the above and under point two the arrows move further away from point two.

If the savings curve is backward-bending, an interest rate increase will not only have the usual effects (shift the F_s curve and increase steepness of its upward sloping part), but may make things even worse:

- If the economy was previously in point 2, even a tiny increase the interest rate will push the economy into point 3.
- Even without the slope change and shift of the F_s curve there will be a massive fall in investment and therefore can be a major contribute to a financial crisis.


Twin Crises

- A currency crisis can be the result of weaknesses in the domestic financial sector (“Banking crisis”). **Twin crises** (= simultaneous banking and currency crisis):
 - Reduction in confidence in country in light of banking crisis → withdrawal of foreign capital → currency crisis.
 - Currency crisis reinforces weaknesses in the domestic financial sector.
- Both currency and banking crises increase the asymmetric information problems.

Banking crises can cause currency crises.

Banking crises and currency crises

Stage I Banking crisis

1.  Domestic financial fragility due to ill -devised financial liberalisation; under-regulated and over-guaranteed banks

2. Large capital inflows; bank lending boom, but poor quality of bank loans.
Banking sector increasingly vulnerable, possible bank runs
3. 1) Deterioration of firms and bank balance sheets.
2) Drop in asset prices.
3) Increase in uncertainty.
1) + 2) + 3): Problems of asymmetric information increase.

Stage II Currency crisis

1. Loss of confidence (foreign) investors; pressure on the exchange rate.
2. Currency crisis and reversal of capital flows;
4) Debt -deflation (debt in foreign currency).
5) Interest rate increase.
4) + 5): Further increase in problems of asymmetric information.

Financial crises: Empirical Evidence

- Banking crises typically precede currency crises
- 'Bad fundamentals' (poor underlying economic conditions) are the main cause of the financial crises.
- Typical pattern in the build-up of a financial crisis:
 - Excessive growth of bank credit and money supply. Often times by under regulation of banks.
 - Overvaluation of currency means imports are cheap so there will be large imports.
 - Fall in foreign exchange reserves.
 - Excessive capital inflow (deterioration of current account.)

Fundamentals vs. self-fulfilling prophecies

- Many factors can trigger a financial crisis.
- Both bad fundamentals and sudden capital outflows for no good reason can be the ultimate cause.
- Bad economic and financial conditions can lead to investors' loss of confidence, but investors' actions can also worsen economic and financial conditions.
- Policy recommendations differ depending on what started the crisis.

The vicious circle of financial crises:

There are many different problems and one problem triggers the other and make the problem worse. Figure 7.3

A financial crisis can begin anywhere on the circle and then trigger other events:

- Investors lose confidence, therefore capital outflow and currency depreciation, consequently net worth of firms falls due to increasing real value of foreign debt, which causes less investment and output, which results in even more loss of confidence.

- To stop the crisis, policy makers need to rebuild investors' confidence in the economy and possibly impose capital controls.
- Fragile financial sector causes over-lending and low quality loans which makes investors lose confidence which causes capital outflow and depreciation which results in a reduction in firms' and banks' net worth (balance sheet problems)...
- To stop the crisis policy makers need to improve the functioning of the financial sector.
- Currency crisis and depreciation causes an increase in real value of foreign debt, which creates balance sheet problems, which makes investors lose confidence, what results in capital outflow and further depreciation ...
- To stop the crisis, policy makers need to stabilize the exchange rate and prevent further depreciation.

Appendix

Figure 7.1

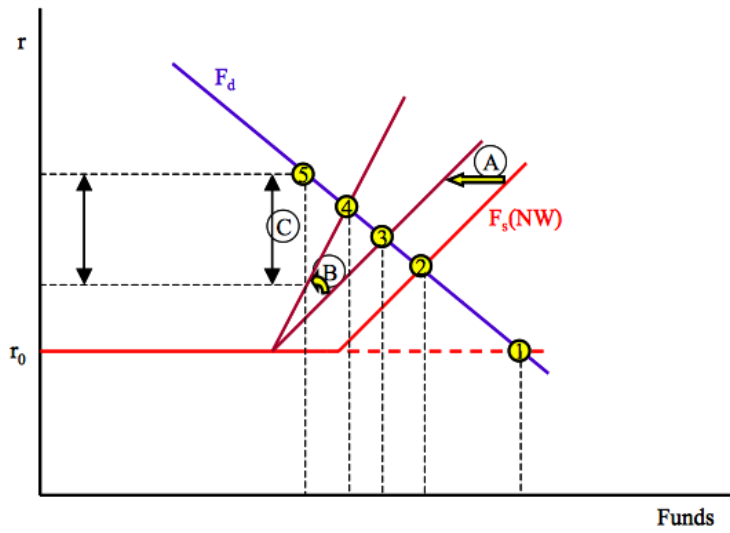


Figure 7.2

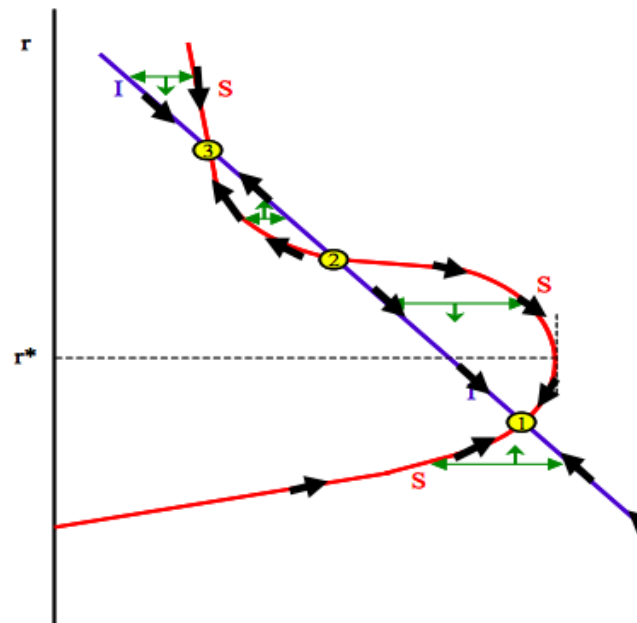


Figure 7.3

Domestic balance sheet problems

