Economics of Banking and Finance Markets
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Lecture - 20
Economic Analysis of Finance Structure: Asymmetric Information

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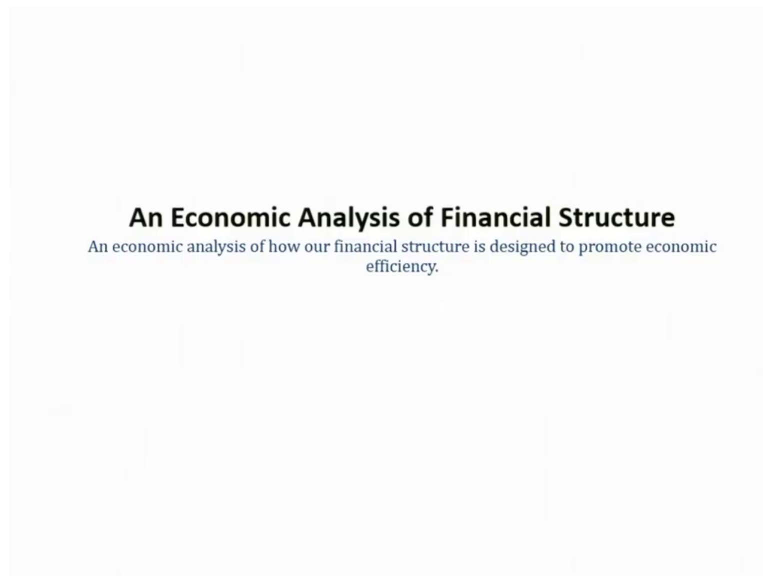

The main objective of this session is to discuss an Economic Analysis of Financial Structure. While carrying out this discussion it will help us to understand and inform how our financial structure is designed to promote economic efficiency.

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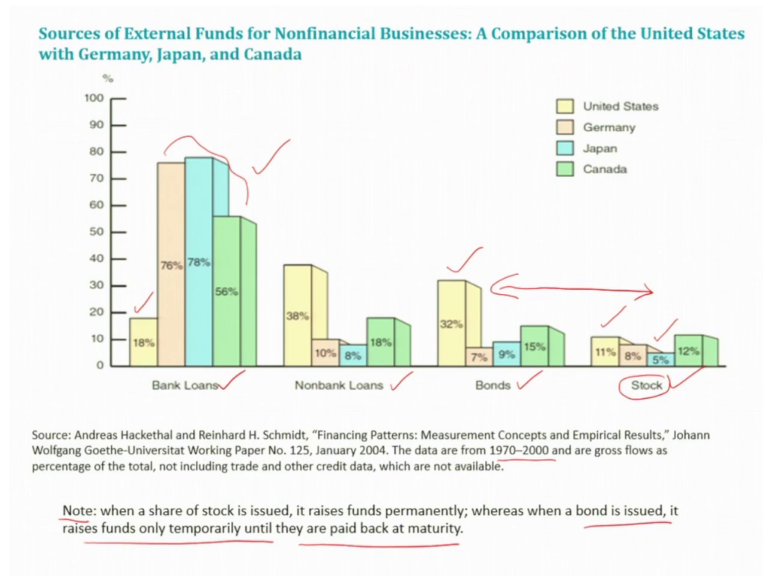

Look at this figure, it shows the sources of external funds for non-financial businesses, a comparison of the United States with Germany, Japan, Canada and US.

You can see it from in the figure that these are the major sources of external funds for non-financial firms. So, from this you can see that the four major sources of external funds; one is bank loans, other one is nonbank loans, bonds, and stock. This data is from 1970 to 2000, so you can see this is the percentage of total external fund for the firms.

So, what are the main inference here, you can see that, for example, for the US you can see that nonbank loans occupy a larger share. But for Germany, Japan, Canada, these are the bank loans, that is, bank loans occupy larger share. Before we discuss further about this figure, let us also make some more observation, for example stocks. Stocks, the share is very less, for example, in the US the share for external fund for the firm is only 11 percentage. In Japan, it is going to be only 5 percentage and even as compared to bonds. Bonds even occupy 32 percentages for the US, but stocks occupy only 11 percentages. That means, most of us think that the major sources of external funds for firms are mainly stocks, but it is not true; actually, they rely on the other sources including bonds, bank loans and nonbank loans.

We have also need to highlight one of the issues here, an important note, we should not make a direct comparison between the share of bond and stock. Because when a share of stock is issued, it raises funds permanently, right. Whereas, when a bond is issued it raises funds only

temporarily until they are paid back. So, in that way, a direct interpretation of this figure may be misleading. So, anyway, let us move further to discuss this figure.

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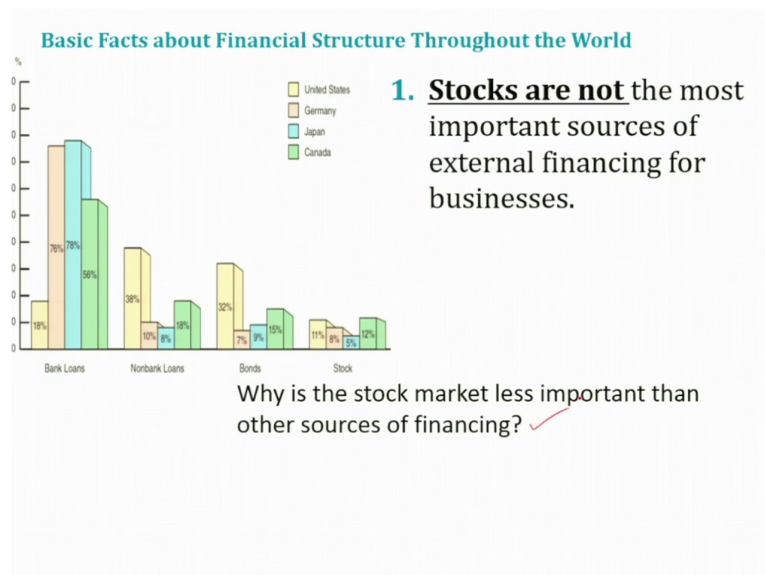

What you can see that, an important observation here is that, in contrast to what we normally think the stocks are the major sources, but this figure clearly shows that stocks are not the most important sources of external financing for businesses. So, the question here is that why is the stock market less important than other sources of financing? This is an important question that we need to answer.

What we will do in this session, and subsequent sessions, first we will interpret this figure, try to make some inferences from this, and then will raise some question and then we will try to answer in subsequent discussion. So, why is the stock market less important than other sources of financing? We will answer it by discussing appropriate theoretical theories behind it, and then we will relate it with the empirical aspects.

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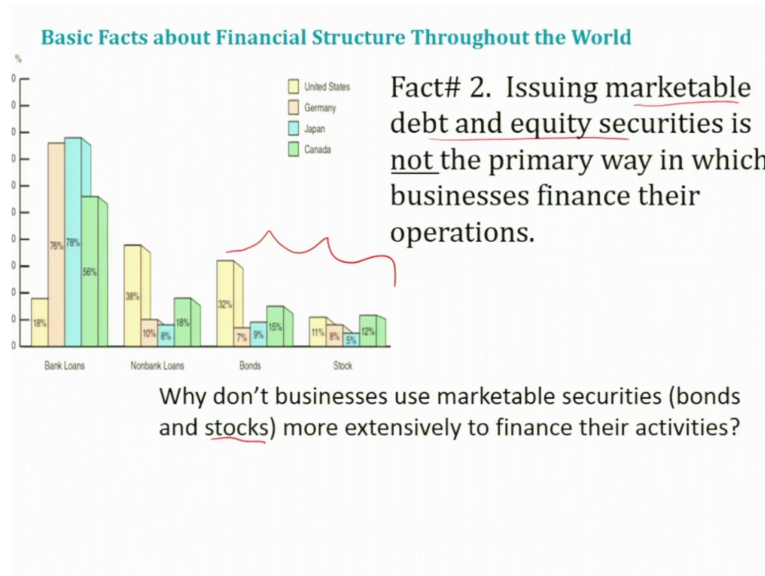

Then going to fact number 2 from this figure, you can see that, issuing marketable debt and equity securities is not the primary way in which businesses finance their operation. So that means, a debt and equity securities is not the primary way in which businesses finance their operation. So, why do not businesses use marketable securities bonds and stock?

So, our question here is that why do not businesses use marketable securities, why do not they borrow from the market and pay rate of interest? For example, issuing bonds is a kind of direct finance; that means, they are selling finance instrument directly in the market and raising without using any financial intermediaries. Why do not they do it and, similarly, why do not they issue more IPO's and raise funds.

Instead, why do they use other options? So, the question here is why do not businesses use marketable securities more extensively to finance their activities?

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And coming to fact number 3, you can see that indirect finance is many times more important than direct finance. That means, raising finance through financial intermediaries, instead of directly buying from the market through issuing, bonds and stocks.

So, then the question here is that why are financial intermediaries and indirect finances so important in finance market? So, one more thing you need to remember that, for example, when the firms are buying through financial intermediaries, in fact the borrowing cost increases. And even you know that when they are buying through banks or any other financial intermediaries; obviously, they also need to pay the transaction cost for the intermediaries and plus their profits as well.

So that means, it is costly for firms to buy through the indirect finance, then still why do they borrow from financial intermediaries and opt indirect finance? However, in recent years, if you observe more about this market data, we can observe that in recent years indirect finance has been declining in importance. Why is this happening? What is happening over time, why the indirect finance has been declining in recent years?

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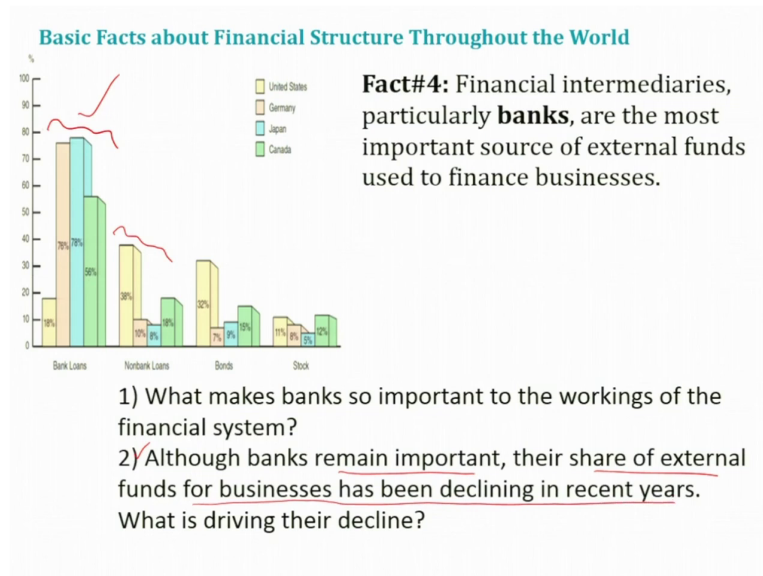

Then moving to fact number 4, financial intermediaries particularly banks, you can see here banks, for example in Germany, it is 76 percentage and Japan is 78 percentage of firms their external financing is through bank loans. So, the question is the fact here is that financial intermediaries, particularly banks, are the most important source of external funds used to finance businesses.

Even within financial intermediaries, it is not only the banks actually occupy larger portion, loans from pension funds or loans from insurance companies, nonbanking financial intermediaries etcetera. Then the question is what we are going to answer in the subsequent sessions is that what makes banks so important to the working of the financial system?

Then, although banks remain important, we can also observe if you go through the data about the sources of external funds, if you visit the data from Federal Reserve and IMF and other sources, you can also see that although banks remain important, their share of external funds for business has been declining in recent years and what is driving their decline. Why is so?

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Basic Facts about Financial Structure Throughout the World (Contd……)

Fact#5: The financial system is among the most heavily regulated sectors of the economy.

Why are financial markets so extensively regulated throughout the world?

Fact#6: Only large, well-established corporations have easy access to securities markets to finance their activities

Why do only large, well-known corporations find it easier to raise funds in securities markets?

Some more facts. We can see that the finance system is among the most heavily regulated sectors of the economy, this is not from the figure anyway. However, it is also related to the financial structure throughout the world. The finances system is among the most heavily regulated sectors of the economy, even if you read the financial dailies in India and the US and other Western countries and rest of the world rest of the globe, you can observe that there are lots of regulation in the financial sector. So, regulations are being done to control the financial system. Then the question here is that why are financial market so extensively regulated throughout the world? What drives, what makes the policy makers to controlling or regulating the finance sector so extensively?

Then another fact is that only large well-established corporations have easy access to security securities market to finance their activities. That means, if you observe, well established firm, for example, Coca Cola, Microsoft, Google if they want to raise funds it is much easier for them to raise funds. You might have also observed that when well established companies issue IPOs, such companies IPOs have been oversubscribed. So, why do only large, well-known corporations find it easier to raise funds in securities markets?

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Basic Facts about Financial Structure Throughout the World (Contd……)

Fact#7: Collateral is a prevalent feature of debt contracts for both households and businesses.

Why is collateral such an important feature of debt contracts?

- Collateral is property that is pledged to the lender to guarantee payment if the borrower is unable to make debt payments. Collateralized debt (also known as secured debt to contrast it with unsecured debt, such as credit card debt, which is not collateralized) is the predominant form of household debt and is widely used in business borrowing as well.

Fact#8: Debt contracts are extremely complicated legal documents that place substantial restrictive covenants on borrowers.

Why are debt contracts so complex and restrictive?

Then 7th fact, which is related to the financial structure throughout the world, collateral is a prevalent feature of debt contracts for both households and businesses. So, the again we raise the question here, why is collateral such an important feature of debt market?

So, before that let us see what is Collateral mean? Collateral is a property that is pledged to the lender to guarantee payment if the borrower is unable to make debt payments collateralized debt also known as secured debt in contrast it with unsecured debt such as credit card debt, which is not collateralized is the predominant form of household debt and is widely used in business borrowing as well. So, the example of collateralized debt is the mortgage the housing loan, vehicle loans etcetera. So, the question here is why collateral is such an important feature of debt contract.

The last and 8th fact, the debt contracts are extremely complicated legal documents that place substantial restrictive covenants on borrowers. And even if you get a loan from a bank or a lender you cannot easily use it, there are lots of restrictive covenants that you need to follow when you use these funds. So, the contracts are extremely complicated legal documents. So, again the question here is that why are debt contracts so complex and restrictive?

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So, to answer these questions which, we will be doing in the subsequent session, as I mentioned, let us discuss the economics behind the reason for this. So, one of the reasons that is leading to most of these factors is the issue of asymmetric information in the market. So, we have seen in one of the previous sessions we said that one of the principles in the finance market, we said that information is an important variable in the finance market.

However, we are going to see that the finance market is filled with mostly asymmetric information, which would eventually lead to market failures. So, let us discuss this concept, what is meant by asymmetric information and what is meant by market failures in the financial markets. So, coming to information, let us first make information into 2 category 2 group, one is perfect information and the other one is imperfect information.

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Market failure: imperfect information

- **Perfect Vs. Imperfect information**
- Asymmetric information
  - **information asymmetry** deals with the study of decisions in transactions where one party has more or better information than the other.
  - Parties on the opposite side of a transaction have different amounts of information

Examples
- Borrowers know their risk of default than lenders
- Patients know their risks, insurance companies may not
- Doctors understand the proper treatments, patients may not

In economics, when we study the perfect competitive market, one of the assumptions is that there is perfect information. Both consumers and producers having perfect information about the quality of the product, about the prices, and about the market demand and supply conditions. For example, about the prices they have perfect information about the quality of the product they have perfect information.

In fact, it is an unrealistic assumption because, in the real world, there is nothing called perfect information about any variable, this is very that is very hard to attain. Most of the market in the real world is based on imperfect information.

That means the information about any economic variable are different for different stakeholders. For example, the quality of the product, for example debt bond instrument or stock. There is a particular instrument, one of the economic variables, we see that there is imperfect information about the quality of the bond. For example, when a bond is issued, the buyer of the bond has limited information, that is, imperfect information about the quality of that bond, including the financial condition of the firm who issued this bond.

Within imperfect information, we are introducing another related concept called asymmetric information.

That means about for example, even about the bond itself, between the supplier of the bond and demanded by the borrower, we are going to say that there is asymmetric information,

even if the information is imperfect. So, asymmetric information means where one party has more or better information than the other. That means, parties on the opposite side of a transaction have different amounts of information.

For example, in this case the bond, which we just mentioned here, we can see that the issuer of the bond that the supplier of bond is having more information about the quality of this bond, that the about the financial condition of this firm and prospects of the investment that they are going to make as compared to the demander of this bond. So, here, what we say that, even if there is imperfect information, but within imperfect information, you can see that one party is having more information than the other one.

So, in this example, asymmetric information here is that borrowers know their risk of default than lenders. About the default risk, the issuer of bond knows more about the default risk of this bond as compared to the demander of the bond in the market.

Another example is that patients know their risk. Suppose someone buying health insurance product, we know that who is buying insurance products know more about the probability or possibility of hospitalization or the health risk of the of him or her than an insurance company. So, the case here is that patients know relatively, not absolutely, know more about their risk as compared to insurance companies.

So, similarly doctors understand the proper treatments, but the patients may not. So, about each economic variable, for example, the first one we talked about the default risk that the economic variable, second one is about the health risk prospective insurance buyer, then the third one is about the treatment quality.

Information asymmetry does not mean that there is perfect information, even within imperfect information, I see that patients know their risk, but still patient really do not know all in-depth about their health risk. But, as compared to insurance companies, they are having more information.

Similarly, doctors know more about the treatments. However, there is still lack of information, doctors not complete knowledge about each and every aspects of treatment and its effects, but as compared to patients we can say that doctors have better understanding about proper treatments. This is called asymmetric information. So, what we are going to see in this session and the subsequent discussion is that the finance market is filled with more

asymmetric information issues, and it adversely affects the efficient working of financial markets.

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Market for Lemons

- George Akeloff (1970), Nobel Laurate
- Market for used cars
- Sellers know exact quality of the cars they sell
- Buyers can only identify the quality by purchasing the good
- Buyer beware: cannot get your $ back if you buy a bad car

Selection problem.

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Because of asymmetric information we are going to see that there is going to be market failure, market will not work efficiently, the demand and supply side of the market and the determination of the prices and market clearing will not happen efficiently.

One of the kinds of market failure due to information asymmetry is called selection problem.

This issue has been first introduced by or discussed thoroughly by George Akeloff, who is the Nobel laureate, in his famous work about market for Lemons. Using the example of market for used cars, he explained what is meant by information asymmetry in the used car market that leads to selection problem in the market, and how eventually the used car markets get finally collapsed, that means market failure.

Suppose someone wants to sell his or her used car, you know that the quality issues. Why is someone selling a car? There may be several reasons, maybe he or she has a financial trouble or maybe he or she think that there is some quality issue with the car.

And maybe something with the engine or any other issues that the potential buyers may not be knowing. So, our assumption here is that sellers know the exact quality of the cars they sell as compared to the buyers the potential buyers. So, buyers can only identify the quality

by purchasing the good, and after start using the car, then only they will come to know about the quality of the car, whether it is good car or bad car.

Here, you know that buyers beware; that means, they cannot get back the dollar after they buy the car. In this case, suppose taking the case of information asymmetry in a car market, let us see how this car market works.

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- Two types of cars: high and low quality (Peach vs. Lemon)
- High quality cars are worth $20,000, low are worth $2000
- Suppose that people know that in the population of used cars that ½ are high quality
  - Already a strong (unrealistic) assumption
  - One that is not likely satisfied

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Let us make the things very clear; there are two types of cars- there are high quality and lower quality car, for the high-quality car we call it Peach, and low-quality car we usually call it Lemon.

In real world, you know that are is not just this two-way classification of quality, that means, high and low, but quality start from low then gradually increasing to medium quality, then high medium quality, then high quality, super high quality etc. For the sake of simplicity and to manage our discussion, so let us assume that there are only two groups of cars, one is high quality and the other one is low quality car.

See that high quality cars in our example are worth 20000 dollar, then the low-quality cars are worth 2000 dollar. And suppose that people know that in the population of used cars that 50 percentage are of high-quality car, which is again another assumption, already a strong unrealistic assumption one that is not likely to be satisfied. Even if we take this assumption, let us see how this market is going to work, how this used car market is going to work.

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Expected price of car

- Buyers do not know the quality of the product until they purchase
- How much are they willing to pay?
- Expected value = (1/2)$20K + (1/2)$2K = $11K
- People are willing to pay $11K for an automobile
- Would $11K be the equilibrium price?

½ × 20 K + ½ × 2 K

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What is the expected price of this car? We have seen that the high-quality car price is 20000, and the low-quality cars price is 2000 and the probability. The probability for used car is the high-quality car is 0.5 and the probability for low quality car is also 0.5.

So, in this market how much are they willing to pay; obviously, you know that the way we answer the average price of this car is going to be this one, 0.5 times 20 K this plus and 0.5 2K. Finally, the expected price of car in this market is going to be dollar 11000 right. This is the expected price.

Now let us see what is going to be the actual price based on the demand and supply conditions in this used car market. We are going to see that people are willing to pay based on this calculation, this much information, people are willing to pay 11 K dollar 11000 for an automobile. So, the question is, would 11000 be the equilibrium price in this used car market, what we are going to see that this is not going to happen.

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- Who is willing to sell an automobile at $11K
  - High quality owner has $20K auto
  - Low quality owner has $2K auto
- Only low quality owners enter the market
- Suppose you are a buyer, you pay $11K for an auto and you get a lemon, what would you do?

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Why? Because who is willing to sell an automobile at 11 K, who is willing to sell at this price? You see the high-quality car owner thinks that the price of his car is 20000 and the low-quality owner knows that the price of his or her car is 2000 only.

In this market, we since the equilibrium price is going to be 11K, why would the owner of the high-quality car, where the value of his or her car is 20 K, why would he sell it at a price of 11 K? And, obviously, you know that the owner of the high-quality car will not sell it in the market. This market will be represented by only low-quality owner because low quality card price is only 2000, but the expected price is 11000.

So, only low-quality owner enters the market. Suppose you are a buyer, you pay 11K for an auto and you get a Lemon, what would you do? So obviously, the buyers also apply their rationality, they understand that this market is only consist of low-quality car and they will not be willing to pay though equilibrium price is 11K, but they will not be willing to pay this equilibrium price of 11K.

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- Eventually what will happen?
  - Low quality cars will drive out high quality
  - Equilibrium price will fall to $2000
  - Only low quality cars will be sold

Adverse selection.

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So, eventually, what will happen? So, you can see that in this market, the low-quality cars will drive out high quality car. So finally, the equilibrium price will fall to 2000; that means, this market will consist only of low-quality cars. So, what we are going to see that this car market will collapse, this is a kind of market failure here.

This market is going to consists of only low-quality car, and we are going to call this problem as Adverse selection.

In the next session, we will continue this discussion, we will discuss more about the selection issue, and then we will discuss different forms of selection problem in financial market.

Thank you.

Keywords: source of external financing, imperfect information, Information asymmetry, market failure, adverse selection