The Functions of Finance in the Real Economy

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*All opinions expressed herein are the author's own and do not necessarily reflect the views of any of the organizations with which the author is affiliated.

金融在实体经济中的作用

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Introduction (引言)

- Finance can add value to the real economy by enabling real transactions that create GDP and employment but otherwise cannot have taken place.
- The financial market can help allocate capital to its highest and best (preferably social) use. (But the highest rate of interest offered by a potential borrower does not necessarily imply that a loan to this borrower is the highest and best use of the capital. A borrowers who does not intend to repay when things do not work out can offer the highest rates of interest.)

Introduction (引言)

- Finance can enable risk-sharing and hence also risk-taking.
- Finance enables the use of leverage (what is the optimal degree of leverage)?
- Finance can also redistribute income and wealth among different groups with or without adding real value. For example, pure betting and gambling is simply redistribution of existing value among individuals and entities, no new value is created. A casino provides entertainment services and can even be profitable for its owners and shareholders but does not fundamentally add value to society.
- Finance can also increase or decrease the overall riskiness of the entire economic system.

Adding Value to the Real Economy (对实体经济增加价值)

- Money as a medium of exchange (货币作为交易媒介)
- Money as a store of value (货币作为价值贮藏)
- The facilitation of trade (促进贸易)
- The facilitation of tangible capital accumulation (促进有形资本的累积)
- The bond and stock markets (债券与股票市场)
- Insurance (保险)
- Futures and options (期货与期权)
- Foreign exchange markets (外汇市场)
- Venture capital (风险投资或创业投资)

Money as a Medium of Exchange (货币作为交易媒介)

- Bartering (以货易货) of goods require coincidence of both demand and supply in the same place and at the same time. The existence of money, a medium of exchange acceptable to both sides of a transaction, makes it unnecessary to barter.
- Money makes it possible for exchange of goods across space and time.

Money as a Store of Value (货币作为价值贮藏)

- Money as “generalised saving or inventory”—it is no longer necessary to save a little of everything
- Money makes possible specialisation in trade
- Money makes possible intertemporal substitution of consumption—work today and consume both today and tomorrow. Thus, retirement can be financed through the saving of money.

The Facilitation of Trade (促进贸易)

- The facilitation of domestic trade—the Shansi banks made it possible to conduct trade between distant cities without physical delivery of money and hence dispense with armed couriers.
- International trade (and economic globalisation) would have been impossible without the U.S. Dollar serving as an international medium of exchange. Countries that wish to trade but do not trust each other's currency can settle in U.S. Dollars.
- The "letter of credit" makes it possible to have "made-to-order" trades. Pre-payment poses risks to the buyer, whereas payment upon delivery poses risks to the producer and seller. A letter of credit is a bank-guaranteed promise to pay upon delivery of the "made-to-order" goods.

The Facilitation of Trade (促进贸易)

- On the basis of the “letter of credit”, the seller can obtain a short-term loan from a bank to finance the purchase of raw materials and the salaries and wages of the workers.

The Facilitation of Trade (促进贸易)

- The buying and selling of homes can use a similar arrangement that reduces risks to both the buyer and the seller/developer.
- The potential buyer makes an offer on a home (either already built or to be built) and makes a non-refundable deposit in an escrow account at a bank approved by both buyer and seller. The offer is subject to the physical delivery of the actual home and possibly the completion of financing arrangements on the part of the buyer by a certain deadline date.)
- If the home is not completed or otherwise cannot be delivered for any reason, the buyer's deposit is released to the buyer by the escrow bank. If the home is completed and delivered and the buyer does not wish to take possession by paying the balance of the agreed purchase price, the deposit is forfeited to the seller.

The Facilitation of Trade (促进贸易)

- This arrangement has the advantage that it protects the buyer from non-completion of the seller and protects the seller from the buyer not taking possession and paying the remainder of the purchase price in full.
- One may ask: Without the pre-sale revenue, how can the developer finance the land and construction costs, since the sale revenue is only available upon completion and delivery?
- The developer can, on the basis of the pre-sales secured by deposits in escrow accounts, apply to the bank for a construction loan. The construction loan, secured by the building works in progress, will be repaid upon receipt of the revenue from the escrow account and from the buyer.

The Facilitation of Tangible Capital Accumulation (促进有形资本的累积)

- The “round-about” model of production. Production takes time. Wine producers cannot sell their output right away. The wines may take years to age and mature. They need to borrow to survive until their wines reach maturity and can be sold.
- Inventory and work-in-progress need financing.
- Loans make investments possible, enabling investment today to increase the output of tomorrow.
- Long-term fixed-rate owner-occupied residential mortgage loans can greatly increase ownership of residential housing, especially among middle- and lower-income households and enhance social harmony and stability.

The Market for Loans

- There are two relevant observations on the market for loans:
  - (1) It makes a huge difference whether the loans are with recourse or without recourse. A loan with recourse means that the borrower continues to be liable for any outstanding deficiency even though the loan may have been collateralised. A loan with recourse is in some sense no different from equity, provided that the borrower has sufficient net worth. A loan without recourse means that the lender is unlikely to be fully repaid if things do not work out under certain states of nature, e.g., the amount outstanding on the loan is more than the value of the collateral. The borrowing entity can simply go bankrupt. Almost all corporate loans are without recourse to the executives and the shareholders of the corporation.
  - (2) The degree of leverage, the debt to equity ratio, also makes a huge difference.

The Market for Loans

- The demand for loans is critically affected by whether it is with or without recourse and by the maximum debt-to-equity ratio. Everyone will want to borrow a zero-equity-required, non-recourse loan. A high degree of leverage with no recourse can significantly increase the demand for loans, and indirectly increase the willingness to pay for assets.
- The demand for loans when the borrower does not have to repay in full under some adverse states of nature is likely to be higher than otherwise. The net result is an excess demand for loans—investments that should not be made will be made. That is one reason why despite a national savings rate in excess of 40 percent, Chinese enterprises still claim that there is not enough capital.

Promoting Affordable Owner-Occupied Housing

- Two measures will greatly increase the demand for owner-occupied residential housing.
- First, longer-term, say thirty-five years, owner-occupied residential mortgage loans meeting certain criteria such as caps on the cost and the size of the residential unit should be promoted.
- Second, fixed-interest-rate mortgage loans should be offered for the duration of the loan period.
- These two measures will make residential housing ownership affordable (through the large reductions in the required monthly payments) and safe (through the fixed-rate feature reducing the risks of a variable interest rate) to a large majority of the middle- and lower-income households.

Promoting Affordable Owner-Occupied Housing

- It should be a major government objective to make residential housing sufficiently affordable so that almost all urban households can live in homes they themselves own.
- Owner-occupancy also has other social advantages—it enhances the feeling of security on the part of households and encourages maintenance and improvements. It contributes immensely to social harmony and stability.
- The challenge is making owner-occupied residential housing affordable to all urban households, including low-income households. The goal should be that everyone with a regular job should be able to afford to own and live in his or her own home.

Promoting Affordable Owner-Occupied Housing

- However, one problem is that commercial banks do not have long-term fixed-rate deposits with which to fund the long-term fixed-rate mortgage loans. They have mostly short-term deposits the interest rate on which can move up and down, depending on the market conditions. If they make long-term fixed-rate loans, they will face large losses if and when the short-term interest rate goes up, causing the interest rate spread to become negative. But they cannot call the long-term loans, so the losses will continue to mount, until the they finally go broke. This is precisely what happened in the U.S. Savings and Loan Associations crisis in the 1980s. The resulting losses cost the U.S. Government approximately US$600 billion in 1980 prices.

Promoting Affordable Owner-Occupied Housing

- Securitization of long-term, fixed-rate owner-occupied residential mortgages is the best way to secure long-term funds to finance long-term mortgage loans.
- The securitization can be facilitated and regulated through the establishment of Chinese versions of Fannie Mae and Freddie Mac, which, however, must remain completely state-owned, since they are, in their nature, policy banks implementing government policy.

Promoting Affordable Owner-Occupied Housing

- Basically, the mortgage lenders can sell their mortgage loans to a government-sponsored institution such as Freddie Mac, for example, provided that they meet certain specifications: the underlying residential housing unit is owner-occupied; the value of the housing unit is below a maximum ceiling; the loan amount is below a maximum ceiling; the loan to value ratio is below a maximum percent (so that there is significant equity in the form of a down payment); the value is established through proper third-party appraisals; the unit satisfies safety requirements and quality construction standards; the borrower has regular and continuing income/employment and has the ability to service the loan; the loan has a maximum maturity (can be up to 35 years), etc.

Promoting Affordable Owner-Occupied Housing

- However, there is one problem with this model, and that has to do with moral hazard.
- Since the original mortgage lenders typically do not have to keep their mortgage loans in their portfolio, but instead sell them off (say to the equivalent of Freddie Mac) as soon as the loans are made, they do not have the incentive to do a thorough vetting of the borrowers or the collateral itself. Thus, non-qualified borrowers may be granted loans and non-qualified properties may be accepted as collateral because the risks will be transferred to the purchasers of the mortgage loans and ultimately to the purchasers of the securities backed by the mortgage loans.

Promoting Affordable Owner-Occupied Housing

- In order to discourage moral hazard, the original mortgage lenders should be required to buy back any mortgage loan that becomes non-performing within three years of its initial funding from the bond holders, or to hold 5% of the mortgage loan until maturity. Thus the original mortgage lenders will have the incentive to be careful in making the loans in the first place.
- Had this rule been in place, the entire sub-prime loan problem in the U.S. would have never arisen.

Long-Term Fixed-Rate Owner-Occupied Residential Mortgage Loans

- A Chinese version of Fanny Mae or Freddie Mac can issue long-term fixed-rate bonds to finance these mortgage loans, which it can purchase using the proceeds of the bonds from other originating lenders provided that the borrowers (regular employment, no bad credit history), the loans (e.g., interest rate, minimum equity requirement, maximum loan limit) and the underlying properties (e.g., owner-occupied, sound construction, maximum floor area) meet certain standards.

Long-Term Fixed-Rate Owner-Occupied Residential Mortgage Loans

- In addition, in order to reduce moral hazard, the originating lender must bear some residual liability for the loan in the event of default. For example, it can be required to retain a residual interest, say, 5 percent, in the mortgage loan originated by it for the life of the loan.
- A Chinese version of Fanny Mae or Freddie Mac will pay the originating lenders for their servicing of the loans and will otherwise set an interest rate on the loans that is only slightly higher (less than 100 basis points) than its cost of funds, which will be at or near sovereign rates. Thus, the monthly mortgage loan payments of the borrowers can be kept as low as possible. The financial burden will be similar to that of renting, but the occupant has ownership.
- This should lead to much higher demand for and supply of owner-occupied residential housing, which in turn should contribute significantly to social harmony and stability.

Long-Term Fixed-Rate Owner-Occupied Residential Mortgage Loans

- But who will be the buyers and holders of these long-term bonds? The buyers of these bonds will be mostly institutions with long-term funds to invest. They will include insurance companies, retirement and pension funds, and permanent endowments of foundations, universities and other similar organisations.
- Thus, there are ready demands for these long-term bonds; there are also ready demands for affordable owner-occupied residential mortgage loans on the part of potential borrowers. A Chinese version of Fanny Mae or Freddie Mac or a policy bank such as China Development Bank can meet both demands by issuing the bonds and offering to purchase qualified residential mortgage loans with the proceeds, motivating commercial lenders to originate these mortgage loans.

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- Long-term fixed-rate loans, especially home mortgage loans, need to be securitised and sold to long-term investors because commercial banks do not have sufficient long-term fixed-rate deposits to meet the demand for such long-term fixed-rate loans. If commercial banks make and keep long-term fixed-rate loans, they will have a maturity mis-match in their assets and liabilities which may eventually result in a similar debacle as the savings and loan associations in the early 1980s.
- The sub-prime mortgage loan crisis in the U.S. arose not so much because of securitisation of the home mortgage loans per se, but rather because these mortgage loans were not securitised in the right way. (This is in addition to the moral hazard of the originating lender problem discussed above.)

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- There are two routes to the securitisation of long-term loans—which we can call direct securitisation and indirect securitisation respectively.
- Direct securitisation takes the form of long-term bonds issued to the public by a financial institution against a specific package of qualified long-term mortgage loans (assets) meeting certain specifications as collateral. The loans (assets) are then owned by the purchasers of these bonds, who will receive the scheduled payments of interest on and repayments of the principals of these loans in the form of bond interest and principal repayments. The bonds may or may not be guaranteed by another financial institution.
- The bondholders, in the absence of explicit guarantees, primarily look to the specific package of loans as the underlying collateral.

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- Indirect securitisation takes the form of long-term bonds issued directly to the public by a financial institution, the primary business of which is to purchase qualified long-term loans meeting certain specifications (with the maturities of the bonds matching the maturity of the loans).
- The purchasers of the bonds look primarily to the financial institution for the payment of bond interest and the repayment of the bond principal. The bonds themselves are not specifically collateralised even though the long-term loans are part of the overall assets owned by the financial institution.

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- The financial institution uses the proceeds from the bonds to purchase these qualified loans from originating mortgage lenders. The loans are owned by the financial institution. The borrowers pay the interest and any repayment of principal on the loans to the financial institution, sometimes through the originating lenders who may be retained as servicing agents for a fee, and the financial institution pays the bondholders, regardless of whether it has been paid by the borrowers.

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- Owner-occupied residential mortgage loans are different from other mortgage loans because their default rate is much lower than that of non-owner-occupied residential mortgage loans taken out by investors and speculators. It is therefore possible, under indirect securitisation, for the financial institution issuing the bonds to bear the risks of loan defaults.
- It is justifiable to have a social policy favouring owner-occupied home-ownership but not favouring investment in or speculation on non-owner-occupied residential property on the grounds that it promotes social harmony, security and stability.

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- There are several advantages of indirect securitisation over direct securitisation.
- First, the bonds issued will have quasi-sovereign status if the financial institution is established as a state policy bank (which was originally the case for Fannie Mae and Freddie Mac) and will therefore be able to carry a lower rate of interest. The lower rate of interest will also benefit the borrowers of the owner-occupied residential mortgage loans.

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- Second, there is pooling of the risks of default on the mortgage loans under indirect securitisation, so that the risks are spread and shared by purchasers of successive issues of bonds of the bank, whereas under direct securitisation, there is no pooling across successive packages of loans. The actual risks and returns to purchasers of directly securitised mortgage-loan-backed securities can therefore vary significantly from package to package.
- Third, if the originating mortgage lenders are required to assume a residual liability of say between 5 and 10 percent of the principal of the mortgage loans they originate (which is good for controlling moral hazard), it is much easier to enforce with the financial institution as the purchaser of the mortgage loans rather than a group of bond investors.

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- Fourth, in the event of a default by one or more borrowers on their mortgage loans, since the mortgage loans are owned directly by the financial institution, it is much easier to have a work-out between the borrower and the bank, through the servicing agent, under indirect securitisation. Under direct securitisation, it is much more difficult and costly for the current owners of the bonds to negotiate a work-out with the individual non-performing borrowers. While direct securitisation per se is not itself to be blamed for the crisis, it greatly complicates the resolution and prolongs the negative impacts of the crisis. Many non-performing mortgage loans in the U.S. remain to be worked out between the borrowers and the current owners of the mortgage loans.

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- Fifth, under indirect securitisation, there will also be greatly reduced transactions costs and there is no need to rely on credit rating agencies to rate each specific package of mortgage loans or on investment banks to package and promote and market the mortgage loans to the investing public.
- Sixth, for the investors and potential investors, the market for these indirectly mortgage-backed bonds will be much bigger as well as more liquid.

The Securitisation of Residential Mortgage Loans (住房贷款证券化)

- One possible complication is whether there should be a pre-payment penalty for these mortgage loans (there should be, in order to keep the transactions cost and hence the rate of interest low), but the same problem exists whether the mortgage loans are directly or indirectly securitised.
- The only disadvantage of indirect securitisation is that the investment banks will no longer be able to earn fat fees for securitising these mortgage loans.

The Bond and Stock Markets (债券与股票市场)

- A bond is a form of loan but borrowed by an enterprise directly from the public and purchasers and holders of bonds have some degree of liquidity through the secondary markets.
- The demand for the bonds issued by an enterprise depends on the credit rating it has received from the credit rating agencies, which are supposed to supply the information. But the credit rating agencies also have no liabilities for mis-rating, but are compensated for providing ratings satisfactory to the issuer of these bonds, creating yet another potential moral hazard.
- In principle, the bank should not be buying corporate bonds of enterprises that they have been lending directly. But many buy from their trust or asset management accounts and charge much higher interest rates and thus circumventing leverage requirements. This is a common form of shadow banking.

The Bond and Stock Markets (债券与股票市场)

- The stock market should be promoted because an economy will be much much more stable if the debt to equity ratio is not too high and a thriving stock market enables enterprises to raise equity capital.
- One policy that can lead to a significant change in the debt to equity ratio of enterprises in China is to make cash dividends deductible against the income of the enterprises in the same way that interest is deductible, so that there is no tax bias in favour of debt over equity.

Insurance (保险)

- The market for insurance is well developed. Insurers such as Lloyds of London have been in business for centuries.
- However, insurance itself is subject to moral hazard, that is, the insured may for other reasons trigger the insurance pay-off. For example, a person may set fire to his or her own house, or to someone else's house on which he or she has taken out fire insurance, to collect the insurance proceeds.

Insurance (保险)

- The insurance companies realise that this may happen, and generally will insure only those who have an insurable interest (可保利益), for example, they will only sell insurance to the actual owner of a house but not to others, and to offer only less-than-full market-value insurance (the insurance payoff is always with reference to the current market value). Less than full market-value insurance amounts to a form of co-payment and can discourage moral hazard because the insured can only recover from insurance proceeds less than the full market value and hence will have no incentive to burn down his or her own house, for example.

Credit Default Swaps (CDSs) as Bond Insurance (信用违约掉换作为债券保险)

- In principle, Credit Default Swaps (CDSs) (信用违约掉换) are insurance contracts on the bonds, the outstanding obligations, of an enterprise. The CDSs pay off in the event there is a default on the bonds by the enterprise.
- A fundamental principle of insurance is that the insured must have an insurable interest. Otherwise it would lead to moral hazard.
- Thus, for example, it is reasonable for someone who owns Lehman Brothers bonds, or who is a contractor or supplier owed money by Lehman Brothers, to purchase a CDS from AIG up to the amount outstanding. But it is not reasonable for anyone else with no direct exposure to Lehman Brothers, especially if this person has the power to influence the outcome, to purchase CDSs on Lehman Brothers, or to purchase an amount of CDS greater than the actual financial exposure.

Credit Default Swaps (CDSs) as Bond Insurance (信用违约掉换作为债券保险)

- However, the insurance companies that sold CDSs lost sight of the fact that they were selling insurance. They thought they were just taking bets, like Ladbrokes (but even Ladbrokes may not take a position on a bet itself). Indiscriminate sale of credit default swaps (CDSs) is the principal source of AIG's problems.
- AIG sold many times more CDSs on Lehman Brothers than Lehman Brothers had bonds outstanding (reportedly much more than ten times). Many purchasers of such CDSs were simply gambling on a Lehman Brothers failure. It would have been fine if these purchasers had no influence on whether Lehman Brothers would go under or not; or if AIG did not take a position itself, merely squaring those that bet that Lehman Brothers would fail with those that bet Lehman Brothers would survive, letting the market determine the odds. But that was not the case. AIG took on the bets itself.

Credit Default Swaps (CDSs) as Bond Insurance (信用违约掉换作为债券保险)

- Unfortunately, many of the purchasers of the CDSs had the power to help force Lehman Brothers under, for example, by massively shorting its stocks or bonds, so that Lehman Brothers would be effectively prevented from accessing the capital and credit markets.
- The total amount of CDSs outstanding has been estimated to be approximately US$50 trillion, relative to the total amount of the underlying bonds outstanding of only one-tenth of US$50 trillion. In other words, the insurance companies collectively sold US$50 trillion worth of insurance on bonds that were only worth US$5 trillion.

Credit Default Swaps (CDSs) as Bond Insurance (信用违约掉换作为债券保险)

- In retrospect, even considered as insurance, the CDSs on Lehman Brothers were not priced correctly. The price of the CDSs did not reflect adequately the probability of its failure, given its high degree of leverage, and moreover did not take into account adverse selection—people bought insurance only because they had reason to expect the firm to fail (some were trying to make the firm fail). Furthermore, adequate insurance reserves were not established. That is why AIG is in so much trouble today.
- Credit default swaps (CDSs) are totally unregulated. One reason is because the U.S. Congress passed legislation in the late 1990s, declaring the CDSs are neither insurance nor gaming, thus effectively prohibiting the regulation of CDSs by the government.

Insurance (保险): Deposit Insurance (存款保险)

- The availability of deposit insurance is the most important single reason why there are so many relatively small private banks in the United States.
- Deposit insurance should have an upper limit per person. Its purpose is to protect small retail depositors, not to help the banks make money.
- With deposit insurance, there will have to be regular bank inspections because of possible moral hazard on the part of the banks or executives of the banks.

Insurance (保险): Inflation-Indexed Bonds (通涨指数债券)

- A financial product that can also be very popular with households, especially households headed by retirees, is a long-term bond (or fixed-term bank deposit) the return on which is linked to the rate of inflation. Inflation-indexed bonds may be viewed as a form of insurance against inflation. However, since most individuals and entities have no influence on the rate of inflation, there is no problem of moral hazard on the part of the purchasers of inflation-indexed bonds. The seller, typically a government, signals its intention and its confidence in reining in inflation by the issuance of inflation-indexed bonds.
- In many countries, including the United States and the United Kingdom, these bonds are issued by the respective Ministries of Finance or the Departments of the Treasury. They allow the common people an inexpensive long-term hedge against inflation.
- The Chinese Government offered inflation-linked bank deposits in 1949, 1988 and 1993, but have not offered them recently.

Futures and Options (期货与期权)

- Markets are not complete, especially futures markets. Some futures markets simply do not exist, e.g., ten-year foreign currency forwards. However, it is not the case that the more markets, the better, unless there is complete and perfect information.
- Many “innovative” financial products have been introduced in recent years. But there is no guarantee that the new products are always socially or even privately productive. (For example, the “accumulator,” which at one time was popular in Hong Kong, is an innovative way of losing money through gambling at basically unknown odds.)

Futures and Options (期货与期权)

- Not all futures markets are socially productive or desirable. Socially productive markets add value and increase GDP and employment; socially unproductive markets do not add value but merely redistribute among the market participants.
- For example, the futures market for cotton is socially productive and desirable. But the futures market for crude oil is much less so because the period of production is far too long relative to the maturity of the futures.

An Example of a Socially Productive Futures Market—Cotton

- The futures market for cotton is socially productive because in its absence, some farmers may decide not to grow cotton, and some spinners may decide not to plan to produce so much yarn.
- A farmer has the choice between growing rice or cotton. If he grows rice, he and his family can always consume it and store any excess if the market price of rice is too low. If he grows cotton, he has to sell at the market price at harvest, whether the price is high or low, so that he can raise the cash to buy rice to feed himself and his family. Thus, if he can commit to sell forward all or part of his expected cotton output, at a pre-determined price on the futures market, the price risk is considerably reduced or even eliminated. Thus the existence of the futures market makes it possible for him to choose to grow cotton.
- A really risk-averse farmer can also buy forward his expected demand of rice at the same time.

An Example of a Socially Productive Futures Market—Cotton

- A cotton spinner has to decide whether to expand his production of yarn to meet demand, but cotton is the essential raw material. If he accepts an order for yarn for delivery in the future, he will have to take a risk on the market price of cotton, which he needs as the raw material, at the time he begins actual production. If the market price turns out to be too high, he will lose money on the order. Thus, if he can commit to buy all or part of his expected cotton requirement at a pre-determined price on the futures market, the price risk is also considerably reduced or even eliminated.
- Thus, the existence of a market for cotton futures makes it possible for the farmers to choose to grow cotton and the spinners to plan to expand their production of yarn in the future. The society is better off—everyone is better off. (How do we know everyone is better off? We know because everyone can always have chosen the status quo ante---not growing cotton and not expanding production—if the farmers and spinners respectively believe it is better to do so.)

An Example of a Socially Productive Futures Market—Cotton

- Thus, the market for cotton futures adds real value to the economy, increases real GDP and employment. It is therefore socially productive. Note that the futures market for cotton works well because of the short production cycle of the cotton crop and yarn spinning relative to the maturity of the futures contracts.

An Example of a Socially Unproductive Futures Market—Crude Oil

- The short-run elasticities of supply and demand of crude oil are both very low.
- It is difficult to increase the total supply of crude oil significantly in the very short run. However, there is significant unused production capacity in countries with large reserves, such as Saudi Arabia. Saudi Arabia has extra unused standby production capacity equal to almost 50% of its production and can probably increase its production within a short period of time if it wishes to do so. But oil-producing countries may be unwilling to expand production because then the oil price may fall.
- Otherwise, exploration for and eventual production from new oil discoveries take years, even up to a decade.

An Example of a Socially Unproductive Futures Market—Crude Oil

- It is also difficult to decrease demand in the short run because of the inherited existing capital stock (equipment and vehicles) which may not be energy efficient at the current high prices--it takes time for the capital stock to turn over.
- However, it is also true that the demand for crude oil cannot increase very much in the short term either, because refineries need to be built first, and it also takes years to build refineries. And without refineries, there is no real use for crude oil. The upper limit of current demand for crude oil is the existing global refinery capacity, which changes very slowly from year to year and is completely predictable. There is currently very little uncommitted crude oil storage capacity available in the world.

An Example of a Socially Unproductive Futures Market—Crude Oil

- Ultimately, the long-run elasticity of demand is quite high—estimates vary between 0.75 and can be as high as unity (one). The experience of the oil shocks in the 1970s and 1980s suggests that the long-run elasticity of demand for oil can be quite high, provided that the price levels are perceived as persistent or permanent. Similarly, the long-run elasticity of supply of crude oil is also quite high, and there are also substitutes such as oil converted from coal, oil from oil shale and tar sands, all of which can become economical at approximately US$80 a barrel.

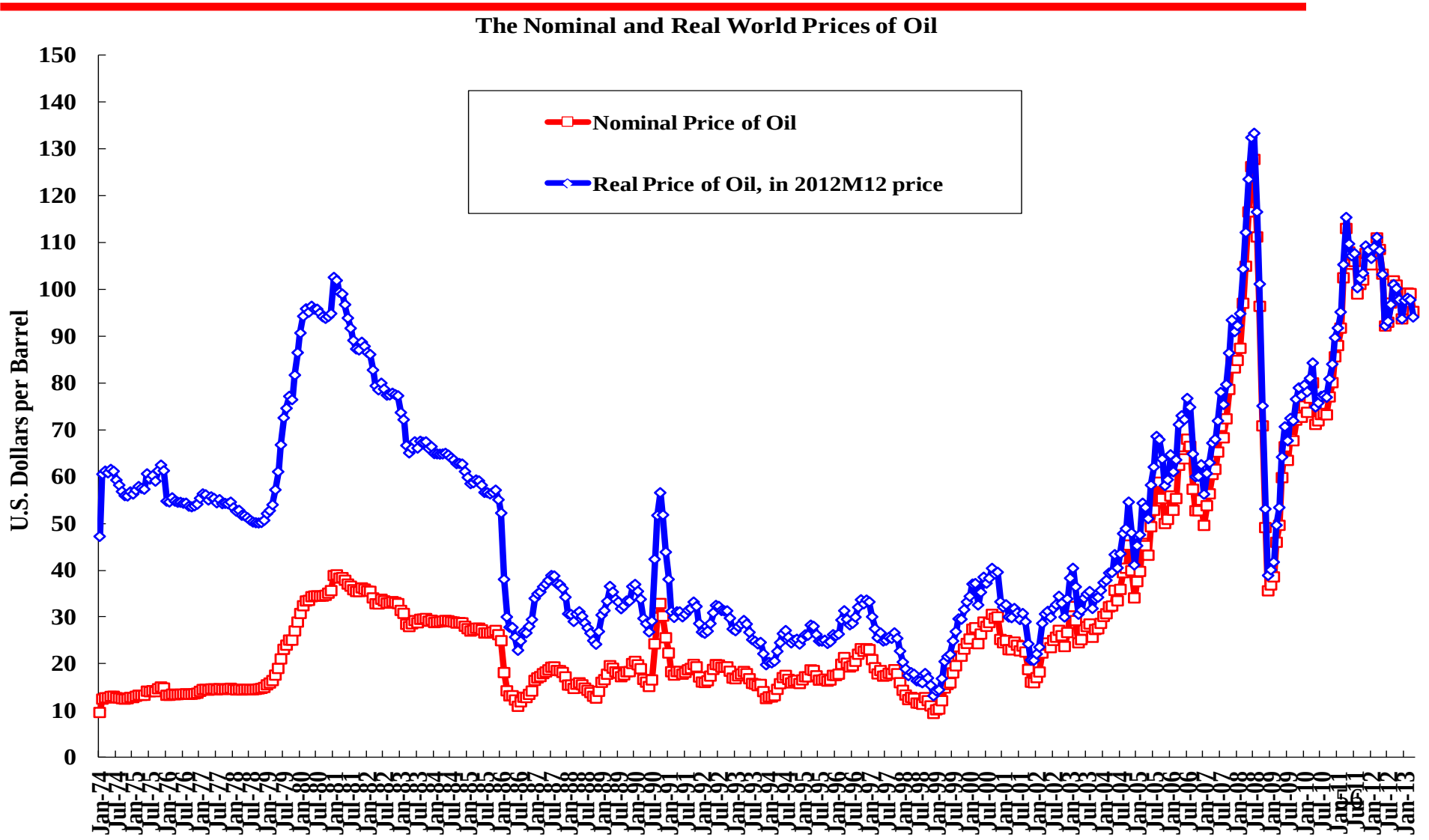
The Spot Market for Crude Oil

- It is in the interests of the oil-producing countries with large reserves (e.g., Saudi Arabia) to keep the price of crude oil at a reasonable and stable level so as not to encourage the development of alternative forms of supply. However, it is in the interests of the oil-producing countries that are about to exhaust their reserves to try to obtain as high a price as possible for their remaining reserves. There is therefore a conflict with the Organisation of Oil-Producing Countries itself as to whether it should go for a high price or a low price.
- In any case, the supply of crude oil in the world is monopolistic—a few large producers/exporters can have undue market power in terms of setting or influencing the world price.

The Spot Market for Crude Oil

- Despite the short-run rise in the world price of oil, mostly caused by speculation by the hedge funds, the short-term spot market supply and demand of crude oil are approximately equal, with perhaps a little excess supply.
- The constraint on crude oil demand in the world is refining capacity. The current potential output of crude oil exceeds slightly the operable refining capacity in the world.
- The spot price of crude oil is exceptionally high on occasion (see the following chart) only because the forward/future price of crude oil was high. It is the price of the futures market affecting the price of the spot market. And the price on the futures market is basically determined by the speculators (and possibly some of the large producers).

The Nominal and Real World Prices of Oil (2012 prices)



An Example of a Socially Unproductive Futures Market—Crude Oil

- Because the production cycle for oil (from exploration to production) is so long—in terms of multiple years and even a decade, and the fixed investment required is so huge—so that recovery of the invested capital also takes many years, the futures market for crude oil, which normally does not go beyond one or two years forward, is of little use in terms of stimulating crude oil exploration, development and production activities. Only a sustained, high, long-term price can have that effect.
- Moreover, the capacity for increasing supply significantly at the present time is already available, in Saudi Arabia and in Kuwait. It is not the lack of ability to supply, but the lack of willingness to supply, that is the constraint. Whether the futures market exists or not has little effect on changing the willingness to supply.

An Example of a Socially Unproductive Futures Market—Crude Oil

- Even for refiners, the futures market can only provide limited, short-term, protection against high raw material prices. In the long run, completely independent refiners will find it difficult to survive. Refineries also have large fixed costs which need to be amortised over a long period of time. Uncertainty of the price of crude oil makes investment in refineries risky unless one is assured of a source of supply with predictable prices. Having a forward market for only a couple of years does not help the refiners very much either.
- What is needed is a long-term supply contract between the crude oil producer and the refiner with the price risk shared by both sides rather than a futures market with only short-period futures. Another way to achieve this same objective of risk-sharing is vertical integration, for the oil producer and the oil refiner to be under common ownership, thus internalising the price risks.

An Example of a Socially Unproductive Futures Market—Crude Oil

- Thus the futures market for oil cannot be considered to be socially productive because it does not materially increase either current or future supply but instead only provides a platform for ramping up the price of crude oil, in the presence of potential excess production capacity, by speculators and perhaps by even some producers themselves.
- No new exploration for oil is going to be launched and no new refineries are going to be built because of the presence of the futures market for crude oil. It is in this sense that the futures market for crude oil is much less socially productive than the futures market for cotton. This does not imply that the futures market for crude oil does not make money for some speculators—but it is merely redistributing among different participants in the market as opposed to creating real added value for society as a whole.

Foreign Exchange Markets (外汇市场)

- Exporters and importers, inbound and outbound direct investors, and inbound and outbound long-term portfolio investors all prefer stable exchange rates to volatile exchange rates.
- The volatility in exchange rates is most frequently the result of short-term speculative inflows or outflows of capital, the so-called hot money. The hot money is of such short-term duration that it cannot be usefully deployed in the destination country. And when it is used to finance longer term projects, it invariably leads to maturity mis-match as well as currency mis-match, the two major causes of financial crises.

Foreign Exchange Markets (外汇市场)

- Foreign currency futures can also be viewed as insurance for exporters and importers, on their expected export proceeds or import costs in terms of the domestic currency.
- Exporters and importers have an interest in the future values of foreign currencies. Exporters who sell their goods and services in U.S. Dollars will want to sell the U.S. Dollars they will be receiving forward; importers who purchase their goods and services in U.S. Dollars will want to buy the U.S. Dollars forward. This way, their revenues and costs in terms of the domestic currency are completely determined and not subject to the effects of fluctuations in the exchange rate. They are thus able to eliminate one major risk for them especially since their comparative advantage is not in the prediction of forward exchange rates.

Foreign Exchange Markets (外汇市场)

- Economic agents who have such insurable interests should be allowed to participate in the futures market for foreign currency at low costs and with little or no margin requirements, provided that they have the appropriate documentation through their bankers: either letters of credit received (by exporters) or letters of credits opened (by importers).
- Pure speculators should face higher costs with relatively high margin requirements if they wish to participate in the futures market for foreign currency.
- Here it is important for the government to try to reduce information asymmetry and hence risks in the market for foreign currency. A futures market, properly organised and managed, can support common beliefs and be socially productive.
- The central bank is the ideal organiser of a futures market in foreign currency for those economic participants with an insurable interest.

Venture Capital (风险投资或创业投资)

- A venture capital investment is one in which a venture capitalist (individual or firm) provides financing in the form of equity and/or loan for an inventor or group of inventors to develop an idea for a new product or process through the pilot stage (just short of commercialisation). Such a venture is often referred to as a "start-up".
- Investment in venture capital has a low probability of success—approximately one in ten venture capital investments will eventually pay off for the investors. However, when it is successful, it is often phenomenally successful.
- The venture capital market is characterised by asymmetric information. No one has better information than the inventor of the new product or process, who probably has the most knowledge on the probability of (technical) success. A venture capitalist, no matter how seasoned, is unlikely to have a better estimate of the probability of (technical) success even though he or she might have a better estimate of the probability of a commercial success.

Venture Capital (风险投资或创业投资)

- From the inventor's point of view, the less real money he or she has to invest in the venture, the better, because then a larger proportion of the potential loss will be borne by investors in the event of failure.
- However, in order to induce the venture capitalist to invest in the venture, the inventor may have an incentive to over-state the probability of (technical) success.
- How does the venture capitalist deal with this inherent information asymmetry between him and the inventor, as well as the potential moral hazard on the part of the inventor?

Venture Capital (风险投资或创业投资)

- From the venture capitalist's point of view, the amount of real money invested by the inventor is an indicator of the degree of confidence of the inventor in the potential success of the venture. The venture capitalist also wants to make sure that the inventor will devote all his or her efforts to the venture.
- The venture capitalist will therefore ask the inventor to put up as equity capital an amount that is significant relative to his or her net worth right at the beginning. And if the inventor pleads no money, he or she will be encouraged to take out a first or second mortgage on the family home and/or to borrow from close relatives such as the father-in-law. The venture capitalist may even make a recourse loan to the inventor to enable the inventor to invest in the venture. The inventor is thus put in a position of "must succeed" and is unlikely to want to proceed unless he or she believes that there is genuinely a reasonable probability of success.

Venture Capital (风险投资或创业投资)

- Whether the inventor is willing to do so reveals how confident he or she is of the success of the venture. If the inventor is not confident enough to be willing to risk his or her own money, why should the venture capitalist take the risk? The venture capitalist will commit to completing the financing of the venture after the inventor's own equity investment is in.
- Such an arrangement reduces the information asymmetry, since the inventor will have to reveal his or her true belief through his or her actions, as well as moral hazard—the inventor will not be able to have a free ride on the venture capitalist's money.

Venture Capital (风险投资或创业投资)

- Stock options, which provide only upside but no downside for the option grantees are ideal for venture capital and for start-ups because these are inherently high-risk ventures but with really no down-side that is not already completely expected by everyone. (However, stock options may not be appropriate for mature enterprises because there may be a significant downside for the owners and shareholders of the firm which may not be shared by the executives granted the stock options.)

Venture Capital (风险投资或创业投资)

- Venture capital adds value to the real economy because in its absence, many innovations would not have been commercialised—Microsoft, Apple, Yahoo, Google Facebook and many others.
- Given the high probability of failure of venture capital investments, in order to encourage venture capital investment, it may be necessary for the Government to allow the venture capital investors to offset their actual cash losses against their other incomes.

Examples of Financial Market Failures (金融市场失能的例子)

- The most common failures in financial markets are due to incomplete and imperfect information (information asymmetry) and to moral hazard (the phenomenon of adverse selection, commonly found in the markets for insurance, is also a form of moral hazard based on asymmetric information).
- However, other failures may also be due to market concentration—markets dominated by a few large players, or to "natural" monopolies, for example, credit card companies, lenders and insurance companies (the larger the loan portfolio or the insured group, the more efficient the lender or insurance company is, other things being equal, because it can spread and share the risks over a larger pool). Deposit-taking in the absence of government deposit insurance is also a potential "natural" monopoly—a bank with larger assets is perceived to be less likely to fail and therefore more likely to attract depositors.

Examples of Financial Market Failures (金融市场失能的例子)

- Maturity and currency mis-match—1980s U.S. savings and loan association crisis, 1994-5 Mexican crisis, 1997 East Asian currency crisis, the interest rate spike in June
- Off-balance sheet activities—Enron, sub-prime loan crisis, shadow banking
- Moral hazard—Credit default swaps (Lehman Brothers and AIG)
- Excessive leverage and spillover externalities—Long-Term Capital Management, 1998 global financial crisis

Excessive Leverage (过度杠杆化)

- Excessive leverage encourages moral hazard and high-risk-taking because it reduces the potential pain that may result from a loss. If a firm with net equity funds of $1 million operates with a debt-to-equity ratio of 50 to 1, a 10% return on assets (after interest payments) translates into a profit of $5 million and a 500% return on equity; but a -10% return, which means a loss of $5 million, will only result in a loss of $1 million to the shareholders of the firm (the firm will of course have negative net worth and be in bankruptcy).

Excessive Leverage (过度杠杆化)

- Excessive leverage not only makes the a firm itself failure-prone, as an ever so slightly adverse development can make it insolvent (that is, turn its net worth negative), but also greatly magnifies the spillover effects when it do fail. Such a firm brings down otherwise well managed banks and firms that do business with it. Excessive leverage therefore has large negative externalities and should be prevented.
- The excessive leverage also in turn increases the risk of other firms having such a firm as a "counter-party."
- Excessive leverage can result from off-balance-sheet activities and shadow-banking.

Excessive Leverage (过度杠杆化)

- In financial crisis after financial crisis, it has always been the excessive leverage that causes the domino effect. A badly managed but highly leveraged firm collapses, bringing down with it all of its creditors, contractors, suppliers, and counter-parties in its financial derivative transactions, in addition to its own shareholders.

Do All Financial Innovations Add Value?

- Financial innovation is not costless. Does it add net value? (Examples: Portfolio insurance, high-frequency trading, repackaging of mortgages, accumulators, Lehman minibonds)
- Financial innovations that encourage or enable moral hazard do not add value (Example: naked credit default swaps (CDSs))
- Financial innovations that encourage excessive leverage (auction-rate securities, asset management accounts, shadow-banking)
- Pyramid or Ponzi schemes (Example: Bernard Madoff, 蚁力神)

Concluding Remarks (结语)

- Information asymmetry should be reduced as much as possible—the market system is no longer efficient (or fair) if there is differential information among the participants. Transparency should be encouraged and off-balance sheet activities by retail deposit-taking banks and publicly listed companies, such as shadow banking, should be prohibited.
- Moral hazard induces excessive risk-taking. It often results in chronically excessive demand for loans and for investment. It must therefore be strictly controlled and discouraged by the financial regulators.
- Limiting the degree of leverage allowed can be quite effective in discouraging moral hazard at the microeconomic level and reducing systemic risk at the macroeconomic level. A low degree of leverage reduces the negative spillover externalities that may result from the bankruptcy of a firm.

Concluding Remarks (结语)

- Financial markets will also fail to be efficient if large participants are allowed to exercise market power, collude among themselves or otherwise manipulate the market for their own benefits. Examples of such behaviour include trying to corner the market at U.S. Treasury security auctions, colluding to fix the LIBOR, SIBOR and HIBOR benchmark interest rates, and manipulating the market for oil futures.
- The social benefits and costs of markets for specific financial derivatives should be carefully investigated. The effects of "financial layering," that is, a fund of funds of funds, also deserve to be investigated. Are they ultimately beneficial to the investors and to the economy as a whole?

Concluding Remarks (结语)

- China should introduce markets for financial derivatives but should do so only gradually with regulations and safeguards against moral hazard and excessive leverage but making sure that they are socially productive and traded on publicly regulated exchanges.
- A market for foreign currency futures should be established by the Chinese Government for qualified users, i.e., exporters and importers and any others who have legitimate interests in hedging against changes in the value of the foreign currency.
- **Finance adds value to the real economy by making possible real transactions that otherwise cannot have taken place.**