

# Lessons from the U.S. Sub-Prime Mortgage Loan Crisis

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# Introduction

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- ◆ The Origins of the Sub-Prime Mortgage Loan Crisis
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- ◆ Securitization of First Mortgage Loans
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# The Origins of the Sub-Prime Mortgage Loan Crisis

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- ◆ How did it happen?
- ◆ Relaxation of the lending standards—the sub-prime mortgage loan borrowers would not have qualified for normal mortgage loans. They frequently have no regular source of income, and no money for down-payment.
- ◆ Many of them are enticed with no down-payment and an initial zero- or low-rate of interest and a grace period before having to service the debt. Many are also told that the worst that can happen is that they will have to give back their “new” homes to the lenders but they are no worse off than before and so have nothing to lose (moral hazard).

# The Origins of the Sub-Prime Mortgage Loan Crisis

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- ◆ Lending institutions that make sub-prime mortgage loans typically do not look to the borrower's current income as a source of repayment, but only to the potential asset value of the mortgaged property (and the asset value may depend on the appraisal of the property, which can be exaggerated, and on expected appreciation in the value of the property).
- ◆ The possibility of subdivision of a mortgage loan into several different layers and separate securitization of the individual layers, presumably with different credit ratings. Thus, the originating lenders can sell off the sub-prime mortgage loans through securitization and have no continuing downside risks.

# The Origins of the Sub-Prime Mortgage Loan Crisis

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- ◆ These are loans that should not have been made in the first place—the borrowers are not expected to be able to service their debts.
- ◆ Financial engineering cannot eliminate these risks—it merely redistributes risks among different classes of investors (if risks appear to have disappeared completely, something is wrong). No amount of financial engineering wizardry can make the bad credit risks go away. However one subdivides the loan, some investor must wind up with the bad credit risks.

# The Origins of the Sub-Prime Mortgage Loan Crisis

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- ◆ Unfortunately, this does not seem to have happened until it is too late—the interest rate spreads between the sub-prime mortgage loans and the U.S. Treasury securities of similar maturity were less than 100 basis points for a long time, until the second quarter of 2007.
- ◆ What this meant was that investors were bidding up the prices of the sub-prime mortgage loan securities and their derivatives, so that their yields became almost as low as the U.S. Treasury securities, and certainly as good as the best corporate bonds.
- ◆ Why were there such eager buyers of these sub-prime mortgage loan securities and their derivatives?

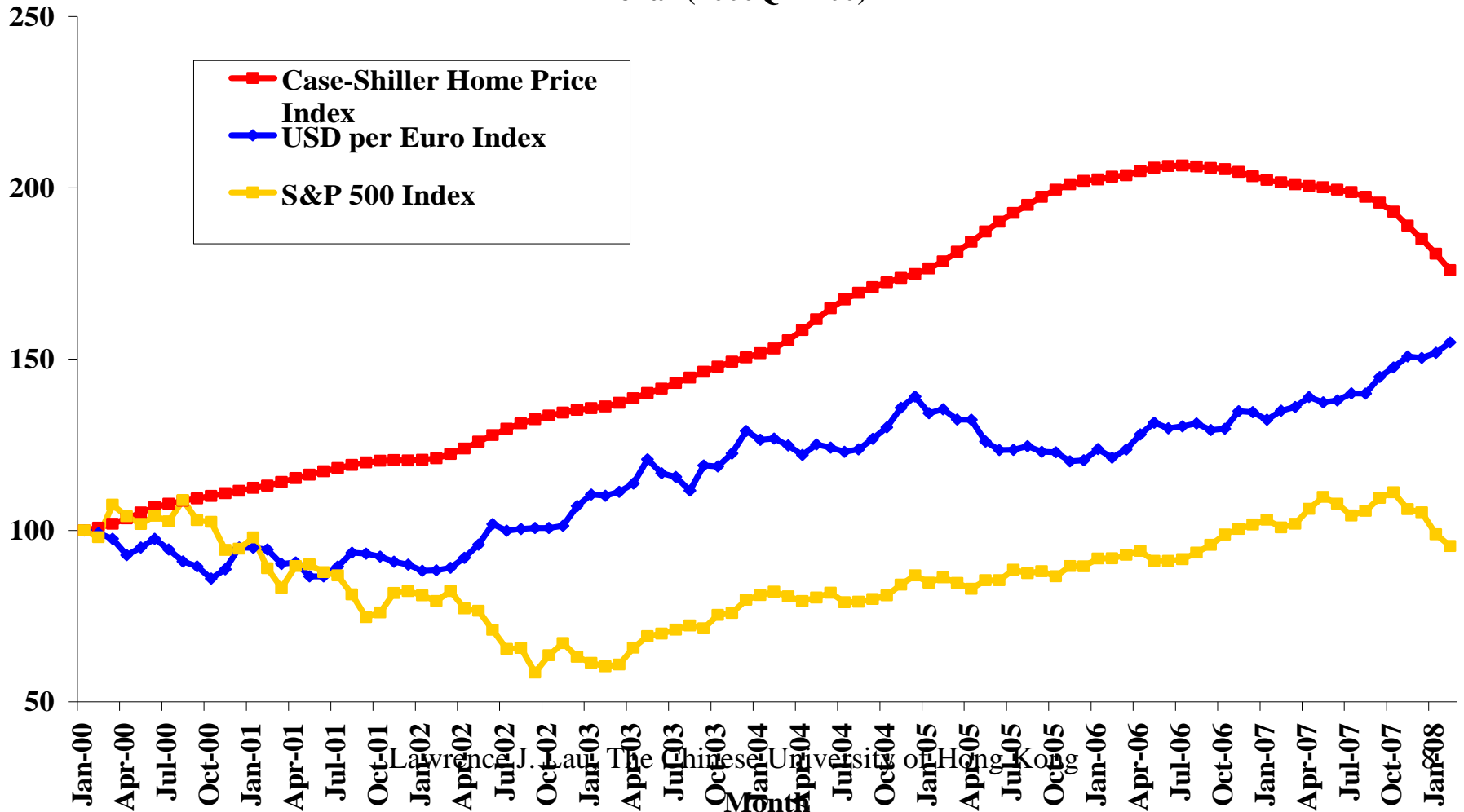
# The Effects of the Sub-Prime Mortgage Loan Crisis on the U. S. Economy

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- ◆ A significant and continuing decline in the price of residential housing in the U.S. since 2007Q2 as well as in its expectation in the future.
- ◆ The threat of foreclosure of the residential units owned by the sub-prime mortgage loan borrowers.
- ◆ Massive losses in the value of sub-prime mortgage loan securities and their derivatives, with consequential massive write-offs by commercial and investment banks of their portfolios of sub-prime mortgage loans and their derivatives. The estimate is that ultimately the cumulative losses will amount to some US\$1 trillion.
- ◆ Huge uncertainty in the valuation of such securities.
- ◆ The drying up of credit even among the commercial banks because of uncertainty and lack of knowledge of the financial balance sheets of one another.
- ◆ The housing market has slowed considerably. Consumption demand has weakened. The unemployment rate has risen. And the U.S. economy is either at or near recession.

# Comparison of Home Price Index, S&P Index and the Exchange Rate, 2000Q1=100

Comparison of Case-Shiller Home Price Index, S&P 500 Index and the Exchange Rate of U.S. Dollar (2000Q1=100)



# The Impact of the Sub-Prime Mortgage Loan Crisis on China

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- ◆ The U.S. demand for imports will likely decline with the reduced household consumption, or at a minimum the rate of growth will decline.
- ◆ Such decline will have a negative effect on the rate of growth of Chinese exports to the U.S. and hence on Chinese GDP, but the effect is expected to be marginal.
- ◆ The overall economic slowdown in the U.S. will last a while, until more positive and certain expectations are restored for both firms and households, probably after the Presidential election in November, 2008.
- ◆ The U.S. dollar will continue to weaken relative to other reserve currencies as the net inflow of capital, especially that of direct and portfolio investment, is reduced.

# The Impact of the Sub-Prime Mortgage Loan Crisis

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- ◆ Chinese exports to the U.S. constitute between 8% (Chinese estimate) and 12% (U.S. estimate) of Chinese GDP; however, the direct domestic value added content of Chinese exports to the U.S. is quite low, averaging 17.7%. Thus, the Chinese GDP originating from Chinese exports to the U.S. is only approximately 2.2% ( $12\% \times 18\% = 2.16\%$ ). (Examples: notebook computers, i-pods)
- ◆ 2.2% of GDP is reasonably significant and will result in hardships in some localities if completely lost. However, even if real Chinese exports to the U.S. falls by 10% (which is considered unlikely), it will cause Chinese GDP to fall by only 0.22%, which is clearly tolerable, especially if the remaining 97.8% of the Chinese economy continues to grow.

# The Impact of the Sub-Prime Mortgage Loan Crisis

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- ◆ If the indirect domestic value added of Chinese exports to the U.S. is also taken into account, a 10% decline in Chinese exports to the U.S. may result in a decline of Chinese GDP of no more than 0.5%.
- ◆ However, the impact may be quite severe on certain localities where most of the economy is dependent on exports, e.g., the cities of Dongguan and Shenzhen in the Province of Guangdong, and Suzhou in the Province of Jiangsu, where the value of exports is much greater than the local GDP. Measures must be put in place in these localities to take care of expected lay-offs of workers as a result of the slowdown in export demand.

# The De-Coupling of Global Growth

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- ◆ It used to be “When America sneezes, Asia catches a cold.”
- ◆ However, the final demand for consumption in Asia has come into its own because of the rapid growth of per capita real GDP in both China and India and elsewhere. The largest market for cell phones is in China. The automobile markets with the highest rates of growth are in China and India.
- ◆ Both China and India are relatively immune from the economic slowdown in the U.S.
- ◆ Moreover, since Chinese exports to the U.S. consist mostly of lower-priced manufactured products, they are more recession-proof as formerly affluent consumers shift to lower-priced products.

# The Growth of the Chinese Economy and the Pattern of World Trade

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- ◆ Because of the rapid economic growth of China, and the demand and supply that such economic growth has generated, the economies of East Asia now trade more with one another than with economies outside of East Asia, including the United States. This is a sea change compared to twenty-five years ago. Interdependence of the East Asian economies has been rising over the years and dependence on the United States and Western Europe has declined.
- ◆ China has become the most important export market for most East Asian economies and runs trade deficits vis-à-vis almost every one.

# The Impact of the Sub-Prime

## Mortgage Loan Crisis—De-Coupling

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- ◆ In general, the phenomenon of “decoupling” is expected to be operative. Chinese economic growth is largely unaffected by external developments, including a possible economic recession in the United States. The other so-called BRIC countries—Brazil, Russia and India—are even less dependent on exports. Brazil has recently discovered huge oil reserves and should be entering a new era of rapid economic development, financed by its new found oil wealth instead of foreign loans. Russia has already been benefiting from the high world price of oil and is not a major exporter of manufactured goods and hence will be relatively unaffected by external developments. India is also not a major exporter, except in computer software, and its economic growth is mostly internally driven.
- ◆ The BRIC countries can be expected to maintain their rates of growth, more or less, and the rest of the world, including developing East Asia, should be able to manage.

# The Impact of the Sub-Prime

## Mortgage Loan Crisis—De-Coupling

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- ◆ Credit in China is tight, not because of the sub-prime mortgage loan crisis, because of the policy of the People's Bank of China to restrain the growth of liquidity. Potential liquidity is abundant. China does not suffer from the tight credit conditions of the U.S. and Western Europe.
- ◆ Paradoxically, because of the potential economic recession in the U.S., there is a slowdown in the capital flow from overseas into the U.S., causing the U.S.\$ to devalue relative to the other major currencies, including the Yuan.
- ◆ Moreover, since short-term capital (hot money) needs a home, much of it has flown into China, further increasing the potential liquidity in China that China does not need.

# Is the End of the Crisis in Sight?

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- ◆ The initial write-offs by investors and banks and financial institutions seem to have been completed, with the heads of many leading financial institutions replaced.
- ◆ The Bear-Stearns rescue by J. P. Morgan Chase, orchestrated by the U.S. Federal Reserve Board, seemed to have staved off the possibility of a large systemic failure for now.
- ◆ However, the sub-prime mortgage loans themselves remain a problem to be solved.
- ◆ And the price of residential housing (as well as other real estate) has continued to decline. It will take a long while before the price of residential housing begins to recover.

# The Anatomy of the Sub-Prime Mortgage Loan Crisis

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- ◆ In order to understand why there was the initial success in the marketing of the sub-prime mortgage loans to non-qualified borrowers and their securitization and sale to other investors, the entire operation can be compared to a “pyramid scheme”.
- ◆ A pyramid scheme has the property that the initial investors can make a great deal of money initially on the basis of the money from the subsequent investors and that is what typically drives a pyramid scheme.
- ◆ How does this work? This works through the creation of expectations that the residential units being bought by the sub-prime mortgage loan borrowers are going to appreciate significantly in value, and fulfilling these expectations initially.

# The Anatomy of the Sub-Prime Mortgage Loan Crisis

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- ◆ Imagine a first batch of the sub-prime mortgage loan borrowers have bought their new homes and that their mortgage loans are bundled and securitized and sold to investors.
- ◆ Enter a second batch of sub-prime mortgage loan borrowers, who will bid for the homes bought by the first batch of borrowers, driving their prices up, using loan funds provided by the originating lenders.
- ◆ The first batch of borrowers sell their homes, with or without the mortgages, and with their capital gains go on to buy higher-price homes. But in the meantime, because the homes underlying the first batch of sub-prime mortgage loan securities have risen in market value, the securities are now worth more, driving down the yield, and making money for the initial investors in these securities. This makes the sale of additional sub-prime mortgage loan securities and their derivatives much easier.

# The Anatomy of the Sub-Prime Mortgage Loan Crisis

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- ◆ This process repeats itself until there are no more new sub-prime mortgage loan borrowers or the market prices for the residential properties are considered too high and stop rising.
- ◆ Some transactions in these sub-prime mortgage loan securities and their derivatives provide for a residual to the seller in the event there is a gain in the value of the sold securities or derivatives. This provides an additional incentive for a holder of such securities and each successive purchaser to keep selling such securities to others.
- ◆ But all pyramid schemes eventually end in disaster and the sub-prime mortgage loans are no exception. (In a way, the internet stock bubble in the late 1990s and early 2000s could also be considered a “pyramid scheme”).

# The Failure of the Monitors: The Auditors and the Accounting Profession

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- ◆ Most, of not all, of the losses suffered by the major commercial banks and investment banks are caused by “special investment vehicles” or “special purpose vehicles” created by them off their balance sheets.
- ◆ These vehicles are set up to purchase sub-prime mortgage loan securities and their derivatives, using funds borrowed from the banks. They are typically very heavily leveraged, with only minimal equity.
- ◆ Eventually these vehicles go sour when the bottom drops out of the market for sub-prime mortgage loan securities and the banks that sponsor these vehicles and lend them the money have to take them back onto their balance sheets and write off their losses.
- ◆ If such off-balance sheet activities were not allowed for commercial banks, such losses would not have occurred. These off-balance sheet activities should not have been allowed, especially after the Enron debacle, which was mostly caused by off-balance sheet activities.

# The Failure of the Monitors: The Auditors and the Accounting Profession

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- ◆ The use of models for the valuation of sub-prime mortgage loan-backed securities and their derivatives should not have been allowed to substitute for the market valuation. Inability to determine a fair market value is often a symptom of much more serious problems and should have been brought to the fore.
- ◆ Fair market price determination of securities requires an independent arms-length third-party purchaser (that is why Warren Buffett, the Chairman and CEO of Berkshire Hathaway, one of the most successful investors in the world, objected to the formation of a consortium of banks to buy back the sub-prime mortgage loan securities and their derivatives owned by themselves).

# The Failure of the Monitors: The Rating and Consumer Protection Agencies

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- ◆ The failure of the rating agencies—they are compensated by the security issuers to provide the ratings on the securities. There is therefore a potential conflict of interest and possible moral hazard. The rating agencies granted AAA ratings to these sub-prime mortgage loan securities and their derivatives on the basis that their then current default rates are low, or on the basis that they have bond insurance.
- ◆ The failure of the consumer protection agencies to protect the sub-prime mortgage loan borrowers who did not know better and were ill-informed and who otherwise thought they had nothing to lose.

# The Moral Hazard

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- ◆ The borrowers—they can simply “walk” away from the sub-prime mortgage loans.
- ◆ The originating lenders—they can sell their mortgage loans even if they are “sub-prime” and hence have no financial responsibility even if the borrowers default.
- ◆ The rating agencies—they make a fee from the security issuers that issue the securities they are rating but are otherwise not responsible.
- ◆ The investment bankers—they make a fee by bundling and selling the sub-prime mortgage loan securities and have no residual liability. They also purchase bond insurance on their securities.

# The Moral Hazard

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- ◆ The hedge fund managers—typically they receive a basic annual management fee of one or two percent, but if they realize a rate of return above a certain threshold, say 6 percent or 8 percent, they will be additionally compensated by what is called “carry”, that is, they will receive a percentage of the excess rate of return over the threshold rate ranging between 20 and 44 percent.
- ◆ The hedge fund managers thus have no downside risks but a huge upside potential because of the carry—thus, they use maximum leverage and put their faith in bond insurance companies. Of course then small adverse movements in the market for sub-prime mortgage loan securities will wipe out the value of their funds and the equity capital of their investors. However, this does not hurt the fund managers because their own money is not at risk, only other people’s money is at risk.
- ◆ The hedge fund managers also take advantage of the fact that they do not have to operate transparently or disclose fully their interests and positions and can benefit themselves at the expense of others through “hidden actions”.

# The Counter-Party Risks

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- ◆ The neglect of counter-party risks—The failure of Long-Term Capital Management in 1998 was largely due to the Russian financial institutions failing to perform, i.e., to purchase the Russian rubles for US Dollars that they had previously contracted to do so, causing an apparently perfectly hedged position to unravel completely. Once again, counter-party risks are central to the severity of the current sub-prime mortgage loan crisis.
- ◆ Counter-party risks cannot be completely hedged away—for example bond performance insurance merely substitutes one counter-party (bond issuer) with another counter-party (insurance company) but both have risks of non-performance.

# The Counter-Party Risks

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- ◆ Instead, there is the implicit assumption that the bond insurers are financially sound, but this is not independent of the financial strength of the insurers, the quality of the bond portfolio being insured, the total size of the obligations relative to the equity capital, as well as the conditions of the market.
- ◆ There is lack of transparency and full disclosure of the financial conditions of many counter-parties.
- ◆ Over-sub-division of a financial instrument can increase risks—because of the additional transactions costs and the increases in other risks such as counter-party risks.
- ◆ Moreover, over-sub-division can easily lead to a wide diffusion of inter-related and inter-dependent risks, leading possibly to systemic failure.
- ◆ The sub-prime mortgage loan problem spread internationally through the worldwide sales by U.S. investment banks to overseas commercial banks, especially in Europe.

# The Lack of Transparency and Full Disclosure

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- ◆ The market for financial derivatives, especially special-purpose and thinly traded derivatives, operates very much like a casino but without rules and known (fair) odds.
- ◆ Very often one investment bank dominates the market of a particular kind of sub-prime mortgage loan security or its derivative. The use of monopoly or monopsony power in the trading of sub-prime mortgage loan securities and their derivatives is common—there is no need to disclose either the full positions or the net positions—insider trading, front running, and buying and selling at the same time without disclosure.

# Securitization of First Mortgage Loans

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- ◆ China should still continue to promote the securitization of first mortgage loans on owner-occupied residential property. Owner-occupied residential property has very low default rates even if the net asset value of the property turns negative—i.e., the value of the outstanding loan exceeds the current market value of the property.
- ◆ Standardization of mortgage loans including the maximum size, down-payment percentage, borrower income requirement, etc. is essential for successful securitization.

# Securitization of First Mortgage Loans

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- ◆ Mortgage loan borrowers prefer long-term fixed-interest-rate mortgages because that enables a lower monthly payment (of both interest and principal) and a constant monthly payment amount that is financially manageable.
- ◆ However, for commercial banks, without long-term fixed-interest-rate deposits, it is extremely risky to make long-term fixed-interest-rate loans. There will be the potential of interest-rate mismatch and maturity mismatch.
- ◆ The U.S. Savings and Loan Associations were essentially wiped out in the early 1980s because they made only long-term fixed-rate loans so when the interest rates went up to almost 20 percent they all went broke.
- ◆ Variable-rate mortgages are too risky for the borrowers (the rates may become too high for them to service) and hence also for the lenders.

# Securitization of First Mortgage Loans

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- ◆ A long maturity on a residential mortgage loan reduces the current burden of the debt service—lower repayment of principal and a stable interest rate.
- ◆ This is because only through securitization, i.e., the sale of mortgage loans to third-party financial institutions such as life insurance companies and pension funds, is it possible to match the maturity of the loans with the source of funding.
- ◆ Securitization also provides these financial institutions with liquidity when required since the mortgaged backed securities can be sold on the secondary markets.
- ◆ In the securitization of owner-occupied residential mortgages, it is best to keep things simple and use only “Plain-Vanilla” standard trading products only.
- ◆ The loan originators should be required to retain some residual risk on the quality of the borrowers and the reliability of the property appraisal, say within the first five years of the mortgage so that they have the incentive to exercise due care—otherwise there will be moral hazard.

# Securitization of First Mortgage Loans

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- ◆ Organizations such as a Fannie Mae or a Freddie Mac would be good for China if they stick to conventional securitization of conventional first mortgage loans for owner-occupied residential housing units.
- ◆ They will provide good investment outlets for long-term investors such as life insurance companies, pension funds and endowments.

# Concluding Remarks: What Should be Done to Avoid a Next Crisis?

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- ◆ Protecting consumers, borrowers and potential borrowers from predatory lenders.
- ◆ Insistence on loan quality and the rule of law.
- ◆ Insurance for various insurable contingencies should be provided in order to protect the interests of both the homeowners and the lenders.
- ◆ The government should pre-commit to a position of no bail-out (so as to prevent moral hazard).
- ◆ The government should not allow a non-discriminate, unregulated and nontransparent market for financial derivatives. It will create havoc in the Chinese financial sector just as it did in the U.S.
- ◆ The government should prosecuting pyramid scheme-like behavior rigorously, e.g., 蚁力神.

# Concluding Remarks:

## Loan Quality and the Rule of Law

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- ◆ In order that qualified Chinese households can continue to have access to long-term fixed-interest-rate mortgage loans for their owner-occupied residential units, it is necessary that the default rate on such mortgage loans be kept at a low level. And the default rate depends on the ability to service and repay the loan on the part of the borrower, the debt-to-equity ratio, and the reliability of the valuation of the worth of the residential unit. And in the rare case of default, foreclosure should be possible.
- ◆ Sub-prime mortgage loans, on which the borrowers have no ability to service the debt, and the lack of a foreclosure option in the case of default will shut down the mortgage loan market in China and make it difficult to achieve universal or almost universal home ownership.

# Concluding Remarks

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- ◆ Securitization of first mortgage loans for owner-occupied residential housing units should continue to be promoted and encouraged in China.
- ◆ Should Glass-Steagall Act be brought back? That is, should commercial banking and investment banking and other financial activities such as insurance companies and securities brokerage be strictly separated in order to reduce overall systemic risk in the financial sector? This is also a question to be considered. Arguably if there is stricter separation of investment banking and commercial banking and between commercial banking and retail brokerage, some of the problems may not have occurred.