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THE UNIVERSITY OF HONG KONG

CRITICAL ANALYSIS OF RELATIONSHIP BETWEEN REAL ESTATE CYCLE AND CREDIT RATINGS

A DISSERTATION SUBMITTED TO

THE FACULTY OF ARCHITECTURE

IN CANDIDACY FOR THE DEGREE OF

BACHELOR OF SCIENCE IN SURVEYING

DEPARTMENT OF REAL ESTATE AND CONSTRUCTION

BY

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HONG KONG

APRIL 2006

DECLARATION

I declared that this dissertation represents my own work, except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualification.

Signed:_____

Name:_____

Date:_____

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ABSTRACT

After the Asian Financial Crisis in 1997, researchers started to realize that financial crisis and bust of real estate bubble happened at the same time. They may have a close relationship and these researchers have worked hard to find out these relationships.

This dissertation builds on the work of the above papers to find out a more effective way to monitor real estate bubble. As credit ratings become more popular after the publishing of Basel II, the author would like to investigate the effect of credit rating on the real estate cycle. Due to the limited space of this paper, the dissertation will only investigate the relationship between real estate cycle and credit ratings as a first step. More researches are needed to further elaborate the function of credit ratings as a monitoring tool.

This dissertation finds that the asset quality, asset value and profit of banking institutions are essential to the credit ratings of banks. In addition, the profitability, asset quality and capital base of banking institutions changed during different stage of real estate cycle. After linking these results together, one could conclude that real estate cycle could affect the credit ratings of banking institutions. Besides, credit ratings have effect on the bank lending attitude, so as its credit to real estate sector. Real estate cycle could be influenced by the credit ratings. Finally, the author concludes that there is a bilateral indirect relationship between such cycle and banking institutions. This paper's contribution is to help HKMA setting up a better supervision policy to maintain the financial stability of Hong Kong. Besides, it sets up a first paper to investigate the relationship between these two variables in academic field. More academic researches such as empirical study can be done in the future to prove their relationship quantitatively.

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CHAPTER 1

INTRODUCTION

1.1 Background

Real estate cycle is always said to be closely related to the macro-economy, demand and supply of the real estate market, interest rate or even bank lending cycle. Obviously, the consequence of real estate cycle depends on its role in an economic region. In Hong Kong, the consequence of real estate cycle is crucial because of extremely high property price. As a result, high cash flow is needed for transaction in this economic sector. To activate the real estate sector, large amount of cash flow is needed. Therefore, banking institutions become the one to finance those real estate projects. As a result, the percentage of real estate related loans becomes a significant part of banks' total domestic loan. In 2005, the percentage of real estate related loan is about 50%. [1]

If the property price rises more than their fundamental value in a large degree, the asset price bubble would be boomed. However, the asset price bubble will bust later when there is a great depression in real estate price. This boom and bust of asset bubble is named as the real estate cycle. Real estate bubbles may occur without banking crises.[2] Banking crises may occur without real estate bubbles. However international experience suggested that they were correlated in a remarkable number of instances. The banking sector plays a central role in the real estate cycle because increases in real estate prices tend to boost

[1] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective*. Washington, DC: Group of Thirty, occasional paper, no 58.

[2] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective*. Washington, DC: Group of Thirty, occasional paper, no 58.

banks' willingness and capacity to lend, while a number of factors allow persistent deviations from efficient pricing. As a result, the banking sector acts as a 'financial accelerator' to accelerate the boom and bust of asset bubble. [3]

The consequences for the real estate bubble on banking sector depend on its role in the financial system. In Hong Kong, the percentage of real estate related loans is about 48% in 1997 and increased to 50% in 2005. [4] Obviously, any changes in real estate sector would have impact on the asset quality and profitability of the banking sector. As they are closely related to each other, the increase or decrease in the price of asset would influence the stability and efficiency of financial system. The bank lending behavior also encourages the raise of property price.

The Asian crisis in the late 1990s followed this pattern. Key features of the buildup included heady belief in an 'East Asian miracle' capable of delivering rapid economic growth over an extended period. As the economic activities became more frequent, the demand of the commercial property increased. [5] Also the increase in population and residents income stimulated the growth of property price. At that time, the domestic credit amount on real estate related loan sharply increased. The growth of property price brought a great profit to banking sector. At the same time, the excessive lending of real estate related loan further pushed the property price to the peak. Subsequently, economic growth suffered setbacks in 1997. [6] Asset markets reversed, and both financial and corporate balance sheets deteriorated. Eventually, investor sentiment turned negative,

[3] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective*. Washington, DC: Group of Thirty, occasional paper, no 58.
[4] Id.
[5] Id.
[6] Id.

exacerbated this process and generated a series of banking and exchange crises across the region.

Thus the banking sector's importance and link to the real estate sector not only amplifies the real estate bubble but also can have major implications for the overall stability of the economy. The relationship between real estate cycle and banking sector is obvious. However the condition of real estate cycle and credit rating is more complex. To my knowledge, until now there is no researchers study for their relationship. Therefore I first suggest that as the credit rating is one of the tools to monitor the lending condition of banking sector, it can indirectly affect the real estate cycle by influencing bank lending behavior. The bank lending behavior is the key between such cycle and credit ratings.

Credit ratings were firstly used as to assess the risk of the bond. Two international credit rating agencies, Standards and Poor's and Moody are recognized as a 'qualifying credit rating' under the Banking Ordinance. [7] These rating agencies rated the bank and published the result so as to let investors know the default risk, financial safety and financial soundness of the bank. These ratings are known as external rating.

Starting from 1860, credits ratings have been commonly used on the publicly issued debt obligations. Due to the outbreak of the new Bank for International Settlement (BIS) capital requirements, where it states that banks that have a sound internal rating system will be allowed a lower amount of capital against loans issued to borrows, credit rating is growing more and more essential. [8] Since the occurrence of the new Basel Accord

7 Hsu, F.C., 2002. Asset Quality in HKSAR's Real Estate Markets: A Public Policy and Legal Analysis. UCLA Pacific Basin Law Journal, Vol. 19, pp. 263-285

8 Matthews, B.C., 2002, Regulatory use of credit ratings: implications for banks, supervisors and markets. Credit ratings: methodologies, rationale and default risk. London: Risk Books.

proposals on credit risk capital, which is also called Basel II, the importance of credit rating is pushed to a crest. As credit ratings become more and more popular in monitoring the performance of banking institutions, it may be probable to monitor the impact from real estate cycle.

HKMA also plans to implement the BIS II in 2006 which further promote the importance of internal rating to banking sector. As a result, credit rating including external rating and bank internal ratings becomes a strong tool to monitor the lending behavior of banks. Thus it is indirect related to the real estate cycle when banking behavior is in between of them. The purpose of this dissertation is to find out their bilateral indirect relationship.

1.2 Objectives

Real estate cycle is one of the dominant factors of financial crisis. To reduce or prevent financial crisis, real estate cycle must be controlled or supervised. The relationship between financial sectors and real estate industries in financial system should therefore under certain protection. Credit ratings are treated as a regulator to regulate the bank lending behavior and finally to have an indirect impact on such cycle. Thus this dissertation is written to analyze the indirect relationship between them. It is suggested that the credit ratings should be further promoted so as to reduce the frequency and magnitude of the real estate cycle.

The objectives of the dissertation are as follows:

1. To identify the determinants and the role of banks in real estate cycle

2. To review the historical background of credit ratings and its impact on banking sector
3. To review the real estate market in Hong Kong
4. To analyze critically the relationship between real estate cycle and credit ratings

1.3 Scope of Study

Due to the complexity of the banking institutions operation, this dissertation limits the scope of study to those measures, including the asset value, profit, asset quality, credit ratings, liquidity, capital adequacy ratio and real estate related loan of banking institutions, which are particularly related to the real estate sector.

1.4 Terminology

Real estate cycle is defined as the ups and downs of property price. In different phases of real estate cycle, different characteristic of real estate market is shown. There are two kinds of the credit ratings in this dissertation. One is the external credit ratings that are the ratings from rating agencies such as S&P. Another is the internal bank ratings which are starting to be promoted in Hong Kong together with the promotion of Basel II. Banking institutions in this dissertation means the authorized institutions defined by HKMA.

1.5 Methodology

To understand the rationale of real estate cycle, extensive literature review is carried out to disclosure the determinants and the role of banking sector in the real estate cycle. The general theory does suggest that banks are acting as a ‘financial accelerator’ to maximize

the fluctuation of property price. Also the theories of disaster myopia, inadequate data and weak analysis are the main explanations of the role of banks in such cycle.

Besides, the historical background of credit ratings is reviewed. The general rating process of international rating agent is examined. The relationship between internal rating, Basel II and banks is also discussed.

In order to have a better understanding of the ac hoc condition in Hong Kong, the real estate market is reviewed. Data from Census & Statistics Department and Rating & Valuation Department is collected to illustrate the development of the real estate market.

Theory of real estate cycle is applied to give a general framework for analyzing the dependence of banks on real estate cycle. Data from different sources such as publications of the HKMA and newspapers is collected. Data is also transformed by mathematical method to compare their changes.

To analyze the credit ratings and banking sector in Hong Kong, relevant material and data such as banks' annual reports are collected. Further analysis of the data collected will be carried out. The analysis results will then be used to support that there do exist an indirect relationship between credit ratings and real estate cycle.

1.6 Structure of Dissertation

This dissertation is divided into six chapters. After the introductory section given in chapter one, chapter two focuses on the theoretical framework of real estate cycle.

Chapter three concerns the background of real estate market and financial crisis in Hong Kong. Chapter three also reviews the historical background of credit ratings and investigates the relationship between credit ratings and banking institutions. The content in chapter four is all about the ac hoc condition in Hong Kong.

Thorough discussion on the impacts of real estate cycle on the banking institutions in Hong Kong is in chapter five. The discussion is based on the theory adopted in chapter two and applies to the existing banking system of Hong Kong. In the final section of chapter five, the bilateral indirect relationship between real estate cycle and credit ratings is examined. Finally, a conclusive summary and recommendation of this dissertation is given in chapter six.

CHAPTER 2

LITERATURE REVIEW OF REAL ESTATE CYCLE

2.1 Introduction

If the real estate price rises more than their fundamental value in a large degree, the real estate bubble would be boomed. However, the real estate bubble will bust later when there is a great depression in real estate price. This boom and bust of real estate price is named as the real estate cycle.[9]

International experience suggested that boom of real estate bubble is usually end in bust of bubbles and banking crisis. One recent example is Asian Financial Crisis in 1997. Some researchers got interest in this phenomenon and expressed their opinions on the role of banking institutions in real estate cycle.[10] Others see bubbles as the outcome of a multitude of factors that change from episode to episode. These multitude factors are incomplete information and uncertainty about future events, biased expectations, unwanted regulatory or tax incentives, and expansionary monetary policy.[11]

Although there are different opinions and ideas about the real estate cycle, most of the researchers do agree that banking institutions contribute a lot to the real estate cycle. I will first talk about the significant of the real estate cycle. Then I will summarize the

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[9] Herring, R. and Wachter, S., 1999. *Real Estate Booms and Banking Busts: An International Perspective*. Washington, DC: Group of Thirty, occasional paper, no 58.

[10] Herring, R. and Wachter, S., 1999. *Real Estate Booms and Banking Busts: An International Perspective.* Washington, DC: Group of Thirty, occasional paper, no 58.

[11] Example are Allen, F. and Gale, D., 1999. Bubbles, crises, and policy. *Oxford Review of Economic Policy*, vol 15, Autumn, 9-18

Kindleberger, C.P., 2000. *Manias, Panics, and Crashes: A History of Financial Crises*. New York: John Wiley & Sons, 4th ed.

Shiller, R.S., 2000. *Irrational Exuberance*. Princeton, New Jersey: Princeton University Press

previous literatures and pointed out the determinants of real estate cycle. Finally examination of the relationship between banking institutions and the real estate cycle will be conducted based on the researches of previous scholars.

2.2 Determinants of real estate cycle

According to the theory of economy, demand and supply are the fundamental factors of the real estate market, which can be treated as sources of fluctuation of real estate price. Since each real estate take long time to be finished, there is a time lag between the demand and supply. Over-supply is very common during the booming of real estate bubble, but after the bubble is bust, over-supply will accelerate the decline of the real estate price. This demand and supply factor as an interior determinant will be examined firstly.

The role of optimist is the reason why land price is higher than the fundamental value. It is also an economic theory that if market does not exist, the transaction cost of that product will be high. Transaction cost includes information cost which is the information of the fundamental value of the land. As there is no public market for the private developers to trade their land, the fundamental value of the land can not be known though the market. Optimists always win the auction and the real estate price will increase as these lands are developed. This factor as an exterior determinant will be examined secondly.

2.2.1 Demand and Supply of real estate market

The demand for real estate is determined by its selling price and the discounted present value of all future cash inflow. It is found that the initial stage of the real estate cycle is a response to the increasing demand. When real estate price rise above the replacement costs, constructors and developers will initiate new construction based on current property prices. By theory of long-run equilibrium, the price of existing property and replacement cost would be equal. Therefore, the fundamental price can then be consistent with long-run equilibrium.

However, long construction lags prevent a quick supply response. In addition, each developer has his own uncertain private information about the forthcoming demand and limited knowledge of future property price. Thus, the supply of new property would be different from the demand of the market. By the time the construction is delivered, the market demand may decrease and the resulting oversupply condition could make property price further decline. As a result, the forecast errors of future demand and the lags in adjustment process of demand and supply lead to the formation of real estate cycle.[12]

One example of this theory is the Asian Financial Crisis in 1997. Before 1997, the real estate price was in a high level and kept increasing. It represented that the demand of real estate was also increasing. Thus, developers greatly increased the supply of residential and office building. When the real estate bubble was bust in 1997, the real estate price dropped sharply. No one wanted to buy the new property. The resulting oversupply in the market made the real estate price continuous to drop in the next few years.

[12] Herring, R. and Wachter, S., 1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.

2.2.2 The role of optimists

Since the price of a real estate depends on the future value of fundamental price, investors may either underestimate or overestimate the fundamental price in an environment with imperfect information.[13] In most of the markets, one could argue that sustained deviations below the fundamental value are unlikely because sophisticated investors who know the fundamental value will profit by buying until the price rises to the fundamental value.[14] This presumption seems plausible for the real estate market. Conversely, it is tempting to assume that if the price is too high, sophisticated investors will profit by selling short until the price falls to the fundamental value. However this assumption is not plausible in the real estate market because of difficulties in selling premises shortly.

In particular, investors becoming overoptimistic about expected growth could drive the price above its replacement cost. In efficient financial markets, these deviations from the fundamental price are countered by sophisticated investors selling real estate short until the price reverts back to its fundamental value. Moreover, increases the supply of land cannot be expected to moderate the rise in price because the supply of land is fixed, at least in the short run.

However, there are no futures or options markets for land. Optimistic investors remain in the market as long as prices are rising and financing is available. Long construction lags prevent a quick supply response, so prices keep rising for a protracted period and a price bubble develops. Finally, as prices move further and further away from their fundamental

[13] Carey, M. 1990. *Feeding the fad: the federal land banks, land market efficiency, and the farm credit crisis*. Dissertation, University of California at Berkeley

[14] Herring, R. and Wachter, S., 1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.

value, more and more investors move to the sell side, dampening price inflation. As this process gathers momentum, prices drop abruptly.

Optimists, those who had purchased the premises above the fundamental value, will strongly influence the price in this kind of market with no short sales and fixed supply.[15] In addition, even if this kind of optimism is not found in real estate market, they are likely to remain in business sector such as developers and main contractors as long as the upward trend in prices continues. Even if they earn substandard returns, they are likely to be able to borrow again for new project.

2.3 The role of banking institutions

Banking institutions are significant to the financing of real estate market. Banking institutions lend money to developers for the purchase of land. They not only finance the construction project, but also lend to firms based on real estate collateral. Obviously, change in banks' lending attitude would also change the behavior of real estate investment and transactions. In addition, the fluctuation in property price could also have impact to the performance of banks.[16] In the down turn of real estate cycle, the number of non-performing loans increases. Therefore, banks' profitability drop as well as banks' capital base. As a result, researchers would like to know more about the close relationship between banking institutions and real estate cycle.

[15] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.

[16] Allen, M., Madura, J. and Wiant, K., 1995. Commercial bank exposure and sensitivity to the real estate market. *Journal of Real Estate Research*, 10(2), pp. 129-140

Rising real estate prices may encourage greater lending to the real estate sector in two ways.[17] They are shown as below:

1) If bank's own holdings of real estate rose, the economic value of the bank's capital increased. Therefore, bank would be more willing to hold real estate loans.

2) When the market value of collateral on outstanding real estate loans increased, the risk of loss on the existing portfolio of loans declined. It would be possible to lend more without increasing the probability of bankruptcy.

Researchers suggested some reasons to explain their relationship. I will talk about them one by one. The first one is disaster myopia and second one is inadequate data and weak analysis.

2.3.1 Disaster myopia

Banking institutions' ability to estimate the probability of crises like a collapse in real estate prices depend on two key factors.[18] They are shown as follow:

1) The frequency with which the shock occurs relative to the frequency of changes in the underlying causal structure. For high frequency shock, which occurs frequently due to the relevant changes in the underlying causal structure, banks can easily predict and prevent it. On the other hand, for low frequency shock

[17] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.
[18] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.

which occurs less frequently, banks had little information about it and thus cannot predict it and prevent it easily.

2) If the shock occurs many times while the structure is stable, probabilities may be estimated with considerable confidence. High-frequency crises create pressure to bank's performance. For example, default rates on credit card receivables and car loans or routine deposit withdrawals can be estimated with considerable confidence. Then, high frequency crises are not a significant source of insolvency exposure for banks. Banks have both the knowledge and the incentive to price high-frequency crises properly and to make adequate provisions to serve as a buffer against loss. If they do not, they will quickly incur ruinous losses that will lead to insolvency.

One of the sources of banking crisis is that banking institutions make a mistake in considering the risk of their loan such as bust in real estate bubble. Their short-sighted to the disaster is based on a few reasons. In the following section, how these reasons affect the bankers' decision and loan portfolio on real estate related loan will be described. These reasons include accounting system, competition, moral hazard and disaster magnification.

Account system

Market participants, e.g. bankers, financiers, and purchasers, should have adequate information in identifying the risks in the real estate market. When this information is available, these participants should be held responsible for their actions taken. It is

suggested that not only should all the relevant information be made available, but also the market participants should process the information of risks, including adequate transparency and accountability, competently.[19]

Susceptibility to disaster myopia is often reinforced by inadequate information. Sometimes bank's accountability can not provide adequate information. The standard accounting practices are useful in pricing, monitoring and provisioning for high-frequency financial crisis. However, they are useless in reducing the exposure to low-frequency crisis because they don't have full knowledge on when the crisis would occur. During booming period of real estate bubble, the accounting data may show low default rate of the real estate related loans, so the default premiums and reserves may be reduced. However, as the potential risk of busting of bubble can not be predicted under standard accounting practices, the high risk real estate related loan can be misleadingly profitable.

Competition

Competition may interact with disaster myopia in two related ways to increase vulnerability.[20]These ways are shown as follow:

1) Competitive markets make it impossible for banks that are not disaster myopic to price transactions as if there were a finite probability of a major shock when banks and other competitors who are disaster myopic price them as if that probability were zero.

[19] Hsu, F.C., 2002. Asset Quality in HKSAR's Real Estate Markets: A Public Policy and Legal Analysis. *UCLA Pacific Basin Law Journal*, Vol. 19, 263-285

[20] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.

2) If banks are apparently earning returns above the competitive level (disregarding the need for reserves against future shocks), especially myopic banks will be encouraged to enter the market, thus eroding those returns. In response, banks can protect target rates of return on equity for a period by increasing their leverage and rationalizing such actions in terms of the need to maintain target returns in the face of shrinking margins, and in terms of similar actions by other banks.

Based on the above means, it is suggested that the competition among banking sector would enforce the disaster myopia of banks. Finally, banks would be vulnerable to any crises such as bust of asset bubble.

Moral hazard

Moral hazard and adverse selection in the banking system exacerbate such price fluctuations in the real estate sector. Moral hazard arises from explicit or implicit deposit guarantees and weak financial regulation, which encourages banks to take on riskier loans without adjusting their cost of funds.[21] Moral hazard, induces excessive risk-taking by banks, overinvestment, and excessive asset prices. The problem is particularly acute for large banks, which often are seen as 'too big to fail'. Moral hazard also plays a critical role, especially when bank shareholders have little to lose and bank depositors believe they will be protected by the safety net.[22]

[21] Allen, F. and Gale D., 2000. Bubbles and crises. *Economic Journal*, vol 110, pp. 236-256

[22] Herring, R. and Wacher, S., 2003. Bubbles in Real Estate Markets. *Asset price bubbles: the implications for monetary, regulatory, and international policies*, Cambridge, Mass.: MIT Press, chap. 14, pp. 217-229

They place a heavy burden on regulators and supervisors, which few have been able to shoulder. When bank capital positions weaken, they often hope for the best to gain more by giving riskier loan, which will increase the risk of bankruptcy, thus the vulnerability of the banking system to a collapse in real estate prices grows.[23] Adverse selection is an asymmetric information problem arises when the riskiest investors are the ones who are the most active loan-seeker. Thus, investors who are the most likely to produce an adverse outcome are the most likely to be selected. At the time when real estate price booms, adverse selection can exacerbate price bubbles.

Disaster Magnification

Once a shock occurs, disaster myopia may turn into disaster magnification.[24] After a dramatic decline in property price, banking managers would have subjective opinion that the real estate price would fall again. This will result in sharply increase of the interest rates in financial markets as lenders try to reduce exposures and increase risk premiums in response to sharply higher shock probabilities.[25] The extent of credit rationing is likely to extend for borrowers who cannot offer a credible contractual rate that will compensate for the increase in the perceived risk of default.

The contraction of the credit amount to real estate market forces property price to a lower position. At the same time, the lending capital to other economic sectors would also fall. To the extent that supervisors and regulators were susceptible to disaster myopia, they

[23] Herring, R. and Wacher, S., 2003. Bubbles in Real Estate Markets. *Asset price bubbles: the implications for monetary, regulatory, and international policies*, Cambridge, Mass.: MIT Press, chap. 14, pp. 217-229

[24] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.

[25] Guttentag, J.M. and Herring, R., 1984. Credit rationing and Financial Disorder. *Journal of Finance*, 39, December, pp. 1359-1382

may also suffer from disaster magnification.[26] Under disaster magnification, bankers subjectively predict that the chance of a disaster is high, so they would insist on higher capital ratios and more aggressive provisioning against potential losses.

2.3.2 Inadequate data and weak analysis

Inadequate information and weak analysis are the reasons for underestimation of the risk of high concentration in real estate related loan. In fact, it is difficult to find out whether the real estate price is higher than its fundamental value or not. As there is a lack of accurate data, reliable valuation method and accurate analysis of market movement, it is hard to give a warning signal to investors with sufficient evidence. In the following section, I will talk about the valuation of real estate and the risk of real estate related loan.

Valuation of real estate

Uncritical reliance on the measured market value leads to errors in underwriting. The most important value to banking sector should be expected value of the property when the loan is to be repaid, but not the current market value. However in common practice, the decision- makers in banking institutions simply evaluate the property value on the basis of the reports of professional surveyors who rely heavily on comparative pricing. As these comparative prices only reflect the prevailing spot prices of property so the decision-makers in banking institutions have a responsibility to ensure that property valuations

[26] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.

meet international standards and should be held liable for accepting these professional reports at face value.[27]

When banking institutions valuating the real estate, discounted present value should be used. The discounted present value depends on the projected rents and discount rates adjusted for anticipated inflation and loss in value due to physical or functional depreciation and vacancies due to the development of competing properties.[28] Prudent bankers should be used to calculate the discounted present value of the property as a benchmark and compare with other valuation approaches.

Risk of real estate related loan

In order to reduce direct exposure to real estate risk, bank use a low loan-to-value ratio. However, it can not protect banks from all credit risk. When asset bubble bursts, the real estate price falls down to a level maybe even lower than that ratio. Therefore banks will still get loss. In addition, banks may use a high loan-to-value ratio to earn more profit. However, banks also need to face the high default risk, especially during the period of asset bubble busts.

Real estate related loan such as loan to construction industry or developers are considered to be riskier. The repayment of these loans depends on the profit generation of their project. Sharply decrease in real estate price would greatly reduce their profitability. As the real estate project can not be completed, these firms can not obtain any return from

[27] Hsu, F.C., 2002. Asset Quality in HKSAR's Real Estate Markets: A Public Policy and Legal Analysis. *UCLA Pacific Basin Law Journal*, Vol. 19, pp. 263-285

[28] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.

the real estate development. They would be in liquidity. These firms may not have adequate cash flow to pay for the loans or borrow new funds. Since the commercial loans to real estate sectors are considered to be less stable, the default of these kind of commercial loans become one of the main contributor to the Asian Financial Crisis.

The banks' lending policy is pro-cyclical. Banking institutions are optimistic to the credit risk exposure of real estate related loans in the period of asset bubble booming. It is because banking sector has poor credit data or risk management skill. This 'disaster myopia' can be a major contributor to the build-up of asset price inflation and increases in banks' credit risk exposure.[29]

Indirect exposure to real estate risk is also crucial to banking institutions. For example, if a bank has lent heavily to non-bank financial intermediaries such as finance companies that engage in real estate lending, it may be taking on substantial additional exposure to the real estate.[30] Using real estate to collateralize of lending is another indirect exposure. When property price is high, real estate seems to be the safer form of collateral to finance other business project. Banks would assume that as the loans are well-collateralized, banks don't have to analysis the detail of the business project to be financed. This is particularly true in countries where accounting and disclosure standards are weak and the techniques of credit analysis and cash flow lending are not well established.[31] However, during downturn of real estate cycle, the value of property may be lower than the outstanding loan. This can greatly increase the default risk. Some of the loan which apparently lends to non real estate market, for example, to manufacturing factories, its

[29] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.
[30] Id.
[31] Id.

exposure was also to the real estate market, as a decrease in real estate market will affect those manufacturing industries, which in turn also affect the amortization of loan to the bank.

2.4 Real estate cycle and credit cycle

In the literature about finance, the interaction between the credit cycle and real estate cycle has been extensively explored in the 'financial accelerator' framework.[32] They have considered the situation where the credit market is imperfect due to asymmetric information between borrowers and lenders. In their model, borrowing conditions are determined by the net value of real estate assets (as collateral). High property price can improve credit availability for borrowers, hence boosting the demand for real estate assets and driving property prices even higher. On the other hand, declining property price would force the value of real estate assets lower. It also reduces the volume of bank loans as credit rationing intensifies.

Based on the above hypotheses of real estate cycles and credit cycle, Davis and Zhu (2004) have developed three dimensions of interaction between property prices and bank lending.[33] They are shown below:

1) Real estate price determine the amount of bank credit. From the borrowers' point of view, changes in real estate prices will have a large effect on their perceived wealth and borrowing capacity, including have to change their borrowing plans

[32] Kiyotaki, N. and Moore J., 1997.Credit cycles. *Journal of Political Economy*, vol 15, no 2, pp. 211-248

[33] Davis, P. and Zhu, H., 2004. Bank lending and commercial property cycles: some cross-country evidence. *BIS Working Papers*, no 150.

and credit demand (given probable costs of bankruptcy when net worth becomes negative). However, the low liquidity and price volatility of property should induce caution among borrowers in taking full account of property price rises.

From the banks' point of view, banks have been involved in real estate markets not only directly by owning properties and extending real estate loans, but also indirectly by providing loans that are collateralized by real estate assets. Lending to property and construction firms alone is one of the most pro-cyclical and volatile elements of banks' provision.[34] Accordingly, after adding these mechanisms together, changes in property prices will have major impacts on banks' asset quality and the value of bank capital, and thus affect banks' lending capacity. The above mechanism supports that real estate and credit cycles are strongly linked with each other. Such relationship will be activated by capital inflows intermediated by domestic banks, as in East Asia in the 1997, as well as poor regulation.[35]

2) Changes in credit availability and lending attitudes have a sizeable impact on the demand for real estate and investment decisions on new construction, which will ultimately lead to changes in property prices. It has been widely documented that floods of capital seeking investment opportunities and the 'industrial' competition among financial institutions after financial deregulation helped to stimulate the building frenzy phenomenon in a number of countries in the 1980s and 1990s. Following the same concept, Krugman (1998) and Renaud (1998) have

[34] Davis, E. P., 1993. Bank credit risk. *Bank of England Working Paper Series*, no 8, April

[35] Collyns, C. and Senhadji, A., 2002. Lending booms, real estate bubbles and the Asia crisis, *IMF Working Paper*, WP/02/20

emphasized that the moral hazard problem caused by the safety net is the key to understand the asset price bubbles and subsequent banking crises in East Asian countries.[36] Hargraves et al (1993) has noted in addition that liberalization tends to drive the higher-quality corporate borrowers to the bond market and depositors to money funds, thus leading banks to take excessive risks to re-establish margins.[37]

3) Credit and property cycles can be driven by common economic factors. Besides, credit cycle behavior is largely determined by economic conditions and prospects (notably GDP and interest rates). On the other hand, the state of economic activity also exerts important impact on the commercial property market.

Changes in the business environment will cause demand and supply imbalances in commercial property and create variations in real estate investments and prices. These external shocks can arise from the demand side, such as changes in income, interest rates and demographic factors; or they can arise from the supply side, such as labour and construction costs as well as changes in restrictions enhancing the availability of credit or land for.[38]

Increase in the price of real estate may increase both the value of bank capital, to the extent that banks own real estate, and increase the value of real estate collateral, leading

[36] Krugman, P., 1998. What happened in Asia?, December, available at www.web.mit.edu/krugman
Renaud, B., 1998. Property cycles and banking crises: what have we learned? Conference paper at the 7th IPD investment strategies conference, Brighton, United Kingdom

[37] Hargraves, M., Schinasi G. and Weisbrod S., 1993. Asset price inflation in the 1980s – a flow of funds perspective. *IMF Working Paper*, WP/93/77

[38] Dokko, Y., Destin, R., lacy, A. and Lee, D., 1999. Real estate income and value cycles: a model of market dynamics. *Journal of Real Estate Research*, 18(1), pp. 69-95

to a downward revision of the perceived risk of real estate lending.[39] Consequently, an increase in real estate prices may increase the supply of credit to the real estate industry, which further increases the price of real estate. These feedback effects go reversely when real estate prices start to decline. A decline in the price of real estate decreases bank capital directly by reducing the value of banks' own real estate asset and indirectly by reducing the value of loans collateralized by real estate (the precise effect depends on country-specific accounting standards). Furthermore, a decline in real estate prices lending would give a further decrease on real estate prices, which in turn feedback to bank lending. As the banking sector weakens, banking supervision and regulation may increase capital requirements and impose stricter rules for classifying and provisioning against real estate loans, squeezing lending to real estate investors even further.

[39] Herring, R. and Wachter, S.,1999. *Real Estate Booms and Banking Busts: An International Perspective. Washington*, DC: Group of Thirty, occasional paper, no 58.

CHAPTER 3

CREDIT RATINGS

3.1 Introduction

Credit ratings are a judgmental process of ranking and classifying credits into different levels of risk categories.[40] Different levels of the ratings represent different ability and willingness of a company being rated. Credit rating is also a future predicting process because it tries to find out the future default probability of the firm being rated. Depending on the frequency of the rating updates, the ultimate goal of the credit rating process is to attempt an educated forecast of the potential loss (as quantified by the expected loss) as the credit deteriorates over the life of the structure until its ultimate demise or default.[41] Thus, this is a process using current data to project the possible future result.

Why is it necessary for the commercial organizations to rate its credits? It seems that it is not an easy task to rate credits, as credit ratings are more like subjective opinions rather than objective facts. Nowadays, the application of credit ratings is quite wide, apart from corporate debt and bank loans. Credit ratings can also be used to rank mortgages, personal loans and even credit card. Since different types of assets have different properties, it is impossible to use one standard to rank all of them. Then how should we rate different asset type? And how can the credits are rated?

[40] Ong, M.K., 2002. *Credit ratings: methodologies, rationale and default risk.* London: Risk Books.
[41] Id.

Credit rating has become a global hot topic in the past few years. The main reasons behind, according to Michael (2003), was the outbreak of disturbing credit events that alerted the public the significant role played by credit rating.[42] Among the events, the issue of Enron Corporation was the most popular one. The issue of Enron Corporation has launched a crisis of confidence.

Enron Corporation was the nations' leading energy trading company. It was much loved by Wall Street. However, its loose accounting caused it to restate earnings and slash the value of its shareholder equity in the weeks that led up to a bankruptcy filing in December 2001. Thousands of Enron employees lost their jobs and much of their life savings, and investors lost billions of dollars. It was accused that fraudulent accounting deals by high-ranking executive was the main fault. Since then, the US government has done many remedies to prevent the further 'Enron' case. This case has also alerted the investors the importance of ethical corporate practice. There was a crisis of confidence spilled globally to the corporation, mainly focused on proper accounting practices and corporate management. The crisis has also extended to banks' practice in the extension and structuring practice. The public started to fight for clarity and transparence of the transactions of the corporation and also concern on the rating agencies' opinion and the methodology behind. Overall speaking, the alertness of crisis was increased and the need for credit ratings was reinforced.

Due to the outbreak of the new Bank for International Settlement (BIS) capital requirements, where it states that banks that have a sound internal rating system will be allowed a lower amount of capital against loans issued to borrows, credit rating is growing more and more essential. Since the occurrence of the new Basel Accord

[42] Ong, M.K., 2002. *Credit ratings: methodologies, rationale and default risk*. London: Risk Books

proposals on credit risk capital, which is also called Basel II, the importance of credit rating is pushed to a crest. International backs and financial institutions have modified existing internal credit risk systems to better systems that are more compatible with Basel II. One of the focuses of Basel II is the use of both internal and external credit ratings as an indicator to monitor the credit risk of capital adequacy.

The normal practice of determining credit ratings is to get a balance between quantitative analysis and qualitative analysis. Quantitative analysis includes ratio analysis, cash flow analysis, industry analysis etc. while qualitative analysis includes financial strength assessment, management and corporate governance etc.

I will first examine the rating practice of the external rating agencies. There are two famous international rating agencies named Moody's and Standard & Poor's. Since the practice used by them on credit rating is similar, I have investigated one of them: S&P to show the rating process. Then the relationship of Basel II accord and credit rating will be examined. Finally the role of real estate on credit rating will be investigated. It is discovered that there are a close relationship among credit rating, companies' performance and real estate cycle.

3.2 S&P

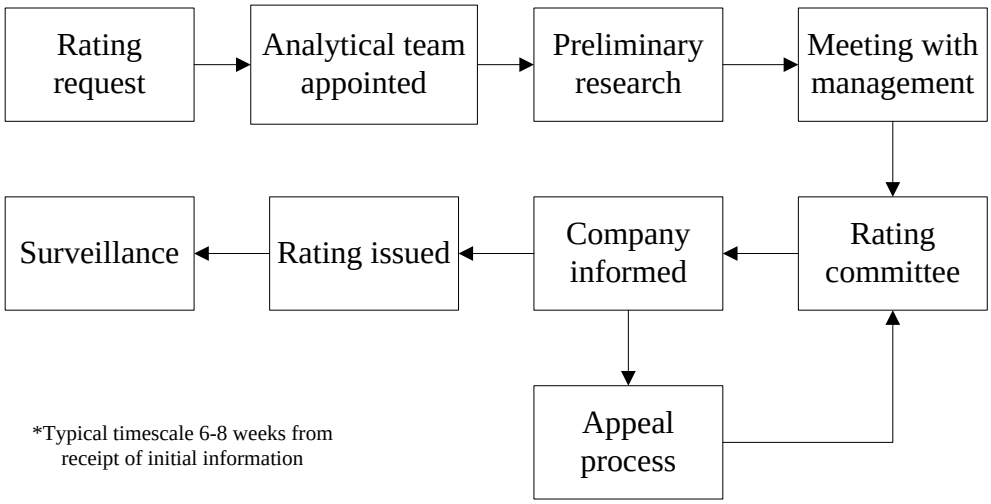
Among the credit ratings agencies, Standard and Poor's (S&P) is one of the most authoritative. It was founded in 1860 and is the leading credit rating services

organization.[43] It is independent from any governments and any other commercial or non-commercial organizations, so its view is considered as fair and full. Apart from credit ratings, it also provides publishing service of finance information and also research service about the publicly issued debt obligations. Its recognition is built up by the willingness of the public to accept its judgment.

3.2.1 Rating Process

Figure 4.1 shows the whole rating process of S&P. The detail of each step will be described below. There are mainly six procedures and one committee involved. They are rating request, meeting with management, rating committee, appeal process, rating issued, surveillance and rating change.

Figure 3.1 S&P Rating Process



Source: S&P[44]

[43] Dinwoodie, C.M., 2003. The A to Z of Standard and Poor's Ratings. *Credit ratings: methodologies, rationale and default risk*. London: Risk Books.
[44] Id.

Rating Request

S&P starts work after the corporation approach and make such a request. Then S&P will assign expertise who are the most relevant to that industry and form a team. That team will seek co-operation from the corporation and to evaluate the performance of the corporation.

Meeting with manager

After that, a meeting with corporate manager will be held to examine the details of the credit factor of the company that will affect the rating, like the company's key operating and financial plans, management policies etc. The management meetings are essential to achieve an assessment according to the company's circumstances and prospects. It is the responsibility of the company to submit its relevant background information, which includes:

1) Five years of audited annual financial statements
2) The last several interim financial statements
3) Narrative descriptions of operations and products
4) If available, a draft registration statement, offering memorandum, or equivalent
5) Relevant industry information
6) Written presentations by management

While item 6 is optional, it has its value by providing a solid framework for discussion. The information provided in this meeting is strictly confidential.

Rating Committee

After the meeting with management, a rating committee with 5 to 7 members will be formed. Then they will try to rate the corporation in that industry by both financial and strategic perspectives, while they will focus on its future rather than the past. The nature of the business and its operating environment, the company's strategic and financial management will be analyzed. After the financial analysis, a rating recommendation will be given in a presentation. The presentation is made to the rating committee, after having received the appropriate financial statistics and comparative analysis.

Appeal Process

After determining the initial rating, the corporation will be notified the result and is given a chance to appeal once they are not too satisfied with the rating. The corporation can provide new and additional data which are relevant to the rating process before S&P finalize the rating and publish the rating.

Surveillance

After publishing the credit rating, it is monitored at least annually by holding routine management meetings, where the analysts would be informed by the updated development of the company. Performance of business units that are out of expectations will be discussed. Then the future plans will be appraised again and amended accordingly.

As long as the company's actions are consistent with its plan and mission, management credibility is achieved.

Rating Changes

The rating should be adjusted if the conditions that will affect the credit rating of the company changes. The process is the similar to the first rating process. The analysts take a preliminary review, evaluate the matter and give a decision on rating and then notify the corporation.

3.3 Basel II Accord and credit rating

The use of credit ratings is becoming more and more widespread both in capital markets and in banks. Banks make use of credit ratings to improve risk management. Due to the outbreak of the new Bank for International Settlement (BIS) capital requirements, where it states that banks that have a sound internal rating system will be allowed a lower amount of capital against loans issued to borrows, credit rating is growing more and more essential. Since the occurrence of the new Basel Accord proposals on credit risk capital, which is also called Basel II, the importance of credit rating is pushed to a crest. International backs and financial institutions have modified existing internal credit risk systems to better systems that are more compatible with Basel II.[45]

[45] Altman, E.I., 2002. Rrevisiting credit scoring models in a Basel II Environment. *Credit ratings: methodologies, rationale and default risk*. London: Risk Books.

3.3.1 Introduction of Basel II

The objective of Basel II is to regulate the capital that banks require to hold to counteract the risks of loans they have lent. The standards were set by banks and their supervisor and were agreed by the Group of Ten (G10) banking supervisors operating under the aegis of Basel Committee on Banking Supervision.[46] The agreement consists of the definition of regulatory capital and the method to evaluate the adequacy of capital of banks.

Originally, Basel II is for use in the G10 countries. Nevertheless, it becomes adopted by international as a standard for assessing bank's minimum regulatory capital. Besides banks, it has been used by rating agencies and market analysts to measure the bank strength.

The reform proposals were released in 1999, where most of the parts were accepted by banks well, except the part which is controversial, at where it despite the fact that some banks have used internal credit ratings in credit risk assessment and modeling processes.[47]

Generally speaking, Basel II is revolutionary. They proposed the use of three-dimensional framework based on three pillars instead of the old one-dimensional quantitative capital framework:[48]

[46] Matthews, B.C., 2002, Regulatory use of credit ratings: implications for banks, supervisors and markets. *Credit ratings: methodologies, rationale and default risk*. London: Risk Books.
[47] Id.
[48] Id.

1) Pillar One would set quantitative requirements that cover credit risk and operational risk.
2) Pillar Two would adjust the minimum quantitative requirements based on supervision.
3) Pillar Three would require banks to increase their transparency through specific disclosures.

Besides, the regulatory capital framework would recognize a broader range of collateral types beyond guarantees and mortgages, establish incentives for backs to lend on a secure basis and present changes to the treatment of off-balance-sheet exposures. The difference between the old one and new one are shown as in **Table 3.1 and Table 3.2**.

Table 3.1 Existing Risk Weights (1988 Basel accord)

Existing Risk Weights (1988 Basel accord)	
OECD sovereigns	0%
OECD sovereigns: local funded, local currency	0%
Multilateral development banks	20%
OECD-based banks	20%
Non-OECD sovereigns: local funded, local currency	20%
Non-OECD-based banks maturity < 364 days maturity > 364 days	 20% 100%
Residual mortgages	50%
Private sector obligators	100%

Source: Basel Capital Accord[49]

[49] Basel Committee on Banking Supervision, 2001, *The standardized approach to credit risk*, January

Table 3.2 Proposed Risk Weights

Proposed Risk Weights					
Ratings		Corporate	Sovereigns	Banks maturity > 3 months	Banks maturity < 3 months
Maximum	Minimum	(%)	(%)	(%)	(%)
AAA	AA-	20	0	20	20
A+	A-	50	20	50	20
BBB+	BB-	100	50	50	20
BB+	B-	-	100	100	50
Below BB-		150	150	150	150
Unrated		100	100	50	20

Source: Basel Committee[50]

3.3.2 Approach to determine credit risk

The Basel Committee has listed some means to make the capital requirements more risk-sensitive in the Basel II., which includes:[51]

1. the use of the output from bank's own internal credit risk models
2. the use of external credit ratings
3. the use of banks' internal rating systems to assign credits to risk buckets

In Basel II, there are 2 alternatives to determine the regulatory capital for credit risk, one is called 'standardized approach', which is intended to apply in banks of low-complexity, and the other one is called internal-ratings based approach, which is intended to apply in banks of high complexity.

[50] Basel Committee on Banking Supervision, 2001, *The standardized approach to credit risk*, January
[51] Id.

Standardized Approach

It is a risk-bucketing approach which only slightly differs from the current accord in respect to adding a few more risk buckets with a wider array of risk weights.[52] The main difference between the new and old means is that, the standardized approach allows banks to use external credit ratings to assign commercial credit to the varying risk buckets, as long as it is possible. As the standardized approach is only slightly different from the current Accord, it is mainly intended for use by smaller and less sophisticated banks.

Internal Ratings-Based (IRB) Approach

Although BIS II hadn't set up the detail and standard format for the IRB approach, it has published the elements needed of that approach. Therefore some examples having these elements used for credit ratings are shown as follows:[53]

1) Fundamental analysis

The traditional practice of determining credit ratings and credit worthiness is to get a subjective balance between quantitative analysis and qualitative analysis. Quantitative analysis includes ratio analysis, cash flow analysis, industry analysis etc. while qualitative analysis includes financial strength assessment, management and corporate governance etc.

[52] Brown, J.A., 2002. Regulatory Capital Based on Banking Internal Ratings of Credit risk. *Credit ratings: methodologies, rationale and default risk*. London: Risk Books.
[53] Prybylski, L., 2000, 'Credit Risk—Credit cannot rest on Tradition,' *The RMA Journal*, November

2) Statistic analysis

Logistics regression, discriminant analysis and neural networks are three types of statistical analysis that are commonly used.

Logistics regression is used for binary random variable, that is, good credit and bad credit, and is used to determine the relationship between independent input variables and the resulting credit state. It allows a non-linear relationship between the input variables and the resulting credit state. That means when the input variables reach extreme values, the probability of bad credits increases in a non-linear way.

Discriminant analysis is a regression approach. It assumes that the regressors are normally distributed which means the output of the analysis is either good credit or bad credit as in logistics regressions.

Neural networks are artificial intelligence systems. They are designed to imitate human's actions. They are used as credit risk modeling by using credit inputs as variables that are weighted through a learning process and to create an algorithm which can determine the output. The output is whether the counterpart is a good or bad credit. The neutral networks model complex non-linear relationships and interdependencies among the variables.

3) Market-based models

Market-based models are mainly used for internal ratings nowadays. There are 2 models, namely Merton model and Jarrow, Lando and Turnball model. The Merton family of models represents a company's equity as a call option on its assets, where the exercise price is equal to the face value of the firm's debt and a maturity equal to the term of the debt. The firm's liabilities are used to determine the default point. The firm's PD is based upon the difference between the company's equity value at a specified time horizon and the default point. Alternatively, the Jarrow, Lando and Turnbull model utilize corporate bond credit spreads to imply a PD for corporate borrowers.

3.3.3 Elements of sound banking internal rating system

It is not easy to give an accurate definition of a good internal rating system. The Basel II committee is still working on this concept. Nevertheless, a sound internal rating system should consist of the following:[54]

1) Internal rating systems must demonstrate the appropriate level of granularity for the type of business the institution participates in and how the systems is being used. For example, if a company needs to know only if its suppliers are solvent and likely to be able to fill orders on a timely basis, a system with only a few gradations is probably sufficient. However, if a bank uses the system to make pricing decisions, then a finer system in credit rating is necessary.

[54] Basel Committee, 2002, "Range of Practice in Banks' Internal rating system", *Bank of Internal Settlements*, January.

2) Obligator and facility ratings should be separated, which means the assessment of the credit rating of the obligor and that of the specific undertaken transactions are separated. The transactions can only mitigate the risk of doing business with a specific obligor to a limited extent, but not completely eliminate the risk.

3) Consistently used of the system is essential. This can be achieved by well documentation of the system and sufficient staff training about the system. As the society is constantly changing, flexibility for a mix of quantitative and qualitative assessment of risk should be allowed in credit rating system within a well-defined framework. Besides a general credit methodology, an industry-specific methodology should also be provided since different industries have different nature and 1 general methodology is not appropriate to apply in all fields.

4) A sound system should track historical default and loss experience and this information should be used for periodic back-testing of the system to ensure that the current default and recovery experience for companies in a particular rating category is similar to those rated in the same category in the past.

3.3.4 Reconciling a bank's internal ratings with external agencies' ratings

Though internal rating systems are used by nearly all banks, it is not convincing outside the organization due to the image of lack of transparency. Therefore, a common language should be used due to:[55]

[55] Basel Committee, 2002, "Range of Practice in Banks' Internal rating system", Bank of Internal Settlements, January.

1) Institutions need a method of conveying the quality of their portfolio to interested third parties such as investors and regulators.

2) Some sort of standardization or common scale allows institutions to benchmark the quality of their portfolio against that of their competitors.

3) A common scale facilitates integration within the rapidly consolidating financial services industry.

Most banks have standards on how to transform their internal rating scale to external rating agency scales. They may be based on analysis, judgment or experience. They are often based on forming from applying a narrow experience to an overall portfolio. A more rigorous approach that incorporates both quantitative and qualitative techniques allows:[56]

1) increased transparency for shareholders, board members and regulators

2) identification of the strengths and weaknesses of the internal rating system

3) use of external sources of default and ratings performance data to supplement and contrast probabilities of default to the internal ratings

[56] Prybylski, L., 2000, 'Credit Risk—Credit cannot rest on Tradition,' *The RMA Journal*, November

Mapping is a key to analyze the effectiveness of an internal rating system. If ratings do not map strictly for a specific book of business, rating category, sector or geographical region, problem will arise from varieties in perspectives, methodology or execution.

Banks that would like to use IRB approach under Basel II have to assign default probabilities to their internal ratings. If internal ratings can be successfully mapped to external ratings, external ratings can assist the internal ratings when assigning default probabilities.

Mapping approaches

A multi-step process is used by S&P to set up an effective mapping between banks' internal ratings and external agencies' ratings:[57]

1) To map a bank's internal rating scale to S&P scale, a primary quantitative approach, which is used to compare a large set of commonly rated entities, is to be applied. For instance, if a bank uses a scoring system of 1-10, a statistically significant number of S&P ratings for each of the bank's 10 rating categories should be possessed. On the other hand, if for instance the bank has 100 obligators scored as 3, but only 1 has a S&P rating, then a mapping exercise would not be feasible without additional work like credit estimates on the underlying assets. The minimum number of S&P ratings that should be present within an institution's scoring system depends on the portfolio population and the dispersion of S&P ratings within the same internal scoring system. S&P co-

[57] Prybylski, L., 2000, 'Credit Risk—Credit cannot rest on Tradition,' *The RMA Journal*, November

operate with the bank to analyze the portfolio and establish if there is a statistically significant number of S&P ratings present to map the portfolio.

2) In reality, there may be cause that the existing set is not large enough or not well distributed enough to permit a mapping with an appropriate degree of confidence. Then, it is a must to increase the number of commonly-related entities by selecting a representative sample of companies in the portfolio and providing an estimate of the credit quality of each entity in the sample according to the rating agency's scale. Even when the sample of commonly-related entities is large enough, it is better to prepare also credit estimates of non-related entities, as the public ratings may be suitable to internal rating process and bias a mapping based only on commonly-related entities.

3.4 The interaction between credit ratings and banking institutions

The purpose of this section is to analyze the effect of change of credit rating on the performance of banking institutions. Seven banks are chosen to study their relationship. The credit ratings of the Financial Strength of banking institutions are measured by Moody's Rating. The bank performance was measured by their total asset, profit before tax, capital adequacy ratio, liquidity ratio and provisions for bad and doubtful debts. Each of these variables are compare with the change of credit rating by a table. In order to analyze them more easily, all data are transferred into average one so as to show their relationship. The results are shown as follows:[58]

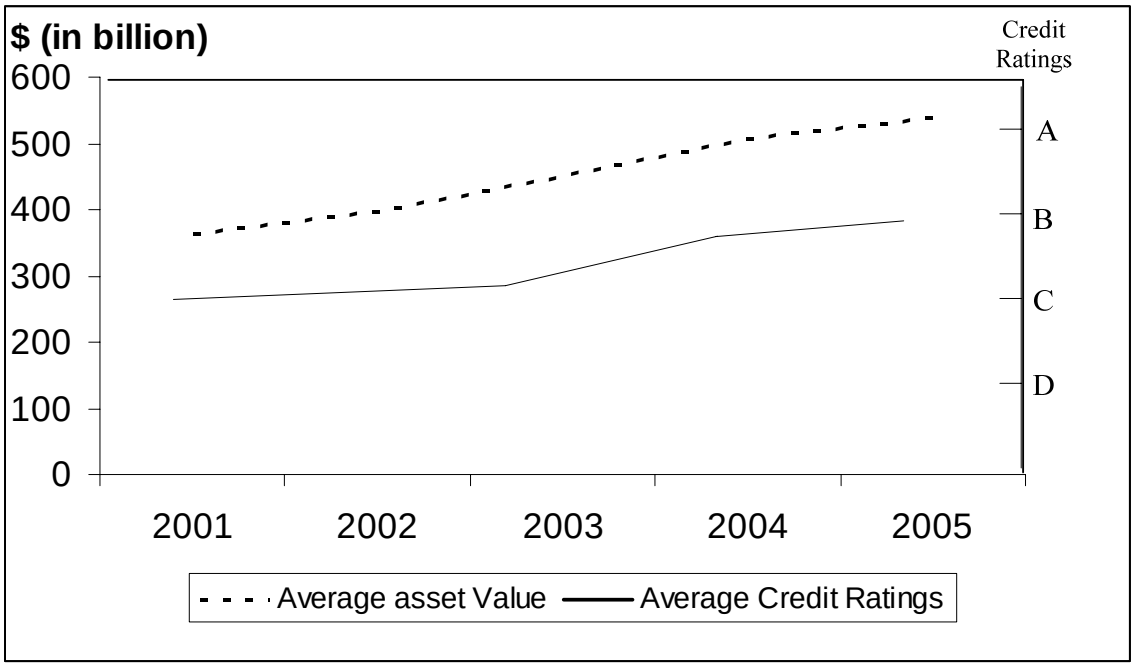
[58] Annual Report of Banks include The HSBC Group, Hang Seng Bank Ltd., Bank of East Asia Ltd., Wing Hang Bank Ltd., CITIC Ka Wah Bank Ltd., Nanyang Commercial Bank & Dah Sing Bank Ltd.

Table 3.3 Credit ratings and Asset value

	2001		2002	2003		2004	2005	
	Credit Ratings[59]	Asset Value[60]	Asset Value	Credit Ratings	Asset Value	Asset Value	Credit Ratings	Asset Value
Nanyang Commercial bank	C	20	73	C	77	80	-	92
The Bank of East Asia	D+	181	185	C-	198	210	C	238
CITIC Ka Wah Bank	D	20	73	D+	77	80	-	84
Dah Sing Bank	D+	51	58	C-	60	70	-	72
Wing Hang Bank	D+	55	57	C-	88	95	C+	104
Hang Seng Bank	B	474	474	B	503	546	B	580
HSBC	B	1742	1867	B	2148	2459	B	-

Source: Various annual report of banks

Figure 3.2 Credit ratings and Asset value



Source: Various annual report of banks

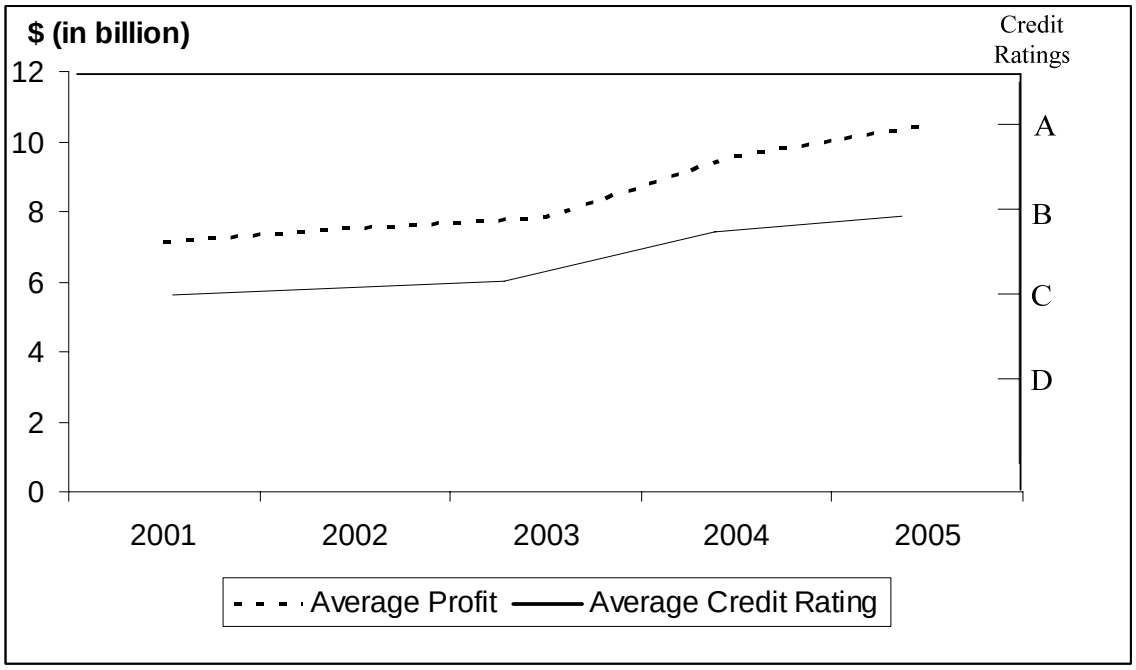
[59] Moody's Rating: Financial Strength
[60] HK$ (in billion)

Table 3.4 Credit Ratings and Profitability

	2001		2002	2003		2004	2005	
	Credit Ratings	Profit[61]	Profit	Credit Ratings	Profit	Profit	Credit Ratings	Profit
Nanyang Commercial bank	C	0.03	0.67	C	0.75	0.97	-	0.99
The Bank of East Asia	D+	1.9	5	C-	5.3	5.5	C	6
CITIC Ka Wah Bank	D	0.03	0.67	D+	0.76	0.5	-	0.77
Dah Sing Bank	D+	1	0.88	C-	1	0.64	-	0.53
Wing Hang Bank	D+	0.9	0.8	C-	1	1.4	C+	1.6
Hang Seng Bank	B	11.5	11.2	B	11.1	13.3	B	13.4
HSBC	B	34.6	33.6	B	34.8	45	B	-

Source: Various annual report of banks

Figure 3.3 Credit Ratings and Profitability



Source: Various annual report of banks

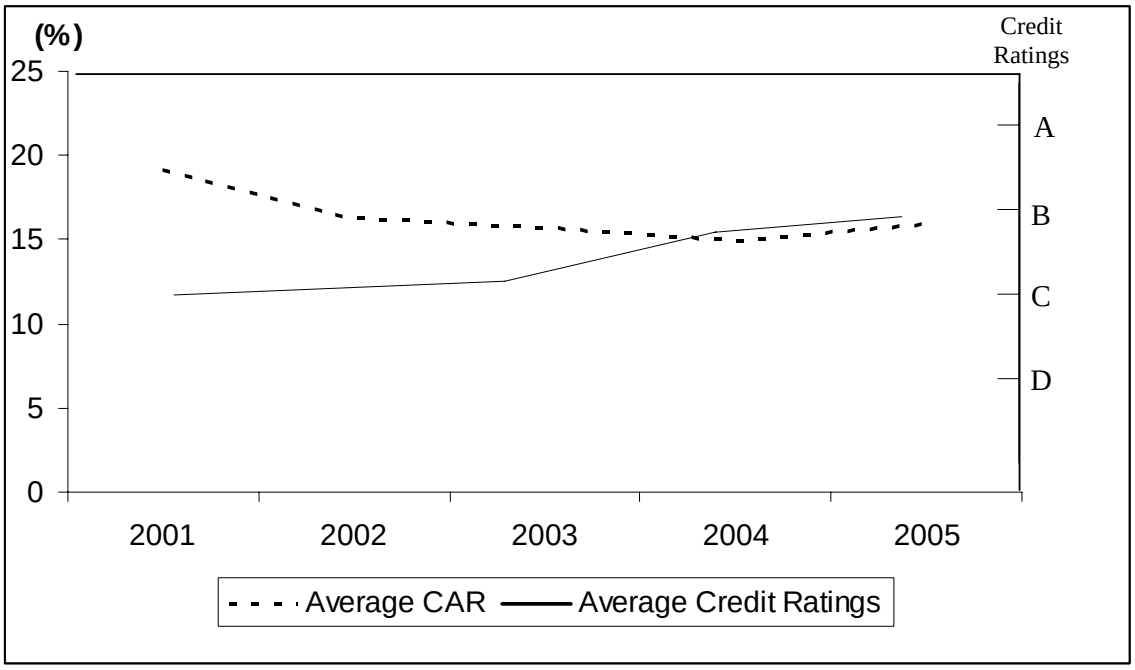
[61] Total Profit before tax , HK$ (in billion)

Table 3.5 Credit Ratings and Capital Adequacy Ratio

	2001		2002	2003		2004	2005	
	Credit Ratings	CAR[62] (%)	CAR (%)	Credit Ratings	CAR (%)	CAR (%)	Credit Ratings	CAR (%)
Nanyang Commercial bank	C	27.1	17.4	C	16.3	16.5	-	20.1
The Bank of East Asia	D+	17.5	16.9	C-	17.2	16.2	C	17.4
CITIC Ka Wah Bank	D	27.1	17.4	D+	16.3	16	-	16
Dah Sing Bank	D+	17.5	18.9	C-	19.4	16.5	-	18.5
Wing Hang Bank	D+	16.5	16.5	C-	15.7	15.7	C+	14.9
Hang Seng Bank	B	15.3	14.2	B	13.2	12	B	12.8
HSBC	B	13	12.7	B	12	11.9	B	-

Source: Various annual report of banks

Figure 3.4 Credit Ratings and Capital Adequacy Ratio



Source: Various annual report of banks

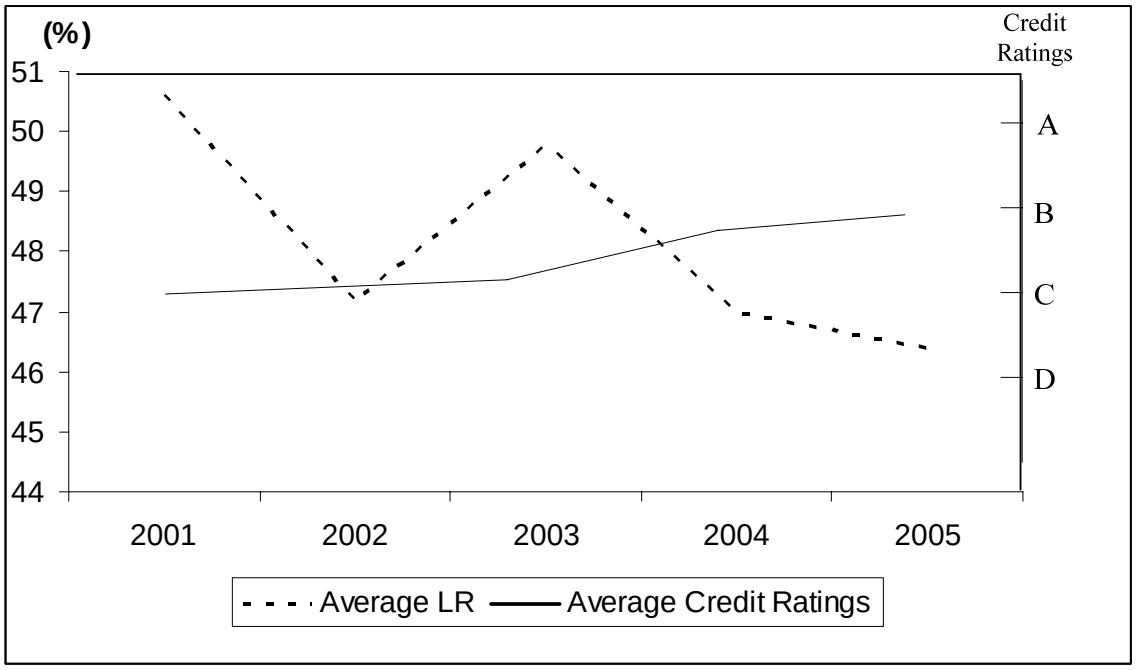
[62] Capital Adequacy Ratio (%)

Table 3.6 Credit Ratings and Liquidity Ratio

	2001		2002	2003		2004	2005	
	Credit Ratings	LR[63] (%)	LR (%)	Credit Ratings	LR (%)	LR (%)	Credit Ratings	LR (%)
Nanyang Commercial bank	C	58.8	47.1	C	49.2	47.9	-	49
The Bank of East Asia	D+	46.6	46.1	C-	44.8	44.4	C	39.3
CITIC Ka Wah Bank	D	58.8	47.1	D+	49.2	47	-	54
Dah Sing Bank	D+	45	52.1	C-	60.8	51.7	-	46.5
Wing Hang Bank	D+	45.3	42.4	C-	49	49.1	C+	50.8
Hang Seng Bank	B	45.6	44.4	B	46.2	47.2	B	45.1
HSBC	B	54.1	51.1	B	49	41.7	B	-

Source: Various annual report of banks

Figure 3.5 Credit Ratings and Liquidity Ratio



Source: Various annual report of banks

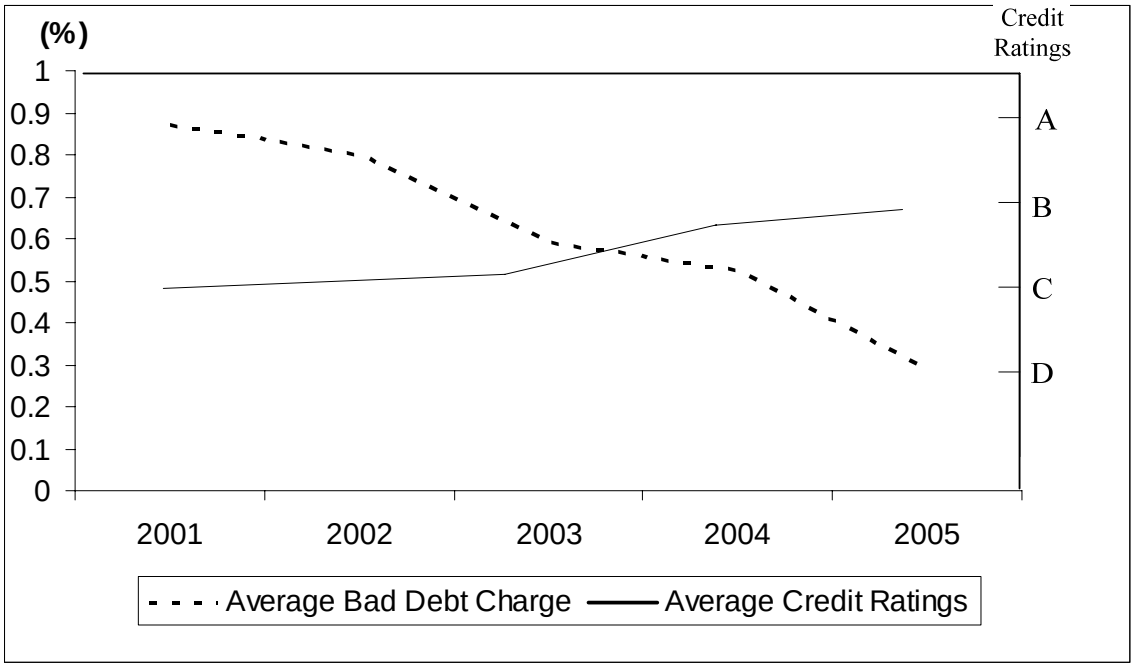
[63] Liquidity Ratio (%)

Table 3.7 Credit Ratings and Provisions for bad and doubtful debts

	2001		2002	2003		2004	2005	
	Credit Ratings	Bad Debts Charge[64] (%)	Bad Debts Charge (%)	Credit Ratings	Bad Debts Charge (%)	Bad Debts Charge (%)	Credit Ratings	Bad Debts Charge (%)
Nanyang Commercial bank	C	1.1	0.7	C	0.6	0.14	-	0.2
The Bank of East Asia	D+	0.23	0.43	C-	0.25	0.1	C	-
CITIC Ka Wah Bank	D	1.1	0.7	D+	0.6	0.06	-	0.1
Dah Sing Bank	D+	0.8	1.15	C-	0.82	1.9	-	0.36
Wing Hang Bank	D+	0.77	0.82	C-	0.37	0.57	C+	0.5
Hang Seng Bank	B	0.2	0.3	B	0.3	0.4	B	-
HSBC	B	1.9	1.5	B	1.2	0.5	B	-

Source: Various annual report of banks

Figure 3.6 Credit Ratings and Provisions for bad and doubtful debts



Source: Various annual report of banks

By concluding the above findings, it is found that the total asset value and profit of banking institutions increased with credit ratings in the last five years. However, capital

[64] Provisions for bad and doubtful debts (%)

adequacy ratio and provisions for bad and doubtful debts declined when the credit ratings increased in the last five years. For the liquidity ratio, it's performance was unpredictable when comparing with performance of credit ratings. As a result, it is found that the improvement of credit ratings can encourage the growth of total asset and profitability of the banking institutions. However, the more the capital adequacy ratio, the lower the credit ratings was. Also the asset quality of banking institutions would increase (bad debt decrease) with the improvement of credit ratings.

CHAPTER 4

BACKGROUND OF REAL ESTATE MARKET AND FINANCIAL CRISIS IN HONG KONG

4.1 Introduction

The recent Asian financial crisis has raised the concern for financial fragility, which precipitated the onset and spread of the crisis. The financial fragility of the economies affected by the crisis can be attributed to 4 major sources: currency mismatch and maturity mismatch in funding domestic investment, asset price inflation, and poor credit expansion.[65] In a typical case, an economy experiences rapid credit expansion associated with rapid growth, financial liberalization, and foreign capital inflow. In fact, the real estate market usually connected to the credit expansion by absorbing large amount of capital. In order to understand the special condition in Hong Kong, the real estate market would be introduced first. The rapid growth of real estate market in 1990s would also be then explained. The real estate related loans would then be discussed. Finally, the key of financial stability and the high land price policy would be analyzed.

4.2 Real estate market in Hong Kong

The transformation of Hong Kong from an export economy to an international center for financial and business services is the main reason for rapid growth in real estate demand. Residential real estate demand rose with population and income. Between 1973 and 1998, about 680,000 flats were built in the private housing market, equal to 72 percentage of

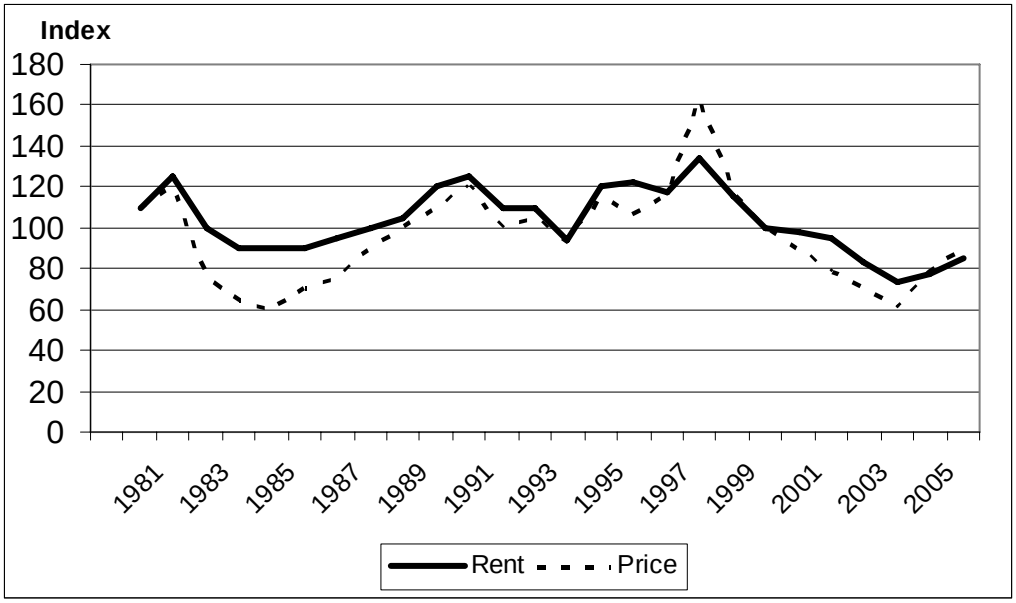
[65] Lane, T., 1999. The Asian Financial Crisis, What Have We Learned? *Finance and Development*, 36(3), pp. 44-47

total private housing stock at the end of 1998.[66]Demand for office or industry real estate was driven by the activities of different companies. The amount of office space, for example, increased from 1.4 million square meters to over 8.6 million square meters between 1975 and 1998.[67]The real estate sector played a prominent role in Hong Kong's economy. It contributes about 20% of the GDP (including income from ownership of premises, building construction, and real estate development and services), forms about 49% of domestic fixed capital formation, generates about 35 percent of government revenue, accounts for 30 to 45% of the capitalization of Hong Kong's stock market, and absorbs 48% of the institutional lending.[68]

The important position of real estate market was formed by substantial volatility in prices and rents. Figure **4.1** and **4.2** plots the price and rental indexes since the last quarter of 1979 in 2 real estate markets—residential, office.[69] The fluctuations of the index can show the situation of the real estate market. The difference between maximum and minimum in rent fluctuation was between 157% in the residential market and 266% in the office market.

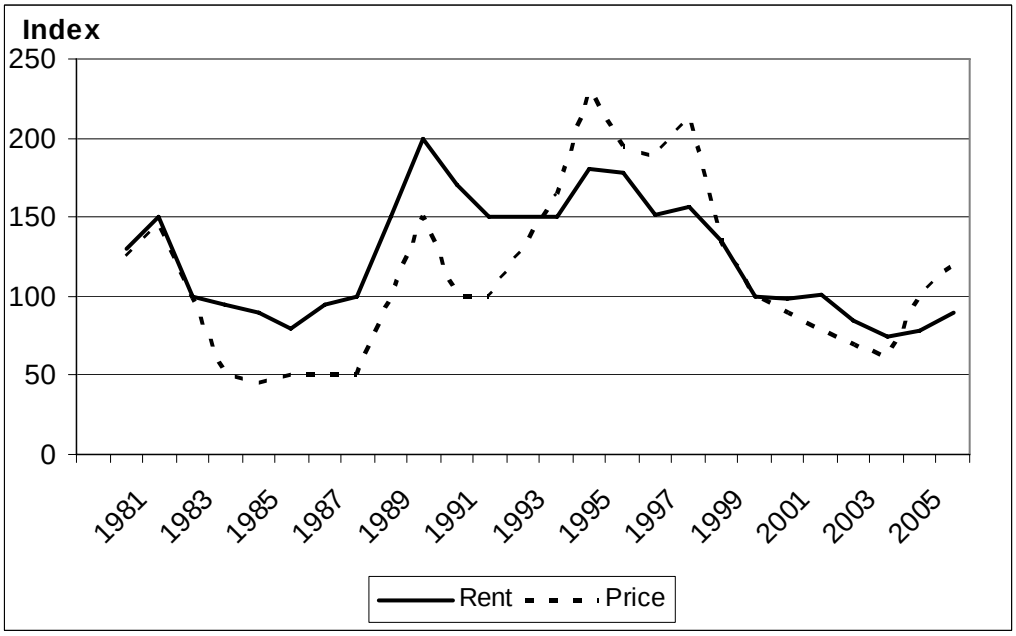
[66] Fu, Y., 2000. Hong Kong: Overcoming Financial Risks of Growing Real Estate Credit. *Asia's Financial Crisis and the Role of Real Estate*, London : M.E. Sharpe
[67] Id.
[68] Id.
[69] Rating and Valuation Department, 2005. Property Market Statistic. Hong Kong: Rating and Valuation Department. Available from: http://www.rvd.gov.hk/en/publications/pro-review.htm [Accessed 12 December 2005]

Figure 4.1 Domestic Rent and Buy index of Residential Property



Source: Rating and Valuation Department

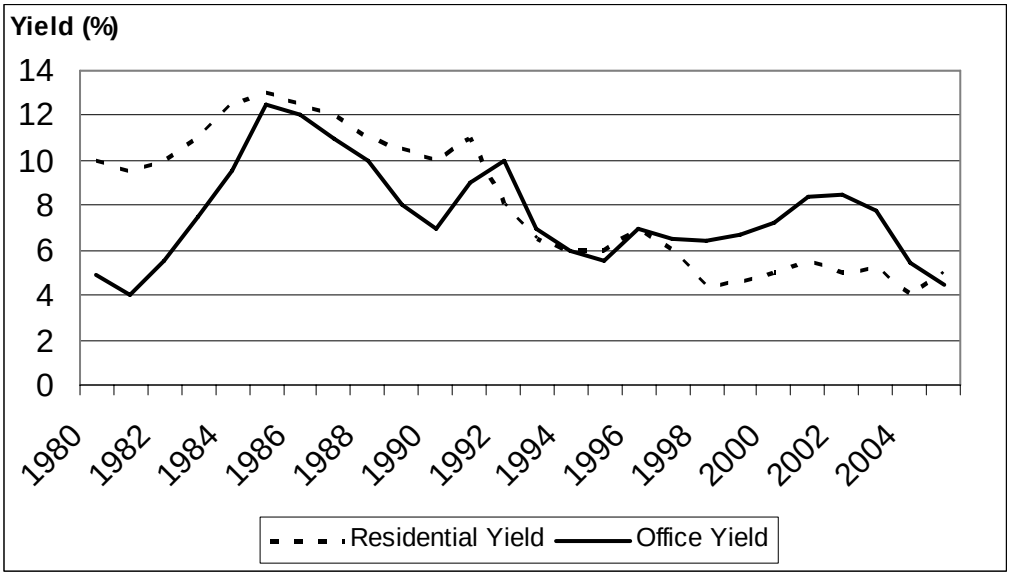
Figure 4.2 Domestic Rent and Buy index of Office Building



Source: Rating and Valuation Department

The causes of real estate price fluctuation can be classified into two groups:[70] (a) real economic activities influence the demand and supply of the real estate market and (b) financial conditions affecting asset valuation. Figures **4.1** and **4.2** expressed two major rent cycles in these markets. In the late 1980s and early 1990s, a boom was formed and it followed by a special pattern. The real estate price and rent reach another peak in 1997 and follows a decline to 2005. Figure **4.3** shows the similar pattern as above and it shows a sharply decrease in 2002.

Figure 4.3 Private Property Market Yield - Residential and Office



Source: Rating and Valuation Department

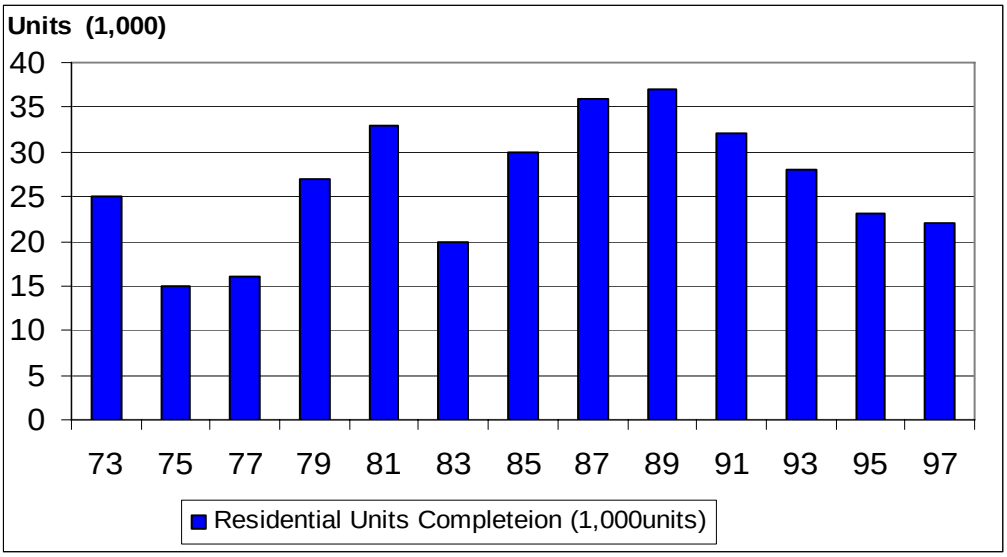
The first bubble, beginning in the end of 1980s, is marked by reduced but steady GDP growth led by consolidation in the manufacturing sector and rapid expansion in international finance and business services.[71] Office rent became higher shown that international finance was more and more significant in GDP of Hong Kong. The

[70] Fu, Y., 2000. Hong Kong: Overcoming Financial Risks of Growing Real Estate Credit. *Asia's Financial Crisis and the Role of Real Estate*, London : M.E. Sharpe

[71] Wong, K.Y., 1998. *Housing Market Bubbles and Currency Crisis: The Case of Thailand.* Working Paper, Department of Economics, University of Washington.

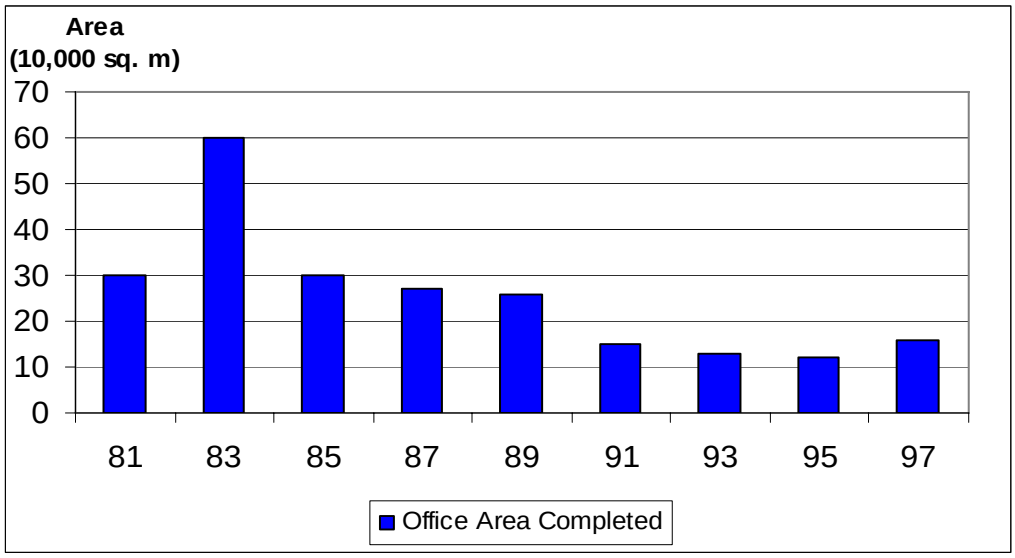
residential rents grow steady because of increasing in population and income. This bubble was end in 1989 when the political was instable in China. Due to the time lag of constructing a building, the supply of real estate market can not react to this rapid change in demand. Figures **4.4, 4.5, 4.6** showed the pattern of changes in demand and supply of office and residential market. The completed residential units reach a peak in 1989 and this over-supply further depreciated the real estate when the bubble bust in 1989.

Figure 4.4 Residential Units Completion



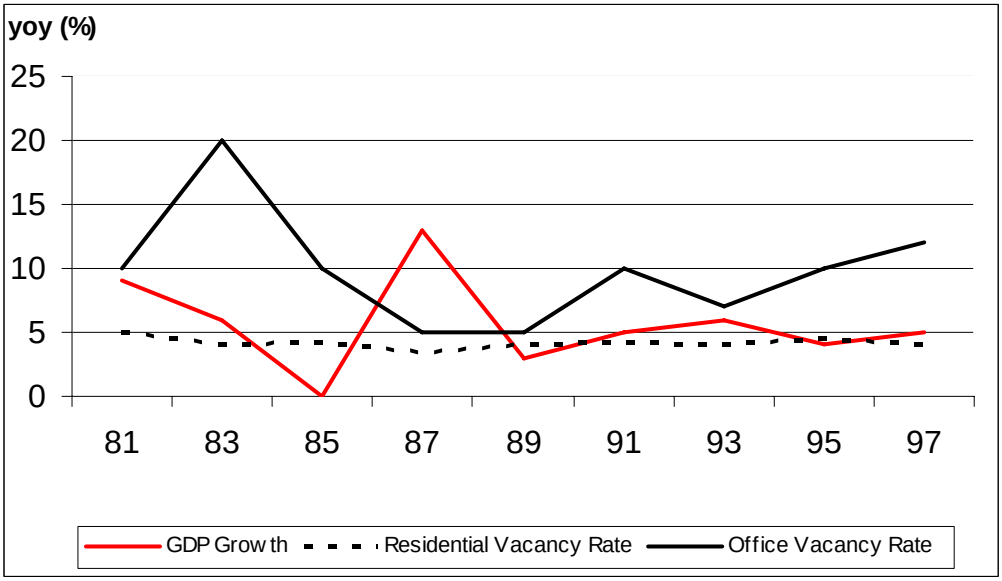
Source: Rating and Valuation Department

Figure 4.5 Office Area Completed



Source: Rating and Valuation Department

Figure 4.6 Economic and Real Estate Market Activities



Source: Rating and Valuation Department and Census and Statistics Department

The second bubble beginning in 1991 and end in 1997 named as Asian Financial Crisis. After 1990, the banking institutions financed a lot in the real estate sector. When the banking crisis was happened in Thailand, there was a strong reaction to the near by

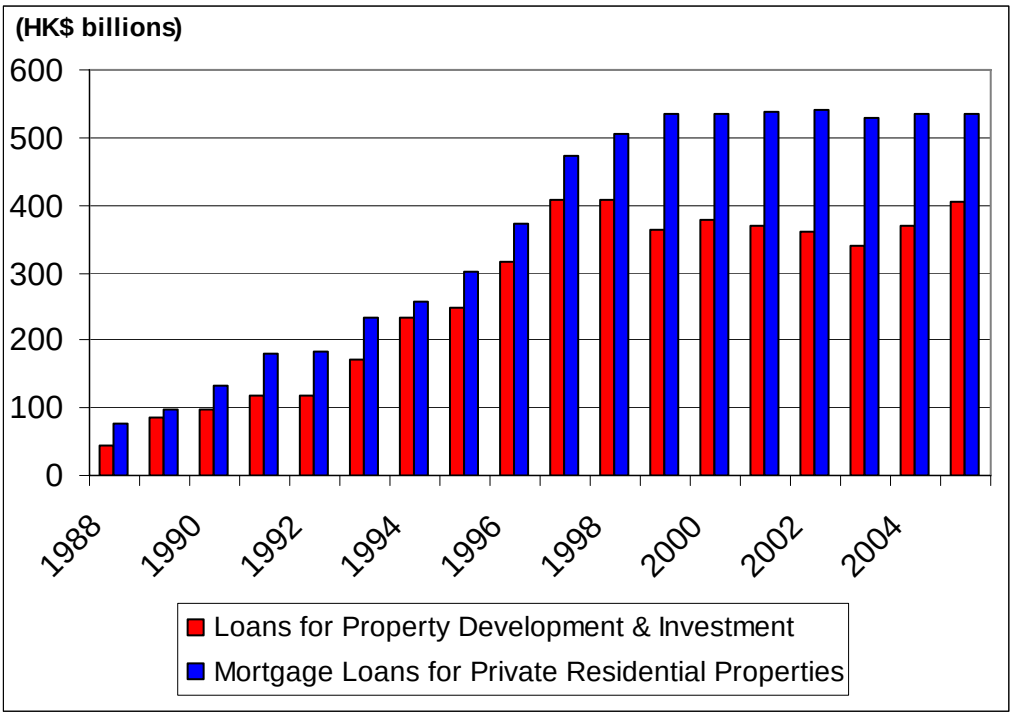
countries. Most of south Asian Counties suffered banking crisis including Hong Kong. After the price of stock was greatly decline, people lost confident to the future. As a result, the real estate market also collapsed. Figure **4.6** showed that the vacancy rate of residential and commercial building reach a peak in 1997. G.D.P. also in a bottom in 1997. Although the real estate market was recovering in the next 8 years, the real estate price still lower than in 1997.

4.3 The real estate related loans

Although the equity of homeowners and real estate firms provided the main source of capital for the real estate market boom in the 1990s, the depository institutions' exposure to the real estate sector rose rapidly since the end of the 1980s (see Figure **4.7**). In addition, the low financial leverage in the real estate sector, for both homeowners and real estate firms, greatly reduces the credit risk of real estate loans. Mortgage loan delinquency ratio, defined as loans overdue for more than ninety days as a percentage of total loan balance outstanding, was generally below 0.2 percent before the Asian financial crisis.[72] The drop in real estate price and economic recession following the Asian financial crisis did push the delinquency ratio to its peak of 1.16 % at the end of May 1999.[73]

[72] Hong Kong Monetary Authority, 1998. Survey of Residential Mortgages in Hong Kong. Hong Kong: Hong Kong Monetary Authority.
[73] Hong Kong Monetary Authority, 1999. Quarterly Bulletin. Hong Kong: Hong Kong Monetary Authority

Figure 4.7 Real Estate Related Loan



Source: HKMA

The delinquency ratio began to decline as the unemployment rate stabilized in June 1999. The mortgage delinquency ratio, however, was considerably lower than the delinquency ratio for all loans, which reached 6.01 % at the end of June 1999.[74] The lower credit risks in mortgage lending encouraged banks to continue to expand their mortgage loan portfolio during 1998 and 1999 even though the overall domestic lending shrank. Clearly, the generally stable credit quality of real estate loans contributed importantly to the confidence and liquidity in the banking sector as Hong Kong suffered the aftershocks of the Asian financial crisis.

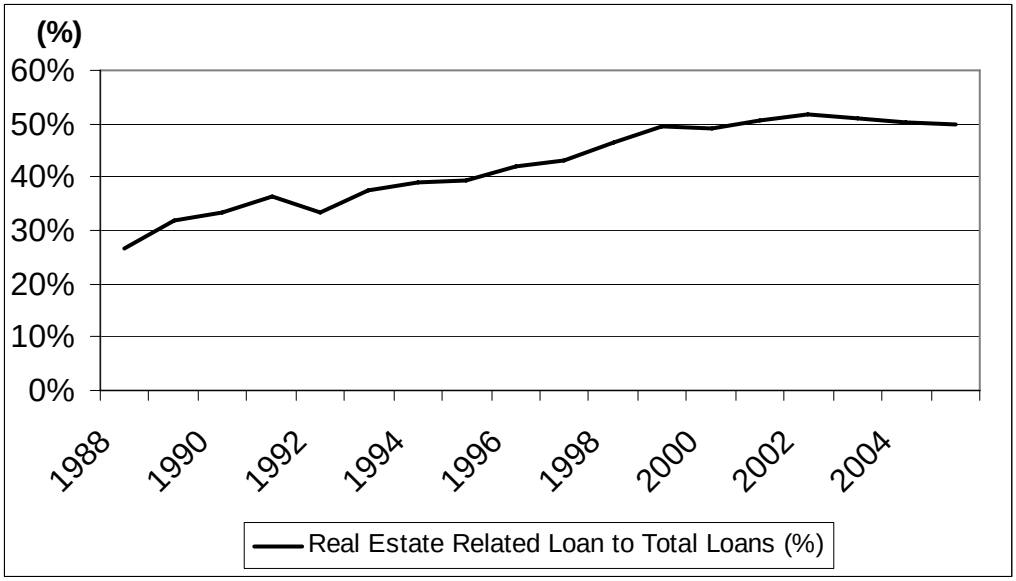
[74] Hong Kong Monetary Authority, 1999. Quarterly Bulletin. Hong Kong: Hong Kong Monetary Authority

In addition to the low financial leverage in the real estate sectors, relatively stable mortgage interest rates and move stable revenue cash flows for developers also contributed to the low credit risk of real estate loans during the latest real estate market downturn. During the recent Asian financial crisis, although borrowing rates fluctuated sharply, mortgage interest rates increased modestly and returned to below 10 % level in 1999. During real estate cycles in 1980s, developers' revenue cash flow depends heavily on sales of new building units and was very highly related to market downturns. In the Asian Financial Crisis, developers expanded their portfolio of investment properties so that their financial position became less vulnerable to sales slowdown.

Figure **4.7** exhibits the growth of real estate and non-real-estate credit over the past two decades. Figure **4.8** shows that real estate related loans accounted for 26 percent of total bank loans for use in Hong Kong in 1988; this share rose to 50% in 2004.[75] In the absence of a private debt market until recently, rising, rising demand for real estate credit became the main source of rapid money supply expansion in Hong Kong, especially during the 1990s.

[75] Hong Kong Monetary Authority, 1998. Quarterly Bulletin. Hong Kong: Hong Kong Monetary Authority

Figure 4.8 Real Estate Related Loan to total Loans



Source: HKMA

After 1997, the major source of credit risk for real estate loans was the fluctuation in interest rates. The high exposure of the real estate sector to interest rate risks is due to the reliance on authorized institutions for real estate related loan. Mortgage interest rates are typically linked to the best lending, with a spread of between 0 to 200 basis points over the best landing rate determined by conditions in the banking market. The shift of the interest-rate risk to homeowners would raise the credit risk in the real estate sector. The credit risk arising from potential interest rate shocks was increased during the period of rapid housing price inflation. Findings from a survey of residential mortgage lending by HKMA show that the average outstanding balance of the loans in banks' mortgage portfolio increased from HK $0.8 million in 1994 to HK $ 1.3million in 1997.[76] At the same time, the average contractual life of these mortgage loans increased from 183 months to 221 month. The increase in the contractual life suggests that borrowers have

[76] Hong Kong Monetary Authority, 1999. Quarterly Bulletin. Hong Kong: Hong Kong Monetary Authority

sought slower principle repayment to make the mortgage obligations affordable and, therefore, have become less tolerant to interest rate shocks.

4.4 The key of financial stability

Hong Kong is an international financial centre and is sensitive to external financial condition, distribution of different domestic credit is essential for financial stability. The phenomenon of short-tern liquidity difficulty caused by excessive lending of financial institutions lures the international speculative attacks its currency peg with US dollar. Luckily, Hong Kong government defended the currency peg on time to prevent the vicious cycle of capital outflow and credit deterioration due to the strong foreign exchange reserve position. Nevertheless, the short-run liquidity difficulty inflicted the severe damage to Hong Kong's economy and caused an economic contraction 1997 and 1998. [77]

The strengths of Hong Kong as an international financial centre are the string supervision of the authorized institutions and supervision policy. The HKMA is responsible to supervise the authorized institution in Hong Kong under the Banking Ordinance. It has provided guidelines on real estate lending and also monitored the real estate exposure levels. Before 1998, the lending guideline tried to maintain the total real estate exposure below 40% of total loans of each bank and the maximum loan-to-value ratio at prudent levels. [78]The maximum loan-to-value ration of financial institutions was decreased from around 88% in 1989 to 70% in the 1990s.[79] At the time of excessive speculation of

[77] Hong Kong Monetary Authority, 1999. Quarterly Bulletin. Hong Kong: Hong Kong Monetary Authority
[78] Id.
[79] Id.

residential property market, like those happened in 1993, 1994 and 1997, lenders reduced the maximum loan-to-value ratio to as low as 60%. To discourage loan application for speculative real estate investment, a penalty of 2-3% of the original loan amount would be imposed if the loan is fully repaid within 12 months. [80]

Lacking private debt market weakened the Hong Kong's financial stability since money supply had to expand more rapidly than GDP so as to support the increasing demand for real estate credit. Funding of real estate credit in terms of monetary was costly and risky as it required more foreign exchange reserve and capital reserve in banks.

4.5 High land price policy

High land price is a political policy. The government is the owner of all land in Hong Kong and land is allowed for private use only via 'Crown Leases'. The government controls the land use by the land use conditions specified in 'Crown Leases'. [81]Before 1970s, the Hong Kong government had not built much infrastructure in New Territories and north of Kowloon since New Territories will be returned to China in 1997. The Sino-British Joint Declaration of 1984 stated that there should only be 50 hectares of land released every year for private development and use until June 30 1997. [82]To generate great revenue, the government sold land in a high price and results in a large cumulative fiscal reserve.

80 Fu, Y., 2000. Hong Kong: Overcoming Financial Risks of Growing Real Estate Credit. Asia's Financial Crisis and the Role of Real Estate, London : M.E. Sharpe
[81] Id.
[82] Id.

Unfortunately, high land price policy could cause problem. Cost of funding real estate sector increased. Credit constraints for private homeownership also increased. Due to high land price policy, some citizens could not afford to purchases their premises and the need for public housing raised, and the government had to spend huge amount of expenditure to build and maintain public housing for the poor citizens. High land price policies also caused high and unsteady taxation on private sector, at which the taxation may be unfair and may distort resource allocation in the economy. [83]

The government once intended to shift the high land price policy. It tried to increase the private home-ownership rate of 70% by 2007 and this is announced during an announcement of long-term housing strategy in February 1998.[84] In the strategy, at least 85,000 units should be built every year. To achieve this, several measures are intended to carry out, like providing more land supply for housing development, spending more on infrastructure, shortening development procedures etc. A five-year land disposal program was published and it listed a total land supply of 690 hectares for housing development. [85]This policy was terminated in the same year due to the pressure from real estate developers as they considered this policy will destabilize housing price.

This reflects that the government does not have enough ability to regulate the housing price by controlling the land supply. The policy is good for increasing private home ownership rate and the one who still has not possessed any premises is benefited. On the

[83] Fu, Y., 2000. Hong Kong: Overcoming Financial Risks of Growing Real Estate Credit. Asia's Financial Crisis and the Role of Real Estate, London : M.E. Sharpe
[84] Hong Kong Monetary Authority, 2004. Survey of Residential Mortgages in Hong Kong. Hong Kong: Hong Kong Monetary Authority.
[85] Fu, Y., 2000. Hong Kong: Overcoming Financial Risks of Growing Real Estate Credit. Asia's Financial Crisis and the Role of Real Estate, London : M.E. Sharpe

other hand, this will hurt the existing homeowners due to lower land prices, which in turn affects the revenue of the government and also developers.

The ridiculous point is, that long-term housing strategy relies 60% of 85,000 housing units on public housing. [86]This indicates that the government was not aware the decline in land prices would be disastrous and may not be able to widen the home ownership in private housing sector.

HKMC

The Hong Kong government intended to develop a strong debt market and the Hong Kong Mortgage Corporation (HKMC) was established in March 1997 for this commitment. HKMC was aimed to provide a secondary mortgage market for the real estate sector. Its operations commenced in October 1997 and by June 1999, it has purchased over HK $10 Billion mortgage loans from its sellers. [87]The primary funding source for HKMC was debt insurance. HKMC was one of the most active corporate issuers in Hong Kong's debt market in October 1998. [88] It encouraged fixed-rate mortgages, which equals to 10% of HKMC's mortgage portfolio, by providing a ready secondary market for such loans for the approved sellers.

86

87

88 Fu, Y., 2000. Hong Kong: Overcoming Financial Risks of Growing Real Estate Credit. *Asia's Financial Crisis and the Role of Real Estate*, London : M.E. Sharpe

4.6 Conclusion

The economic growth of Hong Kong stimulates the demand of real estate market. Since Hong Kong is a small city, land supply is not enough. Also government carried out high land price policy for years. Thus, the real estate price in Hong Kong is relatively high when compared to other city. This chapter explains the growth of the latest two real estate bubble in Hong Kong. Then close relationship between real estate sector and banking institutions are described in terms of real estate related loan and the key of financial stability.

CHAPTER FIVE

HOW REAL ESTATE CYCLE RELATES TO BANKING INSTITUTIONS AND HENCE CREDIT RATINGS

This chapter is divided into four parts. The impact of real estate cycle on banking institutions will be described respectively. Discussion will be mainly focused on the recent data and the bankrupt cases of financial institutions. Having adoption of the theoretical framework from Chapter Two, the reasons of its impact will then be examined. After investigating the impact of real estate cycle on banking institutions and its relation to credit ratings in Chapter Four, the indirect relationship between real estate cycle and credit ratings will then be explained.

5.1 How real estate cycle affects the banking institutions

Generally, the increase in property price can stimulate the credit growth and vice versa. This section investigates the impact of the real estate cycle on the banking institutions. Two cases in Hong Kong will then be used to show its impact.

5.1.1 The impact

The Impact on profitability and asset quality

In HKSAR, banking institutions are the main financial resource of real estate related loan. Within the real estate related loan, mortgage is the most common way for home buyer to

purchase a property. In addition, construction contractors and property developers heavily rely on the credit supply by banking institutions. It is difficult to find a construction project without credit supply. Obviously, the bank lending attitude is crucial to the development of real estate sector. Besides, credit to real estate sector is also source of income to banking institutions. In fact, banking institutions are funding different economic sectors. Why do real estate sector become unique and more important than other sectors?

The reasons are that the demand of these loans is high and they are safer. Due to high land price policy, the real estate price in Hong Kong is relatively high when comparing with other international countries. As a result, it creates a unique phenomenon that huge cash flow is always needed during economic transaction within the sectors. For example, a home buyer want to buy a real estate and the price may be ten times or even twenty times of his annual income. It is impossible for him to buy the house with such huge cash flow, so he needs to borrow money from bank. Another example is that the contract sum of a project is usually of large proportion of the contractor or even more than its asset value. In order to finish the whole construction project, extra cash flow is needed where banking credit is the main source of financial funding. As the whole sector always require large amount of cash flow to support their economic transaction, its demand to bank credit is much larger than other economic sectors. Furthermore, the residential mortgage is said to be safer because banking institutions hold a real estate on hand as collateral. The value of real estate can cover the bad debt of the mortgage, unless property price is lower than the mortgage amount.

Bank credit is significant to real estate sector where real estate sector is also the main client of banking institutions. Real estate related loan has a heavy proportion of the asset portfolio of banking institutions. In 2005, 50% of total domestic loan is defined as real estate related loan. High percentage of property loan interpret that the interest income and the credit risk of banking institutions mainly depend on the performance of real estate market. Obviously, it is suggested that in the peak of the real estate cycle, the profitability of the banking institutions will increase with the property price. When the real estate market goes down to the bottom, the debt default ratio should also increase. The direct impact of real estate cycle on banking institutions can be proven easily. However, the impact on its operating system, management, accounting practice or its lending attitude is more difficult to prove.

There have been a number of studies on the determinants of bank profitability in Hong Kong, using both aggregate and bank-level data. Researchers find that declines in residential property prices, reduced economic growth, and persistent consumer price deflation have had significant impacts on banks' asset quality.[89] Another study suggest that the deterioration in banking institution's profitability in recent years was mainly attributable to the adverse macroeconomic environment in Hong Kong, particular the persistent deflation in general prices, which was in part due to declines in property prices as discussed above.[90] The collapse of the property 'bubble' has also put banks under distress due to the generally large exposure to property-related lending.[91] To conclude,

[89] Shu, C., 2002. The impact of Macroeconomic Environment on the asset quality of Hong Kong's Banking Sector, *HKMA Research Memorandum*, 12/2002.
[90] Jiang, G., Tang, N., Law, E. and Sze, A., 2003. Determinants of Bank Profitability in Hong Kong, *HKMA Research Memorandum*, 09/2003.
[91] Gerlach, S., Peng, W. and Shu, C., 2003. Macroeconomic Conditions and Banking Performance in Hong Kong: A Panel data Study, Autumn Central Bank Economists' Meeting at the BIS on 9-10 October 2003.

most of the researchers do agree that real estate cycle do have an impact on the profit and asset quality of the banking institutions.

Table 5.1 Profitability of the Retail Banking and Residential Property Price

	1997	1998	1999	2000	2001	2002
Operating profit before tax (% of total assets)	1.6	1	1	1.3	1.15	1.25
Residential property price indices	163	117	100	89	78	70

Source: HKMA and The Rating and Valuation Department

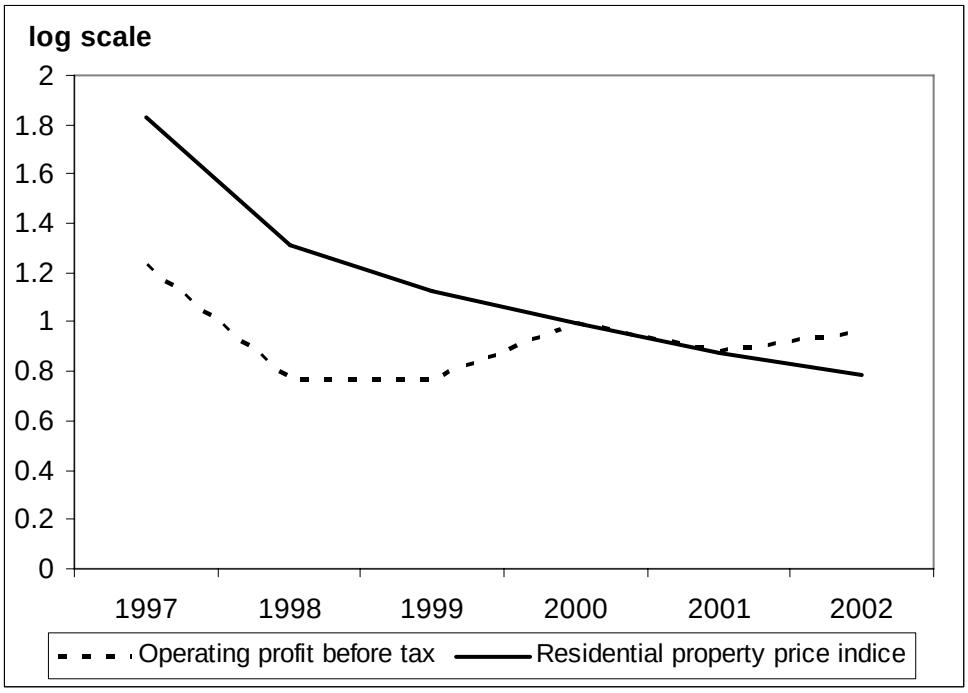
In order to critically analyze the magnitude and the length of this impact, data from HKMA and Census and Statistics Department is used. HKMA had done a study on the profitability of banking institutions in 2002.[92] The figure shows that bank's balance sheets and profitability have been affected by the downturn in the economy and the real estate market (showed in **Table 5.1**). In order to compare the change of profitability and property price index, the information in **Table 5.1** is transformed into logarithm. **Figure 5.1** shows that banks institutions in Hong Kong experienced a considerable decline in profitability following the Asian financial crisis.[93] In the same time, the residential property price also experienced a sharp decline. The profit of bank decreased for 37.5 % from to 1997 to 1998. In the same time, the residential property price decreased for 28.2 %. It shows that the bank profitability was reacted immediately and sensitively to the change in property price. Banking institutions' profitability recovered somewhat in 2000-02, but remained below its pre-crisis level. It is because other economic sectors were

[92] Fan, K. and Peng, K., 2004. Real estate indicators in Hong Kong SAR, HKMA Quarterly Bulletin, 03/2004

[93] The indices in 2000 =1

recovering, and the lending policy of real estate related loan was contracted. However, when it was in the bottom of the real estate cycle, the profit was still lower than in 1997.

Figure 5.1 Profitability of the Retail Banking and Residential Property Price



Source: HKMA and The Rating and Valuation Department

As mentioned above, the real estate cycle also have an impact on the asset quality of the banking institutions. Three indices are used to quantify the asset quality and they are ratio of classified loan ratio to total loans, bad debt charge to total assets and Mortgage delinquency ratio.[94] **Figure 5.2** shows that the ratio of classified loan ratio to total loans raised substantially from 2.2% in 1997 to the peak of 10.25% in 1999 before falling gradually to 1.38% at the end of 2005. The bad debt charge to total asset followed the similar pattern that rose sharply from 0.13% in 1997 to the peak of 0.64% in 1999 before falling back to 0.25% at the end of 2005. On the other hand, the mortgage delinquency

[94] Mortgage delinquency ratio is defined as mortgage loans overdue for more than three months relative to total mortgage loans

ratio rose from 0.1% in 1997 to over 1.2% in 2001, before falling gradually to below 0.2% in 2005.

Table 5.2 Asset Quality and Residential Property price

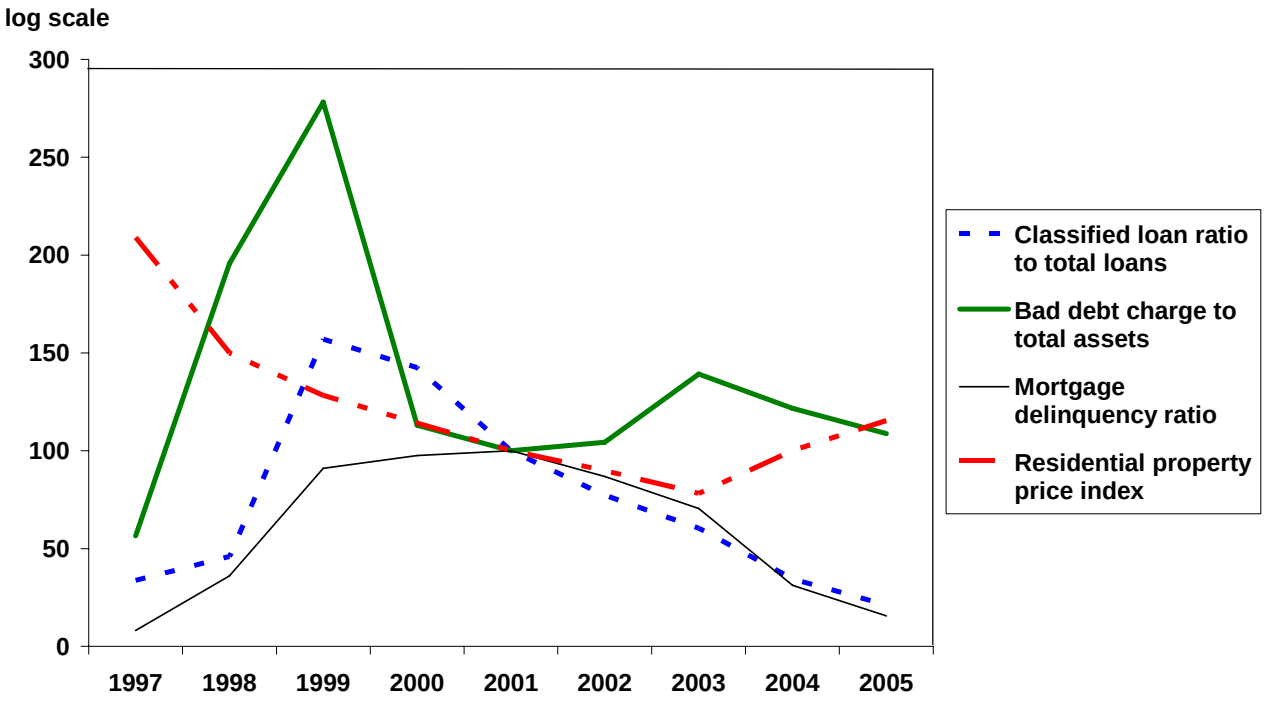
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Classified loan ratio to total loans(%)	2.20	3.00	10.25	9.30	6.53	5.04	3.94	2.25	1.38
Bad debt charge to total assets(%)	0.13	0.45	0.64	0.26	0.23	0.24	0.32	0.28	0.25
Mortgage delinquency ratio (%)	0.10	0.44	1.11	1.19	1.22	1.06	0.86	0.38	0.19
Residential property price index	163	117	100	89	78	70	61	78	90

Source: HKMA and The Rating and Valuation Department

The trend between banking asset quality and real estate cycle was showed and compared.[95] The property price declined sharply from 1997 to 1998 before falling gradually to 2005. The asset quality had a relatively slow reaction to this change. Since indices representing asset quality had reached a peak in 1999, there was 2 year lag to the property price. Also the recover time was still long. As the bad debt charge to total assets in 2005 was still 50% higher than the percentage in 1997, it shows that the asset quality still didn't completely recover from the Asian Financial crisis.

[95] The data in figure 5.3 is transferred into logarithm form for comparison purpose where the indices in 2001=100

Figure 5.2 Asset Quality and Residential Property price



Source: HKMA and The Rating and Valuation Department

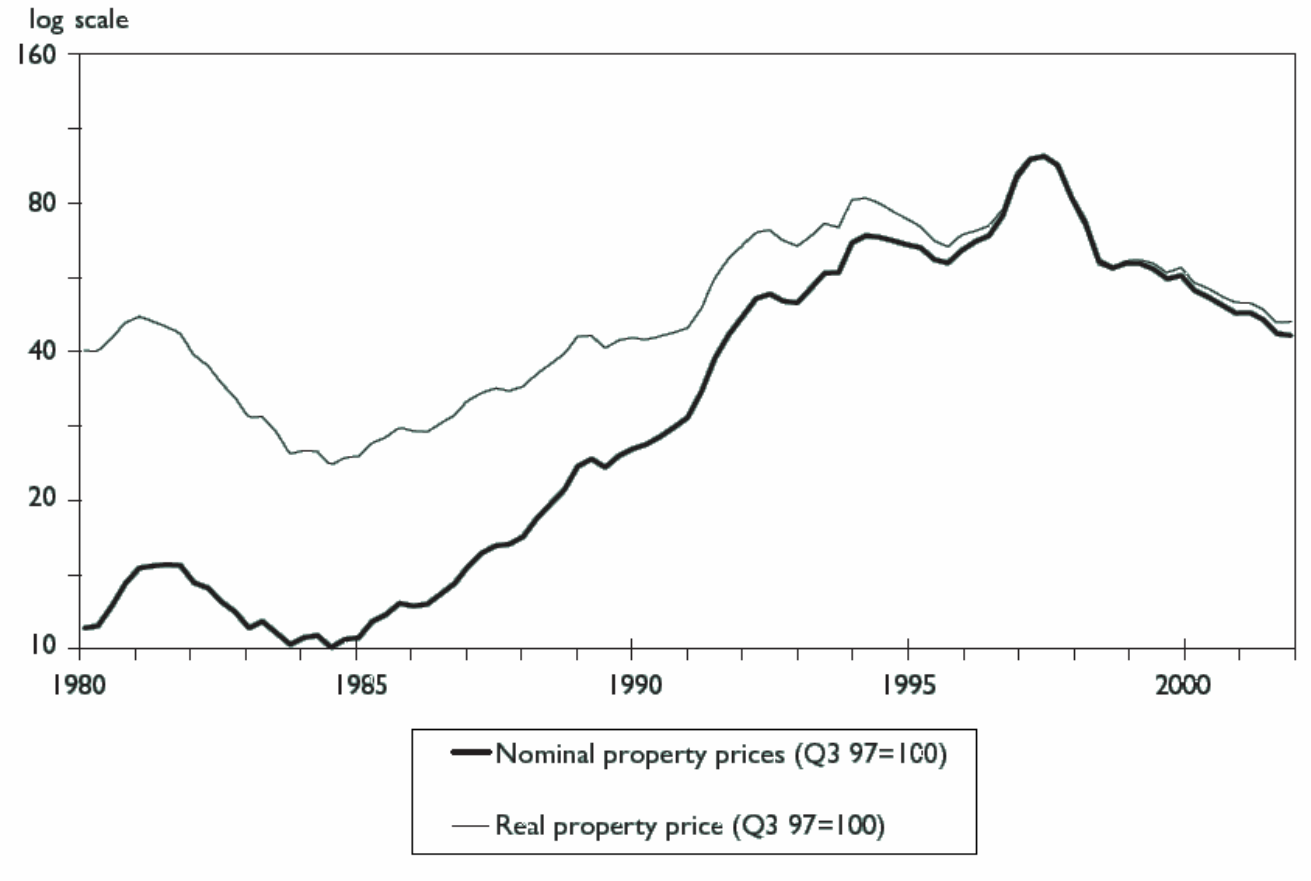
As a result, the impact of real estate cycle on banking institutions was very obvious in the past few years. The profitability of banking institutions rose with property price and its asset quality decreased when property price dropped. It is also found that the reaction time for profit change was one year faster than asset quality change. It showed that the sensitivity of the profitability to property price was higher than asset quality to property price. It can be explained that as banking institutions can't sell their real estate immediately during bottom of real estate cycle, the reaction of asset quality was relatively slow when comparing to profitability. On the other hand, banking institutions have a lot of ways to recover their profitability such as investing in other securities, changing of distribution of domestic loan or modifying their lending attitude.

The impact on credit cycle

International experience suggests that swings in property prices have often led to financial fragility and banking crises. The banking sector tends to play an accelerator role when property prices rise by supply credit, but it also tends to suffer from the disruptive impact of the subsequent decline. In chapter two, the rationale of relationship between real estate cycle and credit cycle was examined. In this section, the case in Hong Kong would be discussed.

Firstly, the behavior of house prices, bank lending, real output and inflation in Hong Kong would be examined. Figure 5.5 shows the real and nominal residential property prices in the period of 1980 to 2002. The figure shows that the property price reduced rapidly between 1981 and 1984. Then it grew sharply till 1997. By the end of 2002, the property price had declined by more than 50% in real and nominal terms.

Figure 5.3 Residential Property Price Indices



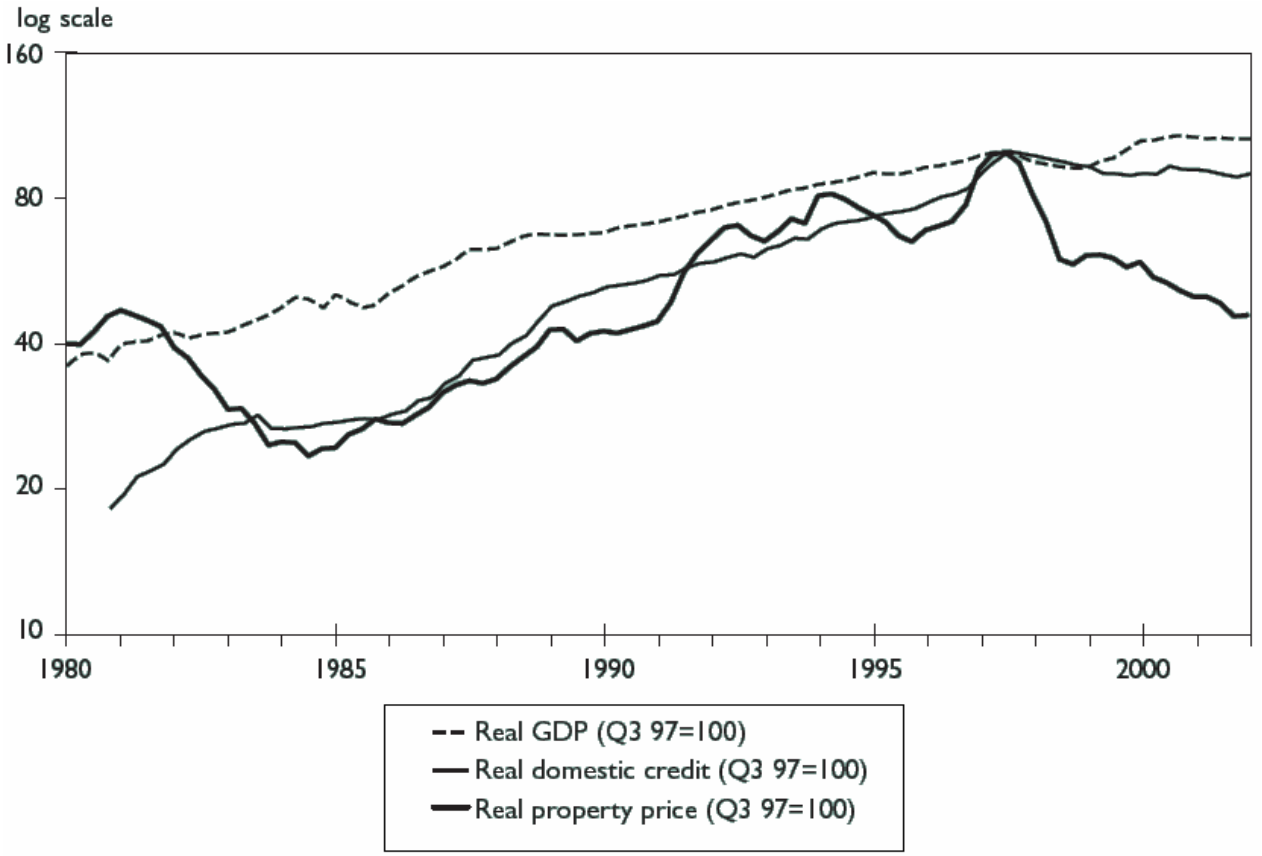
Source: HKMA[96]

Besides, bank lending and output appear more stable than the property prices. All three variables are measured in real terms. In order to get the same scale for comparison, they are transferred in to logarithm and using the data in 1997 as 100. The domestic credit increased rapidly from 1986 to 1997. Bank credit reduced in the wake of Asian financial crisis, and has been relatively stable since late 1998. Real GDP followed a similar trend, with rapid growth in the latter part of the 1980s, and of the 1990s before a significant contraction in 1998.

[96] Gerlach, S. and Peng, W., 2002. Bank lending and property prices in Hong Kong, *HKMA Quarterly Bulletin*, 08/2002, pp.1-10

Result shows that the increase in property price would stimulate the supply of credit to real estate sector. Also the decrease in real estate price would due to contraction of credit supply.

Figure 5.4 Property Price, Domestic Credit and GDP



Source: HKMA[97]

5.1.2 Reasons of its impact

The literature review in chapter two developed a theory framework to analysis the reasons behind the impact of real estate cycle on banking institutions. Three reasons will be

[97] Gerlach, S. and Peng, W., 2002. Bank lending and property prices in Hong Kong, *HKMA Quarterly Bulletin*, 08/2002, pp.1-10

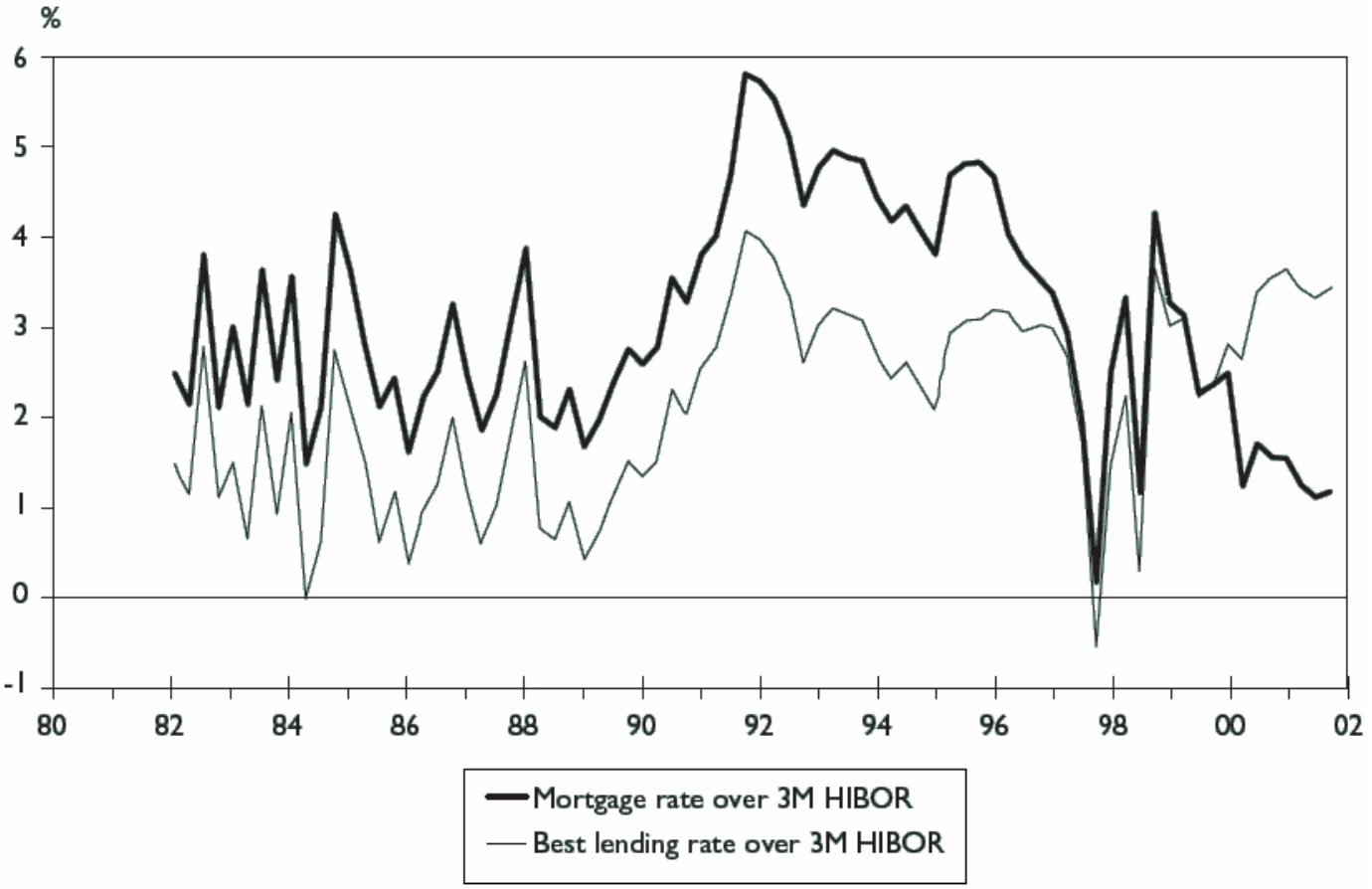
applied to the ac hoc condition in Hong Kong. They are disaster myopia, inadequate data & weak analysis and real estate cycle & credit cycle.

Disaster Myopia

As mentioned in the above, one of the reason that the bank would like to lend more for real estate related loan, is that they have disaster myopia. As they have disaster myopia, the fluctuation of real estate price would force them to change their performance. As a result, the fluctuation of real estate price would be affected further by the banking sector. I would like to examine how the various factors in disaster myopia would result in banking abnormal behavior and render the fluctuation of property price in turn.

One of the reasons that the bank managers tend to lend more to the real estate sector is that these loan can reward the bank with higher profit. As shown in **figure 5.5**, the mortgage rate is higher than the best lending rate on average. From 1993 to 1997, the mortgage rate was higher than the best lending rate (BLR) for about 1-2 %. At that period, the property market was booming, so the bankers was more willing to lend out more residential mortgage to earn the highest interest income. After 1997, as the property price declined sharply, transaction in first hand and second hand property market reduced rapidly. The bankers had to reduce the mortgage rate so as to attract more people to buy property.

Figure 5.5 Mortgage Rate and Best Lending Rate



Source: HKMA and CEIC

In 1996, the total amount of loan for purchase of residential property of authorized institutions was 371 billion HK dollars.[98] The interest income of residential mortgage in that year should be 20 billion HK dollars (average mortgage rate = 5.5%). If that amount of money was lent to other sector, the interest income would be 11 billion (average BLR = 3%). The banking sectors would earn 9 billion HK dollar less profit. This can show that the short term profitability of residential mortgage is relatively higher than the loan to other

[98] HKMA, Loans and advances for use in Hong Kong by economic sector, February, available in http://info.gov.hk/hkma/eng/statistics/msb/index.htm

economic sectors. Therefore, when the property price is increasing, bank would like to lend more to the real estate sector.

Inadequate data and weak analysis

Inadequate information and weak analysis are the reasons for underestimation of the risk of high concentration in real estate related loan. There are two variables that are critical to the banks' lending decision. They are valuation of property and risk of real estate related loan. I am going to explain why different property price leads to difference bank performances.

1) Valuation of property

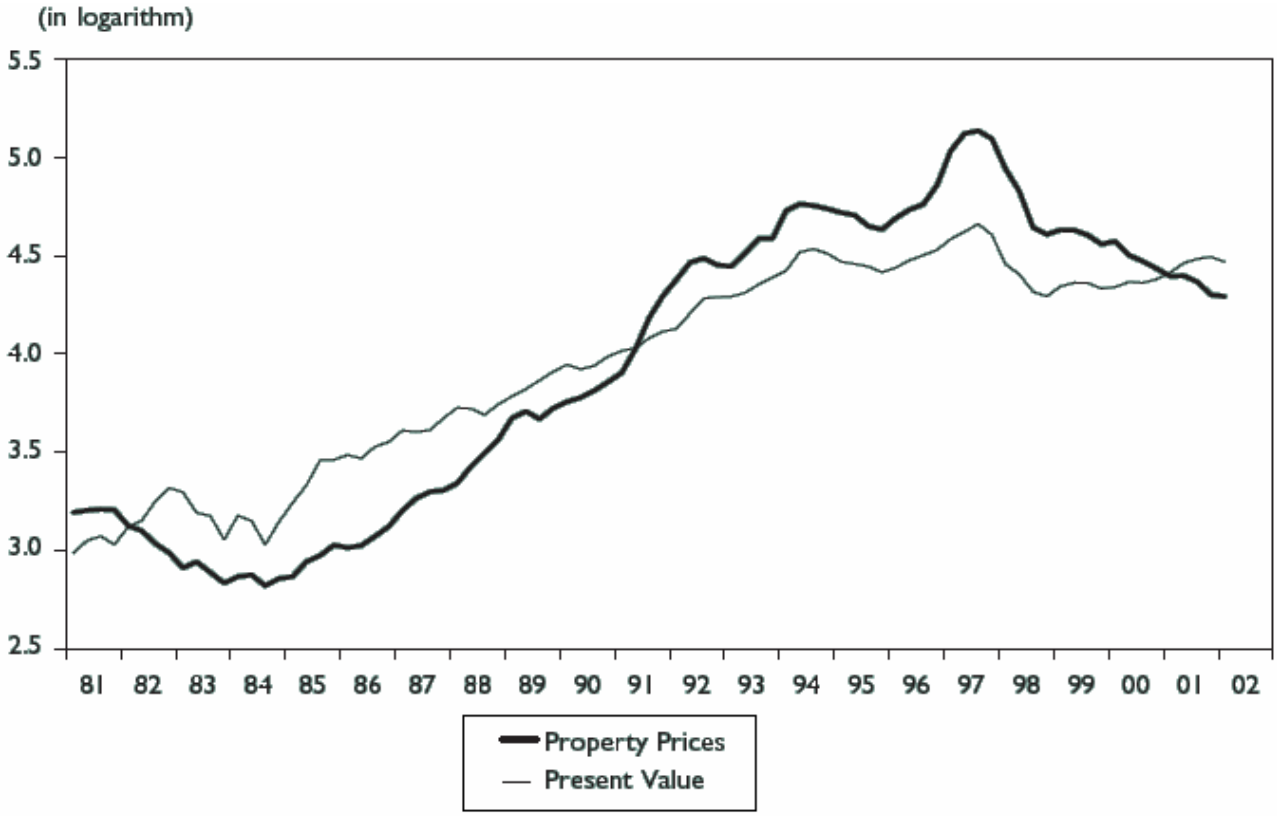
In Hong Kong, when companies borrow money from bank with collateral, the value of the property is the main determinant of the loan amount. It is because when the loan is default, bank can sell the property to compensate their loss. In common practice, they usually employ a professional surveyor to value the property. The valuation is based on both quantitative and qualitative factors (such as size, location, age and facilities etc.) of the property. It is also based on the recent transaction prices of similar properties. The maximum loan will be calculated based on the lower of the purchase price and the valuation amount. It means that the banks are all focus on the market value of the property. The rationale of this section is that the bank is too relying on the market value of property. At the time when the property price fluctuates heavily in real estate market, the market value usually has a great difference with its fundamental value. Therefore, in

chapter 2, it is suggested to use present value to find out the value of the property when loan is repaid.

Researchers derive a present value series to compare with the property price index.[99] **Figure 5.6** show that the market value of the property was persistently higher than its present value in most of the years in 1990s. In 1997, the largest overvaluation recorded in the second quarter was about 50%. After 1997, as the property price sharply declined, the market value of property price became closer to the present value. Consequently, they equaled to each other in the end of 2000. Finally, in 2002, the property price was even lower than the present value for about 18%. During 1990 to 1997, it was the bubble booming period. As most of the properties were overvalued, bank would lend out loan with larger amount. As a result, when the asset bubble was busted in 1997, the property price dropped. Therefore the value of the property could not cover all amount of the default loan.

[99] Peng, W., 2002. What drives property prices in Hong Kong, *HKMA Quarterly Bulletin*, 08/2002, pp.19-33

Figure 5.6 Property prices and Present Value



Source: HKMA[100]

2) Risk of real estate related loan

The credit risk of banking sector depends on the use of loan. As the banking sector has weak analysis on the financial data, they would tend to lend out more real estate related loan, especially residential mortgage. I have reviewed the related literature in chapter two about the risk of real estate related loan. The case in Hong Kong is similar to that theory. When real estate market is booming, bankers may think that it is safer to lend real estate related loan, as the price is continuously increasing. They also think that the residential mortgage is the safer loan. Therefore they tend to lend out more residential mortgage.

[100] Peng, W., 2002. What drives property prices in Hong Kong, *HKMA Quarterly Bulletin*,08/2002,pp.19-33

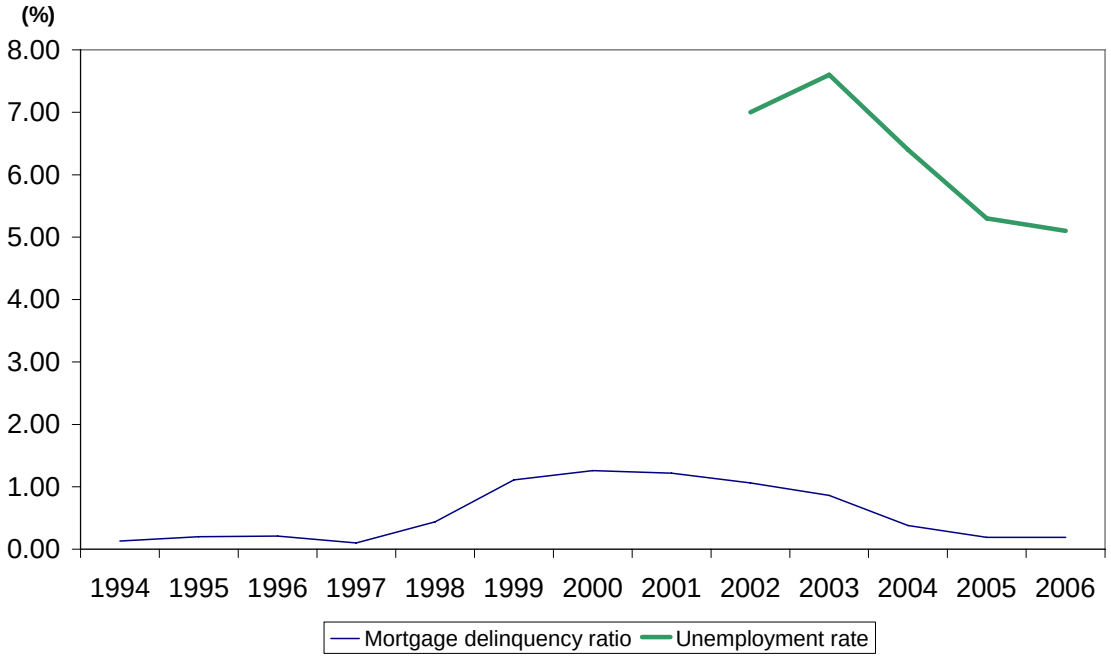
However, the use of loan should not be too concentrated, otherwise it would create problem when asset bubble is busted.

The sharp fall in property prices in 1997 has led to an increase in negative equity of residential mortgage holders in Hong Kong. At the end of September 2004, there were about 25,400 loans with a market value lower than the outstanding loan amount.[101] The total value of these loans was HK $ 43 billion. **Figure 5.7** shows that the mortgage delinquency was below 0.3% from 1994 to 1997.[102] As the delinquency ratio was so low, it seems that the default risk of residential mortgage was low. However, when the property price started to drop from 1997, the ratio increased sharply from 0.1% to over 1.26% in 2000. This shows that although the short term credit risk of mortgage was low, its long term risk did exist. Therefore the bankers should consider their risk prudently.

In addition, the loan repayment ability of the householders depends on different factors such as current loan-to-value ratio, the level of interest rate and the unemployment rate.[103] As shown in **figure 5.7**, the unemployment rate and the mortgage delinquency ratio reached a peak in 2003 and kept on declining until 2006. As this two index changed in the same phase, bankers should also be aware of the unemployment rate.

[101] Wong, J., Fung, L., Fong, T. and Sze, A., 2004. Residential mortgage default risk and the loan-to-value ratio. *HKMA Quarterly Bulletin*, 12/2004,pp.35-45
[102] Mortgage delinquency ratio is defined as mortgage loans overdue for more than three months relative to total mortgage loans
[103] Wong, J., Fung, L., Fong, T. and Sze, A., 2004. Residential mortgage default risk and the loan-to-value ratio. *HKMA Quarterly Bulletin*, 12/2004,pp.35-45

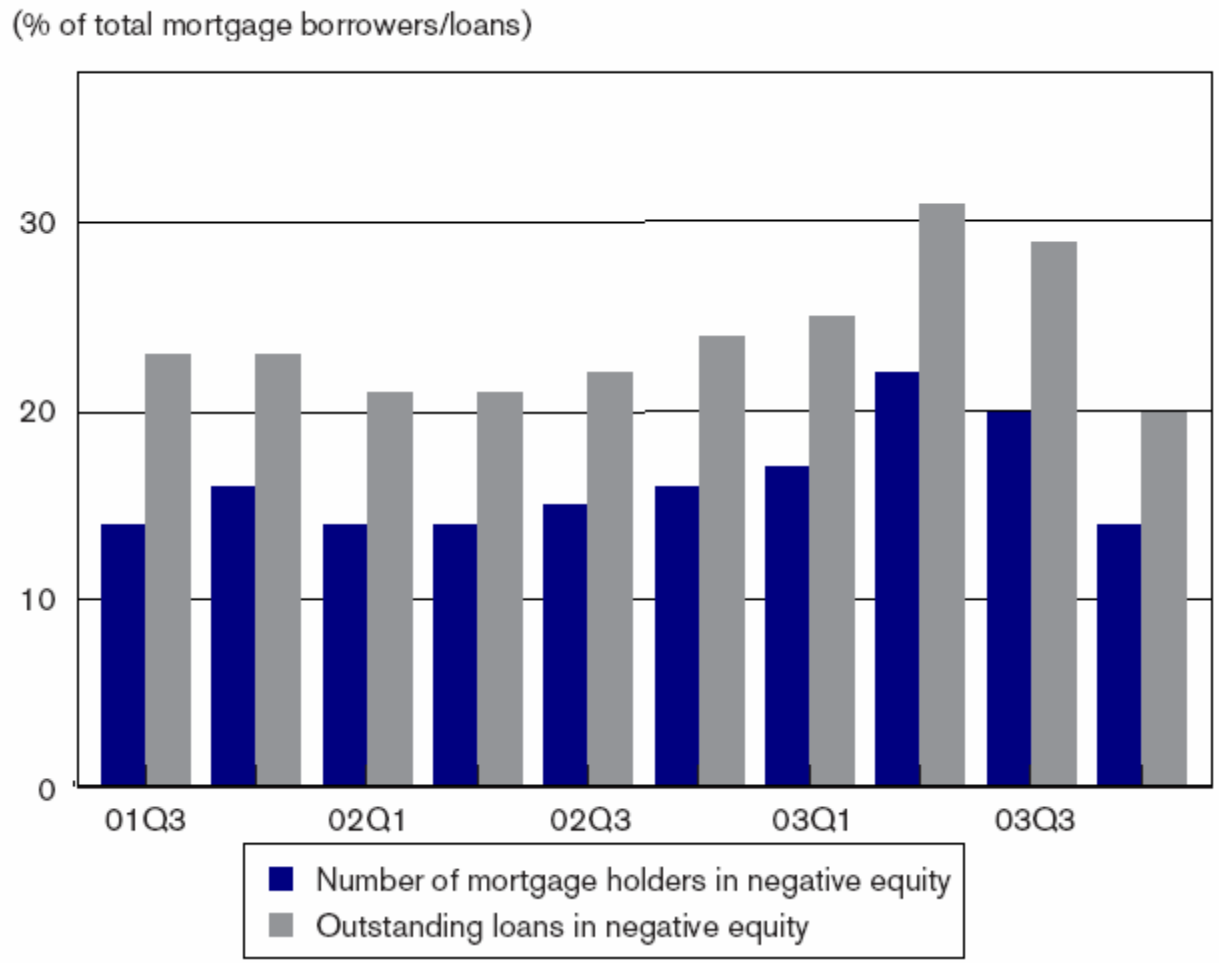
Figure 5.7 Mortgage delinquency ratio and unemployment rate



Source: HKMA and Census & Statistics Department

The HKMA has conducted a survey to obtain information on banks' residential mortgage loans of negative equity since the third quarter of 2001. **Figure 5.8**, the number of residential mortgage loans of negative equity rose substantially to over 20% of the total mortgage borrowers by the end of the second quarter of 2003. At the end of the next quarter, aggregate outstanding loans amounted to HK$155 billion or 29% of total residential mortgage loans. Given that residential mortgage loan represents a crucial part of bank assets, how the negative equity positions of borrowers' mortgage affects borrowers' decisions to default is of interest to policymakers.

Figure 5.8 Residential mortgage loans in negative equity



Source: HKMA

Furthermore, loan-to-value (LTV) ratio is also critical to the mortgage default risk. Although the higher the LTV the larger profit the bank can earn, it also increase the credit risk to the bank. Therefore a maximum LTV ratio of 70% was adopted by the banking industry on a voluntary basis in the latter part of 1991. As it was proven to be effective, it was later endorsed by the HKMA and incorporated in its guideline on property lending in 1994. Researchers found that if the policy of maximum 90% LTV was adopted in 1997,

the average current-to-loan value in 2002 would increase from 127% to 163 %.[104] The default probability would also increase from 0.45 % to 0.95 %. Finally, the estimated amount of default loans would increase from 0.2 billion to 0.4 billion HK dollar. As a result, it is proved that the policy can limit the risks faced by banks from fluctuations in property prices and thus helps to ensure the stability of the banking system in times of market volatility.

5.1.3 Case Analysis

As mentioned above, during the bottom of real estate cycle, the banking institutions can not get back the cash immediately. The more fixed asset the banking institutions held on hand, the more risky the banking institutions were and more vulnerable the banking system was. If the banking institutions do not have adequate capital on hand, they may be bankrupt when depositors requesting to get back their deposit. The banking system will then become instability and banking crisis will also be formed. In this section, two cases were discussed. One of the banks was bankrupted and the other one was took over by the government. The background, effect and lessons learnt from the cases will be discussed as follows.

Case of Ming Tak Bank

In 1962, Hong Kong government amended the building ordinance and stated that new ordinance would be effective from 1966. As the new ordinance would increase the cost of constructing a new building, developers tried to develop their own lands and construct the

[104] Wong, J., Fung, L., Fong, T. and Sze, A., 2004. Residential mortgage default risk and the loan-to-value ratio. *HKMA Quarterly Bulletin*, 12/2004,pp.35-45

building before 1966. Therefore the property price increased steady. The asset bubble is formed because banking sector not only lend out real estate related loan, but also directly invest in the real estate market. As the loan to value ratio was high at that time, investors can easily borrow 80% or even 90% of property price from banks. This practice resulted in an average liquidity ratio drop from 53.3% in 1954 to 27.6% in 1964.[105] The smaller banks raised cash in order to advance loans by offering higher interest rates in competition with the well-established banks.[106] Although the return was high, but so was the risk.

In 1965, a rumor stated that Ming Tak Bank didn't have any cash on hand. [107] The run started when several clients complained the banks' cheque were not honored in the United States. It is known the bank had many dealings in overseas ex-change. The bank managed to pay these customers from other cash in hand, but it later ran out of money.

After the rumor was widely spread, hundreds of people queued up at the bank and waiting to draw out their deposits. However, the bank could not repay their deposit. In order to stabilize the financial system, Hong Kong government then took over the bank in January, 1, 1965.[108] The chairman of Hong Kong's Commissioner of Banking, Mr. Leonidas Cole was responsible to manage the Ming Tak Bank. Mr. Cole acted under the Bank Ordinance, section 13 of which authorizes him to take control of and carry on the business of banks. After taking over the bank, Mr. Leonidas stated that the operation of the bank would be stopped so as to allow the auditors to check for the financial account of the bank. A bank official was quoted as saying the bank had assets of $12 million and deposits of $7million.

[105] Hsu, F.C., 1997, legislative control of Hong Kong financial markets: Some aspects of banking and securities regulations, *Law and Policy in International Business*, Spring 1997.
[106] Id.
[107] Hongkong Tiger Standard, 01/01/1965
[108] Id.

It also had real estate which was not immediately convertible. As a result, the cash flow of the bank was not enough to cover the liability. Finally in February, 4,1965, the manager of Ming Tak bank applied for bankruptcy of the bank and was accepted by the high court.

The consequence of this event was that lots of local bank suffered banking crisis. Canton Trust & Commercial Bank was even closed down in April, 15, 1965. Rumors about the health and financial position of other Chinese banks, including Hang Seng, were rampant.[109] When large crowds started gathering outside the offices of Hang Seng Bank, HSBC, or Hong Kong Bank as it was known then, stepped forward and publicly declared its financial support for Hang Seng.[110] Calm was restored gradually, but a slow drain on deposits continued. By early April, Hang Seng was in danger of being 'inliquid' rather than insolvent, to use the words of Dr Lee Quo-Wei.[111] On the April, 9,1965, the Board of Hang Seng offered a majority interest of 51% of their bank to HSBC.[112] By midnight, an agreement in principle had been reached, ending the run on Hang Seng. The banking sector's profitability in 1965 was all affected by the banking crisis. Therefore, they contracted their lending policy to increase the cash flow. Without the credit support from banks, a lot of construction project and real estate investment could not be continuous. As the developers and construction industry could not finish the project to get back the money, they lost ability to repay the loan. Finally, a number of companies were bankrupt at that time.

[109] Hsu, F.C., 1997, legislative control of Hong Kong financial markets: Some aspects of banking and securities regulations, Law and Policy in International Business, Spring 1997.
[110] Cheng, V., 2003, Closing plenary. Sibos 2003 Singapore.
[111] Cheng, V., 2003, Closing plenary. Sibos 2003 Singapore.
[112] Hsu, F.C., 1997, legislative control of Hong Kong financial markets: Some aspects of banking and securities regulations, Law and Policy in International Business, Spring 1997.

One of the main reasons that the Ming Tak Bank was closed down was that it held too much real estate related loan and property as its asset. Value of the property was crucial to the capital base of banks. During the down turn of the property market, the total asset of the bank would also decrease. As a result, the banks could not have enough cash flow for daily operation. Banking crisis was therefore formed. The exposure of banking sector to real estate market should be controlled at a safety level. The higher the exposure to real estate market, the higher the credit risk of banks would be.

Case of CA Pacific Investments Holdings Limited

In January, 20, 1998, CA Pacific Investments Holdings Limited (CAPIHL) and its five related companies were bankrupt. At that time, CAPIHL was one of the largest investment holdings limited. CA Pacific Securities Limited (CAPSL) and CA Pacific Finance Limited (CAPFL) formed part of a group of financial services companies under a listed holding company. CAPSL was a securities dealer licensed by the Commission. It was also a member of the Stock Exchange of Hong Kong. CAPF was a registered money lender. The money resource of CAPSL was come from CAPFL. The business of CAPFL was to lend out money to the client of CAPSL.

This event was beginning with the financial problem of CAPFL. CAPFL borrowed 0.55 billion from banks by providing the securities from client of CAPSL as collateral. The value of these securities was 2.5 billion which was much higher than the loan. The problem was that CAPIHL used 0.4 billion of the loan to invest in real estate market. CAPIHL held a lot of property on hand. After Asian Financial Crisis, the property price declined sharply. CAPIHL lost a lot of money from real estate investment. As a result,

CAPFL didn't have enough capital to repay the loan to the bank. In order to reduce credit risk, the bank decided to sell all of the collateral – the securities from CAPFL. Since the clients of CAPSL could not get back their securities from CAPSL, they requested compensation from CAPSL. At the same time, CAPSL got cash flow problem and didn't have adequate cash flow for normal operation. As a result, all related companies suffered a great lost and were bankrupt.

The lesson learnt from this event was that the management system of these financial institutions was not mature enough to reduce risk of investment. The liability of the CAPFL was far larger than its asset value. Therefore any risk of the investment can lead to the result of bankrupt. The role of real estate cycle in this case was that the real estate market absorbed their investment capital. When the asset bubble was busted, CAPIHL could not get back the cash immediately, so it had to face a cash flow problem. The depreciation of the property also depreciated its capital base. As a result, these companies got cash flow problem and finally was bankrupt. The exposure to real estate sector should not be too high otherwise the risk of investment would lead to bankrupt of a financial institution.

5.2 How Real Estate Cycle Relate to Credit Rating

In the above chapters, it was found that credit rating can objectively show a bank's future opportunities and risk. Therefore it was a good tool to monitor the operating of the bank and the risk of the portfolio arrangement of the banking institutions. One of the significant implications is that banking institutions as acting a financial accelerator in the real estate cycle, to monitor the banking operation and lending policy mean that the speed

of forming a real estate bubble could be slower. When all the banks became prudential to lending loan to real estate sector, the banking institutions will not acting an financial accelerator to speed up the forming of real estate bubble. As a result the frequency and magnitude of the real estate cycle can be reduced. Conversely, during the bottom of real estate cycle, as the banking asset value and asset quality declined, the credit ratings of banks will also decreased. This shows a bilateral relationship of real estate cycle and credit ratings. In the following section, I will examine what role the real estate act in the internal rating under Basel II.

This section has two parts, the first part would put credit rating and change of property price together to see their relationship. The second part would examine how real estate affects the real estate rating of a company when it borrows money from banks.

How credit rating relate to change of property price

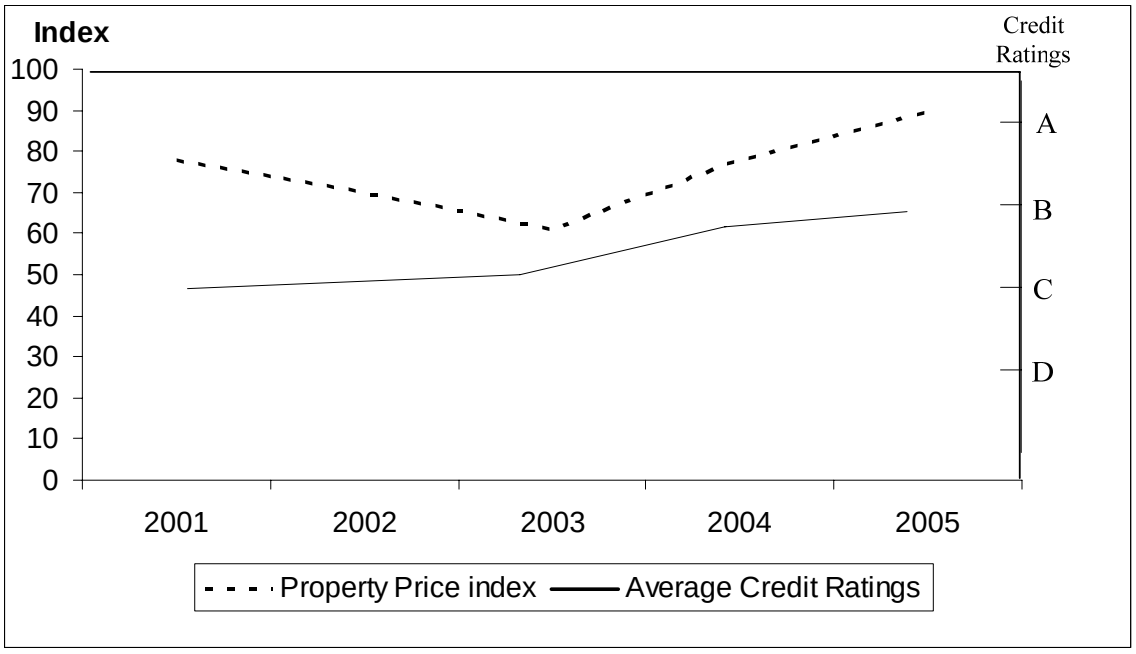
The data of credit ratings of seven banks used in chapter three is used again in the following section. These data would be used to compare the change of property price in the last five years. The result is shown as follows.

Table 5.3 Credit ratings and Residential Property Price Index

	2001	2002	2003	2004	2005
	Credit Ratings		Credit Ratings		Credit Ratings
Nanyang Commercial bank	C		C		-
The Bank of East Asia	D+		C-		C
CITIC Ka Wah Bank	D		D+		-
Dah Sing Bank	D+		C-		-
Wing Hang Bank	D+		C-		C+
Hang Seng Bank	B		B		B
HSBC	B		B		B
Property Price index	78	70	61	78	90

Source: Banks' Annual Report and Rating & Valuating Department

Figure 5.9 Credit ratings and Residential Property Price Index



Source: Banks' Annual Report and Rating & Valuating Department

The result shows that the index of residential property price in 2005 is more than index in 2001, this imply that there are growth of property price. When compare this with the average credit ratings of seven banks, we may conclude that the property price increase

with the improvement of credit ratings. This shows a bilateral indirect relationship of real estate cycle and credit ratings.

How real estate affect real estate rating

Ratings are a tool to deliver transparency for the detailed analysis of credit, market and liquidity risks that are required under Basel II. Real estate is a key cost factor and asset item when analyzing corporate risk. Increase in real estate value is essential to improve company's credit rating. In addition, the risks of an individual property can have a lasting impact on credit ratings. If the main credit risk lie on an individual real estate or real estate project, a rating is usually drawn up for the object itself. Thus the opportunities and risks of the project should be quantified and analyzed by a special real estate rating exercise. The more transparent is the analysis, the higher is the credit rating.

Figure 5.10 The role of real estate in the rating process

	Corporate rating- Real estate is a resource	Objective ratings- Real estate bears the credit risk
Focus of credit investigation	Analysis of credit standing focuses on the company-- the real estate assets influencing the rating	Analysis of credit standing focuses on the real estate itself as the object of project financing
Analysis of the real estate	The focus is on valuation	The focus on the opportunities and risk afforded by the real estate project
Effective levers	Proactive real estate management aims to increase the value of real estate assets	Object ratings serve to quantify and objectivize opportunities and risks

Source: Roland Berger Strategy Consultants[113]

The analysis of the current real estate portfolios has given a result that a minimum of 20% of the properties of the company are not important and can even be changed into cash. In this way, the company's cash flow would be improved and the liquidated reserves could then be expanded and thus can enhance financial flexibility. Financial flexibility is essential in credit worthiness analysis. To enhance the financial flexibility, proactive real estate management is the key. The company can rent out non-operating real estate to ensure a steady and sustainable rental income. For non-essential buildings and land, the company can even sell them to free up liquidity.

[113] Buchele, R.,2003, Basel II and the real estate market: How real estate affects ratings. *Executive Review*, November, Roland Berger Strategy Consultants

Besides, real-estate-specific-costs should be diminish to improve the company's cost and earnings position since these costs can be as much as 5%-10% of total sales in some companies, which is the second largest expenses after salary. Not only improve the company's cost and earnings position, it can also improve assessment of operating risk and this in turn can ensure a healthier cost structure and affect the credit ratings positively,

In some cases, the credit risk of a company is shifted to its real estate. This is common especially during the time the company seeks for project financing or purchases an existing property, if the cost of debt is covered entirely by the revenue of the project. In this way, the real estate produces both opportunities and risks to the financing companies. It is a must to identify, analyze and qualify risks that are related to the property.

By the above explanation, we can found that the impact of real estate portfolio on the credit rating is crucial. On the other hand, the rating to the companies can affect their investment decision on the real estate market. This investment decision can affect the demand and supply of real estate market and finally determine the property price. As a result, there is a cyclical relationship between credit rating, firms' investment decision and real estate cycle.

CHAPTER 6

CONCLUSION

6.1 Conclusion

In this dissertation, the rationale of the real estate cycle has already been discussed in depth. As the real estate cycle does have an impact on the banking institutions, there is a direct relationship between these two variables. It is found that the credit rating can directly show the banks' profitability, asset quality, future opportunities and risk. It means that any determinants affect these factors would affect the credit rating of the banking institutions. In chapter five, by applying the above theoretical framework to the case in Hong Kong, it is also found that real estate cycle has an impact on both profitability and asset quality of banking institutions in Hong Kong.

Therefore in different stage of real estate cycle, the credit ratings of the banking institutions will be modified following the ups and downs of such cycle. Conversely, the credit rating can monitor the performance of banking institutions so as the lending policy and arrangement of asset portfolio. Therefore the banking institutions would rearrange their loan to real estate sector. Real estate cycle could then be affected without the fully financial support from banking institutions. Finally, with the banking institutions acting as a key between real estate cycle and credit ratings, their bilateral indirect relationship are found in this dissertation.

Real Estate Cycle

This dissertation concludes that there are two determinants of real estate cycle which are optimists and demand & supply of real estate market. The role of banking institutions can be represented by two points, disaster myopia and inadequate data & weak analysis.

The dissertation first defines that real estate cycle means the boom and bust of real estate bubble. [114] In addition, the demand and supply of real estate market are defined as the fundamental factors for the fluctuation of real estate price according to the theory of economy. The role of optimist is used to explain the change of land price. After examining the fundamental factors of real estate cycle, the role of banking institutions as a financial accelerator in the real estate cycle is explained. There are different reasons behind its role including accounting system, competition, moral hazard, disaster magnification, valuation of real estate, risk of real estate related loan and the credit cycle.

Credit Ratings

Chapter three reviews the historical background of credit rating. The Standard and Poor's as one of the most famous credit ratings agencies is used for review. The rating process of S&P was examined in this dissertation. There are totally six procedures and one committee involved. They are rating request, meeting with management, rating committee, appeal process, rating issued, surveillance and rating change. Furthermore, the relationship between Basel II and credit ratings is explained.

[114] Herring, R. and Wachter, S., 1999. Real Estate Booms and Banking Busts: An International Perspective. Washington, DC: Group of Thirty, occasional paper, no 58.

Due to the outbreak of the new Bank for International Settlement (BIS) capital requirements, where it states that banks that have a sound internal rating system will be allowed a lower amount of capital against loans issued to borrow, credit rating is becoming more and more essential. Basel II sets up different approach to determine credit risk. These approaches are standardized approach and internal rating-based approach. Although Basel II hadn't set up the detail and format of these approaches, the elements of sound banking internal rating system were already published. Therefore some examples of the internal rating methods are listed in this chapter.

The reconciling of a bank's internal ratings with external agencies' ratings is also discussed. Finally, the interaction between credit ratings and banking institutions is investigate by using different data of domestic banking institutions. It is found that the credit ratings really do show the long term and short term expectation of the bank and it is useful to monitor a bank's behavior. Also the change of credit ratings can force the banking institutions to rearrange their loan to real estate sector.

The impact of real estate cycle on banking institutions

The impact of real estate cycle on the profitability and asset quality of banking institutions is first investigated. By using the data of domestic banking institutions, it is found that the profit of banking institutions increase with real estate price. At the same time, the asset quality of the banking institutions will be the best (the bad debt charge is the lowest). However, when the real estate price declined sharply, the profit will also decrease. The asset quality will be lower. It is also found that the reaction time for profit

change was one year faster than asset quality change. It shows that the sensitivity of the profitability to property price is higher than asset quality to property price.

Secondly, the impact of real estate cycle on credit cycle is examined. Result shows that the increase in property price will stimulate the supply of credit to real estate sector. Also the decrease in real estate price will lead to contraction of credit supply.

Two cases in Hong Kong are also used to illustrate how the ups and downs of property price would force the bank into bankrupt. Then the reasons behind these impacts are suggested. These reasons can be grouped into three types: Disaster myopia, inadequate data & weak analysis and real estate cycle & credit cycle.

The relationship between credit ratings and real estate cycle

In chapter three, the implication of credit ratings on banking institutions are examined. In chapter five, the impact of real estate cycle on banking institutions are also explained. By using banking institutions as the link between them, a bilateral indirect relationship between credit ratings and real estate cycle is found. After applying the data of different banks' credit ratings and the real estate market, it is found that in different stages of real estate cycle, the credit ratings of the banking institutions will be modified following the ups and downs of such cycle. Conversely, the credit rating can monitor the performance of banking institutions in terms of the lending policy and arrangement of asset portfolio. Therefore the banking institutions will rearrange their loan to real estate sector. Real estate cycle can then be affected without the fully financial support from banking institutions.

6.2 Recommendation

It is unrealistic to justify absolutely the effectiveness and impacts of the credit ratings on real estate cycle. Due to the complexity in nature, though not being complied with, the credit ratings agencies receive much positive feedback, one of which is the better control on the ratio of total loan to real estate related loan. However, the HKMA still does not have any relative policy to further improve the effectiveness of credit ratings. HKMA is heavily relying on the Basel I and Basel II to supervise the Banking institutions. Especially for the capital adequacy ratio, HKMA is highly focused on it.

In this paper, the bilateral indirect relationship between real estate cycle and credit rating is found. The change of real estate price will affect the credit rating of banking institutions. Besides, the credit rating as an indicator to measure the risks and opportunities of the banking institutions, acts as a monitoring tool to the banking institutions' lending policy and portfolio arrangement. Its role as a financial accelerator to the real estate cycle can be controlled by the credit ratings. The research result of this paper can then be useful for the banking regulator, HKMA, to use such a relationship to form a new supervision framework to improve the financial stability of Hong Kong.

The HKMA is not aware of the importance of credit ratings nowadays. It is suggested that the HKMA should include the credit ratings of all banking institutions in their annual report or any other publications. In addition, HKMA should provide a data base to obtain the credit ratings of all the banking institutions in all the years. It is because credit ratings as a useful tool to access the banking institutions should be allowed for public to know the change of ratings in the past years. Especially to the domestic investors and overseas

investors as both of them need a more objective and predictive tool to help them to make the appropriate investment decision. Hong Kong as an international city should have a highly transparency disclosure policy to the financial sector. Credit ratings as an essential data should be disclose to the public. It is believed that this disclosure policy will help to improve Hong Kong's reputation as an international financial center.

Secondly, Basel II will be implemented in Hong Kong in 2006. Banks will have internal rating to the credit borrowers. As each bank institution will have different internal rating system, their rating to the same corporation may be different. In order to enhance the efficiency and transparency of the banking internal rating, HKMA should request the banking institutions to disclosure their banking internal rating of their main client to other banks. HKMA can even develop an internal rating data base to collect the internal rating from different banks and regularly publicize the result to the banking institutions. As the system will be more transparent within the banking industry, it can prevent individuals from abusing the bank internal rating system.

Finally, after the data bases for external credit ratings to bank and bank internal rating are set up, HKMA should consider how to use these data to enhance the stability of the financial system. It is suggested that HKMA can set up a 'credit ratings policy' that is based on different ratings of the banks; then different supervision policy will be implemented to these banks. For example, the banks can be all divided into three groups where banks were rated as A will be in group one, banks were rated as B will be in group two and banks were rated in C or below will be in group three. The capital adequacy ratio, disclosure policy and firm visiting will be different among groups. Banks in group one is believed to have a high management quality on the risk control and profit making. Thus,

their capital adequacy ratio can be set up in a relatively lower level. Their disclosure policy can be more relaxed and the frequency of firm visit can be minimal. Besides, the banks in group three should be highly supervised as they are poor managed in risk and profit making. As a result, their capital adequacy ratio and disclosure policy should be set in a high level and more transparency. The frequency of firm visit should be more to prevent them from violating the supervision policy of HKMA. The ratings of banks should be modified annually.

By implementing the above suggestion, it is believed that the reputation of Hong Kong as an international financial center can be upgraded. This paper finds out the importance of credit ratings to real estate cycle. In order to further reduce the frequency and magnitude of real estate cycle, the HKMA should consider for using credit ratings as a formal monitoring tool to supervise the banking institutions in Hong Kong.

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Appendix 1

Bank Deposit Ratings

Moody's Bank Deposit Ratings are opinions of a bank's ability to repay punctually its foreign and/or domestic currency deposit obligations. Foreign currency deposit ratings are subject to Moody's country ceilings for foreign currency deposits. This may result in the assignment of a different (and typically lower) rating for the foreign currency deposits relative to the bank's rating for domestic currency obligations.

Unless otherwise indicated, Moody's Bank Deposit Ratings apply to a bank's foreign and domestic currency deposit obligations. A bank may also be assigned different (typically higher) domestic currency deposit ratings that are unconstrained by the respective country ceilings for foreign currency deposits.

Foreign currency deposit ratings are applicable only to banks and branches located in countries that have been assigned a country ceiling for foreign currency for bank deposits. Such obligations are rated at the lower of the bank's deposit rating or Moody's country ceiling for bank deposits for the country in which the branch is located.

Moody's Bank Deposit Ratings are intended to incorporate those aspects of credit risk that are relevant to the prospective payment performance of the rated bank with respect to its foreign and/or domestic currency deposit obligations. Included are factors such as intrinsic financial strength, sovereign transfer risk (for foreign currency deposits), and both implicit and explicit external support elements.

Moody's Bank Deposit Ratings do not take into account the benefit of deposit insurance schemes that make payments to depositors, but they do recognize the potential support from schemes that may provide direct assistance to banks.

In addition to its Bank Deposit Ratings, Moody's also publishes Bank Financial Strength Ratings, which exclude certain of these external risk and support elements (i.e., sovereign risk and external support). Such ratings are intended to elaborate and explain Moody's Bank Deposit Ratings, which incorporate and reflect such elements of credit risk.

Long-Term Bank Deposit Ratings

Moody's long-term bank deposit ratings employ the same alphanumeric rating system as that for long-term issuer ratings.

Aaa

Banks rated Aaa for deposits offer exceptional credit quality and have the smallest degree of risk. While the credit quality of these banks may change, such changes as can be visualized are most unlikely to materially impair the banks' strong positions.

Aa

Banks rated Aa for deposits offer excellent credit quality, but are rated lower than Aaa banks because their susceptibility to long-term risks appears somewhat greater. The

margins of protection may not be as great as with Aaa-rated banks, or fluctuations of protective elements may be of greater amplitude.

A

Banks rated A for deposits offer good credit quality. However, elements may be present that suggest a susceptibility to impairment over the long term.

Baa

Banks rated Baa for deposits offer adequate credit quality. However, certain protective elements may be lacking or may be characteristically unreliable over any great length of time.

Ba

Banks rated Ba for deposits offer questionable credit quality. Often the ability of these banks to meet punctually deposit obligations may be uncertain and therefore not well safeguarded in the future.

B

Banks rated B for deposits offer generally poor credit quality. Assurance of punctual payment of deposit obligations over any long period of time is small.

Caa

Banks rated Caa for deposits offer extremely poor credit quality. Such banks may be in default, or there may be present elements of danger with regard to financial capacity.

Ca

Banks rated Ca for deposits are usually in default on their deposit obligations.

C

Banks rated C for deposits are usually in default on their deposit obligations, and potential recovery values are low.

Note: Moody's appends the numerical modifiers 1, 2, and 3 to each generic rating category from Aa to Caa. The modifier 1 indicates that the bank is in the higher end of its letter-rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates that the bank is in the lower end of its letter-rating category.

Short-Term Bank Deposit Ratings

Moody's employs the following designations to indicate the relative repayment ability for bank deposits:

P-1

Banks rated Prime-1 for deposits offer superior credit quality and a very strong capacity for timely payment of short-term deposit obligations.

P-2

Banks rated Prime-2 for deposits offer strong credit quality and a strong capacity for timely payment of short-term deposit obligations.

P-3

Banks rated Prime-3 for deposits offer acceptable credit quality and an adequate capacity for timely payment of short-term deposit obligations.

NP

Banks rated Not Prime for deposits offer questionable to poor credit quality and an uncertain capacity for timely payment of short-term deposit obligations.

Bank Financial Strength Ratings

Moody's Bank Financial Strength Ratings (BFSRs) represent Moody's opinion of a bank's intrinsic safety and soundness and, as such, exclude certain external credit risks and credit support elements that are addressed by Moody's Bank Deposit Ratings. In addition to commercial banks, Moody's BFSRs may also be assigned to other types of financial institutions such as multilateral development banks, government-sponsored financial institutions and national development financial institutions.

Unlike Moody's Bank Deposit Ratings, Bank Financial Strength Ratings do not address the probability of timely payment. Instead, Bank Financial Strength Ratings are a measure of the likelihood that a bank will require assistance from third parties such as its owners, its industry group, or official institutions.

Bank Financial Strength Ratings do not take into account the probability that the bank will receive such external support, nor do they address risks arising from sovereign actions that may interfere with a bank's ability to honor its domestic or foreign currency obligations.

Factors considered in the assignment of Bank Financial Strength Ratings include bank-specific elements such as financial fundamentals, franchise value, and business and asset diversification. Although Bank Financial Strength Ratings exclude the external factors specified above, they do take into account other risk factors in the bank's operating environment, including the strength and prospective performance of the economy, as well as the structure and relative fragility of the financial system, and the quality of banking regulation and supervision.

Bank Financial Strength Rating Definitions

A

Banks rated A possess superior intrinsic financial strength. Typically, they will be institutions with highly valuable and defensible business franchises, strong financial fundamentals, and a very predictable and stable operating environment.

B

Banks rated B possess strong intrinsic financial strength. Typically, they will be institutions with valuable and defensible business franchises, good financial fundamentals, and a predictable and stable operating environment.

C

Banks rated C possess adequate intrinsic financial strength. Typically, they will be institutions with more limited but still valuable business franchises. These banks will display either acceptable financial fundamentals within a predictable and stable operating environment, or good financial fundamentals within a less predictable and stable operating environment.

D

Banks rated D display modest intrinsic financial strength, potentially requiring some outside support at times. Such institutions may be limited by one or more of the following factors: a weak business franchise; financial fundamentals that are deficient in one or more respects; or an unpredictable and unstable operating environment.

E

Banks rated E display very modest intrinsic financial strength, with a higher likelihood of periodic outside support or an eventual need for outside assistance. Such institutions may be limited by one or more of the following factors: a weak and limited business franchise; financial fundamentals that are materially deficient in one or more respects; or a highly unpredictable or unstable operating environment.

Note: Where appropriate, a "+" modifier will be appended to ratings below the "A" category and a "-" modifier will be appended to ratings above the "E" category to distinguish those banks that fall in intermediate categories.

Corporate Family Ratings

Moody's Corporate Family Ratings are generally employed for speculative grade corporate issuers. A Corporate Family Rating is an opinion of a corporate family's ability to honor all of its financial obligations and is assigned to a corporate family as if it had:

- a single class of debt;
- a single consolidated legal entity structure.

A Corporate Family Rating does not reference an obligation or class of debt and thus does not reflect priority of claim. It applies to all affiliates under the management control of the entity to which it is assigned. Moody's employs the general long-term rating scale for Corporate Family Ratings.

Counterparty Ratings: Derivatives Product Companies
Issuer ratings assigned to derivative product companies and clearinghouses are opinions of the financial capacity of an obligor to honor its senior obligations under financial contracts, given appropriate documentation and authorizations.

Country Ceilings for Foreign Currency Bank Deposits

Moody's assigns a ceiling for foreign-currency bank deposits and loans to every country (or distinct monetary area) in which there are rated obligors. The ceiling specifies the highest rating that can be assigned to foreign-currency denominated deposit obligations of 1) domestic and foreign branches of banks headquartered in that domicile (even if subsidiaries of foreign banks); and 2) domestic branches of foreign banks. In addition, this ceiling applies to foreign-currency denominated syndicated loans and other non-bond obligations of issuers subject to the authority of the government of that domicile.

Country Ceilings for Foreign Currency Obligations

Moody's assigns a ceiling for foreign-currency bonds and notes to every country (or separate monetary area) in which there are rated obligors. The ceiling generally indicates the highest rating that can be assigned to a foreign-currency denominated security issued by an entity subject to the monetary sovereignty of that country or area. In most cases, the ceiling will be equivalent to the rating that is (or would be) assigned to foreign-currency denominated bonds of the government. Ratings that pierce the country ceiling may be permitted, however, for foreign-currency denominated securities benefiting from special characteristics that are judged to give them a lower risk of default than is indicated by the ceiling. Such characteristics may be intrinsic to the issuer and/or related to Moody's view regarding the government's likely policy actions during a foreign currency crisis.

Country Guidelines for Local Currency Obligations

Moody's assigns local currency guidelines for many countries (or distinct monetary areas) in order to facilitate the assignment of local currency ratings to issues and/or issuers. Local currency ratings measure the credit performance of obligations denominated in the local currency and therefore exclude the transfer risk relevant for foreign-currency obligations. They are intended to be globally comparable.

The country guidelines summarize the general country-level risks (excluding foreign-currency transfer risk) that should be taken into account in assigning local currency ratings to locally-domiciled obligors or locally-originated structured transactions. They indicate the rating level that will generally be assigned to the financially strongest obligations in the country, with the proviso that obligations benefiting from support mechanisms based outside the country (or area) may on occasion be rated higher.

Local Currency Deposit Ceiling

Moody's Local Currency Deposit Ceiling for a country or monetary region is the highest rating that can be assigned to the local currency deposits of a bank or other deposit taking institution domiciled within that rated jurisdiction. It reflects the risk that an important bank would be allowed to default upon local currency deposits either due to limited local

currency resources or to the imposition of a domestic deposit freeze. As such, it reflects: (1) the degree to which the authorities ability to support an important bank may be limited due to a monetary regime which does not permit the creation of unlimited quantities of local currency; and (2) the risk of a local currency deposit freeze.

Credit Default Swaps Ratings

Moody's Credit Default Swaps Ratings measure the risk posed to a credit protection provider on an expected loss basis arising from the possibility that the credit protection provider will be required to make payments in respect of credit events under the terms of the transaction. The ratings also address the potential for any unpaid premiums due to the credit protection provider, up until an early termination date, if any. The ratings do not address potential losses resulting from an early termination of the transaction, nor any market risk associated with the transaction.

Ratings Definitions

Aaa
Obligations rated Aaa are judged to be of the highest quality, with minimal credit risk.

Aa
Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.

A
Obligations rated A are considered upper-medium grade and are subject to low credit risk.

Baa
Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics.

Ba
Obligations rated Ba are judged to have speculative elements and are subject to substantial credit risk.

B
Obligations rated B are considered speculative and are subject to high credit risk.

Caa
Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.

Ca
Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.

C
Obligations rated C are the lowest rated class of bonds and are typically in default, with little prospect for recovery of principal or interest.

Note: Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

Hedge Fund Operations Quality Ratings
A Moodys Hedge Fund Operations Quality rating expresses an opinion of a specific funds operations environment, given its investment strategy. The scope of the assessment includes the funds valuation process, accounting controls, legal structure, compliance system, backgrounds of key personnel and relationships with service providers such as prime brokers, auditors and administrators.

OQ1

Hedge funds rated OQ1 are judged to have an operational infrastructure of excellent quality given their investment strategy.

OQ2

Hedge funds rated OQ2 are judged to have an operational infrastructure of very good quality given their investment strategy.

OQ3

Hedge funds rated OQ3 are judged to have an operational infrastructure of good quality given their investment strategy.

OQ4

Hedge funds rated OQ4 are judged to have an operational infrastructure of fair quality given their investment strategy.

OQ5

Hedge funds rated OQ5 are judged to have an operational infrastructure of poor quality given their investment strategy.

Insurance Financial Strength Ratings

Moody's Insurance Financial Strength Ratings are opinions of the ability of insurance companies to repay punctually senior policyholder claims and obligations. Specific obligations are considered unrated unless they are individually rated because the standing of a particular insurance obligation would depend on an assessment of its relative standing under those laws governing both the obligation and the insurance company.

Insurance Financial Strength Ratings, shown in connection with property/casualty groups, represent the ratings of individual companies within those groups, as displayed in Moody's insurance industry ratings list. The rating of an individual property/casualty company may be based on the benefit of its participation in an intercompany pooling agreement. Pooling agreements may or may not provide for continuation of in-force

policyholder obligations by pool members in the event that the property/casualty insurer is sold to a third party or otherwise removed from the pooling agreement.

Moody's assumes in these ratings that the pooling agreement will not be modified by the members of the pool to reduce the benefits of pool participation, and that the insurer will remain in the pool. Moody's makes no representation or warranty that such pooling agreement will not be modified over time, nor does Moody's opine on the probability that the rated entity may be sold or otherwise removed from the pooling agreement.

Long-Term Insurance Financial Strength Ratings

Moody's rating symbols for Insurance Financial Strength Ratings are identical to those used to indicate the credit quality of long-term obligations. These rating gradations provide investors with a system for measuring an insurance company's ability to meet its senior policyholder claims and obligations.

Aaa

Insurance companies rated Aaa offer exceptional financial security. While the credit profile of these companies is likely to change, such changes as can be visualized are most unlikely to impair their fundamentally strong position.

Aa

Insurance companies rated Aa offer excellent financial security. Together with the Aaa group, they constitute what are generally known as high-grade companies. They are rated lower than Aaa companies because long-term risks appear somewhat larger.

A

Insurance companies rated A offer good financial security. However, elements may be present which suggest a susceptibility to impairment sometime in the future.

Baa

Insurance companies rated Baa offer adequate financial security. However, certain protective elements may be lacking or may be characteristically unreliable over any great length of time.

Ba

Insurance companies rated Ba offer questionable financial security. Often the ability of these companies to meet policyholder obligations may be very moderate and thereby not well safeguarded in the future.

B

Insurance companies rated B offer poor financial security. Assurance of punctual payment of policyholder obligations over any long period of time is small.

Caa

Insurance companies rated Caa offer very poor financial security. They may be in default on their policyholder obligations or there may be present elements of danger with respect to punctual payment of policyholder obligations and claims.

Ca

Insurance companies rated Ca offer extremely poor financial security. Such companies are often in default on their policyholder obligations or have other marked shortcomings.

C

Insurance companies rated C are the lowest-rated class of insurance company and can be regarded as having extremely poor prospects of ever offering financial security.

Note: *Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. Numeric modifiers are used to refer to the ranking within a group with 1 being the highest and 3 being the lowest. However, the financial strength of companies within a generic rating symbol (Aa, for example) is broadly the same.*

Short-Term Insurance Financial Strength Ratings

Short-Term Insurance Financial Strength Ratings are opinions of the ability of the insurance company to repay punctually its short-term senior policyholder claims and obligations. The ratings apply to senior policyholder obligations that mature or are payable within one year or less.

Specific obligations are considered unrated unless individually rated because the standing of a particular insurance obligation would depend on an assessment of its relative standing under those laws governing both the obligation and the insurance company.

P-1

Insurers (or supporting institutions) rated Prime-1 have a superior ability for repayment of senior short-term policyholder claims and obligations.

P-2

Insurers (or supporting institutions) rated Prime-2 have a strong ability for repayment of senior short-term policyholder claims and obligations.

P-3

Insurers (or supporting institutions) rated Prime-3 have an acceptable ability for repayment of senior short-term policyholder claims and obligations.

NP

Insurers (or supporting institutions) rated Not Prime (NP) do not fall within any of the Prime rating categories.

When ratings are supported by the credit of another entity or entities, then the name or names of such supporting entity or entities are listed within parenthesis beneath the name of the insurer, or there is a footnote referring to the name or names of the supporting entity or entities.

In assigning ratings to such insurers, Moody's evaluates the financial strength of the affiliated insurance companies, commercial banks, corporations, foreign governments, or other entities, but only as one factor in the total rating assessment. Moody's makes no representation and gives no opinion on the legal validity or enforceability of any support arrangement.

Purpose

The system of rating securities was originated by John Moody in 1909. The purpose of Moody's ratings is to provide investors with a simple system of gradation by which relative creditworthiness of securities may be noted.

Rating Symbols

Gradations of creditworthiness are indicated by rating symbols, with each symbol representing a group in which the credit characteristics are broadly the same. There are nine symbols as shown below, from that used to designate least credit risk to that denoting greatest credit risk:

Aaa Aa A Baa Ba B Caa Ca C

Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa.

Absence of a Rating

Where no rating has been assigned or where a rating has been withdrawn, it may be for reasons unrelated to the creditworthiness of the issue.

Should no rating be assigned, the reason may be one of the following:

1. An application was not received or accepted.

2. The issue or issuer belongs to a group of securities or entities that are not rated as a matter of policy.

3. There is a lack of essential data pertaining to the issue or issuer.

4. The issue was privately placed, in which case the rating is not published in Moody's publications.

Withdrawal may occur if new and material circumstances arise, the effects of which preclude satisfactory analysis; if there is no longer available reasonable up-to-date data to permit a judgment to be formed; if a bond is called for redemption; or for other reasons.

Changes in Rating

The credit quality of most issuers and their obligations is not fixed and steady over a period of time, but tends to undergo change. For this reason changes in ratings occur so as to reflect variations in the intrinsic relative position of issuers and their obligations.

A change in rating may thus occur at any time in the case of an individual issue. Such rating change should serve notice that Moody's observes some alteration in creditworthiness, or that the previous rating did not fully reflect the quality of the bond as now seen. While because of their very nature, changes are to be expected more frequently among bonds of lower ratings than among bonds of higher ratings. Nevertheless, the user of bond ratings should keep close and constant check on all ratings both high and low to be able to note promptly any signs of change in status that may occur.

Limitations to Uses of Ratings*

Obligations carrying the same rating are not claimed to be of absolutely equal credit quality. In a broad sense, they are alike in position, but since there are a limited number of rating classes used in grading thousands of bonds, the symbols cannot reflect the same shadings of risk which actually exist.

As ratings are designed exclusively for the purpose of grading obligations according to their credit quality, they should not be used alone as a basis for investment operations. For example, they have no value in forecasting the direction of future trends of market price. Market price movements in bonds are influenced not only by the credit quality of individual issues but also by changes in money rates and general economic trends, as well as by the length of maturity, etc. During its life even the highest rated bond may have wide price movements, while its high rating status remains unchanged.

The matter of market price has no bearing whatsoever on the determination of ratings, which are not to be construed as recommendations with respect to "attractiveness". The attractiveness of a given bond may depend on its yield, its maturity date or other factors for which the investor may search, as well as on its credit quality, the only characteristic to which the rating refers.

Since ratings involve judgements about the future, on the one hand, and since they are used by investors as a means of protection, on the other, the effort is made when assigning ratings to look at "worst" possibilities in the "visible" future, rather than solely at the past record and the status of the present. Therefore, investors using the rating should not expect to find in them a reflection of statistical factors alone, since they are an appraisal of long-term risks, including the recognition of many non-statistical factors.

Though ratings may be used by the banking authorities to classify bonds in their bank examination procedure, Moody's ratings are not made with these bank regulations in mind. Moody's Investors Service's own judgement as to the desirability or non-desirability of a bond for bank investment purposes is not indicated by Moody's ratings.

Moody's ratings represent the opinion of Moody's Investors Service as to the relative creditworthiness of securities. As such, they should be used in conjunction with the descriptions and statistics appearing in Moody's publications. Reference should be made to these statements for information regarding the issuer. Moody's ratings are not commercial credit ratings. In no case is default or receivership to be imputed unless expressly stated.

***As set forth more fully on the copyright, credit ratings are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, selling or holding.*

Issuer Rating: Corporates and Financial Institutions

Issuer Ratings are opinions of the ability of entities to honor senior unsecured financial obligations and contracts. Moody's rating symbols for Issuer Ratings are identical to those used to indicate the credit quality of long-term obligations.

Counterparty Ratings: Derivatives Product Companies

Issuer ratings assigned to derivative product companies and clearinghouses are opinions of the financial capacity of an obligor to honor its senior obligations under financial contracts, given appropriate documentation and authorizations

Long-Term Obligation Ratings

Moody's long-term obligation ratings are opinions of the relative credit risk of fixed-income obligations with an original maturity of one year or more. They address the possibility that a financial obligation will not be honored as promised. Such ratings reflect both the likelihood of default and any financial loss suffered in the event of default.

Moody's Long-Term Rating Definitions:

Aaa

Obligations rated Aaa are judged to be of the highest quality, with minimal credit risk.

Aa

Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.

A

Obligations rated A are considered upper-medium grade and are subject to low credit risk.

Baa

Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics.

Ba

Obligations rated Ba are judged to have speculative elements and are subject to substantial credit risk.

B

Obligations rated B are considered speculative and are subject to high credit risk.

Caa

Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.

Ca

Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.

C

Obligations rated C are the lowest rated class of bonds and are typically in default, with little prospect for recovery of principal or interest.

Note: Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

Medium-Term Note Ratings

Moody's assigns long-term ratings to individual debt securities issued from medium-term note (MTN) programs, in addition to indicating ratings to MTN programs themselves. Notes issued under MTN programs with such indicated ratings are rated at issuance at the rating applicable to all pari passu notes issued under the same program, at the program's relevant indicated rating, provided such notes do not exhibit any of the characteristics listed below:

- Notes containing features that link interest or principal to the credit performance of any third party or parties (i.e., credit-linked notes);

- Notes allowing for negative coupons, or negative principal;

- Notes containing any provision that could obligate the investor to make any additional payments;

- Notes containing provisions that subordinate the claim.

For notes with any of these characteristics, the rating of the individual note may differ from the indicated rating of the program.

For credit-linked securities, Moody's policy is to "look through" to the credit risk of the underlying obligor. Moody's policy with respect to non-credit linked obligations is to rate the issuer's ability to meet the contract as stated, regardless of potential losses to investors as a result of non-credit developments. In other words, as long as the obligation has debt standing in the event of bankruptcy, we will assign the appropriate debt class level rating to the instrument.

Market participants must determine whether any particular note is rated, and if so, at what rating level. Moody's encourages market participants to contact Moody's Ratings Desks or visit www.moodys.com directly if they have questions regarding ratings for specific notes issued under a medium-term note program. Unrated notes issued under an MTN program may be assigned an NR (not rated) symbol.

Money Market and Bond Fund Ratings

Moody's Money Market and Bond Fund Ratings are opinions of the investment quality of shares in mutual funds and similar investment vehicles which principally invest in short-term and long-term fixed income obligations, respectively. As such, these ratings incorporate Moody's assessment of a fund's published investment objectives and policies, the creditworthiness of the assets held by the fund, as well as the management characteristics of the fund. The ratings are not intended to consider the prospective performance of a fund with respect to appreciation, volatility of net asset value, or yield.

Aaa

Money Market Funds and Bond Funds rated Aaa are judged to be of an investment quality similar to Aaa-rated fixed income obligations -- that is, they are judged to be of the best quality.

Aa

Money Market Funds and Bond Funds rated Aa are judged to be of an investment quality similar to Aa-rated fixed income obligations -- that is, they are judged to be of high quality by all standards.

A

Money Market Funds and Bond Funds rated A are judged to be of an investment quality similar to A-rated fixed income obligations -- that is, they are judged to possess many favorable investment attributes and are considered as upper-medium-grade investment vehicles.

Baa

Money Market Funds and Bond Funds rated Baa are judged to be of an investment quality similar to Baa-rated fixed income obligations -- that is, they are considered as medium-grade investment vehicles.

Ba

Money Market Funds and Bond Funds rated Ba are judged to be of an investment quality similar to Ba-rated fixed income obligations -- that is, they are judged to have speculative elements.

B

Money Market Funds and Bond Funds rated B are judged to be of an investment quality similar to B-rated fixed income obligations -- that is, they generally lack characteristics of a desirable investment.

Caa

Money Market Funds and Bond Funds rated Caa are judged to be of an investment quality similar to Caa-rated fixed income obligations -- that is, they are of poor standing.

Ca

Money Market Funds and Bond Funds rated Ca are judged to be of an investment quality similar to Ca-rated fixed income obligations -- that is, they represent obligations that are speculative in a high degree.

C

Money Market Funds and Bond Funds rated C are judged to be of an investment quality similar to C-rated fixed income obligations -- that is, they are the lowest-rated class of bonds.

Note: Numerical modifiers 1, 2 and 3 may be appended to each rating classification from Aa to Caa. The modifier 1 indicates that the fund or similar investment vehicle ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates that the fund or similar investment vehicle ranks in the lower end of its letter rating category.

National Scale Ratings

Moody's assigns national scale ratings in certain local capital markets in which investors have found the global rating scale provides inadequate differentiation among credits or is inconsistent with a rating scale already in common use in the country.

Moody's currently maintains national scale ratings for the following countries:

-- Argentina (.ar)

-- Bolivia (.bo)

-- Brazil (.br)

--Chile (.cl)

-- Mexico (.mx)

-- Russia (.ru)

-- South Africa (.za)

-- Taiwan (.tw)

-- Uruguay (.uy)

Relative Rankings

Moody's National Scale Ratings are opinions of the relative creditworthiness of issuers and issues within a particular country. While loss expectation will be an important differentiating factor in the ultimate rating assignment, it should be noted that loss expectation associated with National Scale Ratings can be expected to be significantly higher than apparently similar rating levels on Moody's global scale.

Moody's National Scale Ratings rank issuers and issues in order of relative creditworthiness: higher ratings are associated with lower expected credit loss.

Not Globally Comparable

National Scale Ratings can be understood as a relative ranking of creditworthiness (including relevant external support) within a particular country. National Scale Ratings are not designed to be compared among countries; rather, they address relative credit risk within a given country. Use of National Scale Ratings by investors is only appropriate within that portion of a portfolio that is exposed to a given country's local market, taking into consideration the various risks implied by that country's foreign and local currency ratings.

Rating Criteria

National Scale Ratings take into account the intrinsic financial strength of the obligor, including such traditional credit factors as management quality, market position and diversity, financial flexibility, transparency, the regulatory environment, and the issuer's

ability to meet its financial obligations through the course of normal local business cycles. Issuer segments subject to an abrupt decline in creditworthiness will generally be rated lower than segments less exposed. Certain external support factors may be taken into consideration, including instrument-specific guarantees and indentures, and parent company or government support (if any).

Treatment of Sovereign Risk

National Scale Ratings take into account all credit risks that bear on timely and full payment of a debt obligation, including sovereign related risks such as relative vulnerability to political developments, national monetary and fiscal policies, and, in rare cases, foreign currency convertibility and transfer risk.

Certain extreme events, such as a local currency payment system disruption, are largely extraneous to the analysis (at least as a differentiating factor) since all issuers would probably be equally affected by such a failure. In other extreme cases, such as a government rescheduling or moratorium on local or foreign currency debt obligations, issuers or issues with higher ratings should be relatively more insulated from such an event; nonetheless, in such a situation, even the highest-rated entities may be at risk of temporary default.

For this reason, the traditional concept of "investment grade" that is applied in the international markets cannot necessarily be applied even to the highest national ratings. Although national governments are often in a position to receive the highest national credit ratings, it cannot, in Moody's view, be taken for granted that a country's national government is necessarily the best credit on a domestic scale, since it is possible for a government to default on its local currency obligations while other issuers continue to perform.

National Scale Long-Term Rating Definitions

The rating definitions are as follows, with an "n" modifier signifying the relevant country, for example, Aaa.br for Brazil, or Aaa.tw for Taiwan.

Aaa.n

Issuers or issues rated Aaa.n demonstrate the strongest creditworthiness relative to other domestic issuers.

Aa.n

Issuers or issues rated Aa.n demonstrate very strong creditworthiness relative to other domestic issuers.

A.n

Issuers or issues rated A.n present above-average creditworthiness relative to other domestic issuers.

Baa.n

Issuers or issues rated Baa.n represent average creditworthiness relative to other domestic issuers.

Ba.n

Issuers or issues rated Ba.n demonstrate below-average creditworthiness relative to other domestic issuers.

B.n

Issuers or issues rated B.n demonstrate weak creditworthiness relative to other domestic issuers.

Caa.n

Issuers or issues rated Caa.n are speculative and demonstrate very weak creditwor-thiness relative to other domestic issuers.

Ca.n

Issuers or issues rated Ca.n are highly speculative and demonstrate extremely weak creditworthiness relative to other domestic issuers.

C.n

Issuers or issues rated C.n are extremely speculative and demonstrate the weakest creditworthiness relative to other domestic issuers.

Note: *Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.*

National Scale Short-Term Ratings

Moody's short-term national scale debt ratings are opinions of the ability of issuers in a given country, relative to other domestic issuers, to repay debt obligations that have an original maturity not exceeding one year. Moody's short-term national scale ratings are a measure of relative risk within a single market. National scale ratings in one country should not be com-pared with national scale ratings in another, or with Moody's global ratings. Loss expectations for a given national scale rating will generally be higher than for its global scale equivalent.

There are four categories of short-term national scale ratings, generically denoted N-1 through N-4. In each specific country, the first two letters will change to indicate the

country in which the issuer is located, i.e. BR-1 through BR-4 for Brazil and TW-1 through TW-4 for Taiwan.

N-1

Issuers rated N-1 have the strongest ability to repay short-term senior unsecured debt obligations relative to other domestic issuers.

N-2

Issuers rated N-2 have an above average ability to repay short-term senior unse-cured debt obligations relative to other domestic issuers.

N-3

Issuers rated N-3 have an average ability to repay short-term senior unsecured debt obligations relative to other domestic issuers.

N-4

Issuers rated N-4 have a below average ability to repay short-term senior unse-cured debt obligations relative to other domestic issuers.

Note: The short-term rating symbols P-1.za, P-2.za, P-3.za and NP.za are used in South Africa.

Short-Term Ratings

Moody's short-term ratings are opinions of the ability of issuers to honor short-term financial obligations. Ratings may be assigned to issuers, short-term programs or to individual short-term debt instruments. Such obligations generally have an original maturity not exceeding thirteen months, unless explicitly noted.

Moody's employs the following designations to indicate the relative repayment ability of rated issuers:

P-1

Issuers (or supporting institutions) rated Prime-1 have a superior ability to repay short-term debt obligations.

P-2

Issuers (or supporting institutions) rated Prime-2 have a strong ability to repay short-term debt obligations.

P-3

Issuers (or supporting institutions) rated Prime-3 have an acceptable ability to repay short-term obligations.

NP

Issuers (or supporting institutions) rated Not Prime do not fall within any of the Prime rating categories.

Note: Canadian issuers rated P-1 or P-2 have their short-term ratings enhanced by the senior-most long-term rating of the issuer, its guarantor or support-provider.

Speculative Grade Liquidity Ratings

Moody's Speculative Grade Liquidity Ratings are opinions of an issuer's relative ability to generate cash from internal resources and the availability of external sources of committed financing, in relation to its cash obligations over the coming 12 months. Speculative Grade Liquidity Ratings will consider the likelihood that committed sources of financing will remain available. Other forms of liquidity support will be evaluated and consideration will be given to the likelihood that these sources will be available during the coming 12 months. Speculative Grade Liquidity Ratings are assigned to speculative grade issuers that are by definition Not Prime issuers.

SGL-1

Issuers rated SGL-1 possess very good liquidity. They are most likely to have the capacity to meet their obligations over the coming 12 months through internal resources without relying on external sources of committed financing.

SGL-2

Issuers rated SGL-2 possess good liquidity. They are likely to meet their obli-gations over the coming 12 months through internal resources but may rely on external sources of committed financing. The issuer's ability to access committed sources of financing is highly likely based on Moody's evaluation of near-term covenant compliance.

SGL-3

Issuers rated SGL-3 possess adequate liquidity. They are expected to rely on external sources of committed financing. Based on its evaluation of near-term covenant compliance, Moody's believes there is only a modest cushion, and the issuer may require covenant relief in order to maintain orderly access to funding lines.

SGL-4

Issuers rated SGL-4 possess weak liquidity. They rely on external sources of financing and the availability of that financing is, in Moody's opinion, highly uncertain.

Structured Finance Issuer Ratings

Structured Finance Issuer Ratings are opinions of an entity's general financial capacity to ultimately honor its contracts and financial obligations. The opinions are founded upon an expected loss-based assessment of the credit quality of the entity's assets and also incorporate Moody's opinion of the quality of its management and its investment process and strategy. Moody's ratings symbols for Structured Finance Issuer Ratings are identical to those used to indicate the credit quality of long-term obligations. The credit quality of entities that leverage their structured finance asset portfolios is more accurately expressed via a Counterparty Rating for derivatives product companies.

Structured Finance Long-Term Ratings

Moody's ratings on long-term structured finance obligations primarily address the expected credit loss an investor might incur on or before the legal final maturity of such obligations vis--vis a defined promise. As such, these ratings incorporate Moody's assessment of the default probability and loss severity of the obligations. They are calibrated to Moody's Corporate Scale. Such obligations generally have an original maturity of one year or more, unless explicitly noted. Moody's credit ratings address only the credit risks associated with the obligations; other non-credit risks have not been addressed, but may have a significant effect on the yield to investors.

Structured Finance Long-Term Ratings Definitions

Aaa

Obligations rated Aaa are judged to be of the highest quality, with minimal credit risk.

Aa

Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.

A

Obligations rated A are considered upper-medium grade and are subject to low credit risk.

Baa

Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics.

Ba

Obligations rated Ba are judged to have speculative elements and are subject to substantial credit risk.

B

Obligations rated B are considered speculative and are subject to high credit risk.

Caa

Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.

Ca

Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.

C

Obligations rated C are the lowest rated class of bonds and are typically in default, with little prospect for recovery of principal or interest.

Note: Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

US Bank Other Senior Obligation Ratings

Deposit notes, bank notes and bank subordinated notes are bank obligations that are structured to be sold and traded as securities similar to corporate bonds or medium-term notes. As bank obligations, such instruments are exempt from SEC registration (if issued by a US bank or by the US branch of a foreign bank). Deposit notes have the legal status of deposits and will rank *pari passu* in liquidation with certificates of deposit and other domestic deposit obligations. Bank notes, although nominally senior, are not deposit obligations. US law provides that foreign deposits and senior unsecured obligations, including bank notes, will rank behind domestic deposit obligations of US banks in the event of liquidation.

Moody's Other Senior Obligations (OSO) rating definitions parallel those for long-term and short-term obligations, and may be assigned to foreign deposits and International Banking Facility deposits, as well as to other senior non-depository obligations, including bank notes, letter-of-credit supported obligations, federal funds and financial contracts. A rating distinction between domestic deposits and OSOs will be reflected in those cases where there is a material susceptibility for impairment at a future time. Bank subordinated notes will rank behind both domestic deposits and OSOs in a failed bank liquidation. Therefore, Moody's will generally rate the subordinated debt of US banks substantially below the comparable deposit rating.

US Municipal and Tax-Exempt Ratings

Municipal Ratings are opinions of the investment quality of issuers and issues in the US municipal and tax-exempt markets. As such, these ratings incorporate Moody's assessment of the default probability and loss severity of these issuers and issues. The default and loss content for Moody's municipal long-term rating scale differs from Moody's general long-term rating scale. (Please refer to Corporate Equivalent Ratings under Policies and Procedures.)

Municipal Ratings are based upon the analysis of four primary factors relating to municipal finance: economy, debt, finances, and administration/management strategies. Each of the factors is evaluated individually and for its effect on the other factors in the context of the municipality's ability to repay its debt.

Municipal Long-Term Rating Definitions:

Aaa

Issuers or issues rated Aaa demonstrate the strongest creditworthiness relative to other US municipal or tax-exempt issuers or issues.

Aa

Issuers or issues rated Aa demonstrate very strong creditworthiness relative to other US municipal or tax-exempt issuers or issues.

A

Issuers or issues rated A present above-average creditworthiness relative to other US municipal or tax-exempt issuers or issues.

Baa

Issuers or issues rated Baa represent average creditworthiness relative to other US municipal or tax- exempt issuers or issues.

Ba

Issuers or issues rated Ba demonstrate below-average creditworthiness relative to other US municipal or tax-exempt issuers or issues.

B

Issuers or issues rated B demonstrate weak creditworthiness relative to other US municipal or tax- exempt issuers or issues.

Caa

Issuers or issues rated Caa demonstrate very weak creditworthiness relative to other US municipal or tax-exempt issuers or issues.

Ca

Issuers or issues rated Ca demonstrate extremely weak creditworthiness relative to other US municipal or tax-exempt issuers or issues.

C

Issuers or issues rated C demonstrate the weakest creditworthiness relative to other US municipal or tax-exempt issuers or issues.

Note: Moody's appends numerical modifiers 1, 2, and 3 to each generic rating category from Aa through Caa. The modifier 1 indicates that the issuer or obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

US Municipal Short-Term Debt And Demand Obligation Ratings

Short-Term Debt Ratings

There are three rating categories for short-term municipal obligations that are considered investment grade. These ratings are designated as Municipal Investment Grade (MIG) and are divided into three levels -- MIG 1 through MIG 3. In addition, those short-term obligations that are of speculative quality are designated SG, or speculative grade. MIG ratings expire at the maturity of the obligation.

MIG 1

This designation denotes superior credit quality. Excellent protection is afforded by established cash flows, highly reliable liquidity support, or demonstrated broad-based access to the market for refinancing.

MIG 2

This designation denotes strong credit quality. Margins of protection are ample, although not as large as in the preceding group.

MIG 3

This designation denotes acceptable credit quality. Liquidity and cash-flow protection may be narrow, and market access for refinancing is likely to be less well-established.

SG

This designation denotes speculative-grade credit quality. Debt instruments in this category may lack sufficient margins of protection.

Demand Obligation Ratings

In the case of variable rate demand obligations (VRDOs), a two-component rating is assigned; a long or short-term debt rating and a demand obligation rating. The first element represents Moody's evaluation of the degree of risk associated with scheduled principal and interest payments. The second element represents Moody's evaluation of the degree of risk associated with the ability to receive purchase price upon demand ("demand feature"), using a variation of the MIG rating scale, the Variable Municipal Investment Grade or VMIG rating.

When either the long- or short-term aspect of a VRDO is not rated, that piece is designated NR, e.g., Aaa/NR or NR/VMIG 1.

VMIG rating expirations are a function of each issue's specific structural or credit features.

VMIG 1

This designation denotes superior credit quality. Excellent protection is afforded by the superior short-term credit strength of the liquidity provider and structural and legal protections that ensure the timely payment of purchase price upon demand.

VMIG 2

This designation denotes strong credit quality. Good protection is afforded by the strong short-term credit strength of the liquidity provider and structural and legal protections that ensure the timely payment of purchase price upon demand.

VMIG 3

This designation denotes acceptable credit quality. Adequate protection is afforded by the satisfactory short-term credit strength of the liquidity provider and structural and legal protections that ensure the timely payment of purchase price upon demand.

SG

This designation denotes speculative-grade credit quality. Demand features rated in this category may be supported by a liquidity provider that does not have an investment grade short-term rating or may lack the structural and/or legal protections necessary to ensure the timely payment of purchase price upon demand.

Investment Manager Quality Ratings

Moody's Investment Manager Quality ratings represent an assessment of the manner in which an investment manager, either at a company or a business unit level, creates, manages and monitors its investment offerings and serves its clientele. Investment managers are defined as entities whose principal activities involve the management of retail, high net worth and/or institutional assets.

The ratings incorporate Moody's assessment of an entity's investment management activities and other management characteristics, including, as applicable, the performance of its product offerings, its financial profile, and client servicing performance. The scope of Moody's assessment applies to an entity's sphere of operations and may vary somewhat from one operational unit to another.

Moody's Investment Manager Quality ratings do not indicate a company's ability to repay a fixed financial obligation, or satisfy contractual financial obligations either in its own right or any that may have been entered into through actively managed portfolios.

Also, the ratings are not intended to consider the prospective performance of a portfolio, mutual fund or other investment vehicle with respect to appreciation, volatility of net asset value, or yield.

Investment Manager Quality ratings may be assigned to investment management companies and similar entities, public housing authorities (whose principle activity involves administering US Department of Housing and Urban Development funds and managing public housing), or not-for-profit organizations whose principal activity involves administering government funds and managing low income housing.

Investment Manager Quality rating definitions are, as follows:

MQ1

Entities rated MQ1 are judged to exhibit an excellent management and control environment.

MQ2

Entities rated MQ2 are judged to exhibit a very good management and control environment.

MQ3

Entities rated MQ3 are judged to exhibit a good management and control environment.

MQ4

Entities rated MQ4 are judged to exhibit an adequate management and control environment.

MQ5
Entities rated MQ5 are judged to exhibit a questionable-to-poor management and control environment.

Note: A "+" modifier may be appended to the MQ1 rating category to denote the strongest management and control environment.

Lloyd's Syndicate Performance and Volatility Ratings

Moody's Lloyd's Syndicate Performance and Volatility Ratings have been developed in response to the needs of capital providers and insurance purchasers involved with the Lloyd's Market to compare the relative attraction of individual syndicates. The desire to identify those syndicates with the potential to outperform over the medium to long term is coupled with the requirement to identify syndicates with whom insurance purchasers are content to build long-term business relationships. Moody's Lloyd's Syndicate Performance and Volatility Ratings aim to address these needs.

Lloyd's Syndicate Ratings

Qualitative ratings for each syndicate, based on an assessment of both quantitative and qualitative information, indicate Moody's view of the syndicate's relative long-run potential performance based on currently known factors. The ratings are relative to the rest of the syndicates operating in the Lloyd's market. It should be stressed that the ratings do not attempt to assess the security underlying Lloyd's policies.

The syndicate rating is forward looking, only using historical data as a basis for the assessment of the syndicate's future potential. The emphasis is therefore on a given syndicate's potential future performance rather than claims-paying ability.

A+

Lloyd's syndicates rated A+ for performance offer excellent performance and continuity characteristics, with a very high degree of likelihood that their potential future returns will significantly outperform the market average result over the cycle, and a very limited likelihood that their fundamentally strong position will be impaired.

A

Lloyd's syndicates rated A for performance offer very good performance and continuity characteristics, with a high degree of likelihood that their potential future returns will significantly outperform the market average result over the cycle. They are rated lower than A+ because longer-term risks appear somewhat larger.

A-

Lloyd's syndicates rated A- for performance offer good performance and continuity characteristics, with a high degree of likelihood that their potential future returns will outperform the market average result over the cycle.

B+

Lloyd's syndicates rated B+ for performance offer above-average performance and continuity characteristics, with a good degree of likelihood that their potential future returns will outperform the market average result over the cycle.

B

Lloyd's syndicates rated B for performance offer average performance and continuity characteristics, with the likelihood that their potential future returns will be in line with the market average result over the cycle.

B-

Lloyd's syndicates rated B- for performance offer below average performance and continuity characteristics, with it being questionable whether their potential future returns will be in line with the market average result and the likelihood that they will perform below the market average result over the cycle and that they will offer below average continuity prospects to policyholders.

C+

Lloyd's syndicates rated C+ for performance offer below-average performance and continuity characteristics, with a good degree of likelihood that their potential future returns will be below the market average result over the cycle and that they will offer below-average continuity prospects to policyholders.

C

Lloyd's syndicates rated C for performance offer below-average performance and continuity characteristics, with a good degree of likelihood that their potential future returns will be significantly below the market average result over the cycle and that they will offer significantly below-average continuity prospects to policyholders.

C-

Lloyd's syndicates rated C- for performance offer below-average performance and continuity characteristics, with a high degree of likelihood that their potential future returns will be significantly below the market average result over the cycle and that they will offer significantly below-average continuity prospects to policyholders.

Lloyd's Volatility Ratings

The volatility rating indicates Moody's view of the potential variability of a syndicate's underwriting returns over the insurance cycle based on the historical variability of pure year underwriting returns and the potential for catastrophe losses in the book currently underwritten, the ratings being relative to the rest of the syndicates operating in the Lloyd's market.

Extremely High

Lloyd's syndicates rated Extremely High for volatility demonstrate the potential for returns to vary significantly from their mean due to the nature of the book of business written. Syndicates in the Extremely High rating category include all those syndicates demonstrating potential volatility in their returns that is in excess of the six relative rating categories of Low to Very High, this category not being relative on an absolute basis to the underlying rating categories.

Very High, High, Above Average, Average, Below Average

Lloyd's syndicates rated in these categories are considered to demonstrate the potential for their returns to be respectively up to two, three, four, five and six times more variable than those syndicates in the Low rating category, due to the nature of the book of business written.

Low

Lloyd's syndicates rated Low for volatility demonstrate the lowest potential for returns to vary from their mean, relative to the other syndicates trading at Lloyd's, due to the nature of the book of business written.

Market Risk Ratings

Moody's Mutual Fund Market Risk (MR) ratings are opinions of the relative degree of volatility of a rated fund's net asset value (NAV). In forming an opinion on the fund's future price volatility, Moody's analysts consider risk elements that may have an effect on a fund's net asset value, such as interest rate risk, prepayment and extension risk, liquidity and concentration risks, currency risk, and derivatives risk. The ratings are not intended to reflect the prospective performance of a fund with respect to price appreciation or yield.

MR1

Money Market Funds and Bond Funds rated MR1 are judged to have very low sensitivity to changing interest rates and other market conditions.

MR2

Money Market Funds and Bond Funds rated MR2 are judged to have low sensitivity to changing interest rates and other market conditions.

MR3

Money Market Funds and Bond Funds rated MR3 are judged to have moderate sensitivity to changing interest rates and other market conditions.

MR4

Money Market Funds and Bond Funds rated MR4 are judged to have high sensitivity to changing interest rates and other market conditions.

MR5

Money Market Funds and Bond Funds rated MR5 are judged to have very high sensitivity to changing interest rates and other market conditions.

Note: *A "+" modifier appended to the MR1 rating category denotes constant NAV money market funds and other qualifying funds.*

Portfolio Investment Quality Ratings

Moody's Portfolio Investment Quality Ratings reflect diverse quantitative and qualitative factors affecting a fund's portfolio. These include evaluating the impact of economic trends, assessing asset quality, portfolio diversification and performance, and liquidity management.

Moody's employs a "top down and bottom up approach" when assigning Portfolio Investment Quality Ratings. Moody's will first start with a macro analysis -- examining broad economic trends -- before assessing both the supply and demand fundamentals as well as the competitive position of the assets in the fund.

The "bottom up" approach involves evaluating asset quality and moving to an examination of portfolio characteristics before drawing conclusions about overall risk profile and returns.

The ratings are not intended to consider the prospective performance of a portfolio, mutual fund or other investment vehicle with respect to appreciation, volatility of net asset value, or yield.

When used in conjunction with Management Quality Ratings, the two ratings will be separated by a fraction bar ("/").

Aaa(IQ)

Portfolios rated Aaa(IQ) are judged to have excellent investment quality.

Aa(IQ)

Portfolios rated Aa(IQ) are judged to have very good investment quality.

A(IQ)

Portfolios rated A(IQ) are judged to have good investment quality.

Baa(IQ)

Portfolios rated Baa(IQ) are judged to have adequate investment quality.

Ba(IQ)

Portfolios rated Ba(IQ) are judged to have questionable investment quality.

B(IQ)

Portfolios rated B(IQ) are judged to have poor investment quality.

Note: *Numerical modifiers 1, 2 and 3 may be appended to each rating classification from Aa(IQ) to B(IQ). The modifier 1 indicates that the portfolio ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates that the portfolio ranks in the lower end of its letter rating category.*

Real Estate Portfolio Cash Flow Volatility Ratings

Moodys Real Estate Portfolio Cash Flow Volatility Ratings represent opinions about the risks in real estate funds regarding cash flow volatility. Cash flow is defined here as Net Operating Income (NOI) generated by a portfolio. Volatility is assessed quantitatively from a property database at Moody's Japan, taking into consideration individual real estate property characteristics and portfolio diversity effects. The ratings are Japanese domestic ones and used only in the domestic market. They do not represent the risks regarding property value volatility. As assessments of an existing portfolio, they are not monitored.

CFV-1 Portfolios rated CFV-1 are judged to have the most stable NOI, with minimal cash flow volatility risk.

CFV-2 Portfolios rated CFV-2 are judged to have stable NOI, with low cash flow volatility risk.

CFV-3 Portfolios rated CFV-3 are judged to have moderate cash flow volatility risk.

CFV-4 Portfolios rated CFV-4 are judged to have substantial cash flow volatility risk.

CFV-5 Portfolios rated CFV-5 are judged to have high cash flow volatility risk.

Note: A "+" and "-" modifier may be appended to each rating classification from CFV-2 to CFV-5. The "+" modifier indicates that the portfolio ranks at the higher end of its generic rating category; and the "-" modifier indicates that it ranks at the lower end of its letter rating category. Ratings without modifiers indicate a mid-range ranking.

Servicer Quality Ratings

Moody's Servicer Quality (SQ) ratings are opinions of the ability of a servicer to prevent or mitigate losses in a securitization. SQ ratings are provided for servicers who act as the Primary Servicer (servicing the assets from beginning to end), Special Servicer (servicing

only the more delinquent assets), or Master Servicer (overseeing the performance and reporting from underlying servicers). For Primary Servicers, each SQ rating is assigned to a specific asset type.

SQ ratings represent Moody's assessment of a servicer's ability to affect losses based on factors under the servicer's control. The SQ approach works by separating a servicer's performance from the credit quality of the assets being serviced. In doing this, Moody's evaluates how effective a servicer is at preventing defaults and maximizing recoveries to a transaction when defaults occur.

SQ ratings consider the operational and financial stability of a servicer as well as its ability to respond to changing market conditions. This assessment is based on the company's organizational structure, management characteristics, financial profile, operational controls and procedures as well as its strategic goals.

Moody's SQ ratings are different from traditional debt ratings, which are opinions as to the credit quality of a specific instrument. SQ ratings do not apply to a company's ability to repay a fixed financial obligation or satisfy contractual financial obligations other than, in limited circumstances, the obligation to advance on delinquent assets it services, when such amounts are believed to be recoverable.

Rating Definitions

SQ1 **Strong** combined servicing ability and servicing stability

SQ2 **Above average** combined servicing ability and servicing stability

SQ3 **Average** combined servicing ability and servicing stability

SQ4 **Below average** combined servicing ability and servicing stability

SQ5 **Weak** combined servicing ability and servicing stability

Where appropriate, a "+" or "-" modifier will be appended to the SQ2, SQ3, and SQ4 rating category and a "-" modifier will be appended to the SQ1 rating category. A "+" modifier indicates the servicer ranks in the higher end of the designated rating category. A "-" modifier indicates the servicer ranks in the lower end of the designated rating category.

Trustee Quality Ratings

Moody's Trustee Quality (TQ) Ratings are opinions regarding an organization's ability to manage the entrusted assets for the benefit of investors, relative to other trustees or common representatives within a given country. The ratings represent Moody's assessment of a trustee's organizational structure and other management characteristics, including its monitoring and reporting system, human resources allocation, information technology, operational controls and procedures, and master servicing capability.

The rating definitions are as follows, with an "nn" modifier signifying the relevant country, for example, TQ1.ar for Argentina, or TQ4.mx for Mexico. Moody's currently maintains trustee quality ratings for the following countries:

Argentina (TQ.ar)
Brazil (TQ.br)
Mexico (TQ.mx)

TQ1.nn
Strong management capability of entrusted assets for the benefit of the trust certificate holders.
TQ2.nn
Above-average management capability of entrusted assets for the benefit of the trust certificate holders. Trustee is judged to have "good" financial and operational stability.
TQ3.nn
Average management capability of entrusted assets for the benefit of the trust certificate holders. Trustee is judged to have average financial and operational stability.
TQ4.nn
Elements of weakness in management capability of entrusted assets for the benefit of the trust certificate holders, and in financial and operational stability.
TQ5.nn
Poor management capability of entrusted assets for the benefit of the trust certificate holders, and weak financial and operational stability.

Affirmation of a Rating

Affirmations are used to indicate that the current rating remains in force. Affirmations are communicated through a press release and may occur:

-- following an informal review

-- following the release of new information by the issuer

-- following a major market event (such as regulatory changes, a major acquisition, and/or market turbulence, etc.)

-- in conjunction with an Outlook change

There may be other situations in which ratings are affirmed.

Conditional Rating (*)

Bonds for which the security depends on the completion of some act, or the fulfillment of some condition, are rated conditionally. These are bonds secured by a) earnings of projects under construction, b) earnings of projects unseasoned in operation experience, c) rentals which begin when facilities are completed, or d) payments to which some other limiting condition attaches. The parenthetical rating denotes probable credit stature upon completion of construction or elimination of the basis of the condition.

Confirmation of a Rating

A confirmation occurs when a rating is removed from Watchlist.

Rating confirmations are formally entered in Moody's databases and rating action lists (rating release sheets), and are communicated via a press release.

Corporate Equivalent Ratings

Corporate Equivalent Ratings may be assigned to municipal bond obligations issued into taxable bond markets. Such ratings represent an assessment of creditworthiness as measured against Moody's General Long-term Obligation rating scale and provide a translation between the municipal and general rating scales.

Estimated Ratings

Estimated ratings are one-time opinions of the approximate credit quality of individual securities or financial contracts. They are opinions about overall credit quality and are generally used in conjunction with a securitization and as a precursor to indicative ratings.

Expected Ratings Indicator

To address market demand for timely information on particular types of credit ratings, Moody's has licensed to certain third parties the right to generate "Expected Ratings." Expected Ratings are designated by an "e" after the rating code, and are intended to anticipate Moody's forthcoming rating assignments based on reliable information from third party sources (such as the issuer or underwriter associated with the particular securities) or established Moody's rating practices. Expected Ratings will exist only until Moody's assigns a rating to the instrument. For Medium-Term Notes (MTNs), Expected Ratings indicate that Moody's is awaiting confirmation of details related to a specific drawdown or note from a principal in the transaction. Medium-Term notes are typically, but not always, assigned the same rating as the note's program rating. Consistent with Moody's rating practices, the specific rating assigned to an MTN drawdown will be the same as the program rating, unless the security has certain credit-linked or other differentiating characteristics. Please refer to Moody's current rating definition for details. Market participants may contact Moody's Ratings Desk or visit www.moodys.com if they have questions regarding Expected Ratings.

Indicative Ratings

Indicative ratings are one-time opinions of the credit quality of individual securities or financial contracts that may be issued in the future, based on draft documentation and discussions early in the rating process. These ratings consider the general credit quality of the issuer as well as the specific attributes of the instrument. Indicators are communicated to the requesting party as a narrow range of ratings with the degree of specificity defined by the requesting party.

Internal Ratings

Moody's internal ratings are unpublished credit assessments assigned to certain securities and issuers where the underlying credit components are not publicly rated but need to be evaluated to support other published ratings.

Not Available

An issue that Moody's has not yet rated is denoted by the NAV symbol.

Not Rated

The symbol NR is assigned to unrated obligations, issuers and/or programs.

Provisional Ratings

As a service to the market and typically at the request of an issuer, Moody's will assign a provisional rating when it is highly likely that the rating will become final after all documents are received, or an obligation is issued into the market. A provisional rating is denoted by placing a (P) in front of the rating. Such ratings may also be assigned to shelf registrations under SEC rule 415.

Rating Outlooks

A Moody's rating outlook is an opinion regarding the likely direction of a rating over the medium term. Where assigned, rating outlooks fall into the following four categories: Positive (POS), Negative (NEG), Stable (STA), and Developing (DEV -- contingent upon an event). In the few instances where an issuer has multiple outlooks of differing directions, an "(m)" modifier (indicating multiple, differing outlooks) will be displayed, and Moody's written research will describe any differences and provide the rationale for these differences. A RUR (Rating(s) Under Review) designation indicates that the issuer has one or more ratings under review for possible change, and thus overrides the outlook designation. When an outlook has not been assigned to an eligible entity, NOO (No Outlook) may be displayed.

Refundeds

Issues that are secured by escrowed funds held in trust, reinvested in direct, non-callable US government obligations or non-callable obligations unconditionally guaranteed by the US Government or Resolution Funding Corporation are identified with a # (hatch mark) symbol, e.g., #Aaa.

Terminated Without Rating

The symbol TWR applies primarily to issues that mature or are redeemed without having been rated.

Underlying Ratings

An underlying rating is Moody's published assessment of a particular debt issue's credit quality absent credit enhancement. Moody's will assign and publicly release an

underlying rating requested by an issuer for debt that is entirely credit enhanced. The rating scale is identical to the one used for Moody's long-term obligation ratings.

Watchlist

Moody's uses the Watchlist to indicate that a rating is under review for possible change in the short-term. A rating can be placed on review for possible upgrade (UPG), on review for possible downgrade (DNG), or more rarely with direction uncertain (UNC). A credit is removed from the Watchlist when the rating is upgraded, downgraded or confirmed.

Withdrawn

When Moody's no longer rates an obligation on which it previously maintained a rating, the symbol WR is employed. . Please see *Moodys Guidelines for the Withdrawal of Ratings*, available on www.moodys.com.

Appendix 2

A "Universal" Approach to Credit Analysis

Because it involves a look into the future, credit rating is by nature subjective. Moreover, because long-term credit judgments involve so many factors unique to particular industries, issuers, and countries, we believe that any attempt to reduce credit rating to a formulaic methodology would be misleading and would lead to serious mistakes.

That is why Moody's uses a multidisciplinary or "universal" approach to risk analysis, which aims to bring an understanding of *all* relevant risk factors and viewpoints to every rating analysis. We then rely on the judgment of a diverse group of credit risk professionals to weigh those factors in light of a variety of plausible scenarios for the issuer and thus come to a conclusion on what the rating should be. Several analytical principles guide that reasoning process.

Some Basic Principles

Emphasis on the Qualitative: Quantification is integral to Moody's rating analysis, particularly since it provides an objective and factual starting point for each rating committee's analytical discussion. Those who wish further information on the numerical tools we use may consult our written research on industries and specific issuers.

However, Moody's ratings are not based on a defined set of financial ratios or rigid computer models. Rather, they are the product of a comprehensive analysis of each individual issue and issuer by experienced, well-informed, impartial credit analysts.

Focus on the Long-Term: Since Moody's ratings are intended to measure long-term risk, our analytical focus is on fundamental factors that will drive each issuer's long-term ability to meet debt payments, such as a change in management strategy or regulatory trends. As a rule of thumb, we are looking through the next economic cycle or longer.

Because of this, our ratings are not intended to ratchet up and down with business or supply-demand cycles or to reflect last quarter's earnings report. In our view it would be punitive to rate a security conservatively because of poor short-term performance if we believe the issuer will recover and prosper in the long-term.

Global Consistency: Our approach incorporates several checks and balances designed to promote the universal comparability of rating opinions. Internationally, ratings are normally limited to the sovereign ceiling rating of the nation in which the issuer is domiciled. Our analytical team approach also supports consistency by including Moody's directors, along with global industry specialists and analysts with regional and other perspectives, in every rating decision.

Level and Predictability of Cash Flow: In every sector, the foundation of Moody's rating approach rests on the answer to one question: What is the level of risk associated with receiving full and timely payment of principal and interest on this specific debt obligation and how does that risk compare with that of all other debt obligations?

When we speak of "risk to timely payment," we are measuring the ability of an issuer to generate cash in the future. Our analysis focuses, therefore, on an assessment of the level

and predictability of an issuer's future cash generation in relation to its commitments to repay debtholders.

Our main emphasis throughout the rating analysis is on understanding strategic factors likely to support future cash flow, while identifying critical factors that will inhibit future cash flow. The issuer's capacity to respond favorably to uncertainty is also key. Generally, the greater the predictability of an issuer's cash flow and the larger the cushion supporting anticipated debt payments, the higher the rating will be.

Reasonably Adverse Scenarios: In coming to a conclusion, rating committees routinely examine a variety of scenarios. Moody's ratings deliberately do not incorporate a single, internally consistent economic forecast. They aim rather to measure the issuer's ability to meet debt obligations against economic scenarios reasonably adverse to the issuer's specific circumstances.

"Seeing Through" Local Accounting Practices: Moody's analysts deal frequently with different accounting systems internationally; we are not bound to any particular one. For the purpose of fixed-income analysis, we regard them as languages with differing strengths and weaknesses.

In examining financial data, Moody's focuses on understanding both the economic reality of the underlying transactions and on how differences in accounting conventions may -- or may not -- influence true economic values. For example, in the analysis of assets the concern is with their relative ability to generate cash, not with the value as stated on a balance sheet.

Sector-Specific Analysis

Specific risk factors likely to be weighed in a given rating will vary considerably by sector. In the following sections, we provide a very rough outline of typical rating considerations for two types of issuers: an industrial enterprise and a structured financing.

Moody's publishes more in-depth overviews of our rating approach for each of these sectors and many others -- e.g., sovereign nations, sub-national governments, public utilities, banks, insurance companies, mutual funds, and project financings, along with general obligation bonds and revenue bonds issued by U.S. municipalities. For further information, please contact Moody's directly.

Appendix 3

Moody's Investors Service
Global Credit Research

May 2002

Special Comment

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Rating Policy

Understanding Moody's Corporate Bond Ratings And Rating Process

This Special Comment is the third installment of Moody's commentary about the rating process. It was written following extensive consultation with market participants in connection with Moody's previous Special Comments: *The Bond Rating Process in a Changing Environment* and *The Bond Rating Process: A Progress Report.*[1]

Introduction

Earlier this year, we suggested a number of possible changes to our rating process. We indicated that we would make no changes until after we had engaged in extensive market dialog, which we have done over the last four months.

From these discussions, we determined that market participants support greater disclosure by Moody's of how we arrive at our ratings and why we change them. They also have heightened expectations about the role of rating agencies as vehicles for greater issuer transparency and disclosure, including disclosure of short-term liquidity positions and conditional obligations, such as those with rating triggers.

However, participants strongly oppose some of the possible changes we suggested: increasing the frequency of rating changes without reviews; and streamlining rating outlooks, or even eliminating them. Market participants strongly oppose these changes because they generally desire ratings stability, and they believe such changes would increase ratings volatility. They want ratings to be a view of an issuer's relative fundamental credit risk, which they perceive to be a stable measure of intrinsic financial strength.

We accept the views that we have received and will endeavor to manage our rating process to make it most useful to market participants. We will also strive towards creating greater transparency in our ratings. We will continue to manage our rating system to produce stable long-term ratings, recognizing, however, that in periods of heightened credit stress, ratings have historically been adjusted more frequently.

1. *The Bond Rating Process in a Changing Environment*, January 2002; *The Bond Rating Process: A Progress Report*, February 2002.

continued on page 3

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We have also learned from our dialog that there is incomplete market understanding of some aspects of how we manage the rating process, of the intended meaning of Moody's ratings, and of their empirical behavior. We believe that the primary social value, or public good, that rating agencies can produce is greater efficiency in capital markets. In order to contribute to such efficiency, we need to clearly communicate how we will behave in the markets and how our ratings will behave. This Special Comment provides important additional information that we believe will assist the markets in understanding our behavior and our ratings.

This Special Comment first summarizes our recent dialog with market participants, then it sets forth a number of important principles that govern how Moody's conducts its ratings process. Finally, it comments on the intended meaning of Moody's ratings and their empirical behavior.

Dialog with Market Participants

In January 2002, Moody's published a Special Comment (*The Bond Rating Process in a Changing Environment*) that discussed a number of initiatives intended to enhance the quality and timeliness of our ratings and research. These initiatives included:

- Providing Moody's analysts with information about the market's opinion of an issuer's creditworthiness;
- Conducting a census of rating triggers in the contractual agreements of rated issuers;
- Providing an in-depth analysis of the liquidity risk profiles of commercial paper issuers; and
- Considering measures intended to improve rating timeliness, including shortening rating reviews, quicker reaction to material events, increased incidence of rating changes without formal reviews, and streamlining, or eliminating, rating outlooks.

The Special Comment emphasized that "we will not make material changes to our rating process, nor will we move forward with any proposal without extensive market dialog."

In February 2002, Moody's published a second Special Comment (*The Bond Rating Process, A Progress Report*), that summarized preliminary market opinion and our responses to that opinion.

Over the past three months, Moody's held over 35 meetings with issuer organizations, investors, asset management firms, regulators and other market participants to discuss the role of ratings. The meetings coincided with the publication of the two Moody's Special Comments on the rating process.

Summary of Participants' Responses

Moody's summarizes market participants' responses to our request for comment as follows:

- Market participants desire ratings stability. They want ratings to be a view of an issuer's fundamental credit risk, which they perceive to be a relatively stable measure of intrinsic financial capacity compared with other, more market-sensitive measures.
- Market participants are concerned that the use of quantitative inputs to the rating process will lead to greater volatility based upon transient market sentiment.
- Market participants want to know more about how we arrive at our rating conclusions, and they want us to disclose important considerations underlying changes in ratings.
- Market participants have heightened expectations about the role of rating agencies as vehicles for greater issuer transparency and disclosure. Investors desire that rating agencies demand nonpublic information from issuers and that they dig into it in a more forensic manner.

How Moody's Interprets This Feedback

Among our interpretations of the commentary are:

- The bond rating system remains very important to investor and issuer thinking and behavior.
- Rating stability is highly valued by market participants.
- Investors follow and react to multiple aspects of the rating system—e.g., rating outlooks and the Watchlist—for indications of potential changes in credit quality.

- For some investors, ratings are important as one credit diagnostic—the long-term fundamental credit perspective—of a broader, more holistic portfolio credit-management process.
- Some investors (especially total-return investors) care about ratings less as real-time inputs to buy/sell decisions and more because of internal or third-party-imposed portfolio guidelines; as a result, they highly value rating stability to avoid unexpected portfolio revisions.
- Because rating agency behavior is believed to influence security prices, investors exert considerable effort to anticipate rating changes.

Accordingly, we have confirmed that market participants use bond ratings for both long-term fundamental credit analysis and for portfolio governance. Moody's traditional management of the rating system has facilitated these uses for multiple purposes. Yet, these multiple uses have important ramifications for the behavior and performance of ratings, and both Moody's and users of Moody's ratings must consider how these uses might affect the utility of ratings for purposes other than those intended.

Our goal is to be as transparent as possible about the intended meaning of our ratings in order to minimize any misunderstanding about what we do, so that our behavior can promote efficiency in debt capital markets.

How Moody's Conducts Its Corporate Bond-Rating Activities

There are several core principles that set forth how Moody's acts which should be well-understood by all market participants.

1. *Effect of commercial relationship*: the level of rating that Moody's assigns to an issuer is affected neither by the existence of a commercial relationship between Moody's and the issuer, nor by the nature of that commercial relationship.
2. *Judicious rating process*: because of the potential importance of the rating to the issuer and investor, Moody's carefully and deliberately considers all information relevant to the issuer's rating that the issuer and its advisors present to us. Moody's understands that its ratings can potentially become self-fulfilling forecasts. In the case of upgrades, that can mean greater capital market access and interest cost savings for issuers, and improved securities prices for investors. In the case of downgrades, it can mean higher capital costs for issuers, and portfolio turnover and losses for investors; most dramatically, however, it can terminate an issuer's access to capital, possibly even leading to default. Especially in the case of downgrades, the potentially self-fulfilling nature of ratings requires that Moody's particularly endeavor to avoid "false" negative predictions. Moody's recognizes the views of investors, issuers and intermediaries that we should be cognizant of the potentially damaging consequences of our decisions. Accordingly, while Moody's will not forbear in reaching and disclosing rating opinions, we will conduct the ratings process judiciously, and may tolerate some delays in the ratings process to make sure that relevant information is considered. Nevertheless, if an issuer proposes to bring securities to market before a rating process would normally be concluded, Moody's may accelerate provision of a rating based on the best information that Moody's has at the time.
3. *Effect of a rating action on an issuer*: Moody's will proceed with issuing or changing a rating, notwithstanding the effect of the rating action on the issuer, including the possible effect on the issuer's market access or conditional obligations. The level of rating that Moody's assigns to an issuer that might experience potential changes in market access or conditional obligations will reflect Moody's assessment of the issuer's creditworthiness, including such considerations.
4. *Rating triggers*: Rating triggers — especially if near an existing rating and requiring significant remedies, such as repayments or posting of collateral — can severely restrict a company's available outcomes and create additional volatility in a company's creditworthiness. The use of ratings in triggers can make the rating a causal element of a company's creditworthiness. In managing the rating system, Moody's will treat rating triggers as we would other elements of "conditionality" such as stock-price triggers or material adverse-change clauses. To the extent that these elements of conditionality are consequential to a company's future creditworthiness (or even viability), Moody's acts as judiciously as possible in reaching a rating conclusion. We do not, however, forbear, or allow a company's use of our ratings, to delay rating actions. The three key elements of Moody's rating system management as applied to rating triggers are:

Awareness. Moody's is working to be as comprehensively aware of rating triggers and other material elements of contingent claims as possible for all rated issuers.[2] Depending on their potential consequences, and if we are not aware of rating triggers, we may not be able to reach sound analytical judgments.

Analysis. Moody's will have refined, consistent views on the implications and consequences of rating triggers, especially in areas where Moody's is not involved in their creation (e.g., not involving Moody's Structured Finance department) and where utilization may be rapidly evolving.

Disclosure and Discussion. We will strive to make the results of our analysis known — first, to the issuer and banker, and, second, to the market. Market disclosure is subject, however, to respecting the confidentially of non-public information disclosed to us by the issuer or its agents.

5. *Ratings as forecasts with uncertainty*: Moody's rating is an opinion forecast of an issuer's future relative creditworthiness. Moody's acknowledges that, as in the case of any forecast, there can be a range of actual outcomes and a range of uncertainty about the forecast. If Moody's perceives that an issuer faces a highly restricted set of outcomes that are quite different from each other (as may occur in mergers, or for issuers with very substantial conditional obligations), Moody's will normally assign a rating based on its perception of the most likely outcome; in such cases, Moody's will not normally assign a rating based simply on a probability weighting of the outcomes. Subject to respecting the confidentiality of non-public information disclosed to us by the issuer or his agents, Moody's will endeavor to explain the rationale for such ratings as clearly as possible. In cases where there may be important changes in rating levels based on contingent outcomes, Moody's will further endeavor to explain the degree of possible future rating changes and will include some indication of how likely it views each outcome to be. *This is a new policy for Moody's, and reflects comments made by investors, who would like greater transparency in this area.*
6. *Confidential Non-Public Information*: Moody's will use confidential non-public information that issuers provide to Moody's only for the purpose of assigning ratings. Moody's will not, without the permission of the issuer, disclose the information in the press release or other research reports published in connection with the rating, or in discussions between Moody's analysts and investors, or other issuers. Such information may, however, be disclosed as a result of legal processes. Moody's believes that the efficiency of capital markets is best served by permitting issuers to disclose to rating agencies material non-public information for use solely in rating decisions. If public policy favors broader disclosure of such non-public information that could reasonably be expected to have an effect on rating decisions, Moody's believes that authorities would require that issuers make public disclosure of such information, rather than utilizing rating agencies as the vehicle for such disclosure.

Moody's Corporate Bond Ratings

Moody's ratings are opinions of future relative creditworthiness, derived by fundamental credit analysis and expressed through the familiar Aaa-C symbol system. Fundamental credit analysis incorporates an evaluation of franchise value, financial statement analysis, and management quality. It seeks to predict the credit performance of bonds, other financial instruments, or firms across a range of plausible economic scenarios, some of which will include credit stress.

Credit ratings provide objective, consistent and simple measures of creditworthiness. As such, they improve the flow of information between institutional borrowers (issuers) and lenders (investors). Generally, institutional borrowers know more about their companies than do their lenders. Moody's helps to reduce this asymmetry of information. Ratings, thereby, increase the potential market for issuers' obligations. Ratings also reduce investors' costs of gathering, analyzing, and monitoring the financial positions of borrowers because rating agencies provide scale economies and specialization in performing these functions. Accordingly, credit ratings, in aggregate, lower the costs of borrowing and lending and increase overall market efficiency for both issuers and investors.

2. Moody's cannot, however, force an issuer to disclose the nature or extent of its use of rating triggers. If an issuer determines that public disclosure pursuant to securities laws is not required, and does not otherwise reply to Moody's inquiries about its use of rating triggers, neither Moody's nor investors will have a complete view of the issuer's credit profile.

Beyond this core function, ratings have also come to serve many other uses. Savers, and the institutions that intermediate savings, rely on ratings to minimize costs associated with monitoring the risks taken by investment managers and as benchmarks for determining investment manager performance. Investors and counterparties embed ratings as triggers into private contracts in order to protect themselves from potential deterioration in the creditworthiness of an obligor's financial position. Regulators and lawmakers utilize ratings to measure and limit risks taken by regulated entities, including capital requirements to protect bank depositors, insurance beneficiaries, and taxpayers from unnecessary costs. Many of these uses are predicated on ratings behaving according to certain well-established patterns.

In order to promote a clearer understanding of the signals conveyed by ratings — as well as by rating outlooks and the Watchlist, which are included in Moody's rating system — we explain in the following sections the intended meaning of Moody's corporate bond ratings and their empirical behavior. Our dialog with the market suggests that improved transparency around the formation and meaning of ratings may help users better utilize them in their investment decisions. The following sections describe Moody's view of the usefulness of ratings, sets forth a summary of the established patterns of the behavior of our ratings, and discusses some of the issues raised by investors and others in the wake of recent credit defaults by large issuers. We also comment on how market participants expect our ratings to behave in view of the multiple uses of ratings that are common in debt markets.

Fundamental Credit Analysis

Credit analysis consists of opinion forecasts (predictions) about the probability that an obligor will make promised payments. Because differences in recovery rates (as a percent of principal owed) strongly affect investment outcomes, our analysis also addresses loss severity. The analytic output can be expressed as default (or expected loss) probabilities over a range of horizons, or as simple, ordinal groupings such as bond ratings. There is an expectation that ratings will, on average, relate to subsequent default frequency, although they typically are not defined as precise default rate estimates. Moody's ratings are therefore intended to convey opinions of the relative creditworthiness of issuers and obligations. This relative ranking of issuers and their obligations is based on time-tested, fundamental principles of credit analysis. [3]

A rating analyst relates patterns of financial behavior (including many subjective factors, such as the quality of management) with subsequent default or loss experience. Certain financial patterns (for example, in leverage, coverage, liquidity or profitability) have been found to be associated with subsequent default and loss experience, which are then classified into our rating categories.

Moody's ratings process also involves forming views about the likelihood of plausible scenarios, or outcomes—not forecasting them, but instead placing some weight on their likely occurrence and on the potential credit consequences.[4] Normal fluctuations in economic activity are generally included in these scenarios, and by incorporating our views about the likelihood of such scenarios, we give our ratings relative stability over economic cycles and a sense of "horizon." Otherwise, we would change ratings as a result of reasonably foreseeable changes in the macro economy, in the industry, or in financial ratios.

Understanding The Ratings System

The value of a credit rating system is maximized through wide coverage of issuers and wide dissemination of ratings. Just as important, however, is that users of bond ratings understand the non-rating signals that have become standard features of the rating system. Non-rating signals, such as rating outlooks and the Watchlist, have evolved to meet investors' needs for an indication of the likely direction of future rating actions.

Moody's has developed processes and procedures that insure that our opinions reflect relative fundamental credit risk. While financial data (and markets) can, and do, change frequently, the prevailing view is that creditworthiness, particularly for higher-rated firms, is an intrinsic feature of an issuer that generally takes time to change. Most market participants would argue (rightly or wrongly) that a rating reversal — an upgrade followed by a downgrade, or a downgrade followed by an upgrade — over, for example, a three-month period — would be evidence of a rating "mistake."

3. Moody's publishes rating methodologies for nearly all rated sectors. See *Moody's Rating Methodology Handbook*, February 2001.
4. As previously stated, when potential scenarios are for some reason reduced to a highly restricted set of outcomes—e.g. that either a company will fail or will survive with investment-grade characteristics—we choose a rating consistent with only one of the outcomes, rather than assign an average of the ratings. This is particularly true in merger/acquisition situations and when "rating triggers" might force an outcome inconsistent with the average rating.

Moreover, the potentially self-fulfilling nature of ratings creates a strong bias against "false" negative predictions (compared with other credit measurement systems) because ratings themselves can be causal, either because of market reactions to rating changes or because of the use of ratings in agreements between the issuer and investors or other parties (rating triggers).[5] This is not because rating agencies perform their roles improperly or differently than in the past; it is in fact the opposite — that their track record and objectivity causes markets to react to rating changes to the point where additional signals (rating outlooks and the Watchlist) and careful deliberation are demanded.

A rating outlook, expressed as positive, stable, or negative, provides an opinion regarding the likely direction of any medium-term rating actions, typically based on an 18-month horizon. Nearly all rated investment-grade companies have a rating outlook assigned to them, and a change in rating outlook can be determined by a formal rating committee or by approval of the lead analyst and a Managing Director. Historically, Moody's has not systematically tracked the relationship between rating outlooks and subsequent rating changes, but we have heard significant market interest in our doing so. Moody's plans to respond to this interest and will publish such findings in the future.

If changing circumstances contradict the assumptions or data supporting the current rating, we will place the rating under review (on the Watchlist). The Watchlist highlights issuers (or debt obligations) whose rating is formally on review for possible upgrade, downgrade, or direction uncertain. At the conclusion of a review, typically within 90 days of placement on the Watchlist, we will determine whether the risks and expected loss are still consistent with the assigned rating. Although the Watchlist is not a guarantee or commitment to change ratings over a certain time horizon — or even to change them at all — historically, between 66% and 76% of all ratings have been changed in the same direction (and rarely in the opposite direction) as indicated by their Watchlist review. [6]

A formal rating committee is normally required to place an issuer on the Watchlist, and a separate rating committee is needed to take the issuer off the Watchlist, either by changing or confirming the current rating. In most cases, members of the rating committee will meet with a firm's management after it is placed on the Watchlist. The information gained at this meeting can form the basis for the confirmation of the rating or a rating change.

These practices impart a deliberate, and often serial, behavior to rating changes, and they sometimes limit the information content of individual rating changes. Our discussions with users of ratings, however, indicate that, despite criticism about rating timeliness, investors and other users prefer the system as it currently operates. The market does not look to ratings primarily as buy/sell signals, and does not want ratings to be pro-cyclical or add to market volatility. Our challenge is to increase the information content of ratings without adding unnecessarily to market volatility.

Empirical Results From Moody's Ratings and Ratings Process

Moody's bond ratings are predictions of relative creditworthiness, which can be defined as a relative expected-loss rate. Expected loss rates, in turn, are the product of expected default rates and expected loss-severity rates in the event of default. Our annual reviews of corporate bond defaults and recoveries on defaulted bonds provide an after-the-fact analysis of our ratings and summarize the empirical outcomes of our rating definitions and our rating system-management practices. These findings are supplemented with a variety of periodic research reports on rating transitions, default rate forecasts, tests for rating consistency, and loss severity in the event of default. (A bibliography of this research appears at the end of this document.)

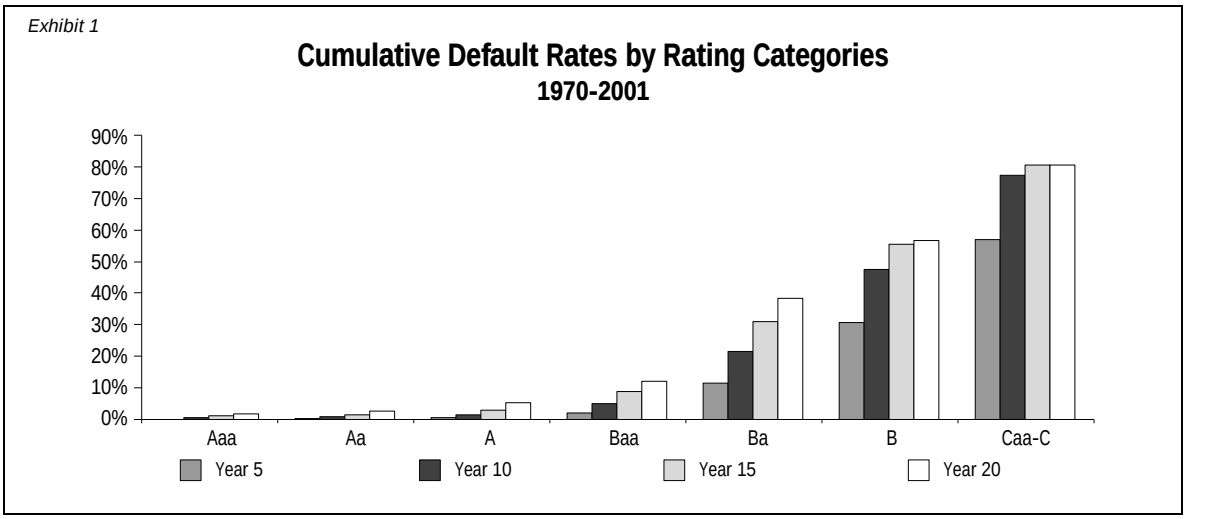
Over 3,500 of the more than 16,000 corporate issuers that Moody's has rated since 1920 defaulted at some point in time. Our default research illustrates the strong historical relationship between Moody's ratings and subsequent average default and loss experience at different investment horizons. Most of our empirical analysis of the broad ratings categories (Aaa, Aa, A, Baa, Ba, B, Caa, Ca, C) has focused on the last three decades. However, when we analyze the performance of our more refined ratings (using the 1,2,3 modifiers), we consider data only from 1983 to the present, since modifiers were first introduced in April 1982.

5. Again, we do not allow potential, causal impacts of a rating action to restrict our ratings.
6. See Moody's Special Comment *An Historical Analysis of Moody's Watchlist*, October 1998.

Cumulative Default Rates By Rating Categories

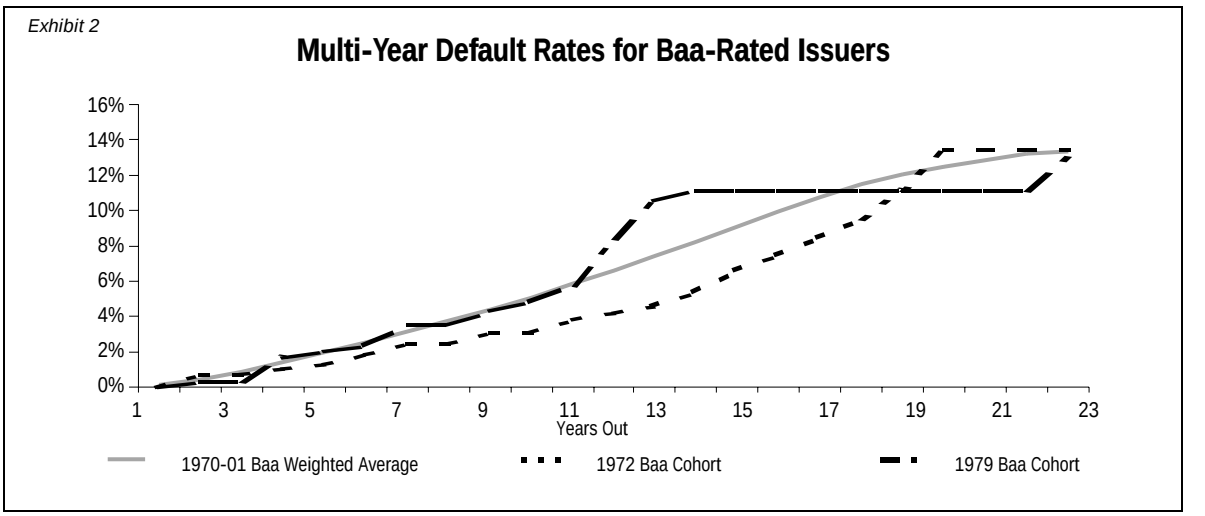
Exhibit 1 presents the standard measure of the relationship between ratings and default risk, as expressed by differences in long-term cumulative default rates across rating categories. Over investment horizons as long as 20 years, Moody's ratings have proven a reliable guide to differences in default risks.

Exhibit 1



As suggested by Exhibit 1, Moody's bond ratings are not specific to any particular investment horizon. Rather, they provide signals about relative default risk over multiple investment horizons. Perhaps this can be best understood by considering the way in which we calculate average cumulative default rates. As indicated in Exhibit 2, an average cumulative default rate incorporates the default experience of many different annual cohorts (i.e., groups of issuers that began the year of the cohort's formation carrying the same rating).

Exhibit 2



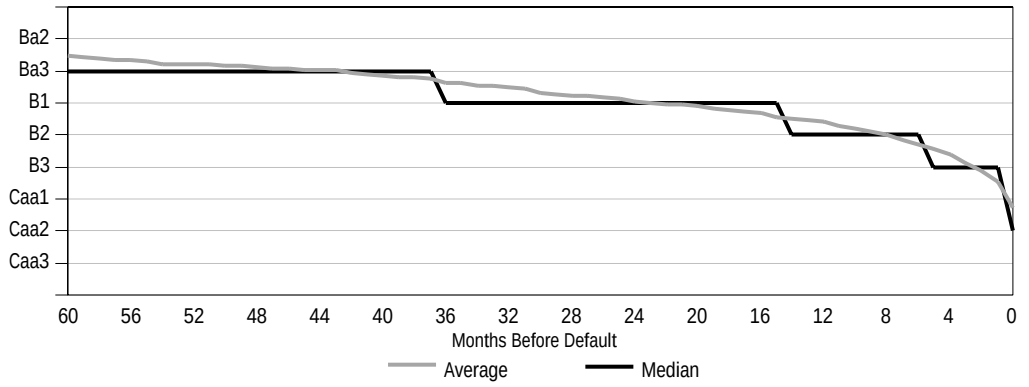
Over short periods of time, the default experience of similarly rated cohorts from different formation years often diverge. For example, while the 1979 Baa-rated cohort experienced a higher cumulative default rate than did the 1972 cohort for most of its first fifteen years, their cumulative default experiences converged in later years.

Long-term cumulative default rates summarize average default experience as a function of ratings that were assigned to issuers many years before default. In practice, Moody's monitors the evolution of issuers' creditworthiness over time and lowers or raises the ratings of issuers that experience substantial deterioration or improvement, respectively, in credit standings.

Ratings Prior To Default

Exhibit 3

Mean and Median Rating Prior to Default, 1983 - 2001



Note: "Average" is calculated by associating an integer with the rating; eg: Aaa = 1; Aa1 = 2, etc. and averaging the integers.

As indicated in Exhibit 3, firms that do eventually default typically have very low ratings long before the default event. A full five years before the event, the typical defaulting firm is already rated speculative grade at Ba3, which is four broad rating categories and twelve rating "notches" (counting the 1, 2, 3 broad rating modifiers) below the highest rating on the scale, Aaa. Within three years of default, the typical firm's rating is B1, and then its rating continues to fall until it is rated at Caa2 at default.

The distribution of ratings one year prior to default, shown in Exhibit 4, indicates a fairly tight grouping around the low speculative grade level. The median rating one year before default is B2 — one-half of all defaulting issuers had ratings equal to or below this category.

Exhibit 4

Distribution of Ratings One Year Prior to Default, 1983 - 2001

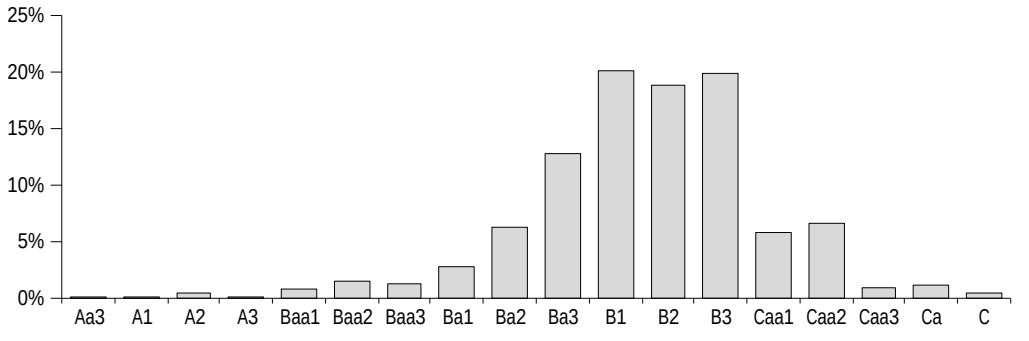
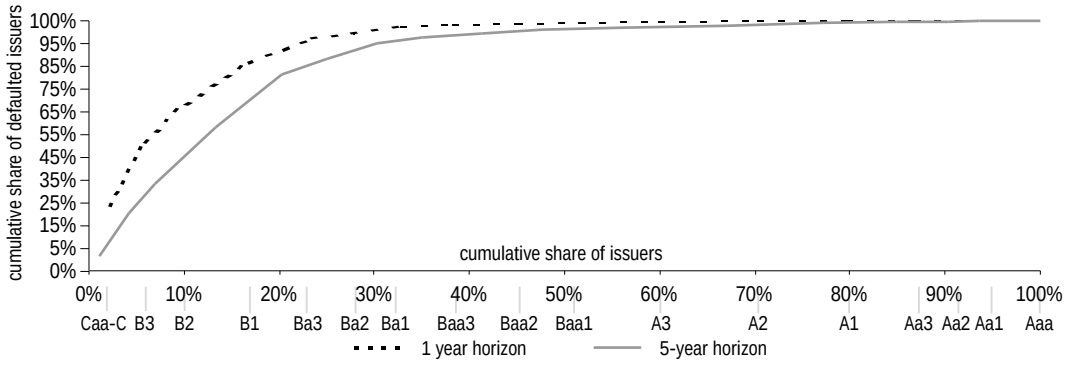


Exhibit 5 provides another perspective on the power with which ratings discriminate defaulters from non-defaulters. As indicated, over 90% of all rated companies that have defaulted since 1983 were rated Ba3 or lower at the beginning of the year in which they defaulted, and almost 80% were rated Ba3 or lower at the beginning of the fifth year before they defaulted.

Exhibit 5

1-Year & 5-Year Default Cumulative Accuracy Profile



Variability of Default Rates by Rating Category

Moody's ratings measure relative risk over a continuous horizon and do not target specific expected default probabilities over specific horizons. Realized default frequencies are, in fact, quite variable over short periods of time. For example, as indicated in Exhibit 6, the standard deviation of five-year cumulative default rates is almost as large — and in Aaa through A categories, larger — than the mean five-year default rate for those same rating categories.

Exhibit 6

Five-Year Cumulative Default Rates for Annual Cohorts formed 1970 through 1997

	Mean	Standard Deviation	Minimum	Maximum
Aaa	0.1%	0.6%	0.0%	2.5%
Aa	0.3%	0.5%	0.0%	1.9%
A	0.5%	0.7%	0.0%	2.6%
Baa	1.9%	1.4%	0.0%	5.4%
Ba	11.5%	7.4%	2.5%	24.0%
B	30.8%	12.2%	3.6%	44.6%
Caa-C	56.6%	25.1%	0.0%	100.0%

Exhibit 6 also shows that there is greater dispersion of default outcomes at lower rating categories. This greater dispersion is the result of two contributing factors. Economic events have a greater impact on lower-rated firms due to their greater vulnerability to shocks. Also, Moody's typically adjusts ratings modestly — not sharply — through the credit cycle because the amplitude and timing of cycles are inherently hard to predict.

The reason why there is dispersion in actual default rates for annual cohorts is that Moody's does not endeavor to maintain constant ex-post default rates in various credit cycles. Given that Moody's ratings target multiple horizons, even with perfect information about the credit cycle, it would be difficult to prescribe the "correct" amount by which ratings should adjust in response to cyclical variations while maintaining constant ex-post default rates for each horizon.

Some investors, however, are very concerned with the expected absolute default rate associated with ratings over short horizons—particularly in the high-yield sector. To meet these investors' needs, Moody's provides a model-based, monthly forecast of the one-year-ahead, speculative-grade default rate. This model, and models like it, can be used by investors to translate Moody's "through-the-cycle" relative rating system to a "point-in-time" cardinal rating system.

Default Severity And Recovery Rates

As statements about expected credit loss, Moody's ratings incorporate assessments of both the likelihood of default and the severity of loss, given default. While the likelihood of default is roughly the same for various debt obligations of the same obligor, these obligations are readily differentiated by the severity of the loss that may be expected in the event of default (as shown in Exhibit 7). For this reason, when rating debt obligations, Moody's pays close attention to the effective security and seniority of the instrument — two of the most important determinants of the post-default recovery that investors may realize. Moody's has also extensively

analyzed the cyclical variation in recovery rates in defaulted bonds, and has found that average recovery rates are lower in periods of high relative default rates, and higher in periods of low relative default rates. [7]

Exhibit 7

Average Debt Prices As a Percent of Face Value One Month After Default, 1982-2001

Senority	Recovery
Sr. Secured Bank Loans	64%
Sr. Unsecured Bank Loans	48%
Equipment Trust Certficates	66%
Sr. Secured Bonds	53%
Sr. Unsecured Bonds	40%
Sr. Subordinated Bonds	32%
Subordinated Bonds	31%
Jr. Subordinated Bonds	22%

Rating Transitions and Serial Dependence

Exhibit 8 depicts historical average one-year rating transition rates for senior unsecured obligations of corporate bond issuers. The table shows the average one-year transition rates for annual cohorts formed between 1970 and 2001, where each annual cohort is weighted by its size (the number of issuers).

Exhibit 8

One-Year Average Rating Transition Matrix, 1970-2001

		Rating to: Aaa	Aa	A	Baa	Ba	B	Caa-C	Default	WR
Rating from:	Aaa	89.09%	7.15%	0.79%	0.00%	0.02%	0.00%	0.00%	0.00%	2.94%
	Aa	1.17%	88.00%	7.44%	0.27%	0.08%	0.01%	0.00%	0.02%	3.01%
	A	0.05%	2.41%	89.01%	4.68%	0.49%	0.12%	0.01%	0.01%	3.21%
	Baa	0.05%	0.25%	5.20%	84.55%	4.51%	0.69%	0.09%	0.15%	4.51%
	Ba	0.02%	0.04%	0.47%	5.17%	79.35%	6.23%	0.42%	1.19%	7.11%
	B	0.01%	0.02%	0.13%	0.38%	6.24%	77.82%	2.40%	6.34%	6.67%
	Caa-C	0.00%	0.00%	0.00%	0.57%	1.47%	3.81%	62.90%	23.69%	7.56%

Exhibit 8 reveals some important features of the behavior of ratings and Moody's rating process over one-year horizons. Higher ratings have generally been less likely than lower ratings to be revised over a one-year period. For example, the inertial frequency for Aaa-rated issuers, was 89% — i.e., the ratings of 89% of Aaa-rated issuers did not change within one year. By contrast, an issuer that began the year within the broad B rating category ended the year with that same broad rating only 78% of the time. We also note that, for issuers holding ratings in the middle of the rating scale, the likelihood of a rating upgrade and a rating downgrade is roughly symmetrical. Of course, Aaa-rated issuers can only migrate down the rating scale (or exit the pool via default or withdrawn ratings (WR)), while Caa-rated issuers can only migrate up the rating scale (or exit the pool via default or a withdrawn rating).

Exhibit 8 presents a so-called "unconditional" rating transition matrix, treating all issuers with a specific rating the same, regardless of how they came to have that rating (either through their initial rating assignments, downgrades or upgrades).

Exhibit 9

One-Year Conditional Rating Transitions, 1984-2001

Rating Changes Over One Year	Following These Rating Actions During Previous Year: Upgraded	Unchanged	Downgraded
Upgraded	16.17%	8.83%	7.46%
Unchanged	76.23%	76.73%	66.43%
Downgraded	6.86%	13.34%	20.33%
Default	0.74%	1.10%	5.78%
	100.00%	100.00%	100.00%

One-Year Conditional Default Rates, 1984-2001

Initial Rating Level	Following These Rating Actions During Previous Year: Upgraded	Unchanged	Downgraded
Ba1	0.00%	0.87%	1.09%
Ba2	0.35%	0.60%	1.79%
Ba3	2.31%	2.59%	3.53%
B1	1.86%	3.97%	3.96%
B2	0.85%	5.25%	10.47%
B3	11.70%	8.41%	23.00%
Caa-C	11.86%	9.92%	32.38%

7. See *Default & Recovery Rates of Corporate Bond Issuers*, February 2002, and *LossCalc: Moody's Model for Predicting Loss Given Default*, February 2002, for a full discussion.

Exhibit 9 reveals that, in fact, historical rating transition frequencies vary sharply, depending on whether a company's rating was downgraded, unchanged, or upgraded in the previous year. Companies that have recently been upgraded are roughly twice as likely to be upgraded again during the following year, as compared with companies that have recently been downgraded or have experienced no recent rating change at all. Similarly, over the following year, companies that have recently been downgraded are: (a) almost one and one-half times more likely to be downgraded and five times more likely to default than companies that experienced no prior rating change; and (b) three times more likely to be downgraded and nearly eight times more likely to default than companies that have recently been upgraded.

These differences in rating transitions for issuers that had been previously downgraded or upgraded should be considered in a broader context. Although they appear to be substantial in the short run, the differences are likely to be less pronounced over longer horizons. Moreover, the differences are likely to be considerably smaller for issuers that are assigned stable outlooks following a rating change. On the other hand, these differences are likely to be more pronounced for issuers who either (1) remain on review for downgrade or are assigned a negative outlook following a rating downgrade, or (2) remain on review for upgrade or are assigned a positive outlook following a rating upgrade.

Exhibit 9 also reveals that conditional one-year default rates by broad rating category may vary, depending on whether or not an issuer experienced a rating change during the prior year. For some rating levels, the default rate for an issuer that experienced a downgrade during the prior year is almost double that for issuers holding the same rating but whose ratings were upgraded. Small sample sizes for upgraded B2, B3 and Caa-C rated issuers contribute to the anomalous results shown for these categories.

The ratings momentum demonstrated in Exhibit 9 is a natural consequence of our rating system-management practices. These do two things in particular: (a) limit rating changes when there are substantial possibilities of near-term rating reversals; and (b) dampen potential ratings volatility by incrementally adjusting ratings in response to changes in credit fundamentals, and by using other signals in the rating system to indicate likely additional rating changes (as described earlier). We will publish follow-up studies of these effects as we gather further information.

Conclusion

In summary, credit ratings powerfully discriminate among relative long-term risks. They target multiple horizons, rather than a single, defined investment horizon. Moreover, they do not target constant, absolute expected credit-loss rates by rating category. Investors who wish to make the best use of credit ratings should understand these properties of the ratings.

Moody's believes that our ratings system-management practices, as set forth above, are desired by both issuers and investors. Issuers want stability in ratings and the opportunity to make changes in their financial condition, if possible, to avoid changes in ratings. Investors want ample notice of potential rating changes, in part because of investment requirements and restrictions that may be placed on them by owners of funds or their representatives such as endowments and pension fund sponsors, and especially with respect to rating changes resulting in changes in indices against which the investors may be measured.

Moody's has carefully considered whether our ratings system-management practices diminish the primary social value or public good that rating agencies can produce, which is greater efficiency in capital markets. We believe that ratings momentum, as we have described it, does not detract from capital market efficiency or permit transfer of wealth between sophisticated and unsophisticated investors.

In general, Moody's does not believe that the information conveyed by rating outlooks, the Watchlist, or ratings themselves benefits one class of investors over another. Moody's disseminates this information publicly and believes that market participants understand the information equally.

Moody's also believes that our ratings system management does not benefit issuers or investment and commercial banks, which may have extended credit to issuers or have opportunities for important fees, over investors with existing or potential positions. Moody's buy-side meetings have strongly confirmed that investors dislike downgrades as much as issuers, and probably more than investment bankers, who have many opportunities for additional fees, including opportunities from downgrades.

Moody's also notes that corporate bonds are generally held by financial institutions or in investment vehicles — pension fund investments or mutual funds advised by institutional investors — rather than by individuals, and believes that institutional investors are well aware of the attributes of Moody's rating system.[8] In addition, common market wisdom is that prices of corporate bonds generally adjust, based on changes in rating

outlooks or the Watchlist, as well as on changes in the ratings themselves. Moody's has not previously maintained a database of our rating outlooks, but will do so in the future and will carefully monitor and make public an analysis of bond price changes following changes in rating outlooks, the Watchlist, and ratings. Finally, this Special Comment should better inform issuers, investors, and owners of funds or their representatives about Moody's ratings system-management practices so that they can make any adjustments they desire in their uses of Moody's rating system.

In order to promote a clearer understanding of Moody's management of the rating system and the signals conveyed by bond ratings, as well as other signals-rating outlooks and the Watchlist-of the rating system, we have detailed in this paper how Moody's conducts and will conduct its corporate bond-rating activities, the intended meaning of Moody's ratings, and their empirical attributes. Our dialog with the market suggests that improved transparency of our behavior and of the meaning and attributes of ratings may help users better utilize them in their financing, investment, and related decisions. Moody's bond ratings are not high-frequency sources of information. Instead, they are based on careful, deliberate analysis and will sometimes appear to "lag the market."

Nevertheless, we believe that a rating system expressing independent credit opinions derived from fundamental analysis provides a valuable means of overcoming the asymmetry of information between borrowers and lenders in the global capital markets and contributes to investor protection and market efficiency. Our objective is to continue to manage the rating system in a way that best meets the needs of market participants and contributes to market efficiency.

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2. *Moody's Rating Migration and Credit Quality Correlation, 1920-1996*, July 1997.
3. *Predicting Default Rates: A Forecasting Model for Moody's Issuer-Based Default Rates*, August 1999.
4. *Debt Recoveries for Corporate Bankruptcies*, June 1999.
5. *An Historical Analysis of Moody's Watchlists*, October 1998.
6. *Testing for Rating Consistency in Annual Default Rates*, February 2001.

8. Moody's will continue to monitor direct individual participation in the corporate bond market and notes that during 2001 there was significant issuance of structured notes for retail customers based on corporate bonds.

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